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APPENDIX A

United States Court of Appeals for the Federal Circuit

B/E AEROSPACE, INC.,
Appellant

v.

C&D ZODIAC, INC,
Appellee

2019-1935, 2019-1936

Appeals from the United States Patent and Trademark Office, Patent Trial and Appeal Board in Nos. IPR2017-01275, IPR2017-01276.

Decided: June 26, 2020

MORGAN CHU, Irell & Manella LLP, Los Angeles, CA, for appellant. Also represented by MICHAEL RICHARD FLEMING.

JOHN C. ALEMANNI, Kilpatrick Townsend & Stockton LLP, Raleigh, NC, for appellee. Also represented by MICHAEL T. MORLOCK, DAVID A. REED, Atlanta, GA; STEVEN MOORE, San Francisco, CA; ANDREW WILLIAM RINEHART, Winston-Salem, NC.

Before LOURIE, REYNA, and HUGHES, *Circuit Judges*.

REYNA, *Circuit Judge*.

B/E Aerospace, Inc. appeals a final written decision of the Patent Trial and Appeal Board that found certain claims of B/E's aircraft lavatory-related patents obvious. B/E contends that the Board's decision is erroneous because the Board incorporated a claim limitation that is not present in the prior art. B/E also contends that the Board erred by relying on printed matter that does not qualify as prior art under 35 U.S.C. § 311(b). We conclude that the Board's final determination of obviousness is correct, and we do not reach the § 311(b) issue. On that basis we affirm the Board's final written decision.

BACKGROUND

This appeal arises from an inter partes review ("IPR") proceeding. Petitioner, C&D Zodiac, Inc. ("Zodiac"), challenged two patents owned by B/E Aerospace, Inc. ("B/E"), U.S. Patent No. 9,073,641 ("the '641 patent") and U.S. Patent No. 9,440,742 ("the '742 patent") (collectively, "the challenged patents").

The technology involved in this appeal is simple. The challenged patents relate to space-saving technologies for aircraft enclosures such as lavatory enclosures, closets, and galleys. *C&D Zodiac, Inc. v. B/E Aerospace, Inc.*, No. IPR2017-01275 at 4

(P.T.A.B. Oct. 23, 2018). Each patent contains a two-page written description that teaches an enclosure with contoured walls designed to "reduce or eliminate the gaps and volumes of space required between lavatory enclosures and adjacent structures." '641 patent at 1:52–56. In other words, the patents are directed to space-saving modifications to the walls of aircraft enclosures; they are not directed to the structures contained within those walls. *Id.*; *see* IPR2017-01275 at 15.

The parties agree that, for purposes of this appeal, the challenged patents and claims are not materially different and that claim 1 of the '641 patent is representative of the challenged claims.

Claim 1 of the '641 patent provides:

> 1. An aircraft lavatory for a cabin of an aircraft of a type that includes a forward-facing passenger seat that includes an upwardly and aftwardly inclined seat back and an aft-extending seat support disposed below the seat back, the lavatory comprising:
>
> a lavatory unit including a forward wall portion and defining an enclosed interior lavatory space, said forward wall portion configured to be disposed proximate to and aft of the passenger seat and including an exterior surface having a shape that is substantially not flat in a vertical plane; and

> wherein said forward wall portion is shaped to substantially conform to the shape of the upwardly and aftwardly inclined seat back of the passenger seat, and includes a ***first recess*** configured to receive at least a portion of the upwardly and aftwardly inclined seat back of the passenger seat therein, and further includes a ***second recess*** configured to receive at least a portion of the aft-extending seat support therein when at least a portion of the upwardly and aftwardly inclined seat back of the passenger seat is received within the first recess.

'641 patent at 4:63–5:17 (emphases added).

This appeal focuses on the "first recess" and "second recess" limitations, labeled as elements 34 and 100, respectively, in Figure 2 below.

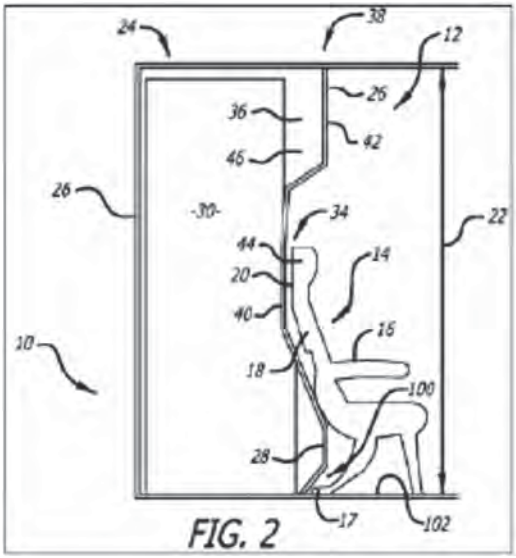


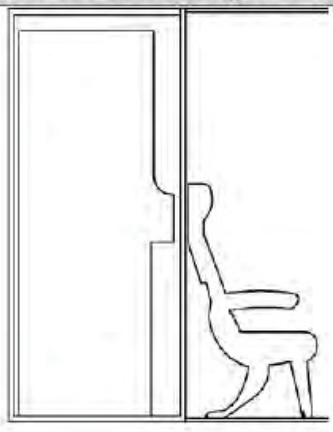
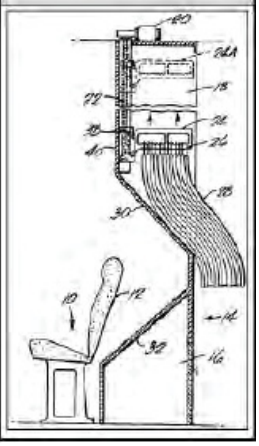
FIG. 2

'641 patent at Fig. 2.

A. Prior Art

Zodiac's petition asserted two grounds of unpatentability. The Board instituted on both grounds. During the proceeding, Zodiac requested a partial adverse judgment, which the Board granted. This left only one instituted ground: that the challenged claims were obvious over the so-called "Admitted Prior Art" and U.S. Patent No. 3,738,497 ("Betts").

In its petition, Zodiac defined the "Admitted Prior Art" as certain portions of the challenged patents, including Figure 1. *See* '641 patent at 1:65–67. As shown below, Figure 1 of the Admitted Prior Art discloses a flat, forward-facing lavatory wall immediately behind a passenger seat that has a rear seat leg extending toward the back of the plane (referred to as an "aft-extending seat support").

Admitted Prior Art: Fig. 1 of the Challenged Patents	**Betts: Fig. 1**
	

Betts discloses an airplane passenger seat with a tilting backrest. Behind the seat is a coat closet that has luggage space along the floor and an overhead coat compartment. Betts at 2:8–14. Rather than a flat forward-facing wall, Betts discloses a contoured forward-facing wall to receive the tilted backrest. *Id.* at 2:19–24. The "lower portion 30 of the coat compartment 18" of Betts "slants rearwardly to provide a space for seatback 12 to be tilted rearwardly." *Id.* The "top 32 of storage space 16 also slants rearwardly so as not to interfere with seatback 12 when tilted." *Id.*

B. Obviousness

In its final written decision, the Board concluded that Zodiac had proven that the challenged claims would have been "obvious over the Admitted Prior Art and Betts." IPR2017-01275 at 39. The Board determined that Betts's contoured wall design met the "first recess" claim limitation. *Id.* at 17 (citing Betts at 2:19–24).[1] The Board also found that skilled artisans (airplane interior designers) would have been motivated to modify the flat forward-facing wall of the lavatory in the Admitted Prior Art with Betts's contoured, forward-facing wall because skilled artisans were interested in adding space to airplane cabins, and Betts's design added space by permitting the seat to be moved further aft. *Id.* at 14–17.

[1] B/E does not challenge the Board's finding that Betts teaches the "first recess" limitation.

The Board found that a skilled artisan would have found it "obvious to further modify the Admitted Prior Art/Betts combination to include the 'second recess' to receive passenger seat supports." *Id.* at 22. The Board used two separate approaches presented by Zodiac to reach that conclusion.[2]

First, Zodiac argued that "the logic of using a recess to receive the seat back applies equally to using another recess to receive the aft extending seat support." *Id.* At 18. The Board found Zodiac's arguments and testimony "credible and convincing." *Id.* at 22. The Board agreed with Zodiac that creating a recess in the wall to receive the seat support was an obvious solution to a known problem. The Board relied on the testimony of Zodiac's expert, Mr. Anderson, who opined that the addition of a second recess "is nothing more than the application of a known technology (i.e., Betts) for its intended purpose with a predictable result (i.e., to position the seat as far back as possible). *Id.* at 18, 23. Mr. Anderson explained that a skilled artisan "would be motivated to modify an enclosure, such as a lavatory, to include a second recess to receive aft facing seat supports"; that this "modification is nothing more than the application of known technology for its intended purpose"; and that the "result of such a modification is predictable, allowing the seat to be positioned further aft in an aircraft." J.A. 1850 ¶191*; see also* IPR2017-01275 at 23, 26.

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[2] The Board stated that it reached its obviousness conclusion through a "traditional approach" and a "common sense" approach. J.A. 156 n.1.

Second, the Board found that Zodiac "established a strong case of obviousness based on the Admitted Prior Art and Betts, coupled with common sense and the knowledge of a person of ordinary skill in the art." IPR2017-01275 at 34. Relying on the testimony of Mr. Anderson, the Board found that recesses configured to receive seat supports "were known in the art" and that "it would have been a matter of common sense" to incorporate a second recess in the Admitted Prior Art/Betts combination. *Id.* at 26.

C. Design Drawings

Zodiac attached to its petition three "design drawings" that undisputedly depict "enclosures that include a lower recess to receive a seat support," i.e., a "second recess." *Id.* at 19. Zodiac did not identify these design drawings as prior art references for any of the enumerated grounds of unpatentability. Instead, Zodiac asserted the drawings as evidence that lower recesses to receive a seat support were "known in the art." *Id.* at 21.

B/E moved to exclude the design drawings and the related testimony on the basis that Zodiac had not shown that the drawings were "patents" or "printed publications" within the meaning of 35 U.S.C. § 311(b). J.A. 513–18. Section 311(b) provides that, in an IPR proceeding, claims may be cancelled as unpatentable only on the basis of prior art consisting of "patents or printed publications."

The Board denied the motion to exclude. IPR2017-01275 at 22–23, 40–41. The Board determined that two of the designs, the SAS MD-90

and the 737 Storage, were in public use or on sale prior to the critical date of the challenged patents. *Id.* But the Board explained that it considered the design drawings only for the purpose of "identify[ing], specifically, the knowledge of those skilled in the art." *Id.* at 24. When used for those purposes, the Board explained, the drawings "need not be 'printed publication' prior art." *Id.* at 41-42; *see also id.* at 24.

B/E requested a rehearing of the Board's determination regarding the design drawings. B/E argued that the Board "misapprehended and/or overlooked the statute defining the scope of IPRs, 35 U.S.C. § 311(b)." J.A. 652. B/E argued that the design drawings and the related testimony "fall[] outside the scope of IPRs, which are instituted only on the basis of prior art consisting of patents or printed publications." *Id.* B/E also challenged the Board's reliance on "common sense" in finding obviousness. The Board denied the request for rehearing.

B/E timely appealed. We have jurisdiction under 28 U.S.C. § 1295(a)(4)(A).

ANALYSIS

We review final written decisions of the Board in accordance with the Administrative Procedure Act, 5 U.S.C. § 706(2) (2012). *HTC Corp. v. Cellular Commc'ns Equip., LLC*, 877 F.3d 1361, 1367 (Fed. Cir. 2017). Obviousness is a question of law with underlying factual findings relating to the scope and content of the prior art; differences between the

prior art and the claims at issue; the level of ordinary skill in the pertinent art; the presence or absence of a motivation to combine or modify prior art with a reasonable expectation of success; and any objective indicia of non-obviousness. *Acoustic Tech., Inc. v. Itron Networked Sols., Inc.*, 949 F.3d 1366, 1373 (Fed. Cir. 2020). We review *de novo* the Board's legal conclusions of obviousness and its factual findings for substantial evidence. *HTC Corp. v. Cellular Commc'ns Equip., LLC*, 877 F.3d 1361, 1369 (Fed. Cir. 2017). Substantial evidence is "such relevant evidence as a reasonable mind might accept as adequate to support a conclusion." *Consol. Edison Co. v. NLRB*, 305 U.S. 197, 229 (1938). We do not reweigh evidence on appeal. *Impax Labs. Inc. v. Lannett Holdings Inc.*, 893 F.3d 1372, 1382 (Fed. Cir. 2018).

B/E raises two general issues on appeal. First, B/E argues that the Board's obviousness determination is erroneous because it improperly incorporated a second recess limitation not disclosed in the prior art. Second, B/E contends that the Board erred by relying on the design drawings, which are not prior art "patents or printed publications" under 35 U.S.C. § 311(b).

A. Obviousness

The Board found that Zodiac established a "strong case of obviousness." We agree. There is no dispute that Betts's contoured wall design meets the "first recess" claim limitation. Nor do the parties dispute that a skilled artisan would have been motivated to modify the Admitted Prior Art with

Betts's contoured wall because skilled artisans were interested in maximizing space in airplane cabins. IPR2017-01275 at 14–17. Only the "second recess" limitation is at issue.

We find no error in the Board's conclusion that—under both approaches it employed—"it would have been obvious to further modify the Admitted Prior Art/Betts combination to include the claimed 'second recess' to receive passenger seat supports." *Id.* at 22.

First, we affirm the Board's conclusion that the challenged claims would have been obvious because modifying the Admitted Prior Art/Betts combination to include a second recess was nothing more than the predictable application of known technology. *Id.* at 23. The prior art yields a predictable result, the "second recess," because a person of skill in the art would have applied a variation of the first recess and would have seen the benefit of doing so. *KSR Int'l Co. v. Teleflex Inc.*, 550 U.S. 398, 416 (2007) ("The combination of familiar elements according to known methods is likely to be obvious when it does no more than yield predictable results. . . . If a person of ordinary skill in the art can implement a predictable variation § 103 likely bars its patentability."). The Board's conclusion is supported by substantial evidence, namely the expert testimony of Mr. Anderson, who opined:

> [A] person of ordinary skill in the art would recognize that as a seat is moved further aft the seat support necessarily is also moved further aft. As the seat is moved aft the feet of the seat support may come into contact with

> the lower section of the wall. Creating one or more recesses to accommodate whatever portion(s) of the seat support that would contact the forward wall of the enclosure is the obvious solution to this known problem.

J.A. 1787 ¶ 74.

Second, we also affirm the Board's conclusion that the challenged claims would have been obvious because "it would have been a matter of common sense" to incorporate a second recess in the Admitted Prior Art/Betts combination. IPR2017-01275 at 26, 38. B/E asserts that the Board legally erred by relying on "an unsupported assertion of common sense" to "fill a hole in the evidence formed by a missing limitation in the prior art." Appellant Br. 14. B/E argues that the Board acted contrary to our precedent in *Arendi S.A.R.L. v. Apple Inc.*, 832 F.3d 1355, 1361 (Fed. Cir. 2016), because the Board failed to provide a "reasoned explanation and record evidence to support its position." *Id.* at 25. We disagree.

In *KSR*, the Supreme Court opined that common sense serves a critical role in determining obviousness. 550 U.S. at 421. As the Court explained, common sense teaches that familiar items may have obvious uses beyond their primary purposes, and in many cases a person of ordinary skill will be able to fit the teachings of multiple patents together like pieces of a puzzle. *Id.* ("A person of ordinary skill is also a person of ordinary creativity, not an automaton."). The Court held that

"rules that deny factfinders recourse to common sense" are inconsistent with our case law. *Id.*

After *KSR*, we recognized that courts must "consider common sense, common wisdom, and common knowledge in analyzing obviousness." *Arendi*, 832 F.3d at 1361. However, we cautioned that common sense cannot be used as a "wholesale substitute for reasoned analysis and evidentiary support, especially when dealing with a limitation missing from the prior art references specified." *Id.* at 1362. Likewise, in *Perfect Web Techs, Inc. v. InfoUSA, Inc.*, we reiterated that "[c]ommon sense has long been recognized to inform the analysis of obviousness if explained with sufficient reasoning." 587 F.3d 1324, 1328 (Fed. Cir. 2009).

Here, the Board's invocation of common sense was properly accompanied by reasoned analysis and evidentiary support. The Board dedicated more than eight pages of analysis to the "second recess" limitation and relied on Mr. Anderson's detailed expert testimony. IPR2017-01275 at 21 (citing J.A. 1786–88 ¶¶ 74–75, J.A. 1849–50 ¶¶ 189–92). The Board noted Mr. Anderson's opinion that a "person of ordinary skill in the art would recognize that as a seat is moved further aft the seat support necessarily is also moved further aft." *Id.* (citing J.A. 1786–87 ¶¶ 74–75). The Board also cited Mr. Anderson's opinion that "lower recesses were a well-known solution to provide space for seat supports where a recess for a seat back in the forward wall of the enclosure unit permitted the seat to be located further aft." *Id.*; J.A. 1787–88 ¶ 75.

In *Perfect Web*, we affirmed a district court's invocation of common sense to supply a missing claim limitation. 587 F.3d at 1338. The missing limitation was step D of steps A–D of a method for delivering a predetermined quantity of emails. *Id.* at 1328. The record showed that the technology was simple and that "step (D) merely involves repeating earlier steps" until success is achieved. *Id.* at 1330. We also determined that the district court "adequately explained its invocation of common sense." *Id.*

Here, just like in *Perfect Web*, the evidence shows that the technology of the claimed invention is simple. The patents relate to contoured walls that "reduce or eliminate the gaps and volumes of space required between lavatory enclosures and adjacent structures." '641 patent at 1:52–56. *See also* IPR2017-01275 at 23 (rejecting B/E's argument that the enclosures at issue are quite complex); J.A. 403. The missing claim limitation (the "second recess") involves repetition of an existing element (the "first recess") until success is achieved. IPR2017-01275 at 18 (reasoning that the logic of using a recess to receive the seat back applies equally to using another recess to receive the aft extending seat support).

We find no error in the Board's conclusion that a skilled artisan would have used common sense to incorporate a second recess in the Admitted Prior Art/Betts combination. We therefore affirm the Board's obviousness conclusion under both of its approaches.

B. Design Drawings

B/E asserts that the Board violated 35 U.S.C. § 311(b) by relying on the design drawings because they are neither patents nor printed publications. The Board, however, did not rely on the design drawings when it found the challenged claims obvious. When the Board found the challenged claims obvious under a "traditional obviousness approach," it relied on expert testimony:

> While we found Petitioner's common sense rationale persuasive, Petitioner's argument and evidence, including the testimony of Petitioner's expert, support the conclusion that the challenged claims are obvious under a traditional obviousness approach that does not rely on the "common sense" rationale supported by [the design drawings].

J.A. 156 n.1. Likewise, when the Board separately found the challenged claims obvious based on "common sense," its conclusion did not rest on its consideration of those drawings:

> We concluded that Petitioner met [the *Arendi* common sense] standard based not only on the citation to second recesses in the [design drawings], but also on the rationale and related analysis provided by Petitioner's expert that we credited and found convincing before addressing the public use/on sale references. We also credited the testimony of Petitioner's expert that the proposed modification would have been predictable.

> Accordingly, because our analysis relied on the analysis and reasoning of Petitioner's expert regarding why it would have been obvious and a matter of common sense to add a second recess, . . . [the design drawings] were instead used as further evidence in support of the common sense argument.
>
> . . .
>
> Because we found the expert analysis credible apart from its reliance on the [design drawings], we need not reach whether supplying a missing limitation via a "common sense" argument, based solely on public uses/sales, runs afoul of § 311(b).

J.A. 165–66, n.2.

We agree that the Board's obviousness conclusions are independently supported by "Petitioner's argument and evidence, including the testimony of Petitioner's expert." J.A. 156 n.1. The Board instituted on grounds supported by the Admitted Prior Art and Betts. The Board fully articulated its conclusion of obviousness, and we conclude that substantial evidence supports the Board's determination of obviousness independent of the design drawings. Accordingly, we need not reach the issues raised by B/E on whether the Board ran afoul of § 311(b) by considering the design drawings.

Conclusion

We have considered B/E's other arguments and find them unpersuasive. For the reasons stated above, we affirm the Board's determination that claims 1, 3–10, and 12–17 of U.S. Patent No. 9,073,641, and claims 8 and 10–16 of U.S. Patent No. 9,440,742, are invalid as obvious.

AFFIRMED

APPENDIX B

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

C&D ZODIAC, INC.,
Petitioner

v.

B/E AEROSPACE, INC.,
Patent Owner.

Case IPR2017-01276
Patent 9,440,742 B2

Before JENNIFER S. BISK, SCOTT A. DANIELS, and RICHARD H. MARSCHALL, *Administrative Patent Judges.*

MARSCHALL, *Administrative Patent Judge.*

FINAL WRITTEN DECISION
35 U.S.C. § 318(a) and 37 C.F.R. § 42.73

I. INTRODUCTION

C&D Zodiac, Inc. ("Petitioner"), filed a petition to institute an *inter partes* review of claims 8 and 10–

16 of U.S. Patent No. 9,440,742 B2 (Ex. 1001, "the '742 patent"). Paper 2 ("Pet."). 35 U.S.C. § 311. B/E Aerospace, Inc. ("Patent Owner"), filed a Preliminary Response. Papers 6, 7 ("Prelim. Resp.").[1] Upon consideration of the Petition and Preliminary Response, we instituted an *inter partes* review pursuant to 35 U.S.C. § 314, as to claims 8 and 10–16. Paper 12 ("Inst. Dec.").

Subsequent to institution, Patent Owner filed a Patent Owner Response (Paper 21, 22, "PO Resp.")[2] and Petitioner filed a Reply to Patent Owner's Response (Paper 28, "Reply"). Patent Owner filed a Motion to Exclude (Paper 34, "Mot. Exclude"), Petitioner filed an Opposition to Patent Owner's Motion (Paper 37, "Opp."), and Patent Owner filed a Reply (Paper 38, "PO Reply to Mot. Exclude"). Patent Owner also filed two unopposed Motions to Seal. Papers 8, 20.

On June 28, 2018, in response to the Board's Orders instituting on Ground 2 based on the Supreme Court's decision in *SAS Institute Inc. v. Iancu*, 138 S. Ct. 1348 (2018), Petitioner filed a Request for Partial Adverse Judgment against itself

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[1] Patent Owner filed two versions of the Preliminary Response: Paper 6, to which access is restricted to the parties and the Board; and Paper 7, a publicly available, redacted version of Paper 6.

[2] Patent Owner filed two versions of the Patent Owner Response: Paper 21, to which access is restricted to the parties and the Board; and Paper 22, a publicly available, redacted version of Paper 21.

with respect to Ground 2, pursuant to 37 C.F.R. § 42.73(b). *See* Paper 30 (modifying institution decision to institute on all challenged grounds presented in Petition); Paper 33 (Petitioner's Request for Partial Adverse Judgment as to Ground 2). We granted Petitioner's Request for Partial Adverse Judgment on July 5, 2018. Paper 36 (granting adverse judgment as to Ground 2).

On August 3, 2018, we held an oral hearing. Paper 40 ("Tr.").[3]

This Final Written Decision is entered pursuant to 35 U.S.C. § 318(a). For the reasons that follow, we determine that Petitioner has demonstrated by a preponderance of the evidence that claims 8 and 10–16 of the '742 patent are unpatentable.

A. Related Matters

Patent Owner asserted the '742 patent along with related patents, U.S. Patent Nos. 9,073,641, 9,365,292, 9,434,476, and D764,031, against Petitioner in *B/E Aerospace, Inc. v. Zodiac Aerospace, Inc.*, No. 2:14-cv-01417 (E.D. Tex.) (the "district court litigation"), that is currently stayed. Pet. 2; Paper 5, 2. All five of these patents claim priority to a U.S. application that issued as U.S. Patent No. 8,590,838 ("the '838 patent"), which patent was the subject of Case IPR2014-00727 between Petitioner and Patent Owner. In the final

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[3] The oral hearing included related proceedings, IPR2017-01275 and PGR2017-00019. Paper 40.

written decision in that case, the Board held that claims 1, 3–7, 9, 10, 12–14, 16–19, 21, 22, 24–29, 31, and 33–37 had been proven unpatentable, and claims 8, 20, 30, and 38 had not been proven unpatentable. IPR2014-00727, Paper 65. Both sides appealed, and the Court of Appeals affirmed. *See B/E Aerospace, Inc. v. C&D Zodiac, Inc.*, 709 F. App'x 687, 2017 WL 4387223 (Fed. Cir. Oct. 3, 2017).

Each of the additional four related patents identified above is the subject of a petition for an *inter partes* or post-grant review filed by Petitioner. *See* Cases IPR2017-01273 (involving Patent 9,434,476); IPR2017-01274 (involving Patent 9,365,292); IPR2017-01275 (involving Patent 9,073,641); PGR2017-00019 (involving Patent D764,031).

B. The '742 Patent

The '742 patent relates to space-saving aircraft enclosures, including lavatories, closets, and galleys. Ex. 1001, 1:20–6, 2:26–31. Figure 2 of the '742 patent is reproduced below.

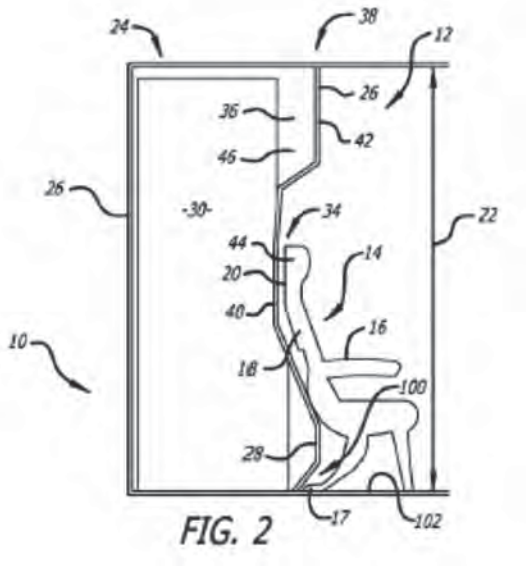

FIG. 2

Figure 2, reproduced above, illustrates enclosure 10, such as a lavatory, positioned aft of aircraft cabin 12. Ex. 1001, 4:22–27. The lavatory has walls that define interior lavatory space 30. *Id.* at 4:33–36. Forward wall 28 of the lavatory is described as "substantially not flat in a vertical plane" and "disposed immediately aft of and adjacent to or abutting the exterior aft surface of" passenger seat 16. *Id.* at 4:36–43. In particular, the forward wall is shaped to provide recess 34, which accommodates the partially-reclined backrest of the passenger seat, as shown in Figure 2. *Id.* at 4:39–43. In addition, the forward wall is shaped to also provide second, lower recess 100, which accommodates "at least a portion of an aft-extending seat support 17." *Id.* at 4:46–51. The '742 patent contrasts the embodiment of Figure 2 with a prior art configuration shown in Figure 1, which is reproduced below.

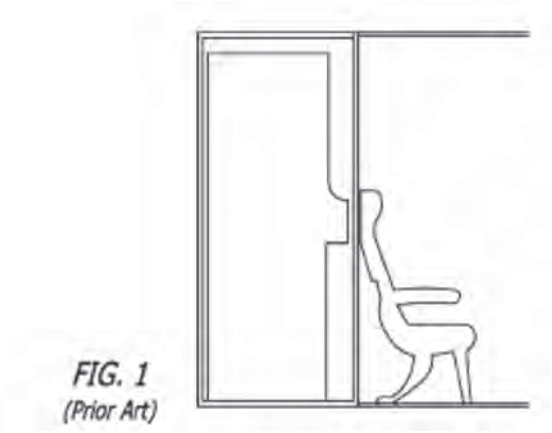

Figure 1, reproduced above, illustrates "a prior art installation of an aircraft lavatory immediately aft of and adjacent to an aircraft passenger seat." Ex. 1001, 4:11–13. In the depiction of the prior art in Figure 1, a forward wall of the lavatory (double-lined structure immediately aft of seat) is flat and in a vertical plane.

> As can be seen by comparing FIG. 1 and FIG. 2, the recess 34 and the lower recess 100 combine to permit the passenger seat 16 to be positioned farther aft in the cabin than would be possible if the lavatory enclosure 10 included a conventional flat and vertical forward wall without recesses like that shown in FIG. 1, or included a forward wall that did not include both recesses 34, 100.

Id. at 4:51–57. Notably, the passenger seat in the Figure 1 depiction of the prior art is identical to the passenger seat in the Figure 2 illustration of the invention.

Petitioner challenges claims 8 and 10–16. Claim 8 is independent, and claims 10–16 ultimately depend from claim 8. Claim 8 is reproduced below.

> 8. A method for reducing a volume of unusable space in a cabin area of a passenger aircraft, comprising:
>
> replacing at least a previously-installed forward partition of a pre-existing aircraft lavatory in the cabin area of the passenger aircraft with a contoured forward partition, wherein
>
> an outward facing vertical surface of the previously-installed forward partition is substantially flat, and
>
> the contoured forward partition comprises
>
> at least one first recess configured to receive at least a portion of an upwardly and aftwardly inclined seat back of a passenger seat therein, and
>
> at least one second recess configured to receive at least a portion of an aft-extending seat support of the passenger seat therein; and
>
> installing the passenger seat in front of the contoured forward partition;
>
> wherein, upon installation,

> the at least one first recess receives at least a portion of the upwardly and aftwardly inclined seat back, and
>
> the second recess receives at least a portion of the aft-extending seat support,
>
> thereby reducing the volume of unusable space in the cabin area by reducing or eliminating gaps that existed between the previously-installed forward wall and the passenger seat.

Ex. 1001, 6:4–29.

C. Instituted Grounds of Unpatentability

We instituted trial based on all asserted grounds of unpatentability. Inst. Dec. 27; Paper 30. After granting Petitioner's Request for Partial Adverse Judgment (Paper 36), the following ground remains for our consideration: whether the Admitted Prior Art[4] and Betts[5] render claims 8 and 10–16 obvious under 35 U.S.C. § 103(a).[6]

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[4] Petitioner defines "Admitted Prior Art" as certain portions of the '742 patent, including Figure 1. Pet. 11–12 (citing Ex. 1001, 1:27–29, Fig. 1; Ex. 1004 ¶ 86).

[5] U.S. Patent No. 3,738,497, issued June 12, 1973 (Ex. 1005) ("Betts").

[6] The Leahy-Smith America Invents Act ("AIA"), Pub. L. No. 112–29, took effect on March 18, 2013. Because the application from which the '742 patent issued was filed before that date,

II. ANALYSIS

A. Principles of Law

To prevail in its challenge to Patent Owner's claims, Petitioner must demonstrate by a preponderance of the evidence that the claims are unpatentable. 35 U.S.C. § 316(e); 37 C.F.R. § 42.1(d).

A claim is unpatentable under 35 U.S.C. § 103(a) if the differences between the claimed subject matter and the prior art are such that the subject matter, as a whole, would have been obvious at the time of the invention to a person having ordinary skill in the art. *KSR Int'l Co. v. Teleflex, Inc.*, 550 U.S. 398, 406 (2007). The question of obviousness is resolved on the basis of underlying factual determinations including: (1) the scope and content of the prior art; (2) any differences between the claimed subject matter and the prior art; (3) the level of ordinary skill in the art; and (4) objective evidence of nonobviousness. *Graham v. John Deere Co.*, 383 U.S. 1, 17–18 (1966).

B. Level of Ordinary Skill

In determining the level of ordinary skill in the art, various factors may be considered, including the "type of problems encountered in the art; prior art solutions to those problems; rapidity with which innovations are made; sophistication of the

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any citations to 35 U.S.C. §§ 102 and 103 are to their pre-AIA version.

technology; and educational level of active workers in the field." *In re GPAC Inc.*, 57 F.3d 1573, 1579 (Fed. Cir. 1995) (citation omitted).

Petitioner relies on the testimony of Alan Anderson, who testifies that a person with ordinary skill in the art "would have had a bachelor's degree in mechanical engineering, industrial design, or a similar discipline, or the equivalent experience, with at least two years of experience in the field of aircraft interior design." Pet. 29 (citing Ex. 1004 27–29). Patent Owner does not address Petitioner's proposal, or offer a competing proposal for a person of ordinary skill in the art. Based on our review of the record, we adopt Petitioner's definition of the level of ordinary skill in the art.

C. Claim Construction

In an *inter partes* review, we construe claim terms in an unexpired patent according to their broadest reasonable construction in light of the specification of the patent in which they appear.[7] 37 C.F.R. § 42.100(b). Consistent with the broadest reasonable construction, claim terms are presumed to have their ordinary and customary meaning as understood by a person of ordinary skill in the art in the context of the entire patent disclosure. *In re Translogic Tech., Inc.*, 504 F.3d 1249, 1257 (Fed. Cir. 2007). Only terms that are in controversy need to be

[7] The outcome of this case would be the same using the claim construction approach articulated in *Phillips v. AWH Corp.*, 415 F.3d 1303 (Fed. Cir. 2005) (en banc).

construed, and then only to the extent necessary to resolve the controversy. *Vivid Techs., Inc. v. Am. Sci. & Eng'g, Inc.*, 200 F.3d 795, 803 (Fed. Cir. 1999).

In the Institution Decision, we declined to construe two terms that Petitioner contended needed construction. Inst. Dec. 10–12. After institution, neither party has asked us to provide a construction of those terms or any other terms. Accordingly, we need not expressly construe any terms in this proceeding.

D. Obviousness in View of Admitted Prior Art and Betts

Petitioner asserts that the subject matter of claims 8 and 10–16 would have been obvious over the Admitted Prior Art and Betts. Pet. 32–47. For the reasons explained below, we determine Petitioner has established by a preponderance of the evidence that claims 8 and 10–16 are unpatentable over the Admitted Prior Art and Betts.

1. The Admitted Prior Art

Petitioner asserts as Admitted Prior Art the illustration and related disclosure of Figure 1 in the '742 patent, which is discussed above. *See* Pet. 11–14 (citing Ex. 1001, 1:27–29, Fig. 1; Ex. 1004 1 86). In the Institution Decision, we found that the asserted Admitted Prior Art constitutes prior art. Inst. Dec. (citing Ex. 1001, 4:11–14 ("FIG. 1 is a schematic diagram of a prior art installation of a lavatory immediately aft of and adjacent to an aircraft passenger seat.") (emphasis added)). Patent

Owner does not contend that the Admitted Prior Art is not prior art, or that it cannot be used in this proceeding as a basis for finding limitations disclosed by the prior art.

Of particular relevance here is that the Admitted Prior Art includes a flat forward-facing lavatory wall with the passenger seat shown in Figure 1 of the '742 patent immediately in front of that wall, with an aft-extending seat support.

2. Betts

Betts notes a desire to "provide more room for passengers in an aircraft or other vehicle." Ex. 1005, 1:6–7. Figure 1 of Betts is reproduced below.

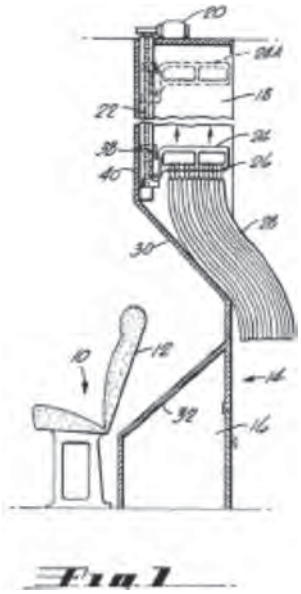

Figure 1 discloses airplane passenger seat 10 having tiltable backrest 12. Ex. 1005, 2:8–9. Behind

the seat is coat closet 14, which has luggage space 16 along the floor and overhead coat compartment 18. *Id.* at 2:9–14. "The lower portion 30 of the coat compartment 18 slants rearwardly to provide a space for seatback 12 to be tilted rearwardly as desired by the occupant. The top 32 of storage space 16 also slants rearwardly so as not to interfere with seatback 12 when tilted." *Id.* at 2:19–24.

3. Obviousness of Claim 8

Petitioner relies on the Declarations of Alan Anderson (Ex. 1004, "Anderson Declaration"), Scott Savian (Ex. 1018), and Vince Huard (Ex. 1019) in support of its assertions that the combination of the Admitted Prior Art and Betts discloses or renders obvious all of the limitations of claim 8. Pet. 21–26, 32–40; Reply 4–15. Patent Owner relies on the Declarations of Dr. Adam Dershowitz (Ex. 2104, "Dershowitz Declaration"), R. Kaus Brauer (Ex. 2046), and James Brunke (Ex. 2097) in its Response, and argues that Petitioner failed to establish that the proposed combination discloses the claimed "second recess" and "reducing a volume of unusable space"/"reducing or eliminating gaps" limitations, and failed to establish an adequate motivation to combine. PO Resp. 8–30. The parties also dispute the relevance and impact of Patent Owner's alleged objective evidence of nonobviousness on the obviousness issues in this case. *See* Pet. 61–64; PO Resp. 31–45; Reply 15–27.

i. Motivation to Combine

Petitioner alleges that it would have been obvious to modify the prior art flat wall lavatory, as shown in the Admitted Prior Art, with a contoured forward wall as shown in Betts. Pet. 22 (citing Ex. 1004 ¶¶ 56–64). We first consider Petitioner's argument that we are collaterally estopped from considering the merits of this issue, because the Board already found in the related *inter partes* review of the '838 patent that "it would have been obvious to apply the recessed forward wall design of Betts to other enclosures, including single-spaced lavatories." Reply 3 (quoting Case IPR2014-00727, 12 (Paper 65) (emphasis removed)). Petitioner relies on the Federal Circuit's affirmance of that decision after the Petition was filed in this case as the basis for its collateral estoppel argument. *Id.* (citing Ex. 1026 (*B/E Aerospace, Inc. v. C&D Zodiac, Inc.*, 709 F. App'x 687 (Fed. Cir. Oct. 3, 2017))). According to Petitioner, Patent Owner should be precluded from arguing that "it would not have been obvious to apply the recessed forward wall design of Betts to other enclosures, including single-spaced lavatories." *Id.* at 3–4. Petitioner only devotes a few sentences of argument to collateral estoppel, does not assess the relevant factors when determining whether to apply collateral estoppel, and does not assess the differences in the claims at issue in the '838 patent and claim 8 here. *See* Reply 3–4; *Banner v. U.S.*, 238 F.3d 1348, 1354 (Fed. Cir. 2001) ("Collateral estoppel requires four factors: (1) the issues are identical to those in a prior proceeding, (2) the issues were actually litigated, (3) the determination of the issues was necessary to the resulting judgment, and (4) the party defending

against preclusion had a full and fair opportunity to litigate the issues."). In addition, Patent Owner has had no meaningful opportunity to address the issue in its own briefing because the collateral estoppel issue was raised for the first time in Petitioner's Reply. Under these circumstances, where the issue has not been fully developed by Petitioner or addressed by Patent Owner, we decline to apply collateral estoppel. We do, however, view the findings in the prior case as informative when they closely resemble the issues we address here.

In support of the proposed modification of the Admitted Prior Art with the contoured wall of Betts, Petitioner relies on the testimony in the Anderson Declaration, explaining that a primary goal of airplane interior design is efficient use of passenger cabin space so that more passengers can fit in the cabin or to make the passengers more comfortable. Pet. 22–23 (citing Ex. 1004 ¶ 57). According to Petitioner, because Betts uses the contoured forward wall to provide more passenger space in the cabin, one of ordinary skill in the art would have been motivated to replace the prior art flat forward lavatory wall with the contoured wall of Betts to provide that same additional space. *Id.* at 23 (citing Ex. 1004 ¶ 58). Petitioner points to the recess in the contoured wall Betts discloses as evidence of that approach, which allows the passenger chairs to be pushed back further aft, accommodating a portion of the seat back. *Id.* at 24–25 (citing Ex. 1004 ¶ 59).

Patent Owner argues "that those of skill in the art had no reason to make the combination proposed" by Petitioner. PO Resp. 24. Patent Owner

relies on the allegedly long co-existence of the Betts design within planes that included the prior art flat lavatory walls, suggesting that there was no motivation to make the modification. *Id.* at 24–26. Patent Owner also argues that the proposed combination would require "total destruction" of Betts, if the coat closet in Betts were turned into a lavatory. *Id.* at 27–29. Patent Owner also contends that Petitioner and Mr. Anderson fail to establish a reasonable expectation of success in light of this total deconstruction of Betts. *Id.* at 29–30.

Based on our review of the evidence and arguments, we find that one of ordinary skill in the art would have been motivated to modify the Admitted Prior Art lavatory by replacing the flat forward wall with the contoured forward wall of Betts. Petitioner submits convincing argument, based on the testimony of Mr. Anderson, that designers of airplane interiors were concerned about adding space to the cabin and that the Betts contoured wall increased interior space. Pet. 22–25 (citing Ex. 1004 ¶¶ 57–59). Betts itself backs up this testimony by stating that one of the goals of its design is "to provide more passenger room." Ex. 1005, Abstract. We also agree with Petitioner's assertion that Figure 1 of Betts depicts a passenger seat further aft in the cabin than it could have been if the wall were flat with no recess, and merely extended up from the bottom portion of the wall. *See* Betts Fig. 1; Pet. 23–24. Betts therefore depicts how the contoured wall and recess provide more passenger space when compared to a flat, vertical wall, and Betts discusses the ability of its design to save space. As such, Betts adequately supports the

proposed modification of the prior art flat forward wall as shown in the Admitted Prior Art.

Patent Owner's argument that flat forward lavatory walls co-existed with the Betts design for years without modification, even if accurate, does not outweigh the more convincing evidence and argument supporting Petitioner's position based on Betts and the Anderson Declaration. In addition, Patent Owner's argument that one would need to "totally deconstruct" Betts in order to add a lavatory to Betts misapprehends Petitioner's proposed modification. Petitioner proposes to replace a lavatory flat forward wall as shown in the Admitted Prior Art with the Betts contoured wall, not add a lavatory behind the Betts contoured wall. *See* Pet. 22, 24; Reply 4–5. Although we do not apply collateral estoppel for the reasons provided above, we note that our findings regarding the proposed combination and modification are consistent with the Federal Circuit's decision in the related case. *See B/E Aerospace*, 709 F. App'x at 694 (rejecting Patent Owner's argument that Petitioner's combination required adding lavatory to Betts).

Based on the foregoing, we find that one of ordinary skill in the art at the time of the invention would have been motivated to modify the lavatory flat forward wall in the Admitted Prior Art by replacing it with the contoured forward wall of Betts.

ii. The "Replacing," "Installing," and "First Recess" Limitations

Claim 8 contains several limitations that are indisputably[8] disclosed by the proposed combination of Betts and the Admitted Prior Art. For example, claim 8 recites "replacing at least a previously-installed forward partition of a pre-existing aircraft lavatory in the cabin area of the passenger aircraft with a contoured forward partition, wherein an outward facing vertical surface of the previously-installed forward partition is substantially flat." Petitioner argues that a person of ordinary skill in the art would know that the contoured forward wall of Betts could be used in place of a flat forward wall to allow the seat to be placed further aft in an aircraft cabin. Pet. 34 (citing Ex. 1004 ¶ 246). This replacing step logically follows from the proposed combination discussed above, where the flat forward lavatory wall of the Admitted Prior Art is replaced by the contoured wall of Betts. We find that a person of ordinary skill in the art would have known about flat forward walls such as that the Admitted Prior Art discloses, and contoured forward walls such as that Betts discloses, and in light of the teachings in Betts that such a contoured wall provides more passenger room, a person of ordinary skill in the art would have been motivated to use a contoured wall to save space in the cabin. *See*, *e.g.*, Ex. 1001, Fig. 1; Ex. 1005, Fig. 1; Ex. 1004 ¶ 246. Once the proposed modification is made, at least the contoured forward

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[8] Patent Owner does not argue that, once the proposed combination is made, the combination fails to disclose these limitations.

partition portion of the "replacing" step is performed.

Claim 8 recites that "the contoured forward partition comprises at least one first recess configured to receive at least a portion of an upwardly and aftwardly inclined seat back of a passenger seat therein." Petitioner contends that Betts discloses this portion of the replacing limitation. *See* Pet. 34–35 (citing Ex. 1005, Fig. 1; Ex. 1004 ¶¶ 247–48). We agree. Figure 1 of Betts discloses slanted walls 30, 32 that form a recess configured to receive at least a portion of inclined seat back 12. *See* Ex. 1005, Fig. 1, 2:19–24 ("The lower portion 30 of the coat compartment 18 slants rearwardly to provide a space for seatback 12 to be tilted rearwardly as desired by the occupant. The top 32 of storage space 16 also slants rearwardly so as not to interfere with seatback 12 when tilted."); *see also B/E Aerospace*, 709 F. App'x at 693 ("Walls 30 and 32 [in Figure 1 of Betts] slant rearwardly to allow the occupant to recline seatback 12 of passenger seat 10." (citing Ex. 1005, 2:7–24)).

Claim 8 recites "installing the passenger seat in front of the contoured forward partition; wherein, upon installation, the at least one first recess receives at least a portion of the upwardly and aftwardly inclined seat back." Petitioner argues that the Admitted Prior Art discloses a seat with an aft extending seat support and that Betts discloses a passenger seat in front of a contoured forward partition, with the seat positioned at least partially within the contour. Pet. 38 (citing Ex. 1004 ¶¶ 118, 175, 188, 216, 247–248, 251–252). We agree with

Petitioner's position. Betts discloses this limitation. *See* Ex. 1005, Fig. 1, 2:19–24; *see also B/E Aerospace*, 709 F. App'x at 693.

iii. "Second Recess"

Claim 8 recites two limitations related to a "second recess": "the contoured forward partition comprises . . . at least one second recess configured to receive at least a portion of an aft-extending seat support of the passenger seat therein" and "wherein, upon installation [of the passenger seat], . . . the second recess receives at least a portion of the aft-extending seat support." Petitioner does not contend that the Admitted Prior Art or Betts alone discloses the second recess. Instead, Petitioner argues that one of ordinary skill in the art would have found it obvious and would have been motivated to add a second recess to a flat forward facing wall. Pet. 35. In support of its assertion, Petitioner first notes that the Admitted Prior Art includes "[a] seat with an aft extending seat support." Pet. 36 (citing Ex. 1001, Fig. 1). Petitioner argues that the logic of using a recess to receive the seat back applies equally to using another recess to receive the aft extending seat support. Pet. 36 (citing Ex. 1004 ¶¶ 189, 191, 250). According to Petitioner, as the seat is moved further aft, the seat support may come into contact with the lower section of the wall, impeding movement, and the addition of the second recess to accommodate the seat support will allow the seat to move further back. Reply 6 (quoting Ex. 1004 ¶ 74). Petitioner further points out that adding a second recess is nothing more than the application of known technology (i.e., Betts) for its intended purpose, with

a predictable result (i.e., to position the seat as far back as possible). Pet. 36. Petitioner relies on Mr. Anderson's testimony that the second recess, although not disclosed by either of the two references, would have been obvious to add to the combination. *Id.* at 37 (citing Ex. 1004 ¶¶ 186–192, 250). Petitioner also relies on Mr. Anderson's citation to three alleged examples of additional enclosures that include a lower recess to receive a seat support. *Id.* at 37–38 (citing Ex. 1004 ¶¶ 192, 250); Reply 6–10 (citing Ex. 1004 ¶¶ 74–79; Ex. 1018, 62; Ex. 1019 ¶¶ 8–11, 17–20). Petitioner contends that it does not matter that the three enclosures were not available as prior art in these proceedings, or prior art at all, as long as they are evidence of what was known in the art. Reply 9–10. According to Petitioner, these designs support Petitioner's position that "it was a common sense solution to include a recess in a wall to enable a seat support to be positioned further aft." Reply 10 (citing Ex. 1004 ¶ 75).

Patent Owner argues that Petitioner's contention that the second recess would have been obvious "is supported by nothing more than Mr. Anderson's opinion." PO Resp. 15. Patent Owner asserts that "actual evidence is required because the claimed second recess is 'more than a peripheral issue' and 'therefore requires a core factual finding.'" *Id.* (quoting *K/S HIMPP v. Hear-Wear Techs., LLC*, 751 F.3d 1362, 1365 (Fed. Cir. 2014)). Relying on the Dershowitz Declaration, Patent Owner argues that such recesses were not common knowledge and that one could not move seats further aft as Mr. Anderson suggests, if using the prior art flat wall. *Id.* at 15–17

(citing Ex. 2104 ¶¶ 146–147). Patent Owner also argues that adding a second recess is not supported by the intended purpose of Betts, which is limited to providing a first recess for seat recline, and adding a second recess would not be predictable due to unpredictable impacts on the lavatory. *Id.* at 17–18 (citing hearing and deposition testimony; Ex. 2104 ¶¶ 147, 154, 165; Ex. 2046 ¶ 36; Ex. 2097 ¶¶ 86, 88). Patent Owner also contends that the three recess examples used by Petitioner were not publicly available because the drawings in question were confidential and not for public use, and cannot be used to show what was known in the art. *Id.* at 18–19.[9]

We agree with Patent Owner that use of common sense to supply a missing limitation must be carefully circumscribed and requires supporting evidence in the situation presented here, but disagree that Petitioner has failed to support its obviousness argument with proper reasoning and evidence. Patent Owner correctly notes that in *K/S HIMPP*, the court held that when a limitation "presents more than a peripheral issue," determination of patentability requires a "core factual finding" that in turn requires "point[ing] to some concrete evidence in the record in support of these findings." *K/S HIMPP*, 751 F.3d at 1365 (quoting *In re Zurko*, 258 F.3d 1379, 1386 (Fed. Cir. 2001)). Similarly, in *Arendi S.A.R.L. v. Apple Inc.*,

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[9] Patent Owner moves to exclude the three references and related testimony, which we deny for the reasons discussed below. *See infra* II.D.

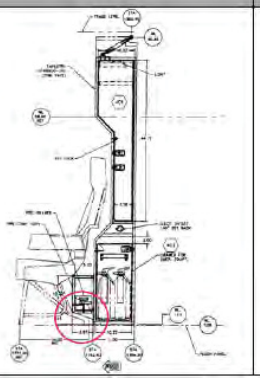
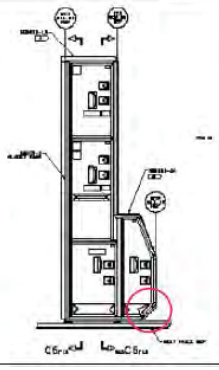
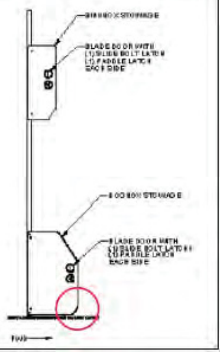
832 F.3d 1355, 1361–62 (Fed. Cir. 2016), the Federal Circuit held that common sense, common wisdom, and common knowledge may be properly considered in an obviousness analysis, but "cannot be used as a wholesale substitute for reasoned analysis and evidentiary support, especially when dealing with a limitation missing from the prior art references specified." *Arendi* distinguished the situation involving a "central" limitation, at issue in *Arendi*, from the situation in *Perfect Web*, where common sense was used to supply a missing limitation. *See Perfect Web Techs., Ins. v. InfoUSA, Inc.*, 587 F.3d 1324 (Fed. Cir. 2009). In *Perfect Web*, the court affirmed a summary judgment decision finding claims invalid as obvious, where the lower court determined that a missing limitation would have been obvious based on common sense, even without reliance on record evidence such as expert testimony. *See id.* at 1329 ("[U]se of common sense does not require a 'specific hint or suggestion in a particular reference,' only a reasoned explanation that avoids conclusory generalizations."), *id.* at 1330 ("No expert opinion is required to appreciate the potential value to persons of such skill in this art of [the missing limitation].").

We need not reach the issue of whether the "second recess" is so peripheral that Petitioner need not have pointed to evidence or expert opinions to support its argument that the missing limitation would have been obvious. Petitioner has supplied reasoned explanation and record evidence to support its position. Petitioner relies on the testimony of Mr. Anderson, who stated that

> a person of ordinary skill in the art would recognize that as a seat is moved further aft the seat support necessarily is also moved further aft. As the seat is moved aft the feet of the seat support may come into contact with the lower section of the wall. Creating one or more recesses to accommodate whatever portion(s) of the seat support that would contact the forward wall of the enclosure is the obvious solution to this known problem.

Ex. 1004 1 74; *see also id.* at ¶ 191.

Petitioner also relies on evidence tending to show that recesses adjacent the floor of cabin, configured to receive a seat support, were known in the art. Pet. 37–38 (citing Ex. 1004 ¶¶ 192, 250); Reply 6–10 (citing Ex. 1004 ¶¶ 74–79; Ex. 1018, 62; Ex. 1019 ¶¶ 8–11, 17–20). The Petition shows three designs with such a recess side-by-side as shown in the figure from page 38 of the Petition, reproduced below:

SAS MD-90 Aft-Storage October 2004	737 Storage February 1994	747 Storage December 2009
		

The figure depicts three designs labelled "SAS MD-90 Aft-Storage" dated October 2004, "737 Storage" dated February 1994, and "747 Storage" dated December 2009. Pet. 38. All three designs show recesses near the floor of the cabin, which Petitioner circled in annotations. *Id.* The first design, shown on the left, also shows a passenger seat in dotted lines, with the aft seat support shown within the recess. *Id.* Petitioner submitted declarations from third parties familiar with the designs that show the recesses were designed to receive passenger seat legs, and the dates that the designs were in public use or on sale. *See* Ex. 1018, 62 (corresponding to SAS MD-90 Aft-Storage); Ex. 1019 ¶¶ 8–11 (corresponding to 737 Storage); Ex. 1019 ¶¶ 17–20 (corresponding to 747 Storage). We find this testimony and evidence credible and convincing, and find that Petitioner has established that it would have been obvious to further modify the Admitted Prior Art/Betts combination to include the claimed "second recess" to receive passenger seat supports.

Patent Owner's arguments, as a whole, are not persuasive. As noted above, we agree with Patent Owner's interpretation of the relevant law to require more than conclusory allegations to establish that a missing claim limitation would have been obvious based on common sense. Petitioner provides more than bare, conclusory allegations, however, including reliance on other references that predate the '742 patent to support its common sense argument. Patent Owner also argues that adding the second recess would have been unpredictable due to the unpredictable nature of lavatory design. PO Resp. 17–18. Much of Patent Owner's cited

evidence does not seem focused on the second recess at all, and instead is directed more generally to lavatories as a whole. *See* Ex. 2052, 37:5–42:17, 53:10–14; Ex. 2075, 36:18–37:15; Ex. 2097 ¶¶ 86, 88. We credit the testimony of Mr. Anderson on behalf of Petitioner, that the "result of such a modification is predictable, allowing the seat to be positioned further aft in an aircraft." Ex. 1004 ¶ 191. We are not persuaded that adding a recess near the cabin floor, standing alone, would introduce unpredictable results due to modifications that would be necessary to that limited area of the lavatory.

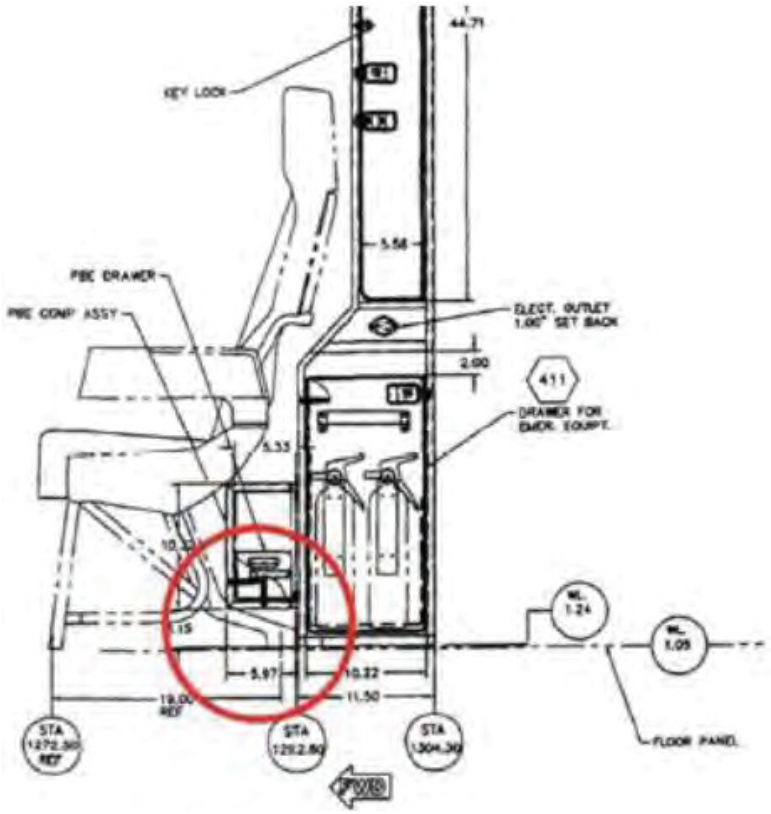
Patent Owner's arguments attacking Mr. Anderson's use of the three examples of recesses in the prior art also bear little fruit. Patent Owner argues, without citation to any support, that in order to support the "common sense" argument, Mr. Anderson could not rely on references that were not available as prior art in *inter partes* reviews, i.e., patents and printed publications. PO Resp. 18. Petitioner does not argue that any of the three drawings are prior art that can be combined with the Admitted Prior Art and Betts as part of a ground of unpatentability, and therefore has not run afoul of the rules governing these proceedings. 35 U.S.C. § 311(b) ("A petitioner in an *inter partes* review may request to cancel as unpatentable 1 or more claims of a patent only on a ground that could be raised under section 102 or 103 and only on the basis of prior art consisting of patents or printed publications"). Petitioner uses the references to support its common sense argument and identify, specifically, the knowledge of those skilled in the art, and Patent Owner points to no authority for the

proposition that such evidence must take a particular form, much less be limited to qualifying patent and printed publication prior art under § 311(b).

Patent Owner also argues that Petitioner failed to establish that the designs shown in the three drawings were prior art at all, and were not publicly known. *Id.* While the drawings themselves may have been confidential as Patent Owner notes, the declarations accompanying the drawings posit that the drawings reflect designs that were on sale and in public use years before the earliest priority date of the '742 patent. *See* Ex. 1018, 62 (corresponding to SAS MD-90 Aft-Storage); Ex. 1019 ¶¶ 8–11 (corresponding to 737 Storage); Ex. 1019 ¶¶ 17–20 (corresponding to 747 Storage). Patent Owner uses the deposition testimony of one of the declarants to cast doubt on whether the design with the recess was part of the product that was sold, but does not attack the other assertions of prior art. PO Resp. 19 (citing Ex. 2079, 54:20–55:4 (corresponding to 747 Storage)). We find the unrebutted testimony establishes that those two designs were in public use or on sale prior to the critical date of the '742 patent. *See* Ex. 1018, 62 (drawing), ¶¶ 11–15 (corresponding to SAS MD-90 Aft-Storage); Ex. 1019 ¶¶ 8–11 (corresponding to 737 Storage)). We find the unrebutted testimony regarding these designs, the SAS MD-90 Aft-Storage and 737 Storage, sufficient to establish that the designs are prior art. Accordingly, two of the designs Petitioner relies on were not only "known" internally within the art,

they were disclosed in prior art designs.[10] An annotated view of the design for the SAS MD-90 Aft-Storage is reproduced below:

[10] Petitioner argues that the three references need not qualify as prior art at all to be considered as part of its "common sense" argument. *See* Reply 10 ("But even if these design documents themselves were never made public, they still demonstrate that airplane designers had long known that it was a common sense solution to include a recess in a wall to enable a seat support to be positioned further aft."); Opp. 8 (citing cases in support of argument). Although not necessary to our Decision, because we find that two of the references are prior art, we agree that such non-prior art references, such as these confidential drawings, can be considered in an obviousness analysis. Here, they constitute concrete evidence in support of Petitioner's common sense argument.



Reply 7 (citing Ex. 1018, 62). The figure above shows a recess adjacent to the cabin floor configured to receive the aftwardly extending rear seat support within the recess. This prior art design convincingly supports Petitioner's position that recesses configured to receive seat supports were known in the art, and it would have been a matter of common sense to incorporate such a known structure in the Admitted Prior Art/Betts combination.

Based on the foregoing, Petitioner has established adequately that it would have been obvious to add a second recess in a manner that

satisfies the "second recess" requirements of claim 8: "the contoured forward partition comprises . . . at least one second recess configured to receive at least a portion of an aft-extending seat support of the passenger seat therein" and "wherein, upon installation [of the passenger seat], . . . the second recess receives at least a portion of the aft-extending seat support."

iv. "Reducing a Volume of Unusable Space" / "Reducing or Eliminating Gaps . . ."

Claim 8 recites "thereby reducing the volume of unusable space in the cabin area by reducing or eliminating gaps that existed between the previously-installed forward wall and the passenger seat." In other words, replacing the flat forward wall with a contoured wall and installing that contoured wall as required by claim 8, results in reducing the volume of unusable space in the cabin by reducing or eliminating gaps that existed between the previously-installed forward wall and the passenger seat. Petitioner argues that the design that results from combining Betts with the Admitted Prior Art would naturally meet these requirements of claim 8. Pet. 39 (citing Ex. 1004 ¶¶ 253–254). Petitioner contends that Figure 1 of Betts shows the seat already positioned within the contour, and therefore reduces or eliminates gaps that existed if a previously-installed flat forward wall remained in place. *Id.* at 39–40. Petitioner's annotated version of Betts Figure 1 is reproduced below.

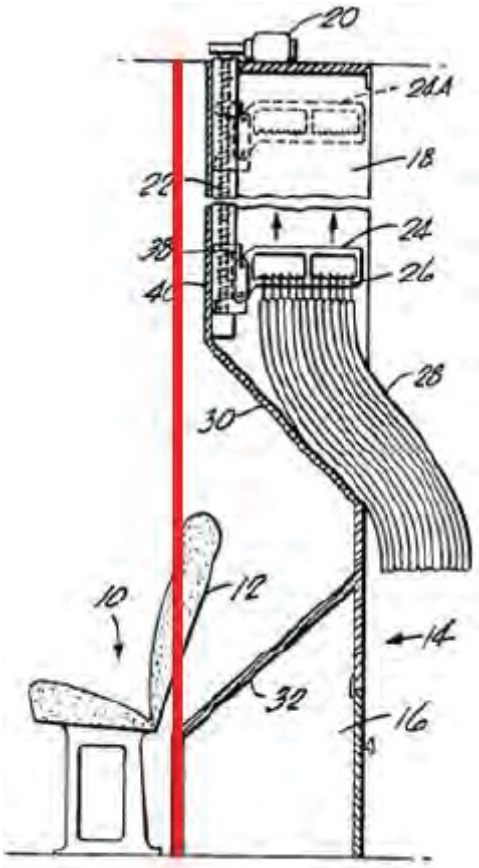


Fig. 1

Annotated Figure 1 includes a line, adding by Petitioner, extending upward from a vertical portion of the forward wall near the cabin floor. Pet. 40. The line intersects a portion of the seat back, with a portion of the seat back extending into the first recess formed by angled walls 30, 32. *Id.* According to Petitioner, the figure confirms that Betts discloses a seat already moved further back than it could have

been if the prior art flat forward wall as shown in the Admitted Prior Art remained in place. *Id.*; Reply 11.

Patent Owner argues that none of the prior art teaches anything about reducing volume of unused space between the seat and the lavatory. PO Resp. 10. Patent Owner acknowledges that "[i]t is no secret that cabin space has always been at a premium in aircraft," but argues that Betts teaches saving space in different ways than by reducing the gaps behind the seat as claimed. *Id.* Patent Owner also contends that to the extent Petitioner again relies on common sense to teach this limitation, that the assertion lacks a reasoned explanation and evidentiary support. *Id.* at 11–12. Patent Owner also argues that Figure 1 of Betts shows the seat in a reclined position, but does not add usable space to the cabin because if the contoured wall merely adds a recline function, it does not allow a seat to be positioned further aft to reduce gaps as claimed. *Id.* at 12–13 (citing Ex. 2104 ¶¶ 140, 151).

We are persuaded by Petitioner's arguments and evidence, and find that the combination of Betts and the Admitted Prior Art teaches this limitation. As noted above, we find that the Petitioner established adequately that one of ordinary skill in the art would have been motivated to replace the flat forward lavatory wall, such as that shown in the Admitted Prior Art, with the contoured forward wall of Betts. Once that modification is made, as Petitioner points out, the passenger seat will already be placed in a position more aft than it would have been if the previously-installed flat forward wall were still in place. *See* Reply 11. This conclusion is supported by

Figure 1 of Betts depicted above, and is consistent with the Board's previous finding in the related IPR2014-00727 that "[w]all 30 projects partly above the seatback even in the non-reclined configuration shown in [Betts] Figure 1." Ex. 1003, 18. Locating the seats in Betts as far back as possible is also consistent with the goal of providing "more room for passengers in an aircraft" with the proposed design in Betts. Ex. 1005, 1:6–7, Abstract. Accordingly, once the proposed modification is made and a seat positioned as shown in Betts, the result is a design "reducing the volume of unusable space in the cabin area by reducing or eliminating gaps that existed between the previously-installed forward wall and the passenger seat."

Patent Owner's arguments largely miss the mark. When Patent Owner argues that none of the prior art, standing alone, discloses the claim limitation, the argument fails to address the results of the proposed modification, as discussed above. Betts may not expressly mention reducing unusable space or reducing gaps, but that is the result of the modification using the Betts design. Further, because the proposed combination discloses the limitation, we do not view Petitioner's argument as one involving resort to common sense, although if viewed in that manner Petitioner has articulated sound reasoning, supported by Betts, for the conclusion that the limitation would have been obvious. *See* Pet. 39–40; Reply 11–12. Finally, although Patent Owner argues that Betts merely shows a seat in a reclined position, and that is why it occupies a portion of the first recess/contoured area in Betts, we find Petitioner's argument and

related expert testimony more credible. *See id.* (citing Ex. 1004 ¶¶ 58 ("As shown in the figure below, the seat shown in Betts could not be located in the position in which it is shown if the forward wall were flat."), 254).

Based on the foregoing, we find that Petitioner has established adequately that the combination of Betts and the Admitted Prior Art discloses "thereby reducing the volume of unusable space in the cabin area by reducing or eliminating gaps that existed between the previously-installed forward wall and the passenger seat."

v. Objective Evidence of Non-Obviousness

We turn now to the secondary considerations evidence that Patent Owner has cited in this proceeding as purportedly demonstrating nonobviousness of claim 8, as well as the other challenged claims. *See* PO Resp. 31–45. Petitioner argues that Patent Owner has failed to establish the required nexus, and that we should follow the approach taken by the Federal Circuit in the related *inter partes* review and conclude that the claims would have been obvious even if we consider the Patent Owner's evidence of objective indicia. Reply 15.

Nexus. "For objective [evidence of secondary considerations] to be accorded substantial weight, its proponent must establish a nexus between the evidence and the merits of the *claimed invention*." *Wyers v. Master Lock Co.*, 616 F.3d 1231, 1246 (Fed. Cir. 2010) (alteration and emphasis in original)

(quoting *In re GPAC Inc.*, 57 F.3d 1573, 1580 (Fed. Cir. 1995)). Patent Owner only addresses nexus in the context of its argument regarding commercial success. PO Resp. 37–38. Patent Owner argues that nexus here "is presumed" because "[t]here is no dispute that [Patent Owner's] Spacewall product, which has been so commercially successful, is an embodiment of the patent." *Id.* at 38 (citing Ex. 2093, 36:16–37:3). Patent Owner also asserts that other documents show that the commercial success of the Spacewall product stemmed from the "curved shape" of the lavatory forward wall or the "lavatory structure design." *Id.* (citing Ex. 2078; Ex. 2090, 136:14–137:11). Such general allegations that Patent Owner's product "is an embodiment of the patent" and led to sales due to a "curved design" ordinarily fail to establish that a product contains all of the limitations of the claim at issue, which is necessary to trigger a presumption of nexus. *See WBIP, LLC v. Kohler Co.*, 829 F.3d 1317, 1330 (Fed. Cir. 2016) (holding that nexus is presumed when patentee establishes that commercial product is an embodiment of the claimed invention). However, Petitioner did not address the presumption of nexus issue in the Petition or the Reply, and did not argue that Patent Owner's Spacewall product was not covered by the challenged claims here. *See* Reply 15–16; Tr. 28:10–13, 93:1–2 (Petitioner acknowledging at the oral hearing that it did not dispute that Patent Owner's product met the limitations of the challenged claims). Accordingly, we apply a presumption of nexus here.

Petitioner argues that nexus cannot be established because all of the claim limitations were

known in the prior art. *See* Pet. 62. Petitioner also argues that none of Patent Owner's evidence ties the "second recess" to the secondary considerations. Reply 15–16. These arguments do not address the presumption of nexus issue, and improperly suggest that Patent Owner must tie the objective indicia to the supposedly new feature in the claims, the second recess. *See WBIP*, 829 F.3d at 1330 ("[P]roof of nexus is not limited to only when objective evidence is tied to the supposedly 'new' feature(s)."). The arguments also fail to rebut the presumption, which requires reliance on evidence of record to successfully rebut the presumption. *See id.* at 1329 (holding that the presumption of a nexus cannot be rebutted adequately by argument alone). Although we find a presumption of a nexus, we will consider Petitioner's arguments regarding a lack of nexus, to the extent they also bear on the weight we give any alleged objective indicia, where appropriate below.

Copying. Patent Owner alleges that Petitioner copied the patented technology. PO Resp. 32–33. More specifically, Patent Owner alleges that Petitioner encountered problems with implementing the "curvature of the lavatory forward wall" and rather than turn to a prior art solution, "copied the curvature" of Patent Owner's lavatory wall. *Id.* (citing Ex. 2091, 138:5142:17, 141:18–22, 142:10–13; Ex. 2104 ¶ 203). Patent Owner relies on Dr. Dershowitz's testimony that Petitioner made a "direct attempt" to use Patent Owner's patented solutions, including the "patented shape" of Patent Owner's forward lavatory wall." *Id.* at 33 (citing Ex. 2104 ¶ 225; Ex. 2075, 111:7–14).

Petitioner argues that Patent Owner fails to prove copying. Reply 16–18. Petitioner contends that Patent Owner's evidence fails to address the "second recess," or establish that Petitioner copied that aspect of Patent Owner's design. *Id.* at 16. Petitioner also argues that Patent Owner misinterprets the deposition testimony from Petitioner's witness, which was not suggesting problems with the forward lavatory wall at all, but instead concerned problems with the curved side wall facing the exterior of the airplane. *Id.* at 16–17 (citing Ex. 2091–37, 144:18–145:5). Petitioner asserts that the statements from the Dershowitz Declaration merely rely on this faulty reading of the deposition. *Id.* at 17.

We agree with Petitioner that Patent Owner has failed to establish copying here. First, as Petitioner notes, Patent Owner has made no attempt to establish that the claimed invention was copied by Petitioner, including the claimed "second recess." *See* PO Resp. 3–33. At most, Patent Owner alleges that Petitioner copied one aspect of the claimed design—the contoured forward wall. *See* Ex. 1005, Fig. 1. Further, Patent Owner's copying allegation rests on an apparent misinterpretation of deposition testimony dealing with problems in the design of the "sidewall" facing the exterior of the aircraft, not the lavatory forward wall that is at issue in this case. *See* Ex. 2091, 144:18–145:5; Reply 16–17. Although the forward wall is also mentioned in the testimony cited by Patent Owner, that testimony does not suggest that the problem was focused on the lavatory forward wall, or that copying the forward wall would alleviate the problems with the sidewall. At best, the testimony and related expert analysis

show a weak case of copying, made weaker by the failure to address the "second recess" and other claim limitations and establish that Petitioner copied a design covered by claim 8.

Skepticism. Patent Owner argues that "skepticism and disbelief expressed by industry participants" regarding its curved wall design supports the nonobviousness of claim 8. PO Resp. 34. Patent Owner contends that customers demanded mock ups of the new designs and tested them to ensure the lavatory still provided sufficient comfort before concluding that the design would work. *Id.* at 34–35 (citing Ex. 2046 ¶¶ 19–25; Ex. 2077, 27:15–31:15, 107:1–13; Ex. 2097, 245:2–24; Ex. 2104 ¶ 216). Patent Owner also contends that Petitioner's expert Mr. Anderson tried and failed to do what Patent Owner "has done with its patents." *Id.* at 35.[11]

Petitioner argues that none of the alleged skepticism mentions the claimed "second recess" and that the testimony introduced amounts to hearsay. Reply 18–19 (referring to Exs. 2046, 2097). Petitioner also argues that testimony showing mere "corporate prudence" when evaluating designs before a purchase does not establish skepticism. *Id.* at 19. Regarding Mr. Anderson's testimony, Petitioner contends that Patent Owner takes the comments out of context, and Mr. Anderson was

[11] Patent Owner's argument may be viewed as "failure of others" rather than "skepticism," but we address it in the manner that Patent Owner framed the issue.

talking more generally about adding seats to a cabin. *Id.* at 19–20.

While we agree with Patent Owner that there appeared to be some skepticism regarding its design, Patent Owner has not convincingly established that there was skepticism about the claimed method. Instead, the testimony appears to reflect normal testing one would expect whenever making a large order of goods, with some skepticism aimed at the size and comfort of the resulting lavatory, which does not bear on the claim language. *See* PO Resp. 34–35. In addition, the testimony of Mr. Anderson does not establish that he tried and failed to arrive at the claimed design at issue here—he merely expressed his experience in not being able to simply add a row of seats to a plane based on saving six inches of room. Reply 19–20. Overall, we view Patent Owner's evidence of industry skepticism regarding the claimed method as weak.

Proceeding Contrary to Conventional Wisdom. Patent Owner argues that conventional wisdom required a flat forward wall and using the space between the seats and the wall for small storage bins known as "dog houses." PO Resp. 36. According to Patent Owner, its "design cut directly against this conventional wisdom" by removing the spaces for the dog houses and allowing the "seat to closely nestle with the lavatory wall behind it." *Id.* at 37. Petitioner argues that Patent Owner again bases its argument on the contoured wall, which was well known in the art. Reply 21. Petitioner also argues that the mere passage of time without a curved-wall

lavatory does not establish nonobviousness. *Id.* at 22.

We accord Patent Owner's evidence that its design was contrary to the ordinary use of dog houses behind seats some weight. However, this argument amounts to little more than an assertion that using a curved lavatory wall was new, when curved walls were known in airplane design and the claims at issue here require far more than a contoured wall. *See* Reply 21; Ex. 1005, Fig. 1. Accordingly, we view the evidence on this point as weak.

Commercial Success. Patent Owner argues that its Spacewall product achieved substantial commercial success based on a desire of its customers to add seats to the aircraft, which the claimed design made possible. PO Resp. 38. Patent Owner relies on "a nearly $800 million, 10-year contract as the exclusive lavatory provider on all new Boeing 737 aircraft," which was the "direct result of the patented technology." *Id.* at 39. Patent Owner also contends that its market share in this market went from 0% to 20% by 2018. *Id.*

Petitioner argues that Patent Owner's $800 million sales figure in a vacuum means little when Patent Owner did not include the contract as evidence, and the contract would reveal that it included sales of unpatented lavatory designs. Reply 22–23. Petitioner also contends that Patent Owner's expert testimony cannot fill the gap because he admitted that he had not reviewed the contract. *Id.* at 24–25.

As noted above, we presume that a nexus exists between Patent Owner's Spacewall product and the claims at issue here. But that nexus does not extend to non-Spacewall products, and Patent Owner's decision not to introduce the $800 million contract undermines its ability to allege that the sales were due to the Spacewall design. Instead, it appears that at least some portion of those sales correspond to unpatented designs. *See* Reply 24 (citing testimony). These same sales, including patented and unpatented products, presumably helped create the 20% market share increase. PO Resp. 39. Without the contract or a breakdown of the sales and market share attributable to the patented Spacewall design, Patent Owner limits the potential impact of the $800 million contract and growing market share on our analysis here. That said, Patent Owner does introduce evidence that at least some customers bought the Spacewall product due to its contoured wall and space-saving design, and sales for the Spacewall were likely substantial even if they were a fraction of the $800 million contract. PO Resp. 38–39. Based on the foregoing, we view Patent Owner's evidence of commercial success as moderate.

Industry Praise. Patent Owner argues that numerous instances of industry praise support the nonobviousness of the claims here. PO Resp. 41–42 (citing Ex. 2046 ¶¶ 26–33; Ex. 2055–2059; Ex. 2096). The alleged praise for the claimed invention include an industry award and positive comments in trade publications. *Id.* Patent Owner contends that "the objective evidence ties directly to claimed features" because it notes that Patent Owner's design frees up floor space and includes curved walls. *Id.* at 43.

Petitioner argues that, upon closer inspection, the industry award was "voted on by a panel of the inventor's colleagues, while he was in the room watching their vote, [and] hardly reflects unbiased industry praise." Reply 26 (emphasis omitted). Petitioner contends that the other purported praise lacks credibility because there is no evidence that the praise was from one of ordinary skill in the art, and the articles suggest that unclaimed features drove the success of the design, including the vacuum toilet, LED lighting, and oxygen system. *Id.* at 26–27 (citing Exs. 2055–2059).

While Petitioner makes some credible arguments that go to the weight to be accorded the industry praise, we find that Patent Owner has established industry praise for the Spacewall product, which we presume has a nexus to the claimed invention.[12] The praise specifically references features relevant to the claimed inventions, such as the curved walls and space savings. *See* PO Resp. 41–42 (citing Ex. 2046 ¶¶ 26–33; Ex. 2055–2059; Ex. 2096). Therefore, although the praise also notes unclaimed features of the lavatory design, and the industry award process may have been flawed, the award and praise of claimed features are sufficient to establish industry

[12] Petitioner has arguably rebutted the presumption of a nexus, or significantly undermined its import, by pointing to evidence that some of the praise was tied to unclaimed features. Reply 26–27 (citing Exs. 2055–2059). We need not determine whether Petitioner has adequately rebutted the presumption because even if we presume the nexus remains, Patent Owner has not established sufficient objective indicia to support a finding of nonobviousness of claim 8.

praise of the claimed invention. We view the evidence of industry praise as moderate.[13]

vi. Conclusion as to Claim 8

Patent Owner has established a moderate level of objective indicia of nonobviousness related to commercial success and industry praise, but Petitioner has established a strong case of obviousness based on the Admitted Prior Art and Betts, coupled with common sense and the knowledge of a person of ordinary skill in the art. Based on the foregoing, after consideration of all of the *Graham* factors and the full record before us, we are persuaded that Petitioner has established, by a preponderance of evidence, that claim 8 would have been obvious over the Admitted Prior Art and Betts.

4. Obviousness of Claims 10–16

Claim 10 depends from claim 8 and recites "wherein the at least one first recess substantially conforms to a contour of an aft surface of the upwardly and aftwardly inclined seat back." Petitioner argues that Betts discloses a wall that conforms to a contour of an inclined seat back, as claimed, and notes the similarities between Figure 1

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[13] We note that our analysis of the objective indicia generally tracks the analysis in the related IPR, although we accord more weight to the commercial success evidence. *See* IPR2014-00727, 22–24 (Paper 65); *B/E Aerospace*, 709 F. App'x at 695–96. The record here included further allegations and evidence, including that related to market share, that was not considered in the prior, related decisions. *See id.*

of Betts and Figure 2 of the '742 patent in this regard. Pet. 40–41 (citing Ex. 1001, Fig. 2; Ex. 1004 ¶¶ 255–256, 258; Ex. 1005, Fig. 1). Patent Owner does not address claim 10. We are persuaded by Petitioner's argument and evidence, and find that Betts discloses the limitations of claim 10.

Claim 11 depends from claim 8 and recites "wherein the contoured forward partition further comprises an upper projection that, upon installation, protrudes forward over a top of the upwardly and aftwardly inclined seat back." Petitioner argues that Figure 1 of Betts discloses the claimed upward projection that protrudes over the top of the inclined seat back, as claimed. Pet. 41–42 (citing Ex. 1004 ¶¶ 259–260; Ex. 1005, Fig. 1). Patent Owner does not address claim 11. We are persuaded by Petitioner's argument and evidence, and find that Betts discloses the limitations of claim 11.

Claim 12 depends from claim 11 and recites "wherein the upper projection is configured to abut an upper surface of the cabin area." Petitioner argues that the Admitted Prior Art discloses an upper portion of the forward wall configured to abut an upper surface of the cabin area. Pet. 42–43 (citing Ex. 1004 ¶ 262; Ex. 1001, Fig. 1). Patent Owner does not address claim 12. We are persuaded by Petitioner's argument and evidence, and find that the Admitted Prior Art discloses the limitations of claim 12.

Claim 13 depends from claim 11 and recites "wherein the upper projection defines an interior

storage space in the aircraft lavatory." Petitioner argues that the Admitted Prior Art discloses a secondary space in the lavatory above the seat back and points to those spaces within both Figures 1 and 2 of the '742 patent. Pet. 43–44 (citing Ex. 1001, 4:43–45, Figs. 1, 2; Ex. 1004 ¶¶ 205–207, 263). Petitioner also argues that prior art lavatories containing such storage spaces were known, and that the lavatory "would continue to contain the prior art interior storage spaces after applying a contour to the forward wall [from Betts]." *Id.* (citing Ex. 1004 ¶ 207). Patent Owner does not address claim 13. We are persuaded by Petitioner's argument and evidence, and find that the Admitted Prior Art discloses the limitations of claim 13.

Claim 14 depends from claim 8 and recites "wherein the upwardly and aftwardly inclined seat back is in an upright and not a reclined position." Petitioner argues that Betts discloses the claimed seat position, and notes the similarities between its position and that shown in the '742 patent. Pet. 4445 (citing Ex. 1001, Fig. 2; Ex. 1004 ¶¶ 264–265; Ex. 1005, Fig. 1). Petitioner argues that "a person of ordinary skill in the art would recognize that the seat shown in Betts is in an upright and unreclined position." *Id.* at 45. Patent Owner does not address claim 14. We are persuaded by Petitioner's argument and evidence, and find that Betts discloses the limitations of claim 14.

Claim 15 depends from claim 8 and recites "wherein the at least one first recess extends along substantially a full width of the contoured forward partition." Petitioner argues Figure 1 of Betts

"shows a side elevation view of the coat closet enclosure" and that "[o]ne of ordinary skill in the art would understand from Figure 1 that the recess extends the full width of the forward wall." Pet. 45 (citing Ex. 1004 ¶¶ 234–235, 267; Ex. 1005, 1:5859, Fig. 1). Petitioner also argues that "nothing in Betts suggest that the recess only extends [for] a portion of the width of the forward wall" and that "one of ordinary skill in the art would be motivated to extend the recess the full width of the forward wall in order accommodate the full row of seats installed immediately forward of the wall." *Id.* at 45–46 (citing Ex. 1004 ¶ 236). Patent Owner does not address claim 15. We are persuaded by Petitioner's argument and evidence, and find that Betts discloses the limitations of claim 15.

Claim 16 depends from claim 8 and recites "wherein replacing the previously-installed forward partition with the contoured forward partition permits the aft-extending seat support to be positioned farther aft in the cabin area than was possible when the previously-installed forward partition was installed in the cabin area." Petitioner argues that the design that results from combining Betts with the Admitted Prior Art would naturally meet the requirements of claim 16. Pet. 46 (citing Ex. 1004 ¶¶ 268–269). Petitioner contends that Betts shows the seat already positioned "further aft than it could be positioned if there were no recess in the forward wall because the seat back is within the recess." *Id.* Petitioner also argues that, as discussed above, it would have been obvious to add a second recess to receive an aft-extending seat support, which also allows the seat to be positioned further

aft. *Id.* at 47. Patent Owner argues that "in Betts the seat support cannot be positioned any further aft to reduce unused space between the seat and the closet" and "[t]here is nothing in Betts that teaches moving or repositioning the seat at all." PO Resp. 20 (citing Ex. 2046 ¶ 40–41). Patent Owner also repeats its argument that Figure 1 of Betts is not drawn to scale, and therefore one cannot conclude that the seat lies within the recess in an unreclined position. *Id.* at 21–22 (citing Ex. 1005, 2:19–22, 4:63–67, Fig. 1; Ex. 2093, 51:11–52:7, 70:4–15, 88:19–22; Ex. 2096, 81:13–82:21). According to Patent Owner, if the wall in Betts "were flat, the seat could simply stay put." *Id.* at 23 (citing Ex. 2104 ¶ 159).

The issues raised by Patent Owner here are similar to those already addressed above. We already found, as we did in the related *inter partes* review, that Figure 1 of Betts discloses a seat partially within the first recess in an unreclined position, such that the seat is positioned further aft than it would have been if Betts employed a flat forward wall. We also found that it would have been obvious to modify the Admitted Prior Art by replacing the flat forward wall with the contoured wall of Betts, and that the result would be a seat position that is further aft than it would have been using the flat forward wall. Similarly here, based on Petitioner's argument and evidence, which we find persuasive, we find that once the combination is made, it "permits the aft-extending seat support to be positioned farther aft in the cabin area than was possible when the previously-installed forward

partition was installed in the cabin area."[14] Based on the foregoing, we are persuaded that Petitioner has established that claim 16 would have been obvious in view of the Admitted Prior Art and Betts.

In summary, we are persuaded that Petitioner has established by a preponderance of the evidence that claims 10–16 would have been obvious over the Admitted Prior Art and Betts.

E. Patent Owner's Motion to Exclude

Patent Owner moves to exclude exhibits 1004, 1006, 1007, 1008, 1018, 1019, and 1020,[15] and any reliance thereon. Mot. Exclude 2. Petitioner opposes the Motion, and argues that Patent Owner waived the majority of the objections made with respect to Exhibit 1004. Opp. 2. Petitioner also argues that Patent Owner mischaracterizes the content of a number of the exhibits that bear on the ground at issue in this proceeding. *Id.* at 3–4. We need not reach these issues given that we deny Patent Owner's Motion on other grounds.

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[14] We note that claim 16 does not require moving a seat, as Patent Owner suggests, but instead requires the structure resulting from replacing the flat forward wall with the contoured wall merely to "permit" the "farther aft" positioning of the seat.

[15] Patent Owner references "Exhibit 1118, Exhibit 1119" in the Motion to Exclude, but the argument section references Exhibits 1018 and 1019, and we interpret the references to Exhibits 1118 and 1119 as typographical errors. *See* Mot. Exclude 2, 7–9.

1. Exhibit 1004

Regarding Exhibit 1004, the Anderson Declaration, Patent Owner argues that the entire declaration "must be excluded under F.R.E. 401, 402, 403, 702, 703, and 37 C.F.R. § 42.65 as irrelevant, prejudicial, and unreliable expert testimony because Mr. Anderson only provides conclusory statements without sufficient citation to evidence or explanation." *Id.* at 3. Patent Owner does not support this broad, undeveloped, exclusion effort further, and to the extent that Patent Owner seeks to exclude the entire declaration rather than the enumerated paragraphs later addressed by Patent Owner, we decline to do so.

Patent Owner then focuses on an extensive list of paragraphs as "not relevant to Betts" and "unreliable because they are based on Ex. 1009, 'KLM Crew Rest,' which is not a prior art reference that is available for use in this IPR." *Id.* at 3–4. We granted Petitioner's request for partial adverse judgment as to the second ground in the Petition based in part on the KLM Crew Rest reference. Paper 36. We did not rely on the KLM Crew Rest in this Decision, nor any of Mr. Anderson's opinions related to the KLM Crew Rest, and we therefore deny Patent Owner's motion to exclude Ex. 1004 as moot to the extent that it seeks to exclude opinions based on the KLM Crew Rest. *See* Mot. Exclude 3–4.

Patent Owner also seeks to exclude certain paragraphs of Exhibit 1004 as too conclusory and lacking sufficient citation. *Id.* at 4–6. We view these arguments as going to the weight to be accorded the

opinions rather than a proper basis for exclusion, and we deny the motion as to these paragraphs on that basis. In addition, with respect to paragraphs 75–79 and 93 related to the three "second recess" references we addressed above, we deny Patent Owner's Motion for the additional reason that those references need not be "printed publication" prior art in order to be considered by Mr. Anderson. *See id.* at 5–7 (arguing that the declarants submitting the alleged prior art did not declare that the references were printed publications available to the public). Patent Owner cites no authority for its position that references must be excluded and not considered in any manner if they are not "printed publication" prior art under 35 U.S.C. § 311(b). Accordingly, we deny Patent Owner's Motion to Exclude Exhibit 1004.

2. Exhibits 1018 and 1019

Patent Owner argues that Exhibits 1018 and 1019 should be excluded because Petitioner only relied on the exhibits for the second ground based on the KLM Crew Rest, and not for the Betts ground. Mot. Exclude 7–8. This argument is misleading. While Exhibits 1018 and 1019 were not cited directly in the Petition, Patent Owner is aware that the exhibits refer to drawings related to the "second recess" issue that are relied upon by Mr. Anderson and reproduced in the Petition. *See* Pet. 38. Petitioner also cites directly to Exhibits 1018 and 1019 in the Reply for that purpose. Reply 7–8. Patent Owner's argument that we should exclude the entirety of the exhibits because they do not relate to the Betts ground lacks merit.

Patent Owner also argues that Petitioner has not shown that the exhibits are prior art. Mot. Exclude 8 ("Petitioner has not shown [that Ex. 1018] is prior art available for use during this IPR."), 9 ("Petitioner has not shown that these declaration exhibits are prior art."). As discussed above, Petitioner introduced unrebutted testimony that two of the three references are prior art, and as to the third Patent Owner raised some doubt as to which version of the product was in public use or on sale. We decline to exclude the references that we already find are prior art. Again, Patent Owner provides no authority for the proposition that we can only consider "printed publication" prior art in this proceeding, even for background art that goes to the common sense issue here. In addition, as to the third reference, where Patent Owner established some doubt about the content of the product in public use and on sale, we need not rely on that reference to find the claims obvious and granting this Motion with respect to that exhibit would have no impact on the outcome of this case.[16] We decline to exclude the references because they are not printed publications or prior art.

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[16] Even if none of the references were prior art, we see no basis to exclude any of the references. They are still germane to Petitioner's argument that adding a second recess was known in the art, even if only in the internal, non-public documents of multiple parties in the industry. *See* Opp. 8. Accordingly, even if not prior art, we would not exclude the references and would assess their weight in the context of Petitioner's common sense argument.

Patent Owner also argues that Exhibits 1018 and 1019 are not properly authenticated because they are not self-authenticating. *Id.* at 7–8. Petitioner argues that Patent Owner waived this objection because it never objected to the *exhibits* to the declarations on the basis of authenticity. Opp. 11 (citing Paper 15, 3–5). Petitioner also argues that Patent Owner's position is baseless and frivolous because "[e]vidence may be authenticated through the testimony of a witness with knowledge that the exhibit is what it is claimed to be." *Id.* (citing FRE 901(b)(1)). Petitioner points to portions of each declaration stating that the witnesses had such "personal knowledge" and that the exhibits to the declarations contain "true and correct copies." *Id.* (citing Ex. 1018 ¶¶ 1, 15; Ex. 1019 ¶¶ 1, 8, 17). Petitioner also submitted deposition testimony from the district court litigation that allegedly authenticates the exhibits. *Id.* at 11–12 (citing Exs. 1024, 1025). Patent Owner did not respond to Petitioner's specific arguments in its Reply.

We need not reach Petitioner's waiver argument. Patent Owner made a boilerplate, undeveloped argument regarding lack of authenticity, and then failed to respond to Petitioner's detailed arguments in support of its showing of authenticity. We agree with Petitioner's arguments and evidence on this issue, and decline to exclude the exhibits on that basis that they were not properly authenticated.

3. Exhibits 1006, 1007, 1008, and 1020

For Exhibits 1006, 1007, 1008, and 1020, Patent Owner seeks to exclude the exhibits for the same

reasons discussed above—because they do not relate to the Betts ground, only the KLM Crew Rest ground; because they are not prior art available for use in an IPR; and because they are not properly authenticated. Mot. Exclude 9. These arguments are not developed further, and Patent Owner does not refer to the specific contents of these exhibits. *Id.* We deny Patent Owner's Motion to Exclude these exhibits for the same reasons provided above when addressing these same arguments.

F. Patent Owner's Motions to Seal

Patent Owner filed two unopposed Motions to Seal. Papers 8, 20. In the first, Patent Owner seeks to seal exhibits 2020, 2038, 2039, 2040, 2048, 2049, 2050, 2051, 2053, 2060, 2061, 2062, 2063, 2064, 2065, and 2066 as well as Patent Owner's Preliminary Response. Paper 8, 1. The Motion also seeks entry of a protective order that deviates from our standard protective order in several respects. *Id.* at 7–8. In the second Motion to Seal, Patent Owner seeks to seal exhibits 2077, 2078, 2079, 2089, 2090, 2091, 2092, 2096, 2097, 2098, and 2104, as well as Patent Owner's Response. Paper 20, 1.

There is a strong public policy that favors making information filed in *inter partes* review proceedings open to the public. *See Garmin Int'l v. Cuozzo Speed Techs., LLC*, Case IPR2012-00001 (PTAB March 14, 2013) (Paper 34) (discussing the standards of the Board applied to motions to seal). The moving party bears the burden of showing that the relief requested should be granted. 37 C.F.R. § 42.20(c).

> [A] movant to seal must demonstrate adequately that (1) the information sought to be sealed is truly confidential, (2) a concrete harm would result upon public disclosure, (3) there exists a genuine need to rely in the trial on the specific information sought to be sealed, and (4), on balance, an interest in maintaining confidentiality outweighs the strong public interest in having an open record.

Argentum Pharms. LLC v. Alcon Research, Ltd., Case IPR2017-01053, 4 (PTAB January 19, 2018) (Paper 27) (informative).

In both Motions, Patent Owner asserts that confidential information has been exchanged in the underlying district court litigation and the parties have agreed that the information can be used in this proceeding, provided that it is filed under seal. Paper 8, 1; Paper 20, 1. Patent Owner asserts that the "material includes confidential and business sensitive information of Patent Owner, Petitioner, and Related Entities." Paper 8, 2; Paper 20, 1. Patent Owner also contends that disclosure of the information would cause competitive harm to one or more of those entities. *Id.* Patent Owner then explains why each exhibit contains confidential information that justifies sealing the exhibit. Paper 8, 2–6; Paper 20, 2–4. For example, Patent Owner contends that Exhibits 2048–2050, 2053, 2061, and 2062 "include competitively-sensitive information regarding the technical composition and operation of systems created and provide[d] by Patent Owner's successor-in-interest." Paper 8, 2; *see also* Paper 20,

2 (addressing Exhibits 2077, 2096, and 2098 using a similar rationale). Patent Owner and Petitioner also contend that Exhibits 2020, 2038, 2039, 2040, 2051, 2060, and 2063–66 contain competitively-sensitive information of Petitioner, including technical schematics for aircrafts manufactured by Petitioner that were exchanged under an "Attorney's Eyes Only" designation in the district court litigation. Paper 8, at 3–6; *see also* Paper 20, 2 (addressing Exhibits 2078, 2089, 2092, and 2097, which include information produced under "Attorney's Eyes Only" designation in district court litigation), 3 (addressing Exhibits 2079, 2090, and 2091, which contain Petitioner's competitively-sensitive information).

Based on our review of the record and Patent Owner's Motions, we agree that a sufficient basis exists to seal the exhibits in question. Although sealing the entirety of all of the exhibits in question is undoubtedly overbroad in that portions of each exhibit contain non-confidential material, we understand the burden imposed in determining, on a line-by-line basis, after consultation with all parties involved, which material is truly confidential and which is not. The public interest in reviewing non-confidential information in exhibits that may not be germane to the issues in the case is also lower than with respect to exhibits at the core of the parties' dispute. Accordingly, we grant Patent Owner's Motion to Seal (Paper 8) as to Exhibits 2020, 2038, 2039, 2040, 2048, 2049, 2050, 2051, 2053, 2060, 2061, 2062, 2063, 2064, 2065, and 2066, and grant Patent Owner's Motion to Seal (Paper 20)

as to Exhibits 2077, 2078, 2079, 2089, 2090, 2091, 2092, 2096, 2097, 2098, and 2104.

We reach a different conclusion regarding the redacted versions of Patent Owner's Preliminary Response and Patent Owner's Response. *See* Papers 7, 22. The Motions do not separately address the specific material redacted from those documents, or justify their exclusion from the public record. The redacted material appears to quote from or summarize information from exhibits subject to the motion to seal. However, as noted above, although we grant the motion to seal the exhibits, that does not mean that every line of every exhibit contains confidential information. In addition, the public interest is perhaps highest when addressing the ability of the public to view the information in the briefs of record. That information, by dint of its inclusion in the briefs, is arguably the most germane to the issues in the case and the basis for our Decision. On balance, we conclude that the interest in maintaining the confidentiality of the redacted portions of the Patent Owner's Preliminary Response and Patent Owner's Response are outweighed by the public interest in viewing the material. Accordingly, we deny the Motion to Seal Patent Owner's Preliminary Response and Patent Owner's Response.

Patent Owner also seeks entry of an agreed Protective Order. Paper 8, 7, Ex. A. According to Patent Owner, the parties' agreed Protective Order deviates from the Board's default protective order by modifying the list of individuals that can receive confidential information, and by clarifying that the

Protective Order only governs documents marked "PROTECTIVE ORDER MATERIAL" in connection with this proceeding. *Id.* at 7–8. Patent Owner states that similar orders have been entered in related *inter partes* reviews. *Id.* at 7. We are amenable to the changes to our default protective order proposed by the parties. Accordingly, we grant Patent Owner's Motion for entry of the Protective Order attached to the Motion to Seal (Paper 8) as Exhibit A.

III. CONCLUSION

For all of the above reasons, we determine that Petitioner has shown by a preponderance of the evidence that claims 8 and 10–16 of the '742 patent are unpatentable. We also deny Patent Owner's Motion to Exclude and grant Patent Owner's Motion to Seal certain exhibits and to enter an agreed Protective Order, but deny Patent Owner's Motion to Seal the Patent Owner's Preliminary Response and Patent Owner's Response.

IV. ORDER

It is

ORDERED that claims 8 and 10–16 of the '742 patent have been shown to be unpatentable;

FURTHER ORDERED that Patent Owner's Motion to Exclude is DENIED;

FURTHER ORDERED that Patent Owner's Motion to Seal (Paper 8) as to Exhibits 2020, 2038, 2039, 2040, 2048, 2049, 2050, 2051, 2053, 2060,

2061, 2062, 2063, 2064, 2065, and 2066 is GRANTED;

FURTHER ORDERED that Patent Owner's Motion to Seal (Paper 20) as to Exhibits 2077, 2078, 2079, 2089, 2090, 2091, 2092, 2096, 2097, 2098, and 2104 is GRANTED;

FURTHER ORDERED that Patent Owner's Motion for entry of an agreed Protective Order (Paper 8, Ex. A) is GRANTED;

FURTHER ORDERED that Patent Owner's Motion to Seal its Patent Owner Preliminary Response (Paper 8) and Patent Owner Response (Paper 20) is DENIED, and Patent Owner shall file unredacted versions of both documents within ten (10) calendar days of the date of this Decision; and

FURTHER ORDERED that, because this is a Final Written Decision, parties to the proceeding seeking judicial review of the decision must comply with the notice and service requirements of 37 C.F.R. § 90.2.

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APPENDIX C
UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

C&D ZODIAC, INC.,
Petitioner,

v.

B/E AEROSPACE, INC.,
Patent Owner.

Case IPR2017-01275
Patent 9,073,641 B2

Before JENNIFER S. BISK, SCOTT A. DANIELS, and RICHARD H. MARSCHALL, *Administrative Patent Judges.*

BISK, Administrative Patent Judge.

FINAL WRITTEN DECISION
35 U.S.C. § 318(a) and 37 C.F.R. § 42.73

I. INTRODUCTION

C&D Zodiac, Inc. ("Petitioner"), filed a petition to institute an *inter partes* review of claims 1, 3-10, and 12-17 of U.S. Patent No. 9,073,641 B2 (Ex. 1001, "the '641 patent"). Paper 2 ("Pet."). 35 U.S.C. § 311. B/E Aerospace, Inc. ("Patent Owner"),

filed a Preliminary Response. Papers 6, 7 ("Prelim. Resp.").[1] Upon consideration of the Petition and Preliminary Response, we instituted an *inter partes* review pursuant to 35 U. S.C. § 314, as to claims 1, 3-10, and 12-17. Paper 12 ("Inst. Dec.").

Subsequent to institution, Patent Owner filed a Patent Owner Response (Paper 20, 21, "PO Resp.")[2] and Petitioner filed a Reply to Patent Owner's Response (Paper 28, "Reply"). Patent Owner filed a Motion to Exclude (Paper 34, "Mot. Exclude"), Petitioner filed an Opposition to Patent Owner's Motion (Paper 37, "Opp."), and Patent Owner filed a Reply (Paper 38, "PO Reply to Mot. Exclude"). Patent Owner also filed two unopposed Motions to Seal. Papers 8, 22.

On June 28, 2018, in response to the Board's Orders instituting on Ground 2 based on the Supreme Court's decision in *SAS Institute Inc. v. Iancu*, 138 S. Ct. 1348 (2018), Petitioner filed a Request for Partial Adverse Judgment against itself with respect to Ground 2, pursuant to 37 C.F.R. § 42.73(b). *See* Paper 30 (modifying institution decision to institute on all challenged grounds presented in Petition); Paper 33 (Petitioner's Request for Partial Adverse Judgment as to Ground

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[1] Patent Owner filed two versions of the Preliminary Response: Paper 6, to which access is restricted to the parties and the Board; and Paper 7, a publicly available, redacted version of Paper 6.

[2] Patent Owner filed two versions of the Patent Owner Response: Paper 20, to which access is restricted to the parties and the Board; and Paper 21, a publicly available, redacted version of Paper 20.

2). We granted Petitioner's Request for Partial Adverse Judgment on July 5, 2018. Paper 36 (granting adverse judgment as to Ground 2).

On August 3, 2018, we held an oral hearing. P aper 40 ("T r. ").[3]

This Final Written Decision is entered pursuant to 35 U.S.C. § 318(a). For the reasons that follow, we determine that Petitioner has demonstrated by a preponderance of the evidence that claims 1, 3-10, and 12-17 of the '641 patent are unpatentable.

A. Related Matters

Patent Owner asserted the '641 patent along with related patents, U.S. Patent Nos. 9,444,742, 9,365,292, 9,434,476, and D764,031, against Petitioner in *B/E Aerospace, Inc. v. Zodiac Aerospace, Inc.*, No. 2:14-cv- 01417 (E.D. Tex.) (the "district court litigation"), that is currently stayed. Pet. 2; Paper 5, 2. All five of these patents claim priority to a U.S. application that issued as U.S. Patent No. 8,590,838 ("the '838 patent"), which patent was the subject of Case IPR2014-00727 between Petitioner and Patent Owner. In the final written decision in that case, the Board held that claims 1, 3-7, 9, 10, 12-14, 16-19, 21, 22, 24-29, 31, and 33-37 had been proven unpatentable, and claims 8, 20, 30, and 38 had not been proven unpatentable. IPR2014-00727, Paper 65. Both sides appealed, and the Court of Appeals affirmed. *See*

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[3] The oral hearing included related proceedings, IPR2017-01276 and PGR2017-00019. Paper 40.

B/E Aerospace, Inc. v. C&D Zodiac, Inc., 709 F. App'x 687, 2017 WL 4387223 (Fed. Cir. Oct. 3, 2017).

Each of the additional four related patents identified above is the subject of a petition for an *inter partes* or post-grant review filed by Petitioner. *See* Cases IPR2017-01273 (involving Patent 9,434,476); IPR2017-01274 (involving Patent 9,365,292); IPR2017-01276 (involving Patent 9,440,742); PGR2017-00019 (involving Patent D764,031).

B. The '641 Patent

The '641 patent relates to space-saving aircraft enclosures, including lavatories, closets, and galleys. Ex. 1001, 1:15-20, 2:14-19. Figure 2 of the '641 patent is reproduced below.

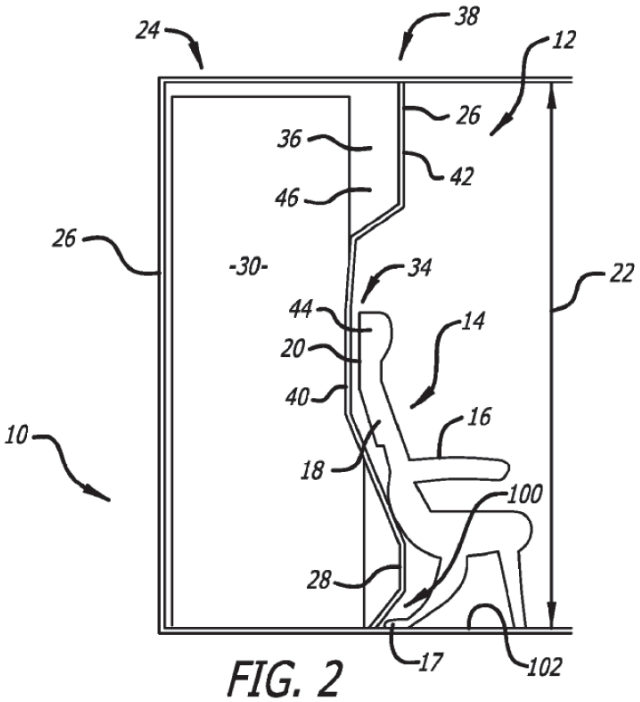

FIG. 2

Figure 2, reproduced above, illustrates enclosure 10, such as a lavatory, positioned aft of aircraft cabin 12. Ex. 1001, 4:1-3, 4:8-13. The lavatory has walls that define interior lavatory space 30. *Id.* at 4:15-24. Forward wall 28 of the lavatory is described as "substantially not flat in a vertical plane" and "disposed immediately aft of and adjacent to or abutting the exterior aft surface of" passenger seat 16. *Id.* at 4:15-24. In particular, the forward wall is shaped to provide recess 34, which accommodates the partially-reclined backrest of the passenger seat, as shown in Figure 2. *Id.* at 4:24-28. In addition, the forward wall is shaped to also provide second, lower recess 100, which accommodates "at least a portion of an aft-extending seat support 17." *Id.* at 4:31-36.

The '641 patent contrasts the embodiment of Figure 2 with a prior art configuration shown in Figure 1, which is reproduced below.

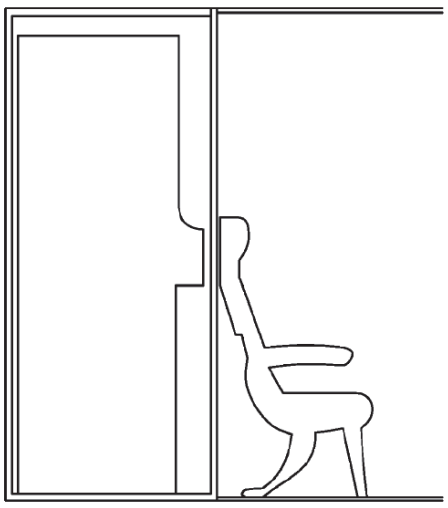

FIG. 1
(Prior Art)

Figure 1, reproduced above, illustrates "a prior art installation of an [aircraft] lavatory immediately aft of and adjacent to an aircraft passenger seat." Ex. 1001, 3:65-67. In the depiction of the prior art in Figure 1, a forward wall of the lavatory (double-lined structure immediately aft of seat) is flat and in a vertical plane.

> As can be seen by comparing FIG. 1 and FIG. 2, the recess 34 and the lower recess 100 combine to permit the passenger seat 16 to be positioned farther aft in the cabin than would be possible if the lavatory enclosure 10 included a conventional flat and vertical forward wall without recesses like that shown in FIG. 1, or included a forward wall that did not include both recesses 34, 100.

Id. at 4:36-42. Notably, the passenger seat in the Figure 1 depiction of the prior art is identical to the passenger seat in the Figure 2 illustration of the invention.

Petitioner challenges claims 1, 3-10, and 12-17. Claims 1 and 8 are independent. Claims 3-7 depend directly from claim 1 and claims 9, 10, and 12-17 ultimately depend from claim 8. Claims 1 and 8 are reproduced below.

> 1. An aircraft lavatory for a cabin of an aircraft of a type that includes a forward-facing passenger seat that includes an upwardly and aftwardly inclined seat back and an aft-extending seat support disposed below the seat back, the lavatory comprising:
>
> a lavatory unit including a forward wall portion and defining an enclosed interior

lavatory space, said forward wall portion configured to be disposed proximate to and aft of the passenger seat and including an exterior surface having a shape that is substantially not flat in a vertical plane; and

wherein the said forward wall portion is shaped to substantially conform to the shape of the upwardly and aftwardly inclined seat back of the passenger seat, and includes a first recess configured to receive at least a portion of the upwardly and aftwardly inclined seat back of the passenger seat therein, and further includes a second recess configured to receive at least a portion of the aft-extending seat support therein when at least a portion of the upwardly and aftwardly inclined seat back of the passenger seat is received within the first recess.

Ex 1001, 4:63-5:17.

8. An aircraft lavatory for an aircraft, the lavatory comprising:

a forward partition;

an aft partition; and

a lavatory space disposed between the forward partition and the aft partition;

wherein the forward partition comprises:

a forward-extending upper portion;

an aft-extending mid-portion; and

wherein the forward-extending upper portion, the aft- extending mid-portion, and the forward-extending lower portion combine to define a first aft-extending recess disposed between the upper forward-extending portion and the forward-extending lower portion, and

wherein the forward partition further defines a second aft- extending recess proximate to a lower end of the forward partition, the second aft-extending recess being configured to receive at least a portion of an aft-extending seat support of a forward-positioned passenger seat therein.

Id. at 5:43-6:14.

C. Instituted Grounds of Unpatentability

We instituted trial based on all asserted grounds of unpatentability. Inst. Dec. 23; Paper 30. After granting Petitioner's Request for Partial Adverse Judgment (Paper 36), the following ground remains for our consideration: whether the

Admitted Prior Art[4] and Betts[5] render claims 1, 3-10, and 12-17 obvious under 35 U.S.C. § 103(a).[6]

II. ANALYSIS

A. Principles of Law

To prevail in its challenge to Patent Owner's claims, Petitioner must demonstrate by a preponderance of the evidence that the claims are unpatentable. 35 U.S.C. § 316(e); 37 C.F.R. § 42.1(d).

A claim is unpatentable under 35 U.S.C. § 103(a) if the differences between the claimed subject matter and the prior art are such that the subject matter, as a whole, would have been obvious at the time of the invention to a person having ordinary skill in the art. *KSR Int'l Co. v. Teleflex, Inc.*, 550 U. S. 398, 406 (2007). The question of obviousness is resolved on the basis of underlying factual determinations including: (1) the scope and content of the prior art; (2) any differences between the claimed subject matter and the prior art; (3) the level of ordinary skill in the art; and (4) objective evidence

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[4] Petitioner defines "Admitted Prior Art" as certain portions of the '641 patent, including Figure 1. Pet. 11-12 (citing Ex. 1001, 1:21-22, Fig. 1; Ex. 1004 186).

[5] U.S. Patent No. 3,738,497, issued June 12, 1973 (Ex. 1005) ("Betts").

[6] The Leahy-Smith America Invents Act ("ALA"), Pub. L. No. 112-29, took effect on March 18, 2013. Because the application from which the '641 patent issued was filed before that date, any citations to 35 U.S.C. §§ 102 and 103 are to their pre-AIA version.

of nonobviousness. *Graham v. John Deere Co.*, 383 U.S. 1, 17-18 (1966).

B. Level of Ordinary Skill

In determining the level of ordinary skill in the art, various factors may be considered, including the "type of problems encountered in the art; prior art solutions to those problems; rapidity with which innovations are made; sophistication of the technology; and educational level of active workers in the field." *In re GPAC Inc.*, 57 F.3d 1573, 1579 (Fed. Cir. 1995) (citation omitted).

Petitioner relies on the testimony of Alan Anderson, who testifies that a person with ordinary skill in the art "would have had a bachelor's degree in mechanical engineering, industrial design, or a similar discipline, or the equivalent experience, with at least two years of experience in the field of aircraft interior design." Pet. 29 (citing Ex. 1004 ¶¶ 27-29). Patent Owner does not address Petitioner's proposal, or offer a competing proposal for a person of ordinary skill in the art. Based on our review of the record, we adopt Petitioner's definition of the level of ordinary skill in the art.

C. Claim Construction

In an *inter partes* review, we construe claim terms in an unexpired patent according to their broadest reasonable construction in light of the specification of the patent in which they appear.[7] 37

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[7] The outcome of this case would be the same using the claim construction approach articulated in *Phillips v. AWH Corp.*, 415 F.3d 1303 (Fed. Cir. 2005) (en banc).

C.F.R. § 42.100(b). Consistent with the broadest reasonable construction, claim terms are presumed to have their ordinary and customary meaning as understood by a person of ordinary skill in the art in the context of the entire patent disclosure. *In re Translogic Tech., Inc.*, 504 F.3d 1249, 1257 (Fed. Cir. 2007). Only terms that are in controversy need to be construed, and then only to the extent necessary to resolve the controversy. *Vivid Techs., Inc. v. Am. Sci. & Eng'g, Inc.*, 200 F.3d 795, 803 (Fed. Cir. 1999).

In the Institution Decision, we declined to construe two terms that Petitioner contended needed construction. Inst. Dec. 8-10. After institution, neither party has asked us to provide a construction of those terms or any other terms. Accordingly, we need not expressly construe any terms in this proceeding.

D. Obviousness in View of Admitted Prior Art and Betts

Petitioner asserts that the subject matter of claims 1, 3-10, and 12-17 would have been obvious over the Admitted Prior Art and Betts. Pet. 31-57. For the reasons explained below, we determine Petitioner has established by a preponderance of the evidence that claims 1, 3-10, and 12-17 are unpatentable over the Admitted Prior Art and Betts.

1. The Admitted Prior Art

Petitioner asserts as Admitted Prior Art the illustration and related disclosure of Figure 1 in the '641 patent, which is discussed above. *See* Pet. 11-14 (citing Ex. 1001, 1:21-22, Fig. 1; Ex. 1004 | 86). In the Institution Decision, we found that the asserted Admitted Prior Art constitutes prior art. Inst. Dec.

11 (citing Ex. 1001, 3:65-67 ("FIG. 1 is a schematic diagram of a *prior art* installation of a lavatory immediately aft of and adjacent to an aircraft passenger seat. ") (emphasis added)). Patent Owner does not contend that the Admitted Prior Art is not prior art, or that it cannot be used in this proceeding as a basis for finding limitations disclosed by the prior art.

Of particular relevance here is that the Admitted Prior Art includes a flat forward-facing lavatory wall with the passenger seat shown in Figure 1 of the '641 patent immediately in front of that wall, with an aft-extending seat support.

2. Betts

Betts notes a desire to "provide more room for passengers in an aircraft or other vehicle." Ex. 1005, 1:6-7. Figure 1 of Betts is reproduced below.

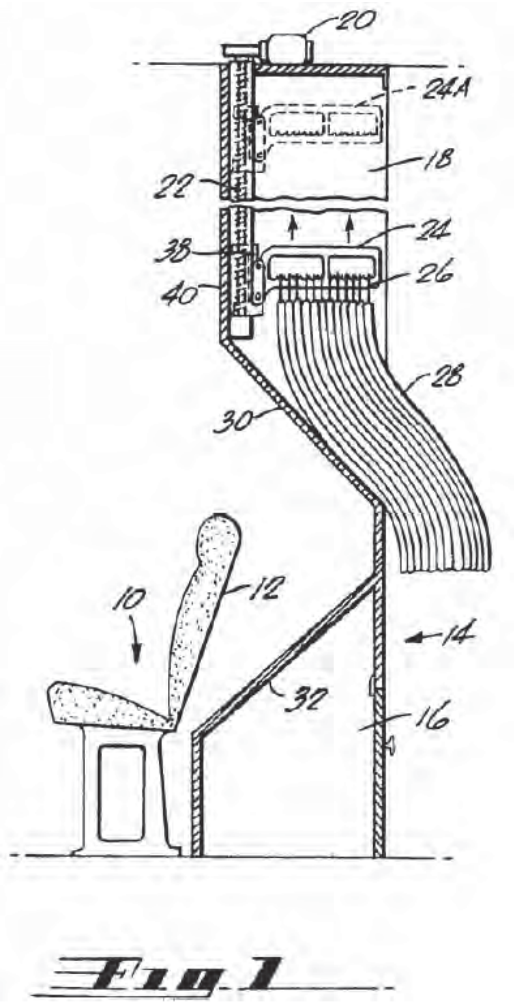

Fig. 1

Figure 1 discloses airplane passenger seat 10 having tiltable backrest 12. Ex. 1005, 2:8-9. Behind the seat is coat closet 14, which has luggage space 16 along the floor and overhead coat compartment 18. *Id.* at 2:9-14. "The lower portion 30 of the coat compartment 18 slants rearwardly to provide a space for seatback 12 to be tilted rearwardly as desired by the occupant. The top 32 of storage space

16 also slants rearwardly so as not to interfere with seatback 12 when tilted." *Id.* at 2:19-24.

3. Obviousness of Independent Claims 1 and 8

Petitioner relies on the Declarations of Alan Anderson (Ex. 1004, "Anderson Declaration"), Scott Savian (Ex. 1018), and Vince Huard (Ex. 1019) in support of its assertions that the combination of Admitted Prior Art and Betts discloses or renders obvious all of the limitations of claims 1 and 8. Pet. 21-26, 31-57; Reply 4-15. Patent Owner relies on the Declarations of Dr. Adam Dershowitz (Ex. 2104, "Dershowitz Declaration"), R. Kaus Brauer (Ex. 2046), and James Brunke (Ex. 2097) in its Response, and argues that Petitioner failed to establish that the proposed combination discloses the claimed "second recess" and "reducing a volume of unusable space"/"reducing or eliminating gaps" limitations, and failed to establish an adequate motivation to combine. PO Resp. 7-22. The parties also dispute the relevance and impact of Patent Owner's alleged objective evidence of nonobviousness on the obviousness issues in this case. *See* Pet. 77-80; PO Resp. 22-37; Reply 15-27.

i. Motivation to Combine

Petitioner alleges that it would have been obvious to modify the prior art flat wall lavatory, as shown in the Admitted Prior Art, with a contoured forward wall as shown in Betts. Pet. 22 (citing Ex. 1004 ¶¶ 56-64). We first consider Petitioner's argument that we are collaterally estopped from considering the merits of this issue, because the Board already found in the related *inter partes*

review of the '838 patent that "it would have been obvious to apply the recessed forward wall design of Betts to other enclosures, including single-spaced lavatories." Reply 3 (quoting Case IPR2014-00727, 12 (Paper 65) (emphasis removed)). Petitioner relies on the Federal Circuit's affirmance of that decision after the Petition was filed in this case as the basis for its collateral estoppel argument. *Id.* (citing Ex. 1026 (*B/E Aerospace, Inc. v. C&D Zodiac, Inc.*, 709 F. App'x 687 (Fed. Cir. Oct. 3, 2017))). According to Petitioner, Patent Owner should be precluded from arguing that "it would not have been obvious to apply the recessed forward wall design of Betts to other enclosures, including single-spaced lavatories." *Id.* at 3-4. Petitioner only devotes a few sentences of argument to collateral estoppel, does not assess the relevant factors when determining whether to apply collateral estoppel, and does not assess the differences in the claims at issue in the '838 patent and claims 1 and 8 here. *See* Reply 3-4; *Banner v. U.S.*, 238 F.3d 1348, 1354 (Fed. Cir. 2001) ("Collateral estoppel requires four factors: (1) the issues are identical to those in a prior proceeding, (2) the issues were actually litigated, (3) the determination of the issues was necessary to the resulting judgment, and (4) the party defending against preclusion had a full and fair opportunity to litigate the issues."). In addition, Patent Owner has had no meaningful opportunity to address the issue in its own briefing because the collateral estoppel issue was raised for the first time in Petitioner' s Reply. Under these circumstances, where the issue has not been fully developed by Petitioner or addressed by Patent Owner, we decline to apply

collateral estoppel. We do, however, view the findings in the prior case as informative when they closely resemble the issues we address here.

In support of the proposed modification of the Admitted Prior Art with the contoured wall of Betts, Petitioner relies on the testimony in the Anderson Declaration, explaining that a primary goal of airplane interior design is efficient use of passenger cabin space so that more passengers can fit in the cabin or to make the passengers more comfortable. Pet. 22-23 (citing Ex. 1004 1 57). According to Petitioner, because Betts uses the contoured forward wall to provide more passenger space in the cabin, one of ordinary skill in the art would have been motivated to replace the prior art flat forward lavatory wall with the contoured wall of Betts to provide that same additional space. *Id.* at 23 (citing Ex. 1004 ¶ 58). Petitioner points to the recess in the contoured wall Betts discloses as evidence of that approach, which allows the passenger chairs to be pushed back further aft, accommodating a portion of the seat back. *Id.* at 24-25 (citing Ex. 1004 ¶ 59).

Patent Owner argues "that those of skill in the art had no reason to make the combination proposed" by Petitioner. PO Resp. 24. Patent Owner relies on the allegedly long co-existence of the Betts design within planes that included the prior art flat lavatory walls, suggesting that there was no motivation to make the modification. *Id.* at 16-18. Patent Owner also argues that the proposed combination would require "total destruction" of Betts, if the coat closet in Betts were turned into a lavatory. *Id.* at 18-21. Patent Owner also contends that Petitioner and Mr. Anderson fail to establish a

reasonable expectation of success in light of this total deconstruction of Betts. *Id.* at 21-22.

Based on our review of the evidence and arguments, we find that one of ordinary skill in the art would have been motivated to modify the Admitted Prior Art lavatory by replacing the flat forward wall with the contoured forward wall of Betts. Petitioner submits convincing argument based on the testimony of Mr. Anderson, that designers of airplane interiors were concerned about adding space to the cabin and that the Betts contoured wall increased interior space. Pet. 22-25 (citing Ex. 1004 ¶¶ 57-59). Betts itself backs up this testimony by stating that one of the goals of its design is "to provide more passenger room." Ex. 1005, Abstract. We also agree with Petitioner's assertion that Figure 1 of Betts depicts a passenger seat further aft in the cabin than it could have been if the wall were flat with no recess, and merely extended up from the bottom portion of the wall. *See* Betts Fig. 1; Pet. 23-24. Betts therefore depicts how the contoured wall and recess provide more passenger space when compared to a flat, vertical wall, and Betts discusses the ability of its design to save space. As such, Betts adequately supports the proposed modification of the prior art flat forward wall as shown in the Admitted Prior Art.

Patent Owner's argument that flat forward lavatory walls co-existed with the Betts design for years without modification, even if accurate, does not outweigh the more convincing evidence and argument supporting Petitioner's position based on Betts and the Anderson Declaration. In addition, Patent Owner's argument that one would need to

"totally deconstruct" Betts in order to add a lavatory to Betts misapprehends Petitioner's proposed modification. Petitioner proposes to replace a lavatory flat forward wall as shown in the Admitted Prior Art with the Betts contoured wall, not add a lavatory behind the Betts contoured wall. *See* Pet. 22, 24; Reply 4-5. Although we do not apply collateral estoppel for the reasons provided above, we note that our findings regarding the proposed combination and modification are consistent with the Federal Circuit's decision in the related case. *See B/E Aerospace*, 709 F. App'x at 694 (rejecting Patent Owner's argument that Petitioner's combination required adding lavatory to Betts).

Based on the foregoing, we find that one of ordinary skill in the art at the time of the invention would have been motivated to modify the lavatory flat forward wall in the Admitted Prior Art by replacing it with the contoured forward wall of Betts.

ii. The "Forward wall " and "First Recess " limitations

Claims 1 and 8 contain several limitations that are indisputably[8] disclosed by the proposed combination of Betts and the Admitted Prior Art. For example, claim 1 recites "a lavatory unit including a forward wall portion and defining an enclosed interior lavatory space, said forward wall portion configured to be disposed proximate to and aft of the passenger seat and including an exterior

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[8] Patent Owner does not argue that, once the proposed combination is made, the combination fails to disclose these limitations.

surface having a shape that is substantially not flat in the vertical plane" and claim 8 recites "a forward partition; an aft partition; and a lavatory space disposed between the forward partition and aft partition; wherein the forward partition comprises: a forward-extending upper portion; an aft-extending mid-portion; and a forward-extending lower portion." Petitioner argues that a person of ordinary skill in the art would know that the contoured forward wall of Betts could be used in place of a flat forward wall on an aircraft lavatory. Pet. 33-34 (citing Ex. 1004 ¶ 178), 46 (citing Ex. 1004 ¶¶ 209-211). This arrangement follows from the proposed combination discussed above, where the flat forward lavatory wall of the Admitted Prior Art is replaced by the contoured wall of Betts. We find that a person of ordinary skill in the art would have known about flat forward walls such as that the Admitted Prior Art discloses, and contoured forward walls such as that Betts discloses, and that the latter could be used in lieu of the former to save space in the cabin. *See, e. g.*, Ex. 1001, Fig. 1; Ex. 1005, Fig. l; Ex. 10041 246. Once the proposed modification is made, the resulting forward wall is "substantially not flat in a vertical plane," as recited by claim 1 and comprises "a forward-extending upper portion; an aft-extending mid-portion; and a forward-extending lower portion" as recited by claim 8.

Claim 1 recites that "said forward wall portion is shaped to substantially conform to the shape of the upwardly and aftwardly inclined seat back of the passenger seat, and includes a first recess configured to receive at least a portion of the upwardly and aftwardly inclined seat back of the

passenger seat therein" and claim 8 recites that "the forward-extending upper portion, the aft-extending mid-portion, and the forward-extending lower portion combine to define a first aft-extending recess disposed between the upper forward-extending portion and the forward-extending lower portion." Petitioner contends that Betts discloses these first recess limitations. *See* Pet. 34-35 (citing Ex. 1005, Fig. l; Ex. 1004 ¶¶ 181-183), 47 (citing Ex. 1004 ¶¶ 213-214). We agree. Figure 1 of Betts discloses slanted walls 30, 32 that form a recess configured to receive at least a portion of inclined seat back 12. *See* Ex. 1005, Fig. 1,2:19-24 ("The lower portion 30 of the coat compartment 18 slants rearwardly to provide a space for seatback 12 to be tilted rearwardly as desired by the occupant. The top 32 of storage space 16 also slants rearwardly so as not to interfere with seatback 12 when tilted."); *see also B/E Aerospace*, 709 F. App'x at 693 ("Walls 30 and 32 [in Figure 1 of Betts] slant rearwardly to allow the occupant to recline seatback 12 of passenger seat 10." (citing Ex. 1005, 2:7-24)).

iii. "Second Recess"

Claim 1 recites "said forward wall portion . . . further includes a second recess configured to receive at least a portion of the aft-extending seat support therein when at least a portion of the upwardly and aftwardly inclined seat back of the passenger seat is received within the first recess" and claim 8 recites "the forward partition further defines a second aft- extending recess proximate to a lower end of the forward partition, the second aft-extending recess being configured to receive at least a portion of an aft-extending seat support of a

forward-positioned passenger seat therein." Petitioner does not contend that the Admitted Prior Art or Betts alone discloses the second recess. Instead, Petitioner argues that one of ordinary skill in the art would have found it obvious and would have been motivated to add a second recess to a flat forward facing wall. Pet. 37. In support of its assertion, Petitioner first notes that the Admitted Prior Art includes "[a] seat with an aft extending seat support." Pet. 37 (citing Ex. 1001, Fig. 1). Petitioner argues that the logic of using a recess to receive the seat back applies equally to using another recess to receive the aft extending seat support. Pet. 37-38 (citing Ex. 1004 11 188, 189, 191). According to Petitioner, as the seat is moved further aft the seat support may come into contact with the lower section of the wall, impeding movement, and the addition of the second recess to accommodate the seat support will allow the seat to move further back. Reply 6 (quoting Ex. 1004 ¶ 74). Petitioner further points out that adding a second recess is nothing more than the application of known technology (i.e., Betts) for its intended purpose, with a predictable result (i.e., to position the seat as far back as possible). Pet. 37. Petitioner relies on Mr. Anderson's testimony that the second recess, although not disclosed by either of the two references, would have been obvious to add to the combination. *Id.* at 38-39 (citing Ex. 1004 ¶¶ 186-192). Petitioner also relies on Mr. Anderson's citation to three alleged examples of enclosures that include a lower recess to receive a seat support. *Id.* at 39 (citing Ex. 1004 ¶ 192); Reply 6-10 (citing Ex. 1004 ¶¶ 74-79; Ex. 1018, 62; Ex. 1019 ¶¶ 8-11, 17-

20). Petitioner contends that it does not matter that the three enclosures were not available as prior art in these proceedings, or prior art at all, as long as they are evidence of what was known in the art. Reply 9-10. According to Petitioner, these designs support Petitioner's position that "it was a common sense solution to include a recess in a wall to enable a seat support to be positioned further aft." Reply 10 (citing Ex. 1004 ¶¶ 75).

Patent Owner argues that Petitioner' s contention that the second recess would have been obvious "is supported by nothing more than Mr. Anderson's opinion. " PO Resp. 9. Patent Owner asserts that the claimed second recess is "'more than a peripheral issue' and 'therefore require[s] a core factual finding.'" *Id.* at 10 (quoting *K/S HIMPP v. Hear- Wear Techs., LLC*, 751 F.3d 1362, 1365 (Fed. Cir. 2014)). Relying on the Dershowitz Declaration, Patent Owner argues that such recesses were not common knowledge and that one could not move seats further aft as Mr. Anderson suggests, if using the prior art flat wall. *Id.* at 11-12 (citing Ex. 2104 ¶¶ 164-165). Patent Owner also argues that adding a second recess is not supported by the intended purpose of Betts, which is limited to providing a first recess for seat recline, and adding a second recess would not be predictable due to unpredictable impacts on the lavatory. *Id.* at 12-13 (citing hearing and deposition testimony; Ex. 2104 ¶¶ 154, 165; Ex. 2046 ¶ 36; Ex. 2097 ¶¶ 86, 88). Patent Owner also contends that the three recess examples used by Petitioner were not publicly available because the drawings in question were confidential and not for

public use, and cannot be used to show what was known in the art. *Id.* at 13-14.[9]

We agree with Patent Owner that use of common sense to supply a missing limitation must be carefully circumscribed and requires supporting evidence in the situation presented here, but disagree that Petitioner has failed to support its obviousness argument with proper reasoning and evidence. Patent Owner correctly notes that in *K/S HIMPP*, the court held that when a limitation "presents more than a peripheral issue," determination of patentability requires a "core factual finding" that in turn requires "point[ing] to some concrete evidence in the record in support of these findings. " *K/S HIMPP*, 751 F.3d at 1365 (quoting *In re Zurko*, 258 F.3d 1379, 1386 (Fed. Cir. 2001)). Similarly, in *Arendi S.A.R.L. v. Apple Inc.*, 832 F.3d 1355, 1361-62 (Fed. Cir. 2016), the Federal Circuit held that common sense, common wisdom, and common knowledge may be properly considered in an obviousness analysis, but "cannot be used as a wholesale substitute for reasoned analysis and evidentiary support, especially when dealing with a limitation missing from the prior art references specified." *Arendi* distinguished the situation involving a "central" limitation, at issue in *Arendi*, from the situation in *Perfect Web*, where common sense was used to supply a missing limitation. *See Perfect Web Techs., Ins. v. InfoUSA, Inc.*, 587 F.3d 1324 (Fed. Cir. 2009). In *Perfect Web*, the court

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[9] Patent Owner moves to exclude the three references and related testimony, which we deny for the reasons outlined below. *See infra* II.E.

affirmed a summary judgment decision finding claims invalid as obvious, where the lower court determined that a missing limitation would have been obvious based on common sense, even without reliance on record evidence such as expert testimony. *See id.* at 1329 ("[U]se of common sense does not require a 'specific hint or suggestion in a particular reference,' only a reasoned explanation that avoids conclusory generalizations."), *id.* at 1330 ("No expert opinion is required to appreciate the potential value to persons of such skill in this art of [the missing limitation].").

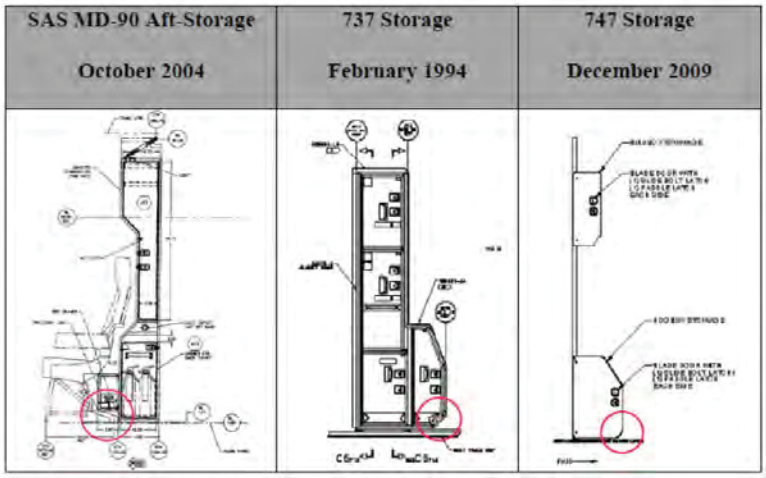
We need not reach the issue of whether the "second recess" is so peripheral that Petitioner need not have pointed to evidence or expert opinions to support its argument that the missing limitation would have been obvious. Petitioner has supplied reasoned explanation and record evidence to support its position. Petitioner relies on the testimony of Mr. Anderson, who stated that

> a person of ordinary skill in the art would recognize that as a seat is moved further aft the seat support necessarily is also moved further aft. As the seat is moved aft the feet of the seat support may come into contact with the lower section of the wall. Creating one or more recesses to accommodate whatever portion(s) of the seat support that would contact the forward wall of the enclosure is the obvious solution to this known problem.

Ex. 1004 ¶ 74; *see also id.* at ¶ 191.

Petitioner also relies on evidence tending to show that recesses adjacent the floor of cabin, configured to receive a seat support, were known in

the art. Pet. 39 (citing Ex. 1004 ¶ 192); Reply 6-10 (citing Ex. 1004 ¶¶ 74-79; Ex. 1018, 62; Ex. 1019 ¶¶ 8-11, 17-20). The Petition shows three designs with such a recess side-by-side as shown in the figure from page 40 of the Petition, reproduced below:



The figure depicts three designs labelled "SAS MD-90 Aft-Storage" dated October 2004, "737 Storage" dated February 1994, and "747 Storage" dated December 2009. Pet. 40. All three designs show recesses near the floor of the cabin, which Petitioner circled in annotations. *Id.* The first design, shown on the left, also shows a passenger seat in dotted lines, with the aft seat support shown within the recess. *Id.* Petitioner submitted declarations from third parties familiar with the designs that show the recesses were designed to receive passenger seat legs, and the dates that the designs were in public use or on sale. *See* Ex. 1018, 62 (corresponding to SAS MD-90 Aft-Storage); Ex. 1019 ¶¶ 8-11 (corresponding to 737 Storage); Ex. 1019 ¶¶ 17-20 (corresponding to 747 Storage). We find this

testimony and evidence credible and convincing, and find that Petitioner has established that it would have been obvious to further modify the Admitted Prior Art/Betts combination to include the claimed "second recess" to receive passenger seat supports.

Patent Owner's arguments, as a whole, are not persuasive. As noted above, we agree with Patent Owner's interpretation of the relevant law to require more than conclusory allegations to establish that a missing claim limitation would have been obvious based on common sense. Petitioner provides more than bare, conclusory allegations, however, including reliance on other references that predate the '641 patent to support its common sense argument. Patent Owner also argues that adding the second recess would have been unpredictable due to the unpredictable nature of lavatory design. PO Resp. 12-13. Much of Patent Owner's cited evidence does not seem focused on the second recess at all, and instead is directed more generally to lavatories as a whole. *See* Ex. 2052, 37:5-42:17, 53:10-14; Ex. 2075, 36:18-37:15; Ex. 2097 ¶¶ 86, 88. We credit the testimony of Mr. Anderson on behalf of Petitioner, that the "result of such a modification is predictable, allowing the seat to be positioned further aft in an aircraft." Ex. 1004 ¶ 191. We are not persuaded that adding an aft recess near the cabin floor, standing alone, would introduce unpredictable results due to modifications that would be necessary to that limited area of the lavatory.

Patent Owner's arguments attacking Mr. Anderson's use of the three examples of recesses in the prior art also bear little fruit. Patent Owner

argues, without citation to any support, that in order to support the "common sense" argument, Mr. Anderson could not rely on references that were not available as prior art in *inter partes* reviews, i.e., patents and printed publications. PO Resp. 10. Petitioner does not argue that any of the three drawings are prior art that can be combined with the Admitted Prior Art and Betts as part of a ground of unpatentability, and therefore has not run afoul of the rules governing these proceedings. 35 U.S.C. § 311(b) ("A petitioner in an inter partes review may request to cancel as unpatentable 1 or more claims of a patent only on a ground that could be raised under section 102 or 103 and only on the basis of prior art consisting of patents or printed publications"). Petitioner uses the references to support its common sense argument and identify, specifically, the knowledge of those skilled in the art, and Patent Owner points to no authority for the proposition that such evidence must take a particular form, much less be limited to qualifying patent and printed publication prior art under § 311(b).

Patent Owner also argues that Petitioner failed to establish that the designs shown in the three drawings were prior art at all, and were not publicly known. *Id.* While the drawings themselves may have been confidential as Patent Owner notes, the declarations accompanying the drawings posit that the drawings reflect designs that were on sale and in public use years before the earliest priority date of the '742 patent. *See* Ex.
1018.62 (corresponding to SAS MD-90 Aft-Storage); Ex 1019 ¶¶ 8-11 (corresponding to 737 Storage); Ex.

1019 ¶¶ 17-20 (corresponding to 747 Storage). Patent Owner uses the deposition testimony of one of the declarants to cast doubt on whether the design with the recess was part of the product that was sold, but does not attack the other assertions of prior art. PO Resp. 14 (citing Ex 2079, 54:20-55:4 (corresponding to 747 Storage)). We find the unrebutted testimony establishes that those two designs were in public use or on sale prior to the critical date of the '742 patent. *See* Ex. 1018.62 (drawing), ¶¶ 11-15 (corresponding to SAS MD-90 Aft-Storage); Ex. 10191 ¶¶ 8-11 (corresponding to 737 Storage)). We find the unrebutted testimony regarding these designs, the SAS MD-90 Aft-Storage and 737 Storage, sufficient to establish that the designs are prior art. Accordingly, two of the designs Petitioner relies on were not only "known" internally within the art, they were disclosed in prior art designs.[10] An annotated view of the design for the SAS MD-90 Aft-Storage is reproduced below:

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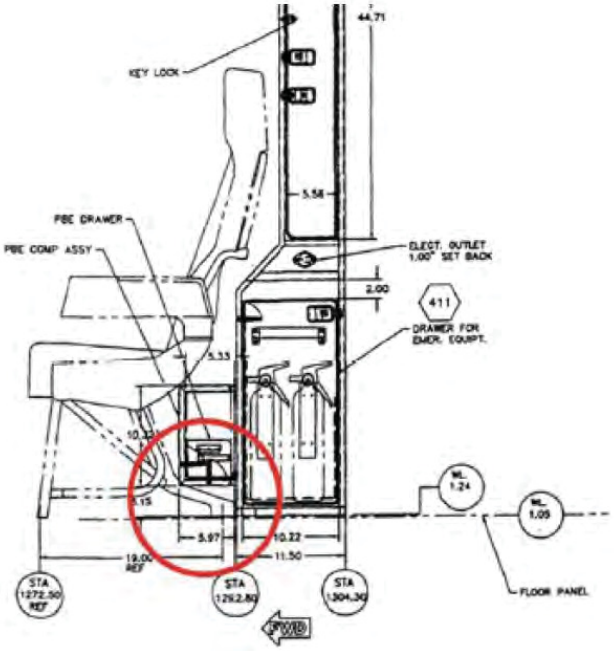
[10] Petitioner argues that the three references need not qualify as prior art at all to be considered as part of its "common sense" argument. See Reply 10 ("But even if these design documents themselves were never made public, they still demonstrate that airplane designers had long known that it was a common sense solution to include a recess in a wall to enable a seat support to be positioned further aft."); Opp. 8 (citing cases in support of argument). Although not necessary to our Decision because we find that two of the references are prior art, we agree that such non-prior art references, such as these confidential drawings, can be considered in an obviousness analysis. Here, they constitute concrete evidence in support of Petitioner's common sense argument.



Reply 7 (citing Ex. 1018, 62). The figure above shows a recess adjacent to the cabin floor configured to receive the aftwardly extending rear seat support within the recess. This prior art design convincingly supports Petitioner's position that recesses configured to receive seat supports were known in the art, and it would have been a matter of common sense to incorporate such a known structure in the Admitted Prior Art/Betts combination.

Based on the foregoing, Petitioner has established adequately that it would have been obvious to add a second recess in a manner that satisfies the "second recess" requirements of claims 1 and 8.

iv. Objective Evidence of Non-Obviousness

We turn now to the secondary considerations evidence that Patent Owner has cited in this proceeding as purportedly demonstrating non-obviousness of claims 1 and 8 (as well as the other challenged claims). *See* PO Resp. 31-45. Petitioner argues that Patent Owner has failed to establish the required nexus, and that we should follow the approach taken by the Federal Circuit in the related *inter partes* review and conclude that the claims would have been obvious even if we consider the Patent Owner's evidence of objective indicia. Reply 15-16.

Nexus. "For objective [evidence of secondary considerations] to be accorded substantial weight, its proponent must establish a nexus between the evidence and the merits of the *claimed invention*." *Wyers v. Master Lock Co.*, 616 F.3d 1231, 1246 (Fed. Cir. 2010) (alteration and emphasis in original) (quoting *In re GPAC Inc.*, 57 F.3d 1573, 1580 (Fed. Cir. 1995)). Patent Owner only addresses nexus in the context of its argument regarding commercial success. PO Resp. 29-30. Patent Owner argues that nexus here "is presumed" because "[t]here is no dispute that [Patent Owner's] Spacewall product, which has been so commercially successful, is an embodiment of the patent." *Id.* at 29 (citing Ex. 2093, 36:16-37:3). Patent Owner also asserts that other documents show that the commercial success of the Spacewall product stemmed from the "curved shape" of the lavatory forward wall or the "lavatory structure design." *Id.* (citing Ex. 2078; Ex. 2090, 136:14-137:11). Such general allegations that Patent

Owner's product "is an embodiment of the patent" and led to sales due to a "curved shape" ordinarily fail to establish that a product contains all of the limitations of the claim at issue, which is necessary to trigger a presumption of nexus. *See WBIP, LLC v. Kohler Co.*, 829 F.3d 1317, 1330 (Fed. Cir. 2016) (holding that nexus is presumed when patentee establishes that commercial product is embodiment of the claimed invention). However, Petitioner did not address the presumption of nexus issue in the Petition or the Reply, and did not argue that Patent Owner's Spacewall product was not covered by the challenged claims here. *See* Reply 15-16; Tr. 30:8-19 (Petitioner acknowledging at the oral hearing that it did not dispute that Patent Owner's product met the limitations of the challenged claims). Accordingly, we apply a presumption of nexus here.

Petitioner argues that nexus cannot be established because all of the claim limitations were known in the prior art. *See* Pet. 77. Petitioner also argues that none of Patent Owner's evidence ties the "second recess" to the secondary considerations. Reply 15-16. These arguments do not address the presumption of nexus issue, and improperly suggest that Patent Owner must tie the objective indicia to the supposedly new feature in the claims, the second recess. *See WBIP*, 829 F.3d at 1330 ("[P]roof of nexus is not limited to only when objective evidence is tied to the supposedly 'new' feature(s)."). The arguments also fail to rebut the presumption, which requires reliance on evidence of record to successfully rebut the presumption. *See id.* at 1329 (holding that the presumption of a nexus cannot be rebutted adequately by argument alone). Although we find a

presumption of a nexus, we will consider Petitioner's arguments regarding a lack of nexus, to the extent they also bear on the weight we give any alleged objective indicia, where appropriate below.

Copying. Patent Owner alleges that Petitioner copied the patented technology. PO Resp. 23-25. More specifically, Patent Owner alleges that Petitioner encountered problems with implementing the "curvature of the lavatory forward wall" and rather than turn to a prior art solution, "copied the curvature" of Patent Owner's lavatory wall. *Id.* at 24 (citing Ex. 2091, 138:5-142:17, 141:18-22, 142:10-13; Ex 2104 ¶ 203). Patent Owner relies on Dr. Dershowitz's testimony that Petitioner made a "direct attempt" to use Patent Owner's patented solutions, including the "patented shape" of Patent Owner's forward lavatory wall." *Id.* at 24-25 (citing Ex. 2104 ¶ 225; Ex. 2075, 111:7-14).

Petitioner argues that Patent Owner fails to prove copying. Reply 16-18. Petitioner contends that Patent Owner's evidence fails to address the "second recess," or establish that Petitioner copied that aspect of Patent Owner's design. *Id.* at 16. Petitioner also argues that Patent Owner misinterprets the deposition testimony from Petitioner's witness, which was not suggesting problems with the forward lavatory wall at all, but instead concerned problems with the curved side wall facing the exterior of the airplane. *Id.* at 16-17 (citing Ex. 2091-37, 144:18-145:5). Petitioner asserts that the statements from the Dershowitz Declaration merely rely on this faulty reading of the deposition. *Id.* at 17.

We agree with Petitioner that Patent Owner has failed to establish copying here. First, as

Petitioner notes, Patent Owner has made no attempt to establish that the *claimed* invention was copied by Petitioner, including the claimed "second recess." *See* PO Resp. 23-35. At most, Patent Owner alleges that Petitioner copied one aspect of the claimed design—the contoured forward wall. *Id.* Further, Patent Owner's copying allegation rests on an apparent misinterpretation of deposition testimony dealing with problems in the design of the "sidewall" facing the exterior of the aircraft, not the lavatory forward wall that is at issue in this case. *See* Ex. 2091, 144:18-145:5; Reply 16-17. Although the forward wall is also mentioned in the testimony cited by Patent Owner, that testimony does not suggest that the problem was focused on the lavatory forward wall, or that copying the forward wall would alleviate the problems with the sidewall. At best, the testimony and related expert analysis show a weak case of copying, made weaker by the failure to address the "second recess" and other claim limitations and establish that Petitioner copied a design covered by claims 1 and 8.

Skepticism. Patent Owner argues that "skepticism and disbelief expressed by industry participants" regarding its curved wall design supports the nonobviousness of claims 1 and 8. PO Resp. 25. Patent Owner contends that customers demanded mock ups of the new designs and tested them to ensure the lavatory still provided sufficient comfort before concluding that the design would work. *Id*. at 25-26. Patent Owner also contends that Petitioner's expert Mr. Anderson tried and failed to

do what Patent Owner "has done with its patents." *Id.* at 26.[11]

Petitioner argues that none of the alleged skepticism mentions the claimed "second recess" and that the testimony introduced amounts to hearsay. Reply 18-19. Petitioner also argues that testimony showing mere "corporate prudence" when evaluating designs before a purchase does not establish skepticism. *Id.* at 19. Regarding Mr. Anderson's testimony, Petitioner contends that Patent Owner takes the comments out of context, and Mr. Anderson was talking more generally about adding seats to a cabin. *Id.* at 19-20.

While we agree with Patent Owner that there appeared to be some skepticism regarding its design, Patent Owner has not convincingly established that there was skepticism about the claimed subject matter. Instead, the testimony appears to reflect normal testing one would expect whenever making a large order of goods, with some skepticism aimed at the size and comfort of the resulting lavatory, which does not bear on the claim language. *See* PO Resp. 25-26. In addition, the testimony of Mr. Anderson does not establish that he tried and failed to arrive at the claimed design at issue here—he merely expressed his experience in not being able to simply add a row of seats to a plane based on saving six inches of room. Reply 19-20. Overall, we view Patent Owner's evidence of industry skepticism regarding the claimed method as weak. *Proceeding*

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[11] Patent Owner's argument may be viewed as "failure of others" rather than "skepticism," but we address it in the manner that Patent Owner framed the issue.

Contrary to Conventional Wisdom. Patent Owner argues that conventional wisdom required a flat forward wall and using the space between the seats and the wall for small storage bins known as "dog houses." PO Resp. 27-28. According to Patent Owner, its "design cut directly against this conventional wisdom" by removing the spaces for the dog houses and allowing the "seat to closely nestle with the lavatory wall behind it." *Id.* at 28. Petitioner argues that Patent Owner again bases its argument on the contoured wall, which was well known in the art. Reply 21. Petitioner also argues that the mere passage of time without a curved-wall lavatory does not establish nonobviousness. *Id.* at 22.

We accord Patent Owner's evidence that its design was contrary to the ordinary use of dog houses behind seats some weight. However, this argument amounts to little more than an assertion that using a curved lavatory wall was new, when curved walls were known in airplane design and the claims at issue here require far more than a contoured wall. *See* Reply 21; Ex. 1005, Fig. 1. Accordingly, we view the evidence on this point as weak.

Commercial Success. Patent Owner argues that its Spacewall product achieved substantial commercial success based on a desire of its customers to add seats to the aircraft, which the claimed design made possible. PO Resp. 29. Patent Owner relies on "a nearly $800 million, 10-year contract as the exclusive lavatory provider on all new Boeing 737 aircraft," which was the "direct result of the patented technology." *Id.* at 30. Patent

Owner also contends that its market share in this market went from 0% to 20% by 2018. *Id.* at 31.

Petitioner argues that Patent Owner's $800 million sales figure in a vacuum means little when Patent Owner did not include the contract as evidence, and the contract would reveal that it included sales of unpatented lavatory designs. Reply 23-24. Petitioner also contends that Patent Owner's expert testimony cannot fill the gap because he admitted that he had not reviewed the contract. *Id.* at 24-25.

As noted above, we presume that a nexus exists between Patent Owner's Spacewall product and the claims at issue here. But that nexus does not extend to non-Spacewall products, and Patent Owner's decision not to introduce the $800 million contract undermines its ability to allege that the sales were due to the Spacewall design. Instead, it appears that at least some portion of those sales correspond to unpatented designs. *See* Reply 24 (citing testimony). These same sales, including patented and unpatented products, presumably helped create the 20% market share increase. PO Resp. 31. Without the contract or a breakdown of the sales and market share attributable to the patented Spacewall design, Patent Owner limits the potential impact of the $800 million contract and growing market share on our analysis here. That said, Patent Owner does introduce evidence that at least some customers bought the Spacewall product due to its contoured wall and space-saving design, and sales for the Spacewall were likely substantial even if they were a fraction of the $800 million contract. PO Resp. 29-31. Based on the foregoing, we view Patent

Owner's evidence of commercial success as moderate.

Industry Praise. Patent Owner argues that numerous instances of industry praise support the nonobviousness of the claims here. PO Resp. 32-34 (citing Ex. 2046 ¶¶ 26-33; Ex. 2055-2059; Ex. 2096). The alleged praise for the claimed invention include an industry award and positive comments in trade publications. *Id.* Patent Owner contends that "the objective evidence ties directly to claimed features" because it notes that Patent Owner's design frees up floor space and includes curved walls. *Id.* at 34. Petitioner argues that, upon closer inspection, the industry award was "voted on by a panel of the inventor's colleagues, while he was in the room watching their vote, [and] hardly reflects unbiased industry praise." Reply 26 (emphasis omitted). Petitioner contends that the other purported praise lacks credibility because there is no evidence that the praise was from one of ordinary skill in the art, and the articles suggest that unclaimed features drove the success of the design, including the vacuum toilet, LED lighting, and oxygen system. *Id.* at 26-27 (citing Exs. 2055-2059).

While Petitioner makes some credible arguments that go to the weight to be accorded the industry praise, we find that Patent Owner has established industry praise for the Spacewall product, which we presume has a nexus to the claimed invention.[12] The praise specifically

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[12] Petitioner has arguably rebutted the presumption of a nexus, or significantly undermined its import, by pointing to evidence that some of the praise was tied to unclaimed features. Reply

references features relevant to the claimed inventions, such as the curved walls and space savings. *See* PO Resp. 32-34 (citing Ex. 2046 ¶¶ 26-33; Ex. 2055-2059; Ex. 2096). Therefore, although the praise also notes unclaimed features of the lavatory design, and the industry award process may have been flawed, the award and praise of claimed features are sufficient to establish industry praise of the claimed invention. We view the evidence of industry praise as moderate.[13]

v. Conclusion as to Claims 1 and 8

Patent Owner has established a moderate level of objective indicia of nonobviousness related to commercial success and industry praise, but Petitioner has established a strong case of obviousness based on the Admitted Prior Art and Betts, coupled with common sense and the knowledge of a person of ordinary skill in the art. Based on the foregoing, after consideration of all of

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26-27 (citing Exs. 2055-2059). We need not determine whether Petitioner has adequately rebutted the presumption because even if we presume the nexus remains, Patent Owner has not established sufficient objective indicia to support a finding of nonobviousness of claims 1 and 8.

[13] We note that our analysis of the objective indicia generally tracks the analysis in the related IPR, although we accord more weight to the commercial success evidence. *See* IPR2014-00727, 22-24 (Paper 65); *B/E Aerospace*, 709 F. App'x at 695-96. The record here includes additional allegations and evidence not available in IPR2014-00727, including that related to market share, that was not considered in the prior, related decisions. *See id.*

the *Graham* factors and the full record before us, we are persuaded that Petitioner has established, by a preponderance of evidence, that claims 1 and 8 would have been obvious over the Admitted Prior Art and Betts.

4. Obviousness of Claim 9

Claim 9 depends from claim 1 and recites "wherein the first aft extending recess defined by the forward-extending upper portion, the aft- extending mid-portion, and the forward-extending lower portion of the forward partition is configured to receive an aft-extending seat back of the forward-positioned passenger seat." Petitioner argues that Figure 1 of Betts discloses the passenger seat positioned at least partially within the contoured forward wall. Pet. 50-51 (citing Ex. 1004 ¶¶ 220-221; Ex. 1005, Fig. 1). Patent Owner does not address claim 9. We are persuaded by Petitioner's argument and evidence, and find that Betts discloses the limitations of claim 9.

5. Obviousness of Claims 3 and 10

Claim 3 depends from claim 1 and recites "wherein said forward wall portion further includes a projection configured to project over the passenger seat back when at least a portion of the upwardly and aftwardly inclined seat back of the passenger seat is received within the first recess and at least a portion of the aft-extending seat support is received within the second recess." Similarly, claim 10 depends from claim 9 and recites "wherein said forward-extending upper portion is configured to project over at least a portion of the forward-positioned passenger seat." Petitioner argues that

Figure 1 of Betts discloses the claimed upward projection that protrudes over the top of the inclined seat back, as claimed. Pet. 40-41 (citing Ex. 1004 ¶¶ 193-195; Ex. 1005, Fig. 1), 51-52 (citing Ex. 1004 ¶¶ 223-224). Patent Owner does not address claims 3 and 10. We are persuaded by Petitioner's argument and evidence, and find that Betts discloses the limitations of claims 3 and 10.

6. Obviousness of Claims 4 and 12

Claim 4 depends from claim 1 and recites "wherein said lavatory unit is taller than the passenger seat." Similarly, claim 12 depends from claim 9 and recites "wherein said lavatory is taller than the forward-positioned passenger seat." Petitioner argues that both Betts and the Admitted Prior Art disclose an enclosure taller than a passenger seat. Pet. 42 (citing Ex. 1004 ¶¶ 106-108, 197; Ex. 1001, Fig. 1; Ex. 1005, Fig. 1), 52. Patent Owner does not address claims 4 and 12. We are persuaded by Petitioner's argument and evidence, and find that the Admitted Prior Art and Betts disclose the limitations of claims 4 and 12.

7. Obviousness of Claims 5-7 and 13-17

Claim 5 depends from claim 1 and recites "wherein said forward wall portion includes a lower portion that is disposed under the passenger seat back when at least a portion of the upwardly and aftwardly inclined seat back of the passenger seat is received within the first recess and at least a portion of the aft-extending seat support is received with the second recess." Petitioner argues that Betts discloses a passenger seat positioned as claimed and

a person of ordinary skill "would be motivated to modify a flat forward wall to include a second recess to receive at least a portion of an aft extending seat support." Pet. 42-43 (citing Ex. 1004 ¶¶ 196, 198-199, 201; Ex. 1005, Fig. 1). Patent Owner does not address claim 5. We are persuaded by Petitioner's argument and evidence, and find that claim 5 would have been obvious in view of the Admitted Prior Art and Betts.

Claim 6 depends from claim 1 and recites "wherein said first recess in said forward wall portion is disposed between an upper wall portion and a lower wall portion." Petitioner argues that Betts discloses a recess positioned as claimed. Pet. 44 (citing Ex. 1004 ¶¶ 202-203; Ex. 1005, Fig. 1). Patent Owner does not address claim 6. We are persuaded by Petitioner's argument and evidence, and find that Betts discloses the limitations of claim 6.

Claim 7 depends from claim 1 and recites "wherein said forward wall portion defines a secondary space in said lavatory space above the passenger seat back." Petitioner argues that the Admitted Prior Art discloses a secondary space in the lavatory above the seat back and points to those spaces within both Figures 1 and 2 of the '641 patent. Pet. 45 (citing Ex. 1001, 4:43-45, Figs. 1, 2; Ex. 1004 ¶¶ 205-207). Petitioner also argues that prior art lavatories containing such storage spaces were known, and that the lavatory "would continue to contain the prior art interior storage spaces after applying a contour to the forward wall [from Betts]." *Id.* (citing Ex. 1004 ¶ 207). Patent Owner does not address claim 7. We are persuaded by Petitioner's

argument and evidence, and find that claim 7 would have been obvious over the Admitted Prior Art and Betts.

Claim 13 depends from claim 8 and recites "wherein the aft partition is substantially vertical and substantially planar." Petitioner argues that the Admitted Prior Art discloses an aft partition that is substantially vertical and substantially planar. Pet. 52-53 (citing Ex. 1001, Fig. 1; Ex. 1004 ¶ 227). Patent Owner does not address claim 13. We are persuaded by Petitioner's argument and evidence, and find that the Admitted Prior Art discloses the limitations of claim 13.

Claim 14 depends from claim 8 and recites "wherein the width of the lavatory space disposed between the forward partition and the aft partition comprises an upper width, a lower width, and a mid-width, and wherein the upper width and the lower width are both substantially wider than the mid-width." Petitioner argues that "a person of ordinary skill in the art would recognize" that modifying a lavatory wall with Betts's contoured wall "could impact the interior width of the lavatory." Pet. 53 (citing Ex. 1004 ¶¶ 228-229). Petitioner adds that "[t]his is clear from the positioning of the recess shown in Figure 1 of Betts, which is substantially the same as Figure 2 of the '641 Patent." *Id.* at 53-54 (citing Ex. 1001, Fig. 2; Ex. 1005, Fig. 1). Patent Owner does not address claim 14. We are persuaded by Petitioner's argument and evidence, and find that claim 14 would have been obvious in view of Betts.

Claim 15 depends from claim 8 and recites "wherein the upper forward-extending portion, the aft-extending mid-portion, and the forward-

extending lower portion of the forward partition form a substantially continuous surface." Petitioner argues Figure 1 of Betts discloses the claimed substantially continuous surface. Pet. 54-55 (citing Ex. 1004 ¶¶ 231-232; Ex. 1005, Fig. 1). Patent Owner does not address claim 15. We are persuaded by Petitioner's argument and evidence, and find that Betts discloses the limitations of claim 15.

Claim 16 depends from claim 8 and recites "wherein said first aft- extending recess extends along substantially a full width of said forward partition." Petitioner argues that "[o]ne of ordinary skill in the art would understand from Figure 1 [of Betts] that the recess [of the coat closet enclosure] extends the full width of the forward wall" and "would be motivated to extend the recess the full width of the forward wall in order to accommodate the full row of seats installed immediately forward of the wall. *Id.* at 55-56 (citing Ex. 1004 ¶¶ 234-236; Ex. 1005, Fig. 1). Petitioner adds that "the side elevation view shown in Figure 1 [of Betts] is essentially identical to the schematic diagram of Figure 2 of the '641 Patent." *Id.* at 56 (citing Ex. 1001, Fig. 2; Ex. 1005, Fig. 1). Patent Owner does not address claim 16. We are persuaded by Petitioner' s argument and evidence, and find that claim 16 would have been obvious in view of the Admitted Prior Art and Betts.

Claim 17 depends from claim 8 and recites "wherein said lavatory has a top, a bottom, a height therebetween, and a middle therebetween, said lavatory has varying lengths along the height of the lavatory, and said lavatory is longer at the top of the lavatory than at the bottom of the lavatory."

Petitioner argues that the Admitted Prior Art discloses a lavatory that has a top, a bottom, a height therebetween, and middle therebetween. Pet. 56. Petitioner adds that "a person of ordinary skill in the art would recognize that [modifying the lavatory with Betts's contoured wall] could impact the interior of the lavatory, e.g., the width or the lengths along the height of the lavatory." *Id*. at 56 (citing Ex. 1005, Fig. 1; Ex. 1004 ¶¶ 238¬239). Petitioner contends that "[t]his is clear from the positioning shown in Figure 1 of Betts, which is substantially the same as Figure 2 of the '641 Patent." *Id*. at 56-57 (citing Ex. 1001, Fig. 2; Ex. 1005, Fig. 1). Patent Owner does not address claim 17. We are persuaded by Petitioner's argument and evidence, and find that claim 17 would have been obvious in view of the Admitted Prior Art and Betts.

In summary, we are persuaded that Petitioner has established by a preponderance of the evidence that claims 5-7 and 13-17 would have been obvious over the Admitted Prior Art and Betts.

E. Patent Owner's Motion to Exclude

Patent Owner moves to exclude Exhibits 1004, 1006, 1007, 1008, 1018, 1019, and 1020, and any reliance thereon. Mot. Exclude 2. Petitioner opposes the Motion, and argues that Patent Owner waived the majority of the objections made with respect to Exhibit 1004. Opp. 2. Petitioner also argues that Patent Owner mischaracterizes the content of a number of the exhibits that bear on the ground at issue in this proceeding. *Id*. at 3-4. We need not reach these issues given that we deny Patent Owner's Motion on other grounds.

8. Exhibit 1004

Regarding Exhibit 1004, the Anderson Declaration, Patent Owner argues that the entire declaration "must be excluded under F.R.E. 401, 402, 403, 702, 703, and 37 C.F.R. § 42.65 as irrelevant, prejudicial, and unreliable expert testimony because Mr. Anderson only provides conclusory statements without sufficient citation to evidence or explanation." Mot. Exclude 3. Patent Owner does not support this broad, undeveloped, exclusion effort further, and to the extent that Patent Owner seeks to exclude the entire declaration rather than the enumerated paragraphs later addressed by Patent Owner, we decline to do so.

Patent Owner then focuses on an extensive list of paragraphs as "not relevant to Betts" and "unreliable because they are based on Ex. 1009, 'KLM Crew Rest,' which is not a prior art reference that is available for use in this IPR." *Id*. at 3-4. We granted Petitioner's request for partial adverse judgment as to the second ground in the Petition based in part on the KLM Crew Rest reference. Paper 36. We did not rely on the KLM Crew Rest in this Decision, nor any of Mr. Anderson's opinions related to the KLM Crew Rest, and we therefore deny Patent Owner's motion to exclude Ex. 1004 as moot to the extent that it seeks to exclude opinions based on the KLM Crew Rest. *See* Mot. Exclude 3-4.

Patent Owner also seeks to exclude certain paragraphs of Exhibit 1004 as too conclusory and lacking sufficient citation. *Id*. at 4-6. We view these arguments as going to the weight to be accorded the opinions rather than a proper basis for exclusion,

and we deny the motion as to these paragraphs on that basis. In addition, with respect to paragraphs 75-79 and 93 related to the three "second recess" references we addressed above, we deny Patent

Owner's Motion for the additional reason that those references need not be "printed publication" prior art in order to be considered by Mr. Anderson. See id. at 5-7 (arguing that the declarants submitting the alleged prior art did not declare that the references were printed publications available to the public). Patent Owner cites no authority for its position that references must be excluded and not considered in any manner if they are not "printed publication" prior art under 35 U.S.C. § 311(b). Accordingly, we deny Patent Owner's Motion to Exclude Exhibit 1004.

9. Exhibits 1018 and 1019

Patent Owner argues that Exhibits 1018 and 1019 should be excluded because Petitioner only relied on the exhibits for the second ground based on the KLM Crew Rest, and not for the Betts ground. Mot. Exclude 7, 8-9. This argument is misleading. While Exhibits 1018 and 1019 were not cited directly in the Petition, Patent Owner is aware that the exhibits refer to drawings related to the "second recess" issue that are relied upon by Mr. Anderson and reproduced in the Petition. *See* Pet. 38. Petitioner also cites directly to Exhibits 1018 and 1019 in the Reply for that purpose. Reply 7-8. Patent Owner's argument that we should exclude the entirety of the exhibits because they do not relate to the Betts ground lacks merit.

Patent Owner also argues that Petitioner has not shown that the exhibits are prior art. Mot.

Exclude 8 ("Petitioner has not shown [that Ex. 1018] is prior art available for use during this IPR."), 9 ("Petitioner has not shown that these declaration exhibits are prior art."). As discussed above, Petitioner introduced unrebutted testimony that two of the three references are prior art, and as to the third, Patent Owner raised some doubt as to which version of the product was in public use or on sale. We decline to exclude the references that we already find are prior art. Again, Patent Owner provides no authority for the proposition that we can only consider "printed publication" prior art in this proceeding, even for background art that goes to the common sense issue here. In addition, as to the third reference, where Patent Owner established some doubt about the content of the product in public use and on sale, we need not rely on that reference to find the claims obvious and granting this Motion with respect to that exhibit would have no impact on the outcome of this case.[14] We decline to exclude the references because they are not printed publications or prior art.

Patent Owner also argues that Exhibits 1018 and 1019 are not properly authenticated because they are not self-authenticating. *Id.* at 8-9.

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[14] Even if none of the references are prior art, we see no basis to *exclude* any of the references. They are still germane to Petitioner's argument that adding a second recess was known in the art, even if only in the internal, non-public documents of multiple parties in the industry. *See* Opp. 8. Accordingly, even if not prior art, we would not exclude the documents and would assess their weight in the context of Petitioner's common sense argument.

Petitioner argues that Patent Owner waived this objection because it never objected to the *exhibits* to the declarations on the basis of authenticity. Opp. 11 (citing Paper 15, 3-4). Petitioner also argues that Patent Owner's position is baseless and frivolous because "[e]vidence may be authenticated through the testimony of a witness with knowledge that the exhibit is what it is claimed to be." *Id.* (citing FRE 901(b)(1)). Petitioner points to portions of each declaration stating that the witnesses had such "personal knowledge" and that the exhibits to the declarations contain "true and correct copies." *Id.* (citing Ex. 1018 || 1, 15; Ex. 1019 || 1, 8, 17). Petitioner also submitted deposition testimony from the district court litigation that allegedly authenticates the exhibits. *Id.* at 11-12 (citing Exs. 1024, 1025). Patent Owner did not respond to Petitioner's specific arguments in its Reply.

We need not reach Petitioner's waiver argument. Patent Owner made a boilerplate, undeveloped argument regarding lack of authenticity, and then failed to respond to Petitioner's detailed arguments in support of its showing of authenticity. We agree with Petitioner's arguments and evidence on this issue, and decline to exclude the exhibits on that basis that they were not properly authenticated.

10. Exhibits 1006, 1007, 1008, and 1020

For Exhibits 1006, 1007, 1008, and 1020, Patent Owner seeks to exclude the exhibits for the same reasons discussed above—because they do not relate to the Betts ground, only the KLM Crew Rest ground; because they are not prior art available for

use in an IPR; and because they are not properly authenticated. Mot. Exclude 9-10. These arguments are not developed further, and Patent Owner does not refer to the specific contents of these exhibits. *Id*. We deny Patent Owner's Motion to Exclude these exhibits for the same reasons provided above when addressing these same arguments.

F. Patent Owner's Motions to Seal

Patent Owner filed two unopposed Motions to Seal. Papers 8, 22. In the first, Patent Owner seeks to seal exhibits 2020, 2038, 2039, 2040, 2048, 2049, 2050, 2051, 2053, 2060, 2061, 2062, 2063, 2064, 2065, and 2066 as well as Patent Owner's Preliminary Response. Paper 8, 1. The Motion also seeks entry of a protective order that deviates from our standard protective order in several respects. *Id*. at 7-8. In the second Motion to Seal, Patent Owner seeks to seal exhibits 2077, 2078, 2079, 2089, 2090, 2091, 2092, 2096, 2097, 2098, and 2104, as well as Patent Owner's Response. Paper 22, 1.

There is a strong public policy that favors making information filed in *inter partes* review proceedings open to the public. *See Garmin Int'l v. Cuozzo Speed Techs., LLC*, Case IPR2012-00001 (PTAB March 14, 2013) (Paper 34) (discussing the standards of the Board applied to motions to seal). The moving party bears the burden of showing that the relief requested should be granted. 37 C.F.R. § 42.20(c).

> [A] movant to seal must demonstrate adequately that (1) the information sought to be sealed is truly confidential, (2) a concrete harm would result upon public disclosure, (3) there exists a genuine need to rely in the trial

> on the specific information sought to be sealed, and (4), on balance, an interest in maintaining confidentiality outweighs the strong public interest in having an open record.

ArgentumPharms. LLC v. Alcon Research, Ltd., Case IPR2017-01053, slip op. at 4 (PTAB Jan. 19, 2018) (Paper 27) (informative).

In both Motions, Patent Owner asserts that confidential information has been exchanged in the underlying district court litigation and the parties have agreed that the information can be used in this proceeding, provided that it is filed under seal. Paper 8, 1; Paper 22, 1. Patent Owner asserts that the "material includes confidential and business sensitive information of Patent Owner, Petitioner, and Related Entities. " Paper 8, 2; Paper 22, 1. Patent Owner also contends that disclosure of the information would cause competitive harm to one or more of those entities. *Id*. Patent Owner then explains why each exhibit contains confidential information that justifies sealing the exhibit. Paper 8, 2-6; Paper 22, 2-4. For example, Patent Owner contends that Exhibits 2048-2050, 2053, 2061, and 2062 "include competitively-sensitive information regarding the technical composition and operation of systems created and provide[d] by Patent Owner's successor-in- interest." Paper 8, 2; *see also* Paper 22, 2 (addressing Exhibits 2077, 2096, and 2098 using a similar rationale). Patent Owner and Petitioner also contend that Exhibits 2020, 2038, 2039, 2040, 2051, 2060, and 2063-66 contain competitively-sensitive information of Petitioner, including technical schematics for aircrafts manufactured by Petitioner

that were exchanged under an "Attorney's Eyes Only" designation in the district court litigation. Paper 8, at 3-6; *see also* Paper 22, 2 (addressing Exhibits 2078, 2089, 2092, and 2097, which include information produced under "Attorney's Eyes Only" designation in district court litigation), 3 (addressing Exhibits 2079, 2090, and 2091, which contain Petitioner's competitively-sensitive information).

Based on our review of the record and Patent Owner's Motions, we agree that a sufficient basis exists to seal the exhibits in question. Although sealing the entirety of all of the exhibits in question is undoubtedly overbroad in that portions of each exhibit contain non-confidential material, we understand the burden imposed in determining, on a line-by-line basis, after consultation with all parties involved, which material is truly confidential and which is not. The public interest in reviewing non- confidential information in exhibits that may not be germane to the issues in the case is also lower than with respect to exhibits at the core of the parties' dispute. Accordingly, we grant Patent Owner's Motion to Seal (Paper 8) as to Exhibits 2020, 2038, 2039, 2040, 2048, 2049, 2050, 2051, 2053, 2060, 2061, 2062, 2063, 2064, 2065, and 2066, and grant Patent Owner's Motion to Seal (Paper 22) as to Exhibits 2077, 2078, 2079, 2089, 2090, 2091, 2092, 2096, 2097, 2098, and 2104.

We do not grant Patent Owner's Motion to Seal (Paper 20) as to Exhibit 2104 because Patent Owner has not provided any reason or rationale as to why Dr. Dershowitz's declaration testimony, on any subject, is confidential. Indeed, the publically

available version of Dr. Dershowitz's testimony filed by Patent Owner contains no redactions or omissions as compared to the Board and Parties Only version also filed by Patent Owner.

We also reach a different conclusion regarding the redacted versions of Patent Owner's Preliminary Response and Patent Owner's Response. *See* Papers 7, 22. The Motions do not separately address the specific material redacted from those documents, or justify their exclusion from the public record. The redacted material appears to quote from or summarize information from exhibits subject to the motion to seal. However, as noted above, although we grant the motion to seal the exhibits, that does not mean that every line of every exhibit contains confidential information. In addition, the public interest is perhaps highest when addressing the ability of the public to view the information in the briefs of record. That information, by dint of its inclusion in the briefs, is arguably the most germane to the issues in the case and the basis for our Decision. On balance, we conclude that the interest in maintaining the confidentiality of the redacted portions of the Patent Owner's Preliminary Response and Patent Owner's Response are outweighed by the public interest in viewing the material. Accordingly, we deny the Motion to Seal Patent Owner's Preliminary Response and Patent Owner's Response.

Patent Owner also seeks entry of an agreed Protective Order. Paper 8, 7, Ex. A. According to Patent Owner, the parties' agreed Protective Order deviates from the Board's default protective order by modifying the list of individuals that can receive

confidential information, and by clarifying that the Protective Order only governs documents marked "PROTECTIVE ORDER MATERIAL" in connection with this proceeding. *Id*. at 7-8. Patent Owner states that similar orders have been entered in related *inter partes* reviews. *Id*. at 7. We are amenable to the changes to our default protective order proposed by the parties. Accordingly, we grant Patent Owner's Motion for entry of the Protective Order attached to the Motion to Seal (Paper 8) as Exhibit A.

III. CONCLUSION

For all of the above reasons, we determine that Petitioner has shown by a preponderance of the evidence that claims 1, 3-10, and 12-17 of the '641 patent are unpatentable. We also deny Patent Owner's Motion to Exclude and grant Patent Owner's Motion to Seal certain exhibits and to enter an agreed Protective Order, but deny Patent Owner's Motion to Seal the Patent Owner's Preliminary Response and Patent Owner's Response.

IV. ORDER

It is

ORDERED that claims 1, 3-10, and 12-17 of the '641 patent have been shown to be unpatentable;

FURTHER ORDERED that Patent Owner's Motion to Exclude is DENIED;

FURTHER ORDERED that Patent Owner's Motion to Seal (Paper 8) as to Exhibits 2020, 2038, 2039, 2040, 2048, 2049, 2050, 2051, 2053, 2060, 2061, 2062, 2063, 2064, 2065, and 2066 is GRANTED;

FURTHER ORDERED that Patent Owner's Motion to Seal (Paper 22) as to Exhibits 2077, 2078, 2079, 2089, 2090, 2091, 2092, 2096, 2097, and 2098 is GRANTED;

FURTHER ORDERED that Patent Owner's Motion to Seal (P aper 20) as to Exhibit 2104 is DENIED;

FURTHER ORDERED that Patent Owner's Motion for entry of an agreed Protective Order (Paper 8, Ex. A) is GRANTED;

FURTHER ORDERED that Patent Owner's Motion to Seal its Patent Owner Preliminary Response (Paper 8) and Patent Owner Response (Paper 22) is DENIED; and

FURTHER ORDERED that, because this is a Final Written Decision, parties to the proceeding seeking judicial review of the decision must comply with the notice and service requirements of 37 C.F.R. § 90.2.

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APPENDIX D

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

C&D ZODIAC, INC.,
Petitioner

v.

B/E AEROSPACE, INC.,
Patent Owner.

Case IPR2017-01276
Patent 9,440,742 B2

Before JENNIFER S. BISK, SCOTT A. DANIELS, and RICHARD H. MARSCHALL, *Administrative Patent Judges*.

MARSCHALL, *Administrative Patent Judge*.

DECISION
Denying Patent Owner's Request for Rehearing
37 C.F.R. § 42.71

INTRODUCTION

C&D Zodiac, Inc. ("Petitioner"), filed a petition to institute an *inter partes* review of claims 8 and 10–16 of U.S. Patent No. 9,440,742 B2 (Ex. 1001, "the '742 patent"). Paper 2 ("Pet."). We issued a Final Decision (Paper 41, "Final Dec.") finding claims 8 and 10–16 of the '742 patent unpatentable. B/E Aerospace, Inc. ("Patent Owner"), filed a Request for Rehearing (Paper 44, "Reh'g Req." or "Request") of our Final Decision. The Request contends that we "misapprehended and/or overlooked the statute defining the scope of IPRs, 35 U.S.C. § 311(b)" and "relevant Federal Circuit precedent and the arguments from Patent Owner's responses that the Petitioner failed to carry its burden of proving the claims obvious." Reh'g Req. 2. In addition, Patent Owner argues that the 2018 Trial Practice Guide Update "expressly prohibits making an obviousness finding by using expert testimony to replace the disclosures from patent and printed publications that are required by statute." *Id.* at 2–3.

"The burden of showing a decision should be modified lies with the party challenging the decision[,]" and that party "must specifically identify all matters the party believes the Board misapprehended or overlooked, and the place where each matter was previously addressed in a motion, an opposition, or a reply." 37 C.F.R. § 42.71(d). For the reasons discussed below, Patent Owner's Request for Rehearing is denied.

ANALYSIS

35 U.S.C. § 311(b) and Arendi

Patent Owner's Request is based on a disagreement with our determinations that two references that contain confidential drawings may be considered in the obviousness analysis even though we did not consider Patent 9,440,742 B2 them to be prior art under § 311(b), and that Petitioner's "common sense" argument passes the standard set by *Arendi S.A.R.L. v. Apple Inc.*, 832 F.3d 1355 (Fed. Cir. 2016). In its Request, Patent Owner presents arguments that "[t]he evidence that the PTAB relies on for the 'second recess' limitation—confidential drawings and fact witness declarations about the alleged prior sale and use—is neither a patent nor a printed publication" and, therefore, under 35 U.S.C. § 311(b), may not be used to support a determination of obviousness in an IPR. Reh'g Req. 4 (citing Final Dec. 16–26; Paper 6 ("Prelim. Resp.") 35–37; Paper 22 ("PO Resp.") 15–16, 18–20). Patent Owner describes Petitioner's expert testimony as "conclusory" despite reliance on the prior use and sale. *Id.* at 5–7. According to Patent Owner, the Final Decision "contradicts the policy underlying" § 311(b) and "invites Petitioners to circumvent the statute by requesting IPRs based on prior use or on sale evidence . . . by merely having an expert rely on this evidence to conclude that a limitation was well-known and therefore obvious." *Id.* at 9–10. Finally, Patent Owner argues that by improperly crediting Petitioner's evidence, our decision is at odds with Federal Circuit law prohibiting using common sense to supply a missing claim limitation to support a finding of obviousness. *Id.* at 10–11 (citing *Arendi*).

As Patent Owner acknowledges, all of these arguments were made during the trial and we addressed each of them in the Final Written Decision. Final Dec. 17–26. Nothing in Patent Owner's request for rehearing persuades us to change our analysis on this issue.

First, Patent Owner mischaracterizes our obviousness analysis by describing it as adding a second recess to the "Admitted Prior Art/Betts combination" merely "because the second recess was in public use or on sale." Reh'g Req. 5. We did not combine Admitted Prior Art/Betts with the public use/on sale references. Instead, we specifically rejected Patent Owner's attempt to frame Petitioner's challenge in that manner. Final Dec. 22–23.

Our analysis focused on whether Petitioner established adequately that the second recess would have been obvious as a matter of common sense under the high standard set forth in *Arendi* and *K/S HIMPP v. Hear-Wear Technologies, LLC*, 751 F.3d 1362, 1365 (Fed. Cir. 2014). *Id.* at 19–22. We concluded that Petitioner met that standard based not only on the citation to second recesses in the public use/on sale references, but also on the rationale and related analysis provided by Petitioner's expert that we credited and found convincing before addressing the public use/on sale references. *See id.* at 20 (citing Ex. 1004 ¶¶ 74, 191). We also credited the testimony of Petitioner's expert that the proposed modification would have been predictable. *Id.* at 22 (citing Ex. 1004 ¶ 191). Accordingly, because our analysis relied on the

analysis and reasoning of Petitioner's expert regarding why it would have been obvious[1] and a matter of common sense to add a second recess, we did not merely combine the prior art with the public use/on sale references to arrive at the claimed invention. The public use/on sale references were instead used as further evidence in support of the common sense argument.[2]

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[1] We find Petitioner's obviousness argument and evidence persuasive even if not deemed a "common sense" approach. The common sense moniker was not used in the Petition or supporting expert declaration, and was instead introduced by Patent Owner and then addressed in Petitioner's Reply. *See* PO Resp. 11–12; Pet. Reply 10, 12. While we found Petitioner's common sense rationale persuasive, Petitioner's argument and evidence, including the testimony of Petitioner's expert, support the conclusion that the challenged claims are obvious under a traditional obviousness approach that does not rely on the "common sense" rationale supported by public use/on sale references. *See* Pet. 36–37 (citing Ex. 1004 ¶¶ 74, 186–192, 250); Reply 6, 10–11 (citing Ex. 1004 ¶ 58, 74); Ex. 1004 ¶¶ 58 (Betts teaches that addition of recesses allows for more room to move seats further aft in an aircraft), 74 (when seat supports moved further aft and the seat support impacts the closet or lavatory wall, creating a second recess in wall to accommodate the seat support "is the obvious solution to this known problem"), 191 ("[The] modification is nothing more than the application of known technology for its intended purpose" and "[t]he result of such a modification is predictable, allowing the seat to be position further aft in an aircraft."); *see also* Final Dec. 20–22 (citing Ex. 1004 ¶¶ 74, 191, finding the testimony credible, and rejecting lack of predictability argument).

[2] Because we found the expert analysis credible apart from its reliance on the public use/on sale references, we need not reach whether supplying a missing limitation via a "common sense"

Our analysis also comports with *Arendi* and *K/S HIMPP*. *Arendi* acknowledges that, even in the context of *inter partes* reviews and 35 U.S.C. § 311(b), petitioners can rely on evidence other than that contained within the four corners of a patent or printed publication, when asserting obviousness. *Arendi*, 832 F.3d at 1363 ("[W]hile 'common sense' can be invoked, even potentially to supply a limitation missing from the prior art, it must still be supported by evidence and a reasoned explanation."). In fact, when a patent challenger relies on common sense, *Arendi* and *K/S HIMPP* require resort to some evidence outside the strict contours of the prior art that forms the basis for the obviousness ground. *See id.*; *K/S HIMPP*, 751 F.3d at 1365 (referring to the need for more than conclusory statements as well as the need for evidence in the record supporting common sense approach to supply a missing limitation). The proper use of common sense to supply a missing limitation presumes that something else in the evidence of record beyond the patents and printed publications at issue supports that common sense approach—if the "missing" limitation were already disclosed in prior art patents or printed publications there would be little need to resort to common sense. Neither *Arendi* nor *K/S HIMPP* limit the form the evidence in support of the common sense approach must take, or suggest that it must come from patent and printed publication art.

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argument, based solely on public uses/sales, runs afoul of § 311(b).

The Federal Circuit's recent decision in *Yeda Research v. Mylan Pharmaceuticals Inc.*, 906 F.3d 1031 (2018), supports our approach. In *Yeda*, the Patent Owner asserted that the Board improperly relied on a reference that did "not qualify as statutory prior art" under 35 U.S.C. § 311(b) and was improperly relied upon "to supplement gaps in the prior art in violation of 35 U.S.C. § 311(b)." *Id.* at 1040–41. The Federal Circuit rejected the argument, concluding that § 311(b) "is unrelated to the question of whether the Board's reliance on [the non-prior art reference] was proper" because "§ 311(b) only addresses prior art and is silent on the question of other evidence." *Id.* at 1041. The court noted that the relevant statute and rules allow petitioners to rely on "evidence beyond the prior art" and contemplate declarations based on supporting evidence and opinions. *Id.* (citing 35 U.S.C. § 312(a)(3) and 37 C.F.R. § 42.104(b)). The Federal Circuit therefore allowed reliance on a reference that was not prior art as part of the "other evidence" that petitioners can rely upon to support an obviousness ground. *See id.* That result supports our approach here, where we relied on Petitioner's use of references that did not qualify as prior art under § 311(b) as part of the "other evidence" that supports Petitioner's "common sense" obviousness argument. We are, therefore, not persuaded that our analysis runs afoul of § 311(b), *Arendi*, or other controlling precedent.

Trial Practice Guide

Patent Owner also argues that the Final Decision "contradicts the USPTO's Revised Trial Practice

Guide that went into effect on August 10, 2018," before the date the Final Decision was issued. Reh'g Req. 7. Specifically, Patent Owner points to pages 4 and 5 of the Trial Practice Guide Update that states"[e]xpert testimony, however, cannot take the place of a disclosure in a prior art reference, when that disclosure is required as part of the unpatentability analysis." *Id.* at 8 (quoting Office Patent Trial Practice Guide August 2018 Update, 83 Fed. Reg. 39,989 at 4 (August 13, 2018) ("Trial Practice Guide Update") (https://go.usa.gov/xU7GP)). The portion of the Trial Practice Guide Update Patent Owner relies upon also states that "in an obviousness analysis, conclusory assertions from a third party about general knowledge in the art cannot, without supporting evidence of record, supply a limitation that is not evidently and indisputably within the common knowledge of those skilled in the art." Trial Practice Guide Update, 5 (citing *K/S HIMPP*, 751 F.3d at 1365).

We are not persuaded that the Trial Practice Guide Update supports Patent Owner's position here. When read in context, the statements from the Trial Practice Guide Update merely warn against the use of "conclusory assertions" in expert testimony to supply a missing limitation. *Id.* In that sense, the Trial Practice Guide Update reminds practitioners of the high bar imposed by *K/S HIMPP* when using expert testimony as part of an effort to supply a limitation missing from the art of record, a standard we have applied here. We do not read this portion of the Trial Practice Guide Update as going further than *K/S HIMPP* and *Arendi*, limiting the type of evidence the expert can rely

upon in an effort to show that a missing limitation would have been added as a matter of common sense.

Patent Owner also cites to IPR2015-01222, in which the PTAB did not credit expert testimony because it did not "explain the unpatentability of certain claims over the cited prior art references." Reh'g Req. 8 (quoting *Global Tel*Link Corp. v. Securus Techs., Inc.*, IPR2015-01222, Paper 43, 51 (PTAB July 12, 2017) (emphasis omitted)). However, that case also involved a situation in which the testimony was not supported by any cited evidence and, therefore, is inapplicable to the situation here. *See* IPR2015-01222, Paper 43, 3. Moreover, the testimony at issue in IPR2015-01222 related to "general knowledge" not "tied to the disclosures" of the asserted prior art and not "used to explain the unpatentability of certain claims over the cited prior art references." *Id.* at 4–5. Here, Petitioner and its expert Mr. Anderson indeed tie his testimony to the claims and prior art at issue. *See*, e.g., Pet. 38–39 (citing Ex. 1004); Reply 6–10 (citing Ex. 1004 ¶¶ 74–79); Ex. 1004 ¶¶ 74, 191, 192.

Accordingly, Patent Owner's Request does not apprise us of sufficient reason to modify our Final Decision.

ORDER

Accordingly, it is:

ORDERED that Patent Owner's Request is *denied*.

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APPENDIX E
UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

C&D ZODIAC, INC.,
Petitioner

v.

B/E AEROSPACE, INC.,
Patent Owner.

Patent No. 9,440,742
Filing Date: April 28, 2016
Issue Date: September 13, 2016
Title: AIRCRAFT INTERIOR LAVATORY

Inter Partes Review No. _____

PETITION FOR *INTER PARTES* REVIEW

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LIST OF EXHIBITS

PETITIONER EXHIBIT	DESCRIPTION
1001	U.S. Patent No. 9,440,742 ("the '742 Patent")
1002	Prosecution History of U.S. Patent No. 9,440,742
1003	Final Written Decision in IPR2014-00727
1004	Declaration of Alan Anderson
1005	U.S. Patent No. 3,738,497 to Betts ("Betts")
1006	Rendering of the KLM Crew Rest
1007	Declaration of Paul Sobotta (Exhibit in IPR2014-000727
1008	Letters from Petitioner to Patent Owner Regarding Prior Art, dated April 7, 2014; April 25, 2014; May 15, 2015; and June 9, 2014
1009	File History from Application No. 09/947,275, which issued as U.S. Patent No. 6,520,451 to Moore.
1010	U.S. Patent No. 6,520,451 to Moore ("Moore")
1011	U.S. Patent No. 4,884,767 to Shibata ("Shibata")
1012	US Patent No. 7,284,287 to Cooper ("Cooper")
1013	U.S. 2009/0050738 A1 to Breuer ("Breuer")

PETITIONER EXHIBIT	DESCRIPTION
1014	Unopposed Motion to Withdraw Motion for Preliminary Injunction in *B/E Aerospace, Inc. v. Zodiac Aerospace, et al.*, No. 2:14-cv-210, Dkt. 47 (E.D. Tex. Jun. 6, 2014).
1015	Voluntary Dismissal in *B/E Aerospace, Inc. v. Zodiac Aerospace, et al.*, No. 2:14-cv-210, Dkt. 50 (E.D. Tex. Jun. 19, 2014).
1016	Patent Owner's Opening Brief in Federal Circuit Appeal Nos. 16-1496, 16-1497.
1017	U.S. Patent No. 8,590,838 ("the '838 Patent")
1018	Declaration of Scott Savian, dated March 20, 2017, including Exhibits A-E thereto.
1019	Declaration of Vince Huard, dated March 10, 2017, including Exhibits A-I thereto.
1020	McDonnell Douglas DC-10 Customer Configuration Summary (a/k/a Orange Book), revised October 1978 (the "Orange Book").
1021	U.S. Patent No. 6,742,840 to Bentley ("Bentley")

I. Summary

Through counsel, C&D Zodiac, Inc. ("Petitioner") hereby petitions for initiation of *inter partes* review of claims 8 and 10-16 of U.S. Patent No. 9,440,742 ("the '742 Patent"), assigned to B/E Aerospace, Inc. ("Patent Owner"). A copy of the '742 Patent is attached as Exhibit 1001 and a copy of the prosecution history of the '742 Patent is attached as Exhibit 1002.

The '742 Patent includes just four columns of description, less than one column of which is the three-paragraph "Detailed Description." The patent describes an enclosure for use in an aircraft (e.g., a closet or a lavatory). The first figure admits that an enclosure with a flat forward wall was well known in the art. The only aspect of the purported invention that is not admitted to be prior art is the recessed forward wall of the embodiment shown in Figure 2. And as explained in further detail below, aircraft enclosures with recessed forward walls have been known and used in the art for decades.

During an IPR of the parent of the '742 Patent, the Board already considered the dispositive issue here: whether it was obvious to apply a curved forward wall to a lavatory. The Board found that it was obvious. Yet, the Examiner inexplicably ignored the Board's decision without mentioning it and allowed Patent Owner's follow-on claims directed to the same subject matter already determined to be obvious—lavatories with a recessed forward wall. In view of the prior art, Petitioner respectfully requests that the Board again find that the same subject

matter already determined to be obvious with respect to the parent patent is also obvious with respect to the children. Accordingly, Petitioner requests that the Board cancel the challenged claims of the '742 Patent.

A. Real Party-in-Interest

The real party-in-interest, C&D Zodiac, Inc., is a Delaware corporation with its principal business address at 5701 Bolsa Avenue, Huntington Beach, California 92647. No other entity is controlling, directing, or funding the submission of this petition and any proceeding initiated as a result therefrom.

B. Related Matters

The '742 Patent is asserted against Petitioner in *B/E Aerospace, Inc. v. Zodiac Aerospace, Inc. et al.*, No. 2:14-cv-01417 (E.D. Tex., Dec. 15, 2016) (the "Underlying Litigation"). Patent Owner also asserts the following four related patents in that case: U.S. Patent Nos. 9,073,641; 9,365,292; 9,434,476; and D764,031. Patent Owner has sought a preliminary injunction against Petitioner in the Underlying Litigation. On or around the time this Petition is filed, Petitioner also will file Petitions for *Inter Partes* Review challenging the three related utility patents. On April 10, 2017 Petitioner filed a Post Grant Review challenging the claim of D764,031, which has been assigned PGR2017-00019.

All five of the asserted patents in the Underlying Litigation claim priority to U.S. Patent No. 8,590,838 ("the '838 Patent"). Patent Owner

previously asserted the '838 Patent against Petitioner in *B/E Aerospace, Inc. v. Zodiac* Aerospace*, Inc. et al.*, No. 2:14-cv-210 (E.D. Tex. Mar. 11, 2014) (the "Prior Litigation"). Patent Owner also sought a preliminary injunction against Petitioner in that case. During the Prior Litigation, Petitioner sent Patent Owner a series of letters containing invalidating prior art. *See* Ex. 1008. Patent Owner subsequently withdrew its motion for preliminary injunction and voluntarily dismissed the Prior Litigation on June 19, 2014. Exs. 1014; 1015.

Petitioner also filed a Petition for *Inter Partes* Review of the '838 Patent. That earlier IPR was assigned Case No. IPR2014-00727, and received a Final Written Decision on October 26, 2015. The Board held claims 1, 3-7, 9, 10, 12-14, 16-19, 21, 22, 24-29, 31, and 33-37 unpatentable. That Final Written Decision is attached hereto as Exhibit 1003. That Decision is currently on appeal to the Federal Circuit where it is assigned Case Nos. 16-1496, 16-1497.

There are several entities related to Petitioner also being sued for infringement of the patents identified above. Petitioner is an indirectly-owned subsidiary of Zodiac Aerospace, a Societe Anonyme organized and existing under the laws of France. Petitioner is a wholly owned subsidiary of Zodiac US Corporation, a corporation organized and existing under the laws of Delaware.

Zodiac Aerospace and Zodiac US Corporation have been sued for infringement of the patents

identified above in the Underlying Litigation. Also sued for infringement of the patents identified above in the Underlying Litigation are:

- Zodiac Seats US LLC, a limited liability company organized and existing under the laws of Texas.

- Heath Tecna, Inc., a corporation organized and existing under the laws of Delaware.

- Northwest Aerospace Technologies, Inc., a corporation organized and existing under the laws of Washington.

C. Fees

This petition is accompanied by a fee payment of $23,000, which includes the $9,000 *inter partes* review request fee, and the $14,000 *inter partes* review post-institution fee. Petitioner further authorizes a debit from Deposit Account 20- 1430 for whatever additional payment is necessary in granting this petition.

D. Designation of Lead Counsel and Backup Counsel

Lead Counsel for Petitioner is John C. Alemanni (Reg. No. 47,384), of Kilpatrick Townsend & Stockton LLP. Back-up counsel for Petitioner are Dean W. Russell (Reg. No. 33,452), David A. Reed (Reg. No. 61,226), Michael T. Morlock (Reg. No. 62,245), and Andrew Rinehart (Reg. No. 75,537).

E. Service Information

As identified in the attached Certificate of Service, a copy of the present petition, in its entirety, is being served to the address of the attorneys or agents of record for the '742 Patent and to the attorneys of record in the Underlying Litigation. Petitioner may be served at its counsel, Kilpatrick Townsend & Stockton LLP. Petitioner consents to service via email to its lead and backup counsel at the following email address: Zodiac-BE-IPR@kilpatricktownsend.com.

F. Power of Attorney

A power of attorney with designation of counsel is filed herewith in accordance with 37 C.F.R. § 42.10(b).

G. Standing

The '742 Patent was filed on April 28, 2016 and claims priority to a utility application filed on April 18, 2011 and therefore is eligible for *inter partes* review immediately following the date of the grant of the patent. 37 C.F.R. § 42.102(a)(2). Further, the '742 Patent is currently asserted in a co-pending litigation, and this petition is being filed within one year of Petitioner being served with a complaint for infringement. Petitioner certifies that the '742 Patent is available for *inter partes* review and that Petitioner is not barred or estopped from requesting an *inter partes* review challenging the patent claims on the grounds identified in this petition.

II. Background

A. Priority Date and Family

The '742 Patent issued on September 13, 2016 from Application No. 15/141,338, filed on April 28, 2016. The '742 Patent claims priority to U.S. Patent No. 8,590,838, filed on April 18, 2011, and to Provisional Application No. 61/326,198, filed April 20, 2010, and Provisional Application No. 346,835, filed May 20, 2010. Thus, the earliest possible effective filing date is April 20, 2010.

Several other related patents also claim priority to the '838 Patent, including U.S. Patent Nos. 9,073,641; 9,365,292; 9,434,476; and D764,031. The related utility patents share a common disclosure with the '742 Patent.

B. The Written Specification and Figures

The '742 Patent relates to an aircraft enclosure, "such as a lavatory, an aircraft closet, or an aircraft galley," having a forward wall (i.e., the wall toward the nose of the aircraft) with a recess that substantially conforms to the aft (i.e., back) surface of a passenger seat located immediately forward of the enclosure. *See* Ex. 1001, 2:21-31.

The challenged claims relate to an enclosure with a contoured forward wall to allow a row of seats to be placed slightly further aft in an aircraft. As explained in further detail below, Figure 1 of the '742 Patent admits that every claim element, other than a contoured forward wall, was known in the

prior art. The only other figure—Figure 2—shows an embodiment with a contoured forward wall with the same prior art seat as shown in Figure 1 positioned slightly further aft.

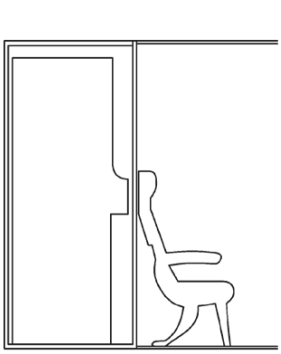


FIG. 1
(Prior Art)

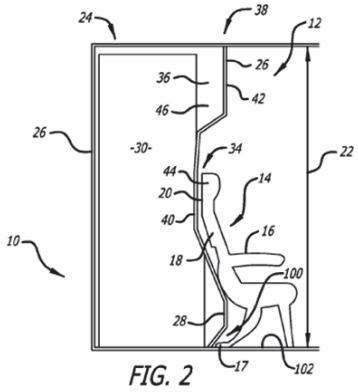
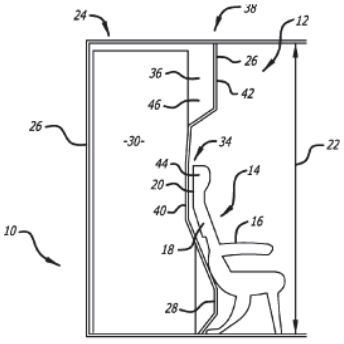
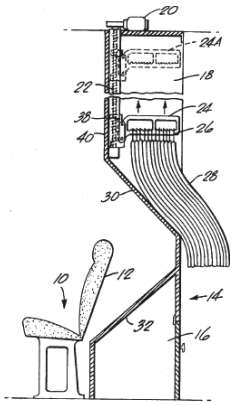


FIG. 2

Such a contoured forward wall was well known in the art long before the earliest claimed priority date, April 20, 2010. This is clear from Figure 1 of Ex. 1005 (Betts), which shows an airplane enclosure with a contoured forward wall from the early 1970s. The forward wall of Betts is almost identical to the forward wall shown in Figure 2 of the '742 Patent. And an embodiment of the Betts enclosure flew on commercial DC-10 aircraft for decades before the earliest claimed priority date. Ex. 1004, ¶¶43, 46; Ex. 1020, at 143-163 (showing commercial embodiments of Betts). This is a fact that Patent Owner itself has admitted to the Federal Circuit. Ex. 1016, 26 ("Betts was patented in 1973. It was actually built and flown on DC-10 aircraft, for decades.").

Ex. 1001, Figure 2	Ex. 1005 (Betts), Figure 1
 FIG. 2	 Fig. 1

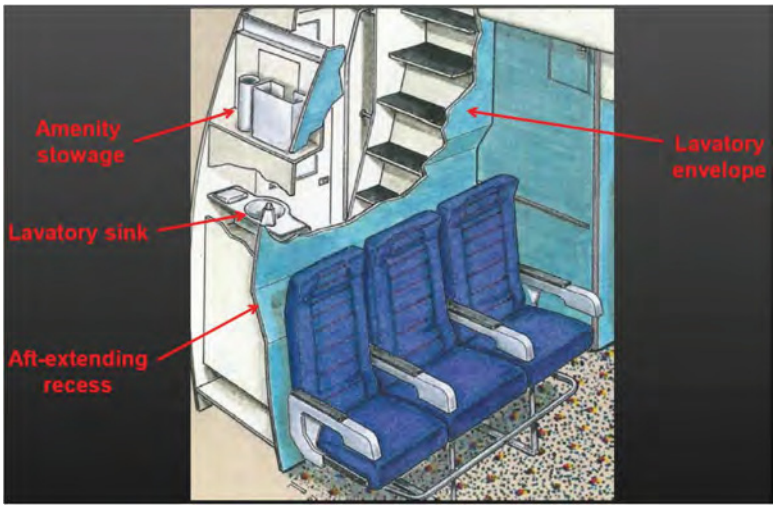
C. The Earlier IPR and Underlying Litigations

In an earlier proceeding addressing the claims of this patent's parent—the '838 Patent (Ex. 1017)—the Board invalidated most of those claims as obvious in view of Betts (Ex. 1005). In so doing, the Board specifically found that:

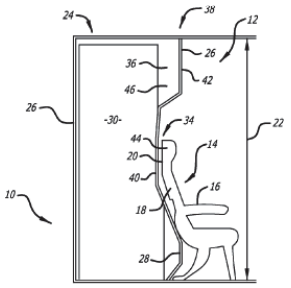
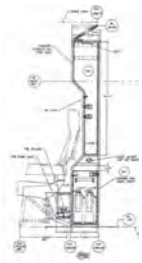
> ***Petitioner has shown that it would have been obvious to apply the recessed forward wall design of Betts to other enclosures, including single-spaced lavatories.***

Ex. 1003 at 12 (emphasis added).

In addition to Betts, there are many other examples of contoured wall enclosures in the prior art. Indeed, one of Patent Owner's own engineers designed a prior art enclosure that was installed in Boeing 747 aircraft in the 1990s. Ex. 1006, 1007. An annotated image of this enclosure is shown below.



Further, before the application that led to the '742 Patent was filed, Patent Owner was aware that Petitioner commercialized enclosures with recessed forward walls long before the earliest claimed priority date. *See* Ex. 1008.

Ex. 1001, Figure 2	Petitioner's S4 Enclosure	Petitioner's S4 Enclosure
 FIG. 2		

Indeed, when Petitioner identified this prior art to Patent Owner (Ex. 1008) Patent Owner withdrew its previous Motion for Preliminary Injunction and voluntarily dismissed its previous complaint asserting the '838 Patent against Petitioner. *See* Exs. 1014 and 1015.

In spite of all this, Patent Owner continued filing applications and convinced an examiner to allow the '742 Patent along with other continuations of the '838 Patent. Several of these are now asserted against Petitioner. Each utility patent shares a common specification, and claims a contoured forward wall along with a collection of other features. Each of these other features are either admitted to be prior art in Figure 1 or are not described in the patents' written description, which comprises just four columns, less than one column of which is the three-paragraph "Detailed Description." Ex. 1001.

The prior art discloses or renders obvious every limitation in the challenged claims. Petitioner respectfully requests that this *inter partes* review proceeding be instituted.

III. Statement of Relief Requested

Pursuant to 35 U.S.C. § 311 and 37 C.F.R. § 42.104(b), this petition requests cancellation of claims 8 and 10-16 as rendered obvious under 35 U.S.C. § 103 by the following combinations:

- Admitted Prior Art ("APA") in Exhibit 1001 and U.S. Patent No. 3,738,497 to Betts et al. ("Betts") (Exhibit 1005), in view of the knowledge of a person of ordinary skill in the art.

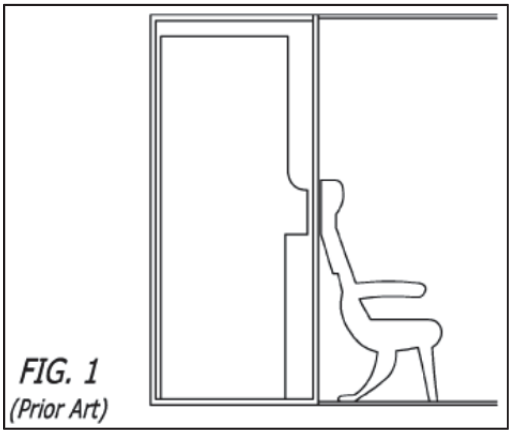
- APA in Exhibit 1001 and the KLM Crew Rest documents (Exhibit 1009), in view of the knowledge of a person of ordinary skill in the art.

IV. Summary of the Prior Art

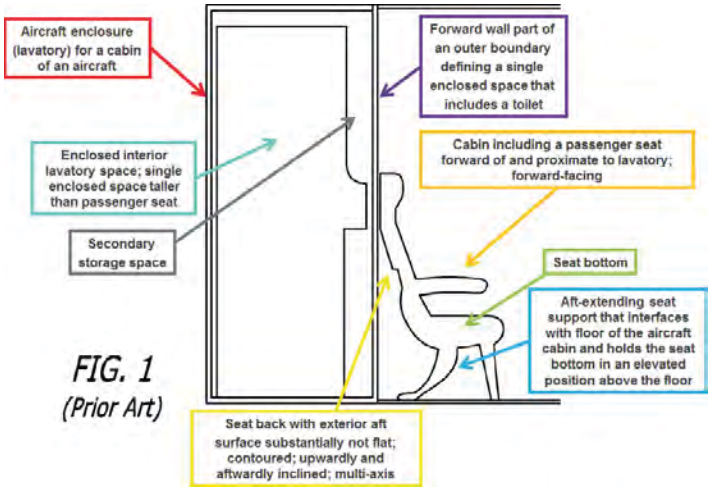
A. Admitted Prior Art (Exhibit 1001)

A flat wall lavatory and a passenger seat were both well known in the art before the earliest claimed priority date of the '742 Patent. Figure 1 of the '742 Patent shows a flat wall lavatory and passenger seat and states that these were "prior art." Ex. 1001, 4:11-13 (emphasis added) ("FIG. 1 is a schematic diagram of a **prior art** installation of a lavatory immediately aft of and adjacent to an

aircraft passenger seat.").



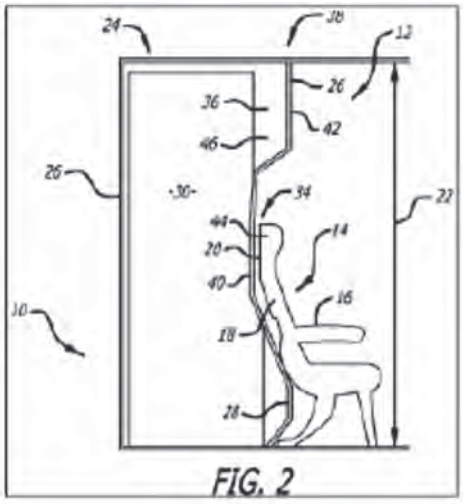
Further, the '742 Patent includes additional admissions that such lavatories were known prior art. "Aircraft lavatories, closets and other full height enclosures commonly have forward walls that are flat in a vertical plane." Ex. 1001, 1:27-29. Many of the features found in the claims are anticipated or obvious in view of this admitted prior art. A summary of the admitted prior art shown in Figure 1 is in the graphic below. Ex. 1004, ¶86.



The Board may rely on this admitted prior art. "Admissions in the specification regarding the prior art are binding on the patentee for purposes of a later inquiry into obviousness." *PharmaStem Therapeutics, Inc. v. ViaCell, Inc.*, 491 F.3d 1342, 1362 (Fed. Cir. 2007); *see also In re Nomiya*, 509 F.2d 566, 570-71 (CCPA 1975) ("We see no reason why appellants' representations in their application should not be accepted at face value as admissions that Figs. 1 and 2 may be considered 'prior art' for any purpose, including use as evidence of obviousness under § 103."); *Constant v. Advanced Micro–Devices, Inc.*, 848 F.2d 1560, 1570 (Fed. Cir. 1988) ("A statement in a patent that something is in the prior art is binding on the applicant and patentee for determinations of anticipation and obviousness."); *I/P Engine, Inc. v. AOL, Inc.* 576 Fed.Appx. 982, 987 (Fed. Cir. 2014) ("Given that its own patents acknowledge that using the original search query for filtering was a 'conventional' technique, I/P Engine cannot now evade invalidity

by arguing that integrating the query into the filtering process was a non- obvious departure from the prior art.").

The only aspect of the purported invention in the '742 Patent that is not admitted prior art is the contoured forward wall depicted in Figure 2.



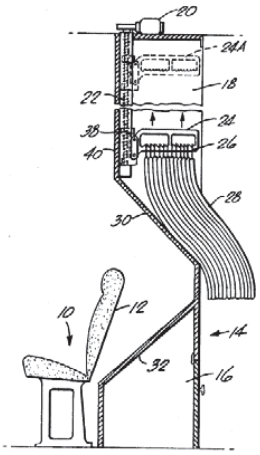
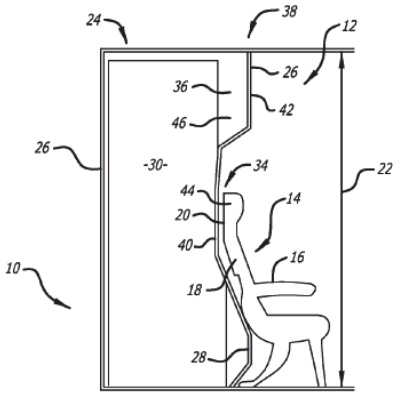
But enclosures with contoured forward walls were well-known in the art as described below.

B. Betts (Exhibit 1005)

Exhibit 1005, U.S. Patent No. 3,738,497 to Betts *et al.* ("Betts"), is assigned to McDonnell Douglas Corporation and issued on June 12, 1973, and is thus prior art under 35 U.S.C. § 102(b). Betts describes a coat closet with a recessed forward wall that "provide[s] more room for passengers in an aircraft

or other vehicle." Ex. 1005, 1:5-7. The design shown in Betts was implemented and flown on commercial DC-10 aircraft well before the earliest claimed priority date. Ex. 1004, ¶¶43, 46.

Figure 1 of Betts is a side elevation that shows an assembly of an overhead coat closet for a cabin of an aircraft that is located immediately aft of and adjacent to a passenger seat. The forward wall of Betts is very similar to that shown in Figure 2 of the '742 Patent.

Betts Figure 1	Ex. 1001, Figure 2
 Fig. 1	 FIG. 2

The Betts passenger seat has an exterior aft surface that is substantially not flat in a vertical plane. *See* Ex. 1005, Fig. 1; 2:7-14. Betts explains that this contour is positioned "to provide a space for seatback 12 to be tilted rearwardly." Ex. 1005, 2:19-

24. One of ordinary skill in the art would understand that the coat closet includes walls forming a complete enclosure of the closet. Ex. 1004, ¶45.

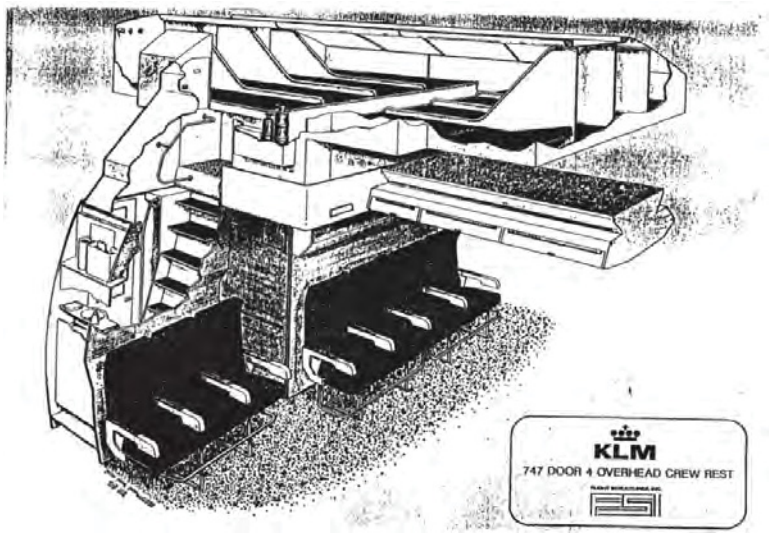
Betts states that the passenger seat is "of the type having a tiltable backrest 12 for the comfort of the occupant." Ex. 1005, 2:8-9. Thus, as described and shown in Betts Figure 1, the passenger seat is contoured and reclineable and therefore not flat in a vertical plane. The seat back shown in Betts closely conforms to the shape of the recess in the forward wall of the enclosure. Ex. 1004, ¶45.

C. The KLM Crew Rest Document (Exhibit 1009)

In 1991, Flight Structures, Inc. ("FSI")—a company B/E now owns—was awarded a contract to develop a crew rest for Royal Dutch Airlines, better known as KLM. Ex. 1007, ¶7. Specifically, FSI was awarded a contract to develop an overhead crew rest for KLM's 747-400 aircraft. FSI developed the KLM Crew Rest during 1991 and 1992. Ex. 1007, ¶7. The KLM Crew Rest was designed to include berths in the overhead space of KLM's 747-400 aircraft for crew members to rest during lengthy flights. Ex. 1007, ¶9.

To provide access to the overhead crew rest, FSI designed an entry on the right side of the aircraft. The entry was modeled on a lavatory envelope (i.e., the outer walls forming a lavatory enclosure) and was located at a typical location for a lavatory on a 747-400 aircraft. Ex. 1007, ¶10. The interior of the lavatory envelope was modified to include a

staircase in place of a toilet, which allows the crew to access the overhead space. Ex. 1007, ¶10. A rendering of the prior art KLM Crew Rest is shown below.



The image of the KLM Crew Rest above was included in the file history of an issued patent. *See* Ex. 1009, at 70.

The Board may rely on the KLM Crew Rest document in that file history as prior art. Patent Owner submitted information regarding the KLM Crew Rest in an Information Disclosure Statement during pendency of the application that issued as U.S. Patent No. 6,520,451. *See* Ex. 1009, at 66-91. This Information Disclosure Statement was

submitted on March 18, 1999, more than ten years before the earliest claimed priority date. *Id*. at 64. And U.S. Patent No. 6,520,451 issued on February 18, 2003, several years before the earliest claimed priority date. Ex. 1010.

Thus, these documents were made available to the public no later than the issue date of U.S. Patent No. 6,520,451, February 18, 2003, when its file history was made available to the public. Ex. 1010; *See* 37 C.F.R. § 1.11(a) ("The specification, drawings, and all papers relating to the file of: A published application; a patent; or a statutory invention registration are open to inspection by the public, and copies may be obtained . . ."). These KLM-related documents are therefore printed publications that may be used in this proceeding.

The Board has held previously that a file history is available as prior art. *Duodecad It Servs. Luxembourg S.A.R.L.*, IPR2015-01036, 2016 WL 6946904 (Oct. 20, 2016) ("It is undisputed that Chen FH was fully available to anyone who ordered it. We find that one of ordinary skill, being aware of Chen, would consult its file history. We conclude, based on the record as fully developed, that Chen FH is available as prior art against the challenged claims."). This is fully consistent with the MPEP, which explains "[i]n the examination of an application, it is sometimes necessary to inspect the application papers of some previously abandoned application (provisional or nonprovisional) or granted patent." MPEP § 901.01(a). The MPEP goes on to provide Examiners with instructions for locating file wrappers for patented and abandoned

applications. *Id.*

The Board's decision in *Duodecad* is consistent with Federal Circuit precedent, which holds that to qualify as a printed publication, a reference "must have been sufficiently accessible to the public interested in the art." *In re Cronyn*, 890 F.2d 1158, 1160 (Fed. Cir. 1989). A reference is sufficiently accessible if it has been indexed or cataloged. *Blue Calypso, LLC v. Groupon, Inc.*, 815 F.3d 1331, 1348 (Fed. Cir. 2016) ("we generally inquire whether the reference was sufficiently indexed or cataloged."). The Federal Circuit has found that an issued patent is "classified and indexed," and that this is sufficient to "provid[e] the roadmap that would have allowed one skilled in the art to locate the [] application." *Bruckelmyer v. Ground Heaters, Inc.*, 445 F.3d 1374, 1378–79 (Fed. Cir. 2006); *see also Ultimax Cement Mfg. Corp. v. CTS Cement Mfg. Corp.*, 587 F.3d 1339, 1355-56 (Fed. Cir. 2009) ("Information disclosed in a patent, even a foreign one, is 'generally known to the public,' especially the relevant public . . . Indeed, one of the primary purposes of patent systems is to disclose inventions to the public."); *Guardian Media Technologies, Ltd. v. Amazon.com, Inc.*, 2014 WL 12561616 *5 (C.D. Cal. Dec. 9, 2014) (finding a patent application file history as prior art as of the date the patent issued). Here, the KLM Crew Rest document was included in the publicly available file wrapper of an issued patent and thus is prior art.

Further, "[a]ccessibility goes to the issue of whether interested members of the relevant public could obtain the information if they wanted to." *Constant v. Advanced Micro–Devices, Inc.*, 848 F.2d

1560, 1568 (Fed. Cir. 1988). The Federal Circuit has further explained that "a published article with an express citation to the potentially invalidating reference would [] provide the necessary guidance." *Blue Calypso*, 815 F.3d at 1350. This is also the case here, as the face of U.S. Patent No. 6,520,451 identifies the KLM Crew Rest submission in a related technical area. Ex. 1010, 1:11-17 (emphasis added) ("This invention relates generally to resting and sleeping quarters for an aircraft crew . . . in ***a space-saving*** and weight-saving configuration ***occupying substantially otherwise unused space aboard an aircraft***.").

OTHER PUBLICATIONS

Boeing 747 Crew Rest Compartment and Proposals for Same; Correspondence From Flight Structures, Inc. to Air France Dated Aug. 3, 1994 (10 Pages), Nov. 15, 1994 (4 Pages) and Jul. 23, 1996 (11 Pages).

Ex. 1010.

Thus, this issued patent provides a "roadmap" for how to locate that reference, e.g., by accessing the publicly available file wrapper. And the Board may therefore rely on the printed publication describing the KLM Crew Rest.

While Petitioner relies on the black and white version of the KLM Crew Rest document shown in Exhibit 1009, a color version is shown below and attached as Exhibit 1006.[1]

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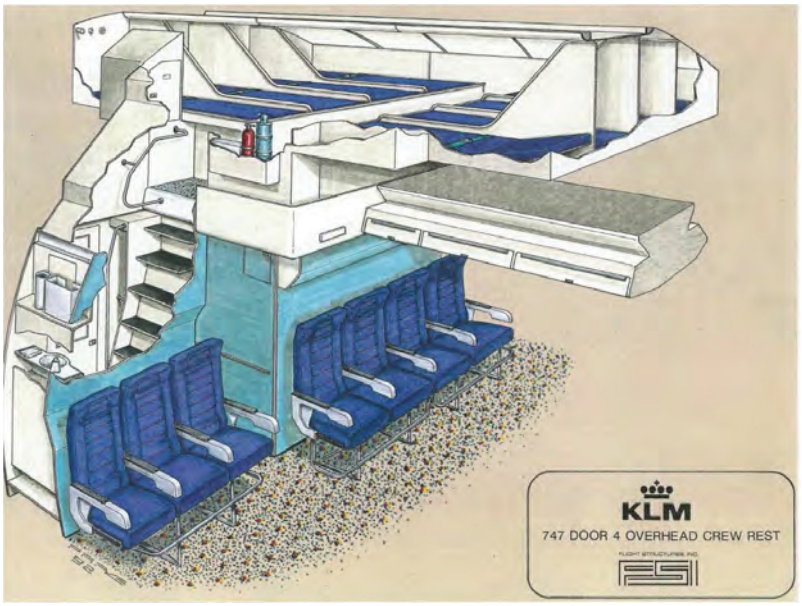
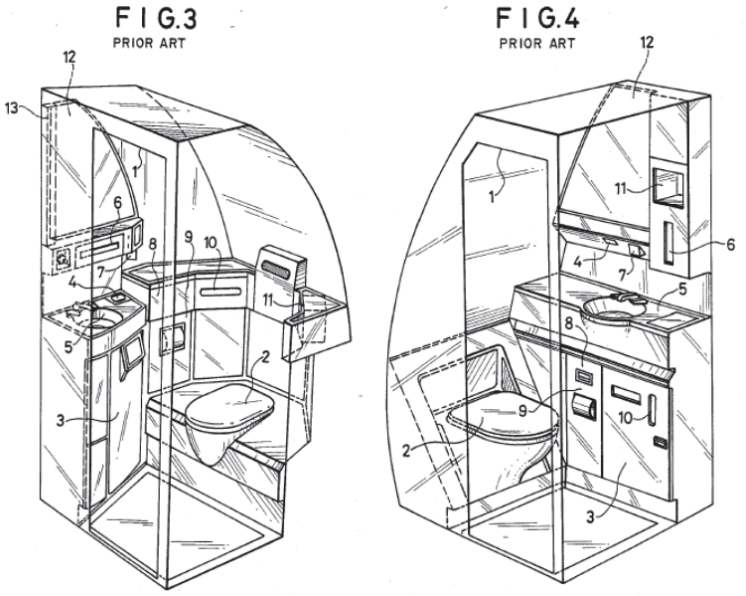
[1] *See* Ex. 1007, ¶17.



V. Motivation to Combine

A. Motivation to Combine APA and Betts

As discussed in Section IV.A above, the '742 Patent admits that a flat wall lavatory was well known in the prior art before its earliest claimed priority date. This is further evidenced by Exhibit 1011, U.S. Patent No. 4,884,767 to Shibata ("Shibata"), which issued in 1989 and includes figures showing flat wall lavatories, which it admits were prior art as of its filing date, 1988.



It would have been obvious to one of ordinary skill in the art to modify a prior art flat wall lavatory to include a contoured forward wall like the wall shown in Betts. Ex. 1004, ¶¶56-64.

First, the Board has previously considered this very combination, and found that it would be obvious to make such a modification. Indeed, the Board stated:

> ***Petitioner has shown that it would have been obvious to apply the*** **recessed forward wall design of Betts to other enclosures, including single-spaced lavatories.**

Ex. 1003 at 12 (emphasis added).

Second, as Mr. Anderson explains, a primary goal of the design of interiors of commercial aircraft is efficient use of valuable passenger cabin space. Ex. 1004, ¶57. Efficient use of space allows an aircraft to accommodate more passengers and/or to accommodate passengers more comfortably, thereby increasing the utility of the aircraft. Ex. 1004, ¶57. As of April 2010, a primary motivation of one of ordinary skill in the art of aircraft interior design would have been to make efficient use of space in the aircraft interior cabin. Ex. 1004, ¶57.

The contoured forward facing wall shown in Betts advantageously provides additional space to locate a seat further aft in an aircraft. Ex. 1004, ¶58. Betts says that the coat hanger rack is elevated "to provide more passenger room." Ex. 1005, Abstract. Betts also describes that it "provide[s] more room for passengers in an aircraft or other vehicle." Ex. 1005, 1:5-7. As shown in the annotated figure below, the seat shown in Betts could not be located in the position in which it is shown if the forward wall were flat. Ex. 1004, ¶58; Ex. 1005. Thus, this contoured forward wall makes more efficient use of the valuable space in the aircraft passenger cabin than would be available with a flat forward wall. Ex. 1004, ¶58.

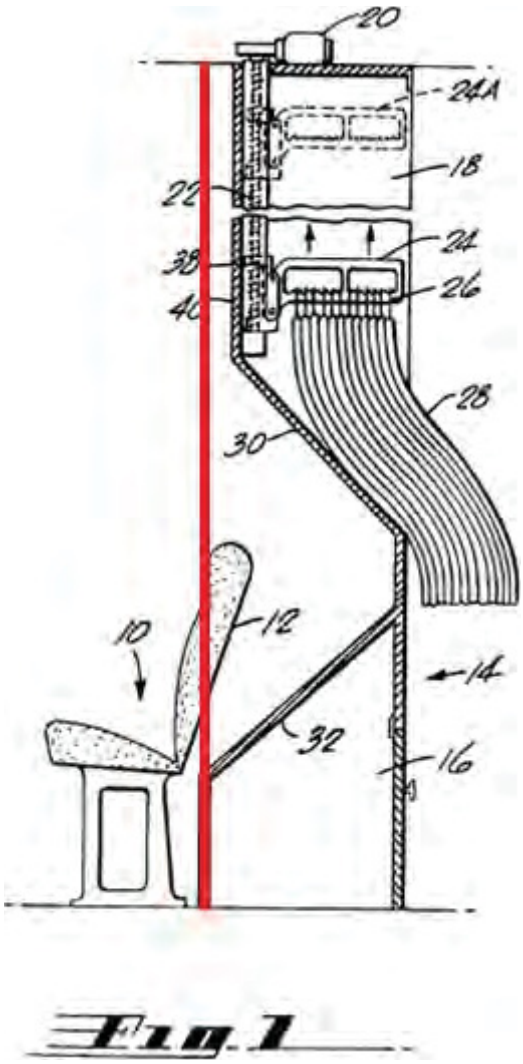


Fig. 1

One of ordinary skill in the art would understand that the forward wall of the enclosure shown in Betts would also be suitable for use with other aircraft enclosures, including lavatories. Ex. 1004, ¶59. In an

aircraft, as a row of seats is moved further aft, the first thing that makes contact with a flat wall is the top of the back of the seat. Ex. 1004, ¶59. And so Betts includes a recess that receives that portion of the seat back. Applying the contoured wall of Betts to a lavatory allows the row of seats placed immediately in front of that contoured wall to be placed further aft. Ex. 1004, ¶59.

The challenged patent does not distinguish between different types of enclosures, instead explaining that the recessed forward wall is applicable to all types of aircraft cabin enclosures, e.g., "[t]he present invention relates generally to aircraft enclosures, and more particularly relates to an aircraft cabin enclosure, such as a lavatory, an aircraft closet, or an aircraft galley." Ex. 1001, 1:20-23. As Mr. Anderson explains, multiple different types of prior art enclosures include one or more recesses to enable seats to be positioned further aft in a cabin. Ex. 1004, ¶59. Combining different types of enclosures, designs and shapes of recesses, and seat geometries would have been obvious to one of skill in the art and provides the predictable result of allowing a seat to be positioned further aft.

Patent Owner has argued in the Underlying Litigation that a person of ordinary skill would not have applied a recess to a lavatory at least because the industry had been reluctant to decrease the width out of concern that airlines and passengers would not accept narrower lavatory spaces. But even if Patent Owner were correct, whether a narrower lavatory would be acceptable to airlines and passengers has no bearing on the obviousness of

applying a contoured wall to a lavatory. *Orthopedic Equip. Co. v. U.S.*, 702 F.2d 1005, 1013 (Fed. Cir. 1983) ("[T]he fact that the two disclosed apparatus would not be combined by businessmen for economic reasons is not the same as saying that it could not be done because skilled persons in the art felt that there was some technological incompatibility that prevented their combination. Only the latter fact is telling on the issue of nonobviousness"). Customer acceptance of a narrow lavatory is a market force, not a technical challenge. *See Friskit, Inc. v. Real Networks, Inc.*, 306 Fed. App'x 610, 617-18 (Fed. Cir. 2009).

B. Motivation to Combine APA and the KLM Crew Rest Document

As discussed in Section IV.A above, a flat wall lavatory was well known in the prior art before the earliest claimed priority date of '742 Patent. It would have been obvious to one of ordinary skill in the art to modify a prior art lavatory to include a contoured forward wall like the wall shown in the KLM Crew Rest document. Ex. 1004, ¶¶65-72.

As noted above, and explained by Mr. Anderson, a primary goal of the design of interiors of commercial aircraft is efficient use of valuable passenger cabin space. Ex. 1004, ¶66. Efficient use of space allows an aircraft to accommodate more passengers and/or to accommodate passengers more comfortably, thereby increasing the utility of the aircraft. Ex. 1004, ¶66. As of April 2010, a primary motivation of one of ordinary skill in the art of aircraft interior design would have been to make

efficient use of space in the aircraft interior cabin. Ex. 1004, ¶66. The contoured forward facing wall shown in the KLM Crew Rest document advantageously provides additional space to locate a seat further aft in an aircraft. Ex. 1004, ¶66. The recess in the forward wall of the KLM Crew Rest was designed to allow the last row of seats in front of the contoured wall to sit further aft in the aircraft, yet still be able to recline. *Id*.; Ex. 1007, ¶13.

The seat in the KLM Crew Rest could not be located in the position in which it is shown if the forward wall was flat, because a flat wall would restrict the passenger's ability to recline the seat and this was not permitted by the customer requirements for the crew rest; rather, if the wall were flat, the seat would need to be moved forward. Ex. 1007, ¶12; Ex. 1004, ¶67. One of ordinary skill in the art would understand that the forward wall of the enclosure used by the KLM Crew Rest would be suitable for use in a lavatory, at least because the KLM Crew Rest itself is designed for occupancy by people and is based on a lavatory envelope, without a toilet, but including "a lavatory sink (and related plumbing), lighting, a mirror, soap dispenser, shaver outlet and amenity stowage." Ex. 1007, ¶16; Ex. 1004, ¶67.

Further one of ordinary skill in the art would recognize that in an aircraft, as a row of seats is moved further aft, the first thing that makes contact with a flat wall is the top of the back of the seat. Ex. 1004, ¶68. And so the KLM Crew Rest includes a recessed forward wall that receives that portion of the seat back. Ex. 1004, ¶68. Including the

contoured wall of the KLM Crew Rest document allows the row of seats placed immediately in front of that contoured wall to be placed further aft. Ex. 1004, ¶68.

The challenged patent explains that the claimed concept is equally applicable to all types of aircraft cabin enclosures, e.g., "[t]he present invention relates generally to aircraft enclosures, and more particularly relates to an aircraft cabin enclosure, such as a lavatory, an aircraft closet, or an aircraft galley." Ex. 1001, 1:20-23. As Mr. Anderson explains, multiple different types of prior art enclosures include one or more recesses to enable seats to be positioned further aft in a cabin. Ex. 1004, ¶68. Combining different types of enclosures, designs and shapes of recesses, and seat geometries would have been obvious to one of skill in the art and provides the predictable result of allowing a seat to be positioned further aft.

Further, one of the designers of the KLM Crew Rest, Robert Papke, confirmed during direct testimony elicited by attorneys for Patent Owner that this contoured wall was really the logical way to allow seats to be placed further aft in an aircraft. Ex. 1004, ¶69; Papke Tr. at 190:1-11.

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Q. When you developed the vestibule with the indentation in it, was your design motivated by some prior system?

MR. REED: Object to form.

THE WITNESS: No. It was defined by the need or the requirements of the airline to provide their recline. There was only one really logical way to get there and still have a usable space for access into the crew rest and provide the closet space that they requested adjacent to the stair housing -- or staircase, itself.

VI. Factual Background

A. Declaration Evidence

This petition is supported by the declaration of Mr. Alan Anderson. Mr. Anderson worked at Boeing for 43 years. From 1999-2011 Mr. Anderson was the Director of Engineering, Payload Systems, where he oversaw all engineering for interiors for all models of Boeing aircraft. He was also Chief Engineer for Interiors for the development of the 787 Interior from 2002 until 2008. Mr. Anderson's declaration is attached as Exhibit 1004.

B. Person of Ordinary Skill in the Art

A person of ordinary skill in the art of the '742 Patent would have had a bachelor's degree in mechanical engineering, industrial design, or a similar discipline, or the equivalent experience, with at least two years of experience in the field of aircraft interior design. Ex. 1004, ¶¶27-29.

VII. Claim Construction

In *inter partes* review, claim terms are interpreted under a "broadest reasonable construction" standard. *See* 37 C.F.R. § 42.100(b). Under 37 C.F.R. § 1.42.104(b)(4), the "claim terms are presumed to take on their ordinary and customary meaning." *See* 77 Fed. Reg. 48699 (2012), Response to Comment 35. The interpretation of the claims presented either implicitly or explicitly herein should not be viewed as constituting, in whole or in part, Petitioner's own interpretation of such claims for the purposes of any litigation or proceeding where the claim construction standard differs from the broadest reasonable interpretation, but instead should be viewed as a broadest reasonable claim construction.

A. "Reducing a Volume of Unusable Space"

The '742 Patent relates to aircraft enclosures. Ex. 1001, 1:19-21. The patent describes that prior art "flat wall enclosures" positioned next to "contoured structures" leads to unusable space. *Id*. at 1:26-35. The patent describes using a contoured wall in an enclosure to "eliminate the gaps and volumes of space previously required between lavatory enclosures and adjacent structures, to allow the installation of an increased number of passenger seats." *Id*. at 2:10-15. Thus, a person of ordinary skill in the art would understand that the broadest reasonable interpretation of "reducing a volume of unusable space" is at least broad enough to include "allowing an airplane seat to be positioned further aft in an aircraft than is possible with a flat wall

enclosure."

B. "Recess"

The '742 Patent describes a forward wall with one or more recesses that permit a seat positioned in front of the forward wall to be positioned further aft than would be possible if the wall were flat. *See* Ex. 1001, 4:51-57 ("the recess 34 and the lower recess 100 combine to permit the passenger seat 16 to be positioned farther aft in the cabin than would be possible if the lavatory enclosure 10 included a conventional flat and vertical forward wall without recesses like that shown in FIG. 1, or included a forward wall that did not include both recesses 34, 100."). The '742 Patent further describes that the recesses cause the forward wall to be "substantially not flat in the vertical plane." Ex. 1001, 4:39-41 ("The forward wall portion has a shape that is substantially not flat in the vertical plane, and preferably is shaped to include a recess 34 . . ."). Based on the description, a wall that is substantially not flat is a wall that includes a contour. Thus, the broadest reasonable interpretation of a "recess" as used by the '742 Patent is at least broad enough to include "a wall that includes a contour in the vertical plane."

VIII. Full Statement of the Reasons for the Relief Requested

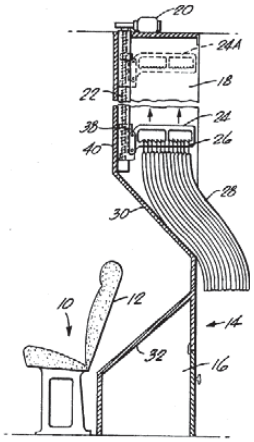
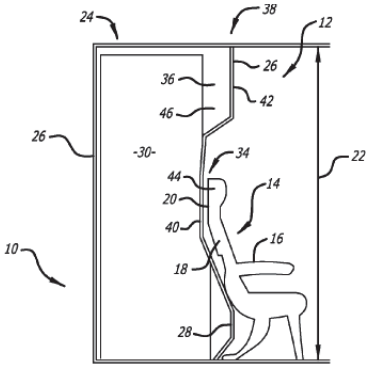
A. Claims 8 and 10-16 are Obvious Under 35 U.S.C. § 103 over APA and Betts.

The combination of APA and Betts teaches or

renders obvious to one of skill in the art each element of the challenged claims and each challenged claim as a whole as described in this section. As discussed in Section V above, one of skill in the art would be motivated to modify the APA in view of the teachings of Betts.

[*'742 Claim 8 Preamble*] A method for reducing a volume of unusable space in a cabin area of a passenger aircraft, comprising:

Figure 1 of Betts is a side elevation that shows an assembly of an enclosure that is located immediately aft of and adjacent to a passenger seat and is nearly identical to Figure 2 of the '742 Patent. Ex. 1005; Ex. 1004, ¶¶241-243.

Betts Figure 1	'742 Patent Figure 2
 Fig. 1	 FIG. 2

As explained above, a person of ordinary skill in the art would be motivated to modify a flat wall lavatory to use the Betts design on the forward wall of a lavatory. Ex. 1004, ¶243. Such a design would "reduce[] a volume of unusable space in a cabin area of a passenger aircraft," under the broadest reasonable interpretation of this claim phrase. *Id*. For example, the seat in Betts is positioned such that it resides within the contour, as is shown by the annotated image below. *Id*.

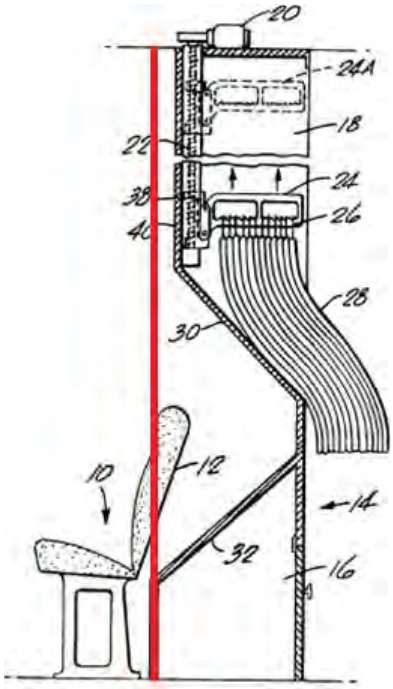
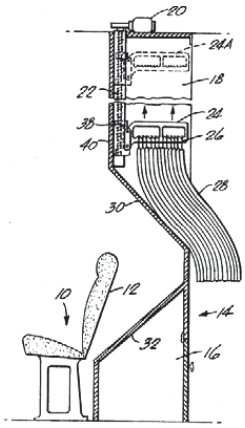
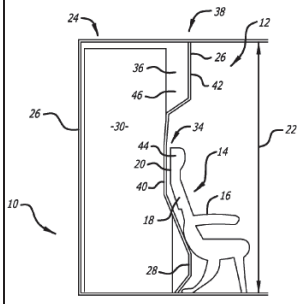


Fig. 1

['*742 Claim 8 Element A*] replacing at least a previously-installed forward

partition of a pre-existing aircraft lavatory in the cabin area of the passenger aircraft with a contoured forward partition, wherein an outward facing vertical surface of the previously installed forward partition is substantially flat, and

As is shown below, Betts includes a contoured forward wall. Ex. 1004, ¶246. A person of ordinary skill in the art would realize that this contoured forward wall could be used in place of a flat forward wall to allow the seat be placed further aft in an aircraft cabin. Ex. 1004, ¶246.

Betts Figure 1	**'742 Patent Figure 2**
 Fig. 1	 FIG. 2

[*'742 Claim 8 Element B*] the contoured forward partition comprises at least one

first recess configured to receive at least a portion of an upwardly and aftwardly inclined seat back of a passenger seat therein, and

As is shown in the annotated figure below, Betts shows an aircraft passenger seat that is positioned at least partially within the contoured forward wall. Ex. 1004, ¶¶247-248. Thus, this seat is received by the contoured wall. *Id*. Further, the back of this seat is both upwardly and aftwardly inclined. *Id*.

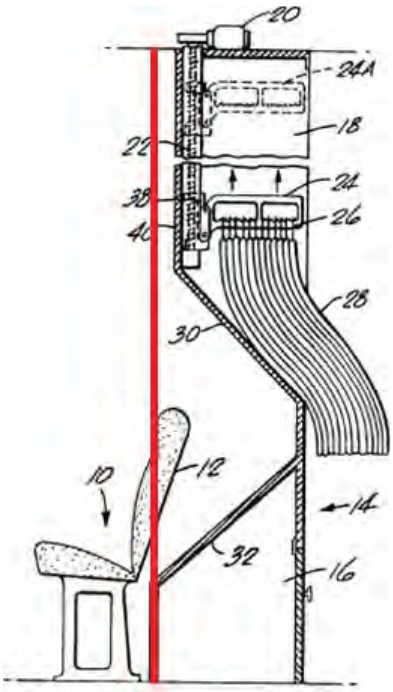
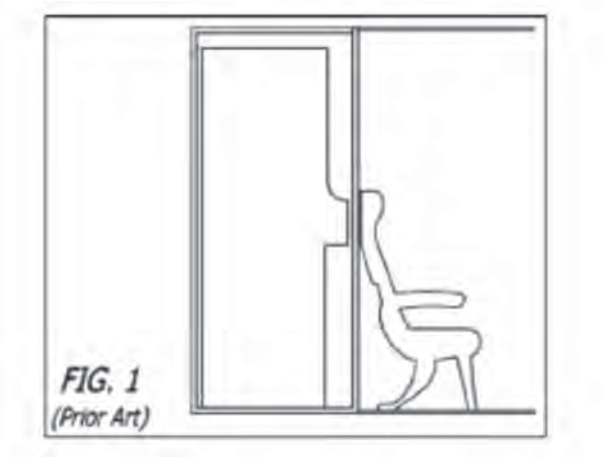


Fig. 1

[*'742 Claim 8 Element C*] at least one second recess configured to receive at least a portion of an aft-extending seat support of the passenger seat therein; and

As explained in Section V above, a person of ordinary skill in the art would be motivated to modify a flat forward facing wall of a lavatory to include a recess to allow a passenger seat to be positioned further aft in the aircraft cabin.

A seat with an aft extending seat support is well known in the art. *See, e.g.*, Ex. 1001, Fig. 1.



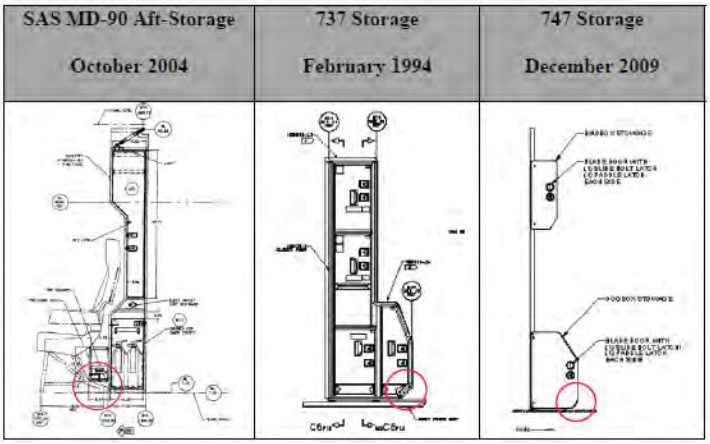
A person of ordinary skill in the art would realize that when such a seat is moved further aft, the first component to impact the wall is the seat back. Ex. 1004, Ex. 1004, ¶¶189, 250. As explained above, Betts includes a forward facing recess that receives the seat back. *Id.*

As the seat is moved further aft, the next component to impact the wall is the aft seat support. Ex. 1004, ¶¶191, 250. As Mr. Anderson explains, a person of ordinary skill in the art would be motivated to modify an enclosure, such as a lavatory, to include a second recess to receive aft facing seat supports. *Id*. Such a modification is nothing more than the application of known technology for its intended purpose. *Id*. The result of such a modification is predictable, allowing the seat to be positioned further aft in an aircraft. *Id*.

Patent Owner cannot argue this difference between the above cited prior art is sufficient to render the claims patentable. The "mere existence of differences between the prior art and an invention does not establish the invention's nonobviousness. The gap between the prior art and respondent's system is simply not so great as to render the system nonobvious to one reasonably skilled in the art." *Dann v. Johnston*, 425 U.S. 219, 230 (1976); *see also* MPEP § 2141 ("The proper analysis is whether the claimed invention would have been obvious to one of ordinary skill in the art after consideration of all the facts."). Mr. Anderson explains in detail why this difference would be obvious to one or ordinary skill in the art. Ex. 1004, ¶¶186-192, 250.

Further, as evidence of this modification being well known, Mr. Anderson cites to three examples of prior art enclosures that include a lower recess to receive a seat support. Ex. 1004, ¶¶192, 250. Each of these designs was sold and included in passenger aircraft well before the earliest claimed priority date of the '742 Patent. *Id*. Patent Owner was aware of at

least the SAS MD-90 Aft-Storage during prosecution of the application that led to the '742 Patent. Ex. 1008.



['*742 Claim 8 Element D*] installing the passenger seat in front of the contoured forward partition; wherein, upon installation, the at least one first recess receives at least a portion of the upwardly and aftwardly inclined seat back, and the second recess receives at least a portion of the aft-extending seat support,

As noted above, Figure 1 of the '742 Patent admits that a seat with an aft extending seat support is well known in the art. Ex. 1004, ¶¶118, 188, 216. Further, Figure 1 of Betts shows both a passenger seat and a contoured forward partition. Ex. 1005; Ex. 1004, ¶¶175, 251-252. As explained above in connection with Claim 8, Element B, the passenger seat is positioned at least partially within

the contour and is thus received by the recess. Ex. 1004, ¶¶247-248.

As explained above , a person of ordinary skill in the art would be motivated to modify the forward wall of an enclosure to accommodate known prior art seat designs that include an aft-extending seat support. Ex. 1004, ¶¶117-122, 189-192, 215-219. Such a modification is nothing more than the application of known technology for its intended purpose. *Id*. The result of such a modification is predictable, allowing the seat to be positioned further aft in an aircraft. Ex. 1004, ¶¶121, 191, 218.

Further, as explained above, there were multiple prior art designs that included a lower recess to accommodate aft extending seat supports. Ex. 1004, ¶¶122, 192.

> **[*'742 Claim 8 Element E*] thereby reducing the volume of unusable space in the cabin area by reducing or eliminating gaps that existed between the previously-installed forward wall and the passenger seat.**

As explained in Section V above, a person of ordinary skill in the art would be motivated to modify a flat wall lavatory to use the Betts design on the forward wall of a lavatory. Such a design would "reduce[] a volume of unusable space in a cabin area of a passenger aircraft," under the broadest reasonable interpretation of this claim phrase. Ex. 1004, ¶¶253-254. For example, the seat in Betts is positioned such that it resides within the contour, as

is shown by the annotated image below. Ex. 1005.

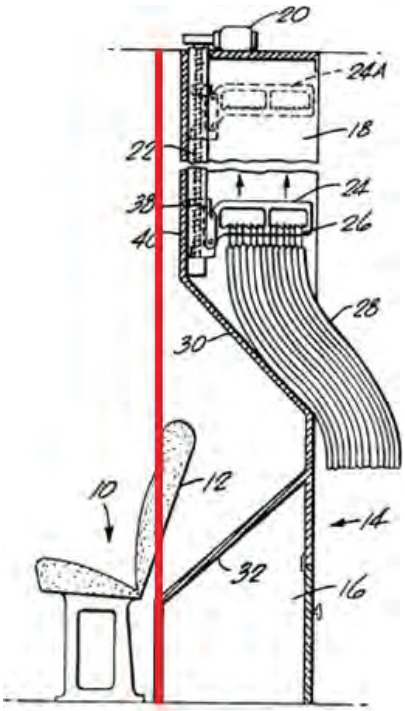
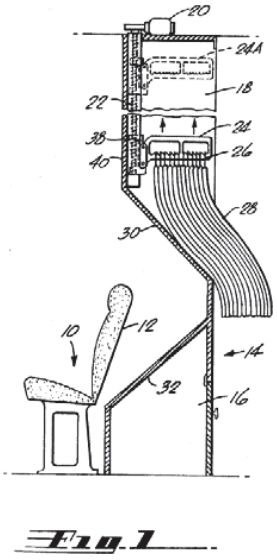
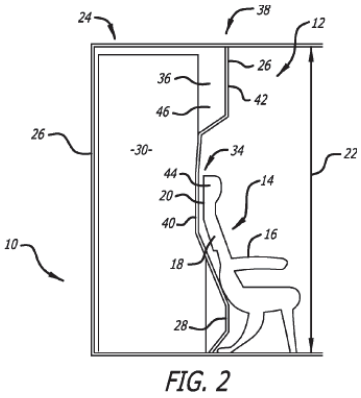


Fig. 1

The Betts design therefore "reduc[es] or eliminate[es] gaps that existed between the previously-installed forward wall and the passenger seat."

['*742 Claim 10*] The method of claim 8, wherein the at least one first recess substantially conforms to a contour of an aft surface of the upwardly and aftwardly inclined seat back.

The recess shown in Betts "substantially conforms to a contour of an aft surface of the upwardly and aftwardly inclined seat back." Ex. 1004, ¶¶255-256. As shown below, the design of Betts Figure 1 is substantially the same as the design shown in Figure 2 of the '742 Patent. *Id*.

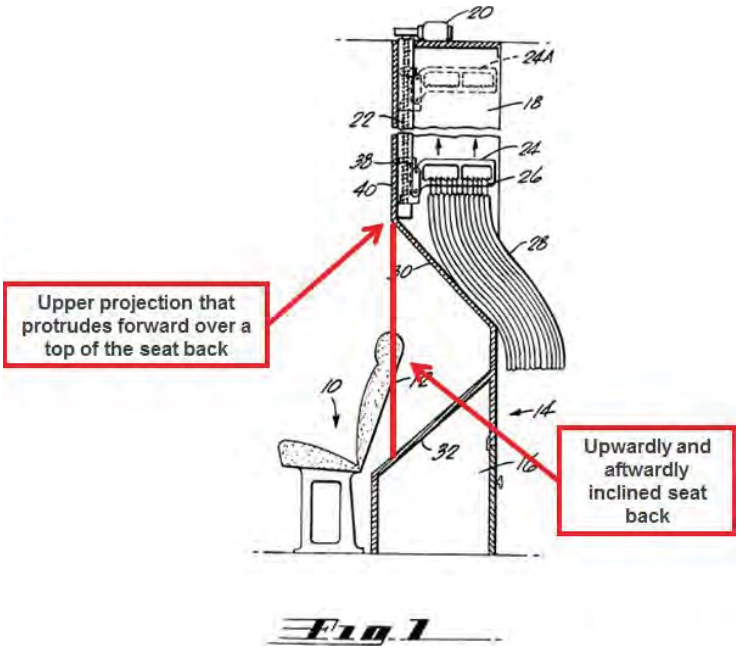
Betts Figure 1	**'742 Patent Figure 2**
	

Betts further discloses a seat with "a contour of an aft surface of the upwardly and aftwardly inclined seat back." Ex. 1004, ¶258. Further, the only seat disclosed in the '742 Patent is admitted to be prior art. *Id*.

['*742 Claim 11*] The method of claim 8, wherein the contoured forward

partition further comprises an upper projection that, upon installation, protrudes forward over a top of the upwardly and aftwardly inclined seat back.

As is shown in the annotated figures below, Betts discloses "an upper projection that, upon installation, protrudes forward over a top of the upwardly and aftwardly inclined seat back." Ex. 1004, ¶¶259-260.



[*'742 Claim 12*] The method of claim 11, wherein the upper projection is

configured to abut an upper surface of the cabin area.

The upper projection shown in the analysis of Claim 11 above "is configured to abut an upper surface of the cabin area." *See* Ex. 1004, ¶262.

Further, the admitted prior art discloses a lavatory wherein the upper portion of the forward wall is configured to abut an upper surface of the cabin area.

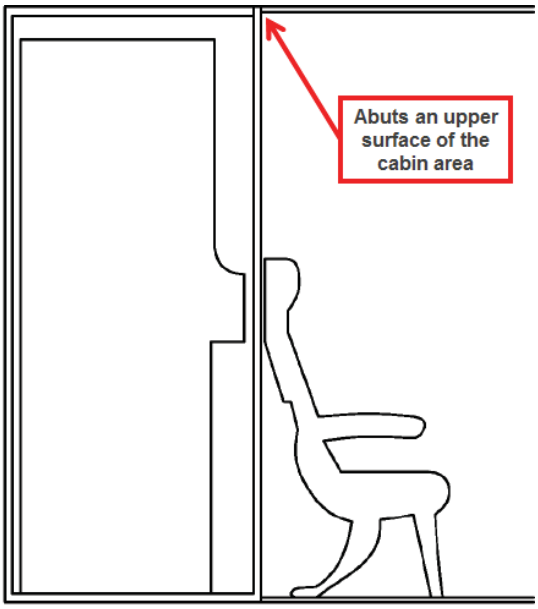


FIG. 1
(Prior Art)

['*742* Claim *13*] The method of claim 11, wherein the upper projection defines an

interior storage space in the aircraft lavatory.

To the extent "an interior storage space in the aircraft lavatory" is described in the '742 Patent, it is admitted to be prior art in Figure 1. The admitted prior art shows "a secondary space in said interior lavatory space above the passenger seat back." The specification of the '742 Patent describes "the forward wall portion defines a secondary space 36 in the interior lavatory space." Ex. 1001, 4:43-45. Such a space is shown in both Figure 1 and Figure 2. Ex. 1004, ¶¶205-206, 263. Further, a person of ordinary skill in the art would recognize that prior art lavatories often include interior storage spaces, e.g., trash receptacles, space for additional paper towels or toilet paper, space for routing plumbing, etc. Ex. 1004, ¶207. A person of ordinary skill in the art would further understand that the enclosed space of a lavatory would continue to contain the prior art interior storage spaces after applying a contour to the forward wall. *Id*.

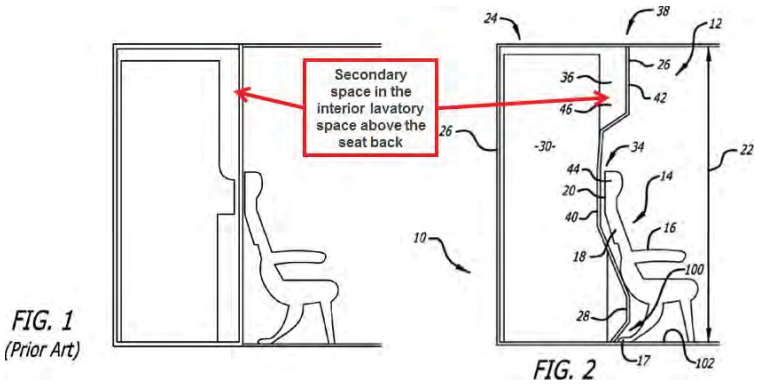


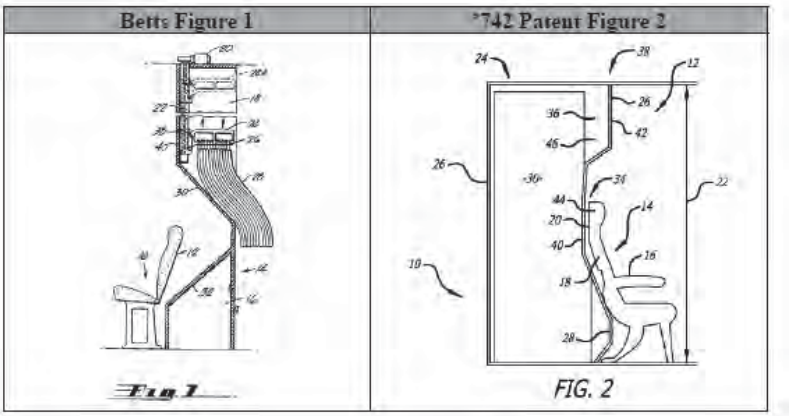
FIG. 1
(Prior Art)

FIG. 2

['*742 Claim 14*] The method of claim 8,

wherein the upwardly and aftwardly inclined seat back is in an upright and not a reclined position.

The seat shown in Betts is in substantially the same position as the seat shown in Figure 2 of the '742 Patent Ex. 1004, ¶264-265.



Further, a person of ordinary skill in the art would recognize that the seat shown in Betts is in an upright and unreclined position. *Id*.

[*'742 Claim 15*] The method of claim 8, wherein the at least one first recess extends along substantially a full width of the contoured forward partition.

Figure 1 of Betts shows a side elevational view of the coat closet enclosure. Ex. 1005, 1:58-59; Ex. 1004, ¶¶234-235, 267. The side elevational view shows the coat closet enclosure from a horizontal plane beside the enclosure. *Id*. One of ordinary skill in the art would understand from Figure 1 that the

recess extends the full width of the forward wall. *Id*.

Further, nothing in Betts suggests that the recess only extends a portion of the width of the forward wall. Ex. 1004, ¶236. Moreover, one of ordinary skill in the art would be motivated to extend the recess the full width of the forward wall in order to accommodate the full row of seats installed immediately forward of the wall. *Id*. In fact, the commercial embodiments of the Betts closet (found on DC- 10s) had a recess that extended the full width of the forward partition. *Id*.

Further, the side elevation view shown in Figure 1 is essentially identical to the schematic diagram of Figure 2 of the '742 Patent. Ex. 1001. The term "width" appears nowhere in the specification of the '742 Patent. *See* Ex. 1001. To the extent that Figure 2 of the '742 Patent describes this limitation, the limitation is also disclosed by Figure 1 of Betts.

> **['*742 Claim 16*] The method of claim 8, wherein replacing the previously-installed forward partition with the contoured forward partition permits the aft-extending seat support to be positioned farther aft in the cabin area than was possible when the previously-installed forward partition was installed in the cabin area.**

As explained in Section V above, a person of ordinary skill in the art would be motivated to modify a flat wall lavatory to use the Betts design on the forward wall of a lavatory. Ex. 1004, ¶¶268-269.

The seat shown in Betts is positioned further aft than it could be positioned if there were no recess in the forward wall because the seat back is within the recess. *Id*. Further, the seat shown in Betts is in substantially the same position as the seat shown in Figure 2 of the '742 Patent. *Id*. And a person of ordinary skill in the art would recognize that the seat shown in Betts is in an unreclined position. *Id*.

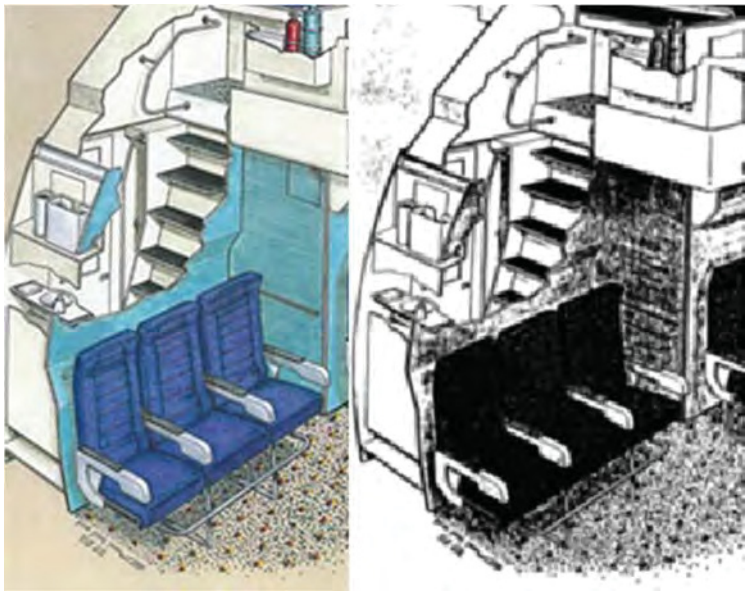
Further, as explained above with regard to Claim 8, Element C, it was well known in the prior art to include a lower recess to receive an aft-extending seat support. Ex. 1004, ¶¶191-192, 271. As Mr. Anderson explains, a person of ordinary skill in the art would be motivated to modify an enclosure, such as a lavatory, to include a second recess to receive aft facing seat supports. *Id*. Such a modification is nothing more than the application of known technology for its intended purpose. *Id*. The result of such a modification is predictable, allowing the seat to be positioned further aft in an aircraft. *Id*.

B. Claims 8 and 10-16 are Obvious Under 35 U.S.C. § 103 over APA and the KLM Crew Rest Document.

The combination of APA and the KLM Crew Rest document teaches or renders obvious to one of skill in the art each element of the challenged claims and each challenged claim as a whole as described in this section. As discussed in Section V above, one of skill in the art would be motivated to modify the APA in view of the teachings of the KLM Crew Rest document.

[*'742 Claim 8 Preamble*] A method for reducing a volume of unusable space in a cabin area of a passenger aircraft, comprising:

As explained above, a person of ordinary skill in the art would be motivated to modify a flat wall lavatory to use the KLM Crew Rest design on the forward wall of a lavatory. Ex. 1004, ¶244. The KLM Crew Rest document shows an image of a lavatory enclosure. *Id*. The enclosure has a contoured wall to allow space for a seat that is located forward of and proximate to the aircraft enclosure. *Id*.

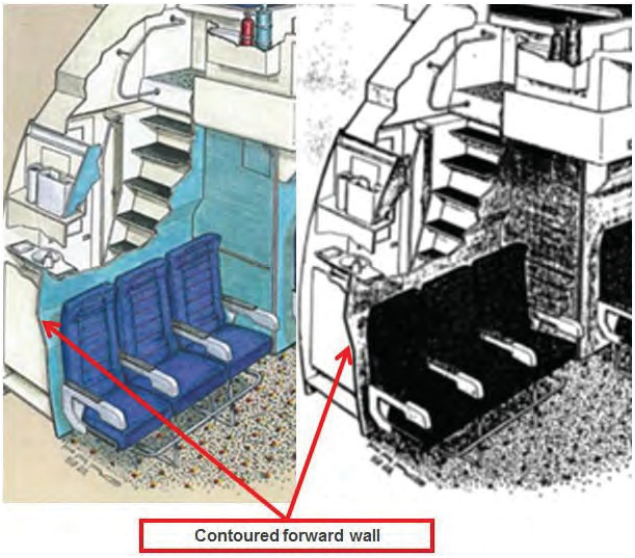


Such a design would "reduce[] a volume of unusable space in a cabin area of a passenger aircraft," under the broadest reasonable interpretation of this claim phrase. Ex. 1004, ¶245. For example, the seat in the KLM Crew Rest

document is positioned such that it can recline into space made available by the contour. Ex. 1007, ¶13. This design allows for passenger seats to be placed further aft than they could be placed with a flat wall. *Id*. This allows for additional seating in the cabin of an aircraft when installed. *Id*.

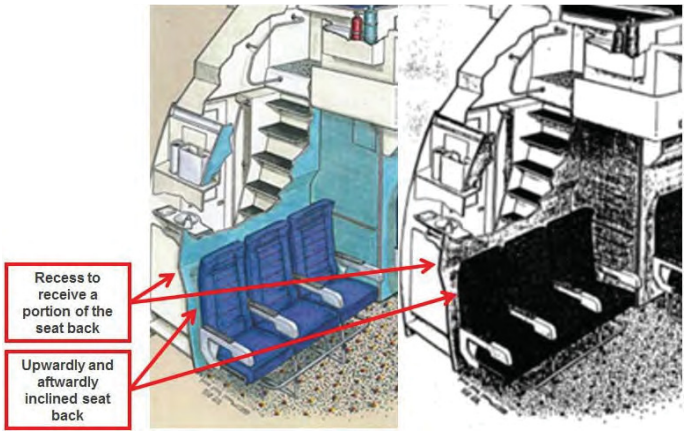
> **[*'742 Claim 8 Element A*] replacing at least a previously-installed forward partition of a pre-existing aircraft lavatory in the cabin area of the passenger aircraft with a contoured forward partition, wherein an outward facing vertical surface of the previously installed forward partition is substantially flat, and**

As is shown in the annotated figure below, the KLM Crew Rest document shows a contoured forward wall. Ex. 1004, ¶246. A person of ordinary skill in the art would realize that this contoured forward wall could be used in place of a flat forward wall to allow the seat be placed further aft in an aircraft cabin. *Id*.



['*742 Claim 8 Element B*] the contoured forward partition comprises at least one first recess configured to receive at least a portion of an upwardly and aftwardly inclined seat back of a passenger seat therein, and

As is shown in the annotated figure below, the KLM Crew Rest document shows a contoured forward wall. Ex. 1004, ¶¶247-249.This contoured forward wall includes a recess configured to receive an upwardly and aftwardly inclined seat back of a passenger seat. *Id*.



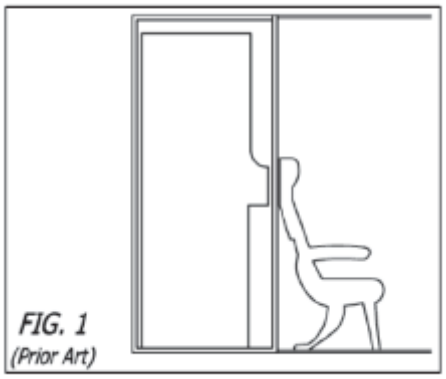
Further, the recess in the KLM Crew Rest was designed to allow the last row of seats positioned in front of the contoured wall to sit further aft in the aircraft, yet still be able to recline. Ex. 1007, ¶13. Thus, if there were no recess, this seat would need to be positioned further forward to allow for recline. Ex. 1004, ¶249. Thus, the contoured wall allows for this seat to sit further aft than it otherwise would be able to sit, and therefore receives the seat back. *Id*. Further, one of ordinary skill in the art would be motivated to restrict the recline of the seat and move the seat further aft into the recess. *Id*. A motivation for doing so would be to increase the pitch of seats between rows or allow for additional rows of seats. *Id*.

['*742 Claim 8 Element C*] at least one second recess configured to receive at least a portion of an aft-extending seat support of the passenger seat therein; and

As explained in Section V above, a person of

ordinary skill in the art would be motivated to modify a flat forward facing wall of a lavatory to include a recess to allow a passenger seat to be positioned further aft in the aircraft cabin.

A seat with an aft extending seat support is well known in the art. *See, e.g.*, Ex. 1001, Fig. 1.



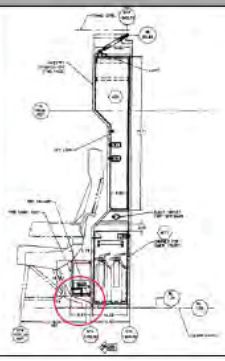
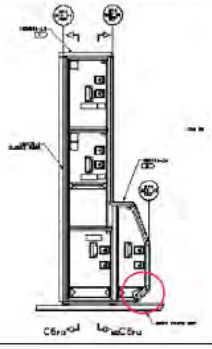
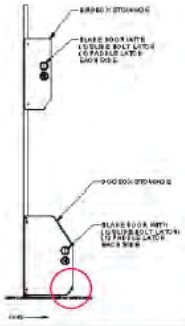
A person of ordinary skill in the art would realize that when such a seat is moved further aft, the first component to impact the wall is the seat back. Ex. 1004, ¶¶189-190, 250. As explained above, the KLM Crew Rest document shows a forward facing recess that receives the seat back when the seat is reclined. *Id*.

As the seat is moved further aft, the next component to impact the wall is the aft seat support. Ex. 1004, ¶¶191, 250. As Mr. Anderson explains, a person of ordinary skill in the art would be motivated to modify an enclosure, such as a lavatory, to include a second recess to receive aft facing seat supports. *Id*. Such a modification is

nothing more than the application of known technology for its intended purpose. *Id*. The result of such a modification is predictable, allowing the seat to be positioned further aft in an aircraft. *Id*.

Patent Owner cannot argue this difference between the above cited prior art is sufficient to render the claims patentable. The "mere existence of differences between the prior art and an invention does not establish the invention's nonobviousness. The gap between the prior art and respondent's system is simply not so great as to render the system nonobvious to one reasonably skilled in the art." *Dann v. Johnston*, 425 U.S. 219, 230 (1976); *see also* MPEP § 2141. A person of ordinary skill in the art would recognize that such a modification was well known in the art. Ex. 1004, ¶¶186-192, 250.

As evidence of this modification being well known, Mr. Anderson cites to three examples of prior art enclosures that include a lower recess to receive a seat support. Ex. 1004, ¶¶192, 250. Each of these designs was sold and included in passenger aircraft well before the earliest claimed priority date of the '742 Patent. *Id*. Patent Owner was aware of at least the SAS MD-90 Aft-Storage during prosecution of the application that led to the '742 Patent. Ex. 1008.

SAS MD-90 Aft-Storage October 2004	737 Storage February 1994	747 Storage December 2009
		

['*742 Claim 8 Element D*] installing the passenger seat in front of the contoured forward partition; wherein, upon installation, the at least one first recess receives at least a portion of the upwardly and aftwardly inclined seat back, and the second recess receives at least a portion of the aft-extending seat support,

As noted above, Figure 1 of the '742 Patent admits that a seat with an aft extending seat support is well known in the art. Ex. 1004, ¶¶118, 188, 216. Further, the KLM Crew Rest document shows both a passenger seat and a contoured forward partition. Ex. 1004, ¶¶175, 251-252. As explained above in connection with Claim 8, Element B, the passenger seat is positioned is positioned such that it could not recline without a contoured forward wall, thus this seat is at least partially within the contour and is thus received

by the recess. Ex. 1004, ¶¶247, 249.

As explained above, a person of ordinary skill in the art would be motivated to modify the forward wall of an enclosure to accommodate known prior art seat designs that include an aft-extending seat support. Ex. 1004, ¶¶117-122, 189-192, 215-219. Such a modification is nothing more than the application of known technology for its intended purpose. *Id*. The result of such a modification is predictable, allowing the seat to be positioned further aft in an aircraft. Ex. 1004, ¶¶121, 191, 218.

Further, as explained above, there were multiple prior art designs that included a lower recess to accommodate aft extending seat supports. Ex. 1004, ¶¶122, 192.

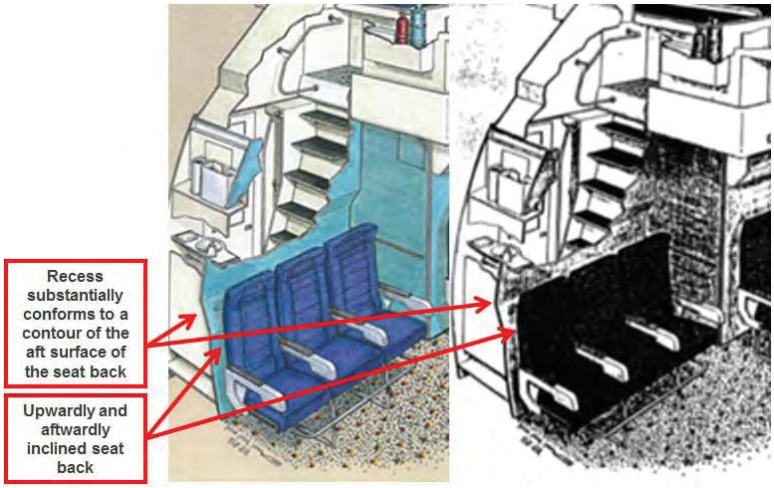
> **[*'742 Claim 8 Element E*] thereby reducing the volume of unusable space in the cabin area by reducing or eliminating gaps that existed between the previously-installed forward wall and the passenger seat.**

As explained in Section V above, a person of ordinary skill in the art would be motivated to modify a flat wall lavatory to use the KLM Crew Rest design on the forward wall of a lavatory. Such a design would "reduce[] a volume of unusable space in a cabin area of a passenger aircraft," under the broadest reasonable interpretation of this claim phrase. Ex. 1004, ¶¶253-254. For example, the seat in the KLM Crew Rest rendering is allowed to be positioned further aft yet still recline as a result of

the contour in the forward wall. Ex. 1007, ¶13. The KLM Crew Rest design therefore "reduc[es] or eliminate[es] gaps that existed between the previously-installed forward wall and the passenger seat."

['*742 Claim 10*] The method of claim 8, wherein the at least one first recess substantially conforms to a contour of an aft surface of the upwardly and aftwardly inclined seat back.

The recess shown in the KLM Crew Rest document "substantially conforms to a contour of an aft surface of the upwardly and aftwardly inclined seat back." Ex. 1004, ¶257. As Mr. Sobotta explains, the design includes a "recess that would receive the seatback of the row of seats located in front of the entry enclosure." Ex. 1007, ¶13. This is shown in the annotated figure below.



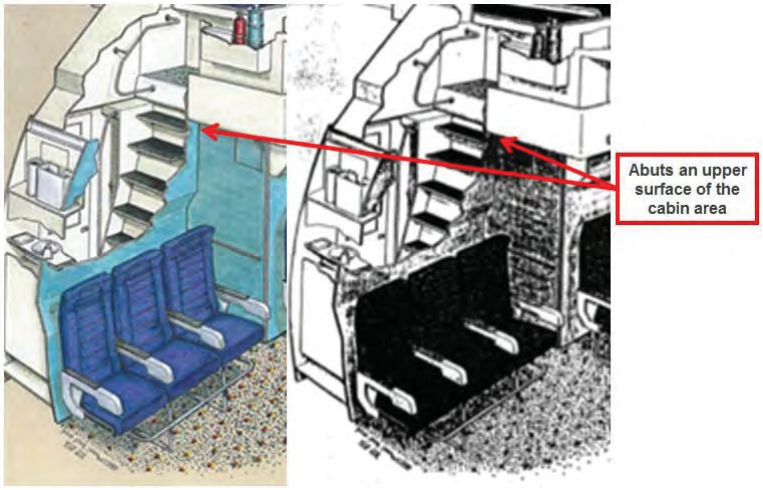
['*742 Claim 11*] The method of claim 8,

wherein the contoured forward partition further comprises an upper projection that, upon installation, protrudes forward over a top of the upwardly and aftwardly inclined seat back.

As explained above, the seat shown in the KLM Crew Rest rendering reclines into the contour in the forward wall. Ex. 1004, ¶259, 261. Thus, at least part of the forward wall is protrudes overtop of the upwardly and aftwardly reclined seat back. *Id.*

[*'742 Claim 12*] The method of claim 11, wherein the upper projection is configured to abut an upper surface of the cabin area.

As is shown in the annotated figure below, the upper part of the KLM Crew Rest, which includes a projection, is configured to abut an upper surface of the cabin area, e.g., the ceiling of the cabin. Ex. 1004, ¶262.



Further, the admitted prior art discloses a lavatory wherein the upper portion of the forward wall is configured to abut an upper surface of the cabin area.

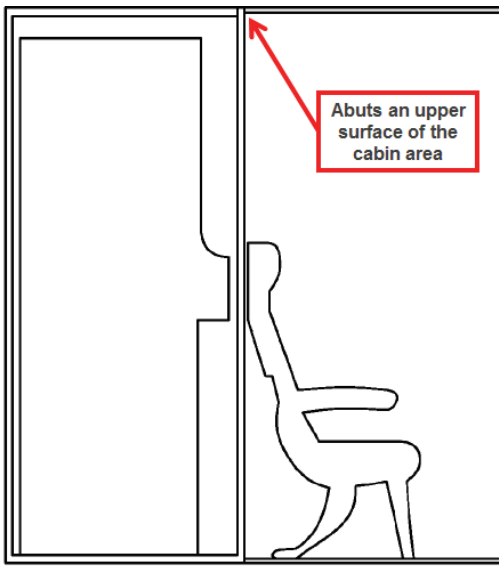
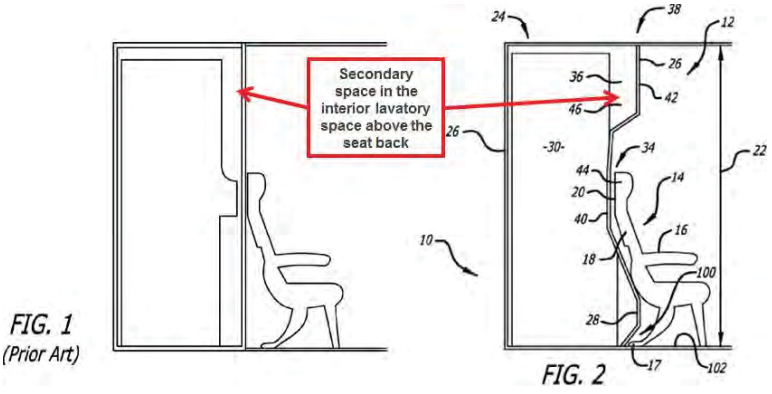


FIG. 1
(Prior Art)

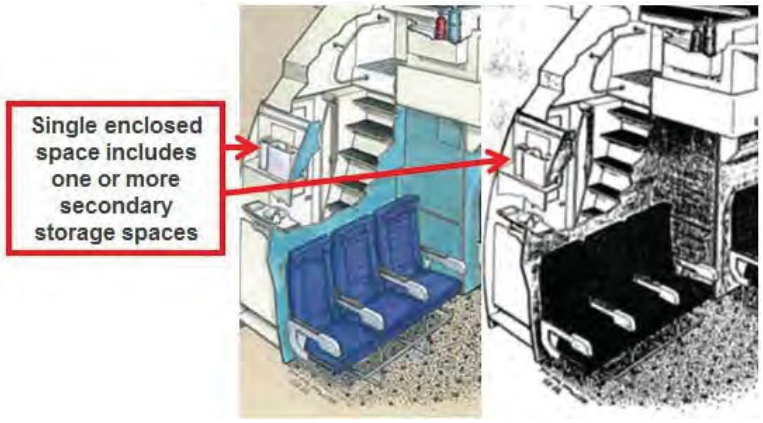
[*'742* Claim *13*] The method of claim 11, wherein the upper projection defines an interior storage space in the aircraft lavatory.

To the extent "an interior storage space in the aircraft lavatory" is described in the '742 Patent, it is admitted to be prior art in Figure 1. The admitted prior art shows "a secondary space in said interior lavatory space above the passenger seat back." The specification of the '742 Patent describes "the forward wall portion defines a secondary space 36 in the interior lavatory space." Ex. 1001, 4:43-45. Such a space is shown in both Figure 1 and Figure 2. Ex. 1004, ¶¶205-206, 263. Further, a person of ordinary skill in the art would recognize that prior art lavatories often include interior storage spaces, e.g., trash receptacles, space for additional paper towels or toilet paper, space for routing plumbing, etc. Ex. 1004, ¶207.



The KLM Crew Rest document also shows

interior storage spaces within the enclosed lavatory space defined by the upper projection as shown in the annotated figure below. Ex. 1009; Ex. 1004, ¶111.



A person of ordinary skill in the art would understand that the enclosed space of a lavatory would continue to contain secondary storage spaces, such as amenity stowage, after applying a contour to the forward wall as shown by the KLM Crew Rest document. Ex. 1004, ¶207.

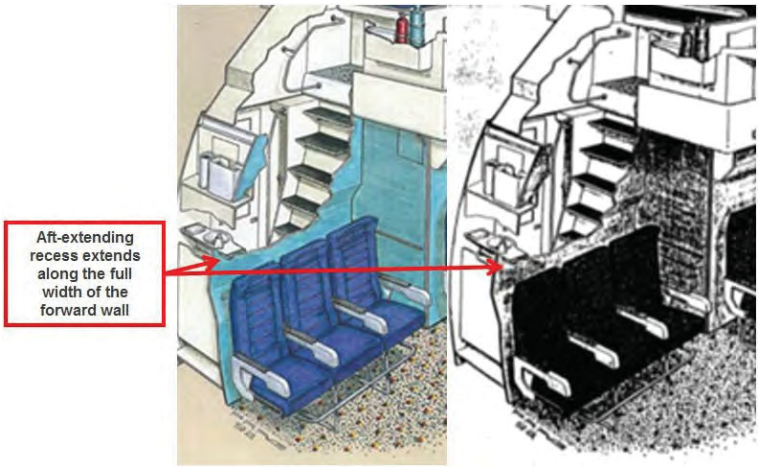
[*'742 Claim 14*] The method of claim 8, wherein the upwardly and aftwardly inclined seat back is in an upright and not a reclined position.

A person of ordinary skill in the art would recognize that the seat shown in the KLM Crew Rest document is positioned further aft than it could be positioned without the recess. Ex. 1004, ¶266, Ex. 1007, ¶13.

Further, a person of ordinary skill in the art would recognize that the seat could be moved further aft, such that the seat was in the recess when in an unreclined position. *Id*. One motivation for doing so would be to increase the amount of space in front of the passenger seat, thereby increasing the pitch of the rows of seats in the aircraft or allowing an additional row of seats to be added. *Id*.

[*'742 Claim 15*] The method of claim 8, wherein the at least one first recess extends along substantially a full width of the contoured forward partition.

The KLM Crew Rest document shows a recess that extends along substantially the full width of the of the contoured forward partition. Ex. 1004, ¶¶237, 267.



[*'742 Claim 16*] The method of claim 8, wherein replacing the previously-installed forward partition with the contoured forward partition permits the aft-extending seat support to be positioned farther aft in the cabin area than was possible when the previously-installed forward partition was installed in the cabin area.

A person of ordinary skill in the art would be motivated to modify a flat wall lavatory to use the KLM Crew Rest design on the forward wall of a lavatory. Ex. 1004, ¶270. A person of ordinary skill in the art would recognize that the seat shown in the KLM Crew Rest document is positioned further aft than it could be positioned without the recess. *Id.*; Ex. 1007, ¶13. A person of ordinary skill in the art would recognize that the seat could be moved further aft, such that the seat was in the recess when in an unreclined position. Ex. 1004, ¶270. One motivation for doing so would be to increase the amount of space in front of the passenger seat, thereby increasing the pitch of the rows of seats in the aircraft or allowing an additional row of seats to be added. *Id.*

Further, as explained above with regard to Claim 8, Element C, it was well known in the prior art to include a lower recess to receive an aft-extending seat support. Ex. 1004, ¶¶191-192, 271. As Mr. Anderson explains, a person of ordinary skill in the art would be motivated to modify an enclosure, such as a lavatory, to include a second recess to receive aft facing seat supports. *Id.* Such a modification is nothing more than the application of known

technology for its intended purpose. *Id*. The result of such a modification is predictable, allowing the seat to be positioned further aft in an aircraft. *Id*.

IX. Any Secondary Considerations Cannot Overcome the Clear Evidence of Obviousness.

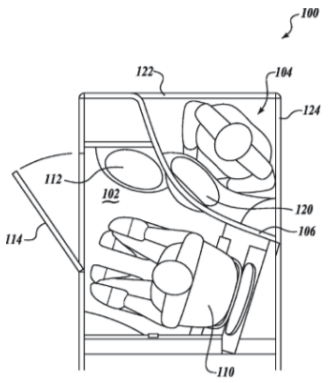
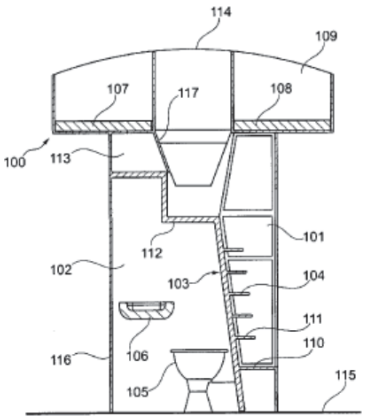
Patent Owner may attempt to overcome the clear obviousness of the challenged claims by pointing to alleged secondary considerations of non-obviousness. The Board has already considered Patent Owner's secondary considerations in the prior IPR regarding the parent '838 Patent. The Board determined that Patent Owner's secondary considerations were insufficient in the face of the strong evidence of obviousness in view of Betts. Ex. 1003, at 23-24. Patent Owner's secondary considerations fail here for the same reasons.

First, evidence of second considerations is significant only if there is a nexus between the claimed invention and the evidence. *Ormco Corp. v. Align Tech., Inc*., 463 F.3d 1299, 1311-12 (Fed. Cir. 2006) ("Evidence of commercial success, or other secondary considerations, is only significant if there is a nexus between the claimed invention and the commercial success."). All types of objective evidence of non-obviousness must be shown to have such a nexus. *Chums, Inc. v. Cablz, Inc*., IPR2014-01240, Paper No. 43 at 27 (PTAB Feb. 8, 2016) (citations omitted).

Patent Owner cannot establish a nexus here because all claim elements were known in the prior

art. When objective evidence results from something that is not "both claimed and ***novel*** in the claim, there is no nexus to the merits of the claimed invention." *In re Kao*, 639 F.3d 1057, 1068 (Fed. Cir. 2011) (emphasis in original); *ClassCo, Inc. v. Apple*, Inc. 838 F.3d 1214, 1220 (Fed. Cir. 2016) ("A nexus may not exist where, for example, the merits of the claimed invention were 'readily available in the prior art.'" (quoting *Richdel, Inc. v. Sunspool Corp.*, 714 F.2d 1573, 1580 (Fed. Cir. 1983)); *ArcelorMittal France v. AK Steel Corp.*, 700 F.3d 1317, 1325 (Fed. Cir. 2012) ("[O]ur cases make clear that the commercial success of the embodiment with additional unclaimed features is to be considered when evaluating the obviousness of the claim, provided that embodiment's success has a sufficient nexus to the ***claimed and novel features of the invention***." (emphasis added)). No claim element is novel and there is thus no nexus to any secondary consideration of non-obviousness.

Second, contrary to Patent Owner's assertion, prior art lavatory designs included contours that intruded on the interior space of the lavatory. Ex. 1004, ¶¶60-64. Two prior art examples are shown below:

US 7,284,287, Ex. 1012	U.S. 2009/0050738 A1, Ex. 1013
	

Patent Owner's argument that one of ordinary skill in the art would not have contoured a lavatory wall or intruded on interior lavatory space simply has no merit. Further, the patent itself makes clear that the disclosure is not limited to lavatories with a wall that intrudes on passenger space. Rather, the patent explains that "the present invention can provide a more spacious lavatory or other enclosure with no need to move adjacent seats or other structures forward." Ex. 1001, 1:65- 67.

Finally, even if Patent Owner were able to establish any secondary considerations and a nexus to them, secondary considerations are insufficient to overcome a strong case of obviousness, like the one here. *Wyers v. Master Lock Co.*, 616 F.3d 1231, 1246 (Fed. Cir. 2010) ("[S]econdary considerations of nonobviousness . . . simply cannot overcome a strong

prima facie case of obviousness."); *Leapfrog Enters., Inc. v. Fisher–Price, Inc.*, 485 F.3d 1157, 1162 (Fed. Cir. 2007) (holding that the objective considerations of nonobvious-ness presented, including substantial evidence of commercial success, praise, and long- felt need, were inadequate to overcome a strong showing of primary considerations that rendered the claims at issue invalid); *Rothman v. Target Cor*p., 556 F.3d 1310, 1322 (Fed. Cir. 2009) ("a strong prima facie obviousness showing may stand even in the face of considerable evidence of secondary considerations."); *Stamps.com Inc. v. Endicia, Inc.*, 437 Fed.Appx. 897, 905 (Fed. Cir. 2011) ("Given the strong showing of obviousness, we find that the evidence of secondary considerations was inadequate to overcome the legal conclusion that the contested claims would have been obvious.").

X. Conclusion

In view of the foregoing, Petitioner respectfully submits that there is a reasonable likelihood that Petitioner will prevail with respect to claims 8 and 10-16 of the '742 Patent. Accordingly, Petitioner requests that the Board grant this petition and initiate an *inter partes* review.

Respectfully submitted,

By: /s/ *John C. Alemanni*
John C. Alemanni

Registration No. 47,384

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CERTIFICATE OF WORD COUNT

The undersigned certifies pursuant to 37 C.F.R. § 42.24(d) that the foregoing **Petition for Inter Partes Review** excluding any table of contents, table of authorities, certificates of service or word count, or appendix of exhibits or claim listing, contains 10,997 words according to the word-processing program used to prepare this paper (Microsoft Word). Including annotations in figures, Petitioner certifies that this **Petition for Inter Partes Review** does not exceed the applicable type-volume limit of 37 C.F.R. § 42.24(a).

Dated: April 13, 2017 /s/ *John C. Alemanni*
Counsel for Petitioner

CERTIFICATE OF SERVICE

The undersigned hereby certifies that on the date below a copy of this **Petition for *Inter Partes* Review** has been served by Express Mail upon the following:

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APPENDIX F

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

C&D ZODIAC, INC.,
Petitioner

v.

B/E AEROSPACE, INC.,
Patent Owner.

Patent No. 9,073,641
Filing Date: October 1, 2013
Issue Date: July 7, 2015
Title: AIRCRAFT INTERIOR LAVATORY

Inter Partes Review No. _____

PETITION FOR *INTER PARTES* REVIEW

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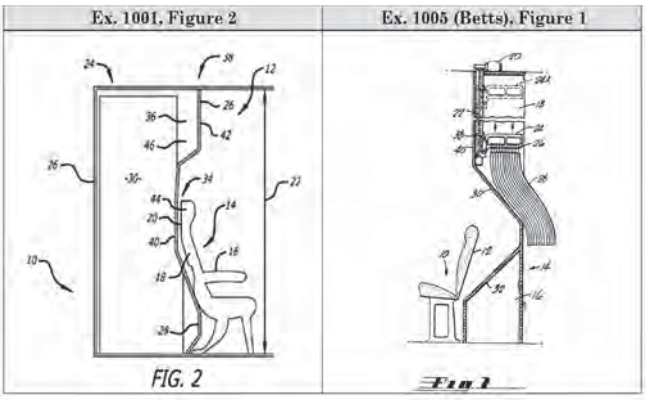

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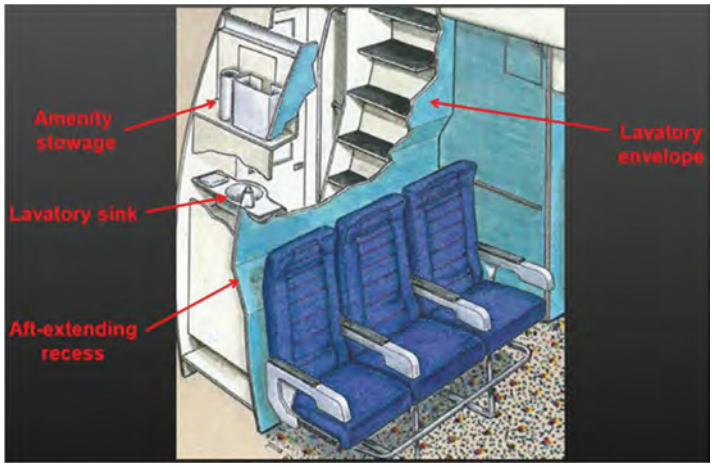

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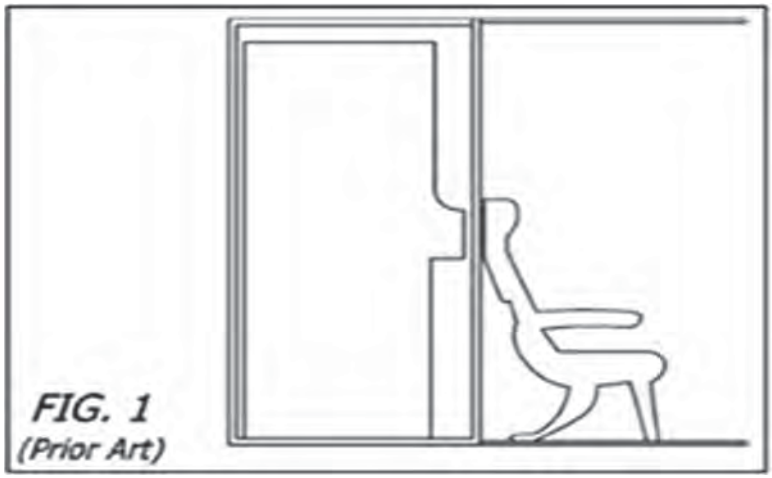

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A. Motivation to Combine APA and Betts 249a

One of ordinary skill in the art would understand that the forward wall of the enclosure shown in Betts would also be suitable for use with other aircraft enclosures, including lavatories. Ex. 1004, ¶59. In an aircraft, as a row of seats is moved

further aft, the first thing that would make contact with a flat wall is the top of the back of the seat. Ex. 1004, ¶59. And so Betts includes a recess that receives that portion of the seat back. Applying the contoured wall of Betts to a lavatory allows the row of seats placed immediately in front of that contoured wall to be placed further aft. Ex. 1004, ¶59. ..... 252a

The challenged patent does not distinguish between different types of enclosures, instead explaining that the recessed forward wall is applicable to all types of aircraft cabin enclosures, e.g., "[t]he present invention relates generally to aircraft enclosures, and more particularly relates to an aircraft cabin enclosure, such as a lavatory, an aircraft closet, or an aircraft galley." Ex. 1001, 1:20-23. As Mr. Anderson explains, multiple different types of prior art enclosures include one or more recesses to enable seats to be positioned further aft in a cabin. Ex. 1004, ¶59. Combining different types of enclosures, designs and shapes of recesses, and seat geometries would have been obvious to one of skill in the art and provides the predictable result of allowing a seat to be positioned further aft. 253a

Patent Owner has argued in the Underlying

Litigation that a person of ordinary skill would not have applied a recess to a lavatory at least because the industry had been reluctant to decrease the width out of concern that airlines and passengers would not accept narrower lavatory spaces. But even if Patent Owner were correct, whether a narrower lavatory would be acceptable to airlines and passengers has no bearing on the obviousness of applying a contoured wall to a lavatory. Orthopedic Equip. Co. v. U.S., 702 F.2d 1005, 1013 (Fed. Cir. 1983) ("[T]he fact that the two disclosed apparatus would not be combined by businessmen for economic reasons is not the same as saying that it could not be done because skilled persons in the art felt that there was some technological incompatibility that prevented their combination. Only the latter fact is telling on the issue of nonobviousness"). Customer acceptance of a narrow lavatory is a market force, not a technical challenge. See Friskit, Inc. v. Real Networks, Inc., 306 Fed. App'x 610, 617-18 (Fed. Cir. 2009). 253a

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Patent Owner's argument that one of ordinary skill in the art would not have contoured a lavatory wall or intruded on interior lavatory space simply has no merit. Further, the patent itself makes clear that the disclosure is not limited to lavatories with a wall that intrudes on passenger space. Rather, the patent explains that "the present invention can provide a more spacious lavatory or other enclosure with no need to move adjacent seats or other structures forward." Ex. 1001, 1:59- 61. ..... 312a

Finally, even if Patent Owner were able to establish any secondary considerations and a nexus to them, secondary considerations are insufficient to overcome a strong case of obviousness, like the one here. Wyers v. Master Lock Co., 616 F.3d 1231, 1246 (Fed. Cir. 2010) ("[S]econdary considerations of nonobviousness . . . simply cannot overcome a strong prima facie case of obviousness."); Leapfrog Enters., Inc. v. Fisher–Price, Inc.,

485 F.3d 1157, 1162 (Fed. Cir. 2007) (holding that the objective considerations of nonobvious-ness presented, including substantial evidence of commercial success, praise, and long- felt need, were inadequate to overcome a strong showing of primary considerations that rendered the claims at issue invalid); Rothman v. Target Corp., 556 F.3d 1310, 1322 (Fed. Cir. 2009) ("a strong prima facie obviousness showing may stand even in the face of considerable evidence of secondary considerations."); Stamps.com Inc. v. Endicia, Inc., 437 Fed.Appx. 897, 905 (Fed. Cir. 2011) ("Given the strong showing of obviousness, we find that the evidence of secondary considerations was inadequate to overcome the legal conclusion that the contested claims would have been obvious."). 312a

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LIST OF EXHIBITS

PETITIONER EXHIBIT	DESCRIPTION
1001	U.S. Patent No. 9,073,641 ("the '641 Patent").
1002	Prosecution History of U.S. Patent No. 9,073,641.
1003	Final Written Decision in IPR2014-00727.
1004	Declaration of Alan Anderson.
1005	U.S. Patent No. 3,738,497 to Betts ("Betts").
1006	Rendering of the KLM Crew Rest.
1007	Declaration of Paul Sobotta .
1008	Letters from Petitioner to Patent Owner Regarding Prior Art, dated April 7, 2014; April 25, 2014; May 15, 2015; and June 9, 2014.
1009	File History from Application No. 09/947,275, which issued as U.S. Patent No. 6,520,451 to Moore.
1010	U.S. Patent No. 6,520,451 to Moore ("Moore").
1011	U.S. Patent No. 4,884,767 to Shibata ("Shibata").
1012	US Patent No. 7,284,287 to Cooper ("Cooper").
1013	U.S. 2009/0050738 A1 to Breuer ("Breuer").

PETITIONER EXHIBIT	DESCRIPTION
1014	Unopposed Motion to Withdraw Motion for Preliminary Injunction in *B/E Aerospace, Inc. v. Zodiac Aerospace, et al.*, No. 2:14-cv-210, Dkt. 47 (E.D. Tex. Jun. 6, 2014).
1015	Voluntary Dismissal in *B/E Aerospace, Inc. v. Zodiac Aerospace, et al.*, No. 2:14-cv-210, Dkt. 50 (E.D. Tex. Jun. 19, 2014).
1016	Patent Owner's Opening Brief in Federal Circuit Appeal Nos. 16-1496, 16-1497.
1017	U.S. Patent No. 8,590,838 ("the '838 Patent").
1018	Declaration of Scott Savian, dated March 20, 2017, including Exhibits A-E thereto.
1019	Declaration of Vince Huard, dated March 10, 2017, including Exhibits A-I thereto.
1020	McDonnell Douglas DC-10 Customer Configuration Summary (a/k/a Orange Book), revised October 1978 (the "Orange Book").
1021	U.S. Patent No. 6,742,840 to Bentley ("Bentley")

I. Summary

Through counsel, C&D Zodiac, Inc. ("Petitioner") hereby petitions for initiation of inter partes review of claims 1, 3-10, and 12-17 of U.S. Patent No. 9,073,641 ("the '641 Patent"), assigned to B/E Aerospace, Inc. ("Patent Owner"). A copy of the '641 Patent is attached as Exhibit 1001 and a copy of the prosecution history of the '641 Patent is attached as Exhibit 1002.

The '641 Patent includes just four columns of description, less than one column of which is the three-paragraph "Detailed Description." The patent describes an enclosure for use in an aircraft (e.g., a closet or a lavatory). The first figure admits that an enclosure with a flat forward wall was well known in the art. The only aspect of the purported invention that is not admitted to be prior art is the recessed forward wall of the embodiment shown in Figure 2. And as explained in further detail below, aircraft enclosures with recessed forward walls have been known and used in the art for decades.

During an IPR of the parent of the '641 Patent, the Board already considered the dispositive issue here: whether it was obvious to apply a curved forward wall to a lavatory. The Board found that it was obvious. Yet, the Examiner inexplicably ignored the Board's decision without mentioning it and allowed Patent Owner's follow-on claims directed to the same subject matter already determined to be obvious—lavatories with a recessed forward wall. In view of the prior art, Petitioner respectfully requests that the Board again find that the same subject

matter already determined to be obvious with respect to the parent patent is also obvious with respect to the children. Accordingly, Petitioner requests that the Board cancel the challenged claims of the '641 Patent.

A. Real Party-in-Interest

The real party-in-interest, C&D Zodiac, Inc., is a Delaware corporation with its principal business address at 5701 Bolsa Avenue, Huntington Beach, California 92647. No other entity is controlling, directing, or funding the submission of this petition and any proceeding initiated as a result therefrom.

B. Related Matters

The '641 Patent is asserted against Petitioner in B/E Aerospace, Inc. v. Zodiac Aerospace, Inc. et al., No. 2:14-cv-01417 (E.D. Tex., Dec. 15, 2016) (the "Underlying Litigation"). Patent Owner also asserts the following four related patents in that case: U.S. Patent Nos. 9,365,292; 9,434,476; 9,440,742; and D764,031. Patent Owner has sought a preliminary injunction against Petitioner in the Underlying Litigation. On or around the time this Petition is filed, Petitioner also will file Petitions for Inter Partes Review challenging the three related utility patents. On April 10, 2017 Petitioner filed a Post Grant Review challenging the claim of D764,031, which has been assigned PGR2017-00019.

All five of the asserted patents in the Underlying Litigation claim priority to U.S. Patent No. 8,590,838 ("the '838 Patent"). Patent Owner

previously asserted the '838 Patent against Petitioner in B/E Aerospace, Inc. v. Zodiac Aerospace, Inc. et al., No. 2:14-cv-210 (E.D. Tex. Mar. 11, 2014) (the "Prior Litigation"). Patent Owner also sought a preliminary injunction against Petitioner in that case. During the Prior Litigation, Petitioner sent Patent Owner a series of letters containing invalidating prior art. See Ex. 1008. Patent Owner subsequently withdrew its motion for preliminary injunction and voluntarily dismissed the Prior Litigation on June 19, 2014. Exs. 1014; 1015.

Petitioner also filed a Petition for Inter Partes Review of the '838 Patent. That earlier IPR was assigned Case No. IPR2014-00727, and received a Final Written Decision on October 26, 2015. The Board held claims 1, 3-7, 9, 10, 12-14, 16-19, 21, 22, 24-29, 31, and 33-37 unpatentable. That Final Written Decision is attached hereto as Exhibit 1003. That Decision is currently on appeal to the Federal Circuit where it is assigned Case Nos. 16-1496, 16-1497.

There are several entities related to Petitioner also being sued for infringement of the patents identified above. Petitioner is an indirectly-owned subsidiary of Zodiac Aerospace, a Societe Anonyme organized and existing under the laws of France. Petitioner is a wholly owned subsidiary of Zodiac US Corporation, a corporation organized and existing under the laws of Delaware. Zodiac Aerospace and Zodiac US Corporation have been sued for infringement of the patents identified above in the Underlying Litigation. Also sued for

infringement of the patents identified above in the Underlying Litigation are:

- Zodiac Seats US LLC, a limited liability company organized and existing under the laws of Texas.
- Heath Tecna, Inc., a corporation organized and existing under the laws of Delaware.
- Northwest Aerospace Technologies, Inc., a corporation organized and existing under the laws of Washington.

C. Fees

This petition is accompanied by a fee payment of $23,000, which includes the $9,000 inter partes review request fee, and the $14,000 inter partes review post-institution fee. Petitioner further authorizes a debit from Deposit Account 20- 1430 for whatever additional payment is necessary in granting this petition.

D. Designation of Lead Counsel and Backup Counsel

Lead Counsel for Petitioner is John C. Alemanni (Reg. No. 47,384), of Kilpatrick Townsend & Stockton LLP. Back-up counsel for Petitioner are Dean W. Russell (Reg. No. 33,452), David A. Reed (Reg. No. 61,226), Michael T. Morlock (Reg. No. 62,245), and Andrew Rinehart (Reg. No. 75,537).

E. Service Information

As identified in the attached Certificate of Service, a copy of the present petition, in its entirety, is being served to the address of the attorneys or agents of record for the '641 Patent and to the attorneys of record in the Underlying Litigation. Petitioner may be served at its counsel, Kilpatrick Townsend & Stockton LLP. Petitioner consents to service via email to its lead and backup counsel at the following email address:ZodiacBEIPR@kilpatricktownsend.com.

F. Power of Attorney

A power of attorney with designation of counsel is filed herewith in accordance with 37 C.F.R. § 42.10(b).

G. Standing

The '641 Patent was filed on October 1, 2013, and claims priority to a utility application filed on April 18, 2011 and therefore is eligible for inter partes review immediately following the date of the grant of the patent. 37 C.F.R. § 42.102(a)(2). Further, the '641 Patent is currently asserted in a co-pending litigation, and this petition is being filed within one year of Petitioner being served with a complaint for infringement. Petitioner certifies that the '641 Patent is available for inter partes review and that Petitioner is not barred or estopped from requesting an inter partes review challenging the patent claims on the grounds identified in this petition.

II. Background

A. Priority Date and Family

The '641 Patent issued on July 7, 2015 from Application No. 14/043,500, filed on Oct. 1, 2013. The '641 Patent claims priority to U.S. Patent No. 8,590,838, filed on April 18, 2011, and to Provisional Application No. 61/326,198, filed April 20, 2010, and Provisional Application No. 346,835, filed May 20, 2010. Thus, the earliest possible effective filing date is April 20, 2010.

Several other related patents also claim priority to the '838 Patent, including U.S. Patent Nos. 9,440,742; 9,365,292; 9,434,476; and D764,031. The related utility patents share a common disclosure with the '641 Patent.

B. The Written Specification and Figures

The '641 Patent relates to an aircraft enclosure, "such as a lavatory, an aircraft closet, or an aircraft galley," having a forward wall (i.e., the wall toward the nose of the aircraft) with a recess that substantially conforms to the aft (i.e., back) surface of a passenger seat located immediately forward of the enclosure. Ex. 1001, 2:14-223.

The challenged claims relate to an enclosure with a contoured forward wall to allow a row of seats to be placed slightly further aft in an aircraft. As explained in further detail below, Figure 1 of the '641 Patent admits that every claim element, other than a contoured forward wall, was known in the prior art. The only other figure—Figure 2—shows an embodiment with a contoured forward wall with the same prior art seat as shown in Figure 1 positioned slightly further aft.

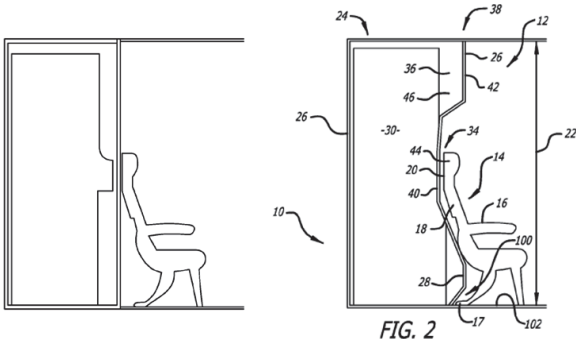
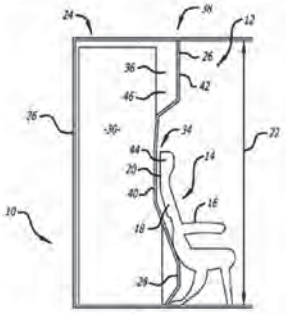
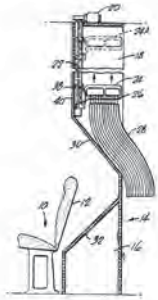


FIG. 1
(Prior Art)

FIG. 2

Such a contoured forward wall was well known in the art long before the earliest claimed priority date, April 20, 2010. This is clear from Figure 1 of Ex. 1005 (Betts), which shows an airplane enclosure with a contoured forward wall from the early 1970s. The forward wall of Betts is almost identical to the forward wall shown in Figure 2 of the '641 Patent. And an embodiment of the Betts enclosure flew on commercial DC-10 aircraft for decades before the earliest claimed priority date. Ex. 1004, ¶¶43, 46; Ex. 1020, at 143-163 (showing

commercial embodiments of Betts). This is a fact that Patent Owner itself has admitted to the Federal Circuit. Ex. 1016, 26 ("Betts was patented in 1973. It was actually built and flown on DC-10 aircraft, for decades.").

Ex. 1001, Figure 2	Ex. 1005 (Betts), Figure 1
 FIG. 2	 Fig. 1

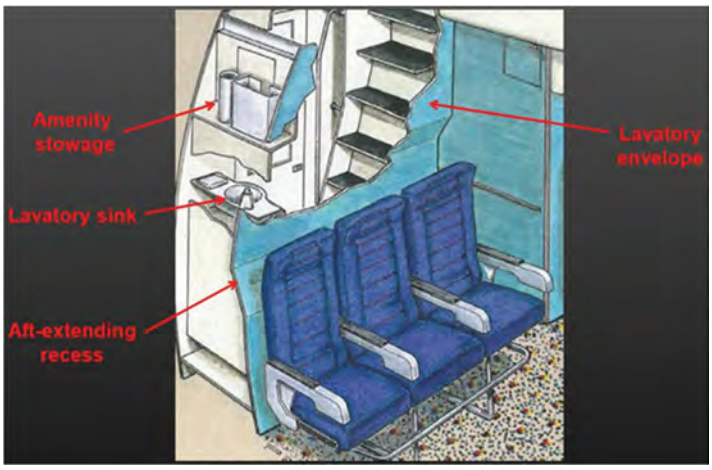
C. The Earlier IPR and Underlying Litigations

In an earlier proceeding addressing the claims of this patent's parent—the '838 Patent (Ex. 1017)—the Board invalidated most of those claims as obvious in view of Betts (Ex. 1005). In so doing, the Board specifically found that:

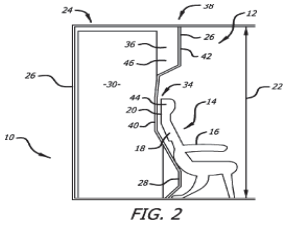
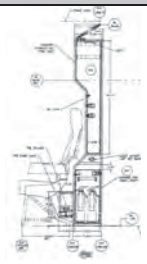
> ***Petitioner has shown that it would have been obvious to apply the recessed forward wall design of Betts to other enclosures, including single-spaced lavatories.***

Ex. 1003 at 12 (emphasis added).

In addition to Betts, there are many other examples of contoured wall enclosures in the prior art. Indeed, one of Patent Owner's own engineers designed a prior art enclosure that was installed in Boeing 747 aircraft in the 1990s. Ex. 1006, 1007. An annotated image of this enclosure is shown below.



Further, before the application that led to the '641 Patent was filed, Patent Owner was aware that Petitioner commercialized enclosures with recessed forward walls long before the earliest claimed priority date. See Ex. 1008.

Ex. 1001, Figure 2	Petitioner's S4 Enclosure	Petitioner's S4 Enclosure
 FIG. 2		

Indeed, when Petitioner identified this prior art to Patent Owner (Ex. 1008) Patent Owner withdrew its previous Motion for Preliminary Injunction and voluntarily dismissed its previous complaint asserting the '838 Patent against Petitioner. See Exs. 1014 and 1015.

In spite of all this, Patent Owner continued filing applications and convinced an examiner to allow the '641 Patent along with other continuations of the '838 Patent. Several of these are now asserted against Petitioner. Each utility patent shares a common specification, and claims a contoured forward wall along with a collection of other features. Each of these other features are either admitted to be prior art in Figure 1 or are not described in the patents' written description, which comprises just four columns, less than one column of which is the three-paragraph "Detailed Description." Ex. 1001.

The prior art discloses or renders obvious every limitation in the challenged claims. Petitioner respectfully requests that this inter partes review proceeding be instituted.

III. Statement of Relief Requested

Pursuant to 35 U.S.C. § 311 and 37 C.F.R. § 42.104(b), this petition requests cancellation of claims 8 and 10-16 as rendered obvious under 35 U.S.C. § 103 by the following combinations:

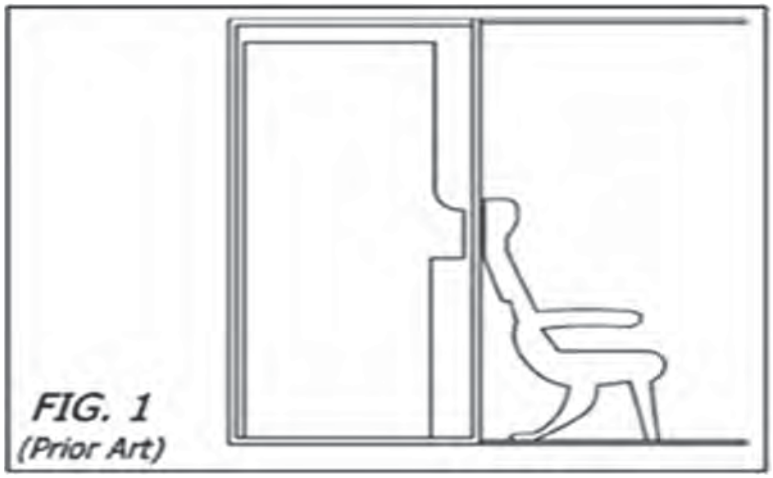
- Admitted Prior Art ("APA") in Exhibit 1001 and U.S. Patent No. 3,738,497 to Betts et al. ("Betts") (Exhibit 1005), in view of the knowledge of a person of ordinary skill in the art.

- APA in Exhibit 1001 and the KLM Crew Rest documents (Exhibit 1009), in view of the knowledge of a person of ordinary skill in the art.

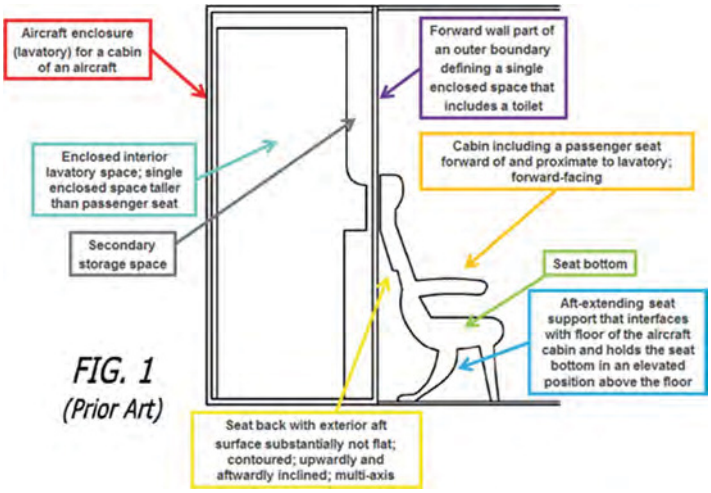
IV. Summary of the Prior Art

A. Admitted Prior Art (Exhibit 1001)

A flat wall lavatory and a passenger seat were both well known in the art before the earliest claimed priority date of the '641 Patent. Figure 1 of the '641 Patent shows a flat wall lavatory and passenger seat and states that these were "prior art." Ex. 1001, 3:65-67 (emphasis added) ("FIG. 1 is a schematic diagram of a prior art installation of a lavatory immediately aft of and adjacent to an aircraft passenger seat.").



Further, the '641 Patent includes additional admissions that such lavatories were known prior art. "Aircraft lavatories, closets and other full height enclosures commonly have forward walls that are flat in a vertical plane." Ex. 1001, 1:21-22. Many of the features found in the claims are anticipated or obvious in view of this admitted prior art. A summary of the admitted prior art shown in Figure 1 is in the graphic below. Ex. 1004, ¶86.



The Board may rely on this admitted prior art. "Admissions in the specification regarding the prior art are binding on the patentee for purposes of a later inquiry into obviousness." *PharmaStem Therapeutics, Inc. v. ViaCell, Inc.*, 491 F.3d 1342, 1362 (Fed. Cir. 2007); *see also In re Nomiya*, 509 F.2d 566, 570-71 (CCPA 1975) ("We see no reason why appellants' representations in their application should not be accepted at face value as admissions that Figs. 1 and 2 may be considered 'prior art' for any purpose, including use as evidence of obviousness under § 103."); *Constant v. Advanced Micro–Devices, Inc.*, 848 F.2d 1560, 1570 (Fed. Cir. 1988) ("A statement in a patent that something is in the prior art is binding on the applicant and patentee for determinations of anticipation and obviousness."); *I/P Engine, Inc. v. AOL, Inc.* 576 Fed.Appx. 982, 987 (Fed. Cir. 2014) ("Given that its own patents acknowledge that using the original search query for filtering was a 'conventional' technique, I/P Engine cannot now evade invalidity

by arguing that integrating the query into the filtering process was a non- obvious departure from the prior art.").

The only aspect of the purported invention in the '641 Patent that is not admitted prior art is the contoured forward wall depicted in Figure 2.

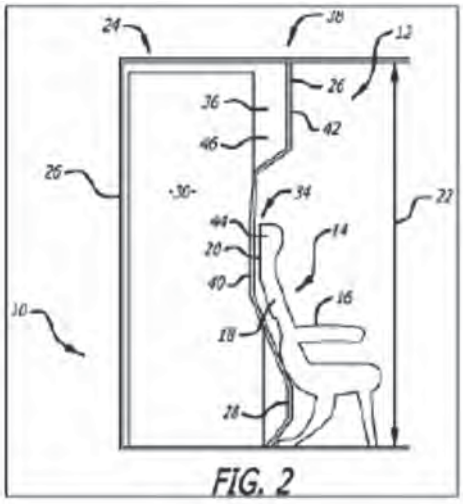


FIG. 2

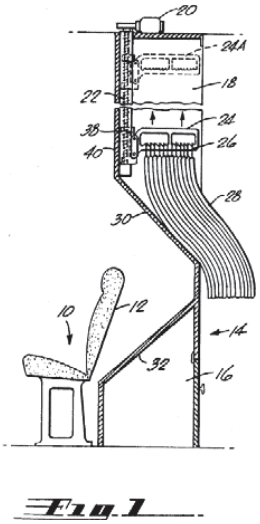
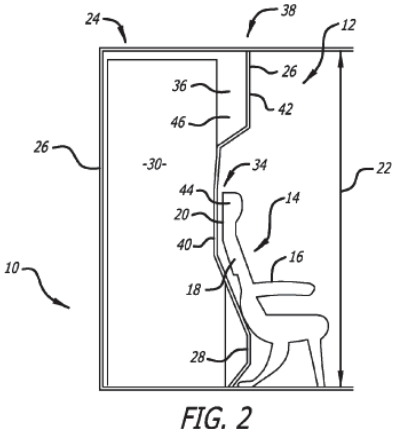
But enclosures with contoured forward walls were well-known in the art as described below.

B. Betts (Exhibit 1005)

Exhibit 1005, U.S. Patent No. 3,738,497 to Betts *et al.* ("Betts"), is assigned to McDonnell Douglas Corporation and issued on June 12, 1973, and is thus prior art under 35 U.S.C. § 102(b). Betts describes a coat closet with a recessed forward wall that "provide[s] more room for passengers in an aircraft or other vehicle." Ex. 1005, 1:5-7. The design shown in Betts was implemented and flown on commercial

DC-10 aircraft well before the earliest claimed priority date. Ex. 1004, ¶¶43, 46.

Figure 1 of Betts is a side elevation that shows an assembly of an overhead coat closet for a cabin of an aircraft that is located immediately aft of and adjacent to a passenger seat. The forward wall of Betts is very similar to that shown in Figure 2 of the '641 Patent.

Betts Figure 1	Ex. 1001, Figure 2
	

The Betts passenger seat has an exterior aft surface that is substantially not flat in a vertical plane. *See* Ex. 1005, Fig. 1; 2:7-14. Betts explains that this contour is positioned "to provide a space for seatback 12 to be tilted rearwardly." Ex. 1005, 2:19-24. One of ordinary skill in the art would understand that the coat closet includes walls forming a

complete enclosure of the closet. Ex. 1004, ¶45.

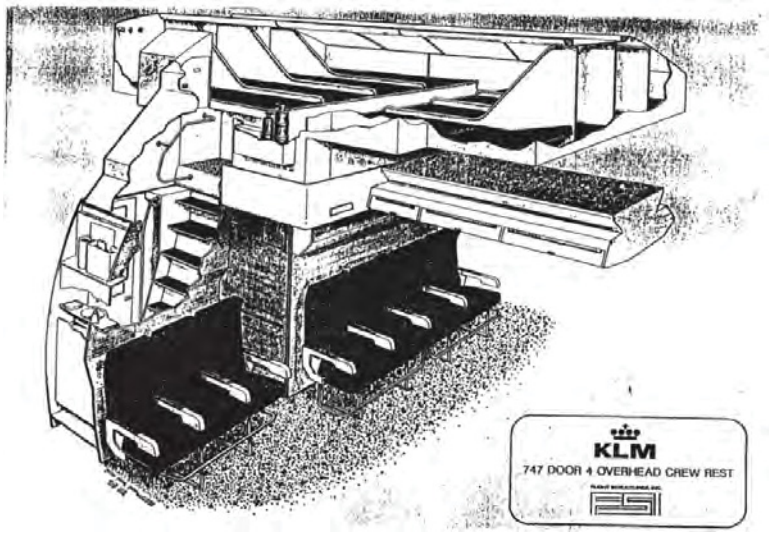
Betts states that the passenger seat is "of the type having a tiltable backrest 12 for the comfort of the occupant." Ex. 1005, 2:8-9. Thus, as described and shown in Betts Figure 1, the passenger seat is contoured and reclineable and therefore not flat in a vertical plane. The seat back shown in Betts closely conforms to the shape of the recess in the forward wall of the enclosure. Ex. 1004, ¶45.

C. The KLM Crew Rest Document (Exhibit 1009)

In 1991, Flight Structures, Inc. ("FSI")—a company B/E now owns—was awarded a contract to develop a crew rest for Royal Dutch Airlines, better known as KLM. Ex. 1007, ¶7. Specifically, FSI was awarded a contract to develop an overhead crew rest for KLM's 747-400 aircraft. FSI developed the KLM Crew Rest during 1991 and 1992. Ex. 1007, ¶7. The KLM Crew Rest was designed to include berths in the overhead space of KLM's 747-400 aircraft for crew members to rest during lengthy flights. Ex. 1007, ¶9.

To provide access to the overhead crew rest, FSI designed an entry on the right side of the aircraft. The entry was modeled on a lavatory envelope (i.e., the outer walls forming a lavatory enclosure) and was located at a typical location for a lavatory on a 747-400 aircraft. Ex. 1007, ¶10. The interior of the lavatory envelope was modified to include a staircase in place of a toilet, which allows the crew to access the overhead space. Ex. 1007, ¶10. A

rendering of the prior art KLM Crew Rest is shown below.



The image of the KLM Crew Rest above was included in the file history of an issued patent. *See* Ex. 1009, at 70.

The Board may rely on the KLM Crew Rest document in that file history as prior art. Patent Owner submitted information regarding the KLM Crew Rest in an Information Disclosure Statement during pendency of the application that issued as U.S. Patent No. 6,520,451. *See* Ex. 1009, at 66-91. This Information Disclosure Statement was submitted on March 18, 1999, more than ten years before the earliest claimed priority date. *Id*. at 64.

And U.S. Patent No. 6,520,451 issued on February 18, 2003, several years before the earliest claimed priority date. Ex. 1010.

Thus, these documents were made available to the public no later than the issue date of U.S. Patent No. 6,520,451, February 18, 2003, when its file history was made available to the public. Ex. 1010; *See* 37 C.F.R. § 1.11(a) ("The specification, drawings, and all papers relating to the file of: A published application; a patent; or a statutory invention registration are open to inspection by the public, and copies may be obtained . . ."). These KLM-related documents are therefore printed publications that may be used in this proceeding.

The Board has held previously that a file history is available as prior art. *Duodecad It Servs. Luxembourg S.A.R.L.*, IPR2015-01036, 2016 WL 6946904 (Oct. 20, 2016) ("It is undisputed that Chen FH was fully available to anyone who ordered it. We find that one of ordinary skill, being aware of Chen, would consult its file history. We conclude, based on the record as fully developed, that Chen FH is available as prior art against the challenged claims."). This is fully consistent with the MPEP, which explains "[i]n the examination of an application, it is sometimes necessary to inspect the application papers of some previously abandoned application (provisional or nonprovisional) or granted patent." MPEP § 901.01(a). The MPEP goes on to provide Examiners with instructions for locating file wrappers for patented and abandoned applications. *Id.*

The Board's decision in *Duodecad* is consistent with Federal Circuit precedent, which holds that to qualify as a printed publication, a reference "must have been sufficiently accessible to the public interested in the art." *In re Cronyn*, 890 F.2d 1158, 1160 (Fed. Cir. 1989). A reference is sufficiently accessible if it has been indexed or cataloged. *Blue Calypso, LLC v. Groupon, Inc.*, 815 F.3d 1331, 1348 (Fed. Cir. 2016) ("we generally inquire whether the reference was sufficiently indexed or cataloged."). The Federal Circuit has found that an issued patent is "classified and indexed," and that this is sufficient to "provid[e] the roadmap that would have allowed one skilled in the art to locate the [] application." *Bruckelmyer v. Ground Heaters, Inc.*, 445 F.3d 1374, 1378–79 (Fed. Cir. 2006); *see also Ultimax Cement Mfg. Corp. v. CTS Cement Mfg. Corp.*, 587 F.3d 1339, 1355-56 (Fed. Cir. 2009) ("Information disclosed in a patent, even a foreign one, is 'generally known to the public,' especially the relevant public . . . Indeed, one of the primary purposes of patent systems is to disclose inventions to the public."); *Guardian Media Technologies, Ltd. v. Amazon.com, Inc.*, 2014 WL 12561616 *5 (C.D. Cal. Dec. 9, 2014) (finding a patent application file history as prior art as of the date the patent issued). Here, the KLM Crew Rest document was included in the publicly available file wrapper of an issued patent and thus is prior art.

Further, "[a]ccessibility goes to the issue of whether interested members of the relevant public could obtain the information if they wanted to." *Constant v. Advanced Micro–Devices, Inc.*, 848 F.2d

1560, 1568 (Fed. Cir. 1988). The Federal Circuit has further explained that "a published article with an express citation to the potentially invalidating reference would [] provide the necessary guidance." *Blue Calypso*, 815 F.3d at 1350. This is also the case here, as the face of U.S. Patent No. 6,520,451 identifies the KLM Crew Rest submission in a related technical area. Ex. 1010, 1:11-17 (emphasis added) ("This invention relates generally to resting and sleeping quarters for an aircraft crew . . . in ***a space-saving*** and weight-saving configuration ***occupying substantially otherwise unused space aboard an aircraft***.").

OTHER PUBLICATIONS

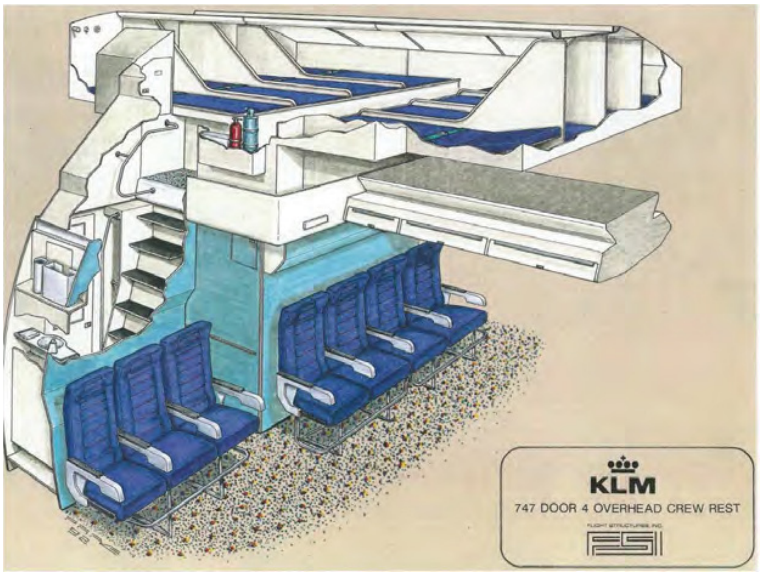
Boeing 747 Crew Rest Compartment and Proposals for Same; Correspondence From Flight Structures, Inc. to Air France Dated Aug. 3, 1994 (10 Pages), Nov. 15, 1994 (4 Pages) and Jul. 23, 1996 (11 Pages).

Ex. 1010.

Thus, this issued patent provides a "roadmap" for how to locate that reference, e.g., by accessing the publicly available file wrapper. And the Board may therefore rely on the printed publication describing the KLM Crew Rest.

While Petitioner relies on the black and white version of the KLM Crew Rest document shown in Exhibit 1009, a color version is shown below and attached as Exhibit 1006.[1]

[1] *See* Ex. 1007, ¶17.



V. Motivation to Combine

A. Motivation to Combine APA and Betts

As discussed in Section IV.A above, the '742 Patent admits that a flat wall lavatory was well known in the prior art before its earliest claimed priority date. This is further evidenced by Exhibit 1011, U.S. Patent No. 4,884,767 to Shibata ("Shibata"), which issued in 1989 and includes figures showing flat wall lavatories, which it admits were prior art as of its filing date, 1988.

FIG.3
PRIOR ART

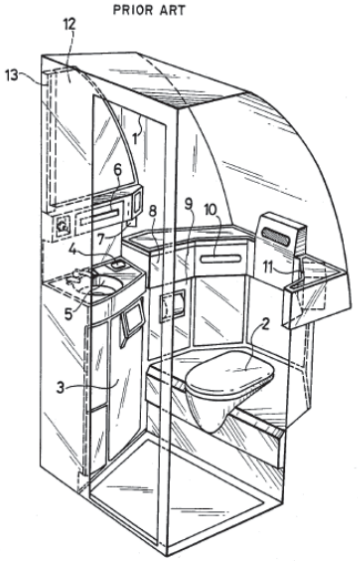
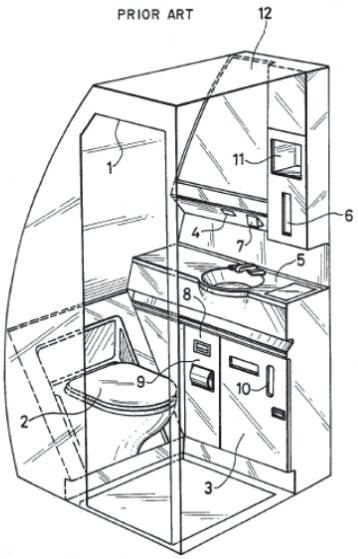


FIG.4
PRIOR ART



It would have been obvious to one of ordinary skill in the art to modify a prior art flat wall lavatory to include a contoured forward wall like the wall shown in Betts. Ex. 1004, ¶¶56-64.

First, the Board has previously considered this very combination, and found that it would be obvious to make such a modification. Indeed, the Board stated:

> ***Petitioner has shown that it would have been obvious to apply the*** **recessed forward wall design of Betts to other enclosures, including single-spaced lavatories.**

Ex. 1003 at 12 (emphasis added).

Second, as Mr. Anderson explains, a primary goal of the design of interiors of commercial aircraft is efficient use of valuable passenger cabin space. Ex. 1004, ¶57. Efficient use of space allows an aircraft to accommodate more passengers and/or to accommodate passengers more comfortably, thereby increasing the utility of the aircraft. Ex. 1004, ¶57. As of April 2010, a primary motivation of one of ordinary skill in the art of aircraft interior design would have been to make efficient use of space in the aircraft interior cabin. Ex. 1004, ¶57.

The contoured forward facing wall shown in Betts advantageously provides additional space to locate a seat further aft in an aircraft. Ex. 1004, ¶58. Betts says that the coat hanger rack is elevated "to provide more passenger room." Ex. 1005, Abstract. Betts also describes that it "provide[s] more room for passengers in an aircraft or other vehicle." Ex. 1005, 1:5-7. As shown in the annotated figure below, the seat shown in Betts could not be located in the position in which it is shown if the forward wall were flat. Ex. 1004, ¶58; Ex. 1005. Thus, this contoured forward wall makes more efficient use of the valuable space in the aircraft passenger cabin than would be available with a flat forward wall. Ex. 1004, ¶58.

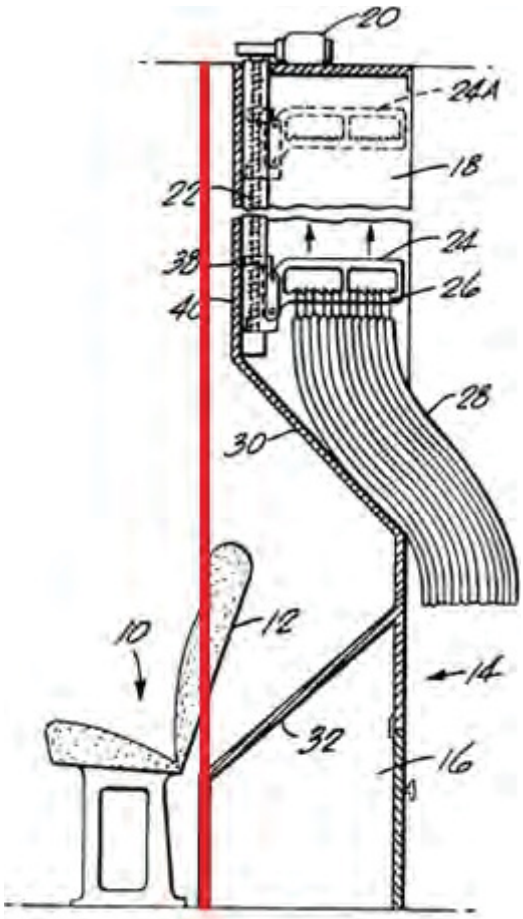


Fig. 1

One of ordinary skill in the art would understand that the forward wall of the enclosure shown in Betts would also be suitable for use with other aircraft enclosures, including lavatories. Ex.

1004, ¶59. In an aircraft, as a row of seats is moved further aft, the first thing that would make contact with a flat wall is the top of the back of the seat. Ex. 1004, ¶59. And so Betts includes a recess that receives that portion of the seat back. Applying the contoured wall of Betts to a lavatory allows the row of seats placed immediately in front of that contoured wall to be placed further aft. Ex. 1004, ¶59.

The challenged patent does not distinguish between different types of enclosures, instead explaining that the recessed forward wall is applicable to all types of aircraft cabin enclosures, e.g., "[t]he present invention relates generally to aircraft enclosures, and more particularly relates to an aircraft cabin enclosure, such as a lavatory, an aircraft closet, or an aircraft galley." Ex. 1001, 1:20-23. As Mr. Anderson explains, multiple different types of prior art enclosures include one or more recesses to enable seats to be positioned further aft in a cabin. Ex. 1004, ¶59. Combining different types of enclosures, designs and shapes of recesses, and seat geometries would have been obvious to one of skill in the art and provides the predictable result of allowing a seat to be positioned further aft.

Patent Owner has argued in the Underlying Litigation that a person of ordinary skill would not have applied a recess to a lavatory at least because the industry had been reluctant to decrease the width out of concern that airlines and passengers would not accept narrower lavatory spaces. But even if Patent Owner were correct, whether a narrower lavatory would be acceptable to airlines and

passengers has no bearing on the obviousness of applying a contoured wall to a lavatory. Orthopedic Equip. Co. v. U.S., 702 F.2d 1005, 1013 (Fed. Cir. 1983) ("[T]he fact that the two disclosed apparatus would not be combined by businessmen for economic reasons is not the same as saying that it could not be done because skilled persons in the art felt that there was some technological incompatibility that prevented their combination. Only the latter fact is telling on the issue of nonobviousness"). Customer acceptance of a narrow lavatory is a market force, not a technical challenge. See Friskit, Inc. v. Real Networks, Inc., 306 Fed. App'x 610, 617-18 (Fed. Cir. 2009).

B. **Motivation to Combine APA and the KLM Crew Rest Document**

As discussed in Section IV.A above, a flat wall lavatory was well known in the prior art before the earliest claimed priority date of '742 Patent. It would have been obvious to one of ordinary skill in the art to modify a prior art lavatory to include a contoured forward wall like the wall shown in the KLM Crew Rest document. Ex. 1004, ¶¶65-72.

As noted above, and explained by Mr. Anderson, a primary goal of the design of interiors of commercial aircraft is efficient use of valuable passenger cabin space. Ex. 1004, ¶66. Efficient use of space allows an aircraft to accommodate more passengers and/or to accommodate passengers more comfortably, thereby increasing the utility of the aircraft. Ex. 1004, ¶66. As of April 2010, a primary motivation of one of ordinary skill in the art of

aircraft interior design would have been to make efficient use of space in the aircraft interior cabin. Ex. 1004, ¶66. The contoured forward facing wall shown in the KLM Crew Rest document advantageously provides additional space to locate a seat further aft in an aircraft. Ex. 1004, ¶66. The recess in the forward wall of the KLM Crew Rest was designed to allow the last row of seats in front of the contoured wall to sit further aft in the aircraft, yet still be able to recline. *Id.*; Ex. 1007, ¶13.

The seat in the KLM Crew Rest could not be located in the position in which it is shown if the forward wall was flat, because a flat wall would restrict the passenger's ability to recline the seat and this was not permitted by the customer requirements for the crew rest; rather, if the wall were flat, the seat would need to be moved forward. Ex. 1007, ¶12; Ex. 1004, ¶67. One of ordinary skill in the art would understand that the forward wall of the enclosure used by the KLM Crew Rest would be suitable for use in a lavatory, at least because the KLM Crew Rest itself is designed for occupancy by people and is based on a lavatory envelope, without a toilet, but including "a lavatory sink (and related plumbing), lighting, a mirror, soap dispenser, shaver outlet and amenity stowage." Ex. 1007, ¶16; Ex. 1004, ¶67.

Further one of ordinary skill in the art would recognize that in an aircraft, as a row of seats is moved further aft, the first thing that makes contact with a flat wall is the top of the back of the seat. Ex. 1004, ¶68. And so the KLM Crew Rest includes a recessed forward wall that receives that portion of

the seat back. Ex. 1004, ¶68. Including the contoured wall of the KLM Crew Rest document allows the row of seats placed immediately in front of that contoured wall to be placed further aft. Ex. 1004, ¶68.

The challenged patent explains that the claimed concept is equally applicable to all types of aircraft cabin enclosures, e.g., "[t]he present invention relates generally to aircraft enclosures, and more particularly relates to an aircraft cabin enclosure, such as a lavatory, an aircraft closet, or an aircraft galley." Ex. 1001, 1:20-23. As Mr. Anderson explains, multiple different types of prior art enclosures include one or more recesses to enable seats to be positioned further aft in a cabin. Ex. 1004, ¶68. Combining different types of enclosures, designs and shapes of recesses, and seat geometries would have been obvious to one of skill in the art and provides the predictable result of allowing a seat to be positioned further aft.

Further, one of the designers of the KLM Crew Rest, Robert Papke, confirmed during direct testimony elicited by attorneys for Patent Owner that this contoured wall was really the logical way to allow seats to be placed further aft in an aircraft. Ex. 1004, ¶69; Papke Tr. at 190:1-11.

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Q. When you developed the vestibule with the indentation in it, was your design motivated by some prior system?

MR. REED: Object to form.

THE WITNESS: No. It was defined by the need or the requirements of the airline to provide their recline. There was only one really logical way to get there and still have a usable space for access into the crew rest and provide the closet space that they requested adjacent to the stair housing -- or staircase, itself.

VI. Factual Background

A. Declaration Evidence

This petition is supported by the declaration of Mr. Alan Anderson. Mr. Anderson worked at Boeing for 43 years. From 1999-2011 Mr. Anderson was the Director of Engineering, Payload Systems, where he oversaw all engineering for interiors for all models of Boeing aircraft. He was also Chief Engineer for Interiors for the development of the 787 Interior from 2002 until 2008. Mr. Anderson's declaration is attached as Exhibit 1004.

B. Person of Ordinary Skill in the Art

A person of ordinary skill in the art of the '742 Patent would have had a bachelor's degree in mechanical engineering, industrial design, or a similar discipline, or the equivalent experience, with at least two years of experience in the field of aircraft interior design. Ex. 1004, ¶¶27-29.

VII. Claim Construction

In *inter partes* review, claim terms are interpreted under a "broadest reasonable construction" standard. *See* 37 C.F.R. § 42.100(b). Under 37 C.F.R. § 1.42.104(b)(4), the "claim terms are presumed to take on their ordinary and customary meaning." *See* 77 Fed. Reg. 48699 (2012), Response to Comment 35. The interpretation of the claims presented either implicitly or explicitly herein should not be viewed as constituting, in whole or in part, Petitioner's own interpretation of such claims for the purposes of any litigation or proceeding where the claim construction standard differs from the broadest reasonable interpretation, but instead should be viewed as a broadest reasonable claim construction.

A. "Recess"

The '641 Patent describes a forward wall with one or more recesses that permit a seat positioned in front of the forward wall to be positioned further aft than would be possible if the wall were flat. See Ex. 1001, 4:36-42 ("the recess 34 and the lower recess 100 combine to permit the passenger seat 16 to be positioned farther aft in the cabin than would be possible if the lavatory enclosure 10 included a conventional flat and vertical forward wall without recesses like that shown in FIG. 1, or included a forward wall that did not include both recesses 34, 100."). The '641 Patent further describes that the recesses cause the forward wall to be "substantially not flat in the vertical plane." Ex. 1001, 4:24-26 ("The forward wall portion has a shape that is

substantially not flat in the vertical plane, and preferably is shaped to include a recess 34 . . .”). Based on the description, a wall that is substantially not flat is a wall that includes a contour. Thus, the broadest reasonable interpretation of a “recess” as used by the ’641 Patent is at least broad enough to include “a wall that includes a contour in the vertical plane.”

VIII. Full Statement of the Reasons for the Relief Requested

A. Claims 1, 3-10, and 12-17 are Obvious Under 35 U.S.C. § 103 over APA and Betts.

The combination of APA and Betts teaches or renders obvious to one of skill in the art each element of the challenged claims and each challenged claim as a whole as described in this section. As discussed in Section V above, one of skill in the art would be motivated to modify the APA in view of the teachings of Betts.

[’641 Claim 1 Preamble] An aircraft lavatory for a cabin of an aircraft of a type that includes a forward-facing passenger seat that includes an upwardly and aftwardly inclined seat back and an aft-extending seat support disposed below the seat back, the lavatory comprising:

Figure 1 of Betts is a side elevation that shows an assembly of an enclosure that is located immediately aft of and adjacent to a passenger seat and is nearly identical to Figure 2 of the ’641 Patent.

Ex. 1004, ¶¶172-174

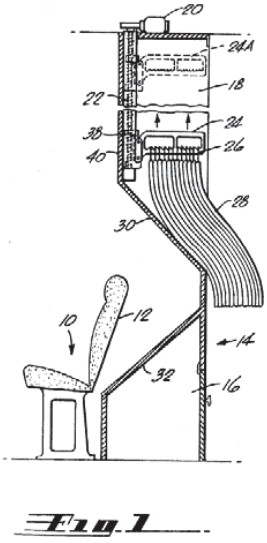
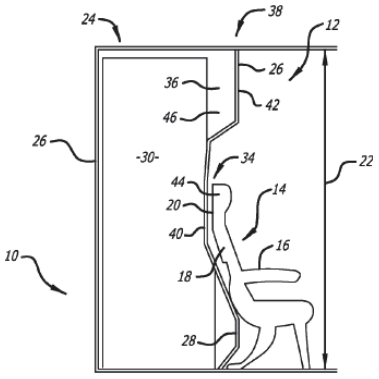
Betts, Figure 1	Ex. 1001, Figure 2
	

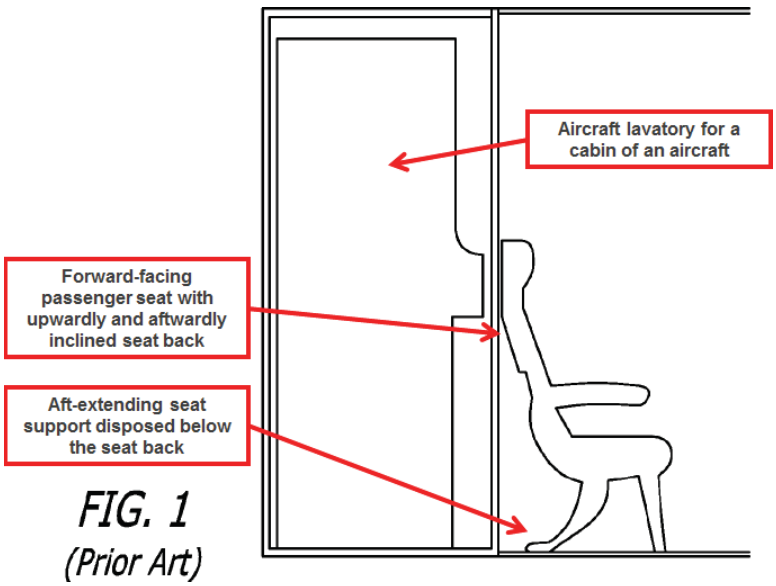
Fig. 1

FIG. 2

As explained above, a person of ordinary skill in the art would be motivated to modify a flat wall lavatory to use the Betts design on the forward wall of a lavatory. Ex. 1004, ¶174.

The only seat shown or described in the '641 Patent is admitted to be prior art. Ex. 1004, ¶¶174. Thus, "a forward-facing passenger seat that includes an upwardly and aftwardly inclined seat back and an aft-extending seat support disposed below the seat back," is admitted to be prior art. Ex. 1004, ¶174. Figure 1 also shows a prior art

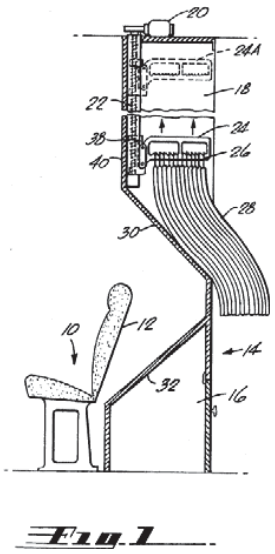
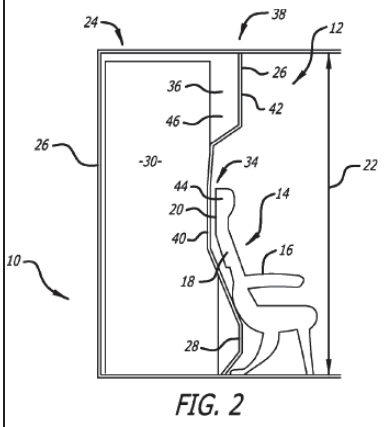
lavatory for a cabin of an aircraft. Ex. 1001, Fig. 1 (annotated).



['641 Claim 1 Element A] a lavatory unit including a forward wall portion and defining an enclosed interior lavatory space, said forward wall portion configured to be disposed proximate to and aft of the passenger seat and including an exterior surface having a shape that is substantially not flat in a vertical plane;

As described in detail above, an airplane lavatory was well known in the prior art and the '641 Patent admits that a flat wall lavatory is known in the art. Such a prior art lavatory includes "a forward wall portion and defining an enclosed interior lavatory space." Ex. 1004, ¶¶176-178.

As is shown below, Betts includes a contoured forward wall. Ex. 1004, ¶178. A person of ordinary skill in the art would realize that this contoured forward wall could be used in place of a flat forward wall on an aircraft lavatory. Id. One motivation to do so would be to allow the seat be placed further aft in an aircraft cabin. Id.

Betts, Figure 1	'641 Patent Figure 2
	

['641 Claim 1 Element B] wherein said forward wall portion is shaped to substantially conform to the shape of the upwardly and aftwardly inclined seat back of the passenger seat, and includes a first recess configured to receive at least a portion of the upwardly and aftwardly inclined seat back of the passenger

seat therein, and

As is shown in the annotated figure below, Betts shows an aircraft passenger seat that is positioned at least partially within the contoured forward wall. Ex. 1004, ¶¶181-182. Thus, this seat is received by the contoured wall. Id. Further, the back of this seat is both upwardly and aftwardly inclined. Id.

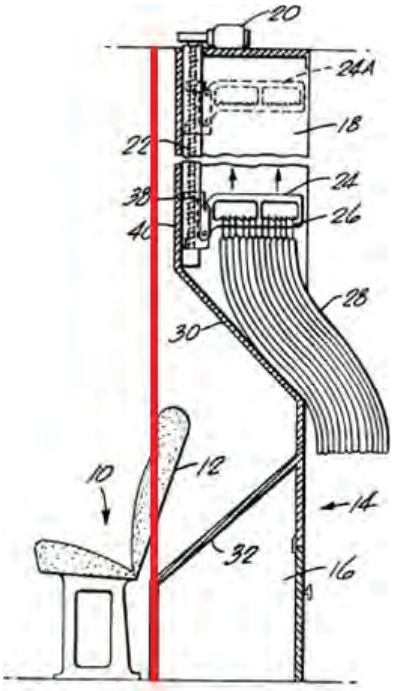
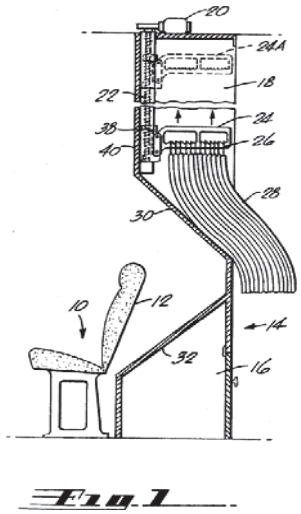
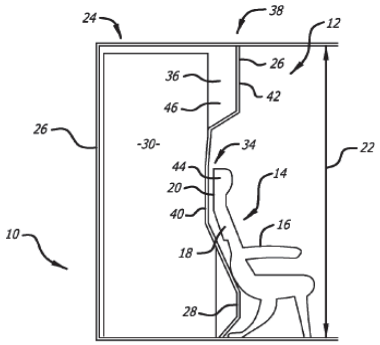


Fig. 1

The recess shown in Betts "substantially conforms to a contour of an aft surface of the upwardly and aftwardly inclined seat back." Ex. 1004, ¶183. As shown below, the design of Betts

Figure 1 is substantially the same as the design shown in Figure 2 of the '641 Patent. Id.

Betts Figure 1	'641 Patent Figure 2
	

['641 Claim 1 Element C] further includes a second recess configured to receive at least a portion of the aft-extending seat support therein when at least a portion of the upwardly and aftwardly inclined seat back of the passenger seat is received within the first recess.

As is shown in the annotated figure below, Betts shows an aircraft passenger seat that is positioned at least partially within the contoured

forward wall. Ex. 1004, ¶¶186-187. Thus, this seat is received by the contoured wall. Id. Further, the back of this seat is both upwardly and aftwardly inclined. Id.

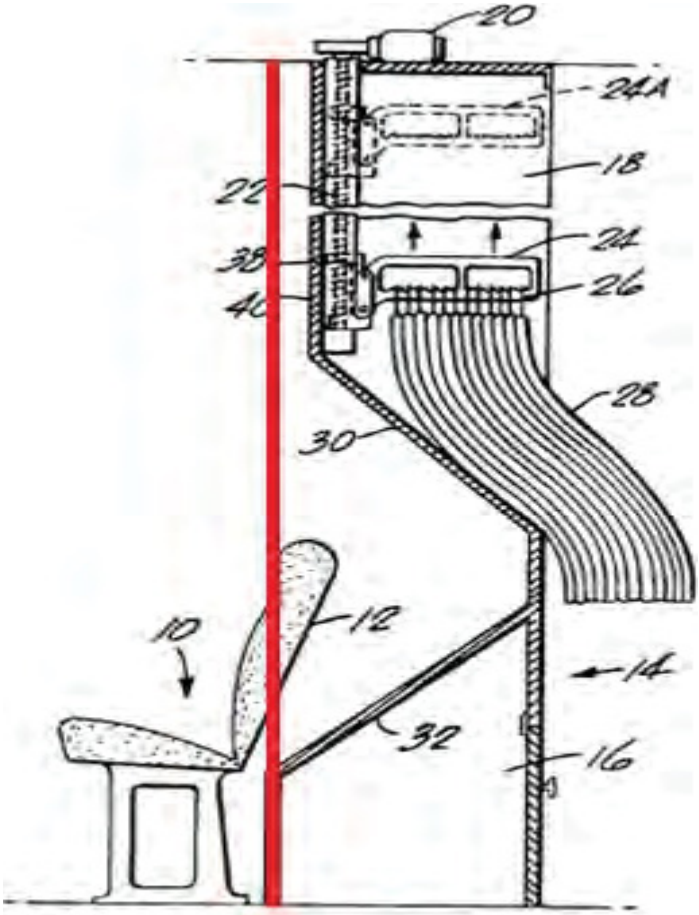
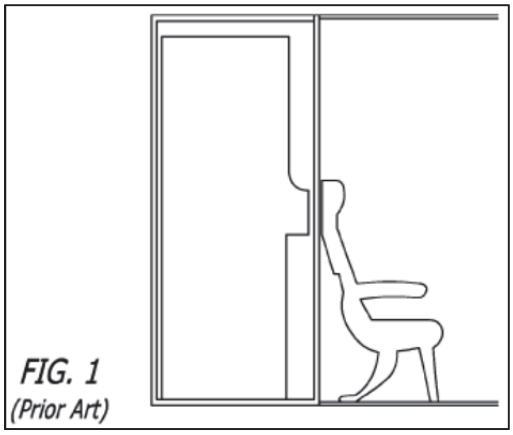


Fig. 1

As explained in Section V above, a person of ordinary skill in the art would be motivated to modify a flat forward facing wall of a lavatory to include a recess to allow a passenger seat to be positioned further aft in the aircraft cabin. Ex. 1004, ¶188. Adding a second recess is no less obvious than adding the first recess. A seat with an aft extending seat support is well known in the art. See, e.g., Ex. 1001, Figure 1.



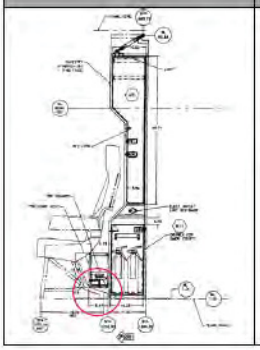
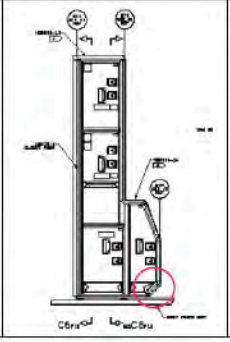
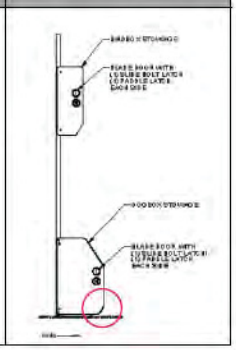
A person of ordinary skill in the art would realize that when such a seat is moved further aft, the first component to impact the wall is the seat back. Ex. 1004, Ex. 1004, ¶¶189, 250. As explained above, Betts includes a forward facing recess that receives the seat back. *Id.*

As the seat is moved further aft, the next component to impact the wall is the aft seat support. Ex. 1004, ¶¶191, 250. As Mr. Anderson explains, a person of ordinary skill in the art would be

motivated to modify an enclosure, such as a lavatory, to include a second recess to receive aft facing seat supports. *Id*. Such a modification is nothing more than the application of known technology for its intended purpose. *Id*. The result of such a modification is predictable, allowing the seat to be positioned further aft in an aircraft. *Id*.

Patent Owner cannot argue this difference between the above cited prior art is sufficient to render the claims patentable. The "mere existence of differences between the prior art and an invention does not establish the invention's nonobviousness. The gap between the prior art and respondent's system is simply not so great as to render the system nonobvious to one reasonably skilled in the art." Dann v. Johnston, 425 U.S. 219, 230 (1976); see also MPEP § 2141 ("The proper analysis is whether the claimed invention would have been obvious to one of ordinary skill in the art after consideration of all the facts."). Mr. Anderson explains in detail why this difference would be obvious to one or ordinary skill in the art. Ex. 1004, ¶¶186-192.

As evidence of this modification being well known, Mr. Anderson cites to three examples of prior art enclosures that include a lower recess to receive a seat support. Ex. 1004, ¶192. Each of these designs was sold and included in passenger aircraft well before the earliest claimed priority date of the '641 Patent. Ex. 1004,¶192. Patent Owner was aware of at least the SAS MD-90 Aft-Storage during prosecution of the application that led to the '641 Patent. Ex. 1008.

SAS MD-90 Aft-Storage October 2004	737 Storage February 1994	747 Storage December 2009
		

['641 Claim 3] The aircraft lavatory of claim 1, wherein said forward wall portion further includes a projection configured to project over the passenger seat back when at least a portion of the upwardly and aftwardly inclined seat back of the passenger seat is received within the first recess and at least a portion of the aft- extending seat support is received within the second recess.

As is shown in the annotated figure below, Betts shows an aircraft passenger seat that is positioned at least partially within the contoured forward wall. Ex. 1005. This shows a projection over the passenger seat back when at least a portion of the upwardly and aftwardly inclined seat back of the passenger seat is received. Ex. 1004, ¶¶193-195.

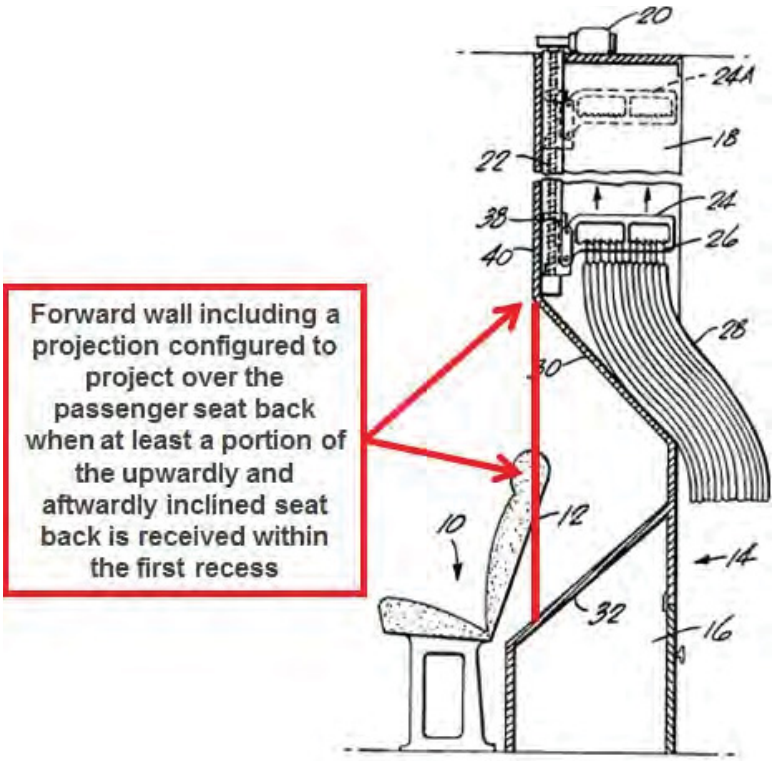


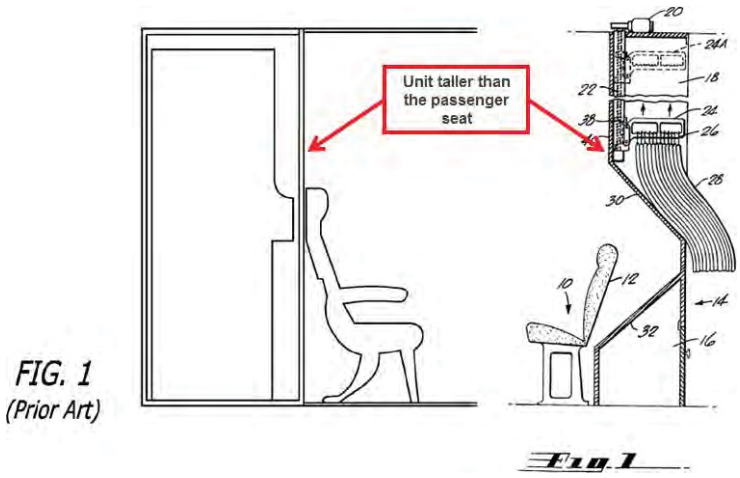
Fig. 1

Further, as explained above with regard to Claim 1, Element C, a person of ordinary skill in the art would be motivated to modify a flat forward wall to include a second recess to receive at least a portion of an aft extending seat support. Ex. 1004, ¶196. One motivation for such a modification would be to allow for the seat to be positioned further aft in an airplane cabin.

['641 Claim 4] The aircraft lavatory of claim 1, wherein said lavatory unit is taller than the

passenger seat.

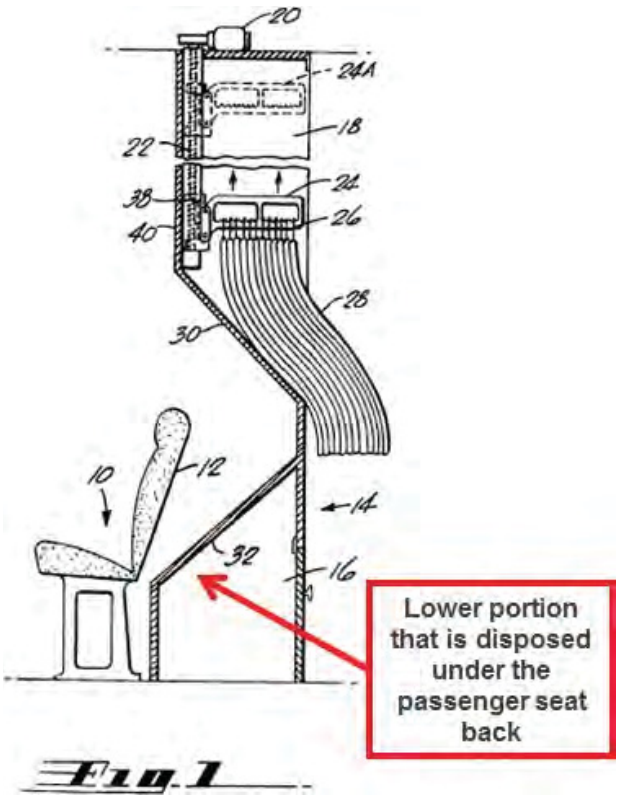
As is shown below, both the Betts enclosure and the admitted prior art enclosure in Figure 1 are taller than a passenger seat. Ex. 1004, ¶¶106-108, 197



['641 Claim 5] The aircraft lavatory of claim 1, wherein said forward wall portion includes a lower portion that is disposed under the passenger seat back when at least a portion of the upwardly and aftwardly inclined seat back of the passenger seat is received within the first recess and at least a portion of the aft-extending seat support is received within the

second recess.

As is shown in the annotated figure below, Betts shows an aircraft passenger seat that is positioned at least partially within the contoured forward wall. Ex. 1004, ¶¶198-199. This shows a lower portion that is disposed under the passenger seat back when at least a portion of the upwardly and aftwardly inclined seat back of the passenger seat is received within the first recess. Id.



Further, as explained above with regard to Claim 1, Element C, a person of ordinary skill in the art would be motivated to modify a flat forward wall to include a second recess to receive at least a portion of an aft extending seat support. Ex. 1004, ¶196. One motivation for such a modification would be to allow for the seat to be positioned further aft in an airplane cabin. Ex. 1004, ¶201.

['641 Claim 6] The aircraft lavatory of claim 1, wherein said first recess in said forward wall portion is disposed between an upper wall portion and a lower wall portion. Ex. 1004, ¶¶202-203.

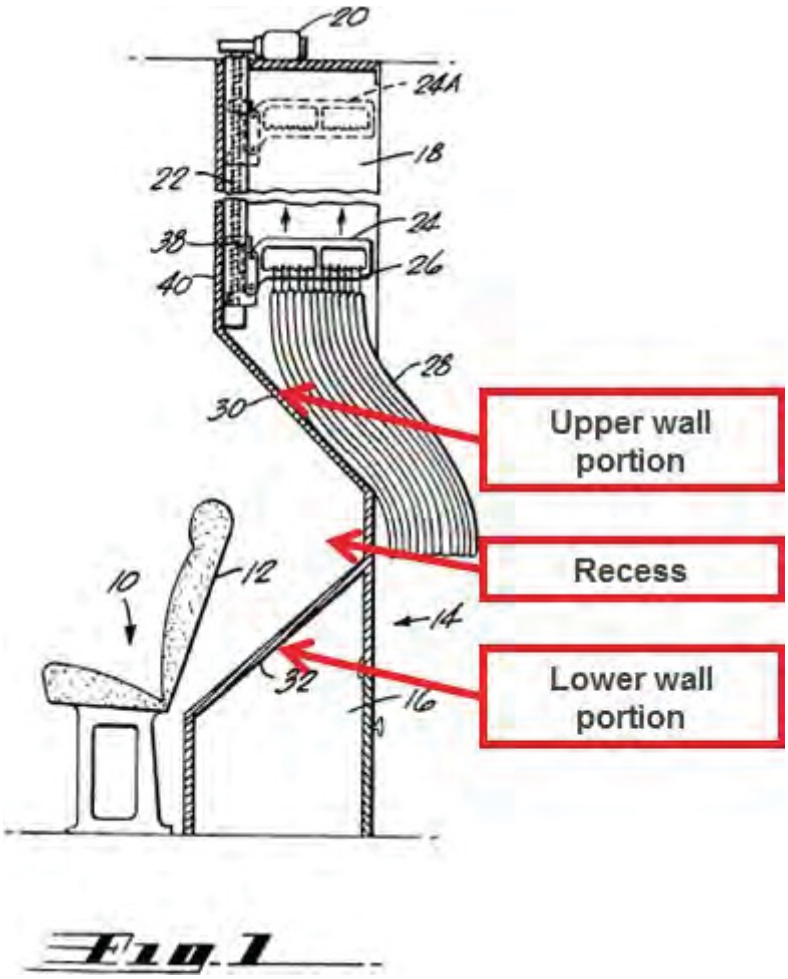


Fig. 1

['641 Claim 7] The aircraft lavatory of claim 1, wherein said forward wall portion defines a secondary space in said interior lavatory space above the passenger seat back.

The admitted prior art shows "a secondary space in said interior lavatory space above the passenger seat back." The specification of the '641 Patent describes "the forward wall portion defines a secondary space 36 in the interior lavatory space." Ex. 1001, 4:43-45. Such a space is shown in both Figure 1 and Figure 2. Ex. 1004, ¶¶205-206. Further, a person of ordinary skill in the art would recognize that prior art lavatories often include secondary storage spaces, e.g., trash receptacles, space for additional paper towels or toilet paper, space for routing plumbing, etc. Ex. 1004, ¶207. A person of ordinary skill in the art would further understand that the enclosed space of a lavatory would continue to contain the prior art secondary storage spaces after applying a contour to the forward wall. Id.

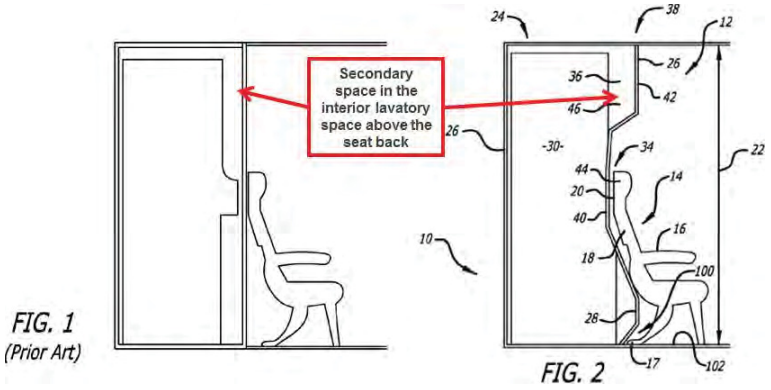


FIG. 1
(Prior Art)

FIG. 2

['641 Claim 8 Preamble] An aircraft lavatory for an aircraft, the lavatory comprising:

As explained above, the '641 Patent admits that an aircraft lavatory was known in the prior art. Ex.

1001, Fig. 1; Ex. 1004, ¶208.

['641 Claim 8, Element A] a forward partition; an aft partition; and a lavatory space disposed between the forward partition and the aft partition;

As explained above, the '641 Patent admits that an aircraft lavatory was known in the prior art. Ex. 1001, Fig. 1; Ex. 1004, ¶209. This lavatory shows a forward partition, an aft partition, and a lavatory spaced disposed between these two partitions. Id.

['641 Claim 8, Element B] wherein the forward partition comprises: a forward-extending upper portion; an aft-extending mid-portion; and a forward-extending lower portion; and

As is shown in the annotated figures below, Betts discloses a forward- extending upper portion; an aft-extending mid-portion; and a forward-extending lower portion. Ex. 1004, ¶¶210-211.

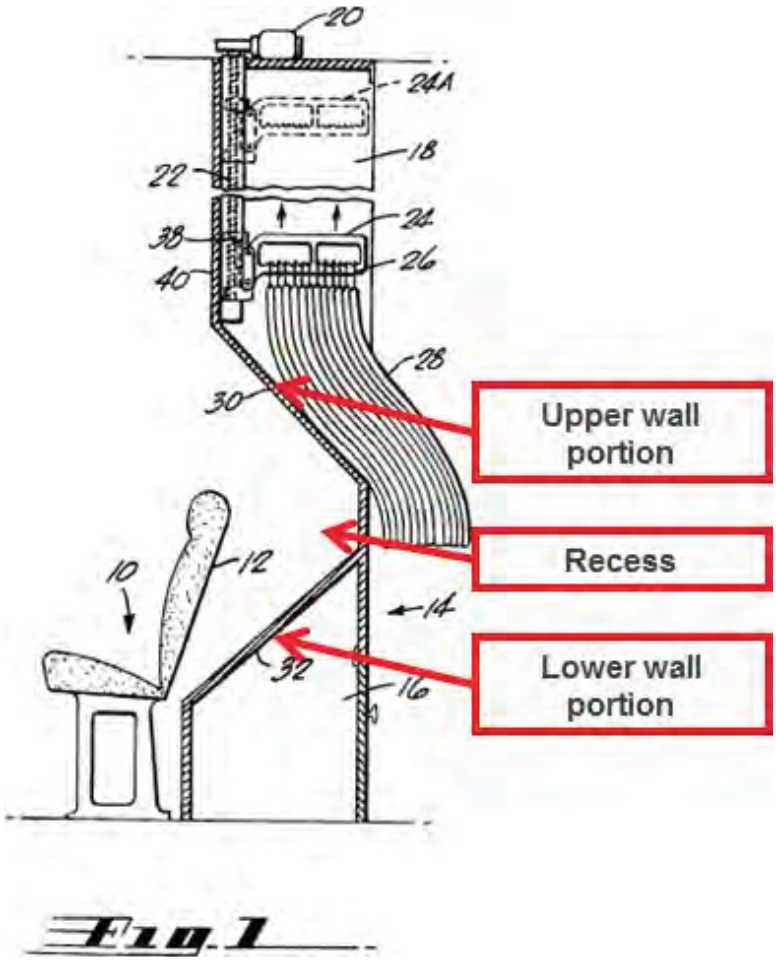


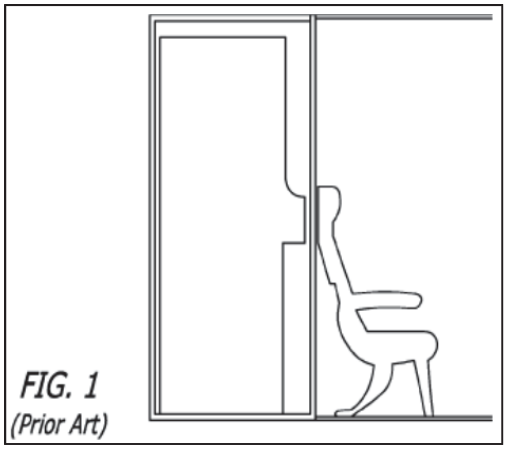
Fig. 1

['641 Claim 8, Element C] wherein the forward-extending upper portion, the aft-extending mid-portion, and the forward-extending lower portion combine to define a first aft-extending recess disposed between the upper forward-extending portion and the forward-extending lower portion, and

As is shown in the annotated Figure above, "the forward-extending upper portion, the aft-extending mid-portion, and the forward-extending lower portion combine to define a first aft-extending recess disposed between the upper forward- extending portion and the forward-extending lower portion." Ex. 1004, ¶¶213-214.

['641 Claim 8, Element D] wherein the forward partition further defines a second aft-extending recess proximate to a lower end of the forward partition, the second aft-extending recess being configured to receive at least a portion of an aft-extending seat support of a forward-positioned passenger seat therein.

As explained above, a person of ordinary skill in the art would be motivated to modify a flat forward facing wall of a lavatory to include a recess to allow a passenger seat to be positioned further aft in the aircraft cabin. Ex. 1004, ¶¶215-216. A seat with an aft extending seat support is well known in the art. Ex. 1001, Fig. 1; Ex. 1004, ¶216.

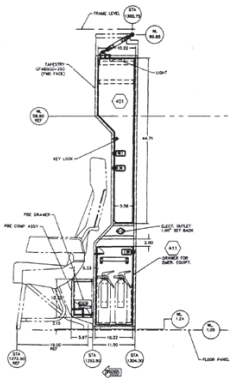
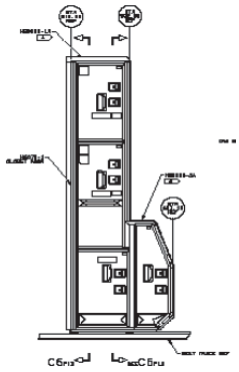
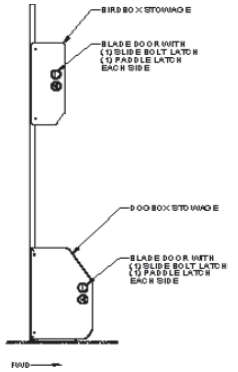


A person of ordinary skill in the art would realize that when such a seat is moved further aft, the first component to impact the wall is the seat back. Ex. 1004, ¶217. As explained above, Betts includes a forward facing recess that receives the seat back. Id.

As the seat is moved further aft, the next component to impact the wall is the aft seat support. Ex. 1004, ¶218. As Mr. Anderson explains, a person of ordinary skill in the art would be motivated to modify an enclosure, such as a lavatory, to include a second recess to receive aft facing seat supports. Id. Such a modification is nothing more than the application of known technology for its intended purpose. Id. The result of such a modification is predictable, allowing the seat to be positioned further aft in an aircraft. Id.

Further, as discussed above with regard to Claim 1, Element C, a person of ordinary skill in the art would recognize that such a modification was well known in the art. Ex. 1004, ¶219 As evidence of this

modification being well known, Mr. Anderson cites to three examples of prior art enclosures that include a lower recess to receive a seat support. Ex. 1004, ¶192. These designs were sold and included in passenger aircraft well before the earliest claimed priority date of the '641 Patent. Ex. 1004, ¶¶76-78.

SAS MD-90 Aft-Storage October 2004	737 Storage February 1994	747 Storage December 2009
		

['641 Claim 9] The aircraft lavatory according to claim 8 wherein the first aft extending recess defined by the forward-extending upper portion, the aft-extending mid-portion, and the forward- extending lower portion of

the forward partition is configured to receive an aft-extending seat back of the forward positioned passenger seat.

As described above with regard to Claim 8, Element D, Betts shows an aircraft passenger seat that is positioned at least partially within the contoured forward wall. Ex. 1004, ¶¶220-221. Thus, this seat is received by the contoured wall. Id. Further, the back of this seat is both upwardly and aftwardly inclined. Id.

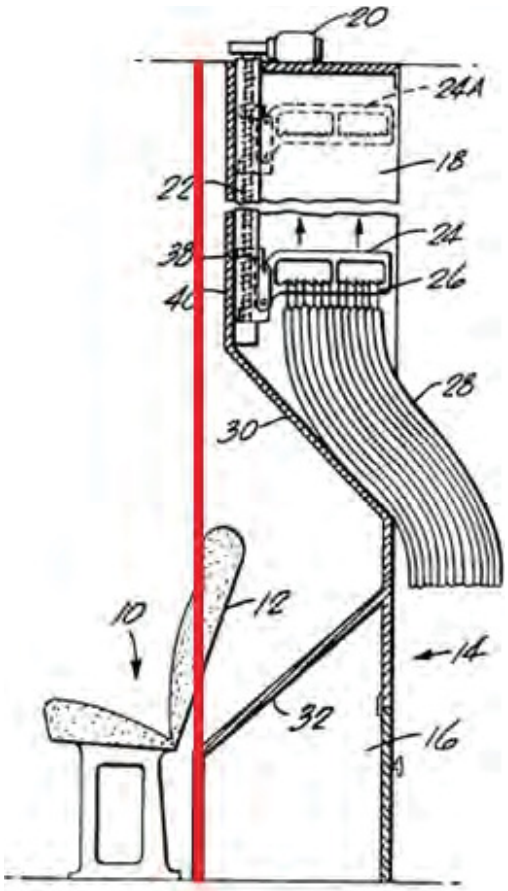


Fig. 1

['641 Claim 10] The aircraft lavatory according to claim 9 wherein said forward - extending upper portion is configured to

project over at least a portion of the forward-positioned passenger seat.

As is shown in the annotated figure below, Betts shows an aircraft passenger seat that is positioned at least partially within the contoured forward wall. Ex. 1004, ¶¶223-224. This shows a projection over the passenger seat back when at least a portion of the upwardly and aftwardly inclined seat back of the passenger seat is received. Id.

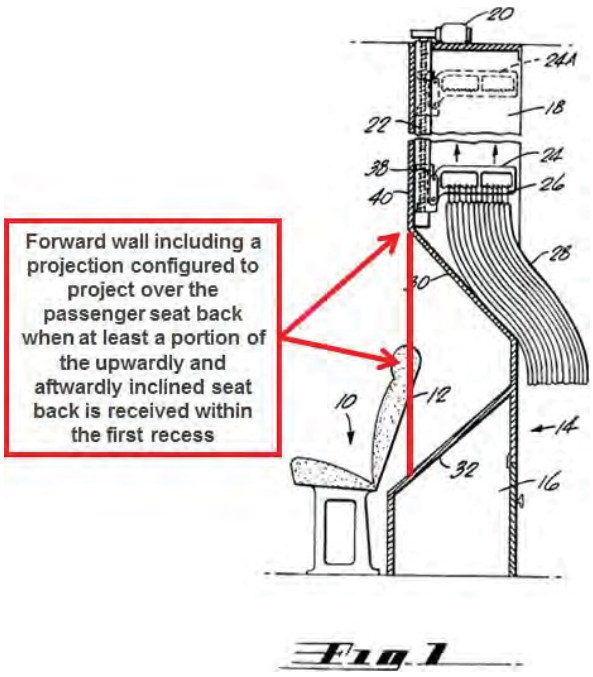


Fig. 1

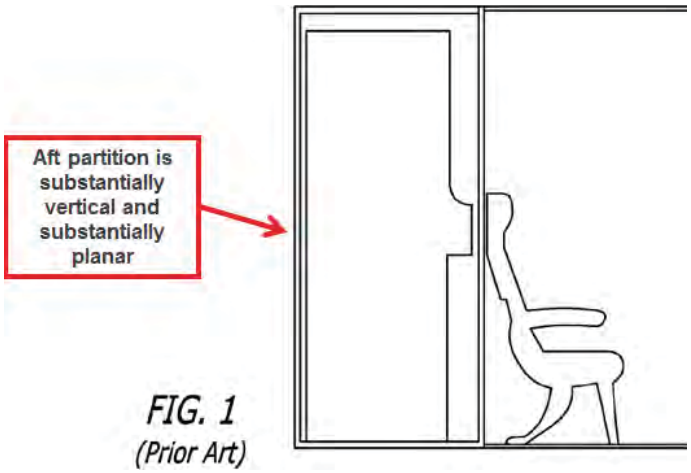
['641 Claim 12] The aircraft lavatory according to claim 9 wherein said lavatory is taller than

the forward-positioned passenger seat.

See analysis of claim 4 above.

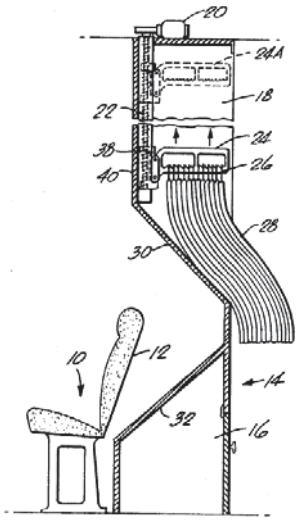
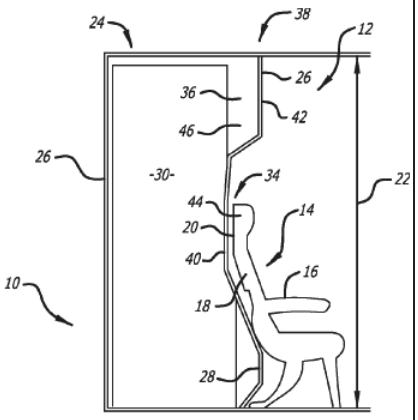
['641 Claim 13] The aircraft lavatory according to claim 8 wherein the aft partition is substantially vertical and substantially planar.

As shown in the admitted prior art of Figure 1 of the '641 Patent, the aft partition is substantially vertical and substantially planar. Ex. 1004, ¶227.



['641 Claim 14] The aircraft lavatory according to claim 8 wherein the width of the lavatory space disposed between the forward partition and the aft partition comprises an upper width, a lower width, and a mid-width, and wherein the upper width and the lower width are both substantially wider than the mid-width.

As discussed in Section V above, a person of ordinary skill in the art would be motivated to modify a flat wall lavatory to include a contoured forward wall. Ex. 1004, ¶¶228-229. A person of ordinary skill in the art would recognize that such a modification could impact the interior width of the lavatory. Ex. 1004, ¶229. This is clear from the positioning of the recess shown in Figure 1 of Betts, which is substantially the same as Figure 2 of the '641 Patent. Id. To the extent that Figure 2 of the '641 Patent describes this limitation, the limitation is also disclosed by Figure 1 of Betts. Id.

Betts, Figure 1	Ex. 1001, Figure 2
 Fig. 1	 FIG. 2

['641 Claim 15] The aircraft lavatory according to claim 8 wherein the upper forward-extending portion, the aft-extending mid-portion, and the forward-extending lower portion of the forward partition form a substantially continuous surface.

As shown in Figure 1 of Betts, the upper forward-extending portion, the aft- extending mid-portion, and the forward-extending lower portion of the forward partition form a substantially continuous surface. Ex. 1004, ¶¶231-232.

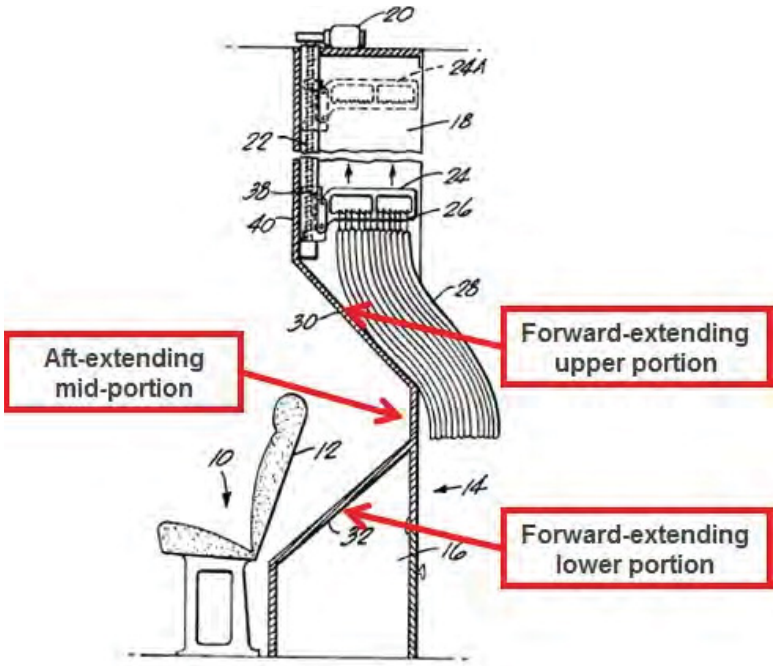


Fig. 1

['641 Claim 16] The aircraft lavatory according to claim 8 wherein said first aft-extending recess extends along substantially a full width of said forward partition.

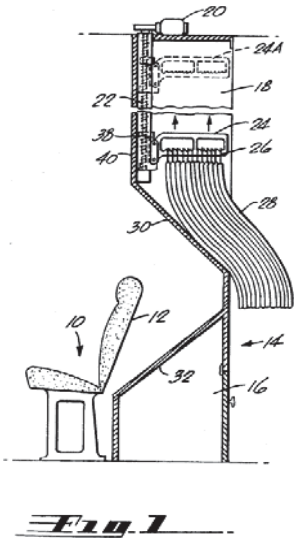
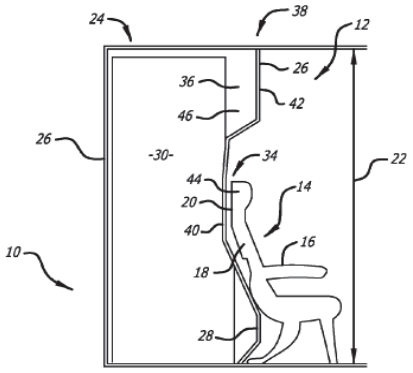
Figure 1 of Betts shows a side elevational view of the coat closet enclosure. Ex. 1005, 1:58-59; Ex. 1004, ¶¶234-235. The side elevational view shows the coat closet enclosure from a horizontal plane beside the enclosure. Id. One of ordinary skill in the art would understand from Figure 1 that the recess extends the full width of the forward wall. Id.

Further, nothing in Betts suggests that the recess only extends a portion of the width of the forward wall. Ex. 1004, ¶236. Moreover, one of ordinary skill in the art would be motivated to extend the recess the full width of the forward wall in order to accommodate the full row of seats installed immediately forward of the wall. Id. In fact, the commercial embodiments of the Betts closet (found on DC- 10s) had a recess that extended the full width of the forward partition. Id.

Further, the side elevation view shown in Figure 1 is essentially identical to the schematic diagram of Figure 2 of the '641 Patent. Ex. 1001. The term "width" appears nowhere in the specification of the '641 Patent. See Ex. 1001. To the extent that Figure 2 of the '641 Patent describes this limitation, the limitation is also disclosed by Figure 1 of Betts.

['641 Claim 17] The aircraft lavatory according to claim 8 wherein said lavatory has a top, a bottom, a height therebetween, and a middle therebetween, said lavatory has varying lengths along the height of the lavatory, and said lavatory is longer at the top of the lavatory than at the bottom of the lavatory.

The prior art lavatory shown in Figure 1 of the '641 Patent shows a lavatory that has a top, a bottom, a height therebetween, and a middle therebetween. Further, as discussed in Section V above, a person of ordinary skill in the art would be motivated to modify a flat wall lavatory to include a contoured forward wall. Ex. 1004, ¶¶238-239. A person of ordinary skill in the art would recognize that such a modification could impact the interior of the lavatory, e.g., the width or the lengths along the height of the lavatory. Id. This is clear from the positioning of the recess shown in Figure 1 of Betts, which is substantially the same as Figure 2 of the '641 Patent. Id. To the extent that Figure 2 of the '641 Patent describes this limitation, the limitation is also disclosed by Figure 1 of Betts. Id

Betts Figure 1	'641 Patent Figure 2
 Fig. 1	 FIG. 2

B. Claims 1, 3-10, and 12-17 are Obvious Under 35 U.S.C. § 103 over APA and the KLM Crew Rest Document.

The combination of APA and the KLM Crew Rest document teaches or renders obvious to one of skill in the art each element of the challenged claims and each challenged claim as a whole as described in this section. As discussed in Section V above, one of skill in the art would be motivated to modify the APA in view of the teachings of the KLM Crew Rest document.

['641 Claim 1 Preamble] An aircraft lavatory for a cabin of an aircraft of a type that includes a forward-facing passenger seat that includes an upwardly and aftwardly inclined seat back and an aft-extending seat support disposed below the seat back, the lavatory comprising:

The admitted prior art discloses the preamble of claim 1 including an aircraft lavatory for a cabin of an aircraft and a forward-facing passenger seat that includes an upwardly and aftwardly inclined seat back and an aft-extending seat support disposed below the seat back. Ex. 1004, ¶172-174.

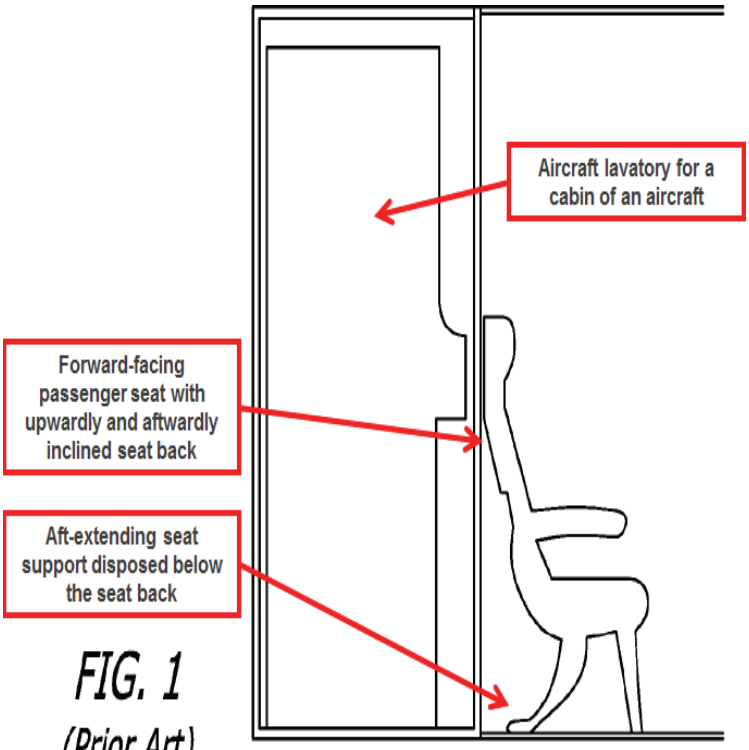
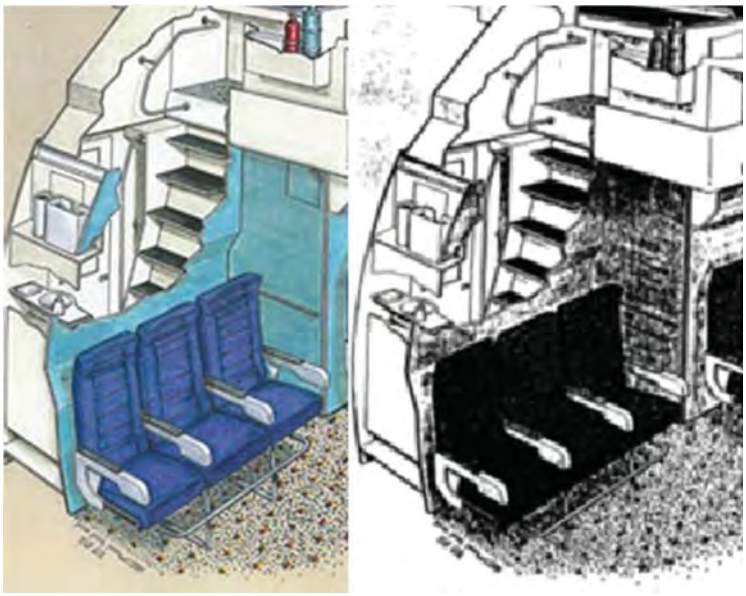


FIG. 1
(Prior Art)

As explained in Section V above, a person of ordinary skill in the art would be motivated to modify a flat wall lavatory to use the KLM Crew Rest design on the forward wall of a lavatory. The KLM Crew Rest document shows a side elevation of a lavatory enclosure. Ex. 1004, ¶175. The enclosure has a contoured wall to allow space for a seat that is located forward of and proximate to the aircraft enclosure. Id. The KLM Crew Rest document shows "a forward-facing passenger seat." Id. This seat includes "an upwardly and aftwardly inclined seat

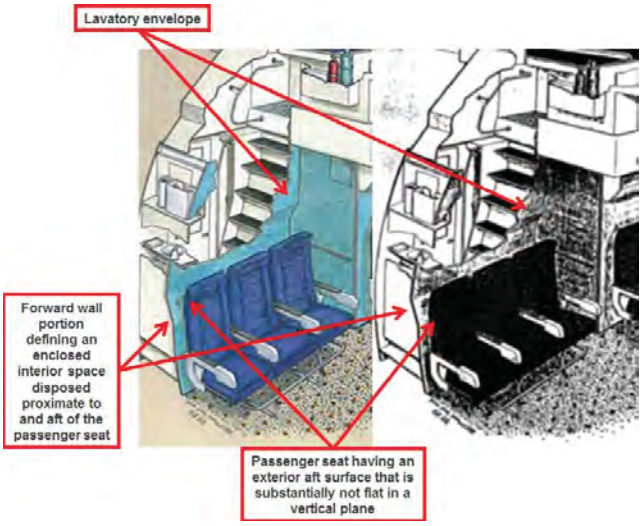
back." Id. The seat shown in the KLM Crew Rest document includes or could be modified to include a prior art seat with an aft extending seat support. Id.



['641 Claim 1 Element A] a lavatory unit including a forward wall portion and defining an enclosed interior lavatory space, said forward wall portion configured to be disposed proximate to and aft of the passenger seat and including an exterior surface having a shape that is substantially not flat in a vertical plane;

As described in detail above, an airplane lavatory was well known in the prior art and the '641 Patent admits that a flat wall lavatory is known in the art. Such a prior art lavatory includes "a forward wall portion and defining an enclosed interior lavatory space." Ex. 1004, ¶¶177.

As is shown below, the KLM Crew Rest rendering includes a contoured forward wall. Ex. 1004, ¶179. A person of ordinary skill in the art would realize that this contoured forward wall could be used in place of a flat forward wall on an aircraft lavatory. Id. One motivation to do so would be to allow the seat be placed further aft in an aircraft cabin. Id.



The contoured forward wall includes an exterior surface having a shape that is substantially not flat in a vertical plane.

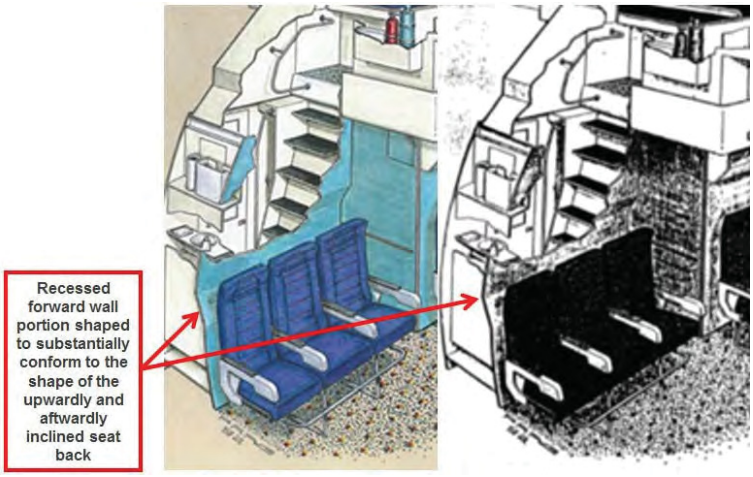
['641 Claim 1 Element B] wherein said forward wall portion is shaped to substantially conform to the shape of the upwardly and aftwardly inclined seat back of the passenger seat, and includes a first recess configured to receive at least a portion of the upwardly and aftwardly inclined seat back of the passenger seat therein, and

As is shown in the annotated Figure above, the

KLM Crew Rest rendering discloses a contoured forward wall. This contoured forward wall includes a recess configured to receive an upwardly and aftwardly inclined seat back of a passenger seat. Ex. 1004, ¶181, 184-185.

Further, the recess in the KLM Crew Rest was designed to allow the last row of seats positioned in front of the contoured wall to sit further aft in the aircraft, yet still be able to recline. Ex. 1007, ¶13. Thus, if there were no recess, this seat would need to be positioned further forward to allow for recline. Ex. 1004, ¶184. Thus, the contoured wall allows for this seat to sit further aft than it otherwise would be able to sit, and therefore receives the seat back. Id. Further, one of ordinary skill in the art would be motivated to restrict the recline of the seat and move the seat further aft. Id. A motivation for doing so would be to increase the pitch of seats between rows or allow for additional rows of seats. Id.

The recess shown in the KLM Crew Rest document "substantially conform[s] to the shape of the upwardly and aftwardly inclined seat back of the passenger seat." Ex. 1004, ¶185. As Mr. Sobotta explains, the design includes a "recess that would receive the seatback of the row of seats located in front of the entry enclosure." Ex. 1007, ¶13. This is shown in the annotated figure below.



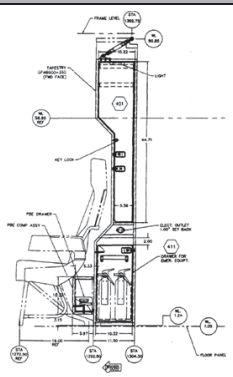
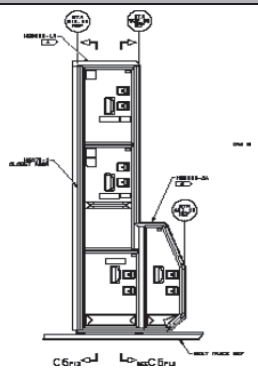
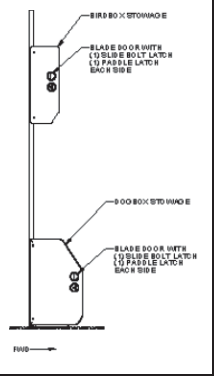
['641 Claim 1 Element C] further includes a second recess configured to receive at least a portion of the aft-extending seat support therein when at least a portion of the upwardly and aftwardly inclined seat back of the passenger seat is received within the first recess.

As noted above, Figure 1 of the '641 Patent admits that a seat with an aft extending seat support is well known in the art. Ex. 1004, ¶¶186-187. Further, the KLM Crew Rest document shows both a passenger seat and a contoured forward partition. Ex. 1004, ¶190. As explained above, the passenger seat is positioned is positioned such that it could not recline without a contoured forward wall, thus this seat is at least partially within the contour and is thus received by the recess. Id.

As explained above, a person of ordinary skill in the art would be motivated to modify the forward

wall of an enclosure to include a second recess to accommodate known prior art seat designs that include an aft-extending seat support. Ex. 1004, ¶191. Such a modification is nothing more than the application of known technology for its intended purpose. Id. The result of such a modification is predictable, allowing the seat to be positioned further aft in an aircraft. Id.

Patent Owner cannot argue this difference between the above cited prior art is sufficient to render the claims patentable. The "mere existence of differences between the prior art and an invention does not establish the invention's nonobviousness. The gap between the prior art and respondent's system is simply not so great as to render the system nonobvious to one reasonably skilled in the art." Dann v. Johnston, 425 U.S. 219, 230 (1976); see also MPEP § 2141. Mr. Anderson explains in detail why this difference would be obvious to one or ordinary skill in the art. Ex. 1004, ¶¶186-192.

SAS MD-90 Aft-Storage October 2004	737 Storage February 1994	747 Storage December 2009
		

As evidence of this modification being well known, Mr. Anderson cites to three examples of prior art enclosures that include a lower recess to receive a seat support. Ex. 1004, ¶192. Each of these designs was sold and included in passenger aircraft well before the earliest claimed priority date of the '641 Patent. Id.

'641 Claim 3] The aircraft lavatory of claim 1, wherein said forward wall portion further includes a projection configured to project over the passenger seat back when at least a portion of the upwardly and aftwardly inclined seat back of the passenger seat is received within the first recess and at least a portion of the aft- extending seat support is received within the second recess.

The recess in the KLM Crew Rest document was

designed to allow the last row of seats in front of the contoured wall to sit further aft in the aircraft, yet still be able to recline. Ex. 1007, ¶13. A person of ordinary skill in the art would recognize that when the seat reclines into the recess in the KLM Crew Rest, the upper part of the recess will project overtop of the passenger seat back. Ex. 1004, ¶195.

Further, as explained above with regard to Claim 1, Element C, a person of ordinary skill in the art would be motivated to modify a flat forward wall to include a second recess to receive at least a portion of an aft extending seat support. Ex. 1004, ¶¶186-192, 196. One motivation for such a modification would be to allow for the seat to be positioned further aft in an airplane cabin. Id.

['641 Claim 4] The aircraft lavatory of claim 1, wherein said lavatory unit is taller than the passenger seat.

As is shown below, the prior art enclosure in Figure 1 and the KLM Crew Rest document are taller than a passenger seat. Ex. 1004, ¶¶106-108, 197.

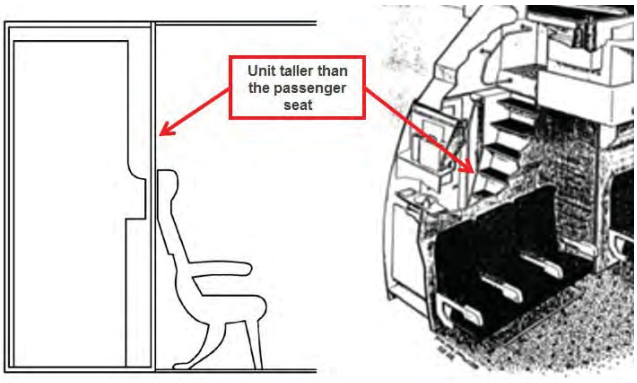
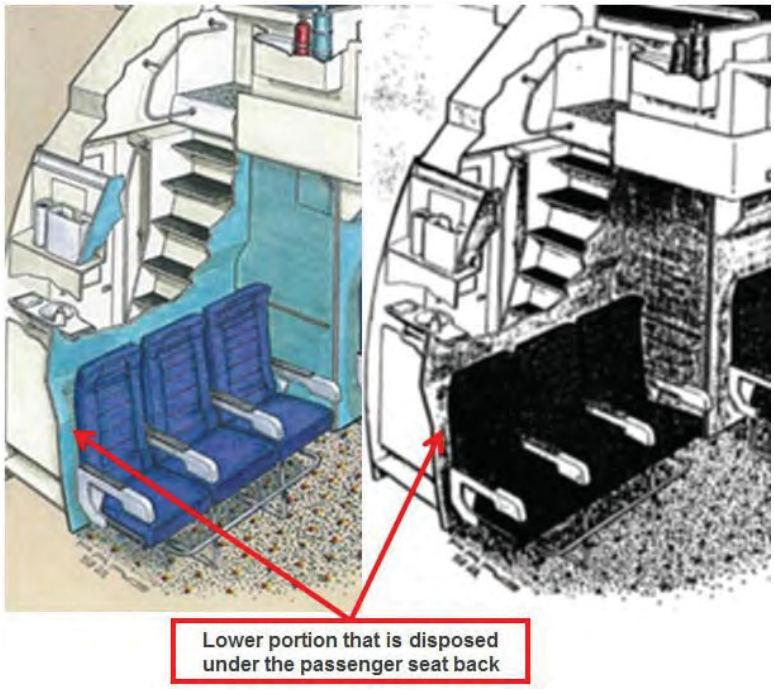


FIG. 1
(Prior Art)

['641 Claim 5] The aircraft lavatory of claim 1, wherein said forward wall portion includes a lower portion that is disposed under the passenger seat back when at least a portion of the upwardly and aftwardly inclined seat back of the passenger seat is received within the first recess and at least a portion of the aft-extending seat support is received within the second recess.

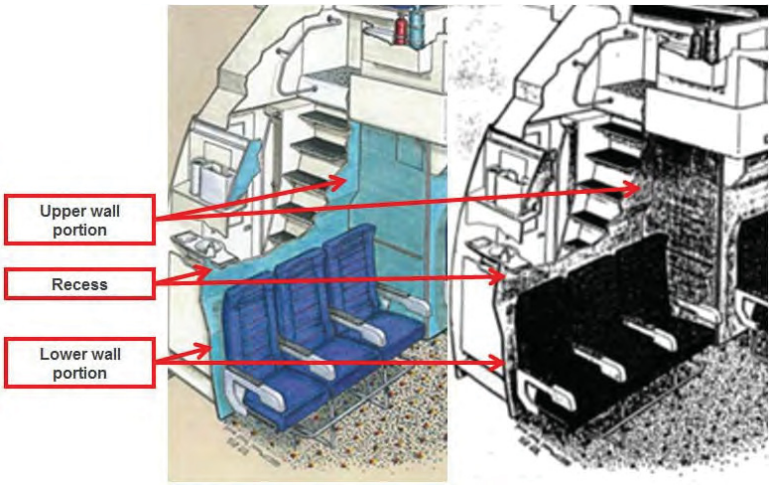
As is shown in the annotated figure below, the KLM Crew Rest document shows an aircraft passenger seat that is positioned at least partially within the contoured forward wall. Ex. 1004, ¶200. This shows a lower portion that is disposed under the passenger seat back when at least a portion of the upwardly and aftwardly inclined seat back of the passenger seat is received within the first recess. Ex.

1004, ¶200.



['641 Claim 6] The aircraft lavatory of claim 1, wherein said first recess in said forward wall portion is disposed between an upper wall portion and a lower wall portion.

As is shown in the annotated figures below, the KLM Crew Rest document discloses a first recess in said forward wall portion is disposed between an upper wall portion and a lower wall portion. Ex. 1004, ¶204.



['641 Claim 7] The aircraft lavatory of claim 1, wherein said forward wall portion defines a secondary space in said interior lavatory space above the passenger seat back.

The admitted prior art shows "a secondary space in said interior lavatory space above the passenger seat back." The specification of the '641 Patent describes "the forward wall portion defines a secondary space 36 in the interior lavatory space." Ex. 1001, 4:43-45. Such a space is shown in both Figure 1 and Figure 2. Ex. 1004, ¶205-206. Further, a person of ordinary skill in the art would recognize that prior art lavatories often include secondary storage spaces, e.g., trash receptacles, space for additional paper towels or toilet paper, space for routing plumbing, etc. Ex. 1004, ¶207. A person of ordinary skill in the art would further understand that the enclosed space of a lavatory would continue to contain the prior art secondary storage spaces

after applying a contour to the forward wall. Id.

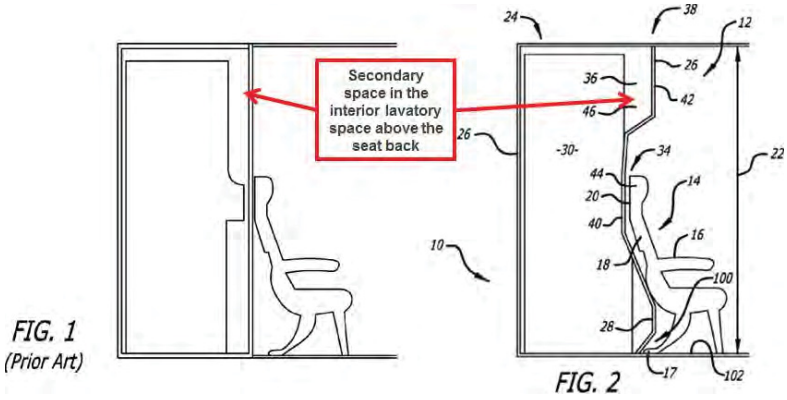


FIG. 1
(Prior Art)

FIG. 2

['641 Claim 8 Preamble] An aircraft lavatory for an aircraft, the lavatory comprising:

As explained above, the '641 Patent admits that an aircraft lavatory was known in the prior art. Ex. 1001, Fig. 1; Ex. 1004, ¶208.

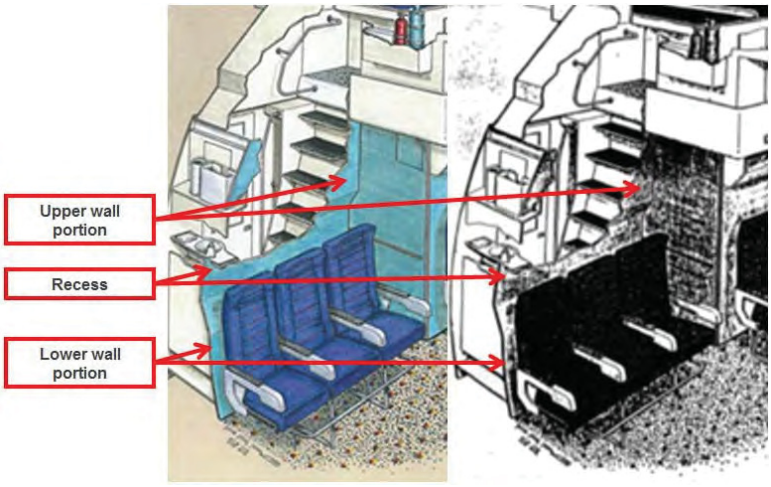
['641 Claim 8, Element A] a forward partition; an aft partition; and a lavatory space disposed between the forward partition and the aft partition;

As explained above, the '641 Patent admits that an aircraft lavatory was known in the prior art. Ex. 1001, Fig. 1; Ex. 1004, ¶209. This lavatory shows a forward partition, an aft partition, and a lavatory spaced disposed between these two partitions. Id.

['641 Claim 8, Element B] wherein the forward partition comprises: a forward-extending upper portion; an aft-extending mid-portion;

and a forward-extending lower portion; and

As is shown in the annotated figures below, the KLM Crew Rest document shows a forward-extending upper portion; an aft-extending mid-portion; and a forward-extending lower portion. Ex. 1004, ¶¶210-211.



['641 Claim 8, Element C] wherein the forward-extending upper portion, the aft-extending mid-portion, and the forward-extending lower portion combine to define a first aft-extending recess disposed between the upper forward-extending portion and the forward-extending lower portion, and

As is shown in the annotated Figure above, "the forward-extending upper portion, the aft-extending mid-portion, and the forward-extending lower portion combine to define a first aft-extending recess

disposed between the upper forward- extending portion and the forward-extending lower portion." Ex. 1004, ¶¶213-214.

['641 Claim 8, Element D] wherein the forward partition further defines a second aft-extending recess proximate to a lower end of the forward partition, the second aft-extending recess being configured to receive at least a portion of an aft-extending seat support of a forward-positioned passenger seat therein.

As explained above, a person of ordinary skill in the art would be motivated to modify a flat forward facing wall of a lavatory to include a recess to allow a passenger seat to be positioned further aft in the aircraft cabin. Ex. 1004, ¶¶215-216. A seat with an aft extending seat support is well known in the art. Ex. 1001, Fig. 1; Ex. 1004, ¶216. A seat with an aft extending seat support is well known in the art. Ex. 1001, Fig. 1; Ex. 1004, ¶216.

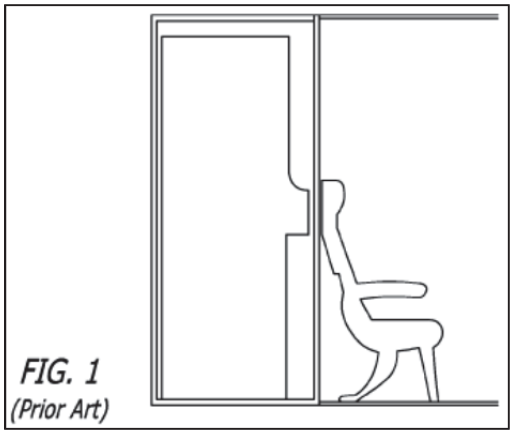


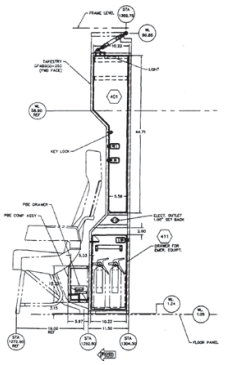
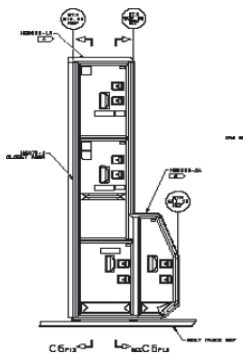
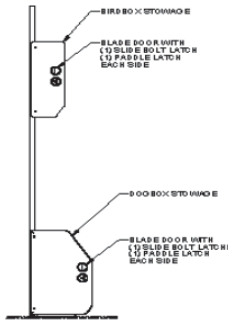
FIG. 1
(Prior Art)

A person of ordinary skill in the art would realize that when such a seat is moved further aft, the first component to impact the wall is the seat back. Ex. 1004, ¶217. As explained above, the KLM Crew Rest document includes a forward-facing recess that receives the seat back. Id.

As the seat is moved further aft, the next component to impact the wall is the aft seat support. Ex. 1004, ¶218. As Mr. Anderson explains, a person of ordinary skill in the art would be motivated to modify an enclosure, such as a lavatory, to include a second recess to receive aft facing seat supports. Id. Such a modification is nothing more than the application of known technology for its intended purpose. Id. The result of such a modification is predictable, allowing the seat to be positioned further aft in an aircraft. Id.

Further, as discussed above with regard to Claim 1, Element C, a person of ordinary skill in the art would recognize that such a modification was well known in the art. Ex. 1004, ¶219. As evidence of this modification being well known, Mr. Anderson cites to three examples of prior art enclosures that include a lower recess to receive a seat support. Ex. 1004, ¶192. Each of these designs was sold and included in passenger aircraft well before the earliest claimed priority date of the '641 Patent. Ex.

1004, ¶¶76-78.

SAS MD-90 Aft-Storage October 2004	737 Storage February 1994	747 Storage December 2009
		

['641 Claim 9] The aircraft lavatory according to claim 8 wherein the first aft extending recess defined by the forward-extending upper portion, the aft-extending mid-portion, and the forward- extending lower portion of the forward partition is configured to receive an aft-extending seat back of the forward positioned passenger seat.

As described above with regard to Claim 1, Element B, the KLM Crew Rest document shows a contoured forward wall. Ex. 1004, ¶222. This contoured forward wall includes a recess

configured to receive an upwardly and aftwardly inclined seat back of a passenger seat. Id.

['641 Claim 10] The aircraft lavatory according to claim 9 wherein said forward-extending upper portion is configured to project over at least a portion of the forward-positioned passenger seat.

As explained above, the seat in the KLM Crew Rest reclines into the contour in the forward wall. Ex. 1004, ¶225. Thus, at least part of the forward wall is protrudes overtop of the upwardly and aftwardly reclined seat back. Id.

['641 Claim 12] The aircraft lavatory according to claim 9 wherein said lavatory is taller than the forward-positioned passenger seat.

See analysis of claim 4 above.

['641 Claim 13] The aircraft lavatory according to claim 8 wherein the aft partition is substantially vertical and substantially planar.

As shown in the admitted prior art of Figure 1 of the '641 Patent, the aft partition is substantially vertical and substantially planar. Ex. 1004, ¶227.

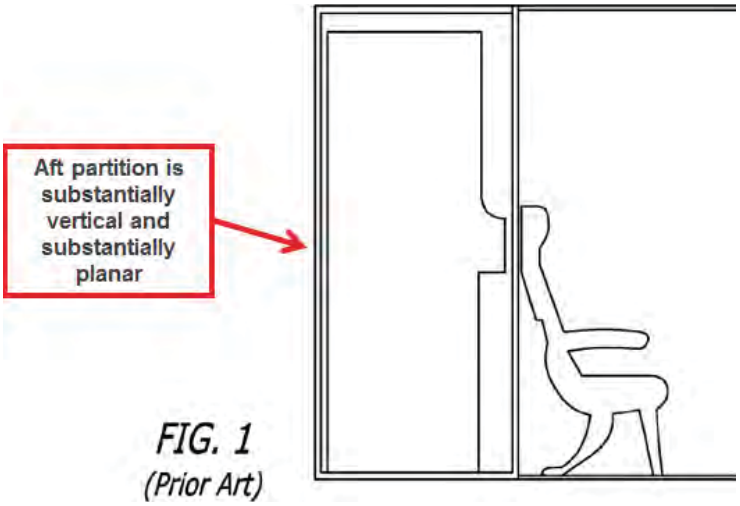


FIG. 1
(Prior Art)

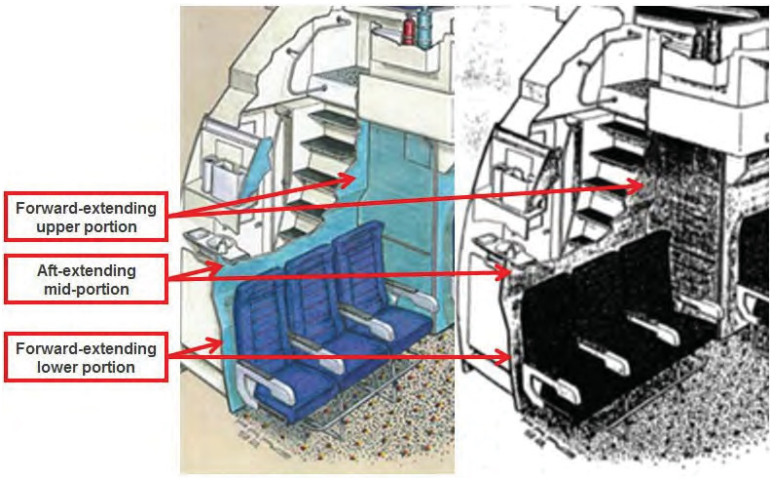
['641 Claim 14] The aircraft lavatory according to claim 8 wherein the width of the lavatory space disposed between the forward partition and the aft partition comprises an upper width, a lower width, and a mid-width, and wherein the upper width and the lower width are both substantially wider than the mid-width.

As discussed in Section V above, a person of ordinary skill in the art would be motivated to modify a flat wall lavatory to include a contoured forward wall. Ex. 1004, ¶230. A person of ordinary skill in the art would recognize that such a modification could impact the interior width of the lavatory. Id. This is clear from the positioning of the recess shown in the KLM Crew Rest rendering, which is substantially the same as Figure 2 of the '641 Patent. Id. To the extent that Figure 2 of the '641 Patent describes this limitation, the limitation is also disclosed by the KLM Crew Rest document.

Id.

['641 Claim 15] The aircraft lavatory according to claim 8 wherein the upper forward-extending portion, the aft-extending mid-portion, and the forward-extending lower portion of the forward partition form a substantially continuous surface.

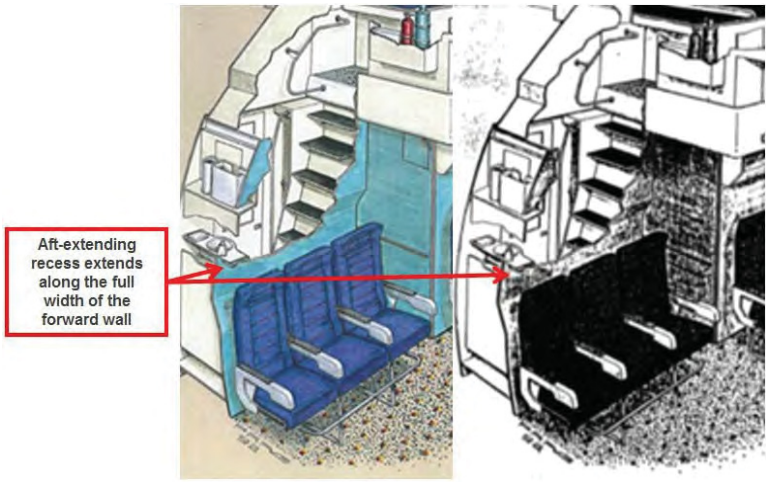
As shown in the annotated rendering of the KLM Crew Rest below, the upper forward-extending portion, the aft-extending mid-portion, and the forward- extending lower portion of the forward partition form a substantially continuous surface. Ex. 1004, ¶233.



['641 Claim 16] The aircraft lavatory according to claim 8 wherein said first aft-extending recess extends along substantially a full width of said forward partition.

The KLM Crew Rest document shows a recess

that extends along substantially the full width of the of the contoured forward partition. Ex. 1004, ¶237.



['641 Claim 17] The aircraft lavatory according to claim 8 wherein said lavatory has a top, a bottom, a height therebetween, and a middle therebetween, said lavatory has varying lengths along the height of the lavatory, and said lavatory is longer at the top of the lavatory than at the bottom of the lavatory.

The prior art lavatory shown in Figure 1 of the '641 Patent shows a lavatory that has a top, a bottom, a height therebetween, and a middle therebetween. Further, as discussed in Section V above, a person of ordinary skill in the art would be motivated to modify a flat wall lavatory to include a

contoured forward wall. Ex. 1004, ¶¶238-240. A person of ordinary skill in the art would recognize that such a modification could impact the interior of the lavatory, e.g., the width or the lengths along the height of the lavatory. Id. This is clear from the positioning of the recess shown in the KLM Crew Rest rendering which is substantially the same as Figure 2 of the '641 Patent. Ex. 1004, ¶240. To the extent that Figure 2 of the '641 Patent describes this limitation, the limitation is also disclosed by the KLM Crew Rest document. Id

XI. Any Secondary Considerations Cannot Overcome the Clear Evidence of Obviousness.

Patent Owner may attempt to overcome the clear obviousness of the challenged claims by pointing to alleged secondary considerations of non-obviousness. The Board has already considered Patent Owner's secondary considerations in the prior IPR regarding the parent '838 Patent. The Board determined that Patent Owner's secondary considerations were insufficient in the face of the strong evidence of obviousness in view of Betts. Ex. 1003, at 23-24. Patent Owner's secondary considerations fail here for the same reasons.

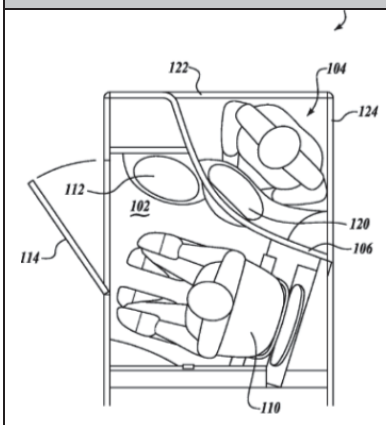
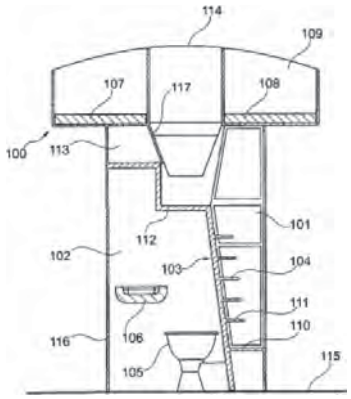
First, evidence of second considerations is significant only if there is a nexus between the claimed invention and the evidence. Ormco Corp. v. Align Tech., Inc., 463 F.3d 1299, 1311-12 (Fed. Cir. 2006) ("Evidence of commercial success, or other secondary considerations, is only significant if there is a nexus between the claimed invention and the commercial success."). All types of objective evidence

of non-obviousness must be shown to have such a nexus. Chums, Inc. v. Cablz, Inc., IPR2014-01240, Paper No. 43 at 27 (PTAB Feb. 8, 2016) (citations omitted).

Patent Owner cannot establish a nexus here because all claim elements were known in the prior art. When objective evidence results from something that is not "both claimed and novel in the claim, there is no nexus to the merits of the claimed invention." In re Kao, 639 F.3d 1057, 1068 (Fed. Cir. 2011) (emphasis in original); ClassCo, Inc. v. Apple, Inc. 838 F.3d 1214, 1220 (Fed. Cir. 2016) ("A nexus may not exist where, for example, the merits of the claimed invention were 'readily available in the prior art.'" (quoting Richdel, Inc. v. Sunspool Corp., 714 F.2d 1573, 1580 (Fed. Cir. 1983)); ArcelorMittal France v. AK Steel Corp., 700 F.3d 1317, 1325 (Fed. Cir. 2012) ("[O]ur cases make clear that the commercial success of the embodiment with additional unclaimed features is to be considered when evaluating the obviousness of the claim, provided that embodiment's success has a sufficient nexus to the claimed and novel features of the invention." (emphasis added)). No claim element is novel and there is thus no nexus to any secondary consideration of non-obviousness.

Second, contrary to Patent Owner's assertion, prior art lavatory designs included contours that intruded on the interior space of the lavatory. Ex. 1004,

¶¶60-64. Two prior art examples are shown below:

US 7,284,287, Ex. 1012	U.S. 2009/0050738 A1, Ex. 1013
	

Patent Owner's argument that one of ordinary skill in the art would not have contoured a lavatory wall or intruded on interior lavatory space simply has no merit. Further, the patent itself makes clear that the disclosure is not limited to lavatories with a wall that intrudes on passenger space. Rather, the patent explains that "the present invention can provide a more spacious lavatory or other enclosure with no need to move adjacent seats or other structures forward." Ex. 1001, 1:59- 61.

Finally, even if Patent Owner were able to establish any secondary considerations and a nexus to them, secondary considerations are insufficient to overcome a strong case of obviousness, like the one here. Wyers v. Master Lock Co., 616 F.3d 1231, 1246 (Fed. Cir. 2010) ("[S]econdary considerations of nonobviousness . . . simply cannot overcome a strong prima facie case of obviousness."); Leapfrog Enters.,

Inc. v. Fisher–Price, Inc., 485 F.3d 1157, 1162 (Fed. Cir. 2007) (holding that the objective considerations of nonobvious-ness presented, including substantial evidence of commercial success, praise, and long- felt need, were inadequate to overcome a strong showing of primary considerations that rendered the claims at issue invalid); Rothman v. Target Corp., 556 F.3d 1310, 1322 (Fed. Cir. 2009) ("a strong prima facie obviousness showing may stand even in the face of considerable evidence of secondary considerations."); Stamps.com Inc. v. Endicia, Inc., 437 Fed.Appx. 897, 905 (Fed. Cir. 2011) ("Given the strong showing of obviousness, we find that the evidence of secondary considerations was inadequate to overcome the legal conclusion that the contested claims would have been obvious.").

X. Conclusion

In view of the foregoing, Petitioner respectfully submits that there is a reasonable likelihood that Petitioner will prevail with respect to claims 8 and 10-16 of the '742 Patent. Accordingly, Petitioner requests that the Board grant this petition and initiate an *inter partes* review.

Respectfully submitted,

By: /s/ *John C. Alemanni*
John C. Alemanni
Registration No. 47,384

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CERTIFICATE OF WORD COUNT

The undersigned certifies pursuant to 37 C.F.R. § 42.24(d) that the foregoing Petition for Inter Partes Review excluding any table of contents, table of authorities, certificates of service or word count, or appendix of exhibits or claim listing, contains 12,590 words according to the word-processing program used to prepare this paper (Microsoft Word). Including annotations in figures, Petitioner certifies that this Petition for Inter Partes Review does not exceed the applicable type-volume limit of 37 C.F.R. § 42.24(a).

Dated: April 13, 2017 /s/ *John C. Alemanni*
Counsel for Petitioner

CERTIFICATE OF SERVICE

The undersigned hereby certifies that on the date below a copy of this **Petition for *Inter Partes* Review** has been served by Express Mail upon the following:

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Dated: April 13, 2017

By: */s/ John C. Alemanni*
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Lead Counsel for
Petitioner

APPENDIX G

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

C&D ZODIAC, INC.,
Petitioner

v.

B/E AEROSPACE, INC.,
Patent Owner.

Case IPR2017-01276
Patent 9,073,641
Patent 9,365,292
Patent 9,434,476
Patent 9,440,742 B2

Before JENNIFER S. BISK, SCOTT A. DANIELS, and RICHARD H. MARSCHALL, *Administrative Patent Judges*.

MARSCHALL, *Administrative Patent Judge*.

Declaration of Alan Anderson Under
37 C.F.R. § 1.68

I, Alan Anderson, declare as follows:

I. Introduction

1. My name is Alan Anderson, and I reside in Woodinville, WA. I am an independent consultant. I am over eighteen years of age, and I would otherwise be competent to testify as to the matters set forth herein if I am called upon to do so.

2. I submit this Declaration at the request of C&D Zodiac, Inc. for consideration by the Patent Trial and Appeal Board in the *Inter Partes* Reviews of U.S. Patent Nos. 9,073,641 ("the '641 patent"); 9,365,292 ("the '292 patent"); 9,434,476 ("the '476 patent"); and 9,440,472 ("the '472 patent") (collectively, "the challenged patents").

3. In forming my opinions, I rely on my knowledge and experience in the field and on documents and information referenced in this Declaration.

A. Background and Expertise

4. My CV is shown in Exhibit A following the signature line of this declaration. I earned a Bachelor of Science in Mechanical Engineering from the University of Washington in 1968.

5. From 1968 to 2011, I was employed by The Boeing Company. I first joined Boeing as an engineering designer for aircraft

interiors in 1968. I remained employed with Boeing for 43 years. In 1978, I was promoted to engineering manager, responsible for managing engineering designers. In 1988, I was promoted to senior engineering manager, responsible for managing other engineering managers. In 1992, I was promoted to Chief Engineer for 747 and 767 Payload Systems, responsible for overseeing all engineering of the aircraft cabin. I was promoted to Director of Engineering, Payload Systems in 1999, where I oversaw all engineering for airplane interiors for all models of Boeing aircraft until my retirement in 2011. Additionally, I also served as Chief Engineer for Interiors for the development of the 787 Interior from 2002 until 2008.

6. During my 43 years with Boeing, I obtained significant, broad experience with the design and configuration of interiors of commercial aircraft. I have specific experience with layout of passenger accommodations ("LOPA") for aircraft. I also have specific experience with the design of aircraft enclosures, such as lavatories, closets, and galleys.

7. I am named as an inventor on U.S. Patent No. 7,222,820, entitled "Aircraft Lavatory."

8. I maintained an active Professional Engineer license in the State of Washington during my career with Boeing.

9. I have been retained by C&D Zodiac, Inc. ("C&D Zodiac") as an expert witness in the above referenced litigation. I worked as a technical consultant for C&D Zodiac from 2012-2014. No part of my compensation from C&D Zodiac is dependent upon the outcome of these proceedings or any issue in these proceedings.

B. Information Considered

10. In forming my opinions, in addition to my knowledge and experience, I have considered the following documents and things that I have obtained, or that have been provided to me:

- U.S. Patent No. 8,590,838 (herein "'838 patent") (attached as Exhibit 1017 to the Petitions for ***inter partes*** review).
- Prosecution history for the '838 Patent.
- U.S. Patent No. 9,434,476 (herein "'476 patent").
- Prosecution history for the '476 patent.
- U.S. Patent No. 9,365,292 (herein "'292 patent").

- Prosecution history for the '292 patent.
- U.S. Patent No. 9,440,742 (herein "'742 patent).
- Prosecution history for the '742 patent.
- U.S. Patent No. 9,073,641 (herein "'641 patent")
- Prosecution history for the '641 patent.
- Documents submitted during the *inter partes* review of the '838 patent, IPR2014-00727.
- Final Written Decision in the *inter partes* review of the '838 patent, IPR2014-00727 (attached as Exhibit 1003 to the Petitions for *inter partes* review)
- U.S. Patent No. 3,738,497 to Betts *et al.,* ("Betts") (attached as Exhibit 1005 to the Petitions for *inter partes* review).
- McDonnell Douglas DC-10 Customer Configuration Summary (a/k/a Orange Book), revised October 1978 (attached as Exhibit 1020 to the Petitions for *inter partes* review).
- Crew Rest for KLM 747-400 Aircraft ("KLM Crew Rest") (attached as Exhibits 1006 and in Exhibit 1009 to the Petitions for *inter partes* review).
- U.S. Patent No. 4,884,767 to Shibata ("Shibata") (attached as Exhibit 1011 to the

Petitions for *inter partes* review).

- U.S. Patent No. 6,742,840 to Bentley ("Bentley") (attached as Exhibit 1021 to the Petitions for *inter partes* review).

- U.S. Patent No. 7,284,287 to Cooper ("Cooper") (attached as Exhibit 1012 to the Petitions for *inter partes* review).

- U.S. 2009/0050738 A1 to Breuer ("Breuer") (attached as Exhibit 1013 to the Petitions for *inter partes* review).

- C&D Aerospace SAS S4 MD-90 Aft-Storage ("MD-90 Storage" or "S4 Storage") C&D0086593-94; C&D0075655-681 (attached as Exhibit 1018, at pages 19-20 and 49-75 to the Petitions for *inter partes* review).

- Heath Tecna Qantas 737 Storage ("737 Storage") C&D0075650, C&D0079852 (attached as Exhibit 1019, at page 10 to the Petitions for *inter partes* review)

- Heath Tecna Qantas 747 Storage ("747 Storage") C&D0075683,

- HT0001550 (attached as Exhibit 1019, at page 104 to the Petitions for *inter partes* review).

- Declaration of Vince Huard dated March 10, 2017 and supporting Exhibits (attached as Exhibit 1019 to this Declaration).

- Declaration of Scott Savian dated March 20, 2017 (attached as Exhibit 1018 to this Declaration)

- Declaration of Paul Sobotta submitted in IPR2017-00727, dated April 2, 2015 (attached as Exhibit 1007 to the Petitions for *inter partes* review).

- Transcript of March 15, 2017, Deposition of Robert Papke.

- Other documents cited herein.

II. LEGAL STANDARDS FOR PATENTABILITY

11. In expressing my opinions and considering the subject matter of the claims of the '292, '476, '641, and '742 patents (collectively "the Challenged Patents"), I am relying upon certain legal principles that counsel has explained to me.

12. First, I understand that for an invention claimed in a patent to be found patentable, it must be, among other things, new and not obvious from what was known before the invention was made.

13. I understand the information that is used to evaluate whether an invention is new and not obvious is generally referred to as "prior art" and generally includes patents

and printed publications (e.g., books, articles, product manuals, company publications, etc.).

14. I understand that in this proceeding C&D Zodiac, Inc. has the burden of proving that the claims of the patents-at-issue are anticipated by or obvious from the prior art by a preponderance of the evidence. I understand that "a preponderance of the evidence" is evidence sufficient to show that a fact is more likely true than it is not true.

15. I understand that in this proceeding, the claims must be given their broadest reasonable interpretation consistent with the specification. The claims after being given their broadest reasonable interpretation are then to be compared to the information disclosed in the prior art.

16. I understand that in this proceeding, the information that may be evaluated is limited to patents and printed publications. My analysis below compares the claims to patents and printed publications that I understand are prior art to the patents-at-issue.

17. I understand that there are two ways in which prior art may render a patent claim unpatentable. First, the prior art can be shown to "anticipate" the claim. Second, the prior art can be shown to have made

the claim "obvious" to a person of ordinary skill in the art. My understanding of the two legal standards is set forth below.

A. Anticipation

18. I understand that a claimed invention is not patentable if it is anticipated by the prior art. I understand that the following standards govern the determination of whether a patent claim is "anticipated" by the prior art.

19. I understand that the "prior art" includes patents and printed publications that existed before the earliest filing date (the "effective filing date") of the patent. I also understand that a patent will be prior art if it was filed before the effective filing date, while a printed publication will be prior art if it was publicly available before that date.

20. I understand that, for a patent claim to be "anticipated" by the prior art, each and every requirement of the claim must be found, expressly or inherently, in a single prior art reference. I understand that a prior art reference inherently discloses a claim limitation if the limitation is necessarily present in the reference.

B. Obviousness

21. I understand that a claimed invention is not patentable if it would have been obvious to a person of ordinary skill in the field of the invention at the time the invention was made. I understand that the following standards govern the determination of whether a claim in a patent is obvious.

22. I understand that to find a claim in a patent obvious, one must make certain findings regarding the claimed invention and the prior art. Specifically, I understand that the obviousness question requires consideration of four factors (although not necessarily in the following order):

- The scope and content of the prior art;
- The differences between the prior art and the claims at issue;
- The knowledge of a person of ordinary skill in the pertinent art; and
- Whatever objective factors indicating obviousness or non-obviousness may be present in any particular case.

23. I understand that the objective indicia that may bear on the question of obviousness or non-obviousness include whether the claimed invention proceeded

in a direction contrary to the accepted wisdom in the field, whether there was a long-felt but unresolved need in the field that was satisfied by the claimed invention, whether others had tried but failed to make the claimed invention, whether others copied the claimed invention, whether the claimed invention achieved any unexpected results, whether the claimed invention was praised by others, whether others have taken licenses to use the claimed invention, whether experts or those skilled in the field of the claimed invention expressed surprise or disbelief regarding the claimed invention, and whether products incorporating the claimed invention have achieved commercial success.

24. In addition, I understand that the obviousness inquiry should not be done in hindsight, but must be done using the perspective of a person of ordinary skill in the relevant art as of the effective filing date of the patent.

25. I also understand that under the correct analysis, any need or problem known in the field of endeavor at the time of invention and addressed by the patent can provide a reason for combining the elements in the manner claimed. I also understand that the combination of familiar elements according to known methods is likely to be obvious when it

does no more than yield predictable results. I further understand that the following are examples of other factors that may show obviousness:

- a combination that only unites old elements with no change in their respective functions is unpatentable. As a result, the combination of familiar elements according to known methods is likely to be obvious when it does no more than yield predictable results,

- a predictable variation of a work in the same or a different field of endeavor is likely obvious if a person of ordinary skill would be able to implement the variation,

- an invention is obvious if it is the use of a known technique to improve a similar device in the same way, unless the actual application of the technique would have been beyond the skill of the person of ordinary skill in the art. In this case, a key inquiry is whether the improvement is more than the predictable use of prior art elements according to their established functions,

- an invention is obvious if there existed at the time of invention a known problem for which there was an obvious solution encompassed by the patent's claims.

- inventions that were "obvious to try" — chosen from a finite number of identified, predictable solutions, with a reasonable expectation of success — are likely obvious,

- known work in one field of endeavor may prompt variations of it for use in either the same field or a different one based on design incentives or other market forces if the variations would have been predictable to one of ordinary skill in the art, and

- an explicit teaching, suggestion, or motivation in the art to combine references, while not a requirement for a finding of obviousness, is a helpful insight in determining on which a finding of obviousness may be based.

26. Finally, I understand that even if a claimed invention involves more than substitution of one known element for another or the application of a known technique to a piece of prior art ready for improvement, the invention may still be obvious. I also understand that in such circumstances courts may need to look to interrelated teachings of multiple patents; the effects of demands known to the design community or present in the marketplace; and the background knowledge possessed by a person having ordinary skill in the art to determine if the claimed invention is obvious

III. Person of Ordinary Skill in the Art

27. It is my opinion that the field of the Challenged Patents is aircraft interior design, specifically the design of aircraft

enclosures, such as lavatories, closets, and galleys. *[See* '476 patent, 1:16-20].

28. It is my opinion that one of ordinary skill in the art as of April 20, 2010, the earliest claimed priority date of the Challenged Patents, would have had a bachelor's degree in mechanical engineering, industrial design, or a similar discipline, or the equivalent experience, with at least two years of experience in the field of aircraft interior design.

29. While a formal bachelor's degree is recited above in my definition, the term "equivalent experience" is meant to include a person who may have achieved the equivalent knowledge through years of experience in the field of aircraft interior design.

30. As I explain above, I have worked in the area of aircraft interior design for many years, and I consider myself to be at least a person of ordinary skill in the art.

IV. Claim Interpretation

31. In coming to the opinions stated herein I have analyzed the claim terms and interpreted them to have their broadest reasonable construction consistent with the specification of the challenged patents. I reserve the right to provide

supplemental opinions on the meaning of terms used by the claims.

V. The Challenged Patents

32. Each of the four Challenged Patents is entitled "Aircraft Interior Lavatory" and has the same specification and figures. Each of the four Challenged Patents claims priority to Application No. 13/089,063, which issued as the '838 patent. The earliest claimed priority date of the '838 patent is the April 20, 2010 filing date of Provisional Application No. 61/326,198. Each of the prior art references I address herein was available prior to April 20, 2010, thus I have not analyzed whether each claim of the Challenged Patents is entitled to the claimed priority date.

33. According to the Background section of the Challenged Patents, prior art aircraft enclosures, such as lavatories or closets, had forward walls that are flat in a vertical plane. The Challenged Patents further explain that the prior art flat forward walls cause inefficient use of space when juxtaposed with the contoured seatback of passenger seats installed forward of the enclosures:

"Aircraft lavatories, closets and other full height enclosures commonly have forward walls that are flat in a vertical plane. Structures such as

passenger seats installed forward of such aircraft lavatories, closets and similar full height enclosures often have shapes that are contoured in the vertical plane. The juxtaposition of these flat walled enclosures and contoured structures renders significant volumes unusable to both the function of the flat walled lavatory or enclosure and the function of the contoured seat or other structure."

['476 patent, at 1:24-32].

34. Figure 1 of the Challenged Patents depicts an example of a prior art installation of an enclosure with a flat forward wall aft of and adjacent to a typical prior art passenger seat:

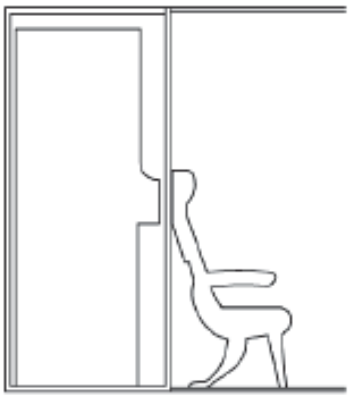


FIG. 1
(Prior Art)

35. The Background section of the Challenged Patents further provides that it would be desirable to provide for more efficient use of space in the aircraft interior:

> "It would be desirable to provide an aircraft lavatory or other enclosure that can reduce or eliminate the gaps and volumes of space previously required between lavatory enclosures and adjacent structures to allow an adjacent structure such as passenger seating installed forward of the lavatory or other enclosure to be installed further aft, providing more space forward of the lavatory or enclosure for passenger seating or other features than has been possible in the prior art. Alternatively, the present invention can provide a more spacious lavatory or other enclosure with no need to move adjacent seats or other structures forward."

['476 patent, at 1:54-64].

36. The Challenged Patents provide a forward wall of an enclosure with an aft-extending recess to receive the aft portion of the passenger seat installed forward of the enclosure. The forward wall of the Challenged Patents is shaped to substantially conform to the shape of the passenger seat or other cabin structure immediately forward of the enclosure.

37. Figure 2 of the Challenged Patents is a schematic diagram of an installation of a lavatory "according to the present invention" that is immediately aft of a passenger seat:

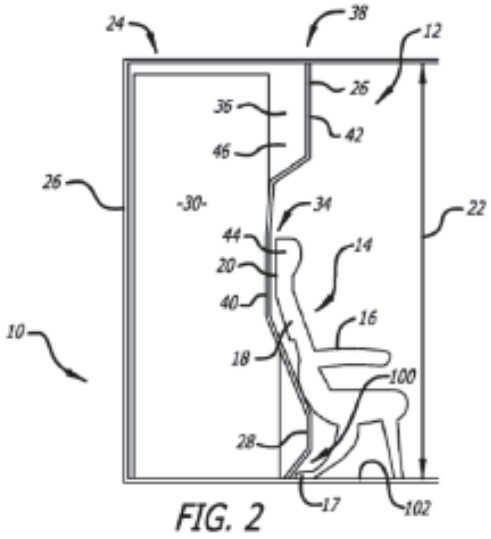


FIG. 2

38. Figure 2 is the only embodiment of the alleged invention depicted in the Challenged Patents. The only difference between Figure 1 (the prior art) and Figure 2 (the embodiment of the alleged invention) is the shape of the forward wall of the lavatory enclosure.

39. In a "preferred aspect" the Challenged Patents provide that the enclosure unit is a lavatory. ['476 patent, 2:53-55]. The specification does not, however, describe that the space-saving design of the forward wall is particularly suitable for lavatories as compared to other enclosure units. Instead, the specification of the '476 patent states that the forward wall is advantageous for lavatories or other enclosures, including closets or galleys.

[See '476 patent, 2:1722 ("Briefly, and in general terms, the present invention provides for an enclosure, such as a lavatory, an aircraft closet, or an aircraft galley, for example, for a cabin of an aircraft including a structure having an aft portion with a substantially vertically extending exterior aft surface that is substantially not flat in a vertical plane."); 2:31-33 ("The enclosure unit can be a lavatory, an aircraft closet, or an aircraft galley, for example."); 4:18-22 ("the present invention provides for an enclosure 10, such as a lavatory for a cabin 12 of an aircraft (not shown), although the enclosure may also be an aircraft closet, or an aircraft galley, or similar enclosed or structurally defined spaces, for example.")].

40. Similarly, during prosecution of the '838 Patent, to which each of the Challenged Patents claims priority, the applicant did not distinguish between lavatories and other enclosures:

"As is discussed in paragraph 0005 of the specification of the present application, it is desirable to provide an aircraft lavatory or other enclosure that can reduce or eliminate gaps and volumes of space such as would occur in Thompson after of the rear group of seats, to allow adjacent passenger seating installed forward of the lavatory or other enclosure to be installed further aft, providing more space

forward of the lavatory or enclosure for passenger seating or other features that has been heretofore possible in the prior art."

['838 prosecution history, pp. 260-261 (April 3, 2013 Response to Non-Final Office Action)].

41. Thus, the Challenged Patents equate various types of aircraft enclosures and provides that their forward wall design would be suitable for any such enclosure.

42. Further, the Challenged Patents describe the exterior, but do not describe interior fixtures, such as whether there is a toilet, plumbing, electrical systems, etc., which a person of skill in the art would know may be installed in the lavatory.

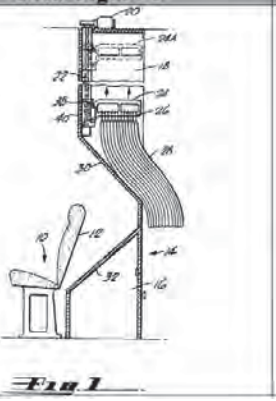
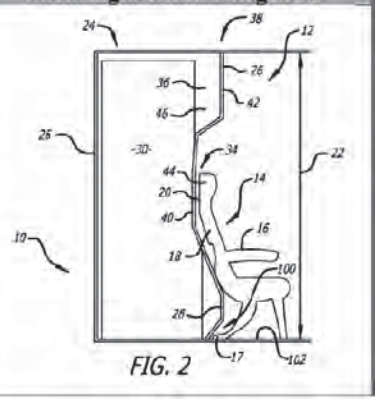
VI. PRIOR ART

A. U.S. Patent No. 3,738,497 to Betts ("Betts")

43. U.S. Patent No. 3,738,497 to Betts *et al.* ("Betts") is assigned to McDonnell Douglas Corporation and issued on June 12, 1973 from Application No. 148,459. This design was implemented and flown on commercial DC-10 aircraft. I understand that Betts qualifies as prior art to each of the Challenged Patents.

44. Figure 1 of Betts is a side elevation that shows an assembly of an overhead coat closet for a cabin of an aircraft that is

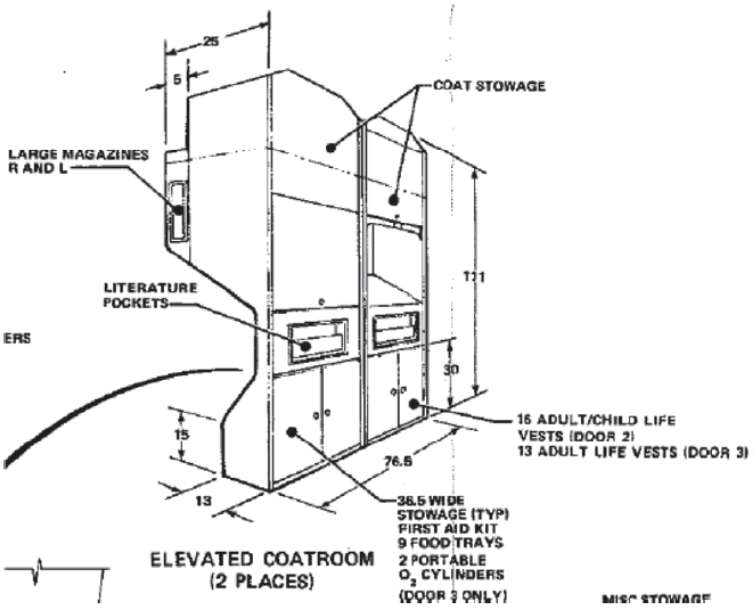
located immediately aft of and adjacent to a passenger seat and is nearly identical to Figure 2 of the Challenged Patents:

Betts Figure 1	Challenged Patents Figure 2
	

45. Figure 1 of Betts is likely not drawn to scale. However, it shows the intended functionality of the concept disclosed in Betts. This concept includes a recessed wall to provide additional space for passengers in the cabin of an aircraft. *See* Betts, Abstract ("to provide more passenger room"); 1:6-7 ("provide more room for passengers in an aircraft or other vehicle"); 2:19-24 ("The lower portion 30 of the coat compartment 18 slants rearwardly to provide a space for seatback 12 to be tilted rearwardly as desired by the occupant. The top 32 of storage space 16 also slants rearwardly so as not to interfere with seatback 12 when tilted."). The passenger seat back shown in Figure 1 closely conforms to the shape of the recess in the forward wall of the

enclosure. A person of ordinary skill in the art would understand that the Betts coat closet includes walls forming an enclosure of the closet.

46. The Betts closet was installed on DC-10 aircraft. I saw the Betts closet as a passenger on at least one commercial flight. I have reviewed the DC-10 Customer Configuration Summary, which was an Exhibit in the inter partes review of the '838 patent. *See* McDonnell Douglas DC-10 Customer Configuration Summary, revised October 1978, attached as Exhibit 1004 to IPR2014-00727. This documents shows the commercial embodiment of the Betts closet, which I have pasted below. I do not rely on this commercial embodiment in coming to my conclusion that the Challenged Patents are invalid. However, its commercial embodiments confirm my understanding and memory of the concept disclosed in Betts. The image below is captured from page 145 of the document.



B. Crew Rest for KLM 747-400 Aircraft ("KLM Crew Rest")

47. I understand that on or about 1991 FSI was awarded a contract to develop a crew rest for Royal Dutch Airlines, better known as KLM. Sobotta Declaration, at ¶ 7. Specifically, FSI was awarded a contract to develop an overhead crew rest for KLM's 747-400 aircraft. FSI developed the KLM Crew Rest during 1991 and 1992. Sobotta Declaration, at ¶ 7.

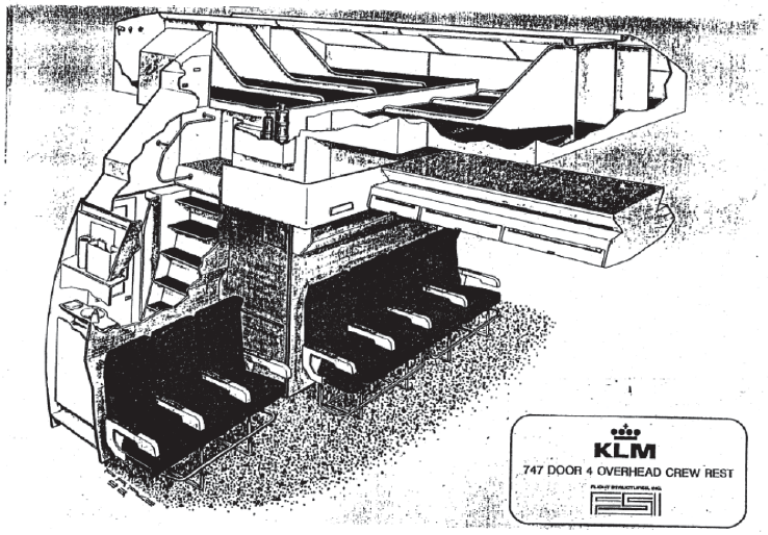
48. The KLM Crew Rest was designed to include overhead berths in the overhead space of KLM's 747-400 aircraft for crew members to rest and sleep during lengthy

flights. Sobotta Declaration, at ¶ 9. Including these overhead berths allowed crew members to rest outside of the passenger area. This increased the space available to passengers in the passenger area, and thus increased the amount of revenue space in the aircraft. The airline could use this space to include additional seats or more space for seats with more recline and leg room.

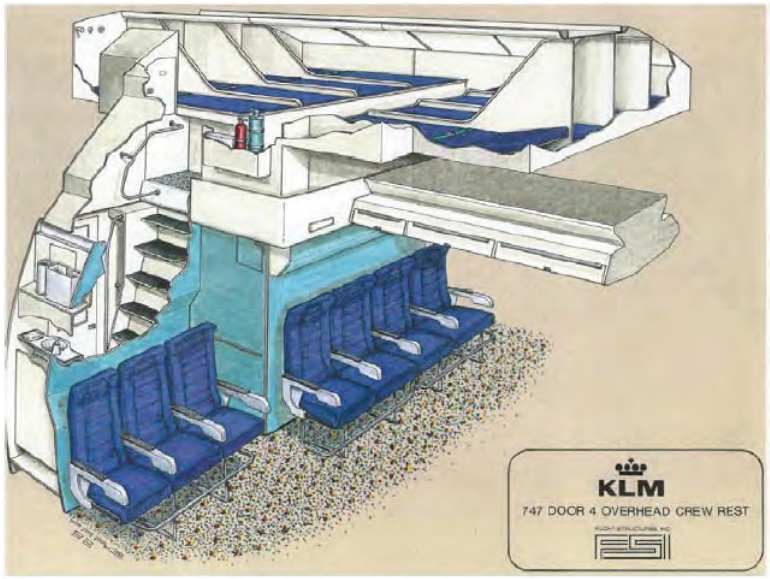
49. I understand that to provide crew member access to the overhead crew rest, FSI designed an entry in front of door 4 (i.e., the fourth door from the front of the aircraft) on the right side of the aircraft. The entry was modeled on a lavatory envelope (i.e., the outer walls forming a lavatory enclosure) and was located at a typical location for a lavatory on a 747-400 aircraft. Sobotta Declaration, at ¶ 10. To provide entry to the overhead crew rest, the interior of lavatory envelope was modified to include a staircase in place of a toilet, which allows crew to access the overhead space. Sobotta Declaration, at ¶ 10.

50. I understand that the crew rest, including the recessed forward wall of the crew rest entry, was put into service on or about November 9, 1992, and was manufactured in Arlington, Washington. Sobotta Declaration, at ¶ 19. I understand that this product, referred to herein as the

KLM Crew Rest qualifies as prior art to each of the Challenged Patents. A rendering of the prior art KLM Crew Rest is shown below.



51. An additional rendering of the KLM Crew Rest is shown below:



VII. SUMMARY OF OPINIONS

52. As explained in further detail in the following paragraphs, in my opinion at least the following claims are invalid in view of both: (1) a prior art flat wall lavatory in view of Betts; and (2) a prior art flat wall lavatory in view of the KLM Crew Rest:

- claims 1-12 of U.S. Patent No. 9,365,292;
- claims 1-6 of U.S. Patent No. 9,434,476;
- claims 1, 3-10, and 12-17 of U.S. Patent No. 9,073,641; and
- claims 8 and 10-16 of U.S. Patent No. 9,440,742.

A. Flat Wall Lavatories were Well-Known Prior Art.

53. A flat wall lavatory was well known in the art prior to the earliest claimed priority date of the Challenged Patents. Figure 1 of the Challenged Patents shows a flat wall lavatory and states that such a lavatory was "prior art." '476 Patent at col. 4:6-8 ("FIG. 1 is a schematic diagram of a prior art installation of a lavatory immediately aft of and adjacent to an aircraft passenger seat.")

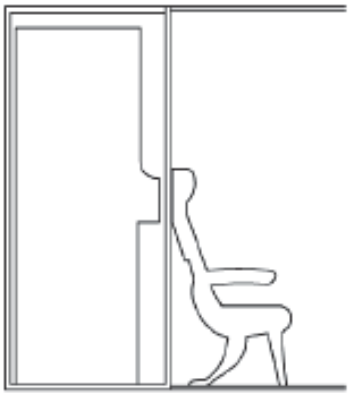


FIG. 1
(Prior Art)

54. Further, the Challenged Patent's description includes additional admissions that such lavatories were known prior art. "Aircraft lavatories, closets and other full height enclosures commonly have forward walls that are flat in a vertical plane." '476 Patent at col. 1:24-26.

55. To the extent that the Challenged Patents do not expressly admit that flat wall lavatories were well known in the art, it is clear from U.S. Patent No. 4,884,767 to Shibata ("Shibata") that flat wall lavatories were well known in the art. Shibata issued in 1989 and includes Figures showing flat wall lavatories, which it admits were prior art as of its filing date, 1988.

FIG.3
PRIOR ART

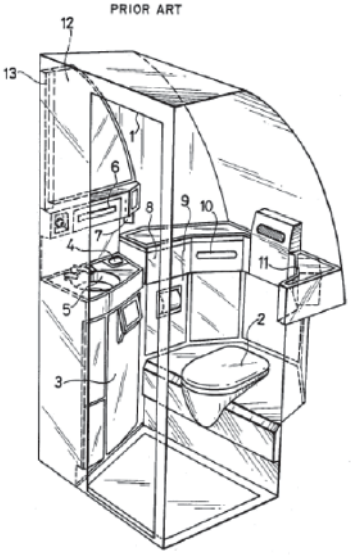
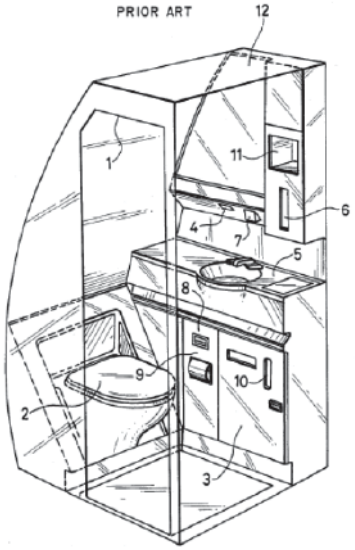


FIG.4
PRIOR ART



B. It Would Have Been Obvious to Modify a Prior Art Flat Wall Lavatory to Include the Curved Forward Wall Shown in Betts

56. As discussed above, a flat wall lavatory was well known in the prior art before the earliest claimed priority date of the Challenged Patents. In my opinion it would have been obvious to one of ordinary skill in the art to modify a prior art flat wall lavatory to include a curved forward wall like the wall shown in Betts.

57. A primary goal of the design of interiors of commercial aircraft is efficient use of valuable passenger cabin space. Efficient use of space allows an aircraft to accommodate more passengers and/or to accommodate passengers more comfortably, thereby increasing the utility of the aircraft. As of April 2010, a primary motivation of one of ordinary skill in the art of aircraft interior design would have been to make efficient use of space in the aircraft interior cabin.

58. The curved forward facing wall shown in Betts advantageously provides additional space to locate a seat further aft in an aircraft. Betts says that the coat hanger rack is elevated to "provide more room for passengers in an aircraft." Betts, 1:5-7, Abstract ("A coat hanger rack silently elevated above passenger seats to store

coats overhead and to provide more passenger room."). As shown in the figure below, the seat shown in Betts could not be located in the position in which it is shown if the forward wall were flat. Thus, this curved forward wall makes more efficient use of the valuable space in the aircraft passenger cabin than would be available with a flat forward wall.

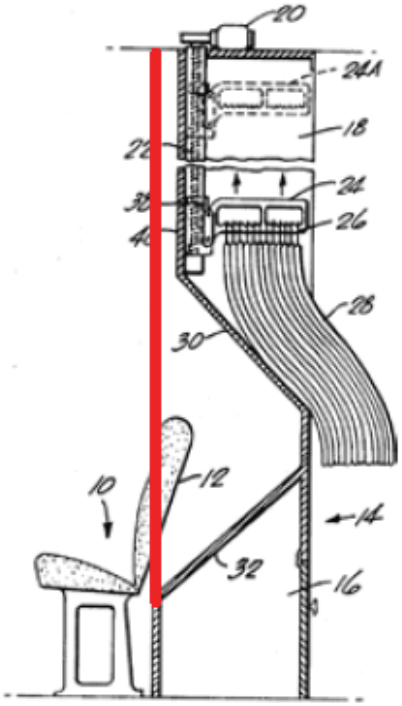


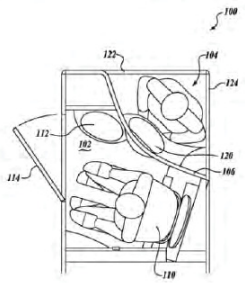
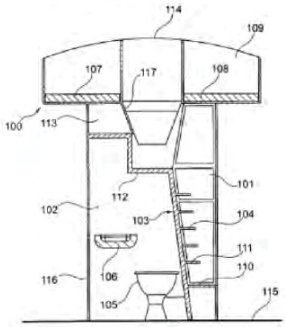
Fig. 1

59. Further, one of ordinary skill in the art would understand that the forward wall of the enclosure shown in Betts would also be suitable for use with other aircraft enclosures, including lavatories. In an aircraft, as you move a row of seats further aft, the first thing that would make contact with a flat wall is the top of the back of the seat. For this reason, Betts includes a recess to receive that portion of the seat back. Including the curved wall of Betts in a lavatory would achieve the same benefit, allowing the row of seats placed immediately in front of that curved wall to be placed further aft. A person of ordinary skill in the art would have been motivated to apply the curved wall of Betts to a lavatory to achieve that same benefit. Thus, combining different types of enclosures and employing different types and designs of recesses would have been obvious to one of skill in the art.

60. I understand that Patent Owner has asserted that one of ordinary skill in the art would not apply a curved wall to a lavatory because it would take up interior space in the lavatory. I disagree with this assertion for a number of reasons. First, one of ordinary skill in the art would understand that applying a recess to a forward wall of a lavatory would not necessarily take up interior space passenger space in the lavatory. Further, the Challenged Patents themselves make

clear that the design may actually "provide a more spacious lavatory," and thus the design is not required to encroach on the space of the passenger. *See* '476 Patent at 1:62-64 ("Alternatively, the present invention can provide more spacious lavatory or other enclosure with no need to move adjacent seats or other structures forward.").

61. In addition, other prior art references clearly show a lavatory wall that is either curved or slanted could be used in an aircraft lavatory. Two examples are shown below:

US 7,284,287 to Cooper ("Cooper")	U.S. 2009/0050738 A1 to Breuer ("Breuer")
	

62. I am informed that both Cooper and Breuer are prior art to the Challenged Patents, and both make clear that it was well known in the art to use curved or slanted lavatory walls in aircraft lavatories prior to the filing date of the Challenged Patents

63. Over the course of my career, lavatory manufacturers have tended to decrease the size of lavatories. For example, aircraft designs in the 1960s and 1970s often included space for passengers to change clothes. Over time as additional seats were included on the aircraft, lavatory space shrunk. Using a curved wall on a lavatory is just the next logical step in this progression as airlines accept smaller lavatories

64. Further, a person of ordinary skill in the art would recognize that many aircraft already include smaller lavatories, such as those in the forward area of the aircraft cabin. These lavatories are often smaller due to the curvature of the aircraft. One example is the 737, which often has a lavatory directly behind the cockpit. This lavatory has a smaller depth than lavatories at the rear of the aircraft, in part because of the curvature of the shaped exterior of the front of the aircraft.

C. It Would Have Been Obvious to Modify a Prior Art Flat Wall Lavatory to Include the Curved Forward Wall Shown in the KLM Crew Rest

65. As discussed above, a flat wall lavatory was well known in the prior art before the earliest claimed priority date of the Challenged Patents. In my opinion it

would have been obvious to one of ordinary skill in the art to modify a prior art flat wall lavatory to include a curved forward wall like the forward wall shown in the KLM Crew Rest.

66. A primary goal of the design of interiors of commercial aircraft is efficient use of valuable passenger cabin space. Efficient use of space allows an aircraft to accommodate more passengers and/or to accommodate passengers more comfortably, thereby increasing the utility of the aircraft. As of April 2010, a primary motivation of one of ordinary skill in the art of aircraft interior design would have been to make efficient use of space in the aircraft interior cabin. The curved forward facing wall shown in the KLM Crew Rest advantageously provides additional space to locate a seat further aft in an aircraft. The recess in the KLM Crew Rest was designed to allow the last row of seats in front of the curved wall to sit further aft in the aircraft while still having the ability to recline. Sobotta Declaration, at ¶ 13. Were recline not required, a person of ordinary skill in the art also would understand that a recessed forward wall could be provided to receive the seat back of an unreclined passenger seat, allowing it to be placed further aft than would be possible with a flat wall design.

67. The seat in the KLM Crew Rest could not be located in the position in which it is shown if the forward wall were flat, because a flat wall would restrict the passenger's ability to recline the seat, which was not permitted by the customer requirements for the KLM Crew Rest. Sobotta Declaration, at ¶ 12. One of ordinary skill in the art would understand that the forward wall of the enclosure used by the KLM Crew Rest would be suitable for use in a lavatory, at least because the KLM Crew rest itself is based on a lavatory envelope, without a toilet, but including "a lavatory sink (and related plumbing), lighting, a mirror, soap dispenser, shaver outlet and amenity stowage." Sobotta Declaration, at ¶ 16.

68. Further one of ordinary skill in the art would recognize that in an aircraft, as you move a row of seats further aft, the first thing that would make contact with a flat wall is the top of the back of the seat. For this reason, the KLM Crew Rest includes a recessed forward wall that receives that portion of the seat back. Including the curved wall of the KLM Crew Rest allows the row of seats placed immediately in front of that curved wall to be placed further aft. Thus, combining different types of enclosures (e.g., a flat wall lavatory with the curved wall lavatory design of the KLM Crew Rest) and employing different types and designs of

recesses would have been obvious to one of skill in the art.

69. Further, one of the designers of the KLM Crew Rest, Robert Papke, confirmed during direct testimony elicited by attorneys for B/E Aerospace that this curved wall of the KLM Crew Rest was the really logical way to allow seats to be placed further aft in an aircraft. *See* Papke Tr. at 190:1-11:

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Q. When you developed the vestibule with the indentation in it, was your design motivated by some prior system?

MR. REED: Object to form.

THE WITNESS: No. It was defined by the need or the requirements of the airline to provide their recline. There was only one really logical way to get there and still have a usable space for access into the crew rest and provide the closet space that they requested adjacent to the stair housing -- or staircase, itself.

70. For the reasons discussed above, BE's arguments for why a lavatory would not use a curved wall are both incorrect. Other prior art references clearly show a lavatory wall that is either curved or slanted could be used in an aircraft lavatory. *See, e.g.,* Cooper and Breuer.

71. Further, as I explain above, over the course of my career, lavatory

manufacturers have tended to decrease the size of lavatories. For example, aircraft designs in the 1960s and 1970s often included space for passengers to change clothes. Over time as additional seats were included on the aircraft, lavatory space shrunk. Using a curved wall on a lavatory is just the next logical step in this progression as airlines accept smaller lavatories.

72. Further, a person of ordinary skill in the art would recognize that many aircraft already include smaller lavatories, such as those in the forward area of the aircraft cabin. These lavatories are often smaller due to the curvature of the aircraft. One example is the 737, which often has a lavatory directly behind the cockpit. This lavatory has a smaller depth than lavatories at the rear of the aircraft, in part because of the curvature of the shaped exterior of the front of the aircraft.

D. It Would Have Been Obvious to Modify a Prior Art Flat Wall Lavatory to Include a Lower Recess to Receive Seat Supports.

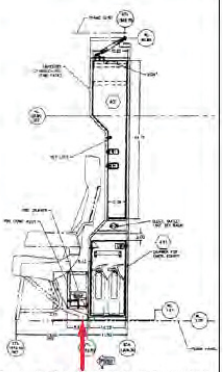
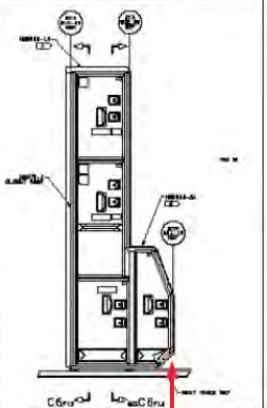
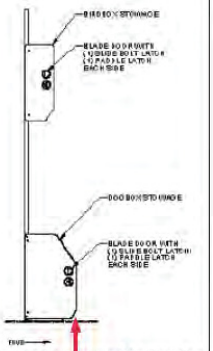
73. As discussed above, a flat wall lavatory was well known in the prior art before the earliest claimed priority date of the Challenged Patents. In my opinion it would have been obvious to one of ordinary skill in the art to modify a prior

art flat wall lavatory to include a recess in the lower part of the wall to receive seat supports.

74. As discussed above, as of April 2010, a primary motivation of one of ordinary skill in the art of aircraft interior design would have been to make efficient use of space in the aircraft interior cabin. One way to accomplish a more efficient use of space is to reduce the space between seats and monuments in the aircraft (e.g., walls for closets or lavatories). Prior art seats vary in terms of the distance that the seat supports extend in the aft direction. As seats are moved closer to these monuments, the rearmost component of the seat may impact the monument. As discussed above, a person of ordinary skill in the art would recognize that as a seat is moved further aft the seat support necessarily is also moved further aft. As the seat is moved aft the feet of the seat support may come into contact with the lower section of the wall. Creating one or more recesses to accommodate whatever portion(s) of the seat support that would contact the forward wall of the enclosure is the obvious solution to this known problem.

75. Many prior art monuments included a lower recess to accommodate the rear seat support. The images of the MD-90 Storage, 737 Storage, and 747 Storage

enclosure units are three examples of enclosure units with a floor-level recess to allow seat supports to be positioned further aft in the cabin. I understand that each of these designs is prior art but that these designs are not available as prior art in this proceeding even though they pre-date the earliest priority date for the Challenged Patents. Thus, I do not rely on these designs as a basis for invalidity. However, these designs inform my opinion by confirming that lower recesses were a well-known solution to provide space for seat supports where a recess for a seat back in the forward wall of the enclosure unit permitted the seat to be located further aft. Thus, floor-level recesses for seat supports would have been obvious to a person of ordinary skill in the art.

MD-90 Storage	737 Storage	747 Storage
 Recess Configured to Receive Aft-Extending Seat Support	 Recess Configured to Receive Aft-Extending Seat Support	 Recess Configured to Receive Aft-Extending Seat Support

76. With regard to the SAS S4 Aft-Storage for the MD-90 ("MD-90 Storage" or "S4 Storage"), I understand that on or around September and October 2004 C&D Aerospace shipped stowage assemblies incorporating a curved wall design (called the S4 enclosure) to Scandinavian Airlines System (better known as "SAS") and that this product was shipped from a C&D facility in California. Savian Declaration, at ¶¶ 11-15. I also understand that on or around August 2001 C&D Aerospace offered these S4 enclosures for sale to SAS. Savian Declaration, at ¶¶ 11-15. As is shown in the figure above, the MD-90 Storage includes a wall with a forward facing recess to receive a seatback when the seat is in an unreclined position. The MD-90 Storage also includes a lower recess configured to receive the rear seat legs. The two recesses enable the seat to be positioned further rearward than they would be positioned if the face of the wall were flat. Further, a tie rod is visible indicating that the MD-90 Storage is affixed to the top of the ceiling.

77. With regard to the Heath Tecna Qantas 737 Storage ("737 Storage"), I understand that on or around February 9, 2004, Heath Tecna offered to sell a design for a curved wall stowage assembly to Qantas for use in the Boeing 737 aircraft. *See*

Huard Decl. at ¶¶ 8-16. I understand that this product, which I refer to as the 737 Storage, qualifies as prior art to each of the Challenged Patents. A drawing of the prior art 737 Storage is shown above. As is shown above, the 737 Storage includes a lower recess configured to receive the rear seat legs. This recess allows a seat to be positioned closer to the front face of the wall than would be possible if the wall were flat. I note that the lower storage shown above is not a doghouse attached to the front of a flat-walled closet, but rather an integral part of the enclosure. Indeed, it is clear from the drawing that this is a unified structure. Further, I understand that the forward wall is shaped to conform to the shape of a passenger seat located immediately in front of the forward wall shown above. Huard Decl. at ¶ 10. Further, as shown above, the forward wall is contoured to include a chamfer that forms a recess at floor level to receive passenger seat legs. Huard Decl. at ¶ 10.

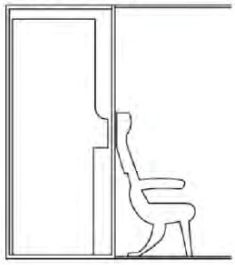
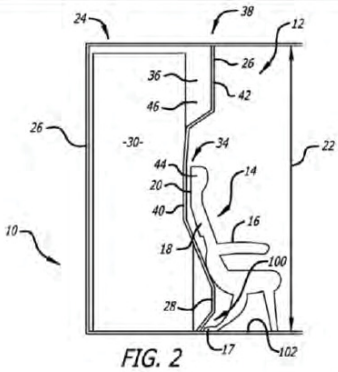
78. With regard to the Heath Tecna Qantas 747 Storage ("747 Storage"), I understand that on or around December 14, 2009, Heath Tecna sold a design for a curved wall stowage assembly to Qantas for use in the Boeing 747 aircraft. See Huard Decl. at ¶¶ 8-16. I understand that this product, which I refer to as the 747 Storage, qualifies as prior art to each of the Challenged Patents. A rendering of

the prior art 747 Storage is shown above. As is shown above, the 747 Storage includes a lower recess configured to receive the rear seat legs. This recess allows a seat to be positioned closer to the front face of the wall than would be possible if the wall were flat.

79. A person of ordinary skill in the art would be motivated to modify a flat wall lavatory or a flat wall lavatory modified as discussed above to include a recess in the lower part of the wall. This modification provides for the predictable result of more efficient use of space, allowing for more seats in a cabin by moving the aftmost row further aft in the cabin.

E. Airplane Seats were Well Known in the Prior Art and It would have been Obvious to Position a Known Airplane Seat in Front of a Curved Wall Lavatory

80. Airplane seats were well known in the art before the earliest claimed priority date of the Challenged Patents. The Challenged Patents admit that passenger seats were well known in the art. The seat shown in Figure 1 (prior art) of the Challenged Patents is the same as the seat shown in Figure 2. As reflected in the Challenged Patents, the shape of passenger seats was known to a person of ordinary skill in the art.

Challenged Patents Figure 1 (Prior Art)	Challenged Patents Figure 2
 FIG. 1 (Prior Art)	 FIG. 2

81. Further, both Betts or the KLM Crew Rest shows an airplane passenger seat. Each of these seats include well known components, e.g., "a seat back with an exterior aft surface that is substantially not flat," "a seat bottom," "seat support that interfaces with the floor of the aircraft cabin and holds the seat bottom in an elevated position above the floor of the aircraft cabin."

82. Further, to the extent any of these aspects of a passenger seat are not fully disclosed in the above references, they are plainly shown in U.S. Patent No. 6,742,840 to Bentley ("Bentley"). Bentley issued on June 1, 2004, and I understand that Bentley is prior art to each of the Challenged Patents. Bentley describes an adjustable airplane seat, which is

substantially the same as the seat shown in Figures 1 and 2 of the Challenged Patents. Figures 2A-C and 5 from the prior art Bentley patent are shown below.

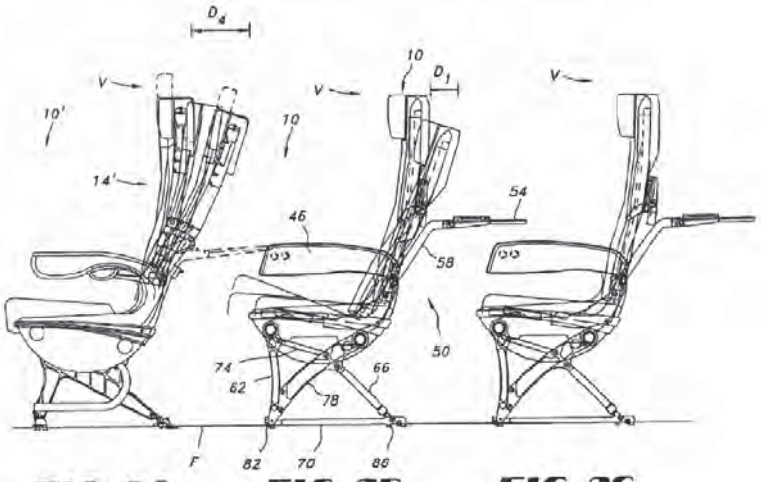


FIG 2A FIG 2B FIG 2C

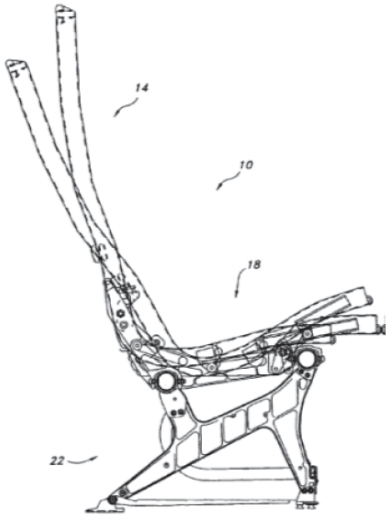


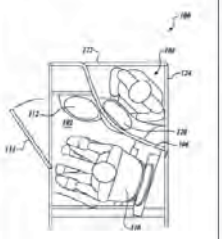
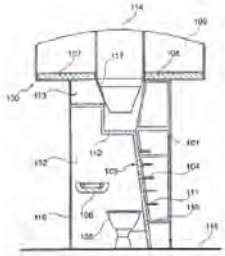
FIG 5

83. Further, to the extent a seat is not disclosed by the references above, it would have been obvious to a person of ordinary skill in the art to substitute the seat shown in either Betts or the KLM Crew Rest with either the prior art seat shown in Figure 1 of the Challenged Patents or the seat shown in Bentley. A person of ordinary skill in the art would recognize that airplane seats are configured to be coupled to a seat track and are therefore moveable and removable/replaceable. A person of ordinary skill in the art necessarily would configure the shape of an enclosure to conform to the shape of a passenger seat to be located adjacent to the enclosure. A person of ordinary skill in the art further would recognize that seats are often replaced, e.g., to provide additional passenger comfort and/or to update seat technology. This replacement has the predictable result of providing a new seat in the aircraft.

F. It is Well Known in the Prior Art that a Lavatory Could Include a Toilet

84. As I note above, the Challenged Patents do not include a description of the toilet or plumbing required to operate a toilet. Indeed, the Challenged Patents provide no description of the configuration of the interior components of the lavatory.

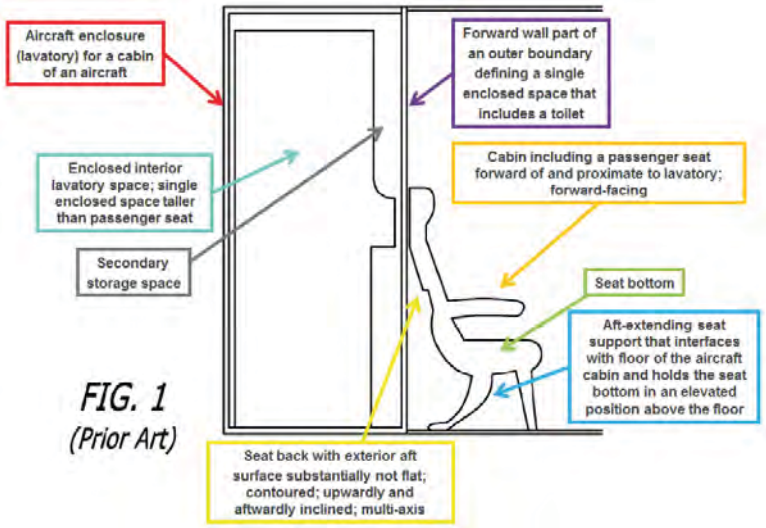
Installing a toilet in airplane lavatory was well known to one of ordinary skill in the art prior to the earliest claimed priority date of the Challenged Patents. Boeing commercial aircraft were outfitted with toilets in flat-walled lavatories long before the time I started working at Boeing in 1968. A person of ordinary skill in the art would recognize that a toilet could be installed in an airplane lavatory. As three examples, Cooper, Breuer, and Shibata show an airplane lavatory that includes a toilet. Cooper explains that "Persons Wishing to use the sink 112 or the toilet 110 in the first section 102 may do so Without preventing others from using the urinal 120 within the second section 104." Similarly, Breuer states "the distance between the first region and the floor of the module is less than 180 cm, for example even less than 150 cm or 130 cm, such that the use of a toilet seat in that region is possible but erect standing is not possible." Breuer at [0007]. Similarly, Shibata states "Items installed within the lavatory module are lavatory equipments including a toilet bowl, a washstand, a toilet closet for storing amenities …" Shibata at col. 1:19-21.

Cooper	Breuer	Shibata
		 FIG.3

85. A person of ordinary skill in the art would therefore realize the a lavatory with a curved wall could include a toilet. For example, Cooper shows a curved wall lavatory that includes a toilet. Including a toilet on a curved wall lavatory is nothing more than the inclusion of elements known in the prior art for their intended use and achieves the predictable result of making a toilet available to passengers of an aircraft that includes a curved wall lavatory.

G. Admitted Prior Art

86. As noted above, the Challenged Patents admit that everything shown in Figure 1 is prior art. Many of the features found in the claims are anticipated or obvious in view of this admitted prior art. A summary of the admitted prior art shown in Figure 1 is in the graphic below.



87. Further, the prior art I discuss above clearly shows that these claim elements were well known in the art and therefore cannot render the claims patentable.

88. I am informed that a claim must be interpreted as a whole. To clarify my analysis in the table below I highlight claim limitations that are admitted to be prior art by Figure 1 of the Patents or are not described by the Challenged Patents. These elements are all admitted prior art and well known in the field.

Limitations	Claims	Admitted Prior Art	Well Known Prior Art
"aircraft	292 patent,	Figure 1, which is	Other such lavatories

Limitations	Claims	Admitted Prior Art	Well Known Prior Art
enclosure" **"aircraft enclosure unit"** **"enclosure unit"** **"lavatory"** **"aircraft lavatory"**	claim 1, 6 476 patent, claims 1, 2 742 patent, claim 8 641 patent, claims 1, 8	admitted prior art, is described as a "lavatory enclosure" with "a conventional flat and vertical forward wall." '476 Patent at col. 4.	having flat walls were well known in the art. *See, e.g.,* Shibata Figures 3 and 4.
"an aircraft passenger seat" **"a passenger seat"** **"said passenger seat having a seat back with an exterior aft surface that is** **substantiall**	292 patent, claims 1, 6 476 patent, claims 1, 2 641 patent, claim 1	Figure 1, which is admitted prior art, illustrates a prior art aircraft passenger seat with these limitations, which are also described in the background.	Passenger seats such as that illustrated in Figure 1 were also well known in the art. *See, e.g.,* Bentley.

Limitations	Claims	Admitted Prior Art	Well Known Prior Art
y not flat" **"a seat bottom, and a seat support that interfaces with the floor of the aircraft cabin and holds the seat bottom in an elevated position above the floor of the aircraft cabin"** **"a forward-facing passenger seat that includes an upwardly and aftwardly inclined seat back**		The same passenger seat is shown in Figure 2. While "seat bottom" and "elevated position" are not mentioned in the specification, they are shown in Figure 1. "including an aircraft cabin structure having an aft portion with a substantially vertically extending exterior aft surface that is substantiall	

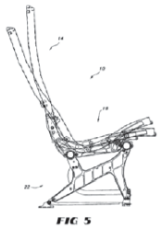
Limitations	Claims	Admitted Prior Art	Well Known Prior Art
and an aft-extending seat support disposed below the seat back"		y not flat in a vertical plane." '476, col. 1:20-22. "Structures such as passenger seats installed forward of such aircraft lavatories, closets and similar full height enclosures often have shapes that are contoured in the vertical plane." '476, col. 1:26-29.	
"single enclosed space that includes a toilet"	292 patent, claims 1 & 6 476 patent,	While "single enclosed space" and "toilet" are not	While "toilet" is not described anywhere in the

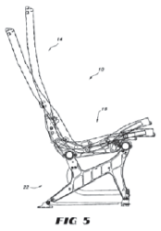
Limitations	Claims	Admitted Prior Art	Well Known Prior Art
	claims 1 & 2	described in the Challenged Patents. If the lavatory in Figure 2 is a single enclosed space, then the lavatory in Figure 1 is as well. Further, while the term "toilet" is not mentioned in the specification, one of skill in the art would understand that when the prior art lavatory or the lavatory in Figure 2 are installed, they would	specification, aircraft lavatories have generally included toilets well before April 2010. *See., e.g.,* Shibata, Cooper, or Breuer.

Limitations	Claims	Admitted Prior Art	Well Known Prior Art
		include a toilet.	
"single enclosed space is taller than said passenger seat" **"a lavatory unit including a forward wall portion and defining an enclosed interior lavatory space"** **"a forward partition; an aft partition; and** **a lavatory space disposed between the**	292 patent, claims 1 & 6 476 patent, claims 1 & 2 641 patent, claims 1, 4, 8 & 12 641 patent, claim 13	If the lavatory in Figure 2 is an enclosed lavatory space, then the lavatory in Figure 1 is as well. Figure 1 shows that the lavatory has a forward wall or partition; a vertical, planar aft partition; a lavatory space in between; and the single enclosed space of the prior art lavatory is	Aircraft lavatories are taller than a passenger seat. *See., e.g.,* Shibata or Cooper.

Limitations	Claims	Admitted Prior Art	Well Known Prior Art
forward partition and the aft partition" **"wherein said lavatory unit is taller than the passenger seat."** **"wherein said lavatory is taller than the forward-positioned passenger seat."** **"wherein the aft partition is substantially vertical and substantially planar."**		taller than the prior art passenger seat.	
"single	292	While they	It was well

Limitations	Claims	Admitted Prior Art	Well Known Prior Art
enclosed space includes one or more secondary storage spaces" **"said forward wall portion defines a secondary space in said interior lavatory space above the passenger seat back."** **"wherein the upper projection defines an interior storage space in the aircraft lavatory."**	patent, claims 2 & 7 641 patent, claim 7 742 patent, claim 13	are not labeled, Figure 1 includes the same areas as Figure 2 describes as secondary storage spaces within the lavatory. Thus the prior art lavatory is a single enclosed space that includes one or more secondary storage areas.	known to include secondary storage in a lavatory for amenities and plumbing as examples. *See., e.g.,* Shibata (disposal opening 27) or Cooper (storage cabinet 300).

Limitations	Claims	Admitted Prior Art	Well Known Prior Art
"a contoured shape of the exterior aft surface of the seat back" **"said exterior aft surface of the seat back has a contoured shape"** **"a contour of an aft surface of the upwardly and aftwardly inclined seat back."** **"upwardly and aftwardly inclined seat back"**	292 patent, claims 9 & 10 476 patent, claims 3 & 4 742 patent, claims 10, 11 & 14	While the terms "upwardly and aftwardly inclined" and "reclined" do not appear in the specification, the prior art passenger seat in Figure 1 has an upwardly and aftwardly inclined seat back. And the seat is shown in an unreclined, i.e., not a reclined, position. This is	This seat shape was well known and is similar to the shape shown in Bentley. 

Limitations	Claims	Admitted Prior Art	Well Known Prior Art
"the upwardly and aftwardly inclined seat back is in an upright and not a reclined position."		typical of passenger seats, including those made, sold, and used prior to April 2010.	
"said contoured shape includes a first section extending along a first axis and a second section extending along a second axis, said first section adapted to support a passenger's head and	292 patent, claims 11 & 12 476 patent, claims 5 & 6	The language about the first and second axis and support of a passenger appear nowhere in the specification. However, the prior art seat shown in Figure 1 has a shape that meets these	This seat shape was well known and is similar to the shape shown in Bentley. 

Limitations	Claims	Admitted Prior Art	Well Known Prior Art
said second section adapted to support a passenger's back, wherein said first axis is not parallel with said second axis"		limitations.	

89. The remaining elements of the claims are shown below. Each of the remaining limitations of the claims relate to Figure 2 of the Challenged Patents, i.e., an enclosure with a contoured forward wall that receives a seat back. The table below summarizes these remaining claim limitations and the claims in which they are found.

Limitations	Claims
"said forward wall being substantially not flat and configured to receive a portion of the exterior aft surface of said seat back when the seat back is in an unreclined seat position"	292 patent, claims 1 & 6 476 patent,

Limitations	Claims
"a portion of the exterior aft surface of said passenger seat back in the unreclined seat position is received by said forward wall"	claims 1 & 2 476 patent, claims 1 & 2 742 patent, claim 8 641 patent, claims 1, 6, 8 & 9
"the contoured forward partition comprises at least one first recess configured to receive at least a portion of an upwardly and aftwardly inclined seat back of a passenger seat therein"	
"said forward wall portion configured to be disposed proximate to and aft of the passenger seat and including an exterior surface having a shape that is substantially not flat in a vertical plane"	
"includes a first recess configured to receive at least a portion of the upwardly and aftwardly inclined seat back of the passenger seat therein"	
"wherein said first recess in said forward wall portion is disposed between an upper wall portion and a lower wall portion."	
"wherein the forward partition comprises: a forward- extending upper portion; an aft-extending mid-portion;	
and a forward-extending lower	

Limitations	Claims
portion; and wherein the forward-extending upper portion, the aft-extending mid-portion, and the forward-extending lower portion combine to define a first aft-extending recess disposed between the upper forward-extending portion and the forward-extending lower portion" **"wherein the first aft extending recess defined by the forward-extending upper portion, the aft-extending mid-portion, and the forward-extending lower portion of the forward partition is configured to receive an aft-extending seat back of the forward-positioned passenger seat."**	
"at least one second recess configured to receive at least a portion of an aft-extending seat support of the passenger seat" **"further includes a second recess configured to receive at least a portion of the aft-extending seat support therein when at least a portion of the upwardly and aftwardly inclined seat back of the passenger seat is received within the first recess."** **"the forward partition further**	742 patent, claim 8 641 patent, claims 1 & 8

Limitations	Claims
defines a second aft- extending recess proximate to a lower end of the forward partition, the second aft-extending recess being configured to receive at least a portion of an aft- extending seat support of a forward-positioned passenger seat therein."	
"forward wall is adapted to provide additional space forward of the aircraft enclosure unit for said seat support to be positioned further aft in the cabin" **"said forward wall is adapted to provide more space forward of the enclosure unit such that the seat support can be positioned further aft in the cabin"**	292 patent, claims 1 & 6 476 patent, claims 1 & 2
"the portion of the exterior aft surface of said seat back received by the forward wall is substantially more than a headrest portion of the exterior aft surface of the seat back."	292 patent, claim 3
"the portion of the exterior aft surface of said seat back received by the forward wall is more than an upper half of the exterior aft surface of the seat back."	292 patent, claim 4
"said forward wall is shaped to substantially conform to [a/the] contoured shape of the exterior aft surface of the seat back when the	292 patent, claims 9

Limitations	Claims
seat back is in the unreclined position" **"the at least one first recess substantially conforms to a contour of an aft surface of the upwardly and aftwardly inclined seat back"** **"said forward wall portion is shaped to substantially conform to the shape of the upwardly and aftwardly inclined seat back of the passenger seat"**	& 10 476 patent, claims 3, 4 742 patent, claim 10 641 patent, claim 1
"said forward wall is also configured to receive at least an aft-extending portion of the seat support of said passenger seat"	292 patent, claims 5 & 8
"reducing the volume of unusable space in the cabin area by reducing or eliminating gaps that existed between the previously-installed forward wall and the passenger seat."	742 patent, claim 8
"the contoured forward partition further comprises an upper projection that, upon installation, protrudes forward over a top of the upwardly and aftwardly inclined seat back." **"said forward wall portion further includes a projection configured to project over the passenger seat back when at least a portion of the**	742 patent, claim 11 641 patent, claims 3, 10

Limitations	Claims
upwardly and aftwardly inclined seat back of the passenger seat is received within the first recess and at least a portion of the aft-extending seat support is received within the second recess." **"said forward-extending upper portion is configured to project over at least a portion of the forward-positioned passenger seat."**	
"the upper projection is configured to abut an upper surface of the cabin area"	742 patent, claim 12
"the at least one first recess extends along substantially a full width of the contoured forward partition" **"wherein said first aft-extending recess extends along substantially a full width of said forward partition"**	742 patent, claim 15 641 patent, claim 16
"the contoured forward partition permits the aft- extending seat support to be positioned farther aft in the cabin area"	742 patent, claim 16
"said forward wall portion includes a lower portion that is disposed under the passenger seat back when at least a portion of the upwardly and aftwardly inclined	641 patent, claim 5

Limitations	Claims
seat back of the passenger seat is received within the first recess and at least a portion of the aft-extending seat support is received within the second recess."	
"said lavatory has a top, a bottom, a height therebetween, and a middle therebetween, said lavatory has varying lengths along the height of the lavatory, and said lavatory is longer at the top of the lavatory than at the bottom of the lavatory." **"wherein the width of the lavatory space disposed between the forward partition and the aft partition comprises an upper width, a lower width, and a mid-width, and wherein the upper width and the lower width are both substantially wider than the mid-width."**	641 patent, claims 14 and 17
"wherein the upper forward-extending portion, the aft-extending mid-portion, and the forward-extending lower portion of the forward partition form a substantially continuous surface."	641 patent, claim 15

90. Such a contoured forward wall was well known in the prior art. As shown below, each of Betts and the KLM Crew Rest are substantially the same as Figure 2 of the Challenged Patents.

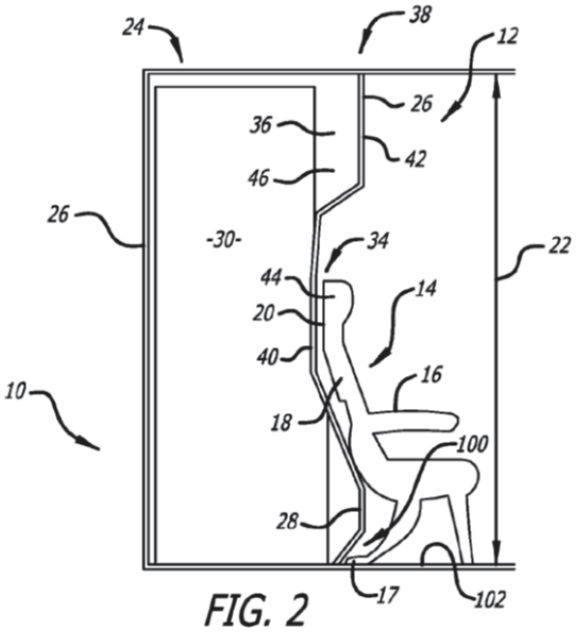
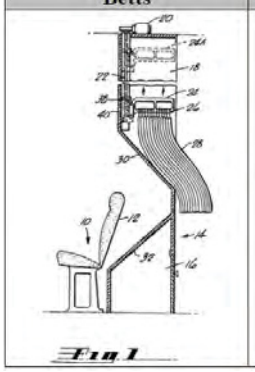
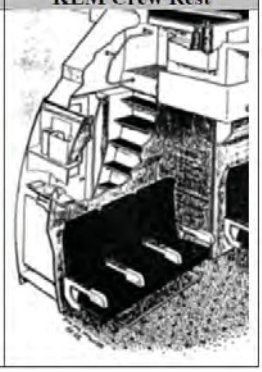


FIG. 2

91. Each shows an enclosure with a contoured forward wall configured to receive a seat back. Each of the enclosures has a different shape for the contour. This is not surprising because each forward wall would have been designed based on different customer specifications or requirements (e.g., different aircraft, different passenger seats, etc.). Designing the shape of the recess to meet those

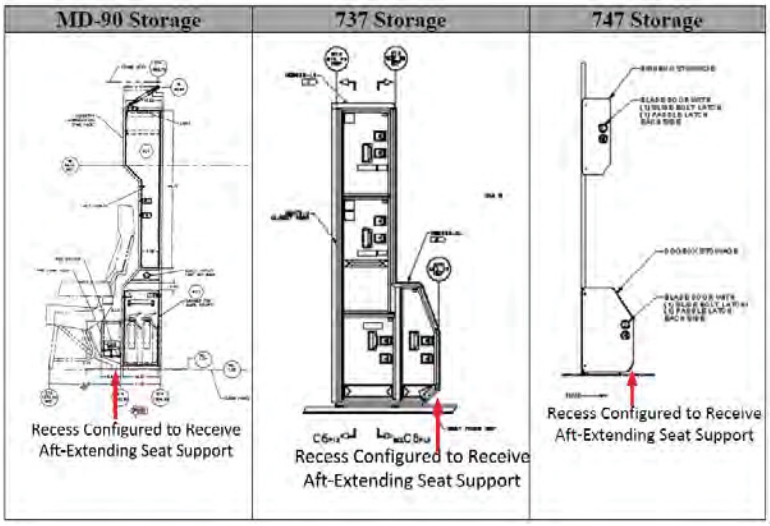
requirements and to conform to the shape of the passenger seat would have been a routine task within the skill of a person of ordinary skill in the art. Each enclosure shown below renders obvious the claims of the Challenged Patents.

Betts	KLM Crew Rest	KLM Crew Rest
		

92. Patent Owner may argue that some claims require a second recess configured to receive a seat support. For the reasons I explain above, it would be obvious to modify a flat wall lavatory to include a second recess.

93. Further, while I do not rely on this art in coming to my conclusion of invalidity, the prior art below demonstrates the knowledge of persons of ordinary skill in the art and well-known solutions to the problem. Thus, the prior art below informs my opinion that including a second recess configured to receive an aft-

extending seat support was well known in the art.



VIII. ANALYSIS OF SPECIFIC CLAIM ELEMENTS

A. '292 Patent, Claims 1-12 are Obvious In View of the Prior Art

['292 Claim 1 Preamble] An aircraft enclosure for a cabin of an aircraft, the cabin including a passenger seat located forward of and proximate to the aircraft enclosure, said passenger seat having a seat back with an exterior aft surface that is substantially not flat, a seat bottom, and a seat support that interfaces with the floor of the aircraft

cabin and holds the seat bottom in an elevated position above the floor of the aircraft cabin, the aircraft enclosure comprising:

94. I am informed that the preamble may not be a limitation. However, to the extent that it is a limitation, in my opinion this element is obvious in view of a flat wall lavatory and seat shown in Figure 1 of the Challenged Patents as modified by Betts or the KLM Crew Rest.

95. As I explain above, a person of ordinary skill in the art would be motivated to modify a flat wall lavatory to use the Betts design on the forward wall of a lavatory. Figure 1 of Betts is a side elevation that shows an assembly of an enclosure that is located immediately aft of and adjacent to a passenger seat and is nearly identical to Figure 2 of the Challenged Patents.

Betts Figure 1	Challenged Patents Figure 2

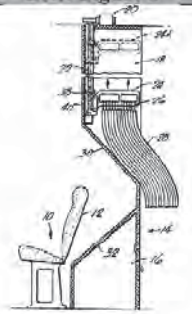
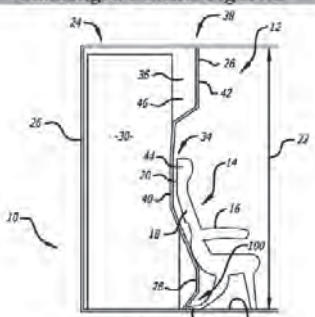
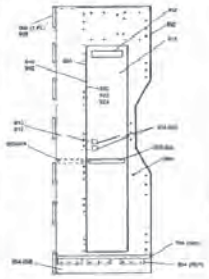
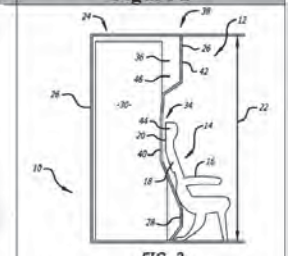

	

Fig. 1	FIG. 2

96. As I explain above, a person of ordinary skill in the art would be motivated to modify a flat wall lavatory to use the KLM Crew Rest design on the forward wall of a lavatory. The KLM Crew Rest shows a side elevation of a lavatory enclosure. The enclosure has a curved wall to allow space for a seat that is located forward of and proximate to the aircraft enclosure.

KLM Crew Rest	KLM Crew Rest	Challenged Patents Figure 2
		 FIG. 2

97. Further, as discussed above, a passenger seat "having a seat back with an exterior aft surface that is substantially not flat, a seat bottom, and a seat support that interfaces with the floor of the aircraft cabin and holds the seat bottom in an elevated position above the floor of the aircraft cabin" was well known in the art prior to the earliest claimed priority date of the Challenged Patents, and to the

extent such a seat is not already disclosed by Betts or the KLM Crew Rest, it would have been obvious to use the prior art design along with one of these designs for a curved wall.

['292 Claim 1, Element A] **an enclosure unit having a forward wall, said forward wall being part of an outer boundary defining a single enclosed space that includes a toilet,**

98. In my opinion, Figure 1 of the Challenged Patents admits that this element was known in the prior art. Further, in my opinion a person of ordinary skill in the art would have been familiar with prior art lavatories that had a forward wall that was part of an outer boundary defining a single enclosed space that includes a toilet.

99. I note that the Challenged Patents include no definition or description of a single enclosed space. However, I understand that Patent Owner asserts that an airplane lavatory meets the definition of a single enclosed space. Prior art Figure 1 of the Challenged Patents as well as each of Betts and the KLM Crew Rest discloses an outer boundary defining either a single enclosed space of an enclosure. Further, to the extent a single enclosed space is not disclosed by these three references, as I discuss above, it

would be obvious to apply these curved walls for use in an airplane lavatory, which Patent Owner asserts meets the definition of single enclosed space.

['292 Claim 1, Element B] **said forward wall being substantially not flat and configured to receive a portion of the exterior aft surface of said seat back when the seat back is in an unreclined seat position;**

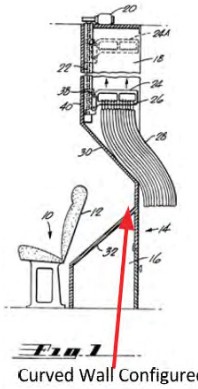
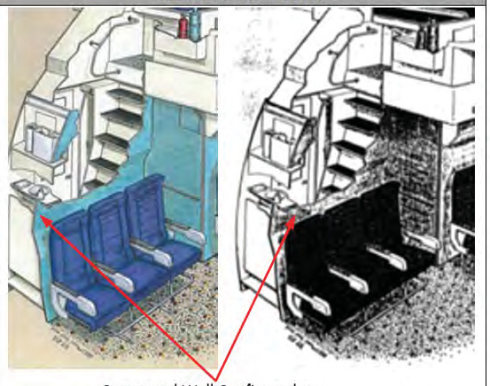
100. In my opinion this element is obvious in view of a flat wall lavatory and seat shown in Figure 1 of the Challenged Patents as modified by Betts or the KLM Crew Rest.

101. As I explain above, a person of ordinary skill in the art would be motivated to modify a flat wall lavatory to use the Betts design on the forward wall of a lavatory. Further, as I explain above, a person of ordinary skill in the art would recognize that a toilet for use in an airplane was well known in the art and could have easily been installed in a curved wall lavatory. A flat wall lavatory including a prior art toilet, as modified by the curved wall of Betts discloses "an enclosure unit having a forward wall, said forward wall being part of an outer boundary defining a single enclosed space that includes a toilet, said forward wall being substantially not flat and configured to receive a portion of the exterior aft surface

of said seat back when the seat back is in an unreclined seat position." This is further shown in the annotated Figure below. Further, it is clear that the seat shown in Betts is positioned further aft than it could be positioned if there were no recess because the seat back is within the recess. Thus the recess is configured to receive the seat back. Further, as I noted above, the seat shown in Betts is in substantially the same position as the seat shown in Figure 2 of the Challenged Patents. Thus, in my opinion this seat is in an unreclined position.

102. As I explain above, a person of ordinary skill in the art would be motivated to modify a flat wall lavatory to use the KLM Crew Rest design on the forward wall of a lavatory. Further, as I explain above, a person of ordinary skill in the art would recognize that a toilet for use in an airplane was well known in the art and could have easily been installed in a curved wall lavatory. A flat wall lavatory including a prior art toilet, as modified by the curved wall of the KLM Crew Rest discloses "an enclosure unit having a forward wall, said forward wall being part of an outer boundary defining a single enclosed space that includes a toilet, said forward wall being substantially not flat and configured to receive a portion of the exterior aft surface of said seat back." This is further shown in the annotated Figure

below. Further, a person of ordinary skill in the art would recognize that the seat shown in the KLM Crew rest is positioned further aft than it could be positioned without the recess. A person of ordinary skill in the art would recognize that the seat could be moved further aft, such that the seat was in the recess when in an unreclined position. One motivation for doing so would be to increase the amount of space in front of the passenger seat, thereby increasing the pitch of the rows of seats in the aircraft or allowing an additional row of seats to be added.

Betts	KLM Crew Rest
 Curved Wall Configured to Receive a Seat Back	 Contoured Wall Configured to Receive a Seat Back

['*292 Claim 1, Element C]* wherein said forward wall is adapted to provide additional space forward of the enclosure unit for said seat support to be positioned further aft in the cabin when

compared with a position of said seat support if said forward wall was instead substantially flat; and

103. In my opinion this element is obvious in view of a flat wall lavatory and seat shown in Figure 1 of the Challenged Patents as modified by Betts or the KLM Crew Rest. A person of ordinary skill in the art would recognize that a seat is fixed to a seat support. Thus, as the seat is moved, the seat support will also move further aft.

104. With regard to both Betts the seat and the seat support is positioned further aft in the cabin, which is clear because the seat is plainly within the recess in the wall. This is shown in the annotated figure below.

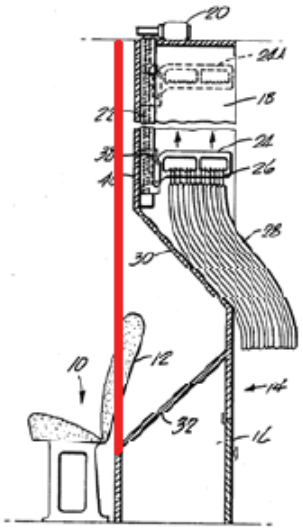


Fig. 1

105. With regard to the KLM Crew Rest, the recess in the KLM Crew Rest was designed to allow the last row of seats positioned in front of the curved wall to sit further aft in the aircraft, yet still be able to recline. Sobotta Declaration, at ¶ 13. Thus, if there were no recess, this seat would need to be positioned further forward to allow for recline. Thus, the curved wall allows for this seat to sit further aft than it otherwise would be able to sit. Furthermore, if seat recline were not required, a person of ordinary skill in the art would further be motivated to restrict the seat recline and position the

seat further aft to provide more room in the passenger cabin for increased seat pitch or additional rows of seats.

[*'292 Claim 1, Element D]* wherein said single enclosed space is taller than said passenger seat.

106. In my opinion this element is obvious in view of a flat wall lavatory and seat shown in Figure 1 of the Challenged Patents as modified by Betts or the KLM Crew Rest.

107. As is shown in the annotated figures above, the enclosure units in each of Betts and the KLM Crew Rest is taller than the seat positioned in front of them.

108. As I noted above, the Challenged Patents include no definition or description of a single enclosed space. However, each of Betts and the KLM Crew Rest discloses an outer boundary defining either a single enclosed space or an enclosure. Further, to the extent a single enclosed space is not disclosed by these three references, as I discuss above, it would be obvious to modify any of these three curved walls for use in an airplane lavatory, which Patent Owner asserts meets the definition of single enclosed space.

[*'292 Claim 2]* The apparatus of claim 1, wherein said single enclosed space

includes one or more secondary storage spaces.

109. In my opinion this element is obvious in view of a flat wall lavatory and seat shown in Figure 1 of the Challenged Patents as modified by Betts or the KLM Crew Rest. The Challenged Patents do not define the term "secondary storage spaces," however, by any reasonable definition for this term, secondary storage spaces inside a lavatory were known in the art. Indeed, the admitted prior art Figure 1 of the Challenged Patent shows secondary storage space inside the prior art lavatory.

110. As I explain above, a person of skill in the art would be motivated to modify a prior art lavatory to include the curved forward wall design shown in Betts. One of ordinary skill in the art would recognize that a lavatory will include components that Patent Owner has identified as meeting the secondary storage space claim limitation, e.g., trash storage and receptacles, and storage space under the sink and behind the toilet, among other places.

111. Further, the KLM Crew Rest clearly shows secondary storage spaces, such as amenity stowage. Sobotta Declaration, at ¶ 16 (the crew rest includes "a lavatory sink (and related plumbing), lighting, a

mirror, soap dispenser, shaver outlet and amenity stowage.").

['*292 Claim 3]* The apparatus of claim 1, wherein the portion of the exterior aft surface of said seat back received by the forward wall is substantially more than a headrest portion of the exterior aft surface of the seat back.

112. In my opinion this element is obvious in view of a flat wall lavatory and seat shown in Figure 1 of the Challenged Patents as modified by Betts or the KLM Crew Rest.

113. The Challenged Patents do not define what is meant by "substantially more than a headrest portion of the exterior aft surface of the seat back." However, under any reasonable definition this is obvious in view of the disclosure of Betts or the KLM Crew Rest.

114. To the extent this claim limitation is not already disclosed by Figure 1 of Betts or the KLM Crew rest a person of ordinary skill in the art would recognize that the seat shown in these references could be moved further aft, e.g., to increase seat pitch or to allow for an additional row of seats in the aircraft.

['*292 Claim 4]* The apparatus of claim 1, wherein the portion of the exterior aft surface of said seat back received by the

forward wall is more than an upper half of the exterior aft surface of the seat back.

115. In my opinion this element is obvious in view of a flat wall lavatory and seat shown in Figure 1 of the Challenged Patents as modified by Betts or the KLM Crew Rest.

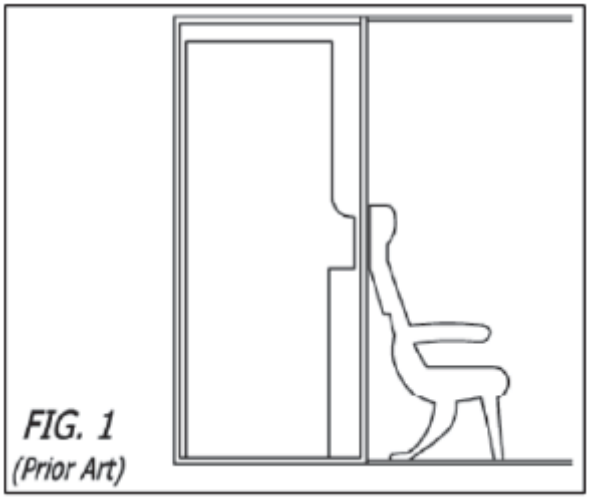
116. The Challenged Patents do not define what is meant by "more than an upper half of the exterior aft surface of the seat back." To the extent this claim limitation is not already disclosed by Figure 1 of Betts or the KLM Crew rest a person of ordinary skill in the art would recognize that the seat shown in these references could be moved further aft, e.g., to increase seat pitch or to allow for an additional row of seats in the aircraft.

[*'292 Claim* 5] The apparatus of claim 1, wherein said forward wall is also configured to receive at least an aft-extending portion of the seat support of said passenger seat.

117. In my opinion this element is obvious in view of a flat wall lavatory and seat shown in Figure 1 of the Challenged Patents, as modified by Betts or the KLM Crew Rest.

118. As is shown in the annotated figure below, the challenged patents admit that

a seat with an aft extending seat support is well known in the art.

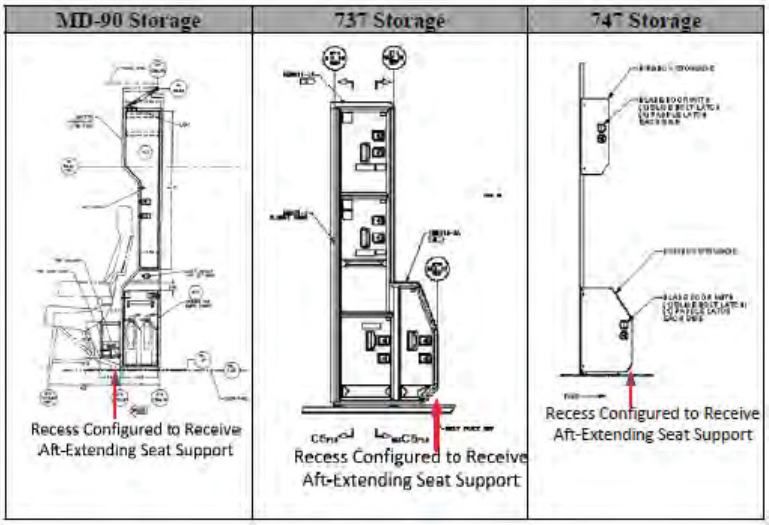


119. As I explain above, a person of ordinary skill in the art would realize that when such a seat is moved further aft, the first component to impact the wall is the seat back. As I explain above, Betts includes a forward facing recess that receives the seat back.

120. Further, the KLM Crew Rest shows both a passenger seat and a contoured forward partition. As I explain above, the passenger seat is positioned is positioned such that it could not recline without a contoured forward wall, thus this seat is at least partially within the contour and is thus received by the recess.

121. Further, a person of ordinary skill in the art would understand that as the seat is moved further aft, the next component to impact the wall is the aft seat support. A person of ordinary skill in the art would be motivated to modify an enclosure, such as a lavatory, to include a second recess to receive aft facing seat supports. In my opinion, this modification is nothing more than the application of known technology for its intended purpose. The result of such a modification is predictable, allowing the seat to be positioned further aft in an aircraft.

122. As evidence of this modification being well known, I include three examples of prior art enclosures that included a lower recess to accommodate aft- extending seat supports. I understand that these designs are not available as prior art in this proceeding. Thus, I do not rely on these designs as a basis for invalidity. However, these designs inform my opinion by confirming that such a modification was well known in the art, and thus would have been obvious to a person of ordinary skill in the art.



***['292 Claim 6 preamble*] A combination of an aircraft enclosure unit and an aircraft passenger seat for installation in an aircraft cabin, the combination comprising:**

123. I am informed that the preamble may not be a limitation. However, to the extent that it is a limitation, in my opinion this element is obvious in view of a flat wall lavatory and seat shown in Figure 1 of the Challenged Patents as modified by Betts or the KLM Crew Rest. I incorporate my analysis discussed above with regard to ['292 Claim 1, Preamble].

[*'292 Claim 6 Element A*] said passenger seat configured to be located forward of

and proximate to the aircraft enclosure unit, said passenger seat having a seat back with an exterior aft surface that is substantially not flat, a seat bottom, and a seat support that interfaces with the floor of the aircraft cabin and holds the seat bottom in an elevated position above the floor of the aircraft cabin;

124. In in my opinion this element is obvious in view of a flat wall lavatory and seat shown in Figure 1 of the Challenged Patents as modified by Betts or the KLM Crew Rest. I incorporate my analysis discussed above with regard to ['292 Claim 1, Preamble].

['292 *Claim 6 Element B]* the aircraft enclosure unit having a forward wall, said forward wall being part of an outer boundary defining a single enclosed space that includes a toilet,

125. In in my opinion this element is obvious in view of a flat wall lavatory and seat shown in Figure 1 of the Challenged Patents as modified by Betts or the KLM Crew Rest. I incorporate my analysis discussed above with regard to ['292 Claim 1, Element A].

['292 *Claim 6 Element C]* said forward wall being substantially not flat and configured to receive a portion of the exterior aft surface of said seat back

when the seat back is in an unreclined seat position;

126. In in my opinion this element is obvious in view of a flat wall lavatory and seat shown in Figure 1 of the Challenged Patents as modified by Betts or the KLM Crew Rest. I incorporate my analysis discussed above with regard to [‘292 Claim 1, Element B].

[‘292 *Claim 6 Element D]* wherein said forward wall is adapted to provide additional space forward of the aircraft enclosure unit for said seat support to be positioned further aft in the cabin when compared with a position of said seat support if said forward wall was substantially flat; and

127. In in my opinion this element is obvious in view of a flat wall lavatory and seat shown in Figure 1 of the Challenged Patents as modified by Betts or the KLM Crew Rest. I incorporate my analysis discussed above with regard to [‘292 Claim 1, Element C].

[*‘292 Claim 6 Element* E] wherein said single enclosed space is taller than said passenger seat.

128. In in my opinion this element is obvious in view of a flat wall lavatory and seat shown in Figure 1 of the Challenged

Patents as modified by Betts or the KLM Crew Rest. I incorporate my analysis discussed above with regard to ['292 Claim 1, Element D].

['*292 Claim 7*] The apparatus of claim 6, wherein said single enclosed space includes one or more secondary storage spaces within said boundary defining said single enclosed space.

129. In in my opinion this element is obvious in view of a flat wall lavatory and seat shown in Figure 1 of the Challenged Patents as modified by Betts or the KLM Crew Rest. I incorporate my analysis discussed above with regard to ['292 Claims 2 and 6].

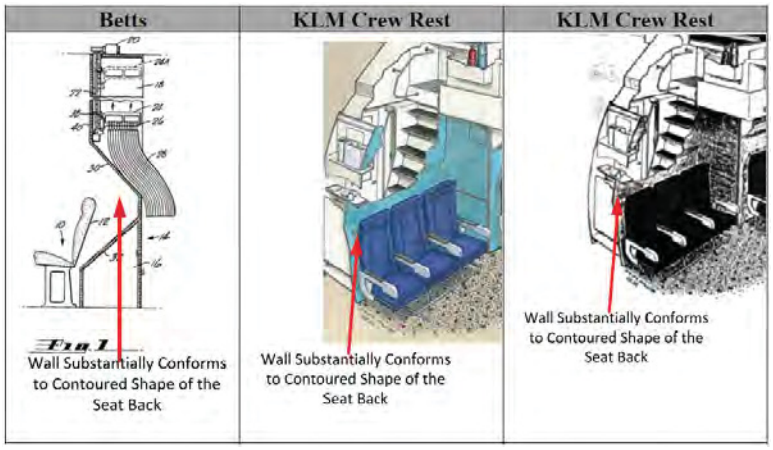
['*292 Claim* 5] The apparatus of claim 6, wherein said forward wall is also configured to receive at least an aft-extending portion of the seat support of said passenger seat.

130. In in my opinion this element is obvious in view of a flat wall lavatory and seat shown in Figure 1 of the Challenged Patents as modified by Betts or the KLM Crew Rest. I incorporate my analysis discussed above with regard to ['292 Claims 6 and 5].

['*292 Claim 9*] The aircraft enclosure of claim 1, wherein said forward wall is

shaped to substantially conform to a contoured shape of the exterior aft surface of the seat back when the seat back is in the unreclined position.

131. In in my opinion this element is obvious in view of a flat wall lavatory and seat shown in Figure 1 of the Challenged Patents as modified by Betts or the KLM Crew Rest. The Challenged Patents do not include a definition for what is meant by "substantially conform" but as shown in Figure 2 of the Challenged Patents, the forward wall is not required to precisely conform to the shape of the passenger seat. As is shown in the Figure below, the walls of each of Betts and the KLM Crew Rest substantially conform to a contoured shape of the exterior aft surface of the seat back. Further, in both cases the seat is provided with the ability to recline, but if the ability to recline the seat were removed or not required, a person of ordinary skill in the art would have designed the shape of the recess to substantially conform to the shape of the passenger seat in its upright (i.e., unreclined) position. A person of ordinary skill in the art would have been motivated to do so to more efficiently maximize the use of space in the cabin.



132. I also incorporate my analysis discussed above with regard to ['292 Claim 6 and Claim 1].

> **['*292 Claim 10*] The apparatus of claim 6, wherein said exterior aft surface of the seat back has a contoured shape, and said forward wall is shaped to substantially conform to the contoured shape of the exterior aft surface of the seat back when the seat back is in the unreclined position.**

133. In my opinion this element is obvious in view of a flat wall lavatory and seat shown in Figure 1 of the Challenged Patents as modified by Betts or the KLM Crew Rest.

134. As I explain above, the only seat shown in the Challenged Patents includes a contoured shape and is admitted to be prior art. Further, a seat with a contoured shape is well known in the art. *See* Bentley, discussed above. A person of ordinary skill

in the art would realize that seats on an airplane could be removed and replaced. Thus, a person of ordinary skill in the art could replace any of the seats shown in Betts or the KLM Crew Rest with a prior art seat design. Further, a person of ordinary skill in the art would have designed the shape of the recess to substantially conform to the shape of the passenger seat to more efficiently maximize the use of space in the cabin.

135. I also incorporate my analysis discussed above with regard to ['292 Claim 6, Claim 9, Claim 1 Element A].

> **['292 *Claim 11]* The aircraft enclosure of claim 9, wherein said contoured shape includes a first section extending along a first axis and a second section extending along a second axis, said first section adapted to support a passenger's head and said second section adapted to support a passenger's back, wherein said first axis is not parallel with said second axis.**

136. In my opinion this element is obvious in view of a flat wall lavatory and seat shown in Figure 1 of the Challenged Patents as modified by Betts or the KLM Crew Rest.

137. As I explain above, the only seat shown in the Challenged Patents includes a contoured shape and is admitted to be prior art. This seat has "a contoured shape includes a first section extending along a first axis and a second section extending

along a second axis, said first section adapted to support a passenger's head and said second section adapted to support a passenger's back, wherein said first axis is not parallel with said second axis."

138. Further, a seat with "a contoured shape includes a first section extending along a first axis and a second section extending along a second axis, said first section adapted to support a passenger's head and said second section adapted to support a passenger's back, wherein said first axis is not parallel with said second axis" is well known in the art. *See* Bentley, discussed above. Further, the KLM Crew Rest shows a passenger seat with a contoured shape that includes a first section extending along a first axis for supporting a passenger's head and a second section extending along a second axis for supporting a passenger's back. As I explain above, a person of ordinary skill in the art would realize that seats on an airplane could be removed and replaced. Thus, a person of ordinary skill in the art could replace any of the seats shown in Betts or the KLM Crew Rest with another prior art seat design.

> **[*'292 Claim 12]* The apparatus of claim 10, wherein said contoured shape includes a first section extending along a first axis and a second section extending along a second axis, said first section adapted to support a passenger's head and said second section adapted to support a passenger's back, wherein said first axis is not parallel with said second axis.**

139. In my opinion this element is obvious in view of a flat wall lavatory and seat shown in Figure 1 of the Challenged Patents as modified by Betts or the KLM Crew Rest. I incorporate my analysis discussed above with regard to ['292 Claims 10 and 11].

B. '476 Patent, Claims 1-6 are Obvious

> ***['476 Claim 1 Preamble]*** **A method of retrofitting *an* aircraft to provide additional passenger seating in the cabin of said aircraft, the cabin including a passenger seat having a seat back with an exterior aft surface that is substantially not flat, a seat bottom, and a seat support that interfaces with the floor of the aircraft cabin and holds the seat bottom in an elevated position above the floor of the aircraft cabin, the method comprising the steps of:**

140. I am informed that the preamble may not be a limitation. However, to the extent that it is a limitation, in my opinion this element is obvious in view of a flat wall lavatory and seat shown in Figure 1 of the Challenged Patents as modified by Betts or the KLM Crew Rest. I incorporate my analysis discussed above with regard to ['292 Claim 1, Preamble].

141. A prior art flat wall lavatory could be modified to include the contoured forward wall shown in either Betts or the KLM Crew Rest. As I explain above, a motivation for doing so would be to

enable a row of passenger seats to sit further aft in the aircraft cabin.

142. A person of ordinary skill in the art also would understand that a lavatory modified to include the contoured forward wall of Betts or the KLM Crew Rest could be sold and installed for either line fit or retrofit applications, which are the two major types of contracts for the aircraft lavatory market. Thus, the claimed method of retrofitting would have been well-known and obvious to a person of ordinary skill in the art.

> ***['476 Claim 1 Element A]*** **installing an aircraft enclosure unit comprising: a forward wall, said forward wall being part of an outer boundary defining a single enclosed space that includes a toilet,**

143. In my opinion this element is obvious in view of a flat wall lavatory and seat shown in Figure 1 of the Challenged Patents as modified by Betts or the KLM Crew Rest. I incorporate my analysis discussed above with regard to ['292 Claim 1, Element A].

> ***['476 Claim 1 Element B]*** **said forward wall being substantially not flat and configured to receive a portion of the exterior aft surface of the seat back when the seat back is in an unreclined seat position**

144. In my opinion this element is obvious in view of a flat wall lavatory and seat shown in Figure 1 of

the Challenged Patents as modified by Betts or the KLM Crew Rest. I incorporate my analysis discussed above with regard to ['292 Claim 1, Element B].

145. A prior art flat wall lavatory could be modified to include the contoured front wall shown in either Betts or the KLM Crew Rest. As I explain above, a motivation for doing so would be to enable a row of passenger seats to sit further aft in the aircraft cabin.

> ***['476 Claim 1 Element C]*** **wherein said forward wall is adapted to provide more space forward of the enclosure unit such that the seat support can be positioned further aft in the cabin than if the cabin included another enclosure unit having a substantially flat front wall located in substantially the same position in the cabin as the forward wall, and**

146. In my opinion this element is obvious in view of a flat wall lavatory and seat shown in Figure 1 of the Challenged Patents as modified by Betts or the KLM Crew Rest. I incorporate my analysis discussed above with regard to ['292 Claim 1, Element C].

> **[*'476 Claim 1 Element D]* wherein said enclosed space is taller than the passenger seat; and**

147. In my opinion this element is obvious in view of a flat wall lavatory and seat shown in Figure 1 of the Challenged Patents as modified by Betts or the

KLM Crew Rest. I incorporate my analysis discussed above with regard to ['292 Claim 1, Element D].

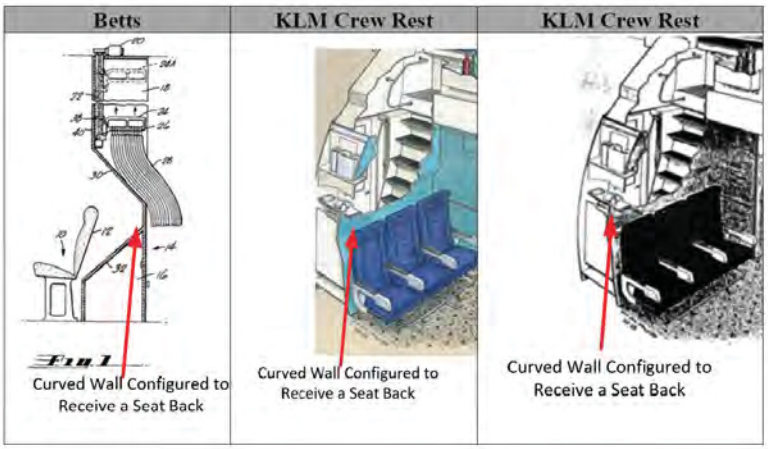
> ***['476 Claim 1 Element*** **E] positioning said seat support further aft in said aircraft cabin than *said* seat support could have been positioned prior to retrofitting said aircraft, whereby a portion of the exterior aft surface of said passenger seat back in the unreclined seat position is received by said forward wall.**

148. In my opinion this element is obvious in view of a flat wall lavatory and seat shown in Figure 1 of the Challenged Patents as modified by Betts or the KLM Crew Rest.

149. As I explain above, a person of ordinary skill in the art would be motivated to modify a flat wall lavatory to use the Betts design on the forward wall of a lavatory. Further, it is clear that the seat shown in Betts is positioned further aft than it could be positioned if there were no recess in the forward wall because the seat back is within the recess. Thus the recess is configured to receive the seat back. Further, as I noted above, the seat shown in Betts is in substantially the same position as the seat shown in Figure 2 of the Challenged Patents. Thus, in my opinion this seat is in an unreclined position.

150. As I explain above, a person of ordinary skill in the art would be motivated to modify a flat wall lavatory to use the KLM Crew Rest design on the forward wall of a lavatory. A person of ordinary skill in the art would recognize that the seat shown in the

KLM Crew rest is positioned further aft than it could be positioned without the recess. A person of ordinary skill in the art would recognize that the seat could be moved further aft, such that the seat was in the recess when in an unreclined position. One motivation for doing so would be to increase the amount of space in front of the passenger seat, thereby increasing the pitch of the rows of seats in the aircraft or allowing an additional row of seats to be added.



['476 Claim 2 Preamble] **A method of providing an aircraft with more passenger seats in the aircraft's cabin, the method comprising the steps of:**

151. I am informed that the preamble may not be a limitation. However, to the extent that it is a limitation, in my opinion this element is obvious in view of a flat wall lavatory and seat shown in Figure 1 of the Challenged Patents as modified by Betts or

the KLM Crew Rest. I incorporate my analysis discussed above with regard to ['476 Claim 1 Preamble].

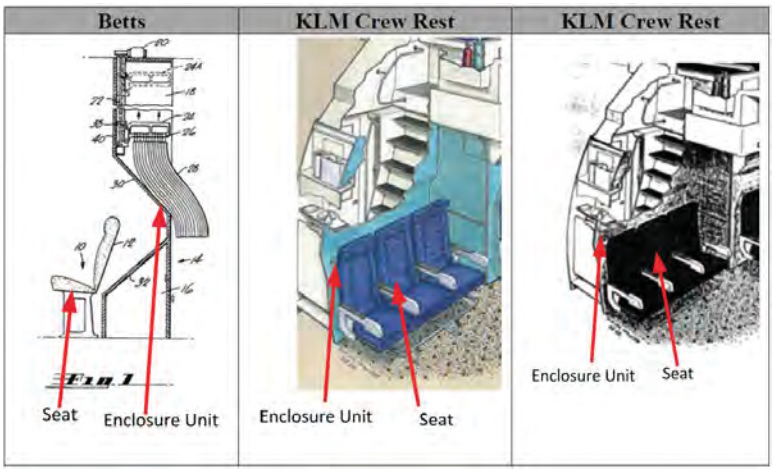
> ***['476 Claim 2 Element A]*** **installing a combination of an enclosure unit and a passenger seat in the aircraft, said passenger seat having a seat back, a seat bottom, and a seat support that interfaces with the floor of the aircraft cabin and holds the seat bottom in an elevated position above the floor of the aircraft cabin, the combination comprising**

152. In my opinion this element is obvious in view of a flat wall lavatory and seat shown in Figure 1 of the Challenged Patents as modified by Betts or the KLM Crew Rest. I incorporate my analysis discussed above with regard to ['476 Claim 1 Preamble and Element A].

> ***['476 Claim 2 Element B]*** **the passenger seat being configured to be located forward of and proximate to the enclosure unit,**

153. In my opinion this element is obvious in view of a flat wall lavatory and seat shown in Figure 1 of the Challenged Patents, which shows a passenger seat located forward of and proximate to the enclosure unit, as modified by Betts or the KLM Crew Rest. As shown below, each of Betts and the KLM Crew Rest also show an enclosure unit and a

passenger seat forward of and proximate to the enclosure unit.



> **[*'476 Claim 2 Element C]* the enclosure unit being located aft of the passenger seat, the enclosure unit having a forward wall, said forward wall being part of an outer boundary defining a single enclosed space that includes a toilet,**

154. In my opinion this element is obvious in view of a flat wall lavatory and seat shown in Figure 1 of the Challenged Patents as modified by Betts or the KLM Crew Rest. I incorporate my analysis discussed above with regard to ['476 Claim 1 Element A].

> ***['476 Claim 2 Element D]* said forward wall being substantially not flat and configured to receive a portion of the exterior aft surface of the passenger seat back in an unreclined seat position,**

155. In my opinion this element is obvious in view of a flat wall lavatory and seat shown in Figure 1 of the Challenged Patents as modified by Betts or the KLM Crew Rest. I incorporate my analysis discussed above with regard to ['476 Claim 1 Element B].

> ***['476 Claim 2 Element E]*** **wherein said forward wall is adapted to provide more space forward of the enclosure unit such that the seat support can be positioned further aft in the cabin than if the cabin included another enclosure unit having a front wall that is substantially flat and is located in substantially the same position in the cabin as the forward wall,**

156. In my opinion this element is obvious in view of a flat wall lavatory and seat shown in Figure 1 of the Challenged Patents as modified by Betts or the KLM Crew Rest. I incorporate my analysis discussed above with regard to ['476 Claim 1 Element C].

> **[*'476 Claim 2 Element F]* wherein said enclosed space is taller than the passenger seat,**

157. In my opinion this element is obvious in view of a flat wall lavatory and seat shown in Figure 1 of the Challenged Patents, as modified by Betts or the KLM Crew Rest. I incorporate my analysis discussed above with regard to ['476 Claim 1 Element D].

> ***['476 Claim 2 Element G]*** **whereby said seat support is installed further aft in said cabin than would be possible if the**

substantially flat front wall of the other enclosure unit was located in substantially the same position in the aircraft cabin as the forward wall, and

158. In my opinion this element is obvious i in view of a flat wall lavatory and seat shown in Figure 1 of the Challenged Patents, as modified by Betts or the KLM Crew Rest. I incorporate my analysis discussed above with regard to ['476 Claim 1 Element E].

['476 Claim 2 Element H] **whereby a portion of the exterior aft surface of said passenger seat back in the unreclined seat position is received by said forward wall.**

159. In my opinion this element is obvious i in view of a flat wall lavatory and seat shown in Figure 1 of the Challenged Patents, as modified by Betts or the KLM Crew Rest. I incorporate my analysis discussed above with regard to ['476 Claim 1 Element E].

['476 Claim 3] **The method of claim 1, wherein said exterior aft surface of the passenger seat back has a contoured shape, and wherein said forward wall is shaped to substantially conform to the contoured shape of the exterior aft surface of the passenger seat back when the exterior aft *surface* of said passenger seat back in the unreclined position is received by said forward wall whereby a**

portion of the exterior aft surface of said passenger seat back in the unreclined seat position is received by said forward wall.

160. In in my opinion this element is obvious in view of a flat wall lavatory and seat shown in Figure 1 of the Challenged Patents as modified by Betts or the KLM Crew Rest.

161. As I explain above, the only seat shown in the Challenged Patents includes a contoured shape and is admitted to be prior art. Further, a seat with a contoured shape is well known in the art. *See* Bentley, discussed above. A person of ordinary skill in the art would realize that seats on an airplane could be removed and replaced. Thus, a person of ordinary skill in the art could replace any of the seats shown in Betts or the KLM Crew Rest with another prior art seat design.

162. The Challenged Patents do not include a definition for what is meant by "substantially conform" but as shown in Figure 2 of the Challenged Patents, the forward wall is not required to precisely conform to the shape of the passenger seat. As is shown in the figure below, the walls of Betts and the KLM Crew Rest substantially conforms to a contoured shape of the exterior aft surface of the seat back.

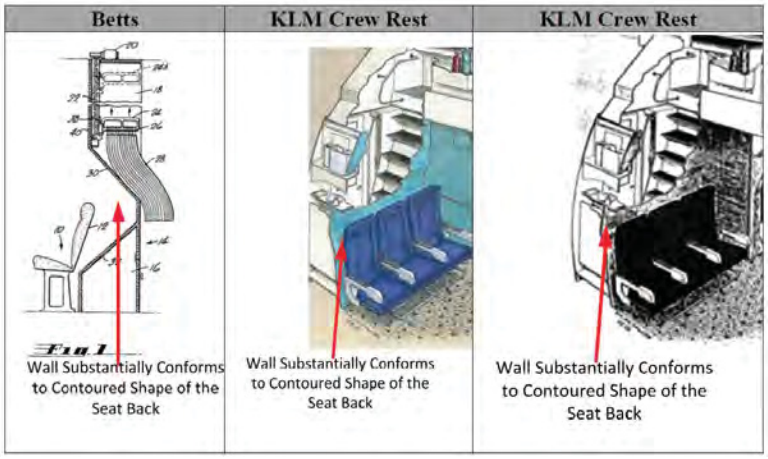
163. For Betts and the KLM Crew Rest the seat is provided with the ability to recline, but if the ability to recline the seat were removed or not required, a person of ordinary skill in the art would have

designed the shape of the recess to receive and substantially conform to the shape of the passenger seat in its upright (i.e., unreclined) position. Designing recess to receive the seat back when the seat back is in an unreclined position would have been an obvious design choice to a person of ordinary skill in the art. A person of ordinary skill in the art would have been motivated to do so to more efficiently maximize the use of space in the cabin.

164. I also incorporate my analysis discussed above with regard to ['292 Claim 1 Element A].

165. It is clear that the seat shown in Betts is positioned further aft than it could be positioned if there were no recess because the seat back is within the recess. Thus the recess receives the seat back. Further, as I noted above, the seat shown in Betts is in substantially the same position as the seat shown in Figure 2 of the Challenged Patents. Thus, in my opinion this seat is in an unreclined position.

166. A person of ordinary skill in the art would recognize that the seat shown in the KLM Crew Rest is positioned further aft than it could be positioned without the recess. A person of ordinary skill in the art would recognize that the seat could be moved further aft, such that the seat was in the recess when in an unreclined position. One motivation for doing so would be to increase the amount of space in front of the passenger seat, thereby increasing the pitch of the rows of seats in the aircraft or allowing an additional row of seats to be added.



> ***['476 Claim 4]*** **The method of claim 2, wherein said exterior aft surface of the passenger seat back has a contoured shape, and wherein said forward wall is shaped to substantially conform to the contoured shape of the exterior aft surface of the passenger seat back when the exterior aft surface of said passenger seat back in the unreclined position is received by said forward wall.**

167. In in my opinion this element is obvious in view of a flat wall lavatory and seat shown in Figure 1 of the Challenged Patents as modified by Betts or the KLM Crew Rest. I incorporate my analysis discussed above with regard to ['476 Claim 2 and Claim 3].

> ***['476 Claim*** **5] The method of claim 3, wherein said contoured shape includes a first section extending along a first axis and a second section extending along a**

second axis, said first section adapted to support a passenger's head and a second adapted to support a passenger's back, wherein said first axis is not parallel with said second axis.

168. In my opinion this element is obvious in view of a flat wall lavatory and seat shown in Figure 1 of the Challenged Patents as modified by Betts or the KLM Crew Rest.

169. As I explain above, the only seat shown in the Challenged Patents is admitted to be prior art. This seat has "a contoured shape includes a first section extending along a first axis and a second section extending along a second axis, said first section adapted to support a passenger's head and said second section adapted to support a passenger's back, wherein said first axis is not parallel with said second axis."

170. Further, a seat with "a contoured shape includes a first section extending along a first axis and a second section extending along a second axis, said first section adapted to support a passenger's head and said second section adapted to support a passenger's back, wherein said first axis is not parallel with said second axis" is well known in the art. *See* Bentley, discussed above. Further, a seat with "a contoured shape includes a first section extending along a first axis and a second section extending along a second axis, said first section adapted to support a passenger's head and said second section adapted to support a passenger's back, wherein said first axis is not parallel with said

second axis" is well known in the art. *See* Bentley, discussed above. Further, the KLM Crew Rest shows a passenger seat with a contoured shape that includes a first section extending along a first axis for supporting a passenger's head and a second section extending along a second axis for supporting a passenger's back. As I explain above, a person of ordinary skill in the art would realize that seats on an airplane could be removed and replaced. Thus, a person of ordinary skill in the art could replace any of the seats shown in Betts or the KLM Crew Rest with another prior art seat design.

> ***['476 Claim* 6] The method of claim 4, wherein said contoured shape includes a first section extending along a first axis and a second section extending along a second axis, said first section adapted to support a passenger's head and a second adapted to support a passenger's back, wherein said first axis is not parallel with said second axis.**

171. In my opinion this element is obvious in view of a flat wall lavatory and seat shown in Figure 1 of the Challenged Patents, as modified by Betts or the KLM Crew Rest. I incorporate my analysis discussed above with regard to ['476 Claim 4 and Claim 5].

C. '641 Patent, Claims 1, 3-10, and 12-17 are Obvious

> ***['641 Claim 1 Preamble]* An aircraft lavatory for a cabin of an aircraft of a type that includes a forward-facing**

passenger seat that includes an upwardly and aftwardly inclined seat back and an aft-extending seat support disposed below the seat back, the lavatory comprising:

172. I am informed that the preamble may not be a limitation. However, to the extent that it is a limitation, in my opinion this element is obvious in view of a flat wall lavatory and seat shown in Figure 1 of the Challenged Patents as modified by Betts or the KLM Crew Rest.

173. Figure 1 of Betts is a side elevation that shows an assembly of an enclosure that is located immediately aft of and adjacent to a passenger seat and is nearly identical to Figure 2 of the '641 Patent.

Betts Figure 1	'641 Patent Figure 2

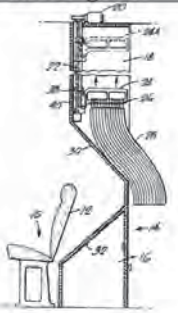
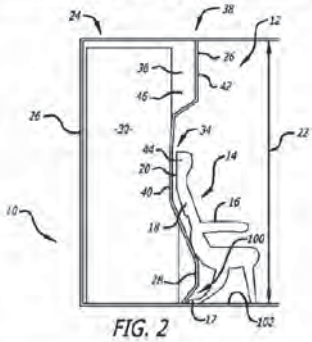
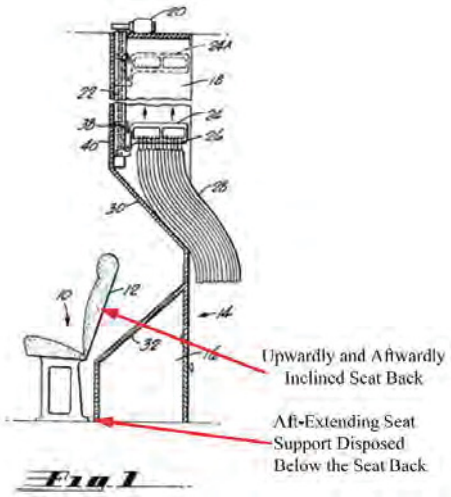

	

Fig. 1	FIG. 2

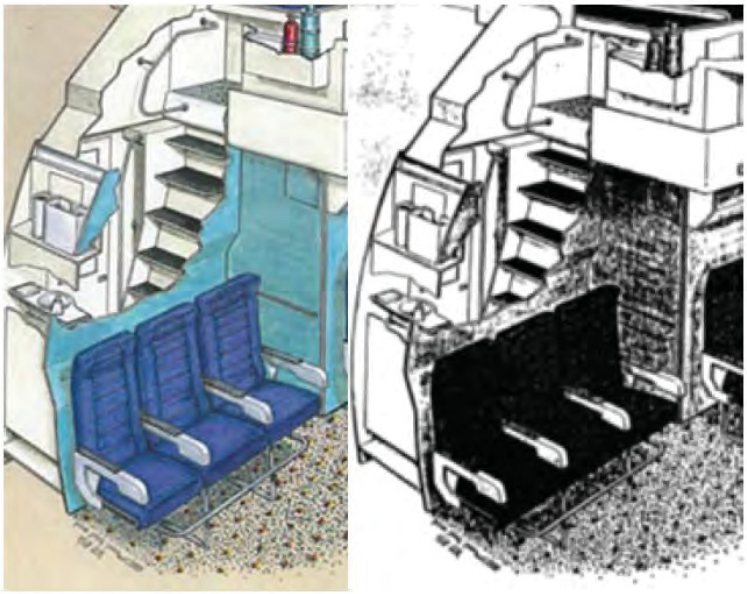
174. As I explain above, a person of ordinary skill in the art would be motivated to modify a flat wall lavatory to use the Betts design on the forward wall of a lavatory. Further, the only seat shown or

described in the '641 Patent is admitted to be prior art. Thus, "a forward-facing passenger seat that includes an upwardly and aftwardly inclined seat back and an aft-extending seat support disposed below the seat back," is admitted to be prior art. However, to the extent it is not, as shown in the annotated figure below, Figure 1 of Betts shows "a forward- facing passenger seat." This seat includes "an upwardly and aftwardly inclined seat back." The seat further includes "an aft-extending seat support disposed below the seat back."



175. The KLM Crew Rest shows a side elevation of a lavatory enclosure. The enclosure has a contoured wall to allow space for a seat that is located forward of and proximate to the aircraft enclosure. Further, the KLM Crew Rest shows "a forward-facing passenger seat." This seat includes "an upwardly and aftwardly inclined seat back." The seat shown in the KLM Crew Rest could be modified to include a

prior art seat with an aft extending seat support. One motivation for such a modification would be to increase the structural strength of the seat supports by providing a longer base.



> ***['641 Claim 1 Element A]*** **a lavatory unit including a forward wall portion and defining an enclosed interior lavatory space, said forward wall portion configured to be disposed proximate to and aft of the passenger seat and including an exterior surface having a shape that is substantially not flat in a vertical plane;**

176. In my opinion this element is obvious in view of a flat wall lavatory and seat shown in Figure 1 of

the Challenged Patents, as modified by Betts or the KLM Crew Rest.

177. As described in detail above, an airplane lavatory was well known in the prior art and the '641 Patent admits that a flat wall lavatory is known in the art. Such a prior art lavatory includes "a forward wall portion and defining an enclosed interior lavatory space."

178. Further, as is shown below, Betts includes a contoured forward wall. In my opinion, a person of ordinary skill in the art would realize that this contoured forward wall could be used in place of a flat forward wall on a prior art flat-walled aircraft lavatory. One motivation to do so would be to allow the seat be placed further aft in an aircraft cabin.

Betts Figure 1	'641 Patent Figure 2

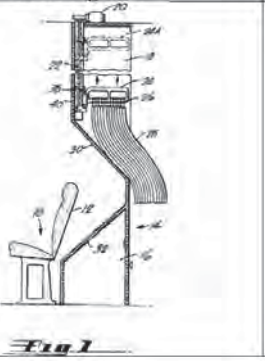
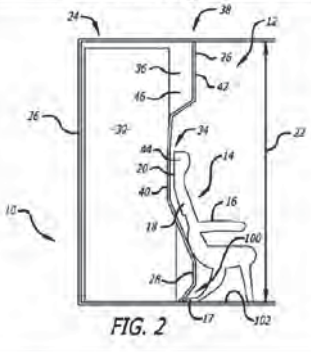
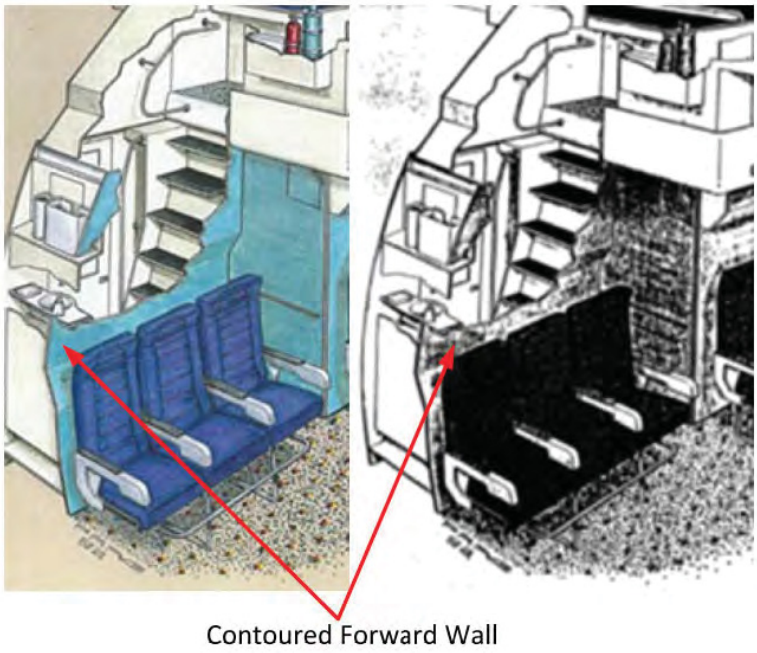

	

Fig 1	FIG. 2

179. Further, as is shown below, the KLM Crew Rest includes a contoured forward wall that is used on a lavatory envelope. In my opinion, a person of ordinary skill in the art would realize that this contoured forward wall could be used in place of a flat forward wall on an aircraft lavatory. One

motivation to do so would be to allow the seat be placed further aft in an aircraft cabin.



180. The contoured forward wall includes an exterior surface having a shape that is substantially not flat in a vertical plane.

> ***['641 Claim 1 Element B]*** **wherein said forward wall portion is shaped to substantially conform to the shape of the upwardly and aftwardly inclined seat back of the passenger seat, and includes a first recess configured to receive at least a portion of the upwardly and aftwardly inclined seat back of the passenger seat therein, and**

181. In my opinion this element is obvious in view of a flat wall lavatory and seat shown in Figure 1 of the Challenged Patents, as modified by Betts or the KLM Crew Rest.

182. As is shown in the annotated figure below, Betts shows an aircraft passenger seat that is positioned at least partially within the contoured forward wall. This seat is received by the contoured wall. Further, the back of this seat is both upwardly and aftwardly inclined.

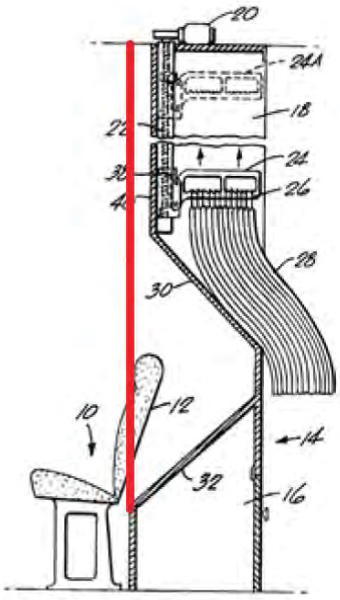
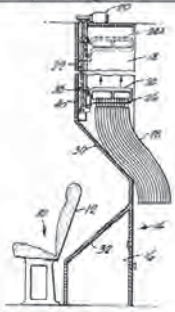
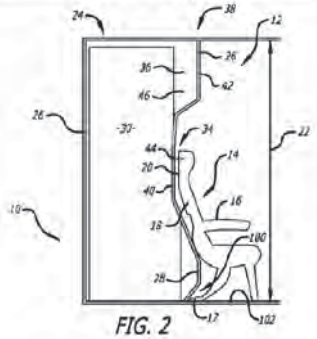


Fig. 1

183. In my opinion, the recess shown in Betts "substantially conforms to a contour of an aft surface of the upwardly and aftwardly inclined seat back."

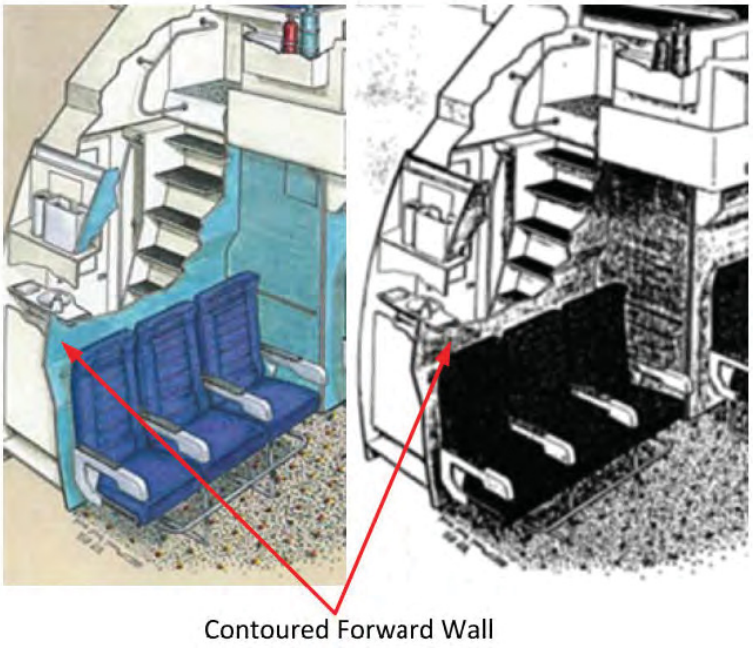
As shown below, the design of Betts Figure 1 is substantially the same as the design shown in Figure 2 of the '641 Patent.

184. The recess in the KLM Crew Rest was designed to allow the last row of seats positioned in front of the contoured wall to sit further aft in the aircraft, yet still be able to recline. Ex. 1007, |13. Thus, if there were no recess, this seat would need to be positioned further forward to allow for recline. Thus, the contoured wall allows for this seat to sit further aft than it otherwise would be able to sit, and therefore receives the seat back. Further, one of ordinary skill in the art would be motivated to restrict the recline of the seat and move the seat into the recess. A motivation for doing so would be to increase the pitch of seats between rows or allow for additional rows of seats.

Betts Figure 1	'641 Patent Figure 2
 Fig. 1	 FIG. 2

185. In my opinion, the recess shown in the KLM Crew Rest "substantially conform[s] to the shape of the upwardly and aftwardly inclined seat back of the

passenger seat." As Mr. Sobotta explains, the design includes a "recess that would receive the seatback of the row of seats located in front of the entry enclosure." Ex. 1007, ¶ 13. This is shown in the annotated figure below.



> ***['641 Claim 1 Element C]*** **further includes a second recess configured to receive at least a portion of the aft-extending seat support therein when at least a portion of the upwardly and aftwardly inclined seat back of the passenger seat is received within the first recess.**

186. In my opinion this element is obvious in view of a flat wall lavatory and seat shown in Figure 1 of

the Challenged Patents, as modified by Betts or the KLM Crew Rest.

187. As is shown in the annotated figure below, Betts shows an aircraft passenger seat that is positioned at least partially within the contoured forward wall. This seat is received by the contoured wall. The back of this seat is both upwardly and aftwardly inclined.

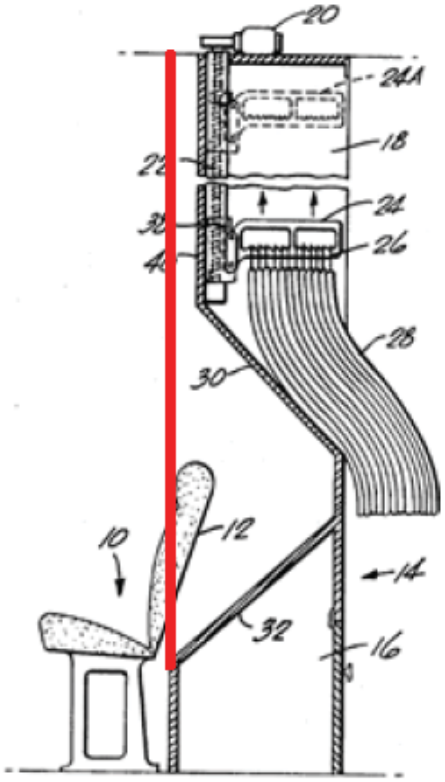
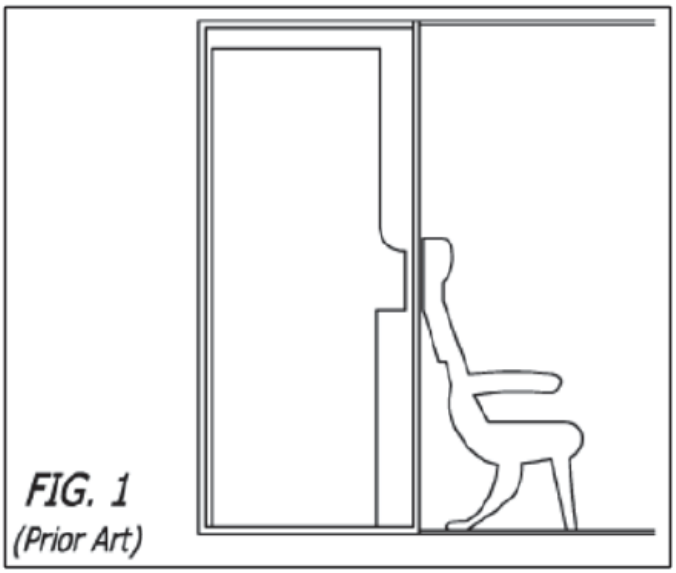


Fig. 1

188. As I explain above, a person of ordinary skill in the art would be motivated to modify a flat forward facing wall of a lavatory to include a recess to allow a passenger seat to be positioned further aft in the aircraft cabin. The challenged patents admit that a seat with an aft extending seat support is well known in the art..



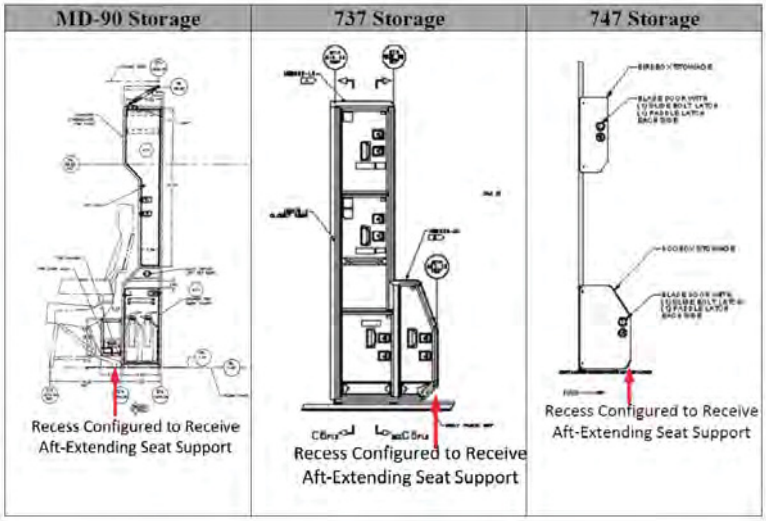
189. As I explain above, a person of ordinary skill in the art would realize that when such a seat is moved further aft, the first component to impact the wall is the seat back. As I explain above, Betts includes a forward facing recess that receives the seat back.

190. Further, the KLM Crew Rest shows both a passenger seat and a contoured forward partition.

As I explain above, the passenger seat is positioned is positioned such that it could not recline without a contoured forward wall, thus this seat is at least partially within the contour and is thus received by the recess.

191. Further, a person of ordinary skill in the art would understand that as the seat is moved further aft, the next component to impact the wall is the aft seat support. A person of ordinary skill in the art would be motivated to modify an enclosure, such as a lavatory, to include a second recess to receive aft facing seat supports. In my opinion, this modification is nothing more than the application of known technology for its intended purpose. The result of such a modification is predictable, allowing the seat to be positioned further aft in an aircraft.

192. As evidence of this modification being well known, I include three examples of prior art enclosures that included a lower recess to accommodate aft- extending seat supports. I understand that these designs are not available as prior art in this proceeding. Thus, I do not rely on these designs as a basis for invalidity. However, these designs inform my opinion by confirming that such a modification was well known in the art, and thus would have been obvious to a person of ordinary skill in the art.

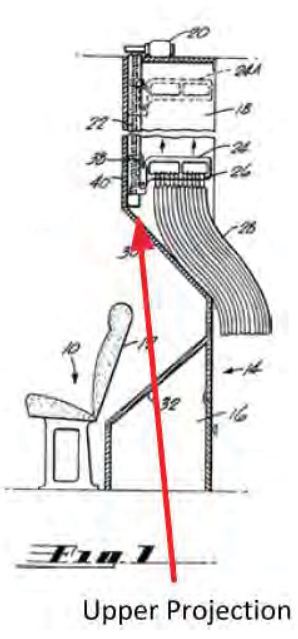


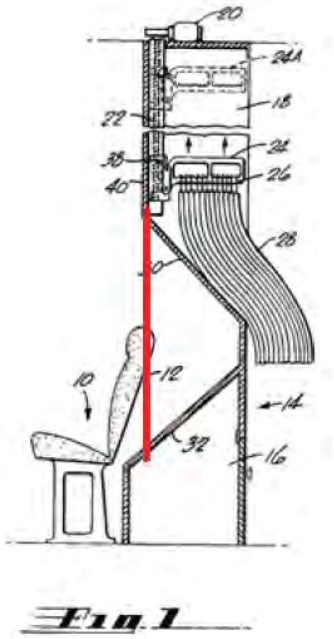
> ***['641 Claim* 5] The aircraft lavatory of claim 1, wherein said forward wall portion further includes a projection configured to project over the passenger seat back when at least a portion of the upwardly and aftwardly inclined seat back of the passenger seat is received within the first recess and at least a portion of the aft- extending seat support is received within the second recess.**

193. In my opinion this element is obvious in view of a flat wall lavatory and seat shown in Figure 1 of the Challenged Patents, as modified by Betts or the KLM Crew Rest.

194. As is shown in the annotated figure below, Betts shows an aircraft passenger seat that is positioned at least partially within the contoured

forward wall. This shows a projection over the passenger seat back when at least a portion of the upwardly and aftwardly inclined seat back of the passenger seat is received.





195. The recess in the KLM Crew Rest was designed to allow the last row of seats in front of the contoured wall to sit further aft in the aircraft, yet still be able to recline. Ex. 1007, ¶13. A person of ordinary skill in the art would recognize that when the seat reclines into the recess in the KLM Crew rest, the upper part of the recess will project overtop of the passenger seat back.

196. Further, as I explain above with regard to ['641 Claim 1, Element C] a person of ordinary skill in the art would be motivated to modify a flat

forward wall to include a second recess to receive at least a portion of an aft extending seat support. One motivation for such a modification would be to allow for the seat to be positioned further aft in an airplane cabin.

> ***['641 Claim 4]*** **The aircraft lavatory of claim 1, wherein said lavatory unit is taller than the passenger seat.**

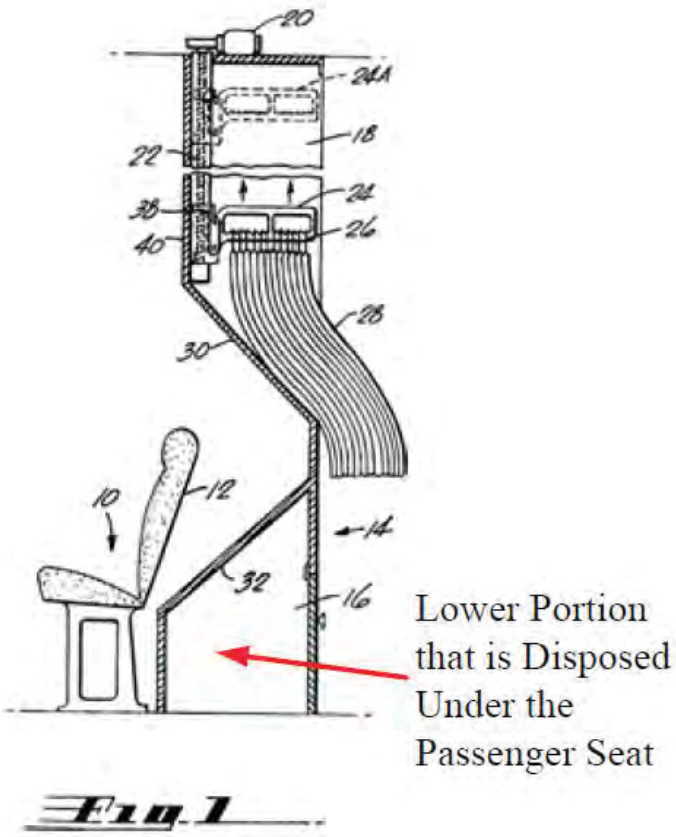
197. In my opinion this element is obvious in view of a flat wall lavatory and seat shown in Figure 1 of the Challenged Patents, as modified by Betts or the KLM Crew Rest. I incorporate my analysis discussed above with regard to ['476 Claim 1 Element C].

> ***['641 Claim*** **5] The aircraft lavatory of claim 1, wherein said forward wall portion includes a lower portion that is disposed under the passenger seat back when at least a portion of the upwardly and aftwardly inclined seat back of the passenger seat is received within the first recess and at least a portion of the aft- extending seat support is received within the second recess.**

198. In my opinion this element is obvious in view of a flat wall lavatory and seat shown in Figure 1 of the Challenged Patents, as modified by Betts or the KLM Crew Rest

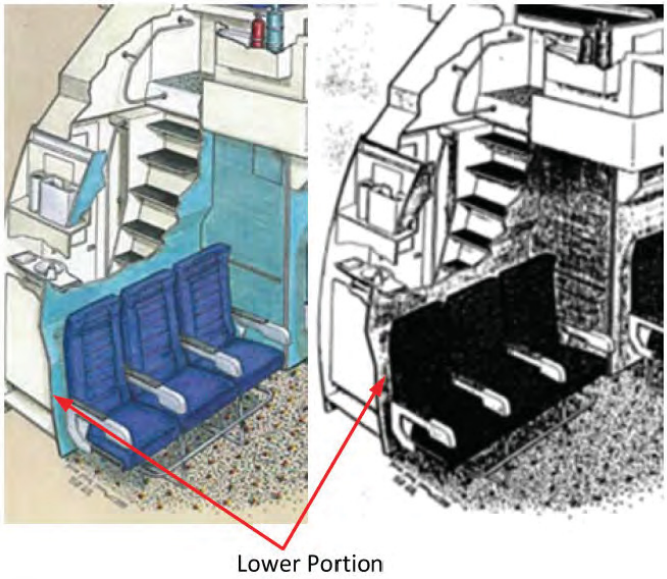
199. As is shown in the annotated figure below, Betts shows an aircraft passenger seat that is positioned at least partially within the contoured

forward wall. This shows a lower portion that is disposed under the passenger seat back when at least a portion of the upwardly and aftwardly inclined seat back of the passenger seat is received within the first recess.



200. Further, as is shown in the annotated figure below, the KLM Crew Rest shows an aircraft passenger seat that is positioned at least partially within the contoured forward wall. This shows a lower portion that is disposed under the passenger seat back when at least a portion of the upwardly

and aftwardly inclined seat back of the passenger seat is received within the first recess



201. Further, as I explain above with regard to ['641 Claim 1, Element C] a person of ordinary skill in the art would be motivated to modify a flat forward wall to include a second recess to receive at least a portion of an aft extending seat support. One motivation for such a modification would be to allow for the seat to be positioned further aft in an airplane cabin.

> **[*'641 Claim 6]* The aircraft lavatory of claim 1, wherein said first recess in said forward wall portion is disposed between an upper wall portion and a lower wall portion.**

202. In my opinion this element is obvious in view of a flat wall lavatory and seat shown in Figure 1 of the Challenged Patents, as modified by Betts or the KLM Crew Rest.

203. As is shown in the annotated figures below, Betts discloses a first recess in said forward wall portion is disposed between an upper wall portion and a lower wall portion.

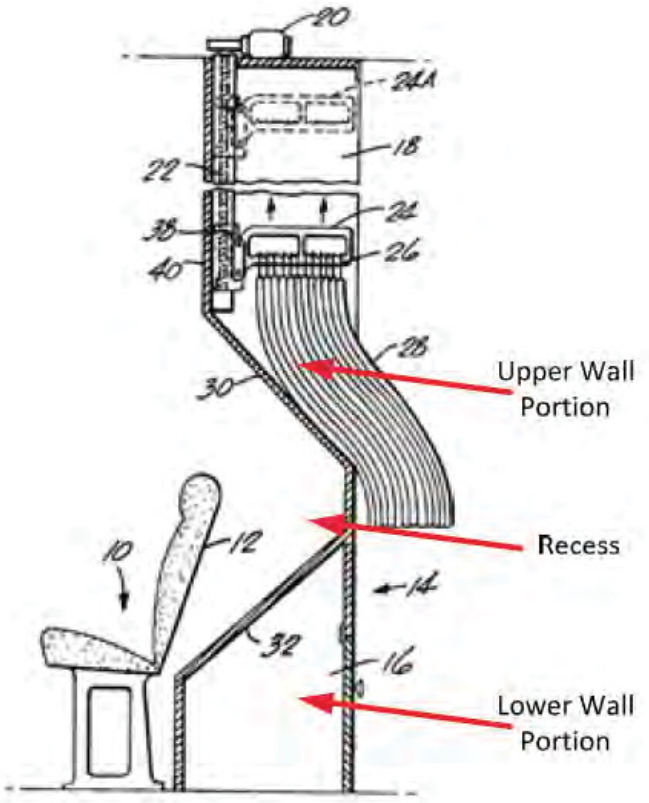
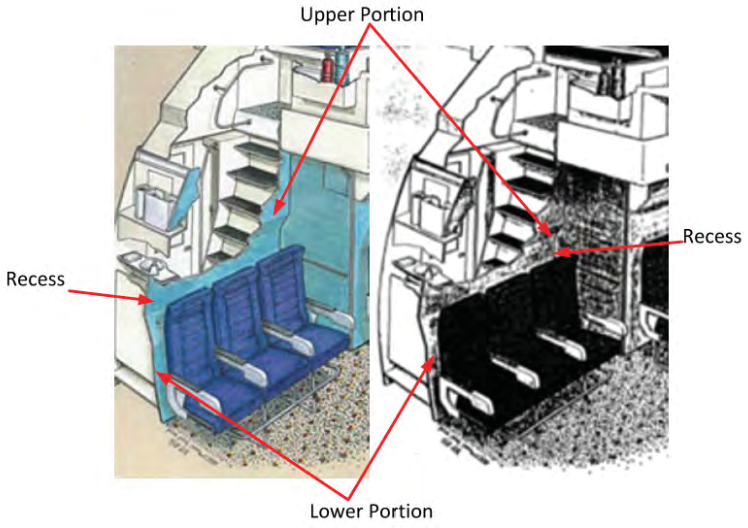


Fig. 1

204. Further, as is shown in the annotated figures below, the KLM Crew Rest discloses a first recess in said forward wall portion is disposed between an upper wall portion and a lower wall portion.

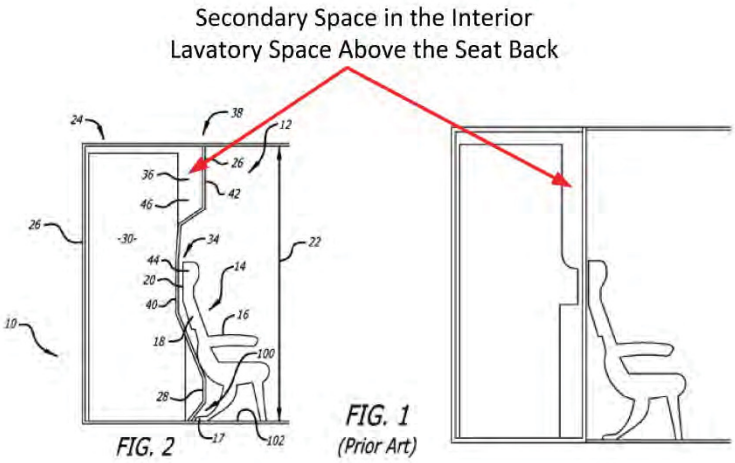


[641 *Claim 7]* The aircraft lavatory of claim 1, wherein said forward wall portion defines a secondary space in said interior lavatory space above the passenger seat back.

205. In my opinion this element is obvious in view of a flat wall lavatory and seat shown in Figure 1 of the Challenged Patents, as modified by Betts or the KLM Crew Rest.

206. Figure 1 of the challenged patents shows "a secondary space in said interior lavatory space above

the passenger seat back." The specification of the '641 Patent describes "the forward wall portion defines a secondary space 36 in the interior lavatory space." '641 Patent, col. 4:43-45. Such a space is shown in both Figure 1 and Figure 2.



207. Further, a person of ordinary skill in the art would recognize that many prior art lavatories and other enclosures—including the KLM Crew Rest—included secondary storage spaces, e.g., trash receptacles, space for additional paper towels or toilet paper, space for routing plumbing, etc. A person of ordinary skill in the art would recognize that the enclosed space of a lavatory would continue to have such stowage even with a contoured forward wall, as shown by the KLM Crew Rest.

> **['*641* Claim 8 Preamble] An aircraft lavatory for an aircraft, the lavatory comprising:**

208. In my opinion this element is obvious i in view of a flat wall lavatory and seat shown in Figure 1 of the Challenged Patents. As I explain above, the '641 Patent admits that an aircraft lavatory was known in the prior art. *See, e.g.,* '641 Patent at Figure 1.

> ***['641* Claim 8, Element A] a forward partition; an aft partition; and a lavatory space disposed between the forward partition and the aft partition;**

209. In my opinion this element is obvious in view of a flat wall lavatory and seat shown in Figure 1 of the Challenged Patents. As I explain above, the '641 Patent admits that an aircraft lavatory was known in the prior art. *See, e.g.,* '641 Patent at Figure 1. This lavatory shows a forward partition, an aft partition, and a lavatory spaced disposed between these two partitions.

> ***['641* Claim 8, Element B] wherein the forward partition comprises: a forward-extending upper portion; an aft-extending mid-portion; and a forward-extending lower portion; and**

210. In my opinion this element is obvious in view of a flat wall lavatory and seat shown in Figure 1 of the Challenged Patents as modified by Betts or the KLM Crew Rest.

211. As is shown in the annotated figures below, Betts discloses a forward-extending upper portion;

an aft-extending mid-portion; and a forward-extending lower portion.

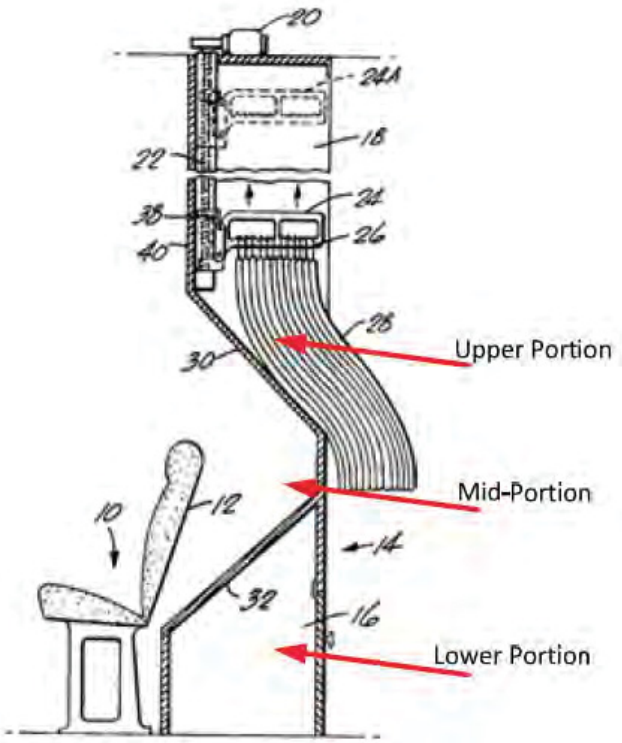
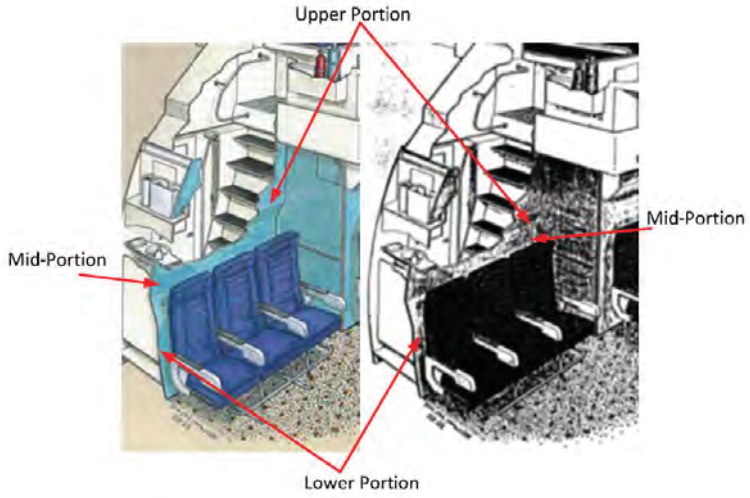


Fig. 1

212. Further, as is shown in the annotated figures below, the KLM Crew Rest discloses a forward-extending upper portion; an aft-extending mid-portion; and a forward-extending lower portion.



> ***['641* Claim 8, Element C] wherein the forward-extending upper portion, the aft-extending mid-portion, and the forward-extending lower portion combine to define a first aft-extending recess disposed between the upper forward-extending portion and the forward-extending lower portion, and**

213. In my opinion this element is obvious in view of a flat wall lavatory and seat shown in Figure 1 of the Challenged Patents as modified by Betts or the KLM Crew Rest. I incorporate my analysis above of ['641 Claim 8, Element B]

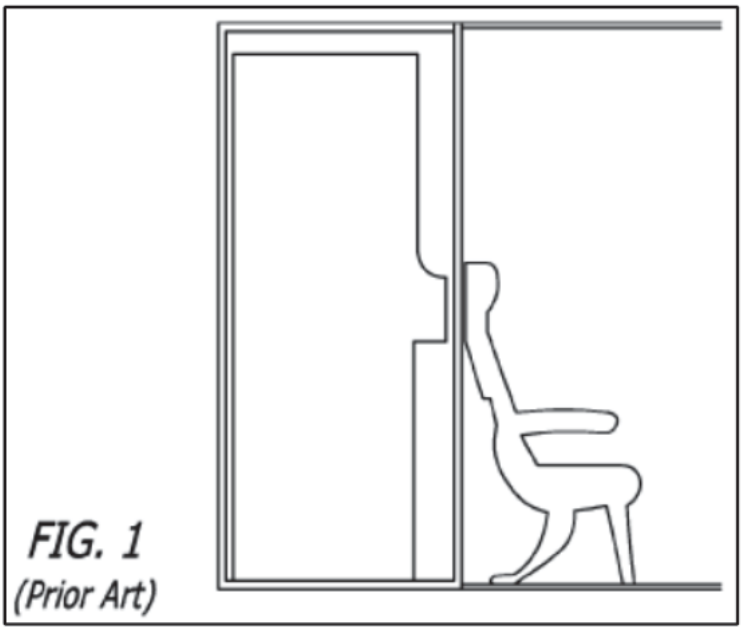
214. As is shown in the annotated Figures above, in both the KLM Crew Rest and Betts "the forward-extending upper portion, the aft-extending mid-portion, and the forward-extending lower portion combine to define a first aft- extending recess

disposed between the upper forward-extending portion and the forward-extending lower portion."

> **['*641* Claim 8, Element D] wherein the forward partition further defines a second aft-extending recess proximate to a lower end of the forward partition, the second aft-extending recess being configured to receive at least a portion of an aft-extending seat support of a forward-positioned passenger seat therein.**

215. In my opinion this element is obvious in view of a flat wall lavatory and seat shown in Figure 1 of the Challenged Patents as modified by Betts or the KLM Crew Rest

216. As I explain above, a person of ordinary skill in the art would be motivated to modify a flat forward facing wall of a lavatory to include a recess to allow a passenger seat to be positioned further aft in the aircraft cabin. A seat with an aft extending seat support is well known in the art. *See* Challenged Patents at Figure 1.



217. A person of ordinary skill in the art would realize that when such a seat is moved further aft, the first component to impact the wall is the seat back. As I explain above, both Betts and the KLM Crew Rest include a forward facing recess that receives the seat back.

218. As the seat is moved further aft, the next component to impact the wall is the aft seat support. A person of ordinary skill in the art would be motivated to modify an enclosure, such as a lavatory, to include a second recess to receive aft facing seat supports. Such a modification is nothing more than the application of known technology for its intended purpose. The result of such a

modification is predictable, allowing the seat to be positioned further aft in an aircraft..

219. Further, as I discuss above with regard to ['641, Claim 1, Element C] a person of ordinary skill in the art would recognize that such a modification was well known in the art.

> **[*'641 Claim 9*] The aircraft lavatory according to claim 8 wherein the first aft extending recess defined by the forward-extending upper portion, the aft-extending mid-portion, and the forward-extending lower portion of the forward partition is configured to receive an aft-extending seat back of the forward positioned passenger seat.**

220. In my opinion this element is obvious in view of a flat wall lavatory and seat shown in Figure 1 of the Challenged Patents as modified by Betts or the KLM Crew Rest.

221. As I describe above with regard to ['641 Claim 8, Element D] Betts shows an aircraft passenger seat that is positioned at least partially within the contoured forward wall. Thus, this seat is received by the contoured wall. Further, the back of this seat is both upwardly and aftwardly inclined.

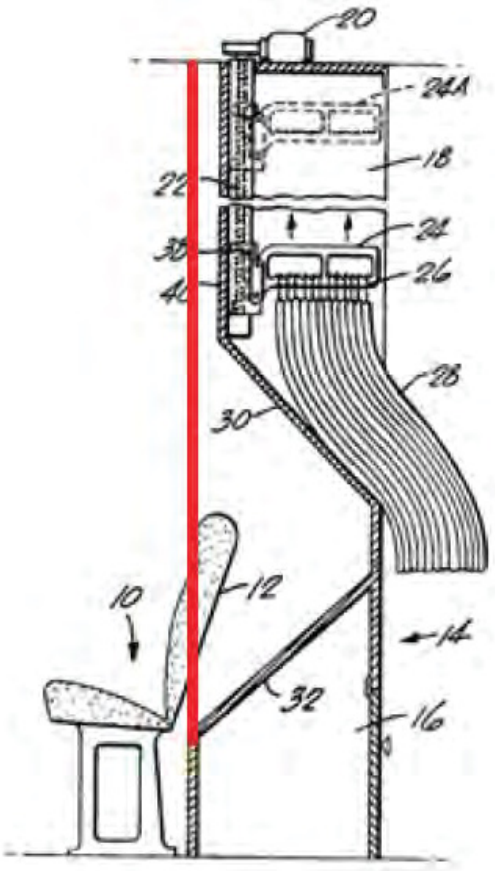


Fig. 1

222. Similarly, as I explain above, The curved forward facing wall shown in the KLM Crew Rest advantageously provides additional space to locate a seat further aft in an aircraft. The recess in the KLM Crew Rest was designed to allow the last row of seats in front of the curved wall to sit further aft in the aircraft, yet still be able to recline. Sobotta

Declaration, at ¶ 13. Thus, the KLM Crew Rest includes a recess configured to receive an upwardly and aftwardly inclined seat back of a passenger seat.

> ***['641 Claim 10]*** **The aircraft lavatory according to claim 9 wherein said forward -extending upper portion is configured to project over at least a portion of the forward-positioned passenger seat.**

223. In my opinion this element is obvious in view of a flat wall lavatory and seat shown in Figure 1 of the Challenged Patents, as modified by Betts or the KLM Crew Rest.

224. As is shown in the annotated figure below, Betts shows an aircraft passenger seat that is positioned at least partially within the contoured forward wall. This shows a projection over the passenger seat back when at least a portion of the upwardly and aftwardly inclined seat back of the passenger seat is received.

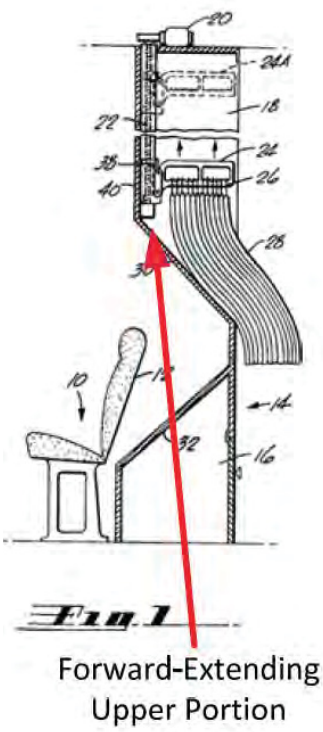


Fig. 1

Forward-Extending
Upper Portion

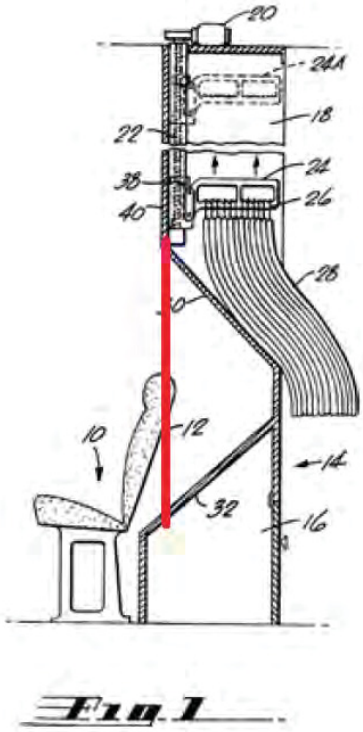


Fig. 1

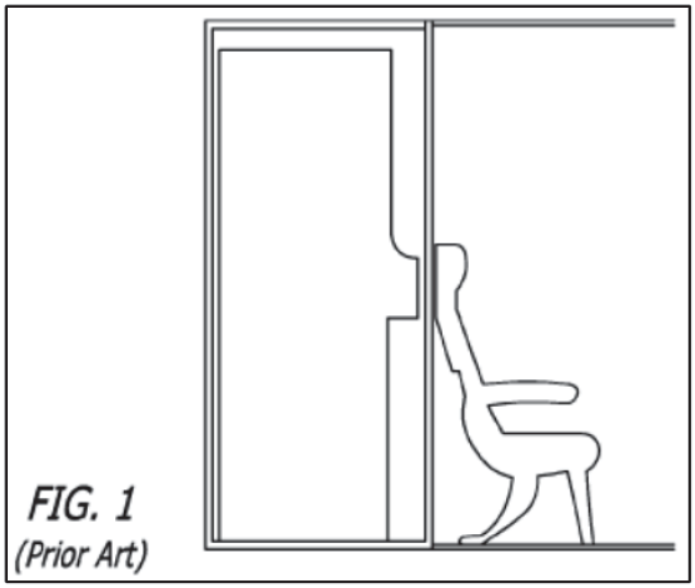
225. As I explain above, the seat in the KLM crew rest is reclines into the contour in the forward wall. Thus, at least part of the forward wall is protrudes overtop of the upwardly and aftwardly reclined seat back.

> ***['641 Claim 12]*** **The aircraft lavatory according to claim 9 wherein said lavatory is taller than the forward-positioned passenger seat.**

226. In my opinion this element is obvious in view of a flat wall lavatory and seat shown in Figure 1 of the Challenged Patents, as modified by Betts or the KLM Crew Rest. I incorporate my analysis discussed above with regard to ['476 Claim 1 Element C].

['641 Claim 13] **The aircraft lavatory according to claim 8 wherein the aft partition is substantially vertical and substantially planar.**

227. In my opinion this element is obvious in view of a flat wall lavatory and seat shown in Figure 1 of the Challenged Patents. As shown in Figure 1 of the Challenged Patents, the aft partition is substantially vertical and substantially planar.

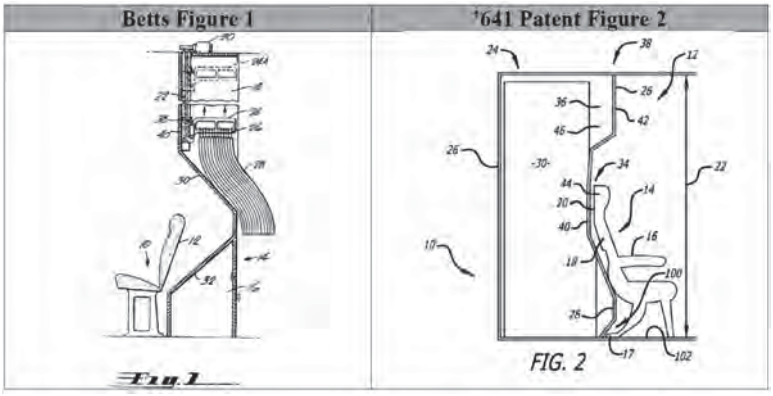


['641 Claim 14] **The aircraft lavatory according to claim 8 wherein the width of the *lavatory* space disposed between the forward partition and the aft partition comprises an upper width, a lower width, and a mid-width, and wherein the upper width and the lower**

width are both substantially wider than the mid-width.

228. In my opinion this element is obvious in view of a flat wall lavatory and seat shown in Figure 1 of the Challenged Patents, as modified by Betts or the KLM Crew Rest.

229. As discussed above, a person of ordinary skill in the art would be motivated to modify a flat wall lavatory to include a contoured forward wall. A person of ordinary skill in the art would recognize that such a modification could impact the interior width of the lavatory. This is clear from the positioning of the recess shown in Figure 1 of Betts, which is substantially the same as Figure 2 of the Challenged Patents. To the extent that Figure 2 of the Challenged Patents describes this limitation, the limitation is also disclosed by Figure 1 of Betts.



230. Further, as discussed above, a person of ordinary skill in the art would be motivated to modify a flat wall lavatory to include a contoured

forward wall. A person of ordinary skill in the art would recognize that such a modification could impact the interior width of the lavatory. This is clear from the positioning of the recess shown in the KLM Crew Rest, which is substantially the same as Figure 2 of the Challenged Patents. Thus, in my opinion, to the extent that Figure 2 of the Challenged Patents describes this limitation, the limitation is also disclosed by the KLM Crew Rest.

> ***['641 Claim* 15] The aircraft lavatory according to claim 8 wherein the upper forward-extending portion, the aft-extending mid-portion, and the forward-extending lower portion of the forward partition form a substantially continuous surface.**

231. In my opinion this element is obvious in view of a flat wall lavatory and seat shown in Figure 1 of the Challenged Patents, as modified by Betts or the KLM Crew Rest.

232. As shown in Figure 1 of Betts, the upper forward-extending portion, the aft-extending mid-portion, and the forward-extending lower portion of the forward partition form a substantially continuous surface.

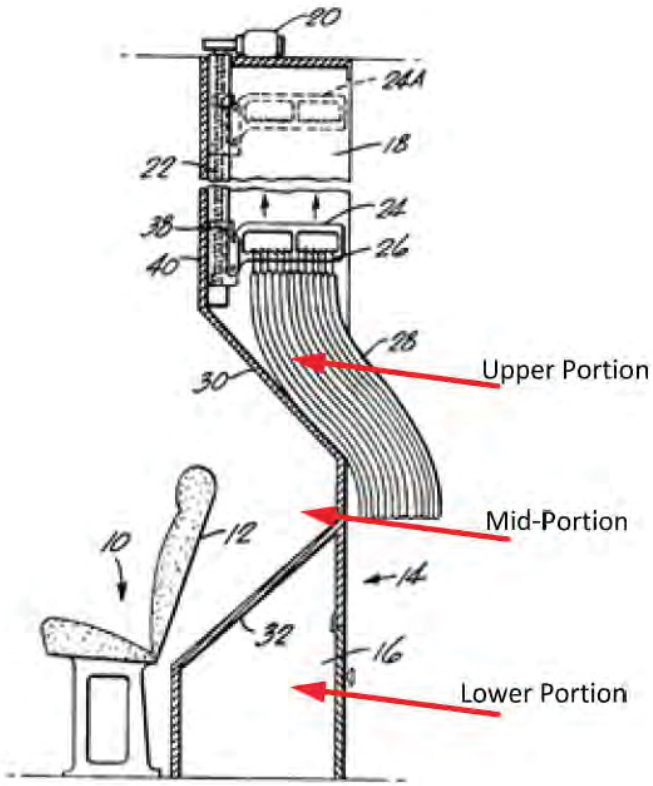
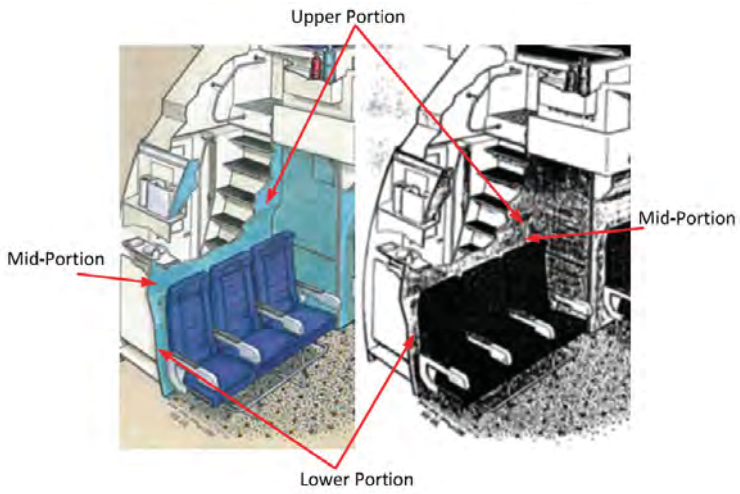


Fig. 1

233. Further, as shown in the annotated Figure of the KLM Crew Rest below, the upper forward-extending portion, the aft-extending mid-portion, and the forward-extending lower portion of the forward partition form a substantially continuous surface.



> ***'641 Claim 16]*** **The aircraft lavatory according to claim 8 wherein said first aft-extending recess extends along substantially a full width of said forward partition.**

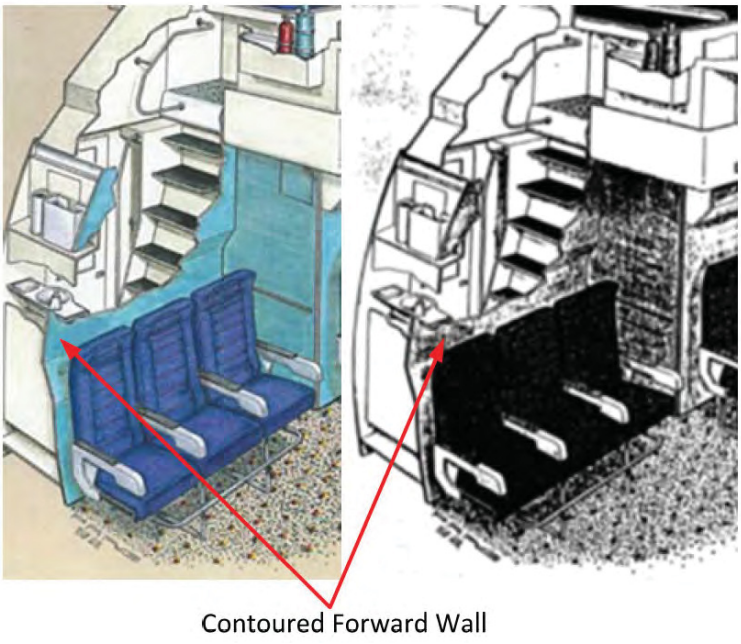
234. In my opinion this element is obvious in view of a flat wall lavatory and seat shown in Figure 1 of the Challenged Patents, as modified by Betts or the KLM Crew Rest

235. Figure 1 of Betts shows a side elevational view of the coat closet enclosure. Betts, 1:58-59. The side elevational view shows the coat closet enclosure from a horizontal plane beside the enclosure. One of ordinary skill in the art would understand from Figure 1 that the recess extends the full width of the forward wall.

236. Further, nothing in Betts suggests that the recess only extends a portion of the width of the forward wall. One of ordinary skill in the art would

be motivated to extend the recess the full width of the forward wall in order to accommodate the full row of seats installed immediately forward of the wall. In fact, the commercial embodiments of the Betts closet (found on DC-10s) had a recess that extended the full width of the forward partition.

237. In my opinion, the KLM Crew rest shows a recess that extends along substantially the full width of the of the contoured forward partition.

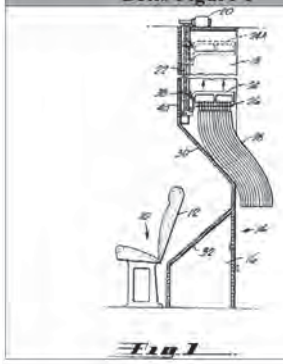
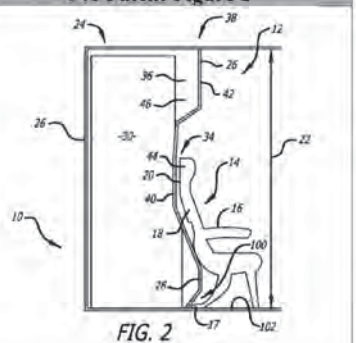


['641 Claim 17] **The aircraft lavatory according to claim 8 wherein said lavatory has a top, a bottom, a height therebetween, and a middle therebetween, said lavatory has varying lengths along the height of the lavatory,**

and said lavatory is longer at the top of the lavatory than at the bottom of the lavatory.

238. In my opinion this element is obvious in view of a flat wall lavatory and seat shown in Figure 1 of the Challenged Patents, as modified by Betts or the KLM Crew Rest.

239. The prior art lavatory shown in Figure 1 of the Challenged Patents shows a lavatory that has a top, a bottom, a height therebetween, and a middle therebetween. Further, as discussed above, a person of ordinary skill in the art would be motivated to modify a flat wall lavatory to include a contoured forward wall. A person of ordinary skill in the art would recognize that such a modification could impact the interior of the lavatory, e.g., the width or the lengths along the height of the lavatory. This is clear from the positioning of the recess shown in Figure 1 of Betts, which is substantially the same as Figure 2 of the '641 Patent. To the extent that Figure 2 of the '641 Patent describes this limitation, the limitation is also disclosed by Figure 1 of Betts. Further, claim 8 of Betts even requires "… a tilt back seat in front of said closet whereby said back tilts under said sloping portion and clothes on said rack are moved vertically for storage over said seat." Thus, Betts contemplates a closet with varying dimensions, including one wherein the top of the closet extends over the seat back.

Betts Figure 1	'641 Patent Figure 2
 Fig. 1	 FIG. 2

240. Similarly, a person of ordinary skill in the art would recognize on review of a flat wall lavatory as modified by the KLM Crew Rest would recognize that such a modification would impact the interior of the lavatory, e.g., the width or the lengths along the height of the lavatory. This is clear from the positioning of the recess shown in the KLM Crew Rest which is substantially the same as Figure 2 of the Challenged Patents. Thus, in my opinion, to the extent that Figure 2 of the '641 Patent describes this limitation, the limitation is also disclosed by the KLM Crew Rest.

D. '742 Patent, Claims 8 and 10-16 are Obvious

['742 Claim 8 Preamble] **A method for reducing a volume of unusable space in a cabin area of a passenger aircraft, comprising:**

241. I am informed that the preamble may not be a limitation. However, to the extent that it is a limitation, in my opinion this element is obvious in view of a flat wall lavatory and seat shown in Figure 1 of the Challenged Patents as modified by Betts or the KLM Crew Rest.

242. The Challenged Patents do not define the term "unusable space," however, by any reasonable definition for this term, Betts or the KLM Crew Rest render the preamble obvious.

243. As I explain above, a person of ordinary skill in the art would be motivated to modify a flat wall lavatory to use the Betts design on the forward wall of a lavatory. Figure 1 of Betts is a side elevation that shows an assembly of an enclosure that is located immediately aft of and adjacent to a passenger seat and is nearly identical to Figure 2 of the Challenged Patents. The Betts wall allows the seat to be positioned further aft so that it is received by the recess. Applying the forward wall of Betts to a lavatory would reduce a volume of unusable space in the cabin of a passenger aircraft.

Betts Figure 1	Challenged Patents Figure 2

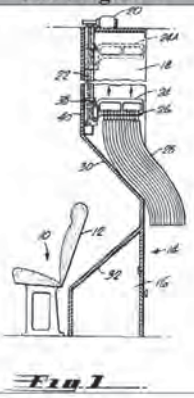
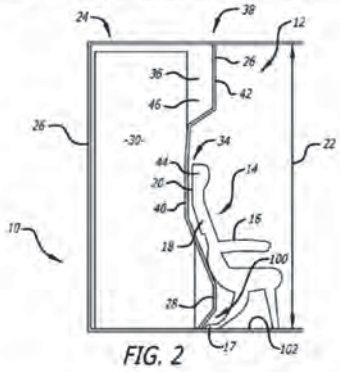

	

Fig. 1	FIG. 2

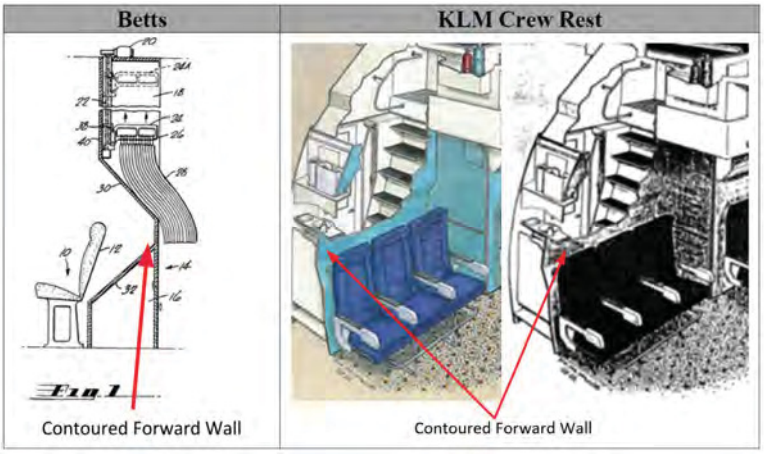
244. As I explain above, a person of ordinary skill in the art would be motivated to modify a flat wall lavatory to use the KLM Crew Rest design on the forward wall of a lavatory. The KLM Crew Rest shows a lavatory envelope. The enclosure has a curved wall to allow space for a seat that is located forward of and proximate to the aircraft enclosure to be positioned further aft and be received by the recess.

245. As I explain above, each of these designs allows for passenger seats to be placed further aft than they could be placed with a flat wall. This allows for additional seating in the cabin of an

aircraft when installed and reduces the volume of unusuable space in the cabin of the aircraft.

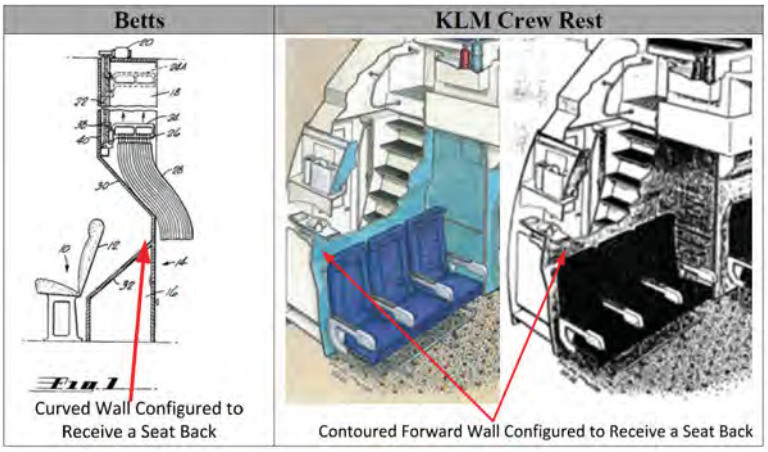
> ***['742 Claim 8 Element* A] replacing at least a previously-installed forward partition of a pre-existing aircraft lavatory in the cabin area of the passenger aircraft with a contoured forward partition, wherein an outward facing vertical surface of the previously installed forward partition is substantially flat, and**

246. In my opinion this element is obvious in view of a flat wall lavatory and seat shown in Figure 1 of the Challenged Patents as modified by Betts or the KLM Crew Rest. As is shown in the diagrams below, each of Betts and the KLM Crew Rest includes a contoured forward partition. Further, any of these contoured forward partitions could replace a flat forward partition.



***['742 Claim 8 Element* B] the contoured forward partition comprises at least one first recess configured to receive at least a portion of an upwardly and aftwardly inclined seat back of a passenger seat therein, and**

247. In my opinion this element is obvious in view of a flat wall lavatory and seat shown in Figure 1 of the Challenged Patents as modified by Betts or the KLM Crew Rest. As is shown in the diagrams below, each of these references discloses a forward wall that includes a recess configured to receive an upwardly and aftwardly inclined seat back of a passenger seat.



248. With regard to Betts, the seat and the seat support are positioned further aft in the cabin, which is clear because the seat is plainly within the recess in the wall. Thus, the recess receives the seat back. This is shown in the annotated figure below.

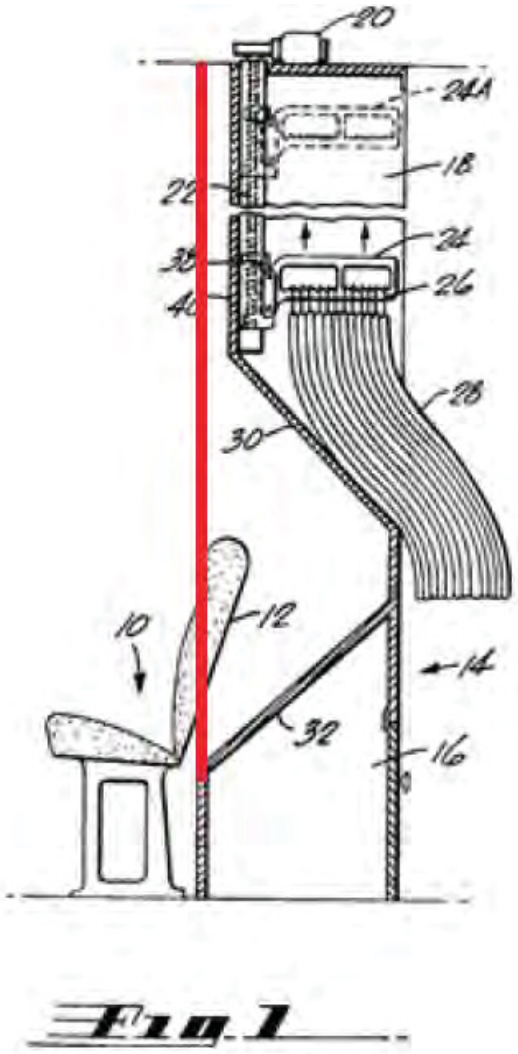


Fig. 1

249. With regard to the KLM Crew Rest, the recess in the KLM Crew Rest was designed to allow the last row of seats positioned in front of the curved wall to sit further aft in the aircraft, yet still be able to recline. Sobotta Declaration, at 13. Thus, if there

were no recess, this seat would need to be positioned further forward to allow for recline. Thus, the curved wall allows for this seat to sit further aft than it otherwise would be able to sit, and therefore receives the seat back. Further, one of ordinary skill in the art would be motivated to restrict the recline of the seat and move the seat into the recess. A motivation for doing so would be to increase the pitch of seats between rows or allow for additional rows of seats.

> ***['742 Claim 8 Element C]*** **at least one second recess configured to receive at least a portion of an aft-extending seat support of the passenger seat therein; and**

250. In my opinion this element is obvious in view of a flat wall lavatory and seat shown in Figure 1 of the Challenged Patents, as modified by Betts or the KLM Crew Rest. I incorporate my analysis above of ['641 Claim 1, Element C].

> ***['742 Claim 8 Element D]*** **installing the passenger seat in front of the contoured forward partition; wherein, upon installation, the at least one first recess receives at least a portion of the upwardly and aftwardly inclined seat back, and the second recess receives at least a portion of the aft-extending seat support,**

251. In my opinion this element is obvious in view of a flat wall lavatory and seat shown in Figure 1 of the Challenged Patents, as modified by Betts or the

KLM Crew Rest. I incorporate my analysis discussed above with regard to ['742 Claim 8 Elements B and C] and ['641 Claim 8 Element D].

252. Further, as I explain above, the only seat shown in the Challenged Patents is admitted to be prior art. And each of Betts and the KLM Crew Rest discloses an airplane seat installed forward of a contoured forward wall. Further, airplane seats were well known in the art. *See, e.g.,* Bentley.

> ***['742 Claim 8 Element E]*** **thereby reducing the volume of unusable space in the cabin area by reducing or eliminating gaps that existed between the previously-installed forward wall and the passenger seat.**

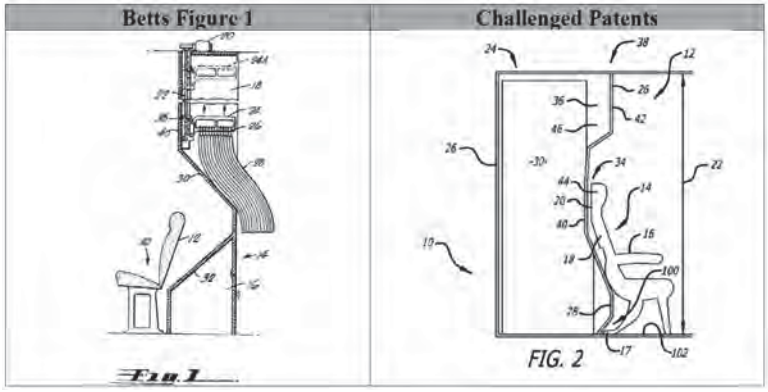
253. In my opinion this element is obvious in view of a flat wall lavatory and seat shown in Figure 1 of the Challenged Patents, as modified by Betts or the KLM Crew Rest.

254. The term "unusable space" is not defined or explained in the Challenged Patents. This term is unclear, as all space in an airplane is usable, e.g., a coat or reading material could be place in the space between a seat and a forward facing wall. However, as best as I understand the term "unusable space," this element is obvious in view of a flat wall lavatory modified by one of Betts or the KLM Crew Rest. I incorporate my analysis above of ['742 Claim 8 Preamble].

['742 Claim 10] **The method of claim 8, wherein the at least one first recess substantially conforms to a contour of an aft surface of the upwardly and aftwardly inclined seat back.**

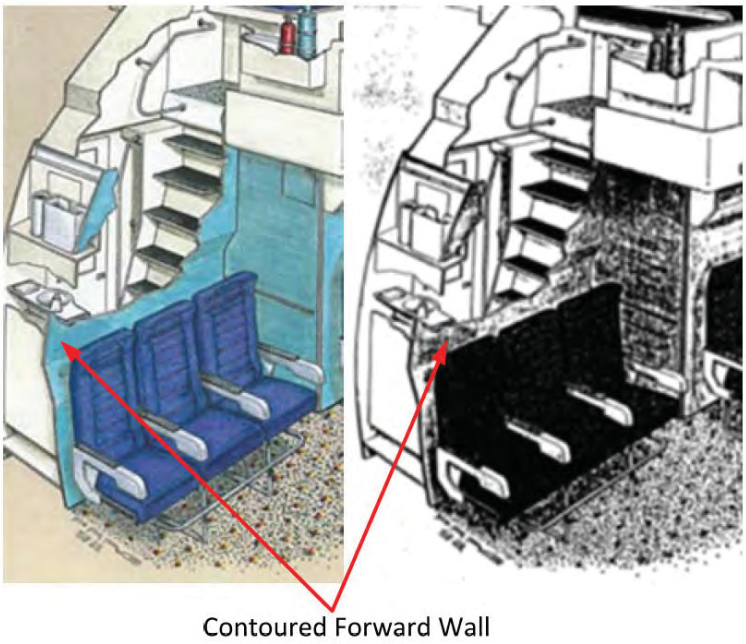
255. In my opinion this element is obvious in view of a flat wall lavatory and seat shown in Figure 1 of the Challenged Patents as modified by Betts or the KLM Crew Rest. I incorporate herein my analysis of ['742 Claim 8 Element B].

256. In my opinion, the recess shown in Betts "substantially conforms to a contour of an aft surface of the upwardly and aftwardly inclined seat back." For example, as shown below, the design of Betts Figure 1 is substantially the same as the design shown in Figure 2 of the Challenged Patents.



257. Further, the recess shown in the KLM Crew Rest "substantially conforms to a contour of an aft surface of the upwardly and aftwardly inclined seat back." As Mr. Sobotta explains, the design includes

a "recess that would receive the seatback of the row of seats located in front of the entry enclosure." This is shown in the annotated figure below.

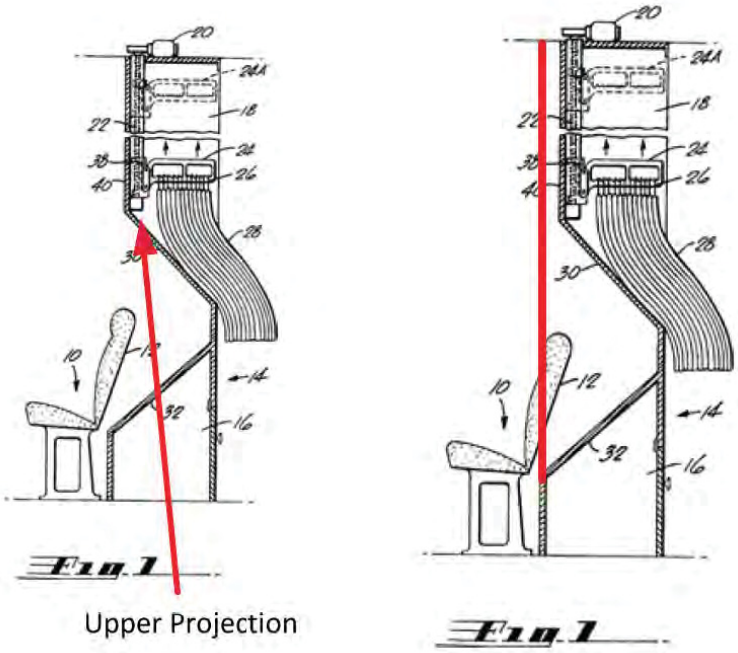


258. With regard to "a contour of an aft surface of the upwardly and aftwardly inclined seat back," the only seat disclosed in the '742 patent is admitted to be prior art.

> ***['742 Claim* 11] The method of claim 8, wherein the contoured forward partition further comprises an upper projection that, upon installation, protrudes forward over a top of the upwardly and aftwardly inclined seat back.**

259. In my opinion this element is obvious in view of a flat wall lavatory and seat shown in Figure 1 of the Challenged Patents as modified by Betts or the KLM Crew Rest.

260. As is shown in the annotated figures below, Betts discloses "an upper projection that, upon installation, protrudes forward over a top of the upwardly and aftwardly inclined seat back."



261. Further, as I explain above, the seat in the KLM crew rest is reclines into the contour in the forward wall. Thus, at least part of the forward wall is protrudes overtop of the upwardly and aftwardly reclined seat back.

['742 Claim 12] **The method of claim 11, wherein the upper projection is configured to abut an upper surface of the cabin area.**

262. In my opinion this element is obvious in view of a flat wall lavatory and seat shown in Figure 1 of the Challenged Patents as modified by Betts or the KLM Crew Rest. As is shown in the annotated Figures in my analysis of ['742 Claim 11], the upper projection shown in each of these figures abuts an upper surface of the cabin area, e.g., the interior ceiling of the aircraft.

['742 **Claim *13*] The method of claim 11, wherein the upper projection defines an interior storage space in the aircraft lavatory.**

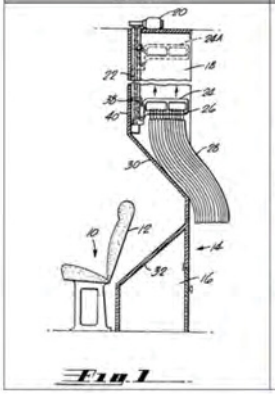
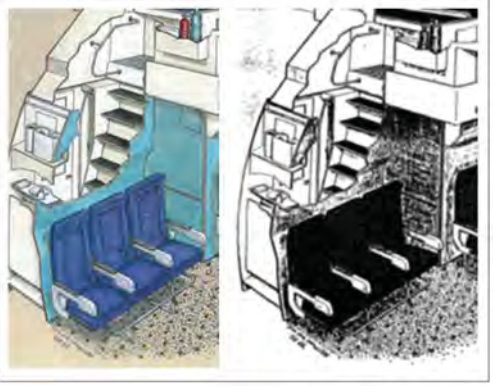
263. In my opinion this element is obvious in view of a flat wall lavatory and seat shown in Figure 1 of the Challenged Patents as modified by Betts or the KLM Crew Rest. I incorporate my analysis of ['641 Claim 7].

['742 Claim 14] **The method of claim 8, wherein the upwardly and aftwardly inclined seat back is in an upright and not a reclined position.**

264. In my opinion this element is obvious in view of a flat wall lavatory and seat shown in Figure 1 of the Challenged Patents as modified by Betts or the KLM Crew Rest.

265. The seat shown in Betts is in substantially the same position as the seat shown in Figure 2 of the Challenged Patents. Thus, in my opinion this seat is in an unreclined position.

266. A person of ordinary skill in the art would recognize that the seat shown in the KLM Crew rest is positioned further aft than it could be positioned without the recess. A person of ordinary skill in the art would recognize that the seat could be moved further aft, such that the seat was in the recess when in an unreclined position. One motivation for doing so would be to increase the amount of space in front of the passenger seat, thereby increasing the pitch of the rows of seats in the aircraft or allowing an additional row of seats to be added.

Betts	KLM Crew Rest
	

***['742 Claim* 15] The method of claim 8, wherein the at least one first recess extends along substantially a full width of the contoured forward partition.**

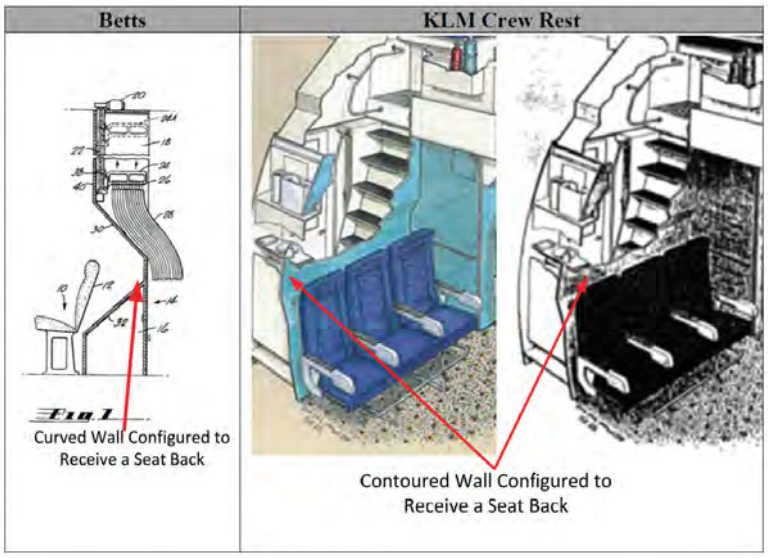
267. In my opinion this element is obvious in view of a flat wall lavatory and seat shown in Figure 1 of the Challenged Patents, as modified by Betts or the KLM Crew Rest. I incorporate my analysis above of [‘641 Claim 16].

> ***[‘742 Claim 16*] The method of claim 8, wherein replacing the previously-installed forward partition with the contoured forward partition permits the aft-extending seat support to be positioned farther aft in the cabin area than was possible when the previously-installed forward partition was installed in the cabin area.**

268. In my opinion this element is obvious in view of a flat wall lavatory and seat shown in Figure 1 of the Challenged Patents, as modified by Betts or the KLM Crew Rest

269. As I explain above, a person of ordinary skill in the art would be motivated to modify a flat wall lavatory to use the Betts design on the forward wall of a lavatory. Further, it is clear that the seat shown in Betts is positioned further aft than it could be positioned if there were no recess in the forward wall because the seat back is within the recess. Thus the recess is configured to receive the seat back. Further, as I noted above, the seat shown in Betts is in substantially the same position as the seat shown in Figure 2 of the Challenged Patents. Thus, in my opinion this seat is in an unreclined position.

270. As I explain above, a person of ordinary skill in the art would be motivated to modify a flat wall lavatory to use the KLM Crew Rest design on the forward wall of a lavatory. A person of ordinary skill in the art would recognize that the seat shown in the KLM Crew rest is positioned further aft than it could be positioned without the recess. A person of ordinary skill in the art would recognize that the seat could be moved further aft, such that the seat was in the recess when in an unreclined position. One motivation for doing so would be to increase the amount of space in front of the passenger seat, thereby increasing the pitch of the rows of seats in the aircraft or allowing an additional row of seats to be added.



271. Further, as I explain above, it would be obvious to modify a prior art flat wall lavatory to

include a second recess. I incorporate my analysis above of ['641 Claim 1, Element C].

IX. SUMMARY

272. I note that my analysis is continuing and that I may modify or supplement my conclusions as I receive additional information. I declare under penalty of perjury that the foregoing Declaration is true and correct.

Dated: April 13, 2017 /s/ *Alan J. Anderson*
Alan J. Anderson

Exhibit A - Anderson CV

Professional Experience

The Mission Zero Foundation
Founding Board Member, 2015 to Present

The Ray C Anderson Foundation
Advisory Board Member, 2013 to Present

Independent Consultant
The Boeing Company, 2012-2014
C&D Zodiac, 2012-2014

The Boeing Company

- 1968 to 1978; Design Engineer, then Lead Engineer (747, 707, 727, 737 and 757 Programs) responsible for developing Engineering Detail, Assembly and Installation Drawings, Component and System Specifications, Test and Certification Plans. Coordinating Airline Requirements for Cargo Handling Equipment, Passenger and Crew Oxygen Systems, Galleys, Seats and Lavatories.
- 1978 to 1988; Engineering Design Manager (727, 737, 757 and 7J7 Programs) for Oxygen, Insulation, Interior Linings, Waste, Water, Cargo, Galleys and Lavatories.
- 1978 to 1992; Chief Engineer Payload Systems Advanced Programs, Overseeing Technology and New Product Development for Payload Systems.
- 1992 to 1999; Chief Engineer 747 and 767 Payload Systems, overseeing all Engineering activity for Payload Systems

- 1999 to 2011; Chief Engineer and Director of Engineering, Payload Systems, overseeing Engineering staffing, technical development, and commonality for both parts and processes across all Boeing Airplane Interiors
- 2003 to 2011; Chief Engineer, Interiors, 787 Program, developing requirements, budgets and schedules for the program and being responsible to bring the 787 Interior to market.

Education

University of Washington
Bachelor of Science, Mechanical Engineering, 1964 to 1968
Dartmouth College
National Science Foundation Student, Engineering Design. 1965
Columbian Business School
Executive Education, 1996

Professional Activities and Associations

- US (Air Transport Association) Representative to the European Cabin Safety Working Group, 1991 to 1992.

APPENDIX H

(12) **United States Patent**

Cook et al.

(10) **Patent No.: US 9,440,742 B2**

(45) **Date of Patent: Sep. 13, 2016**

(54) **AIRCRAFT INTERIOR LAVATORY**

(71) Applicant: **B/E Aerospace, Inc.**, Wellington, FL (US)

(72) Inventors: **Donald F. Cook**, Arlington, WA (US); **Liberty Harrington**, Seattle, WA (US); **Philipp Steiner**, Seattle, WA (US); **Robert K. Brauer**, Seattle, WA (US); **Trevor Skelly**, Mercer Island, WA (US)

(73) Assignee: **B/E AEROSPACE, INC.**, Wellington, FL (US)

(*) Notice: Subject to any disclaimer, the term of this patent is extended or adjusted under 35 U.S.C. 154(b) by 0 days.

(21) Appl. No.: **15/141,338**

(22) Filed: **Apr. 28, 2016**

(65) **Prior Publication Data**

US 2016/0236783 A1 Aug. 18, 2016

Related U.S. Application Data

(63) Continuation of application No. 14/709,409, filed on May 11, 2015, which is a continuation of application No. 14/043,500, filed on Oct. 1, 2013, now Pat. No. 9,073,641, which is a continuation of application No.

(Continued)

(51) **Int. Cl.**

B64D 11/06 (2006.01)

B64D 11/02 (2006.01)

B64F 5/00 (2006.01)

(52) **U.S. Cl.**

CPC ***B64D 11/02*** (2013.01); ***B64D 11/06*** (2013.01); ***B64F 5/00*** (2013.01)

(58) **Field of Classification Search**

CPC B64D 11/00; B64D 2011/0046; B64D 11/0023; B64D 11/06; B64D 2011/0617; B64D 2011/0665; B64D 11/02; B64D 29/00; B64D 29/02

See application file for complete search history.

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Primary Examiner — Benjamin P Lee

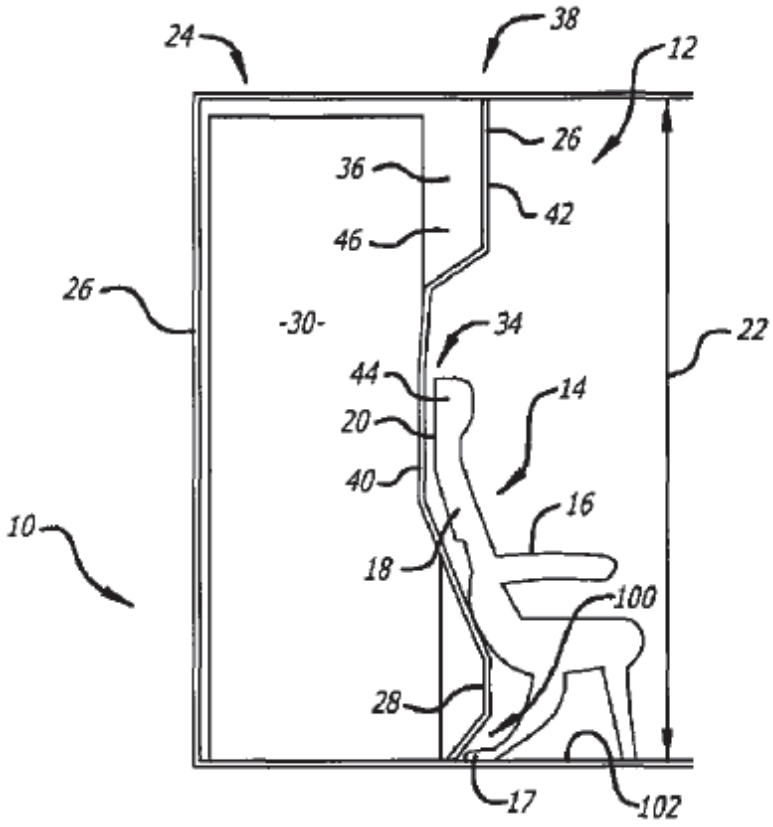
(74) *Attorney, Agent, or Firm* — Obion, McClelland, Maier & Neustadt, L.L.P.

(57) **ABSTRACT**

A lavatory for an aircraft cabin includes a wall having a forward wall portion disposed immediately aft of and substantially conforming to an exterior aft surface of an aircraft cabin structure, such as a passenger seat, that is substantially not flat in a vertical plane. The forward wall portion includes a forward projection over an aft portion of the adjacent passenger seat. The forward wall portion can define a secondary space in the interior lavatory space,

which can provide an amenity stowage space, and can include design elements providing visual space.

17 Claims, 1 Drawing Sheet



Related U.S. Application Data

13/089,063, filed on Apr. 18, 2011, now Pat. No. 8,590,838.

(60) Provisional application No. 61/346,835, filed on May 20, 2010, provisional application No. 61/326,198, filed on Apr. 20, 2010.

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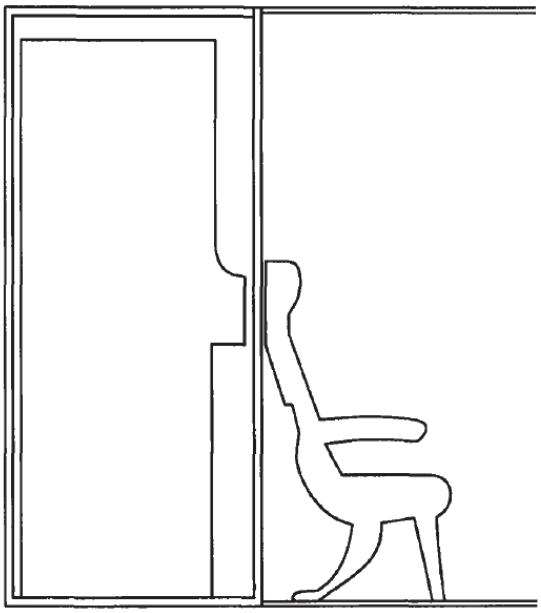

FIG. 1
(Prior Art)

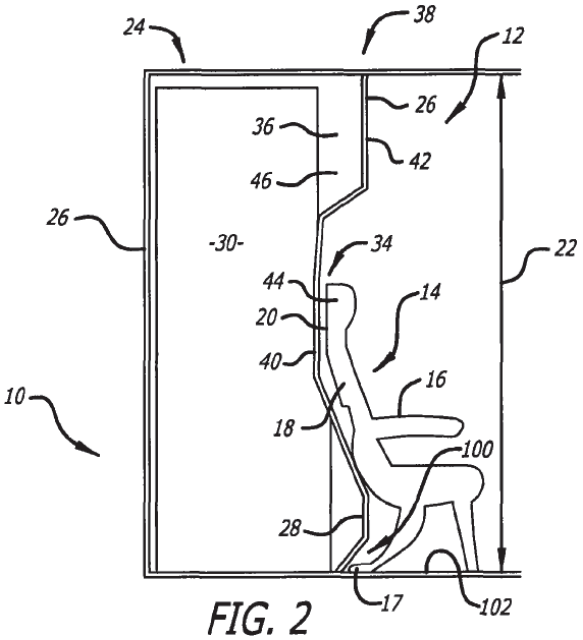

FIG. 2

AIRCRAFT INTERIOR LAVATORY

CROSS-REFERENCES TO RELATED APPLICATIONS

This application is a continuation of and claims the benefit of priority from U.S. Ser. No. 14/709,409, filed May 11, 2015, which is a continuation of U.S. Ser. No. 14/043,500, filed on Oct. 1, 2013, U.S. Pat. No. 9,073,641, issue date Jul. 7, 2015, which is a continuation of U.S. Ser. No. 13/089,063, filed on Apr. 18, 2011, U.S. Pat. No. 8,590,838, issue date Nov. 26, 2013, which claims priority from Provisional Application No. 61/326,198, filed Apr. 20, 2010, and Provisional Application No. 61/346,835, filed May 20, 2010, which are incorporated by reference in their entirety herein.

BACKGROUND OF THE INVENTION

The present invention relates generally to aircraft enclosures, and more particularly relates to an aircraft cabin enclosure, such as a lavatory, an aircraft closet, or an aircraft galley, for example, including an aircraft cabin structure having an aft portion with a substantially vertically extending exterior aft surface that is substantially not flat in a vertical plane.

Aircraft lavatories, closets and other full height enclosures commonly have forward walls that are flat in a vertical plane. Structures such as passenger seats installed forward of such aircraft lavatories, closets and similar full height enclosures often have shapes that are contoured in the vertical plane. The

juxtaposition of these flat walled enclosures and contoured structures renders significant volumes unusable to both the function of the flat walled lavatory or enclosure and the function of the contoured seat or other structure. Additionally, due to the lack of a provision for structural load sharing, conventional aircraft lavatories require a gap between the lavatory enclosures and adjacent structures, resulting in a further inefficiency in the use of space.

Aircraft bulkheads, typically separating passenger cabin areas or classes of passenger service, are in common use, and typically have a contour permitting passengers seated behind the bulkhead to extend their feet modestly under the premium seats immediately forward of the bulkhead. These provide a comfort advantage to passengers seated behind the bulkhead, but provide no increased efficiency in the use of space, in that they do not enable the seats fore and aft of the bulkhead to be placed more closely together. Short, floor-mounted stowage boxes, typically no taller than the bottom cushion of a passenger seat, are often positioned between the flat wall of current lavatories or other enclosures and passenger seats. These provide no improvement to the utility or spatial efficiency of the lavatory or other enclosure. While they do provide some useful stowage for miscellaneous items, they do not provide sufficient additional stowage to provide more space for passenger seating.

It would be desirable to provide an aircraft lavatory or other enclosure that can reduce or

eliminate the gaps and volumes of space previously required between lavatory enclosures and adjacent structures to allow an adjacent structure such as passenger seating installed forward of the lavatory or other enclosure to be installed further aft, providing more space forward of the lavatory or enclosure for passenger seating or other features than has been possible in the prior art. Alternatively, the present invention can provide a more spacious lavatory or other enclosure with no need to move adjacent seats or other structures forward.

It would also be desirable to provide an aircraft lavatory or other enclosure with a wall to bear loads from an adjacent passenger seating or other structure, permitting elimination of a required gap between the lavatory or other enclosure and the adjacent passenger seating or other structure, making more space available for other uses. In addition, enabling a lavatory or other enclosure to bear loads from an adjacent structure can reduce the combined weight of the lavatory or other enclosure and the adjacent structure.

It also would be desirable to provide an aircraft lavatory or other enclosure that can reduce or eliminate the gaps and volumes of space previously required between lavatory enclosures and adjacent structures, to allow the installation of an increased number of passenger seats, to increase the value of the aircraft. The present invention meets these and other needs.

SUMMARY OF THE INVENTION

Briefly, and in general terms, the present invention provides for an enclosure, such as a lavatory, an aircraft closet, or an aircraft galley, for example, for a cabin of an aircraft including a structure having an aft portion with a substantially vertically extending exterior aft surface that is substantially not flat in a vertical plane. The enclosure structure permits a combination of the enclosure with the structure in a manner that permits significant saving of space in the aircraft, which in turn permits more seats to be installed, or more space to be offered per seat, increasing the value of the aircraft.

Accordingly, in one presently preferred aspect, the present invention provides for an enclosure unit for a cabin of an aircraft including an aircraft cabin structure having an aft portion with an exterior aft surface that is substantially not flat in a vertical plane. The enclosure unit can be a lavatory, an aircraft closet, or an aircraft galley, for example. In one presently preferred aspect, the enclosure unit includes one or more walls that are taller than an adjacent aircraft cabin structure, the one or more walls defining an interior enclosure space and having a forward wall portion. The forward wall portion is configured to be disposed immediately aft of and adjacent to or abutting the exterior aft surface of the aircraft cabin structure, and the forward wall portion is shaped to substantially conform to the shape of the exterior aft surface of the aircraft cabin structure.

In another presently preferred aspect, the enclosure unit includes an enclosure stall unit, and

the aircraft cabin structure is a passenger seat installed immediately forward of the enclosure stall unit. In another presently preferred aspect, the forward wall portion of the enclosure unit is configured to accept loads from the aircraft passenger seat. In another presently preferred aspect, the forward wall portion includes a forward projection configured to project over an aft portion of the adjacent passenger seat immediately forward of the enclosure stall unit.

In another presently preferred aspect, the enclosure is a lavatory, including a lavatory stall unit with one or more walls having a forward wall portion. The one or more walls define an interior lavatory space, and the forward wall portion is configured to be disposed immediately aft of and adjacent to or abutting an aircraft cabin structure having an exterior aft surface having a shape that is substantially not flat in a vertical plane. In a presently preferred aspect, the forward wall portion is shaped to substantially conform to the shape of the exterior aft surface of the aircraft cabin structure.

In another presently preferred aspect, the aircraft cabin structure is a passenger seat installed immediately forward of the lavatory stall unit, and the forward wall portion of the lavatory stall unit is configured to accept loads from the passenger seat. In another presently preferred aspect, the forward wall portion includes a forward projection configured to project over an aft portion of the adjacent passenger seat immediately forward of the lavatory stall unit. In another presently preferred

aspect, the forward wall portion defines a secondary space in the interior lavatory space in an area forward of an aft-most portion of the forward wall portion. The secondary space can provide an amenity stowage space inside the lavatory stall unit in the area forward of an aft-most portion of the forward wall portion, and can include design elements providing visual space inside the lavatory in the area forward of an aft-most portion of the forward wall portion.

In another presently preferred aspect, the present invention provides for an assembly of an aircraft enclosure unit and an aircraft cabin structure for an aircraft cabin, the assembly in combination including an aircraft cabin structure having an exterior aft surface having a shape that is substantially not flat in a vertical plane, and an aircraft enclosure unit including at least one wall having a forward wall portion. The one or more walls define an interior enclosure space, the forward wall portion is disposed immediately aft of and adjacent to the aircraft cabin structure, and the forward wall portion is shaped to substantially conform to the shape of the exterior aft surface of the aircraft cabin structure. In another presently preferred aspect, the aircraft cabin structure is a passenger seat installed immediately forward of the aircraft enclosure unit. In another presently preferred aspect, the forward wall portion is configured to accept loads from the aircraft passenger seat. In another presently preferred aspect, the forward wall portion includes a forward projection configured to project over an aft portion of the adjacent passenger seat immediately forward of the aircraft enclosure unit.

In another presently preferred aspect, the aircraft enclosure unit is a lavatory stall, and the one or more walls define an interior lavatory space. In another presently preferred aspect, the forward wall portion defines a secondary space in the interior lavatory space in an area forward of an aft-most portion of the forward wall portion.

In another presently preferred aspect, the present invention provides for an assembly of an aircraft lavatory unit and an aircraft cabin structure for an aircraft cabin, in which the assembly in combination includes an aircraft cabin structure having an exterior aft surface having a shape that is substantially not flat in a vertical plane, and an aircraft lavatory stall unit including one or more walls having a forward wall portion. In another presently preferred aspect, the one or more walls define an interior lavatory space, the forward wall portion is disposed immediately aft of and adjacent to the aircraft cabin structure, and the forward wall portion is shaped to substantially conform to the shape of the exterior aft surface of the aircraft cabin structure. In another presently preferred aspect, the aircraft cabin structure is a passenger seat installed immediately forward of the aircraft lavatory stall unit, and wherein the forward wall portion of the aircraft lavatory stall unit is configured to accept loads from the passenger seat. In another presently preferred aspect, the forward wall portion includes a forward projection configured to project over an aft portion of the adjacent passenger seat immediately forward of the aircraft lavatory stall unit. In another presently preferred aspect, the forward wall portion defines a secondary space in the interior lavatory

space in an area forward of an aft-most portion of the forward wall portion.

These and other aspects and advantages of the invention will become apparent from the following detailed description and the accompanying drawings, which illustrate by way of example the features of the invention.

BRIEF DESCRIPTION OF THE DRAWINGS

FIG. 1 is a schematic diagram of a prior art installation of a lavatory immediately aft of and adjacent to an aircraft passenger seat.

FIG. 2 is a schematic diagram of an installation of a lavatory according to the present invention immediately aft of and adjacent to or abutting an aircraft cabin passenger seat.

DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENTS

Referring to the drawings, which are provided by way of example, and not by way of limitation, the present invention provides for an enclosure 10, such as a lavatory for a cabin 12 of an aircraft (not shown), although the enclosure may also be an aircraft closet, or an aircraft galley, or similar enclosed or structurally defined spaces, for example. As is illustrated in FIG. 2, the cabin includes a structure 14, and the enclosure may be taller than the cabin structure. The cabin structure can be a passenger seat 16, for example, installed immediately forward of the enclosure and having an

aft portion 18 with and exterior aft surface 20 that is substantially not flat in a vertical plane 22. The lavatory includes a lavatory stall unit 24 having one or more walls 26 having a forward wall portion 28. The one or more walls define an interior lavatory space 30, and the forward wall portion is configured to be disposed immediately aft of and adjacent to or abutting the exterior aft surface of the aircraft cabin structure. The forward wall portion has a shape that is substantially not flat in the vertical plane, and preferably is shaped to include a recess 34 such that the forward wall portion substantially conforms to the shape of the exterior aft surface of the aircraft cabin structure. In a presently preferred aspect, the forward wall portion of the lavatory stall unit is configured to accept loads from the passenger seat. As shown in FIG. 2, the forward wall portion 28 can be configured to provide a lower recess 100 formed between the forward wall portion 28 and the cabin deck 102. As also shown in FIG. 2, the lower recess 100 can be configured to receive at least a portion of an aft-extending seat support 17 therein. As can be seen by comparing FIG. 1 and FIG. 2, the recess 34 and the lower recess 100 combine to permit the passenger seat 16 to be positioned farther aft in the cabin than would be possible if the lavatory enclosure 10 included a conventional flat and vertical forward wall without recesses like that shown in FIG. 1, or included a forward wall that did not include both recesses 34, 100.

In another presently preferred aspect, the forward wall portion defines a secondary space 36 in the interior lavatory space in an area 38 forward of an aft-most portion 40 of the forward wall portion,

and the forward wall portion includes a forward projection 42 configured to project over the aft portion of the adjacent passenger seat back 44 immediately forward of the lavatory stall unit. The secondary space can include an amenity stowage space 46 inside the lavatory stall unit in the area forward of the aft-most portion of the forward wall portion, and the secondary space can include design elements providing visual space, such as a visual perception of space, inside the lavatory in the area forward of an aft-most portion of the forward wall portion.

It will be apparent from the foregoing that while particular forms of the invention have been illustrated and described, various modifications can be made without departing from the spirit and scope of the invention. Accordingly, it is not intended that the invention be limited, except as by the appended claims.

The invention claimed is:

1. An aircraft lavatory for an aircraft, the aircraft lavatory comprising:

an aft partition; and

a forward partition, including

a forward-extending upper portion,

an aft-extending mid-portion, and

a forward-extending lower portion, wherein

the forward-extending upper portion, the aft-extending mid-portion, and the forward-extending lower portion combine to define a first aft-extending recess disposed between the forward-extending upper portion and the forward-extending lower portion, wherein the first aft-extending recess is configured to receive an aft-extending seat back of a forward-positioned passenger seat therein, and

the forward partition further defines at least one second aft-extending recess proximate to a lower end of the forward partition, the at least one second aft-extending recess being configured to receive at least a portion of an aft-extending seat support of the forward-positioned passenger seat therein,

wherein the forward partition is configured to accept loads from the aft-extending seat back;

wherein the aft partition and forward partition define a lavatory space disposed therebetween.

2. The aircraft lavatory of claim 1, wherein the first aft-extending recess and the at least one second aft-extending recess permit the aft-extending seat support to be positioned

further aft in a cabin area of the aircraft when compared with a position of said aft-extending seat support if said forward partition was instead substantially flat.

3. The aircraft lavatory of claim 1, wherein the first aft-extending recess substantially conforms to a contour of an aft surface of the aft-extending seat back.

4. The aircraft lavatory of claim 1, wherein the forward extending upper portion is adapted to protrude forwardly over a top of the aft-extending seat back.

5. The aircraft lavatory of claim 1, wherein the aft-extending seat back is in an upright and not a reclined position.

6. The aircraft lavatory of claim 1, wherein the first aft-extending recess extends along substantially a full width of the forward partition.

7. The aircraft lavatory of claim 1, wherein the first aft-extending recess and the at least one second aft-extending recess permit the aft-extending seat support to be positioned in a manner that reduces a volume of unusable space in a cabin area of the aircraft by reducing or eliminating gaps that would otherwise exist between a substantially flat forward partition of the aircraft lavatory and the forward-positioned passenger seat.

8. A method for reducing a volume of unusable space in a cabin area of a passenger aircraft, comprising:

replacing at least a previously-installed forward partition of a pre-existing aircraft lavatory in the cabin area of the passenger aircraft with a contoured forward partition, wherein

an outward facing vertical surface of the previously-installed forward partition is substantially flat, and

the contoured forward partition comprises

at least one first recess configured to receive at least a portion of an upwardly and aftwardly inclined seat back of a passenger seat therein, and

at least one second recess configured to receive at least a portion of an aft-extending seat support of the passenger seat therein; and

installing the passenger seat in front of the contoured forward partition;

wherein, upon installation,

the at least one first recess receives at least a portion of the upwardly and aftwardly inclined seat back, and

the second recess receives at least a portion of the aft-extending seat support,

thereby reducing the volume of unusable space in the cabin area by reducing or eliminating gaps that existed between the previously-installed forward wall and the passenger seat.

9. The method of claim 8, wherein the contoured forward partition is adapted to receive loads from the passenger seat.

10. The method of claim 8, wherein the at least one first recess substantially conforms to a contour of an aft surface of the upwardly and aftwardly inclined seat back.

11. The method of claim 8, wherein the contoured forward partition further comprises an upper projection that, upon installation, protrudes forward over a top of the upwardly and aftwardly inclined seat back.

12. The method of claim 11, wherein the upper projection is configured to abut an upper surface of the cabin area.

13. The method of claim 11, wherein the upper projection defines an interior storage space in the aircraft lavatory.

14. The method of claim 8, wherein the upwardly and aftwardly inclined seat back is in an upright and not a reclined position.

15. The method of claim 8, wherein the at least one first recess extends along substantially a full width of the contoured forward partition.

16. The method of claim 8, wherein replacing the previously-installed forward partition with the contoured forward partition permits the aft-extending seat support to be positioned farther aft in the cabin area than was possible when the previously-installed forward partition was installed in the cabin area.

17. The method of claim 8, wherein a combined weight of the contoured forward partition and passenger seat is reduced in comparison to a combined weight of the previously installed forward partition and the passenger seat.

APPENDIX I

(12) United States Patent

Cook et al.

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(45) Date of Patent: Jul. 7, 2015

(54) AIRCRAFT INTERIOR LAVATORY

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(*) Notice: Subject to any disclaimer, the term of this patent is extended or adjusted under 35 U.S.C. 154(b) by 0 days.

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(65) **Prior Publication Data**

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Related U.S. Application Data

(63) Continuation of application No. 13/089,063, filed on Apr. 18, 2011, now Pat. No. 8,590,838.

(60) Provisional application No. 61/346,835, filed on May 20, 2010, provisional application No. 61/326, 198, filed on Apr. 20, 2010.

(51) **Int. Cl.**

B64D 11/06 (2006.01)

B64D 11/02 (2006.01)

B64C 1/10 (2006.01)

(52) **U.S. Cl.**

CPC. ***B64D 11/02*** (2013.01); ***B64C 1/10*** (2013.01); Y02T 50/46 (2013.01)

(58) **Field of Classification Search**

CPC B64D 11/00; B64D 2011/0046; B64D 11/0023; B64D 11/06; B64D 2011/0617; B64D 2011/0665; B63B 11/00; B63B 11/02; B63B 29/00; B63B 29/02; E47K 3/00; E47K 11/00

USPC 244/1 R, 118.5, 118.6, 129.1, 117 R; 114/116

See application file for complete search history.

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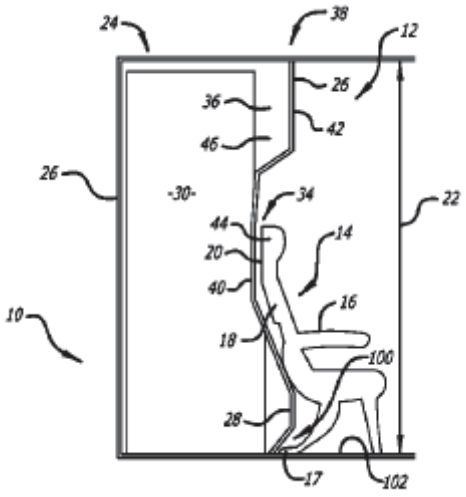
(57) **ABSTRACT**

A lavatory for an aircraft cabin includes a wall having a forward wall portion disposed immediately aft of and substantially conforming to an exterior aft surface of an aircraft cabin structure, such as a passenger seat, that is substantially not flat in a vertical plane. The forward wall portion includes a forward projection over an aft portion of the adjacent passenger seat. The forward wall portion can define a secondary space in the interior lavatory space, which can provide an amenity stowage space, and can include design elements providing visual space.

17 Claims, 1 Drawing Sheet



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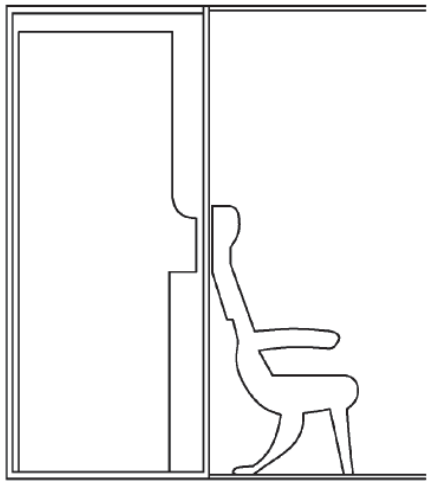

FIG. 1
(Prior Art)

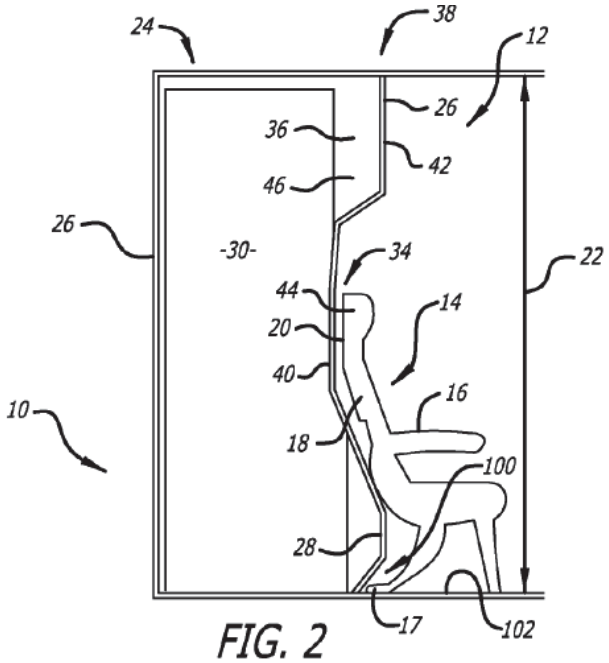

FIG. 2

AIRCRAFT INTERIOR LAVATORY

CROSS-REFERENCES TO RELATED APPLICATIONS

This continuation application is based upon U.S. Ser. No. 13/089,063, filed on Apr. 18, 2011, which claims priority from Provisional Application No. 61/326,198, filed Apr. 20, 2010, and Provisional Application No. 61/346,835, filed May 20, 2010, which are incorporated by reference in their entirety herein.

BACKGROUND OF THE INVENTION

The present invention relates generally to aircraft enclosures, and more particularly relates to an aircraft cabin enclosure, such as a lavatory, an aircraft closet, or an aircraft galley, for example, including an aircraft cabin structure having an aft portion with a substantially vertically extending exterior aft surface that is substantially not flat in a vertical plane.

Aircraft lavatories, closets and other full height enclosures commonly have forward walls that are flat in a vertical plane. Structures such as passenger seats installed forward of such aircraft lavatories, closets and similar full height enclosures often have shapes that are contoured in the vertical plane. The juxtaposition of these flat walled enclosures and contoured structures renders significant volumes unusable to both the function of the flat walled lavatory or enclosure and the function of the contoured seat or other structure. Additionally, due

to the lack of a provision for structural load sharing, conventional aircraft lavatories require a gap between the lavatory enclosures and adjacent structures, resulting in a further inefficiency in the use of space.

Aircraft bulkheads, typically separating passenger cabin areas or classes of passenger service, are in common use, and typically have a contour permitting passengers seated behind the bulkhead to extend their feet modestly under the premium seats immediately forward of the bulkhead. These provide a comfort advantage to passengers seated behind the bulkhead, but provide no increased efficiency in the use of space, in that they do not enable the seats fore and aft of the bulkhead to be placed more closely together. Short, floor-mounted stowage boxes, typically no taller than the bottom cushion of a passenger seat, are often positioned between the flat wall of current lavatories or other enclosures and passenger seats. These provide no improvement to the utility or spatial efficiency of the lavatory or other enclosure. While they do provide some useful stowage for miscellaneous items, they do not provide sufficient additional stowage to provide more space for passenger seating.

It would be desirable to provide an aircraft lavatory or other enclosure that can reduce or eliminate the gaps and volumes of space previously required between lavatory enclosures and adjacent structures to allow an adjacent structure such as passenger seating installed forward of the lavatory or other enclosure to be installed further aft,

providing more space forward of the lavatory or enclosure for passenger seating or other features than has been possible in the prior art. Alternatively, the present invention can provide a more spacious lavatory or other enclosure with no need to move adjacent seats or other structures forward.

It would also be desirable to provide an aircraft lavatory or other enclosure with a wall to bear loads from an adjacent passenger seating or other structure, permitting elimination of a required gap between the lavatory or other enclosure and the adjacent passenger seating or other structure, making more space available for other uses. In addition, enabling a lavatory or other enclosure to bear loads from an adjacent structure can reduce the combined weight of the lavatory or other enclosure and the adjacent structure.

It also would be desirable to provide an aircraft lavatory or other enclosure that can reduce or eliminate the gaps and volumes of space previously required between lavatory enclosures and adjacent structures, to allow the installation of an increased number of passenger seats, to increase the value of the aircraft. The present invention meets these and other needs.

SUMMARY OF THE INVENTION

Briefly, and in general terms, the present invention provides for an enclosure, such as a lavatory, an aircraft closet, or an aircraft galley, for example, for a cabin of an aircraft including a

structure having an aft portion with a substantially vertically extending exterior aft surface that is substantially not flat in a vertical plane. The enclosure structure permits a combination of the enclosure with the structure in a manner that permits significant saving of space in the aircraft, which in turn permits more seats to be installed, or more space to be offered per seat, increasing the value of the aircraft.

Accordingly, in one presently preferred aspect, the present invention provides for an enclosure unit for a cabin of an aircraft including an aircraft cabin structure having an aft portion with an exterior aft surface that is substantially not flat in a vertical plane. The enclosure unit can be a lavatory, an aircraft closet, or an aircraft galley, for example. In one presently preferred aspect, the enclosure unit includes one or more walls that are taller than an adjacent aircraft cabin structure, the one or more walls defining an interior enclosure space and having a forward wall portion. The forward wall portion is configured to be disposed immediately aft of and adjacent to or abutting the exterior aft surface of the aircraft cabin structure, and the forward wall portion is shaped to substantially conform to the shape of the exterior aft surface of the aircraft cabin structure.

In another presently preferred aspect, the enclosure unit includes an enclosure stall unit, and the aircraft cabin structure is a passenger seat installed immediately forward of the enclosure stall unit. In another presently preferred aspect, the forward wall portion of the enclosure unit is

configured to accept loads from the aircraft passenger seat. In another presently preferred aspect, the forward wall portion includes a forward projection configured to project over an aft portion of the adjacent passenger seat immediately forward of the enclosure stall unit.

In another presently preferred aspect, the enclosure is a lavatory, including a lavatory stall unit with one or more walls having a forward wall portion. The one or more walls define an interior lavatory space, and the forward wall portion is configured to be disposed immediately aft of and adjacent to or abutting an aircraft cabin structure having an exterior aft surface having a shape that is substantially not flat in a vertical plane. In a presently preferred aspect, the forward wall portion is shaped to substantially conform to the shape of the exterior aft surface of the aircraft cabin structure.

In another presently preferred aspect, the aircraft cabin structure is a passenger seat installed immediately forward of the lavatory stall unit, and the forward wall portion of the lavatory stall unit is configured to accept loads from the passenger seat. In another presently preferred aspect, the forward wall portion includes a forward projection configured to project over an aft portion of the adjacent passenger seat immediately forward of the lavatory stall unit. In another presently preferred aspect, the forward wall portion defines a secondary space in the interior lavatory space in an area forward of an aft-most portion of the forward wall portion. The secondary space can provide an

amenity stowage space inside the lavatory stall unit in the area forward of an aft-most portion of the forward wall portion, and can include design elements providing visual space inside the lavatory in the area forward of an aft-most portion of the forward wall portion.

In another presently preferred aspect, the present invention provides for an assembly of an aircraft enclosure unit and an aircraft cabin structure for an aircraft cabin, the assembly in combination including an aircraft cabin structure having an exterior aft surface having a shape that is substantially not flat in a vertical plane, and an aircraft enclosure unit including at least one wall having a forward wall portion. The one or more walls define an interior enclosure space, the forward wall portion is disposed immediately aft of and adjacent to the aircraft cabin structure, and the forward wall portion is shaped to substantially conform to the shape of the exterior aft surface of the aircraft cabin structure. In another presently preferred aspect, the aircraft cabin structure is a passenger seat installed immediately forward of the aircraft enclosure unit. In another presently preferred aspect, the forward wall portion is configured to accept loads from the aircraft passenger seat. In another presently preferred aspect, the forward wall portion includes a forward projection configured to project over an aft portion of the adjacent passenger seat immediately forward of the aircraft enclosure unit.

In another presently preferred aspect, the aircraft enclosure unit is a lavatory stall, and the one or more walls define an interior lavatory space.

In another presently preferred aspect, the forward wall portion defines a secondary space in the interior lavatory space in an area forward of an aft-most portion of the forward wall portion.

In another presently preferred aspect, the present invention provides for an assembly of an aircraft lavatory unit and an aircraft cabin structure for an aircraft cabin, in which the assembly in combination includes an aircraft cabin structure having an exterior aft surface having a shape that is substantially not flat in a vertical plane, and an aircraft lavatory stall unit including one or more walls having a forward wall portion. In another presently preferred aspect, the one or more walls define an interior lavatory space, the forward wall portion is disposed immediately aft of and adjacent to the aircraft cabin structure, and the forward wall portion is shaped to substantially conform to the shape of the exterior aft surface of the aircraft cabin structure. In another presently preferred aspect, the aircraft cabin structure is a passenger seat installed immediately forward of the aircraft lavatory stall unit, and wherein the forward wall portion of the aircraft lavatory stall unit is configured to accept loads from the passenger seat. In another presently preferred aspect, the forward wall portion includes a forward projection configured to project over an aft portion of the adjacent passenger seat immediately forward of the aircraft lavatory stall unit. In another presently preferred aspect, the forward wall portion defines a secondary space in the interior lavatory space in an area forward of an aft-most portion of the forward wall portion.

These and other aspects and advantages of the invention will become apparent from the following detailed description and the accompanying drawings, which illustrate by way of example the features of the invention.

BRIEF DESCRIPTION OF THE DRAWINGS

FIG. **1** is a schematic diagram of a prior art installation of a lavatory immediately aft of and adjacent to an aircraft passenger seat.

FIG. **2** is a schematic diagram of an installation of a lavatory according to the present invention immediately aft of and adjacent to or abutting an aircraft cabin passenger seat.

DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENTS

Referring to the drawings, which are provided by way of example, and not by way of limitation, the present invention provides for an enclosure **10**, such as a lavatory for a cabin **12** of an aircraft (not shown), although the enclosure may also be an aircraft closet, or an aircraft galley, or similar enclosed or structurally defined spaces, for example. As is illustrated in FIG. **2**, the cabin includes a structure **14**, and the enclosure may be taller than the cabin structure. The cabin structure can be a passenger seat **16**, for example, installed immediately forward of the enclosure and having an aft portion **18** with and exterior aft surface **20** that is substantially not flat in a vertical plane **22**. The lavatory includes a lavatory stall unit **24** having one

or more walls **26** having a forward wall portion **28**. The one or more walls define an interior lavatory space **30**, and the forward wall portion is configured to be disposed immediately aft of and adjacent to or abutting the exterior aft surface of the aircraft cabin structure. The forward wall portion has a shape that is substantially not flat in the vertical plane, and preferably is shaped to include a recess **34** such that the forward wall portion substantially conforms to the shape of the exterior aft surface of the aircraft cabin structure. In a presently preferred aspect, the forward wall portion of the lavatory stall unit is configured to accept loads from the passenger seat. As shown in FIG. **2**, the forward wall portion **28** can be configured to provide a lower recess **100** formed between the forward wall portion **28** and the cabin deck **102**. As also shown in FIG. **2**, the lower recess **100** can be configured to receive at least a portion of an aft-extending seat support **17** therein. As can be seen by comparing FIG. **1** and FIG. **2**, the recess **34** and the lower recess **100** combine to permit the passenger seat **16** to be positioned farther aft in the cabin than would be possible if the lavatory enclosure **10** included a conventional flat and vertical forward wall without recesses like that shown in FIG. **1**, or included a forward wall that did not include both recesses **34**, **100**.

In another presently preferred aspect, the forward wall portion defines a secondary space **36** in the interior lavatory space in an area **38** forward of an aft-most portion **40** of the forward wall portion, and the forward wall portion includes a forward projection **42** configured to project over the aft portion of the adjacent passenger seat

back **44** immediately forward of the lavatory stall unit. The secondary space can include an amenity stowage space **46** inside the lavatory stall unit in the area forward of the aft-most portion of the forward wall portion, and the secondary space can include design elements providing visual space, such as a visual perception of space, inside the lavatory in the area forward of an aft-most portion of the forward wall portion.

It will be apparent from the foregoing that while particular forms of the invention have been illustrated and described, various modifications can be made without departing from the spirit and scope of the invention. Accordingly, it is not intended that the invention be limited, except as by the appended claims.

We claim:

1. An aircraft lavatory for a cabin of an aircraft of a type that includes a forward-facing passenger seat that includes an upwardly and aftwardly inclined seat back and an aft-extending seat support disposed below the seat back, the lavatory comprising:

a lavatory unit including a forward wall portion and defining an enclosed interior lavatory space, said forward wall portion configured to be disposed proximate to and aft of the passenger seat and including an exterior surface having a shape that is substantially not flat in a vertical plane; and

wherein said forward wall portion is shaped to substantially conform to the shape of the upwardly and aftwardly inclined seat back of the passenger seat, and includes a first recess configured to receive at least a portion of the upwardly and aftwardly inclined seat back of the passenger seat therein, and further includes a second recess configured to receive at least a portion of the aft-extending seat support therein when at least a portion of the upwardly and aftwardly inclined seat back of the passenger seat is received within the first recess.

2. The aircraft lavatory of claim 1, wherein said forward wall portion is configured to accept loads from the passenger seat back.

3. The aircraft lavatory of claim 1, wherein said forward wall portion further includes a projection configured to project over the passenger seat back when at least a portion of the upwardly and aftwardly inclined seat back of the passenger seat is received within the first recess and at least a portion of the aft-extending seat support is received within the second recess.

4. The aircraft lavatory of claim 1, wherein said lavatory unit is taller than the passenger seat.

5. The aircraft lavatory of claim 1, wherein said forward wall portion includes a lower portion that is disposed under the passenger seat back when at least a portion of the upwardly and aftwardly inclined seat back of the passenger seat is received within the first recess and at least a portion of the

aft-extending seat support is received within the second recess.

6. The aircraft lavatory of claim 1, wherein said first recess in said forward wall portion is disposed between an upper wall portion and a lower wall portion.

7. The aircraft lavatory of claim 1, wherein said forward wall portion defines a secondary space in said interior lavatory space above the passenger seat back.

8. An aircraft lavatory for an aircraft, the lavatory comprising:

a forward partition;

an aft partition; and

a lavatory space disposed between the forward partition and the aft partition;

wherein the forward partition comprises:

a forward-extending upper portion;

an aft-extending mid-portion; and

a forward-extending lower portion; and

wherein the forward-extending upper portion, the aft-extending mid-portion, and the forward-extending lower portion combine to define a first aft-extending recess disposed between the upper

forward-extending portion and the forward-extending lower portion, and

wherein the forward partition further defines a second aft-extending recess proximate to a lower end of the forward partition, the second aft-extending recess being configured to receive at least a portion of an aft-extending seat support of a forward-positioned passenger seat therein.

9. The aircraft lavatory according to claim 8 wherein the first aft extending recess defined by the forward-extending upper portion, the aft-extending mid-portion, and the forward-extending lower portion of the forward partition is configured to receive an aft-extending seat back of the forward-positioned passenger seat.

10. The aircraft lavatory according to claim 9 wherein said forward-extending upper portion is configured to project over at least a portion of the forward-positioned passenger seat.

11. The aircraft lavatory according to claim 9 wherein said forward partition is configured to accept loads from the forward-positioned passenger seat.

12. The aircraft lavatory according to claim 9 wherein said lavatory is taller than the forward-positioned passenger seat.

13. The aircraft lavatory according to claim 8 wherein the aft partition is substantially vertical and substantially planar.

14. The aircraft lavatory according to claim 8 wherein the width of the lavatory space disposed between the forward partition and the aft partition comprises an upper width, a lower width, and a mid-width, and wherein the upper width and the lower width are both substantially wider than the mid-width.

15. The aircraft lavatory according to claim 8 wherein the upper forward-extending portion, the aft-extending mid-portion, and the forward-extending lower portion of the forward partition form a substantially continuous surface.

16. The aircraft lavatory according to claim 8 wherein said first aft-extending recess extends along substantially a full width of said forward partition.

17. The aircraft lavatory according to claim 8 wherein said lavatory has a top, a bottom, a height therebetween, and a middle therebetween, said lavatory has varying lengths along the height of the lavatory, and said lavatory is longer at the top of the lavatory than at the bottom of the lavatory.