No. 18-1515

IN THE

Supreme Court of the United States

ELI LILLY AND COMPANY,

Petitioner,

v.

ERFINDERGEMEINSCHAFT UROPEP GBR,

Respondent.

On Petition for Writ of Certiorari to the United States Court of Appeals for the Federal Circuit

BRIEF FOR AMICUS CURIAE HIGH TECH INVENTORS ALLIANCE IN SUPPORT OF PETITIONER

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INTEREST OF AMICUS CURIAE[1]

The High Tech Inventors Alliance ("HTIA") is a coalition of high technology companies that was created to advocate on patent law and policy issues.[2] HTIA members are some of the most innovative technology companies in the world, creating the computer, software, semiconductor, and communications products and services that support growth in every sector of the economy. HTIA collectively invests over $60 billion in research and development each year, generating technological advances protected by more than 115,000 patents.

HTIA is a strong supporter of the patent system and of effective patent protection. At the same time, its members—like many successful technology companies—have frequently been defendants in suits brought by increasingly sophisticated non-practicing entities seeking a return on litigation as a portfolio investment strategy. Often such suits are based on purely functional patent claims that purport to cover every means of achieving a particular result, thereby preempting later-developed innovations that the patentee did not invent.

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[1] Pursuant to Supreme Court Rule 37.6, counsel for *amicus curiae* state that no counsel for a party authored this brief in whole or in part, and no party or counsel for a party, or any other person other than *amicus curiae* or its counsel, made a monetary contribution intended to fund the preparation or submission of this brief. All parties have consented in writing to the filing of this brief.

[2] HTIA is described at https://www.hightechinventors.com/. The eight HTIA members are Adobe, Amazon, Cisco, Dell, Google, Intel, Oracle, and Salesforce.

HTIA believes that such claims undermine the fundamental patent balance, pursuant to which an inventor must disclose and precisely describe his or her invention in return for patent protection. Purely functional claims enable patentees to expand the patent monopoly well beyond what they have actually invented, laying claim to entire fields of invention and impeding future innovation. As an alliance whose members are industry participants developing and offering to the public real products embodying important technologies, HTIA has a strong interest in curbing patent claims that use purely functional language to monopolize future innovations.

INTRODUCTION AND SUMMARY OF THE ARGUMENT

This Court has long held that functional patent claims—those that describe a claimed invention in terms of what it *does*, rather than what it *is*—are invalid. *Halliburton Oil Well Cementing Co.* v. *Walker*, 329 U.S. 1 (1946). Purely functional claims are not limited to a specific means of achieving a result, but instead claim *all* possible means, even those that the patentee has not invented and that are not presently known. Such claiming therefore raises much the same concerns about preempting entire fields of invention and impeding innovation that have animated this Court's recent decisions strengthening the rules governing patent-eligible subject matter and definiteness in claiming. See *Alice Corp. Pty.* v. *CLS Bank Int'l*, 573 U.S. 208, 216 (2014); *Nautilus, Inc.* v. *Biosig Instruments, Inc.*, 572 U.S. 898, 909–10 (2014).

In a series of decisions culminating in *Halliburton*, this Court held that claims whose scope is defined primarily by a desired result rather than by particular structure are invalid because they fail to describe the invention with adequate definiteness. 329 U.S. at 8-9. In the Patent Act of 1952, Congress refined that rule, providing in 35 U.S.C. § 112(f) that a patent claim may be phrased in functional terms, but it shall be construed as limited to the structure described in the patent's specification.[3] Section 112(f) thus establishes a critical limiting rule of construction that ensures that claims phrased in functional terms will be construed narrowly enough to avoid the preemption concerns that this Court identified in *Halliburton*. At the same time, Congress did not alter the baseline rule that purely functional claims—those that are not supported by any structural description in either the claims or the specification—are invalid.

An important question in applying the rule against functional claiming is how to determine whether a claim speaks in functional, rather than structural, terms. In accord with the preemption concerns underlying the rule against functional claiming, this Court has examined whether any purportedly structural description within the claim is sufficient to exclude some ways of performing the function, including those that the patentee has not invented. *Halliburton*, 329 U.S. at 8-10. In the seventy years since this Court last considered

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[3] As originally enacted, the relevant provision was numbered as Section 112, ¶ 6. In 2012, Congress renumbered the provisions as Section 112(f). Although Section 112, ¶ 6 applies to the patent at issue, Section 112(f) is substantively identical. This brief will refer to Section 112(f) for the sake of simplicity.

functional claiming, however, the Federal Circuit has moved away from that pragmatic approach, instead focusing myopically on whether a claim contains particular words that, in the Federal Circuit's view, signify the claim drafter's intent to engage in functional claiming. The decision in this case exemplifies that rigid approach. And it illustrates the inevitable result of such formalism, as the decision permits the patentee to lay claim to billions of compounds—including those that it did not invent, that have not yet been discovered, and that would require substantial experimentation to identify—that can perform the function in question.

The Federal Circuit's emphasis on form over substance has been particularly harmful in the software and networking fields. Software claims often take the form of broad descriptions of a function or result, with no accompanying structure other than a general-purpose computer or processor. The Federal Circuit does not treat such claims as functional, despite the fact that a claim's disclosure of generic computer components does not meaningfully limit its scope to particular means of performing the function. As a result, patentees—including non-practicing entities—have been able to use creative claim drafting to capture monopolies that sweep far more broadly than what they actually invented. This Court should grant review in order to reaffirm the rule against functional claiming and to ensure that Section 112(f) plays the robust role in limiting functional claims that Congress intended.

ARGUMENT

I. Under Supreme Court precedent and the Patent Act, purely functional claims are invalid.

A. The Supreme Court has long held that claims using functional language are invalid.

Since the nineteenth century, this Court has held that "[t]he use or function" of an invention cannot be "made the measure or test" of patent claim scope because to do so permits the patentee to expand the patent monopoly beyond the invention. *Holland Furniture Co.* v. *Perkins Glue Co.*, 277 U.S. 245, 253 (1928); *Risdon Iron & Locomotive Works* v. *Medart*, 158 U.S. 68 (1895).

1. This Court first addressed the problem of functional claiming in *O'Reilly* v. *Morse*, 56 U.S. (15 How.) 62 (1853), which concerned Samuel Morse's claim to all uses of electric current to send messages over a distance, regardless of the specific machinery used. *Id.* at 113. Though the Court did not expressly refer to Morse's claim as a "functional" one, the Court recognized that Morse claimed "the exclusive right to every improvement where the motive power is the electric or galvanic current, and the result is the marking or printing intelligible characters, signs, or letters at a distance." *Id.* at 112. "[I]t matters not," the Court elaborated, "by what process or machinery the result is accomplished." *Id.* at 113. The Court held the claim invalid, explaining that to allow it would be to enable Morse "to avail himself of new discoveries in the properties and powers of electromagnetism which scientific men might bring to light,"

thereby "shut[ting] the door against" future inventions by others. *Ibid.*

The Court subsequently identified "function[al]" claiming as a prohibited practice in *Risdon Iron & Locomotive Works* v. *Medart*, 158 U.S. 68 (1895). There, the Court explained that "a valid patent cannot be obtained for a process which involves nothing more than ... the function of a machine." *Id.* at 77. The Court grounded the rule against functional claiming in preemption concerns, stating that a claim to the "operation of a piece of mechanism" or "for the function of a machine" is equivalent to "a claim for an art or principle in the abstract." *Ibid.* Later decisions reiterated the same concern. In *Holland Furniture Co.* v. *Perkins Glue Co.*, 277 U.S. 245, 253 (1928), for instance, the Court held invalid a claim to a starch glue that had the properties of animal glue, reasoning that "[a] claim so broad, if allowed, would operate to enable the inventor, who has discovered that a defined type of starch answers the required purpose, to exclude others from all other types of starch." *Id.* at 257. If such claims were permitted, the "patent monopoly would thus be extended beyond the discovery, and would discourage rather than promote invention." *Ibid.*

This Court's functional-claiming jurisprudence culminated in *Halliburton*, in which the Court explained that claims using "conveniently functional language at the exact point of novelty" are invalid because they fail to satisfy several statutory requirements for patentability, including the requirements that the patentee claim his invention in definite terms and provide a written description of the invention. 329 U.S. at 8-9 (citing Rev. Stat. § 4888 as amended (formerly 35 U.S.C. § 33)); *Gen. Elec. Co.* v. *Wabash Appliance Co.*, 304 U.S. 364, 371

(1938); *Holland*, 277 U.S. at 257. The Court also reiterated that a functional claim could cover any number of "different devices … of various kinds and characters" that would perform the same function, including "many other [embodiments] beyond our present information or indeed our imagination." *Halliburton*, 329 U.S. at 12.

2. The preemption concerns animating the Court's rule against functional claiming also drove its analysis of whether a claim was functional in the first place. The Court broadly defined functional claims as those that describe the purported invention in terms of "what it will do rather than in terms of its own physical characteristics." *Halliburton*, 329 U.S. at 9. In evaluating whether a claim was functional, the Court analyzed the claim language to determine whether the claim made "[t]he use or function" of the invention "the measure or test" of patent claim scope. *Holland*, 277 U.S. at 253. The Court did not require that a claim contain any particular words to trigger an inquiry into whether it was functional in nature. Compare *Halliburton*, 329 U.S. at 8 ("means … for tuning"), with *Holland*, 277 U.S. at 250 ("[a] glue … having substantially the properties of animal glue"). Instead, the inquiry entailed a pragmatic examination of whether the claim described sufficient structure to avoid claiming every way of performing the relevant function, including ways that the patentee did not invent.

Thus, the Court recognized that even when a claim contained *some* arguably structural language, it should still be considered functional in nature if that structure did not prevent the claim from broadly preempting the field of invention. In *Holland*, for instance, the claims

described the claimed glue as a "starch" that was "viscous" and that, when combined with "three parts or less" of water, had the properties of animal glue. 277 U.S. at 250-251. Despite those arguably structural terms, the Court concluded that the glue was described functionally, rather than structurally, because the claims would reach "any glue made of a starch base" that had similar properties as animal glue, thereby expanding the patent monopoly beyond the invention. *Id.* at 256-257; accord *Consol. Elec. Light Co* v. *McKeesport Light Co.*, 159 U.S. 465, 472 (1895) (holding that a claim to any "fibrous or textile material" used as "incandescent conductors" was not meaningfully limited by structure). And in *Halliburton*, the Court acknowledged that the claimed "means associated with said pressure responsive device for tuning" referred to a "tuned acoustical pipe" or "acoustical resonator," which was ostensibly a structural element. 329 U.S. at 8. Nonetheless, the Court recognized that this element did not prevent the claim from being functional because it merely recited a functional attribute that all tuned acoustical pipes have in common: the detection of sound waves to measure distance. See *id.* at 7, 11–12.

B. Section 112(f), enacted in response to *Halliburton*, leaves in place this Court's overarching approach to functional claiming.

In the Patent Act of 1952, Congress responded to *Halliburton* by enacting Section 112(f). That section provides:

> An element in a claim for a combination may be expressed as a means or step for performing a

> specified function without the recital of structure, material, or acts in support thereof, and such claim *shall be construed to cover* the corresponding structure, material, or acts described in the specification and equivalents thereof.

35 U.S.C. § 112(f) (emphasis added). By its terms, Section 112(f) is a rule of claim construction that permits a combination claim—i.e., one with at least two elements or steps—to use functional language, with the caveat that the claim will be construed to encompass only the embodiments of structure, material, or acts and equivalents described in the specification. This rule of construction for so-called means-plus-function terms is a "significant departure from the normal rules of patent claim construction," under which claim terms are construed to not be limited to specific embodiments. Mark A. Lemley, *Software Patents and the Return of Functional Claiming*, 2013 Wis. L. Rev. 905, 916 (2013); see also *Phillips* v. *AWH Corp.*, 415 F.3d 1303, 1311 (Fed. Cir. 2005) (en banc).

Section 112(f) thus responds to *Halliburton* by "providing a construction of [the functionally described claim element] narrow enough to avoid the problem of undue breadth" identified in *Halliburton*. *In re Hyatt*, 708 F.2d 712, 715 (Fed. Cir. 1983) (Rich, J.); see *Warner-Jenkinson Co.* v. *Hilton Davis Chem. Co.*, 520 U.S. 17, 28 (1997). The provision does so by effectively transforming a claim described in functional terms into one limited to a corresponding structure. The claims permitted by Section 112(f) therefore are not truly functional at all, in that they are construed as limited to the structure described in the specification. See Lemley, 2013 Wis. L. Rev. at 917.

Nothing in Section 112(f) reflects any intent to abrogate *Halliburton*'s holding that purely functional claims—those not supported by any meaningful structural description in the claims or the specification—are invalid. To the contrary, Congress's decision to permit claims that use functional language *on the condition* that they be construed as limited to a particular structure indicates that Congress shared this Court's understanding that purely functional claims raise significant preemption concerns and should not be permitted. As Judge Rich explained, Section 112(f) "saves" claims within its ambit from *Halliburton*'s rule that purely functional claims are invalid; it does not abrogate that baseline rule of invalidity. *Hyatt*, 708 F.2d at 715.

Section 112(f) also does not purport to modify this Court's approach to determining whether a claim is expressed in functional terms in the first place. The provision applies whenever a claim element is expressed in terms of function "without the recital of structure," 35 U.S.C. § 112(f), but it does not instruct courts *how* to determine whether the claim contains a recital of structure. When Congress legislates against the backdrop of an established judicial framework, it is presumed not to alter that framework absent clear evidence to the contrary. See *Samantar* v. *Yousuf*, 560 U.S. 305, 319 (2010). As a result, Section 112(f) does not disturb the Court's pragmatic approach of evaluating whether a claim contains sufficient structural language to avoid covering all or virtually all means of performing the function.

II. The Federal Circuit has adopted a rigid approach to identifying functional claiming that ignores *Halliburton* and permits many purely functional claims to persist.

In the decades since Section 112(f)'s enactment, the Federal Circuit has adopted a rigid approach to functional claiming that ignores *Halliburton*'s continuing effect and permits clever claim drafting to control the functional claiming inquiry. Rather than following this Court's pragmatic approach to determining whether a claim is functional, the Federal Circuit has accorded talismanic significance to Section 112(f)'s description of functional claims as those that focus on the "means" for performing a function. 35 U.S.C. § 112(f). The court has accordingly applied a presumption that claims that do not use the word "means" are not functional, and therefore not subject to Section 112(f)'s limiting construction. That approach undermines Section 112(f)'s intended purpose of guarding against broadly preemptive functional claims. And contrary to *Halliburton*, it permits many functional claims—particularly in the software and networking fields, which are particularly fertile ground for functional claiming—to persist without limitation, thereby impeding innovation.

A. The Federal Circuit has incorrectly construed Section 112(f) to focus on the claim drafter's intent and to require a presumption that claim language is not functional unless it uses the word "means."

In determining whether a claim element is functional, such that Section 112(f) applies, the Federal Circuit applies a threshold "drafting" inquiry that focuses

on the claim drafter's choice of particular words. Substantively, that approach errs in at least two respects.

First, the Federal Circuit asks if "a claim term is drafted in a manner that 'invokes'" means-plus-function claiming. *Williamson* v. *Citrix Online, LLC*, 792 F.3d 1339, 1347 (Fed. Cir. 2015) (en banc). The court thus assumes that claim drafters seek to invoke Section 112(f) as a safe harbor for functional claiming, despite the consequence that the functional claim elements would be restricted to corresponding embodiments. In practice, claim drafters often do the opposite, seeking to obtain the broadest claims that the Patent and Trademark Office ("PTO") will allow. See Oskar Liivak, *Overclaiming Is Criminal*, 49 Ariz. St. L.J. 1417, 1418 (2017). One increasingly common way to accomplish this is to draft functional claims that contain some nominal structure, so as to obtain the benefit of functional claiming's breadth (all ways to achieve a recited use or result) while avoiding Section 112(f)'s restriction on claim scope. See Lemley, *supra*, at 918 ("Patent lawyers tend to avoid means-plus-function claim language, except ... to hedge risk [against invalidation].").

Second, the Federal Circuit facilitates this sort of evasion by applying a presumption that claim language is *not* functional unless the claim drafter has used the words "means" or "step"—the terms that Section 112(f) uses to describe functional product and process claims, respectively—or other equivalent "nonce" words.[4] *Williamson*, 792 F.3d at 1350; 35 U.S.C. § 112(f) ("a means

[4] Those terms include "[g]eneric terms such as 'mechanism,' 'element,' 'device,' and other nonce words that reflect nothing more than verbal constructs." *Williamson*, 792 F.3d at 1350.

or step for performing a specified function"). To overcome the presumption and demonstrate that a claim that does not use "means" is functional, the challenger must establish by "a preponderance of the evidence" that no word in the claims would be understood by skilled artisans "to have a sufficiently definite meaning as the name for structure."[5] *Zeroclick, LLC* v. *Apple Inc.*, 891 F.3d 1003, 1007 (Fed. Cir. 2018). The Federal Circuit has never clearly explained the rationale behind this presumption, although it appears to stem from the intuition that "it is more likely that a party is covered by a statute when it uses the words of the statute." *Williamson*, 72 F.3d at 1357 (Reyna, J., concurring in part and dissenting in part).

There is no reason to think, however, that in enacting Section 112(f), Congress intended to transform the functional-claiming inquiry from one of substance into one of form. Section 112(f) asks whether the claim recites structure, not whether it uses certain words. See 35 U.S.C. § 112(f) (referring to any "means or step for performing a specified function *without the recital of structure*, material, or acts in support thereof" (emphasis added)). And the preemption concerns animating the rule against functional claiming are present any time a claimed invention is defined by its function rather than its structure, regardless of the precise words used in the claim. This Court's pre-1952 decisions accordingly did not hinge on the presence or absence of particular words in the claims; indeed, the claims at issue in *Holland* and

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[5] Although the Federal Circuit had previously described the presumption as a "strong" one, it has stepped back from that characterization while reaffirming the presumption itself. *Williamson,* 792 F.3d at 1349.

General Electric did not use the word "means" or any equivalent word.[6] *Holland*, 277 U.S. at 250 ("[a] glue comprising cassava carbohydrate … having substantially the properties of animal glue"); *Gen. Elec. Co.*, 304 U.S. at 368 ("a filament for electric incandescent lamps" "made up mainly of a number of comparatively large grains of such size and contour as to prevent substantial sagging and offsetting").

One particularly troubling consequence of the Federal Circuit's presumption is that the Federal Circuit will treat a claim that does not use "means" as not functional if it has *any* arguably structural language, regardless of whether that language actually excludes some means of performing the function. See, *e.g.*, *Zeroclick*, 891 F.3d at 1008 (concluding that "program" and "user interface code," taken in context, provide sufficient structure because they refer to "conventional graphical user interface programs" or code, without analyzing whether these terms excluded any ways of performing the function); *Skky, Inc.* v. *MindGeek, s.a.r.l.*, 859 F.3d 1014, 1019–20 (Fed. Cir. 2017) (similar; claim describing "wireless device means" was not functional because "'wireless device' is used in common parlance ... to des-

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[6] The presumption also does not make sense as an analytical matter. The question whether a claim is phrased in functional terms without reciting structure is a matter of claim construction—in other words, a legal question. *Personalized Media Commc'ns, LLC* v. *Int'l Trade Comm'n*, 161 F.3d 696, 702 (Fed. Cir. 1998). A "presumption" that requires "evidentiary support" and a showing "by a preponderance of the evidence," *Zeroclick*, 891 F.3d at 1007, has no place in the inquiry. See *Merck Sharp & Dohme Corp.* v. *Albrecht*, 139 S. Ct. 1668, 1679 (2019) (evidentiary standards have no application to questions of law).

ignate structure'") (citation omitted). This approach deviates from this Court's decisions examining whether any purportedly structural term in the claim meaningfully limits the claim to particular ways of performing the function. And it ensures that many claims drafted to cover a particular function or result, with no effective structural limitation, will be treated as not functional at all—and therefore not subject to Section 112(f)'s limiting construction—so long as the claim drafter avoids the particular words that the Federal Circuit views as triggering Section 112(f).

B. The district court's reasoning in this case exemplifies the Federal Circuit's formalistic approach.

In this case, the district court upheld respondent's claim to a method of treating benign prostatic hyperplasia (BPH) by administering an effective amount of "an inhibitor of" the enzyme phosphodiesterase V (or PDE V). The claim thus covers the administration of any compound that performs the function of inhibiting PDE V—a category that includes "billions" of compounds. Pet. 4. The district court nonetheless concluded that the claim is not functional. Its reasoning exemplifies the Federal Circuit's formalistic approach to functional claiming.

First, the district court applied the Federal Circuit's erroneous presumption that the claim was not functional simply because it did not use the words "means" or "step." Pet. App. 177a-178a. The court therefore incorrectly required petitioner to "overcome" that presumption by "presenting evidence" that a skilled artisan would have understood the phrase "inhibitor of PDE V" to be a "purely functional limitation." *Ibid.*

Second, contrary to *Halliburton*, the district court held that the claim disclosed adequate structure without considering whether that purportedly structural language would meaningfully limit the claim. The court acknowledged that "the term 'an inhibitor of phosphodiesterase (PDE) V' is described in part by its function." Pet. App. 178a. But the court concluded that the term also discloses sufficient structure because skilled artisans would understand that such inhibitors must share some "overall structural similarity" to bind to PDE V. *Id.* at 182a. The court expressly acknowledged that this "overall structural similarity" would impose no real limitation, as it credited testimony that "[n]o one could know the range of compounds that could be included in that class," and that a skilled artisan would not perceive any "common chemical structure or feature for all inhibitors of PDE V." *Id.* at 183a; *id.* at 182a. Nonetheless, the court concluded that the claim should not be considered functional simply because a skilled artisan would discern some general structure in the description.

The court thus did not examine whether the claim raises the concerns animating the rule against functional claiming. It did not inquire whether the claim effectively covers all or nearly all means of inhibiting PDE V—even as it acknowledged that the claim extends to means of inhibiting PDE V that have not yet been discovered. The decision, and the Federal Circuit's affirmance, thus reflect the court of appeals' departure from this Court's longstanding approach to functional claiming. See, *e.g.*, *Halliburton*, 329 U.S. at 7-9.

C. The Federal Circuit's formalistic approach is particularly problematic in the context of software, hardware, and networking patents.

The Federal Circuit's formalistic approach to functional claiming is poorly equipped to address the challenges presented by functional claiming in the context of software, hardware, and networking claims. Inventions in those fields are inherently functional: in general, it does not "matter what type of computer a program runs on; all computers have standard elements." Lemley, 2013 Wis. L. Rev. at 919. As a result, software patents are often phrased in functional terms that could encompass any number of specific solutions. See *Intellectual Ventures I LLC* v. *Symantec Corp.*, 838 F.3d 1307, 1327 (Fed. Cir. 2016) (Mayer, J., concurring) ("Software patents typically do not include any actual code developed by the patentee, but instead describe, in intentionally vague and broad language, a particular goal or objective."); see also, *e.g.*, *Soverain Software LLC* v. *Newegg Inc.*, 705 F.3d 1333, 1338 (Fed. Cir. 2013) (discussing claim to e-commerce software that disclosed a "buyer computer being programmed to receive a plurality of requests from a user to add a plurality of respective products to a shopping cart"). And because computer and network technology evolves so quickly, patentees have ample incentive to draft claims to attempt to obtain patent protection covering future developments.

The Federal Circuit's focus on particular "nonce" words leaves the court without a ready framework for determining whether claims that use black-box or generic terms such as "computer" or "microprocessor"

should be considered functional rather than structural. These terms may ostensibly invoke structure, but without more, they fail to meaningfully limit claims. Computers and microprocessors can be programmed to perform very different tasks in virtually limitless ways. See Lemley, 2013 Wis. L. Rev. at 927 ("The presence of structure in the form of 'a computer' or 'a processor' or even 'the Internet' has led the Federal Circuit to give these claims control over the claimed function however implemented."). But in determining whether a claim using those terms is functional, the court does not analyze whether they actually exclude some ways of performing the function.

As a result, the Federal Circuit has routinely concluded that software, hardware, or networking claims are not functional, and therefore not subject to Section 112(f), even when they contain no meaningful structural limitation. When a software claim does not use words like "means," the court will hold that even the most generic computer terms suffice to prevent the claim from being characterized as functional. For instance, the court has held that generic terms like "central piece of equipment," "Ethernet terminal equipment," and "end device" connote sufficient structure to avoid Section 112(f), solely on the ground that "those terms refer to known structures in the art." *Chrimar Holding Co.* v. *ALE USA Inc.*, 732 F. App'x 876, 884 (Fed. Cir. 2018). The court has reached similar conclusions with respect to the claim language "program that can operate the movement of the pointer (0)" and "user interface code." *Zeroclick*, 891 F.3d at 1007-1009. But these terms provide little more hint of structure than terms like "means." "Equipment" could encompass a vast range of

structures, and is unclear how "program" and "code" provide any structure at all.[7]

The Federal Circuit's approach to determining whether a software claim is subject to Section 112(f) in the first place is particularly inexplicable in light of its treatment of software claims that it has concluded *are* governed by Section 112(f). When a software claim does "invoke" Section 112(f) by using words like "means," the Federal Circuit analyzes whether the specification discloses sufficient structure "to avoid pure[ly] functional claiming." *Aristocrat Techs. Austl. Pty.* v. *Int'l Game Tech.*, 521 F.3d 1328, 1333 (Fed. Cir. 2008). In that context, the Federal Circuit has properly recognized that "the structure disclosed in the specification [must] be more than simply a general purpose computer or microprocessor." *Ibid.* Instead, the specification must disclose a specific algorithm—which serves as the limiting "structure" in the software context—and pursuant to Section 112(f), the claim is construed as limited to that

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[7] The PTO's guidelines on functional software claiming confirm that existing Federal Circuit law is ill-equipped to identify overbroad software, hardware, and networking patents. The PTO's general examiner guidance follows the Federal Circuit in focusing primarily on whether a claim uses the term "means" or a "substitute for 'means.'" Manual of Patent Examining Procedure § 2181(1) (9th ed., Jan. 2018). The PTO recently published further proposed examiner guidance, ostensibly to address software, with several examples of "non-structural generic placeholders that may invoke 35 U.S.C. § 112(f)": for instance, "mechanism for," "module for," "device for," or "system for." Examining Computer-Implemented Functional Claim Limitations for Compliance with 35 U.S.C. 112, 84 Fed. Reg. 57, 59 (Jan. 7, 2019). All of these terms pertain primarily to mechanical patents, however, and claim drafters can easily avoid using them in favor of formulations like "computer programmed to."

algorithm. *Ibid.* But the Federal Circuit applies that rule only *after* it has determined that the claim language at issue is functional, such that Section 112(f) requires that adequate structure must be found in the specification.

The standard for determining whether the recited structure is sufficient, however, should not turn on whether the purportedly structural language appears in the claims or the specification. Either way, the "structure, material, or acts," 35 U.S.C. § 112(f), must be sufficiently concrete and specific to avoid claiming every way of performing the relevant function. Otherwise, the recited structure is no structure at all.

Thus, under the proper application of these principles, courts would treat claims that recite various generic computer terms as functional and therefore subject to Section 112(f). That provision would then require that the claims be limited to specific algorithms disclosed in the specification—or, if they did not disclose such structure, invalidated as purely functional claims under *Halliburton*. To give a few examples, this analysis should apply to claims of the following types:

(a) a computer being programmed to [perform a function] or computer system providing [a function];

(b) a processor for [performing function] or configured to [perform function];

(c) software or code for [performing function]; and

(d) coined but essentially unlimited terms, such as a selector for [performing the function of selecting].

Yet under the Federal Circuit's rigid approach, all of these examples would likely sidestep functional-claiming scrutiny under Section 112(f) and *Halliburton* altogether, simply because they do not use words like "means," and they recite terms that ostensibly have structure. As a result, these sorts of software claims are permitted to broadly preempt all or nearly all ways of performing the relevant function.

III. Purely functional claiming undermines the patent system by permitting patentees to preempt innovations they have not actually invented.

As this Court has long recognized, purely functional claiming undermines the fundamental patent balance by permitting patentees to draft overbroad, vague patents that sweep in mechanisms for achieving a result that patentees did not invent. See *Halliburton*, 329 U.S. at 12. By allowing patentees to lay claim to entire fields of invention, purely functional claims raise the very same preemption concerns that animate this Court's recent decisions tightening the rules governing patent-eligible subject matter and definiteness in claiming. See *Alice Corp. Pty.* v. *CLS Bank Int'l*, 573 U.S. 208, 216 (2014); *Nautilus, Inc.* v. *Biosig Instruments, Inc.*, 572 U.S. 898, 909-910 (2014). They too broadly encompass innovations "beyond our present information or indeed our imagination which will perform [the claimed] function," thereby "frighten[ing] from the course of experimentation" future "inventive genius." *Halliburton*, 329 U.S. at 12.

That concern has been borne out in practice. Particularly in fast-moving technological fields like software and networking, functional claims present a severe

threat to innovation. See Federal Trade Commission, *The Evolving IP Marketplace: Aligning Patent Notice and Remedies with Competition* 80-81, 85 (2011) (*FTC Report*). Vaguely worded, broad claims—of which functional claims are a subset—have enabled patentees (often non-practicing entities) to aggressively demand licensing fees from, and assert infringement claims against, companies whose innovations allegedly fall within the uncertain scope of the entities' claims. See *Commil USA, LLC* v. *Cisco Sys., Inc.*, 135 S. Ct. 1920, 1930 (2015). Innovative companies like HTIA's members often face hundreds of vague, potentially applicable patents in a given field, and they must expend resources to license the patents, attempt to design around them, or risk costly and lengthy infringement suits.[8] Those resources could otherwise be spent on innovation.

Purely functional software and networking claims, like those permitted under the Federal Circuit's formalistic approach, are particularly problematic. *FTC Report* 85. Using functional software and networking claims, non-practicing entities have been able to lie in wait and obtain patent monopolies that cover later-developed embodiments. See Executive Office of the President, Patent Assertion and U.S. Innovation 8 (2013) ("These broad, functionally-defined, and intertwined patents are … a key part of the [nonpracticing entities'] business model" because they enable the entity to assert

[8] The high technology industry experiences the highest volume of patent disputes in district court and the Patent Trial and Appeal Board, and approximately 85% of those disputes relate to assertions by non-practicing entities. Q1 2019 Patent Dispute Report, Unified Patents at Fig. 4 (Apr. 1, 2019), https://www.unifiedpatents.com/pdr (analyzing cases filed between January 1, 2015, and March 31, 2019).

the patent more broadly than "the specific software used by the inventor."). This simply impedes innovation.

A return to this Court's functional-claiming jurisprudence would address this problem by permitting Section 112(f) to play the robust claim-limiting role that Congress intended. *Halliburton* and its predecessor decisions provide a framework for determining whether a claim is functional by analyzing whether the claim excludes some ways of performing the function, including those that the patentee has not actually invented. That approach would better enable courts to evaluate claims that contain some arguably structural disclosure, to determine whether that structure meaningfully limits the claims. And it would ensure that claims that do not themselves contain adequate structure are subject to Section 112(f), and therefore limited to structural embodiments disclosed in the specification. And when the specification does not disclose structure to which the claims can be limited, the claims should be invalidated under *Halliburton*'s rule against purely functional claims.

In recent decades, however, the Federal Circuit has deviated from this Court's precedents, and patentees have taken advantage of the Federal Circuit's formalistic approach to draft broadly functional claims that escape treatment under Section 112(f) and improperly capture later-developed innovations. This Court should grant certiorari in order to reaffirm its understanding of the rule against functional claiming and to ensure that Section 112(f) plays the role that Congress intended.

CONCLUSION

The petition for a writ of certiorari should be granted.

Respectfully submitted,

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