APPENDIX

Page	Document
App 2a	Federal Circuit Decision dated August 29, 2018
App 8a	Patent Trial and Appeal Board (PTAB) Decision on Rehearing Dated April 7, 2017
App 14a	PTAB Decision on Appeal Dated December 19, 2017
App 26a	Examiner's Answer (Excerpt) Dated September 5, 2014
App 31a	Federal Circuit denial of Rehearing and Rehearing en banc dated October 31, 2018
App 33a	Briefs submitted by Petitioners to the Federal Circuit
App 55a	Petitioners Request for Rehearing to the PTAB
App 76a	Petitioner's Reply to Examiner's Answer
App 88a	USPTO Appeal Brief (Claims Only)
App 91a	Application Specification
App 123a	Application Drawings

NOTE: This disposition is nonprecedential.

United States Court of Appeals for the Federal Circuit

IN RE: MARIO VILLENA, JOSE VILLENA,
Appellants

2017-2069

Appeal from the United States Patent and Trademark Office, Patent Trial and Appeal Board in Application No. 13/294,044.

Decided: August 29, 2018

BURMAN YORK MATHIS, III, Law Offices of Burman Y. Mathis, Harpers Ferry, WV, argued for appellants.

ROBERT J. MCMANUS, Office of the Solicitor, United States Patent and Trademark Office, Alexandria, VA, argued for appellee Andrei Iancu. Also represented by BENJAMIN T. HICKMAN, THOMAS W. KRAUSE.

Before PROST, Chief Judge, HUGHES and STOLL, Circuit Judges. STOLL, Circuit Judge. Mario and Jose Villena (collectively, "Applicants") appeal the final decision of the U.S. Patent and Trademark Office's Patent Trial and Appeal Board ("Board") affirming the rejection of claims 57–59 of U.S. Patent Application No. 13/294,044 as claiming

patent-ineligible subject matter under 35 U.S.C. § 101. We affirm.

I

The '044 application is titled "Systems and Methods for Property Information Development, Distribution and Display" and "relates to a computer-based system for creating and maintaining massive databases containing computationally complex and novel property information." J.A. 62, 739.

Claim 57, which the Board considered representative of the rejected claims, recites:

57. A system for distributing real-estate related information, comprising:

one or more computers configured to:

receive user-provided information and determine a geographic region based on received user-provided information;

produce a plurality of automated valuation method (AVM) values using residential property information, the residential properties being within the geographic region, the AVM values reflecting current market estimates for the residential properties;

provide display information to a remote terminal over a publicly accessible network based on the user-provided information, the display information enabling the remote terminal to generate a map-like display for the geographic region, the map-like display containing at least:

respective icons for each of a plurality of residential properties within the geographic region, the icons being spatially distributed relative to one another based on geographic information also residing in one or more computer readable mediums; and

an AVM value for at least one of the plurality of residential properties within the map-like display, wherein each AVM value is pre-process [sic] such that an AVM value for the at least one residential property pre-exists before a user query of the respective property is performed, and wherein the one or more computers update each of the AVM values without requiring a user query.

J.A. 215 –16; see also J.A. 216–17 (claims 58–59).

The Board affirmed the examiner's rejection of claims 57–59 under § 101 and maintained its affirmance on rehearing. Applicants appeal.

We have jurisdiction under 28 U.S.C. § 1295(a)(4)(A) and 35 U.S.C. § 141(a).

II

We review de novo whether a claim is drawn to patent-ineligible subject matter. *Berkheimer v. HP Inc.*, 881 F.3d 1360, 1365 (Fed. Cir. 2018) (citing *Intellectual Ventures I LLC v. Capital One Fin. Corp.*, 850 F.3d 1332, 1338 (Fed. Cir. 2017)). Section 101 defines patent-eligible subject matter as "any new and useful process, machine, manufacture, or composition of matter, or any new and useful improvement thereof." 35 U.S.C. § 101. Laws of

nature, natural phenomena, and abstract ideas, however, are not patentable. See *Mayo Collaborative Servs. v. Prometheus Labs., Inc.*, 566 U.S. 66, 70–71 (2012) (citing *Diamond v. Diehr*, 450 U.S. 175, 185 (1981)).

To determine whether an invention claims ineligible subject matter, the Supreme Court has established a two-step framework. First, we must determine whether the claims at issue are directed to a patent-ineligible concept such as an abstract idea. *Alice Corp. Pty. Ltd. v. CLS Bank Int'l*, 134 S.Ct. 2347, 2355 (2014). Second, if the claims are directed to an abstract idea, we must "consider the elements of each claim both individually and 'as an ordered combination' to determine whether the additional elements 'transform the nature of the claim' into a patent-eligible application." Id. (quoting Mayo, 566 U.S. at 79). To transform an abstract idea into a patent-eligible application, the claims must recite "more than simply stating the abstract idea while adding the words 'apply it.'" Id. at 2357 (quoting Mayo, 566 U.S. at 72 (internal alterations omitted)).

Beginning with Alice step one, we conclude that claim 57 is directed to an abstract idea – specifically, a fundamental economic practice. Claim 57 merely recites the familiar concept of property valuation. As the Supreme Court explained in Alice, claims involving "a fundamental economic practice long prevalent in our system of commerce," such as the concepts of hedging and inter mediated settlement, are patent-ineligible abstract ideas. Alice, 134 S.Ct. at 2356 (quoting *Bilski v. Kappos*, 561 U.S. 593, 611 (2010)). It follows that the claims at issue here are directed to an abstract idea. Applicants' claims recite

one or more computers configured to receive a user's target geographic region, produce property valuations, and display that information. Like the risk hedging in Bilski and the concept of intermediated settlement in Alice, the concept of property valuation, that is, determining a property's market value, is "a fundamental economic practice long prevalent in our system of commerce." Id. (quoting Bilski, 561 U.S. at 611). Prospective sellers and buyers have long valued property and doing so is necessary to the functioning of the residential real estate market. As such, claim 57 is directed to the abstract idea of property valuation.

Turning to Alice step two, we conclude that claim 57 does not contain an inventive concept sufficient to "'transform the nature of the claim' into a patent-eligible application." Id. at 2355 (quoting Mayo, 566 U.S. at 78). The elements of claim 57 simply recite an abstract idea executed using computer technology, such as "one or more computers" and a "remote terminal" on a "publically accessible network." '044 application at claim 57; J.A. 215. Applicants argue that an inventive concept arises from the ordered combination of steps in claim 57, but we are not convinced. Claim 57 recites the basic steps of receiving user input, producing property valuations, and providing display information. This is a classic case of implementing an abstract idea on a computer, which is not eligible under Alice. Id. at 2358. Nor do the pre-processing limitations in the claim add anything more to make the claims eligible. Rather, the pre-processing limitations are directed to using a computer to perform routine computer activity.

Nor are we persuaded by Applicants' argument that the Board failed to provide substantial evidence to support its rejection. Not every § 101 determination contains genuine disputes regarding underlying facts material to the § 101 inquiry. Berkheimer, 881 F.3d at 1368. Applicants do not point to any unresolved factual disputes that would warrant such consideration here.

In sum, claims 57–59 are directed to the abstract idea of property valuation and fail to recite any inventive concepts sufficient to transform that abstract idea into a patent-eligible invention. We therefore affirm.

AFFIRMED
COSTS
No costs.

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD
Ex parte MARIO VILLENA and JOSE VILLENA
Appeal 2015-000949
Application 13/294,0441
Technology Center 3600

Before BIBHU R. MOHANTY, JAMES A. WORTH, and BRADLEY B. BAY AT, *Administrative Patent Judges.*

WORTH, *Administrative Patent Judge.*

DECISION ON REQUEST FOR REHEARING
STATEMENT OF THE CASE

.
.
.

ANALYSIS

The Court in *Alice* emphasized the use of a two-step framework for analysis of patentability under 35 U.S.C. § 101:

First, we determine whether the claims at issue are directed to one of those patent-ineligible concepts. If so, we then ask, "[w]hat else is there in the claims before us?" To answer that question, we consider the elements of each claim both individually and "as an ordered combination" to determine whether the additional elements "transform the nature of the claim" into a patent-eligible

application. *See Alice Corp., Pty. Ltd. v CLS Bank Intl,* 134 S. Ct. 2347, 2355 (2014) (citing *Mayo Collaborative Servs. v. Prometheus Labs., Inc.,* 132 S. Ct. 1289 (2012)).

In the Decision, we determined that claims 57-59 were directed to the abstract idea of property valuation, which is a fundamental economic principle, and that the remaining limitations do not add significantly more to transform the abstract idea into patentable subject matter. Decision 4--7. Appellants set forth several arguments in support of their Request. We address each in tum. First, Appellants argue that the panel failed to supply evidence in support of its holding that the claims are not directed to patentable subject matter. Request 3-5. Appellants contend that the Administrative Procedure Act requires substantial evidence to support. Although not at issue, the Decision also reversed the Examiner's rejections of claims 57-59 under 35 U.S. C.§ 112, second paragraph, and under 35 U.S.C. § 103. factual assertions, and that, in addition, the panel did not consider the claims "as a whole." *Id.* 4--9 (citing *Dickenson v. Zurko,* 527 US 150, 162 (1999)).

However, in our Decision, we relied on the intrinsic evidence of the patent, and in particular on the express limitations of the claims. Decision ("Whether the Examiner has provided evidence in support of the proposition that providing property values is a way of organizing human activity or a long-prevalent economic practice, it is evident from the claim language itself that the "automated" valuation is based on mathematical algorithms."). In addition, we relied on established case law for the

understanding that property valuation is a fundamental economic principle and is therefore not patentable subject matter. Decision 5-6 (citing *Versata Development Group, Inc. v. SAP America, Inc.,* 793 F.3d 1306, 1333-34 (Fed. Cir. 2015)).

Further, the panel carefully reviewed the claims as a whole. It is not necessary for an opinion to reproduce the limitations of the claims in characterizing them. For purposes of this discussion, we note that the following limitations of claim 57 are directed to the abstract idea of property valuation using mathematical algorithms: ... determine a geographic region based on received user provided information; produce a plurality of automated valuation method (AVM) values using residential property information, the residential properties being within the geographic region, the AVM values reflecting current market estimates for the residential properties; an AVM value for at least one of the plurality of residential properties within the map-like display, wherein each AVM value is pre-process such that an AVM value for the at least one residential property pre-exists before a user query of the respective property is performed, and wherein the one or more computers update each of the AVM values without requiring a user query. Claims App.

Other limitations of claim 57 are directed to the display of information: *Id.* receive user-provided information ...provide display information to a remote terminal over a publically accessible network based on the user-provided information, the display information enabling the remote terminal to generate a map-like display for the geographic region, the map-like display containing at least:

respective icons for each of a plurality of residential properties within the geographic region, the icons being spatially distributed relative to one another based on geographic information also residing in one or more computer-readable mediums; and We determine that, as in *Electric Power Group, LLC v. Alstom S.A.,* 830 F.3d 1350 (Fed. Cir. 2016), the receiving and displaying of data by itself does not transform the abstract idea into patentable subject matter. Further, the invention here is not like the highly-technological invention of *Trading Technologies,* Inc. v. CQG, Inc., No. 2016-1616, 2017 WL 192716 (Fed. Cir. Jan. 18, 2017) (non-precedential), in which there was an invention based on advances in computer science that enabled the placing of trades based on specific structure and concordant functionality. Nor is this a technological invention as in *Enfish, LLC v. Microsoft Corp.,* 822 F.3d 1327 (Fed. Cir. 2016), in which there were advances in database technology.

Even Appellants concede that the claimed invention uses general purpose computers. Request 10. Indeed, paragraphs 20 and 21 of the Specification state that the invention may use a personal computer for a terminal or a server. Appellants argue that the mere use of an algorithm or a generic computer do not render claims unpatentable subject matter. Request 5-6 (citing *Enfish, LLC.,* 822 F.3d at 1335; *McRO, Inc. v. Bandai Namco Games Am. Inc.,* 837 F.3d 1299 (Fed. Cir. 2016)). Appellants argue that the invention relates to an advance in software, citing paragraph 46 of the Specification. Request 10. However, this portion of the Specification merely indicates that the software computes the property valuations before the data is requested. *See* Request

8. We agree with the Examiner that this is conventional technology, and that the mere use of a computer to perform calculations that can be performed mentally does not render claims patentable. *See Alice,* 134 S. Ct. at 2357 (discussing *Gottschalk v. Benson,* 409 U.S. 63, 67 (1972)). This is not an invention that is necessarily rooted in technology. In other words, contrary to Appellants' arguments, the claims and the Specification do not provide significantly more than the use of an algorithm.

With respect to the display of information, claim 57 also recites the use of a map display. Request 8. Claims 58 and 59 recite display using fields of information. However, in our view, displaying data on a map does not render the display of data non-abstract. The invention is not to a house but to the pricing of a house. Just as a realtor might point out the values of homes on a street as he or she drives down a street with a client, the correlation of the valuation to a street does not render the information non-abstract. Taking the claims as whole, the additional limitations do not transform the abstract idea of property valuation into patentable subject matter. This was addressed on page 6 of the Decision, and we do not believe that we overlooked or misapprehended any information.

Finally, Appellants argue that "Ignorance Is Not A Valid Grounds for Sustaining A § 101 Rejection." Request 11. Appellants assert that an AVM is not merely a computerized form of an appraisal because AVMs do not rely on human inspection, human intuition or an appraiser's specialized knowledge of a local real estate market. *Id.* at 12 (citing http:/

/nationalmortgageprofessional.com/news/8232/appraisals-bpos-and-avms).

However, the Decision's affirmance of the Examiner's rejection was not predicated on equating AVMs with appraisals, but rather on the determination that AVMs were a form of property valuation. The claims and the Specification are consistent therewith. It is the property valuation (a fundamental economic concept), calculated using mathematical algorithms, that constitutes the abstract idea. Nor does the application create a new valuation methodology because the Specification states that "Automated Valuation Methodology (AVM) is a computer-based technology that has been used to determine the market value of real estate for nearly a decade." Specification (¶ 15).

DECISION

In view of the foregoing, the panel has granted Appellants' Request to the extent that we have reconsidered our Decision in light of Appellants' Request. But we are not persuaded that we misapprehended or overlooked any points of law or fact in rendering our Decision; therefore, we deny Appellants' request to make any changes therein.

The Chief Judge was informed of Appellants' request for rehearing *en banc* and has declined to expand the panel. No time period for taking any subsequent action in connection with this appeal may be extended under 37 C.P.R. § 1.136(a). *See* 37 C.P.R. § 1.136(a)(l)(iv).

DENIED

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

Ex parte MARIO VILLENA and JOSE VILLENA
Appeal2015-0009491
Application 13/294,0442
Technology Center 3600

Before BIBHU R. MOHANTY, JAMES A. WORTH, and BRADLEY B. BAY AT, *Administrative Patent Judges.*

WORTH, *Administrative Patent Judge.*

DECISION ON APPEAL

..

Introduction

Appellants' application relates to "a computer-based system for creating and maintaining massive databases containing computationally complex and novel property information" (Spec. ,-r 1). Claims 57, 58, and 59 are the independent claims on appeal. Claim 57, reproduced below, is illustrative of the subject matter on appeal:

> 57. A system for distributing real-estate related information, comprising:
> one or more computers configured to:
> receive user-provided information and determine a geographic region based on received user-provided information;

produce a plurality of automated valuation method (AVM) values using residential property information, the residential properties being within
the geographic region, the AVM values reflecting current market estimates for the residential properties;

provide display information to a remote terminal over a publicly accessible network based on the user-provided information, the display information enabling the remote terminal to generate a map-like display for the geographic
region, the map-like display containing at least:

respective icons for each of a plurality of residential properties within the geographic region, the icons being spatially distributed relative to one another based on geographic information also residing in one or more computer-readable
mediums; and

an AVM value for at least one of the plurality of residential properties within the maplike display, wherein each AVM value is preprocess such that an AVM value for the at least one residential property pre-exists before a user query of the respective property is performed,
and wherein the one or more computers update each of the AVM values without requiring a user query.

(Appeal Br. 59, Claims App.)

Rejections on Appeal

The Examiner maintains, and Appellants appeal, the following rejections:

I. Claims 57-59 stand rejected under 35 U.S.C. § 101 because the claimed invention is directed to non-statutory subject matter because the claim(s) as a whole, considering all claim elements both individually and in combination, do not amount to significantly more than an abstract idea.

II. Claims 57-59 stand rejected under 35 U.S.C. § 112 (preAlA), first paragraph, as failing to comply with the written description requirement.

III. Claims 57-59 stand rejected under 35 U.S.C. § 112 (preAlA), second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which the applicant regards as the invention.

IV. Claims 58 and 59 stand rejected under 35 U.S.C. §1 02(b) as anticipated by or, in the alternative, under 35 U.S.C. § 103(a) as obvious over Sklarz (US 2002/0087389 A1 , pub. July 4, 2002). This rejection was set forth in the Answer pursuant for the procedures for a new ground of rejection in the Answer.

V. Claim 57 stands rejected under 35 U.S.C. § 103(a) a being unpatentable over Sklarz and Florance (US 2004/0030616 AI, pub. Feb. 12, 2004).

ANALYSIS

Rejection I (Patentable Subject Matter)

Claims 57-59

In analyzing whether claimed subject matter is patent eligible, the Court in *Alice* articulated the use of a two-step framework set forth in *Mayo Collaborative Services v. Prometheus Laboratories, Inc.,* 132 S.Ct. 1289 (2012): First, we determine whether the claims at issue are directed to one of those patent-ineligible concepts. If so, we

then ask, "[w]hat else is there in the claims before us?" To answer that question, we consider the elements of each claim both individually and "as an ordered combination" to determine whether the additional elements transform the nature of the claim" into a patent-eligible application. *See Alice Corp., Pty. Ltd. v CLS Bank lntl,* 134 S.Ct. 2347,2355 (2014). *See also* USPTO 2014 Interim Guidance on Patent Subject Matter Eligibility, 79 Fed. Reg. 74,618, 74,621 (Dec. 16, 2014).

The Examiner rejected claims 57-59 as being directed to the abstract idea of providing updated AVM (automated valuation method) values to customers, which the Examiner finds is a method of organizing human activities and a fundamental economic practice that has long been prevalent in our system of commerce such as in the real estate industry (Ans. 3). With respect to the individual recitations, the Examiner finds that the ability to receive user provided information is routine and

conventional in the computing arts; that producing a plurality of AVM values is simply the executing of a mathematical algorithm; that providing display information to a remote terminal is performed on a general computing device; and that claims do not result in any improvement to the functioning of the computer itself, and do not effect an improvement in another technology or technical field (Ans. 3--4). We agree with the Examiner's findings and determinations. Appellants put forth several arguments which we address in tum.

First, Appellants argue that the claims are not sufficiently abstract to warrant exclusion because the claims do not fall into any of the categories of organizing human activities, fundamental economic practices, ideas in and of themselves, and mathematical relationships and formulas (Reply Br. 6). Appellants assert that the Examiner has not provided any evidence in support of the finding that the claims are directed to categories of human activities, fundamental economic practices, or mathematical relationship and that the Examiner has not asserted the claim recites an idea in and of itself *(id.* at 7-11).

Whether the Examiner has provided evidence in support of the proposition that providing property values is a way of organizing human activity or a long-prevalent economic practice, it is evident from the claim language itself that the "automated" valuation is based on mathematical algorithms.

Further, putting aside the history and long-standing nature of property valuation, we agree with the Examiner that the idea of property valuation is fundamental to an economic system. *See Versata*

Development Group, Inc. v. SAP America, Inc., 793 F.3d 1306, 1333-34 (Fed. Cir. 2015) (reviewing cases and holding a computer-implemented method of determining a price to be abstract).

Therefore, the subject matter of property valuation is "abstract" or non-patentable for at least two independent reasons: (1) because it is based on mathematical algorithms and (2) because it is directed to a fundamental economic principle.

Appellants also argue that the claimed idea will not impede other economic activity (Reply Br. 12). Although pre-emption of other inventions may be the result of an abstract idea, a showing of pre-emption is not required for a determination that an idea is directed to non-patentable subject matter. *Ariosa Diagnostics, Inc. v. Sequenom, Inc.,* 788 F.3d 1371, 1377 (Fed. Cir. 2015) ("Where a patent's claims are deemed only to disclose patent ineligible subject matter under the *Mayo* framework, as they are in this case, preemption concerns are fully addressed and made moot.").

Accordingly, we agree with the Examiner that under step one of *Alice,* claim 57, is directed to an abstract idea, i.e., property valuation.

Finally, Appellants argue that the claims are not abstract and are patent eligible because the combination is unconventional and represents an improvement in technology by creating a faster process (Reply Br. 13-18). However, we agree with the Examiner that the claims may be performed on a general purpose computer, and that Appellants have not persuasively argued that the application of a mathematical algorithm to a general computer

represents a technological improvement. Therefore, we agree with the Examiner that the additional recitations of claims 57-59, individually or as a whole, do not remove the claims from the realm of patent-ineligible subject matter. Thus, we sustain the Examiner's rejection under § 101 of claims 57-59.

Rejection II (Written Description)

Claims 57-59

The Examiner reasons that the limitation "update each of the AVM values without requiring a user query," as recited in independent claim 57 is not supported by paragraph 65 of the Specification (Final Act. 3).

Appellants argue that the Specification need not disclose a claim limitation *in haec verba* and that a negative limitation is adequately supported when the specification describes a reason to exclude the relevant limitation (Appeal Br. 16---22; *see also* Reply Br. 19 (citing *Santarus v. Par Pharmaceutical,* 694 F.3d 1344 (Fed. Cir. 2012)). Written description support is sufficient if the specification conveys that an applicant was in possession of the invention at the time of filing. *See LizardTech, Inc. v. Earth Res. Mapping, Inc.,* 424 F.3d 1336, 1345 (Fed. Cir. 2005). A patent applicant is not required to describe explicitly in the Specification every embodiment of the invention *(id.*).

We are persuaded by Appellants' argument. Paragraph 65 of the Specification states that the system updates the valuation "often." Although this paragraph does not say that this is done "without requiring a user query," in our view a person reading

the Specification would understand that the valuation is updated automatically or independently, i.e., without a user query. Further, when paragraph 65 of the Specification states that the valuation is updated "after every sale," such a disclosure does not require a user query even if it involves user input. As such, we do not sustain the Examiner's rejection under§ 112, first paragraph, of independent claim 57.

For similar reasons, we do not sustain the Examiner's rejection under§ 112,

first paragraph, of independent claims 58 and 59.

Rejection III (Indefiniteness)

Claims 57-59

The Examiner reasons that the limitation "update each of the AVM values without requiring a user query," as recited in independent claim 57 is indefinite because it is a negative limitation that is unclear (Final Act. 3). Appellants argue that negative limitations are permissible (Appeal Br. 24--27 (citing MPEP § 2173.05(i)).

We are persuaded by Appellants' arguments. Although negative limitations may be disfavored, i.e., when they are unsupported by the original Specification, they may be used when adequately supported by the Specification. Further, we conclude that it is reasonably clear that "without requiring a user query" is another way of saying that the database is updated by the computer automatically. As such, we do not sustain the Examiner's rejection under§ 112, second paragraph, of independent claim 57.

For similar reasons, we do not sustain the Examiner's rejection under§ 112, second paragraph, of independent claims 58 and 59.

Rejection IV (Anticipation and/or Obviousness Over Sklarz)

Claims 58 and 59

We are persuaded by Appellants' argument that Sklarz fails to disclose updating AVM values, as recited in independent claim 58, i.e., "update each of the AVM databases values without requiring a user query" (Appeal Br. 37, 49-51, 52).[4]

The Examiner correctly finds that paragraph 51 of Sklarz discloses that databases are updated periodically (Final Act. 12). However, the Examiner has not shown that the information in the database which is updated periodically is an appraisal value (i.e., rather than previous sale price). Rather the information in the VYH database of paragraph 51 is VYH data type information, as set forth in paragraph 48, or, in the alternative, MLS (Multiple Listing Service) data. Indeed, the Examiner relies on paragraphs 3, 7, 15, 18, 223, 248, and 250 of Sklarz for appraisal based on sales data (Final Act. 7-1 0), but paragraphs 223 and 248 of Sklarz indicate that the comparative market analysis or appraisal is performed in response to a user query *(see also* Sklarz, Fig. 16).

---

[4] This argument is made in a section with a heading referring to claim 57, but it is clear from the context that this applies to independent claim 58 as well.

The Examiner reasons in the alternative that the predicted sales price may be stored in a cache and therefore would not need to be recalculated in the event of a subsequent query (Final Act. 13; *see also* Ans. 27-30). However, in our view, such an event would still be in response to a user query.

Therefore, we do not sustain the Examiner's rejection under§ 102 of independent claim 58. For similar reasons, we do not sustain the Examiner's rejection under § 102 of independent claim 59.

With respect to the Examiner's rejection under § 103 of independent claims 58 and 59, the Examiner reasons that it would have been obvious to update the AVM values (e.g., in the cache) automatically in the same manner as the database is automatically updated in order to provide current prices to users *(see* Final Act. 13-14). In our view, this reasoning is conclusory (i.e., to update in order to provide current information), and, in any event, it is unclear that the cache information is created independent of a user query. Therefore, we do not sustain the Examiner's rejection under § 103 of claims 58 and 59 for lack of a *prima facie* case.

Rejection V (Obviousness over Sklar and Florance)

Claim 57

Unlike independent claims 58 and 59, independent claim 57 contains an additional recitation relating to geographical mapping to represent the information, for which the Examiner relies on Florance in combination with Sklarz, i.e., "an AVM value for at least one of the plurality of residential properties within the map-like display,

wherein each AVM value is preprocess such that an AVM value for the at least one residential property preexists before a user query of the respective property is performed."

In particular, the Examiner finds that it would have been obvious to combine the zip code information of Sklarz (¶¶48, 59-60, 162, and Fig. 12) with the icon map of Florance (¶¶ 347, 348, Fig. 58) in order to prevent information in a user-friendly format (Final Act. 17-18; Ans. 34-35).

Appellants argue that the heat maps of Sklarz do not display graphic information of an AVM value (Appeal Br. 52). Appellants are referring to the description of color-coded maps in paragraph 162 of Sklarz. We agree with Appellants inasmuch as these maps only reflect ranges of prices for which homes have sold; they do not show actual AVM values of prices currently for sale.

Nor does Florance remedy the deficiency in Sklarz. Florance's map in Figure 58 shows a sale price, but paragraph 347 of Florance explains that the sale price is shown in response to the user dragging the mouse over a location icon. As such, Florance does not show an AVM value that preexists a user query.

The Examiner determines that the recitations relating to AVM values "pre-exist[ing]" or being "pre-process" are non-limiting because, according to the Examiner, it does not affect the structure of the AVM values (Final Act. 18). However, we disagree with the Examiner's construction of these recitations as non-structural because we conclude the recitations are structural in a time-dependent fashion. In other

words, the AVM values simply do not exist in Sklarz when the user turns on the application until the user enters a query. Because neither Sklarz nor Florance shows appraisal values prior to a user query, we do not sustain the Examiner's rejection under § 103 of claim 57 for lack of a *prima-facie* case.

DECISION

The Examiner's decision to reject claims 57-59 is affirmed. No time period for taking any subsequent action in connection with this appeal may be extended under 37 C.P.R. § 1.136(a)(l)(iv).

AFFIRMED

EXAMINER'S ANSWER (EXCERPT)

This is in response to the appeal brief filed 08/18/14.

1. Grounds of Rejection to be Reviewed on Appeal

Every ground of rejection set forth in the Office action dated 06/12/14 from which the appeal is taken is being maintained by the examiner except for the grounds of rejection (if any) listed under the subheading "WITHDRAWN REJECTIONS." New grounds of rejection (if any) are provided under the subheading "NEW GROUNDS OF REJECTION."

The following ground(s) of rejection are applicable to the appealed claims.

Claims 57-59 are rejected under 35 U.S. C. 112(a) or 35 U.S. C. 112 (pre-A/A), first paragraph, as failing to comply with the written description requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor or a joint inventor, or for pre-A/A the inventor(s), at the time the application was filed, had possession of the claimed invention.

Claims 57-59 are rejected under 35 U.S. C. 112(b) or 35 U.S. C. 112 (pre-A/A), second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which the inventor or a joint inventor, or for pre-AIA the applicant regards as the invention.

Claims 58,59, are rejected under 35 U.S.C. 102(b) as anticipated by or, in the alternative, under 35 U.S.C. 103(a) as obvious over Sklarz et al. (20020087389).

Claim 57 is rejected under 35 U.S. C. 103(a) as being unpatentable over Sklarz et al. (20020087389) in view of Florance et al. (20040030616).

2. NEW GROUNDS OF REJECTION

The following new grounds of rejection is in response to the Supreme Court of the United States decision in *Alice Corp. Pty. Ltd. v CLS Bank Inti. eta/ ..* The new grounds of rejection was necessitated by the above SCOTUS decision. 35 U.S.C. 101 reads as follows:

> Whoever invents or discovers any new and useful process, machine, manufacture, or composition of matter, or any new and useful improvement thereof, may obtain a patent therefor, subject to the conditions and requirements of this title.

Claims 57-59 are rejected under 35 U.S.C. 101 because the claimed invention is directed to non-statutory subject matter because the claim(s) as a whole, considering all claim elements both individually and in combination, do not amount to significantly more than an abstract idea. The claim(s) is/are directed to the abstract idea of providing updated AVM values to customers, something that amounts to a method of organizing human activities as well as being a fundamental economic practice. The providing of AVM values to

customers, including updated AVM values, is something that is a fundamental economic practice that has long been prevalent in our system of commerce such as in the real estate industry. Providing AVMs to customers, including updated AVMs is a fundamental aspect to the real estate industry that has been known for many years. The providing of AVM values to customers is also considered to be a method of organizing human activities, just like the SCOTUS stated in the *Alice* decision for the *Bilski* claims directed to financial hedging. Looking at the claimed steps/functions individually with respect to the functions being performed by the computer system, they are all routine and conventional. The claimed ability for one or more computers to receive user provided information is simply reciting a step of being able to receive data, something that is routine and conventional in the computing arts. The claimed step of producing a plurality of AVM values is simply the executing of a mathematical algorithm to arrive at a price in terms of a number (such as 250,000 as an AVM value). This step itself is simply the calculation of a number by using any and all algorithms by which one could calculate an AVM value. The claim scope is such that the AVM could be an average sale price of a number of properties. This is nothing but a mathematical calculation. The claimed producing of the AVM(s) step covers any and all forms of AVM models in the claim scope, something that is evidence of the claim including an abstract idea. The claimed step of providing display information to a remote terminal is simply the act of providing data, all computers and computing devices are capable of providing information to generate a

display. Further, the use of a map-like display is also considered to be routine and conventional in the art as is evidenced by the prior art reference to Florance (relevant for claim 57). The claimed ability to repeatedly update data is something all computers can provide for, and is routine and conventional in the computing arts. The claimed functions that the one or more computers are configured to provide are directed at computing functions that are routine and conventional in the computing arts (receiving information, performing math operations to calculate an AVM, and providing data for a display). The claimed functions are capable of being performed by any generic computing device. The additional element(s) or combination of elements in the claim(s) other than the abstract idea per se amount(s) to no more than a generic computer, or a generic computer with a computer readable medium. Viewed as a whole, these additional claim element(s) do not provide meaningful limitation(s) to transform the abstract idea into a patent eligible application of the abstract idea such that the claim(s) amounts to significantly more than the abstract idea itself. The claim recitations of the computer being configured to do what is claimed or reciting the computer is actually performing the claimed steps, amounts to more or less reciting that the method is to be applied by a generic computer, nothing more. This does nothing more than instruct a practitioner to implement the abstract idea on a generic computer and is not sufficient to transform the abstract idea into a patent eligible invention. The claims do not result in any improvement to the functioning of the computer itself, and do not affect an improvement in another technology or technical field. The business

of providing AVM values to customers is not improving another technology or technological field. Therefore, for the reasons set forth above, the claim(s) are rejected under 35 U.S.C. 101 as being directed to non-statutory subject matter.

NOTE: This order is nonprecedential.

United States Court of Appeals for the Federal Circuit

IN RE: MARIO VILLENA, JOSE VILLENA,
Appellants

2017-2069

Appeal from the United States Patent and Trademark Office, Patent Trial and Appeal Board in No. 13/294,044.

ON PETITION FOR PANEL REHEARING AND REHEARING EN BANC

Before PROST, *Chief Judge*, NEWMAN, LOURIE, DYK, MOORE, O'MALLEY, REYNA, WALLACH, TARANTO, CHEN, HUGHES, and STOLL, *Circuit Judges*. PER CURIAM.

O R D E R

Appellants Jose Villena and Mario Villena filed a combined petition for panel rehearing and rehearing en banc. A response to the petition was invited by the court and filed by Appellee Andrei Iancu. The petition was referred to the panel that heard the appeal, and thereafter the petition for rehearing en

banc was referred to the circuit judges who are in regular active service.

Upon consideration thereof,

IT IS ORDERED THAT:

The petition for panel rehearing is denied.

The petition for rehearing en banc is denied.

The mandate of the court will issue on November 7, 2018.

FOR THE COURT

October 31, 2018
Date

/s/ Peter R. Marksteiner
Peter R. Marksteiner
Clerk of Court

February 16, 2018
Hon. Peter Marksteiner, Clerk of the Court
U.S. Court of Appeals for the Federal Circuit
717 Madison Place, N.W.
Washington, DC 20439
Re: *In re: Villena,* Appeal No. 17-2069

Dear Colonel Marksteiner:

Pursuant to FRAP 28(j), the Director submits this response to Appellant's February 13, 2018 letter (ECF No. 36), citing this Court's decision in *Berkheimer v. HP Inc.*, Appeal No. 2017-1437 (Feb. 8, 2018). The Court in *Berkheimer* vacated the district court's summary judgment decision holding that claims 4-7 are patent ineligible under § 101. The Court held that those claims recite the purported technological advances described in the patent specification over then-existing art, creating a "factual dispute regarding whether the invention describes well-understood, routine, and conventional activities" under step two of the § 101 inquiry articulated in *Alice Corp. Pty. Ltd. v. CLS Bank Int'l*, 134 S. Ct. 2347 (2014). Slip Op. at 15-17. But the Court affirmed the trial court's summary decision that claims 1-3 and 9 recite patent-ineligible subject matter because those claims only implement the abstract idea with "conventional computer components," thus failing *Alice* step two. *Id.* at 15-16.

The Board's conclusion here that Villena's claims 57-59 fail *Alice* step two is consistent with *Berkheimer*. *See* USPTO Br. at 15-23; Appx3-7; Appx32-35; Appx113-115. The Board explained that Villena "concede[s]" what the claim language and the

'044 specification make plain: "the claimed invention uses general purpose computers." Appx5-6; *see* Appx20; Appx743 (¶¶ 20-21). The Board rejected Villena's argument that the claimed combination of generic computer technology was "unconventional and represents an improvement in technology by creating a faster process" because applying the known mathematical algorithms (the claimed "AVM") on general-purpose computers is not a "technological improvement." Appx34-35; *see* Appx3-7. Thus, the record supports the conclusion that the limitations in Villena's claims 57-59, whether considered individually or collectively, do not remove the claims from the realm of patent-ineligible subject matter because they merely recite conventional computer technology to implement an abstract idea like the patent-ineligible claims in *Berkheimer* and countless other judicial decisions. *See Alice,* 134 S. Ct. at 2358 ("[T]he mere recitation of a generic computer cannot transform a patent-ineligible abstract idea into a patent-eligible invention.").

Respectfully submitted,

/s/ Robert J. McManus
Robert J. McManus
Associate Solicitor

UNITED STATES COURT OF APPEALS FOR THE FEDERAL CIRCUIT

In re Mario Villena and Jose Villena,

Appeal No. 2017-2069

Citation of Supplemental Authorities under FRAP 28(j)

To the Clerk of the Court:

Appellants now cite a recent decision of the Federal Circuit, *Exergen Corp. v. Kaz USA, Inc.*, Appeal 2016-2315 (Fed. Cir. 2018) that was not available at the time of initial briefing, but which is highly-relevant to the present case. As with the recent *Berkheimer* decision, *Exergen* requires an evidentiary requirement for determining patent ineligibility under 35 U.S.C. § 101, and holds/observes:

(1) Step two of the Mayo/Alice test is satisfied when claim limitations involve more than performance of "well-understood, routine [and] conventional activities previously known to the industry" Majority op. at p. 6.

(2) Whether a claim element or combination of elements is well-understood, routine and conventional is a question of fact. Majority op. at pp. 9-10.

(3) "Something is not well-understood, routine, and conventional merely because it is disclosed in a prior art reference." Majority op. at p. 10.

(4) The Majority upheld the district court's recognition that a "new combination of steps in a process may be patentable even though all the constituents of the combination were well known and in common use before the combination.'" Majority op. at pp. 8 et seq.

Appellants vigorously argued these above-mentioned evidentiary principles in both their blue and grey briefs. See, e.g., App.Br. at pp. 13-15; Rep.Br. at pp. 4-6.

The Examiner's only reference to evidence in his § 101 rejection is a passing mention of "the prior art reference to Florance." See Appx114, ll. 13-15.

Further, there is no evidence, or even an assertion, that the specific ordered combination of steps or acts (beyond the asserted "abstract idea") recited in any of the present claims "were well known and in common use before the combination." See Appx3-7; Appx32-35; Appx113-115.

The PTO's § 101 rejection thus fails the substantial evidence requirement.

Dated: March 14, 2018 /s/ Burman Y. Mathis
Burman Y. Mathis
Attorney for Appellants

No. 2017-2069

-- CORRECTED --

United States Court of Appeals
for the
Federal Circuit

Appeal No: 2017-2069
(Originating Patent Application No. 13/294,044)

In re: Mario Villena and Jose Villena

Appeal from the United States Patent and Trademark Office,
Patent Trial and Appeal Board

BRIEF FOR APPELLANTS

Burman York Mathis, Esq.
471 Riverside Drive
Harper's Ferry, WV 25425
(703) 901-1683
budmathis@yahoo.com

I. Outstanding Rejections

Claims 57-59 are rejected under 35 USC §101. Claims 57-59 can be found at Appx215-217.

II. Procedural History

The §101 rejection was first raised on appeal by the Examiner in an Examiner's Answer on August 5, 2014. The Examiner cited no evidence to support the rejection. Appx113-115. The PTAB reversed the outstanding §103 and §112 rejections, but sustained the §101 rejection. Appx29-39. Appellants filed a Request for Rehearing, which was subsequently denied. This appeal followed.

III. Summary of Argument

The PTO concluded the instant claims are patent ineligible for two reasons including: (1) because it is based on mathematical algorithms, and (2) because it is directed to a fundamental economic principle. Appx34, ll. 3-6. The Panel also inferred that the claims are abstract because they can be performed by a generic computer. Appx34, last paragraph.

The decisions of the PTO should be set aside for: (1) failing to cite <u>any</u> supporting evidence, which necessary fails the substantial evidence test; (2) failing to consider the claims as a whole; (3) using legal standards that conflict with Supreme Court precedent; and (4) failing to consider evidence and arguments favoring patentability.

As will be explained below, this Panel's §101 holding is not only inconsistent with recent Federal Circuit holdings, but fails to comply with the mandates of the Administrative Procedure Act (APA), the Federal Circuit's holding in *In re Sang-Su Lee*, 277 F.3d 1338 (Fed. Cir. 2002), and the Supreme Court's holdings in *Dickenson. v.. Zurko,* 527 US 150 (1999), *Diamond v. Diehr*, 405 U.S. 175 (1981) and *Alice Corp. PTY. Ltd. v. CLS Bank Int'l*, 573 U.S. __ (2014).

ARGUMENT

IV. Standard of Review

The Federal Circuit reviews the Board's legal conclusions *de novo*, *In re Elsner*, 381 F.3d 1125, 1127 (Fed. Cir. 2004), and the Board's factual findings underlying those determinations for substantial evidence, *In re Gartside*, 203 F.3d 1305, 1316 (Fed. Cir. 2000). A finding is supported by substantial evidence if a reasonable mind might accept the evidence to support the finding. *Consol. Edison Co. v. NLRB*, 305 U.S. 197, 229 (1938).

A determination of patentability must be based on the entire record by a preponderance of evidence. *In re Oetiker,* 977 F.2d 1443 (Fed. Cir. 1992). Further, a decision on patentability must be made based upon consideration of all the evidence before the examiner, and a decision to make or maintain a rejection in the face of all the evidence must show that it was based on the totality of the evidence. *Id.*

Ultimately, the determination of whether an asserted claim is invalid for lack of subject matter patentability under §101 is a question of law. *See Bilski v. Kappos*, 545 F.3d 943, 950 (Fed. Cir. 2008). While invalidity is a question of law, "determination of this question may require findings of underlying facts specific to the particular subject matter and its mode of claiming." *Arrhythmia Research Technology, Inc. v. Corazonix Corp.*, 958 F.2d 1053, 1056 (Fed. Cir. 1992).

Proceedings of the Board are governed by the APA, Title 5, §§551 et seq. *Allentown Mack Sales & Serv., Inc. v. NLRB*, 522 U.S. 359, 374 (1998). Section 706 of the APA recites the following:

> "To the extent necessary to decision and when presented, the reviewing court shall decide all relevant questions of law, interpret constitutional and statutory provisions, and determine the meaning or applicability of the terms of an agency action. The reviewing court shall—
>
> . . .
>
> **(2)** hold unlawful and set aside agency action, findings, and conclusions found to be—
>
> **(A)** arbitrary, capricious, an abuse of discretion, or ***otherwise not in accordance with law***;
>
> . . .
>
> **(E)** ***unsupported by substantial evidence in*** . . . reviewed on the record of an agency hearing provided by statute;
>
> . . .
>
> In making the foregoing determinations, the court shall review the whole record or those

> parts of it cited by a party, and ***due account shall be taken of the rule of prejudicial error***." (emphasis added)

The "substantial evidence" requirement for PTO findings of fact was solidified by the Supreme Court in *Zurko*. In its holdings, the Supreme Court "stressed the importance of not simply rubber-stamping agency fact-finding." *Zurko*, 527 US at 162. "The APA requires meaningful review; and [the APA's] enactment meant stricter judicial review of agency factfinding than Congress believed some courts had previously conducted." *Id.*

In view of the *Zurko* decision, the Federal Circuit held that the PTO is obligated not only to come to a sound decision, but to fully and particularly set out the bases upon which it reached that decision. *Sang-Su Lee*, 277 F.3d at 1342. The Federal Circuit also held that the PTO "must set forth its findings and the grounds thereof, as supported by the agency record, and explain its application of the law to the found facts." *Id.* "Judicial review of a Board denying an application for patent is thus founded on the obligation of the agency to make the necessary findings and provide an administrative record showing the evidence on which the findings are based, accompanied by the agency's reasoning in reaching its conclusions." *Id.* Factual inquiries "must be based on objective evidence of record." *Id.* at 1343. "The need for specificity pervades this authority." *Id.* "[R]eview of an administrative decision must be made on the grounds relied on by the agency." *Id.* at 1345. "If those grounds are inadequate or improper, the court is powerless to

affirm the administrative action by substituting what it considers to be a more adequate or proper basis." *Id.* at 1345-46 (quoting *Securities & Exchange Comm'n v. Chenery Corp.*, 332 U.S. 194, 196 (1947)).

While the Federal Circuit formulated an exception to the "court is powerless to affirm" requirement of the APA in *In re Comiskey*, 499 F.3d. 1365 (Fed. Cir. 2007) under the theory that "[i]t would be wasteful" to send a case back to an agency, that cannot be the case for ongoing prosecution in an era where §101 law is so unsettled as it is today, or in the case where the Patent Office lacks substantial evidence. Further, prosecution is an ongoing process, and forcing the Patent Office to follow the most basic of §101 rules cannot be a waste - especially given (as shown below) that the Patent Office failed to adhere to the most basic principles of *Alice Corp.*

V. The §101 Rejection Should Be Reversed Because The PTO Failed To Consider The Claims As A Whole Under Step 1 Of The Alice/Mayo Test, or Provide Any Substantial Evidence That The Limitations As An Ordered Combination Were Well-Known, Routine and Conventional

A. The PTO Failed to Consider The Claims As A Whole

In *Diamond v. Diehr* the Supreme Court held that, in determining patent eligibility, "claims must be considered as a whole, it being inappropriate to

dissect the claims into old and new elements . . . ." *Diehr*, 450 U.S. at 188.

Mayo Collaborative Services v. *Prometheus Laboratories, Inc.*, 566 U.S. ___ (2012) later clarified that, not only must claims be considered as a whole, but that all claim limitations must be considered "as an ordered combination." *Id.* at ___ (slip op., at 10). *Alice Corp.* repeated this rule. *Alice Corp*, 573 U.S. ___ (slip op., at 2, 3, 7, 15).

McRO, Inc. v. Bandai Namco Games Am. Inc., 837 F.3d 1299 (Fed. Cir. 2016) not only adhered to the requirement of analyzing "the ordered combination of claimed steps" (*Id.* at 1302), it re-iterated that the courts "'must be careful to avoid oversimplifying the claims' by looking at them generally and failing to account for the specific requirements of the claims," and held that "[w]hether at step one or step two of the *Alice* test, in determining the patentability of a method, a court must look to the claims as an ordered combination, without ignoring the requirements of the individual steps." *Id.* at 1313.

Claim 57 is reproduced below for convenience:

> "57. A system for distributing real-estate related information, comprising:
>
> one or more computers configured to:
>
> *receive user-provided information and determine a geographic region based on received user-provided information;*
>
> produce a plurality of automated valuation method (AVM) values using residential property information, the residential

properties being within the geographic region, the AVM values reflecting current market estimates for the residential properties;

provide *display information to a remote terminal over a publically accessible network based on the user-provided information, the display information enabling the remote terminal to generate a map-like display for the geographic region, the map-like display containing at least:*

respective icons for each of a plurality of residential properties within the geographic region, the icons being spatially distributed relative to one another based on geographic information also residing in one or more computer-readable mediums; and

an AVM value for at least one of the plurality of residential properties *within the maplike display, wherein each AVM value is preprocess such that an AVM value for the at least one residential property pre-exists before a user query of the respective property is performed,*

and wherein the one or more computers update each of the AVM values without requiring a user query." (emphasis added)

Of the one-hundred and ninety-nine (199) words of claim 57, the PTAB ignored no less than one-hundred forty-nine (149) words, which amounts to almost three-fourths of the claim. In particular, the Examiner ignored: (1) all geographic and map-related aspects of the claim, (2) the requirement that an AVM value for the at least one residential property pre-exists before a user asks for it, and (3)

the requirement that AVM values be updated without requiring a user request for such updates.

Thus, Claim 57 above is directed to no less than: (1) repeatedly generating and storing AVM values without a request by a user in a fashion such that, even before a user does request an AVM value, it is available; and (2) displaying such AVM value(s) on a map-like display.

After Appellants pointed out that the PTAB failed to address each and every limitation, the PTAB (in its decision on rehearing) asserted: "the panel carefully reviewed the claims as a whole. It is not necessary for an opinion to reproduce the limitations of the claims in characterizing them." Appx4, ll. 13-15.

However, there is no discussion on the limitations marked in red above as an ordered combination.

While the PTAB did finally get around to discussing individual limitations upon rehearing (Appx4-6), the PTAB's late analysis is naught more than dismissals of individual limitations in a way that conflates step 2 of the *Alice Corp.* test with step 1 while ignoring the most basic requirements of step 1.

That is - the PTAB failed under step 1 to even assert that the limitations amounted to an ordered combination of limitations that together are well-known, conventional and routine within the field of providing AVM values.

A. The PTO Failed to Provide Substantial Evidence

In addition to ignoring the "as a whole" requirement under step 1 of *Alice Corp.*, the PTO provided no evidence to support its rejection.

Thus, the PTO's decision must be reversed because, even assuming that providing AVM values is a fundamental economic activity (to which the Examiner cited no evidence), there is no substantial evidence as required by law that the ordered combination of all limitations of each claim constitute an economic activity that is fundamental, i.e., well-known, routine and conventional.

The Federal Circuit's holding in *Bandai* is instructive. Specifically, in *Bandai* the Federal Circuit observed that "Defendants provided no evidence that the process previously used by animators is the same as the process required by the claims" (*Bandai*, slip op. at p. 24, ll. 8-11), and "Defendants' attorney's argument that any rules-based lip-synchronization process must use the claimed type of rules has appeal, but no record evidence supports this conclusion." *Bandai*, slip op. at p. 26, ll. 5-7. Based on this lack of evidence, this Court held for the Plaintiff. That is, the *Bandai* panel resisted the "appeal" to fill in the gaps with what might be considered common sense or common knowledge, and instead issued an evidentiary requirement.

As with *Bandai*, the present §101 rejections are based upon assertions of fact having no evidentiary support.

Under the PTO's existing policy of evidence-free §101 rejections, there cannot be a meaningful manner to resolve what is well-known, routine and conventional, and what is not. *Everything is adjudged in an evidentiary vacuum.*

While the PTAB Panel did state that "it is evident from the claim language itself that the 'automated' valuation is based on mathematical algorithms" (Appx4, ll. 7-8), this is insufficient to: (1) establish that providing AVM values is a fundamental economic activity, and (2) establish patent ineligibility under any known law given that the present claims recite far more than using AVMs to generate valuations.

While the PTAB Panel also cited *Versata Development Group, Inc. v. SAP America, Inc.*, 573 U.S. ___ (2014) (Fed. Cir. 2014), "for the understanding that property valuation is a fundamental economic principle and is therefore not patentable subject matter" (Appx4, ll. 8-11), *Versata* does not hold or suggest that all forms of price valuations are abstract. Further, any finding of fact in *Versata* cannot be applicable to Appellants as Appellants were not party to that litigation. What the PTAB has done is an improper application of collateral estoppel while ignoring that the *Versata* decision was based on evidence submitted by the various parties and acknowledged by the Federal Circuit as "substantial evidence on the record." Slip. Op. at p. 56, lines 7-17.

There is no substantial evidence on the record to support the present rejection.

Certainly, the Examiner might have claimed official notice / judicial notice, but chose not to. Examiner's at the PTO do not believe that evidence is necessary to reject a claim under §101. This erroneous idea needs to be corrected by this Court.

There is no *de facto* difference between ignoring claim limitations to arrive at "a high level of abstraction" (as was performed by the district court with *Enfish*) and merely declaring (without evidence and meaningful analysis) that such claim limitations do not amount to "something more." Both practices ensure that the exceptions to §101 swallow the rule.

VI. The Supreme Court's *Alice Corp.* Decision Did Not Render Claims Patent Ineligible Merely Because They Include A Mathematical Algorithm Or Because They May Be Performed By A Generic Computer

As far back as 1981, the Supreme Court recognized that the mere use of computers or mathematical algorithms does not render a claim abstract. To wit, the Supreme Court held:

> "Although [Respondents'] process employs a well-known mathematical equation, they do not seek to pre-empt the use of that equation, except in conjunction with all of the other steps in their claimed process. ***A claim drawn to subject matter otherwise statutory does not become nonstatutory simply because it uses a mathematical formula, computer program, or digital computer***. Respondents' claims must be considered as a whole, it being inappropriate to dissect the claims into old

> and new elements and then to ignore the presence of the old elements in the analysis." (emphasis added) *Diamond v. Diehr*, 405 US 175, 188 (1981).

Thus, the PTO's decision is inconsistent with thirty-five years of Supreme Court precedent.

Further, since the Supreme Court's *Alice Corp.* decision, the Federal Circuit issued two cases confirming that the mere inclusion of math and the complete implementation of a claim using generic computers do not render claims abstract: *Enfish v.Microsoft*[1] and *McRO v. Bandai*.[2]

In *Enfish*, the claims were reported by the Federal Circuit as being directed to an improvement in the functioning of a computer, i.e., a self-referential table. In *Bandai* there was no such assertion of computer enhancement, but instead an assertion that certain sets of rules added to mathematically-intensive animation algorithms constituted an improvement to an animation process. Regardless, the end result was the same: both sets of completely-computer implemented claims were determined to be patent-eligible in view of *Alice Corp.*

Accordingly, the Panel's holding is in error and should be set aside.

---

[1] *Enfish v.Microsoft*, Appeal No. 15-1244 (Fed. Cir. 2016)

[2] *McRo v. Bandai*, Appeal No. 15-1080 (Fed. Cir. 2016)

VII. The §101 Rejection Should Be Reversed Because The Board Improperly Dismissed Appellants' Statements Of Specific Utility That Support §101 Eligibility under Step 2 of *Alice Corp*.

Under this second prong of the *Mayo-Alice* analysis, the Supreme Court identified non-limiting, non-exclusive criteria of indicating patentability under 35 U.S.C. §101, such as when something "significantly more" is recited in a claim with an abstract idea including improvements to the functioning of the computer itself. *Alice,* 573 U.S. at (slip op., at 13).

Applicants have asserted that the presently claimed methods and systems provide for reduced latency by, for example, preprocessing data such that rendering a map (upon user request) containing AVM values can be reduced from seconds or minutes to a time measured in milliseconds. See Appx19-20, Appx76-77 and Appx749-750.

The PTAB misconstrued Appellants' assertions of utility to merely "creating a faster process" without regard to the specifically-asserted advantage by stating: "we agree with the Examiner that the claims may be performed on a general purpose computer." Appx34, ll. 17-21.

Appellants admit that the present claims derive advantage via software and can be performed by a generic computer, but such admissions are not relevant to patent eligibility. Improvements to completely computer implemented devices and methods may be achieved through software. *Enfish*, slip-op at p. 11 ("Software can make non-abstract

improvements to computer technology just as hardware improvements can, and sometimes the improvements can be accomplished through either route.").

Appellants' assertion of advantage is one of specific utility and is supported by the instant specification nearly throughout, with specific advantage described in paragraph [0046](Appx749-750) of the specification as originally filed. [3] Further, it is not disputed that preprocessing data before it is requested eliminates the requirement to process such data at the time such data is requested. That's a specific solution to latency issues.

Appellants' asserted benefits discussed above are issues of specific utility and, while a patent application is before the PTO, the rules of utility under §101 are governed by the MPEP. The MPEP §2107(II) ("Examination Guidelines for the Utility Requirement") states in part:

> "Office personnel are reminded that they *must treat as true a statement of fact made by an applicant in relation to an asserted utility*, unless countervailing evidence can be provided

---

[3] The PTAB also stated that "Appellants have not persuasively argued that the application of a mathematical algorithm to a general purpose computer represents a technological improvement." Appx34, ll. 21-23. However, Appellants never made any such assertion as Appellants' "technological improvement" is based on repeatedly pre-processing housing estimates to maintain current/valid estimates, which in turn reduces online latency.

> that shows that one of ordinary skill in the art would have a legitimate basis to doubt the credibility of such a statement." (emphasis added)

See also, MPEP §2107.02(IV) ("[T]he PTO must do more than merely question operability - it must set forth factual reasons which would lead one skilled in the art to question the objective truth of the statement of operability" (quoting *In re Gaubert,* 524 F.2d 1222, 1224 (CCPA 1975)).

The PTO *never* provided argument or evidence to contradict Appellants' statements of utility, and therefore any §101 rejection falls short on applicable law and substantial evidence – both grounds sufficient under §706 of the APA to reverse the honorable Panel's decision. Accordingly, the §101 rejection is not in accordance with law as is required by the APA, the MPEP and over 40 years of case law.

As to the PTAB's post-rationalizations found in their Decision on Rehearing, the PTAB compared the present case to *Electric Power Group, LLC v. Alstom,* 830F.3d 1350 (Fed. Cir. 2016) falsely insinuating that the present claims do nothing more than receive and display data.

Do the present claims receive data? Yes.

Do the present claims display data? Yes.

Yet, the same can be said for the claims of *DDR Holdings*, *Enfish* and *Bandai*. However, the present claims also generate new data (AVM values) based on received data, display such new data in a way never done before with AVM values, and generate the data such that any number of current AVM

values are available before requested by a user - issues the PTAB ignored.

As to the PTAB's assertion that the present claims are not as technologically advanced as the claims in *Trading Technologies Inc. v. CQG, Inc.,* Appeal No. 2016-1616 (Fed Cir. 2017), this is a ridiculous assertion totally unsupported by any evidence. Further, ***this rationale constitutes a new grounds of rejection*** by changing the trust of the rejection in a way that prejudices Appellants.

Appellants were never given a chance to address the PTAB's new "factual findings" related to relative technological advancement. Compare the Examiner's Answer at Appx113-115. "[A]n applicant for a patent who appeals a rejection to the Board is entitled to notice of the factual and legal bases upon which the rejection was based." *In re Leithem,* 661 F.3d 1316, 1319 (Fed. Cir. 2011) (holding that "[m]ere reliance on the same statutory basis and the same prior art references, alone, is insufficient to avoid making a new ground of rejection when the Board relies on new facts and rationales not previously raised to the applicant by the examiner."). Id. at 1319.

Applicant asserts that Graphic User Interfaces (GUIs) are old technologies - so old that in the 1970s GUIs were in many households in the form of portable video games, such as "Pong." While the GUI in *Trading Technologies* is clever, it does not represent a "highly-technological invention." The PTAB's assertions have no evidentiary basis, and the comparison is absurd.

The Panel's reliance on *Ariosa Diagnostics v. Sequenom,* 788 F.3d 1371 (Fed. Cir. 2015) is also misplaced. See Appx34. In *Ariosa* there was evidence that the ordered limitations of a claim were well-known, routine and conventional. Further, there was a district court factual finding in *Ariosa* that the patent-owner's claims "posed a risk of preempting a natural phenomenon." *Ariosa* 788 F.3d at ___. Specifically, the district court held "claims covering the only commercially viable way of detecting that phenomenon do carry a substantial risk of preempting all practical uses of it." *Ariosa* 788 F.3d at ___.

There is no such factual finding in the present case.

I. Introduction

As an initial matter, Appellants wish to thank the honorable Panel for their hard work on each and every issue. The relatively mature state of law for the §112, §102, and §103 issues, and the Board's reasoned application consistent with such law, has consequentially led to the Panel's reversal on such rejections.

However, Applicants most respectfully assert that the Supreme Court's *Alice Corp.*[1] decision has led to an unfortunate chaos in the patent community, which in turn has led to fundamental misunderstandings as to what constitutes abstractness under Title 35 USC §101. Fortunately, since the time of initial briefing and the time the Panel considered Appellants' arguments, the Court of Appeals for the Federal Circuit (CAFC) has issued several cases clarifying *Alice Corp.* that the PTAB must consider upon rehearing in order to come to a legal decision that complies with recent applicable law and the Administrative Procedure Act (APA).

Turning to the merits of the instant claims, the honorable Panel has concluded the instant claims are patent ineligible for two reasons including: (1) because it is based on mathematical algorithms, and (2) because it is directed to a fundamental economic principle. The Panel has also inferred that the

---

[1] *Alice Corp. PTY, LTD v. CLS Bank Int'l*, 573 U.S. ____ (2014)

claims are abstract because they can be performed by a generic computer.

As will be explained below, this Panel's §101 holding is not only inconsistent with relatively recent CAFC holdings, but fails to comply with the mandates of the Administrative Procedure Act (APA), the CAFC's holding in *In re Sang-Su Lee*, 277 F.3d 1338 (Fed. Cir. 2002), and the Supreme Court's holdings in *Dickenson. v.. Zurko,* 527 US 150 (1999), *Diamond v. Diehr*, 405 U.S. 175 (1981) and *Alice Corp.*

II. The Administrative Procedure Act Requires The PTO to Provide Substantial Evidence to Support All Factual Assertions, And Demonstrate That It Considered The Claims As A Whole When Rejecting Claims under §101

Proceedings of the Board are governed by the APA, Title 5, §§551 et seq. *Allentown Mack Sales & Serv., Inc. v. NLRB*, 522 U.S. 359, 374 (1998). Section 706 of the APA recites the following:

> "To the extent necessary to decision and when presented, the reviewing court shall decide all relevant questions of law, interpret constitutional and statutory provisions, and determine the meaning or applicability of the terms of an agency action. The reviewing court shall—
>
> . . .
>
> **(2)** hold unlawful and set aside agency action, findings, and conclusions found to be—

> (A) arbitrary, capricious, an abuse of discretion, or *otherwise not in accordance with law*;
>
> . . .
>
> (E) *unsupported by substantial evidence in* . . . reviewed on the record of an agency hearing provided by statute;
>
> . . .
>
> In making the foregoing determinations, the court shall review the whole record or those parts of it cited by a party[.]" (emphasis added)

The "substantial evidence" requirement for PTO findings of fact was solidified by the Supreme Court in *Zurko*. In its holdings, the Supreme Court "stressed the importance of not simply rubber-stamping agency fact-finding." *Zurko*, 527 US at 162. "The APA requires meaningful review; and [the APA's] enactment meant stricter judicial review of agency factfinding than Congress believed some courts had previously conducted." *Id.*

In view of the *Zurko* decision, the CAFC held that the PTO is obligated not only to come to a sound decision, but to fully and particularly set out the bases upon which it reached that decision. *Sang-Su Lee*, 277 F.3d at 1342. The Federal Circuit also held that the PTO "must set forth its findings and the grounds thereof, as supported by the agency record, and explain its application of the law to the found facts." *Id.* "Judicial review of a Board denying an application for patent is thus founded on the obligation of the agency to make the necessary findings and provide an administrative record

showing the evidence on which the findings are based, accompanied by the agency's reasoning in reaching its conclusions." *Id.* Factual inquiries "must be based on objective evidence of record." *Id.* at 1343. "The need for specificity pervades this authority." *Id.* "[R]eview of an administrative decision must be made on the grounds relied on by the agency." *Id.* at 1345. "If those grounds are inadequate or improper, the court is powerless to affirm the administrative action by substituting what it considers to be a more adequate or proper basis." *Id.* at 1345-46 (quoting *Securities & Exchange Comm'n v. Chenery Corp.*, 332 U.S. 194, 196 (1947)).

Turning to §101 patent eligibility, the Supreme Court requires that claim limitations must be considered *as a whole* when evaluated under §101. *Diehr*, 450 U.S. at 188 ("In determining the eligibility of respondents' claimed process for patent protection under §101, their claims must be considered as a whole"). Nothing has changed this requirement.

Thus, as an issue of law any decision by the honorable Panel not in compliance with the "as a whole" requirement must be set aside by the CAFC upon appeal.

III. The Supreme Court's *Alice Corp.* Decision Did Not Render Claims Patent Ineligible Merely Because They Include A Mathematical Algorithm Or Because They May Be Performed By A Generic Computer

As far back as 1981, the Supreme Court recognized that the mere use of computers and

mathematical algorithms does not render a claim abstract. To wit, the Supreme Court held:

> "Although [Respondents'] process employs a well-known mathematical equation, they do not seek to pre-empt the use of that equation, except in conjunction with all of the other steps in their claimed process. A claim drawn to subject matter otherwise statutory does not become nonstatutory simply because it uses a mathematical formula, computer program, or digital computer. Respondents' claims must be considered as a whole, it being inappropriate to dissect the claims into old and new elements and then to ignore the presence of the old elements in the analysis." *Diamond v. Diehr*, 405 US 175, ___ (1981).

Unless the present Panel asserts that the instant claims recite nothing more than a mathematical algorithm, the Panel's decision is inconsistent with thirty-five years of Supreme Court precedent.

Perhaps more helpful to the instant Panel, since the Supreme Court's *Alice Corp*. decision, the CAFC has issued two cases confirming that the mere inclusion of math and the complete implementation of a claim using generic computers do not render claims abstract: *Enfish v.Microsoft* [1] and *McRO v. Bandai*. [3]

---

[2] *Enfish v.Microsoft*, Appeal No. 15-1244 (Fed. Cir. 2016)

[3] *McRo v. Bandai*, Appeal No. 15-1080 (Fed. Cir. 2016)

In *Enfish*, the claims were reported by the CAFC as being directed to an improvement in the functioning of a computer, i.e., a self-referential table. In *Bandai* there was no such assertion of computer enhancement, but instead an assertion that certain sets of rules added to mathematically-intensive animation algorithms constituted an improvement to an animation process. Regardless, the end result was the same: both sets of completely-computer implemented claims were determined to be patent-eligible in view of *Alice Corp*.

Accordingly, unless the honorable Panel can provide some indicia beyond the mere fact that the present claims are implemented via a computer – enlightenment that Applicants and the patent community would greatly welcome – Appellants assert that the Panel's holding is in error and should be withdrawn.

IV. The Supreme Court's *Alice Corp.* Decision Still Requires That Claims Be Considered as A Whole, And The CAFC's *Enfish* and *Bandai* Decisions Dictate That The *Alice Corp.* Test Be Meaningful By Addressing All Claim Limitations in Both Part 1 and Part 2.

As stated above, Supreme Court case law requires that claim limitations must be considered *as a whole* when evaluated under §101. *Diehr*, 450 U.S. at 188.

As the CAFC observed in *Enfish*, in setting up the two-stage *Mayo*/*Alice* inquiry, the Supreme Court has declared: "We must first determine whether the claims at issue are directed to a patent ineligible concept." *Enfish*, slip op. at p. 10 (quoting *Alice*, 134

S. Ct. at 2355). "That formulation plainly contemplates that the first step of the inquiry is a meaningful one[.]" *Id.* The "directed to" inquiry, therefore, cannot simply ask whether the claims *involve* a patent-ineligible concept, because essentially every routinely patent-eligible claim involving physical products and actions *involves* a law of nature and/or natural phenomenon[.]" *Id.*

Turning to *Bandai*, the CAFC stated: We have previously cautioned that courts "must be careful to avoid oversimplifying the claims" by looking at them generally and failing to account for the specific requirements of the claims. *Bandai,* slip op. at p. **. "***Whether at step one or step two of the Alice test, in determining the patentability of a method, a court must look to the claims as an ordered combination, without ignoring the requirements of the individual steps***." (emphasis added) *Id.*

Turning to the issue at hand, the Examiner came to the conclusion that, under Part 1 of *Alice Corp.*, the independent claims are directed to "*[p]roviding AVM values to customers, including updated AVM values*" (cite). The honorable Panel (p. 5, bottom) has gone further by ignoring a term of art, i.e., AVM, to further generalize that "the idea of property valuation is fundamental to an economic system."

Claim 57 is reproduced below for convenience:

"57. A system for distributing real-estate related information, comprising:

one or more computers configured to:

receive user-provided information and determine a geographic region based on received user-provided information;

produce a plurality of automated valuation method (AVM) values using residential property information, the residential properties being within the geographic region, the AVM values reflecting current market estimates for the residential properties;

provide display information to a remote terminal over a publically accessible network based on the user-provided information, the display information enabling the remote terminal to generate a map-like display for the geographic region, the map-like display containing at least:

respective icons for each of a plurality of residential properties within the geographic region, the icons being spatially distributed relative to one another based on geographic information also residing in one or more computer-readable mediums; and

an AVM value for at least one of the plurality of residential properties *within the maplike display, wherein each AVM value is preprocess* (sic: preprocessed) *such that an AVM value for the at least one residential property pre-exists before a user query of the respective property is performed,*

and wherein the one or more computers update each of the A VM values without requiring a user query." (emphasis added)

Herein lies the reasons for setting aside the Examiner's rejection PTO's decision.

First, the Examiner has provided no evidence that "providing of AVMs values to customers, including updated AVM values" (p. 3 of Examiner's Answer ("ExAns")) is a fundamental economic activity. Respectfully, the honorable Panel's citation of *Versata Development Group, Inc. v. SAP America* [4] is misplaced. Unlike the instant case, in *Versata* the CAFC found that the PTAB's "underlying fact findings and credibility determinations are supported by substantial evidence in the record." *Versata*, slip op. at p. 56. *Nothing was assumed*.

The Panel's reliance on *Ariosa Diagnostics* [5] is similarly misplaced. Again, in *Ariosa* there was evidence that the ordered limitations of a claim were well-known, routine and conventional under the *Mayo* framework. Again, *nothing was assumed*. Further, there was a district court factual finding in *Ariosa* that the patent-owner's claims "posed a risk of preempting a natural phenomenon." <cite> Specifically, the district court held "claims covering the only commercially viable way of detecting that phenomenon do carry a substantial risk of preempting all practical uses of it." <cite> There has been no such factual finding or even an assertion in the present case.

---

[4] *Versata Development Group, Inc. v. SAP America,* 793 F.3d 1306, 1333-34 (Fed. Cir. 2015).

[5] *Ariosa Diagnostics v. Sequenom, Inc.* 788 F.3d 1371, 1377 (Fed. Cir. 2015)

Continuing, of the one-hundred and ninety-nine (199) words of claim 57, the Examiner has ignored no less than one-hundred twenty-nine (129) words, which amounts to nearly two-thirds of the claim. In particular, the Examiner has ignored: (1) all map-related aspects of the claim, (2) the requirement that an AVM value for the at least one residential property pre-exists before a user asks for it, and (3) the requirement that AVM values be updated without requiring a user request for such updates.

Thus, the Panel's decision must be reversed because: (1) even assuming that providing AVM values is a fundamental economic activity, there is no substantial evidence as required by law that the ordered combination of limitations of the claims constitutes economic activity that is fundamental, i.e., well-known, routine and conventional; (2) the Examiner failed to consider the claim as a whole under Part 1 of *Alice Corp.*, and (3) the Examiner failed to consider the claim as a whole under Part 2 of *Alice Corp.* It is impermissible as an issue of law to assess the nature of a claim by reading only a part of it and ignoring the rest. *Diehr*, 450 U.S. at 188.

Thus, the honorable Panel is compelled to reverse the Examiner. The initial burden of proof is upon the Examiner. The requirement to consider the claims as a whole in both Part 1 and Part 2 of *Alice Corp.* cannot be ignored. These failures by the Examiner cannot be overlooked.

This CAFC's holding in *Bandai* is instructive. Specifically, in *Bandai* the CAFC observed that "Defendants provided no evidence that the process previously used by animators is the same as the process required by the claims" (*Bandai*, slip op. at p.

24, ll. 8-11), and "Defendants' attorney's argument that any rules-based lip-synchronization process must use the claimed type of rules has appeal, but no record evidence supports this conclusion." *Bandai*, slip op. at p. 26, ll. 5-7. Based on this lack of evidence, this Court held for the Plaintiff. That is, the *Bandai* panel resisted the "appeal" to fill in the gaps with what might be considered common sense or common knowledge, and instead issued an evidentiary requirement.

As with *Bandai*, the present §101 rejections are based upon assertions of fact having no evidentiary support.

Now compare the present case with *Enfish*. As the CAFC stated in *Enfish*, Part 1 of the *Alice Corp.* inquiry should be meaningful. *Enfish*, slip op. at p. 10. This has always been Appellants' position. In *Enfish*, the Federal Circuit observed that the district court failed to consider sufficient claim limitations under Part 1 of the *Alice Corp.* test to conclude that such a practice "all but ensures that the exceptions to §101 swallow the rule." *Enfish*, slip op. at p. 14.

There is no *de facto* difference between ignoring claim limitations to arrive at "a high level of abstraction" (as was performed by the district court with *Enfish*) and merely declaring (without evidence and reasoned argument) that such claim limitations do not amount to "something more." Both practices ensure that the exceptions to §101 swallow the rule.

Under the PTO's existing policy of evidence-free §101 rejections, there cannot be a meaningful manner to resolve what is well-known, routine and

conventional, and what is not. *Everything is adjudged in an evidentiary vacuum.*

The present claims are still subject to prosecution. Prosecution before the PTO is an ongoing process. Appellants are not demanding that any of the present claims be allowed. Appellants are demanding meaningful processes that will properly vet claim eligibility and such processes necessitate substantial evidence, and an opportunity for Applicants to address such evidence.

V. The Board Misconstrued Appellants' Claims Regarding Improvements to the Functioning of a Computer

Under this second prong of the *Mayo-Alice* analysis, claims, the Supreme Court identified non-limiting, non-exclusive criteria of indicating patentability under 35 U.S.C. §101, such as when something "significantly more" is recited in a claim with an abstract idea including: improvements to the functioning of the computer itself. *Alice,* 573 U.S. at (slip op., at 13).

Applicants have asserted that the presently claimed methods and systems provide for reduced latency by, for example, preprocessing data such that rendering a map (upon user request) containing AVM values can be reduced from seconds or minutes to a time measured in milliseconds.

The honorable Panel has unfortunately misconstrued Appellants' assertions to merely "creating a faster process" without regard to the specifically-asserted advantage by stating: "we agree

with the Examiner that the claims may be performed on a general purpose computer."

Appellants admit that the present claims derive advantage via software and can be performed by a generic computer.

However, the recent *Enfish* decision has recognized that, as with the present claims, improvements to completely computer implemented devices and methods may be achieved through software as well as hardware. *Enfish*, slip-op at p. 11 ("Software can make non-abstract improvements to computer technology just as hardware improvements can, and sometimes the improvements can be accomplished through either route.").

Appellants' assertion of advantage is one of specific utility and is supported by the instant specification nearly throughout, with specific advantage described in paragraph [0046] of the specification as originally filed.[6] Further, it is not disputed that preprocessing data before it is requested eliminates the requirement to process such data at the time such data is requested. That's a specific solution to latency issues.

---

[6] The Panel also stated that "Appellants have not persuasively argued that the application of a mathematical algorithm to a general purpose computer represents a technological improvement." Respectfully, Appellants assert that they never made any such assertion as Appellants' "technological improvement" is based on repeatedly pre-processing of housing estimates in order to reduce online latency.

Appellants' asserted benefits discussed above are issues of specific utility and, while a patent application is before the PTO, the rules of utility under §101 are governed by the MPEP. The MPEP §2107(II) ("Examination Guidelines for the Utility Requirement") states in part:

> "Office personnel are reminded that they *must treat as true a statement of fact made by an applicant in relation to an asserted utility*, unless countervailing evidence can be provided that shows that one of ordinary skill in the art would have a legitimate basis to doubt the credibility of such a statement." (emphasis added)

See also, MPEP §2107.02(IV) ("[T]he PTO must do more than merely question operability - it must set forth factual reasons which would lead one skilled in the art to question the objective truth of the statement of operability." (quoting *In re Gaubert,* 524 F.2d 1222, 1224 (CCPA 1975)).

The Examiner *never* provided argument or evidence to contradict Appellants' statements of utility, and therefore any §101 rejection falls short on applicable law and substantial evidence – both grounds sufficient under §706 of the APA to reverse the honorable Panel's decision. The honorable Panel has unfortunately mistaken/overlooked Appellant's claims of specific utility. Accordingly, the §101 rejection is not in accordance with law as is required by the APA.

VI. Ignorance Is Not a Valid Grounds for Sustaining a §101 Rejection

Businesses, especially well-known, routine and conventional forms of business, do not exist in a vacuum devoid of context. It is therefore not appropriate to assert that "providing AVMs to customers" *per se* is a fundamental form of business. It may be part of a business model, but to over-simplify the real-world for the convenience of jurists is as erroneous as oversimplifying a claim. Jurists, especially judges, are assumed to be experts in law. However, nothing in the study of law qualifies jurists to be experts in the realm of real-world business practices, such as real estate.

The problem is as follows: As with §102 and §103 rejections, factual assertions under §101 rejections require evidence which, in turn, provides a fundamental context for the understanding of the rejections. As patent professionals, the honorable Panel must realize that *it is not possible to refute evidence or amend a claim to overcome evidence if there is no evidence to address*.

As a first example of a problem that has arisen, AVMs cannot be conflagrated with other forms of housing estimates as the honorable Panel appears to have done. An AVM is not merely a computerized form of an appraisal. AVMs, for example, do not rely on human inspection, human intuition or an appraiser's specialized knowledge of a local real estate market. AVMs and appraisals also serve different functions within the realm of real estate. See, e.g., http://nationalmortgageprofessional.com/news18232/

appraisals-bpos-and-avms, reproduced as Exhibit #1.[7]

As a second example of a problem that has arisen, how can Appellants address the limitations embodied in the one-hundred, twenty-nine (129) words if they are unexamined/ignored by the Examiner in Part 1 of the *Alice Corp*. test, and dismissed without evidence or meaningful discussion in Part 2 of the *Alice Corp*. test? How, for example, can Appellants address the limitation of "each AVM value [being preprocessed] such that an AVM value for the at least one residential property pre-exists before a user query of the respective property is performed" without evidence or discussion?

Such practice is prejudicial and would not be tolerated for §102 and §103 rejections.

V. Conclusion

For the reasons set forth above, the remaining§ 101 rejections should be reversed.

Date: January 2, 2017

Respectfully submitted,
/B. Y Mathis/
B. Y. Mathis,
Registration No. 44,907

---

[7] Appellants further assert that the National Mortgage magazine reference, which was published more than seven years after Appellants first working AVM hardware, provides no evidence that AVMs were routine and conventional in the realm of real estate at the time of the invention.

Exhibit #1
(dated June 19, 2010)

Appraisals, BPOs and AVMs

It seems that the opinions of those in the lending community, involving the different methods, procedures and practices pertaining to the evaluation of collateral, vary. Most of us have grown accustomed to appraisals; however, there are other methods being used that many of us never have had reason to become aware of.

In today's evaluation environment, we have many so-called appraisal techniques. that the scope of this article cannot contain all of them. Recent technological advances in computers and the Internet have been a game-changer in the properly evaluation arena. There is a much broader an-ay of products than there has been in the past. This can be a good thing, but it is not necessarily good. Each product has its strengths and shortcomings.

This discussion may not have been as necessary as it is if we hadn't had the recent economic crisis and mortgage meltdown. Over the decades, we have had other economic downturns, and with each downturn has come a review of why there were so many bank Failures, foreclosures and other financial setbacks. With all of the safety nets. just what is it in our system that seems to make the banking industry so vulnerable to risk and loss? ln most every occasion of this type, the microscope is placed upon appraisers. Even though I am ar1 appraiser, I admit that this is a perfectly legitimate area to explore. Having said that, the industry is filled with those

who suggest that collateral should be evaluated in some other way than the traditional appraisal. Issues. such as turnaround time, cost and trust. are always touted as areas where the traditional appraisal comes up short.

Among the smorgasbord of evaluation techniques available, there are three that seem to be talked about the most, and which are probably used the most.

They are as follows, and included is a broad statement as to their strengths, weaknesses and primary uses.

l. The traditional appraisal
Strengths: Highly accurate, uses human judgment and thorough.
Weaknesses: Higher cost and slower turnaround time.
Use: First mortgage, originations and many other alternative uses.

2. The broker price opinion (BPO)
Strengths: Moderately accurate and uses human judgement.
Weaknesses: Less detail, slow turnaround time.
Use: Mostly used in cases of loss mediation and foreclosure.

3. The automated valuation model (AVM)
Strengths: Very fast and economical.
Weakness: No human inspection or judgment and less certainly.
Use: Secondary or support to appraisal or BPO.

The traditional appraisal is the most thorough and arguably the most accurate. It is generally used when it is important to get the most accurate evaluation, such as in the origination of a loan. It is the most expensive of the three methods and takes much longer to obtain than an AVM, which is available almost instantly. Most, but not all, appraisals are prepared alter a thorough interior inspection. Appraisers are not expected to have any interest in the property and must conform to Uniform Standards of Professional Appraisal Practice (USPAP).

The BPO is prepared by a real estate broker who has less evaluation !raining than an appraiser. It is usually prepared after an exterior-only or drive-by inspection. It is not subject to USPAP and is most often prepared by a broker with an interest in listing the property for sale. BPOs are not normally accepted by secondary market entities, such as Fannie Mae, Freddie Mac and the Federal Housing Administration (FHA) when they buy paper.

The AVM has been more widely used lately, given the availability of more comparable data. It uses zero human judgment, rather a series of formulas that compare the subject to other sales of properties. There are no property inspections, and usually it is not proven that the properly actually exists. If there has been a fire that burned the home down or if there has been a mistake in the address, it is possible that there is minimal property value. The AVM is used mostly to support or to provide additional data when other collateral assessment techniques are employed as a second opinion.

Sound confusing? What does all this *mean* to the lender making a decision relative to a mortgage loan?

First, it is no more confusing than we as people make it If it is necessary to obtain a value indication immediately at little cost, then the AVM may be the best alternative. This should only be tried provided that the decision does *not* require verification of the existence of the property, an evaluation of the condition of the propet1y or human judgment relative to the comparing property to comparable sales.

It may also be appropriate to purchase and use a BPO in evaluating a property under some circumstances. If the property is subject to foreclosure, then a broker, taking a look at it and rendering an opinion as to its market value and what price range the property will likely fall into, may be appropriate. The BPO *can serve* as support to an appraisal or an AVM can also serve as a supplement to a BPO. In some cases, all these may be appropriate.

Finally, if it is important to get the best and most accurate opinion of value for a propet1y, choose an appraisal by a licensed appraiser. The appraiser is trained for the task. verifies the existence of the property, typically performs a thorough inspection of a property, has access to all of the most recent comparable data, has been trained to offer superior judgment about a property. prepares a product that is USPAP compliant and should be an unbiased party with no interest in the property. Appraisers are people, and they are not perfect. They can make mistakes and they sometimes do.

Other evaluation methods have their place, depending upon their intended purpose, but should not be considered an alternative to an appraisal when it is critical to get the most professional and accurate opinion relative to a property.

I. The Claims Are Directed To Patentable Subject Matter Because The Claims Are Not Sufficiently Abstract To Warrant Exclusion Under Supreme Court Precedent

Before embarking on its § 101 analysis in *Alice Corporation Pty. Ltd. v. CLS Bank International, et al.,* 573 U.S. (2014), the Supreme Court emphasized the caution with which one should proceed when considering § 101 issues: "we tread carefully in construing this exclusionary principle lest it swallow all of patent law." *Alice,* 573 U.S. _ (slip op., at 6). The Court was careful to state that "an invention is not rendered ineligible for patent simply because it involves an abstract concept." *Id.* citing *Diamond v. Diehr,* 450 U.S. 175, 187 (1981). "'Applications' of such concepts 'to a new and useful end' remain eligible for patent protection." *Id.* Quoting *Benson,* 409 U.S. at 67. The purpose of "abstract idea" exception to 35 U.S.C. §101 is to avoid foreclosure of the "basic tools of scientific and technological work." *Gottschalk v. Benson,* 409 U.S. 63, 67 (1972). In *Alice Corp.* the Supreme Court explained that the framework set forth in *Mayo Collaborative Services v. Prometheus Laboratories, Inc.,* 132 S. Ct. 1289 (2012), is to be used to analyze claims under the abstract idea exception for subject matter eligibility under § 101. *Alice,* 573 U.S._ (slip op., at 7) (2014).

The first step in *Mayo-Alice* analysis is to determine whether, in fact, the claims at issue are actually directed to a patent-ineligible concept. *Alice,* 573 U.S. (slip op., at 7). Only if one determines that the claims actually recite an abstract idea does one reach the second step of the analysis, under which

the claims are examined to determine if they improperly monopolize that idea. *Id.*

The *Alice* Court did not set forth any specific test for determining when a claim recites an abstract idea. *Id.* at_ (slip op., at 10)("[W]e need not labor to delimit the precise contours of the 'abstract ideas' category in this case."). Instead, it was sufficient to compare the claims at issue with those found to be patent-ineligible in *Bilski* to recognize that they recited an abstract idea. *Id.* (slip op. at 8-l 0). In performing this comparison, the Court set forth examples of abstract ideas, including: (A) organizing human activities. Id., (slip op., at 10); (B) fundamental economic practices, Id. (slip op., at 9); (C) ideas in and of themselves, Id. (slip op., at 7); and (D) mathematical relationships and formulas, *Id.* (slip op., at 8).

The present claims do not fall within any of these categories.

It is the claims of a patent that "define the scope of a patent grant." *Markman v. Westview Instruments, Inc.,* 517 U.S. 370, 373 (1996). For this reason, the Supreme Court has explained that claim language, as written, is definitive. The claim is a statutory requirement, prescribed for the very purpose of making the patentee define precisely what his invention is; and it is unjust to the public, as well as an evasion of the law, to construe it in a manner different from the plain import of its terms. *White v. Dunbar,* 119 U.S. 47, 51-52 (1886); *see also McCarty v. Lehigh Valley R.R.,* 160 U.S. 110, 116 (l895)("if we once begin to include elements not mentioned in the claim, in order to limit such claim ... , we should never know where to stop").

In analyzing any claim for patent-eligibility, therefore, one must always consider the claim as a whole. *Diehr,* 450 U.S. at 188(claims must be considered as a whole, rather than "dissect[ing] the claims into old and new elements and then ... ignor[ing] the presence of the old elements in the analysis"); *Warner Jenkinson Co. v. Hilton Davis Chern. Co.,* 520 U.S. 17, 29 (l997)("Each element contained in a patent claim is deemed material to defining the scope of the patented invention."). In particular, the eligibility of a claim under § 101 does not tum on whether any individual element of the claim is itself patent-eligible or "novel." *Diehr,* 450 U.S. at 188-89 ("The 'novelty' of any element or steps in a process, or even of the process itself, is of no relevance in determining whether the subject matter of a claim falls within the §101 categories of possibly patentable subject matter."). Instead, the relevant inquiry is whether a claim, on its face, recites an abstract idea, and, if it does, whether it "implements or applies that formula in a structure or process which, when considered as a whole, is performing a function which the patent laws were designed to protect." *Id.* at 192. Indeed, a contrary approach would, "if carried to its extreme, make all inventions unpatentable because all inventions can be reduced to underlying principles of nature which, once known, make their implementation obvious." *Id.; see also Mayo,* 132 S. Ct. at 1293 ("[T]oo broad an interpretation of [the exceptions to subject-matter eligibility] could eviscerate patent law. For all inventions at some level embody, use, reflect, rest upon, or apply laws of nature, natural phenomena, or abstract ideas.").

A. The Claims Are Not Directed To "Organizing Human Activity"

On page 3 of the Examiner's Answer, the Examiner asserts, *inter alia,* that "providing updated AVM values to customers . . . amounts to a method of organizing human activity." This assertion is a bald, unsupported conclusion as well as facially absurd.

First, the Examiner's assertion is conclusory and the Examiner proffers no evidence in support.

Second, there is no explanation as to how human activity is organized, nor could there be - especially in claims where no human activity is actually required.

Third, the claims don't require providing a single AVM value to a single customer.

Fourth, the Supreme Court never held that claims directed to "organizing human activity" are patent ineligible. The issue appears in a concurring opinion penned by Justice Sotomayor that only two other justices joined. *Alice* 574 U.S. __ (cone. slip op. at 1). Six justices rejected Justice Sotomayor's position. It goes to say that the statement against "organizing human activity" fails to rise to the level of dicta. The Examiner's position should be dismissed as capricious, erroneous and conclusory.

B. The Claims Are Not Directed to a Fundamental Economic Practice

The Examiner's assertion that the claims are directed to an abstract idea is based on a false premise and a misstatement of facts. The Examiner asserts, for example (page 3), that "[t]he providing of

AVMs values to customers, including updated AVM values, is something that is a fundamental economic practice that has long been prevalent in ... the real estate industry." The problems with this assertion are many-fold, including the fact that *the Examiner's provides no evidence to support his assertion* that, at the time of the invention, providing AVMs was a "fundamental economic practice." At most, the Examiner's assertions amount to bald conclusions that Applicants refute as conclusory and false. For this reason alone the Examiner's rejection fails.

The next problem is that Appellants' claims are directed to far more than merely providing AVMs to consumers. *The Examiner's analysis necessarily excises the great majority of claim language* in order to reach the false conclusion that the instant claims merely provide AVMs to consumers.

However, *it is impermissible as an issue of law to assess the nature of a claim by reading only a part of it and ignoring the rest. Diehr,* 450 U.S. at 188 (1981). Even under the broadest reasonable construction of the claimed subject matter, much more than "providing of AVMs values to customers" is claimed. Now here could the instant claims, if granted, possibly prohibit any entity from merely "providing of AVMs values to customers" any more than a claim directed to a new bicycle tire might preempt humanity from the use of bicycles. Thus, for a second reason being that *the Examiner has refused to consider the claims as a whole,* his rejection must fail.

As emphasized in *Alice Corp.,* abstract ideas *per se* are excluded from eligibility based on a concern that monopolization of the basic tools of scientific

and technological work might impede innovation more than it would promote it. However, as explicitly recognized by the Supreme Court, at some level, all inventions embody, use, reflect, rest upon or apply abstract ideas and the other exceptions. Thus, an invention is not rendered ineligible simply because it involves an abstract concept. To wit, the Supreme Court stated: 'In applying the § 101 exception, this Court must distinguish patents that claim the "'buildin[g] block[s]"' of human ingenuity, which are ineligible for patent protection, from those that integrate the building blocks into something more, see *Mayo Collaborative Services* v. *Prometheus Laboratories, Inc.,* 566 U. S. _, _, thereby "transform[ing]" them into a patent-eligible invention, *id.,* at Pp. 5-6.' Alice slip op at pp. l-2

This statement reflects why the instant claims are eligible for patent protection under 3 5 USC § 101. Even assuming that an AVM is a "building block" of human ingenuity, Applicants have used this building block as but one aspect of their claims to produce a patent-eligible invention. *The instant claims do not grant an improper monopoly over the idea of providing AVMs to customers, and the Examiner makes no assertion to the contrary.* Thus, for a third reason being that *the claims as a whole do not amount to a monopoly of a basic building block of human ingenuity,* the Examiner's rejection must fail.

C. The Claims Are Not Directed To "Ideas In And Of Themselves"

The claims are not directed to mere ideas *per se.* They are not directed to, for example, a principle, a fundamental truth, an original cause or a motive.

Compare, *Alice* at *(slip op.* at p. 8). The Examiner makes no such assertions, and if he did, they would be facially absurd.

D. The Claims Are Not Directed To *A* Mathematical Relationship And/Or *A* Formula

The claims are not directed to mere mathematical relationships and formulas. While the term "AVM" implies that one of many different algorithmic and/or nonalgorithmic approaches that may be used by a computer, the use of AVMs in the present claims amounts to a narrowly-defined use of AVMs that does not impede innovation. Again, *the Examiner has never asserted that the claims, if granted, would impede innovation,* and there is no a scintilla of evidence to support such an assertion.

The claims recite the use of an AVM as but one of many building blocks of human ingenuity, rather than the usurpation of AVMs or any other building block. The present claims before this honorable Board are exactly the sort of claims the *Alice* Court stated should be patent-eligible.

E. The Claims Do Not Recite An Abstract Idea

The Examiner correctly states (page 4) that "[a]ll computers and computing devices are capable of performing math equations and are all capable of providing the result to a user," and laments that the present claims include receiving information, performing math operations and providing data. See page 4, lines 18-20 of the Examiner Answer. Examiner further laments that the "claimed steps

are directed at computing functions that are routine and conventional in the computing arts."

While in a sense certain individual claim steps may be considered "routine and conventional," this is true for l 00% of all claims implemented on any form of digital processing circuitry. All digital electronics, including computers, are limited to basic functions, such as adding, subtracting, multiplying, comparing, branching and accessing data. This is all a computer can do. Yet, human ingenuity allows these basic functions to be combined so as to create greater functionality, such as performing queries, performing regressions, and even modeling the beginnings of the universe itself. The Supreme Court, being aware of the same limitations opined upon by the Examiner, never stated that inventions embodied in a general purpose computer are patent ineligible.

To the contrary, the Supreme Court stated, *inter alia,* "[t]he introduction of a computer into the claims does not alter the analysis." *Alice,* 574 U.S. (slip op at 2).

Turning to the instant application, individual claim steps include, for example, requirements that AVM values be placed in a common database and repeatedly updated such that, at any time an AVM value for a plurality of properties (even for substantially every property in multiple states) will reflect current market conditions. The claims also allow for performing queries and displaying AVM data in a way that AVM data was never before displayed.

There is nothing conventional or routine about the instant claim limitations, either considered

individually or as a whole. Queries *per se,* for example, may be conventional, but querying repeatedly updated AVM values is not.

F. The Claims Are Patent-Eligible Under 35 USC §101 Because They Provide Improvements To Existing Technological Processes, Provides Improvements To The Functioning Of *A* Computer, And Include Meaningful Limitations

Under this second prong of the *Mayo-Alice* analysis, claims, the Supreme Court identified non-limiting, non-exclusive criteria of indicating patentability under 35 U.S.C. §101, such as when something "significantly more" is recited in a claim with an abstract idea including: (1) improvements to another technology or technical field; (2) improvements to the functioning of the computer itself; and (3) meaningful limitations beyond generally linking the use of an abstract idea to a particular technological environment. *Alice,* 573 U.S. at_ (slip op., at 13). The present claims represent such an improvement in the relevant technology, improvements to the functioning of a computer implementing AVMs, and meaningful limitations beyond merely "providing AVMs to customers."

On page 5 of his Answer, the Examiner erroneously concludes that the instant claims "do not result in any improvement to the functioning of the computer itself, and do not effect an improvement in another technology or technological field. The Examiner's conclusion is based on his false (and repeated) assertion that the instant claims are directed to nothing more than merely providing AVMs to customers.

Merely for the purpose of context, it is to be appreciated that computer latency for on-line services is important. A study by Amazon Corp., for example, found that every delay of 100ms cost Amazon l% in sales. Google similarly found that an extra 0.5 seconds in search page generation caused traffic to drop by 20%.[1]

The presently claimed methods and systems addressed, *inter alia,* not only novel and unobvious methods and systems capable of providing displays containing near limitless numbers of present market value AVMs at the request of a user - but provide for reduced latency in a unique way long before Amazon or Google performed a single study about the problems of online latency.

For example, assume that a computer circa 2004 could calculate an AVM in one second - a process that would include determining a set of comparable properties, addressing subtle differences in such properties, searching and locating meaningful sales data and performing some form of estimation using any number of regression or other processes. Providing a display containing 1,000 AVMs would take 1,000 seconds (over 16 minutes) ignoring the process time required to render a display.

The Sklarz reference (cited by the Examiner) could easily require a very industrious human thirty minutes for each of its valuations. Thus, providing

---

[1] See, e.g., http:/lblog.gigaspaces.com/amazon-found-every-100ms-of-latencycost-them-1-in-sales/; http://glinden.blogspot.com/2006/11/marissa-mayer-at-web-20.html

1,000 valuations according to Sklarz's methods and systems would take one person working 40 hours/week over three months to produce, and at the end of the process the first valuations calculated would not likely reflect current market conditions.

In contrast, the claimed methods and systems can readily retrieve the same thousand AVMs in a time measured in milliseconds.

The difference in providing AVM values in milliseconds (versus minutes or even months) is without question not just an improvement in the art of providing a unique data service to users, but a revolution in the relevant technical field. The claims similarly represents an improvement to the functioning of any computer directed to producing AVMs given that Appellants' innovations can produce AVMs hundreds or thousands of times faster than previously known devices. Without Applicants' innovation of constantly preprocessing and updating AVMs an innovation that the online real estate industry has praised and copied – there could be no viable online resource for large-scale usable (current market value) AVM information.

Similarly, there would be no resource for conveniently identifying the best investment properties for sale in a large region. As stated in the present specifications, the claimed methods and systems allow for a Differential Valuation Search (DVS), which allows prospective users to quickly identify properties that are offered for sale at a price below their market value. See, paragraph [0027] of the specification as originally filed. Appellants' innovations not just provide a resource for conveniently identifying good investment properties

in large regions - they provide it at any given minute in any given day and can do so in a time frame below human perception.

Thus for these reasons alone, Appellants' claims represent both a technological improvement in the field of real estate, as well as an improvement in the operation of computers dedicated to producing AVMs. While the Examiner asserts (page 5) that "[v]iewed as a whole, these additional claim element(s) do not provide meaningful limitation(s) to transform the abstract idea into a patent eligible application of the abstract idea," *it is telling that the Examiner's lamentations do not include a single example of how innovation would possibly be stymied by a grant of the present claims.*

The Examiner's lamentations are mere conclusory applications of boilerplate language that lack the slightest idea as to what constitutes "meaningful limitation(s)" within the framework of Supreme Court precedent. The Examiner falsely characterizes the present claims as nothing more than merely "providing AVM values to customers." The Examiner's characterizations are thus a denial of the Supreme Court's edict that claims must be considered in their entirety as the Examiner refuses to consider the vast majority of claim language while focusing on the single term "AVM." No claim could ever issue from Directorate 3600 if examiners are allowed to continue in this way.

Appendix of the Claims

Claims 1-56 (canceled)

57. (Rejected) A system for distributing real-estate related information, comprising:

one or more computers configured to:

receive user-provided information and determine a geographic region based on received user-provided information;

produce a plurality of automated valuation method (AVM) values using residential property information, the residential properties being within the geographic region, the AVM values reflecting current market estimates for the residential properties;

provide display information to a remote terminal over a publicly accessible network based on the user-provided information, the display information enabling the remote terminal to generate a map-like display for the geographic region, the map-like display containing at least:

respective icons for each of a plurality of residential properties within the geographic region, the icons being spatially distributed relative to one another based on geographic information also residing in one or more computer-readable mediums; and

an AVM value for at least one of the plurality of residential properties within the map-like display, wherein each AVM value is pre-process such that an AVM value for the at least one residential property pre-exists before a user query of the respective property is performed, and

wherein the one or more computers update each of the AVM values without requiring a user query.

58. (Rejected) A system for distributing real-estate related information, comprising:

one or more tangible computer-readable mediums that includes one or more databases with entries for a plurality of residential properties with each entry including at least: a first field containing an address of a residential property, and a second field containing an automatic valuation method (AVM) value reflecting a computer-generated value of the residential property identified by the address of the first field; and one or more computers configured to:

update each of the AVM values using residential property information so as to enable the one or more databases so as to repeatedly reflect market changes in the AVM values of the residential properties; and

distribute the AVM values to any one of a plurality of users over a publicly-accessible network, wherein the one or more computers update each of the AVM values without requiring a user query.

59. (Rejected) A method for distributing real-estate related information using one or more tangible computer-readable mediums that includes one or more databases with entries for

plurality of residential properties with each entry including at least a first field containing an address of a residential property, and a second field containing an automatic valuation methodology (AVM) value reflecting a computer generated value of the residential property identified by the address of the first field, the method comprising:

repeatedly updating the AVM values based on residential property information so as to reflect market changes in the values of the residential properties using one or one or more first computers configured to generate AVM values from residential property information; and

distributing the AVM values to any one of a plurality of users over a publicly-accessible network using one or more second computers configured to distribute data over a network, wherein repeatedly updating the AVM values occurs without requiring a user query.

COMPUTERIZED SYSTEMS FOR FORMATION AND UPDATE OF DATABASES

FIELD OF THE INVENTION

[0001] This disclosure relates to a computer-based system for creating and maintaining massive databases containing computationally complex and novel property information.

BACKGROUND OF THE INVENTION

[0002] Real estate is a multi-billion dollar industry touching virtually every strata of our society. Although the industry has consolidated somewhat during the last ten years, it remains highly fragmented. Unfortunately, the "power to transact" is largely concentrated in the hands of real estate brokers and agents regardless of the fact that entry and exit barriers are low. Further, the range of available buying and selling options are limited since the services provided by practically every real estate professional are virtually the same throughout the entirety of tl1e United States and beyond.

[0003] Unfortunately, the real estate industry has been highly resistant to the threat of new and potentially disruptive technologies as consumer behavior have been almost completely ignored. While a number of new computer-based tools are under development or have been proposed. their effect has either been inconsequential or specifically designed to preserve the status quo of the real estate industry, rather than directed to transform the industry to the benefit of property owners. Accordingly, new

technological approaches relating to real estate are desirable.

SUMMARY OF THE INVENTION

[0004] ln one aspect, a storage medium containing a .database of property related information that, when accessed by a computer, can enable a user to perform a number of property-related queries includes records · on substantially every residential property in a defined geographic region. Each entry of the property database can itself include an identifying field identifying a specific property and an automated valuation field containing an AVM produced value of the identified property.

[0005] In another aspect, an apparatus for creating and maintaining a database containing information relating to residential properties includes an AVM device configured to receive information relating to substantially every known property within a defined geographical region that is currently offered for sale, further configured to perform an AVM operation on each property to produce an AVM value for each property and still further configured to create an AVM database containing entries of a plurality of the AVM values.

[0006] There has thus been outlined, rather broadly, certain embodiments of the invention in order that the detailed description thereof herein may be better understood. and in order that the present contribution to the art may be better appreciated. There are, of course, additional embodiments of the invention that will be described or referred to below

and which will form the subject matter of the claims appended hereto.

[0007] In this respect. before explaining at least one embodiment of the invention in detail, it is to be understood that the invention is not limited in its application to the details of construction and to the arrangements of the components set forth in the following description or illustrated in the drawings. The invention is capable of embodiments in addition to those described and of being practiced and carried out in various ways. Also, it is to be understood that the phraseology and terminology employed herein, as well as the abstract, are for the purpose of description and should not be regarded as limiting.

[0008] As such, those skilled in the art will appreciate that the conception upon which this disclosure is based may readily be utilized as a basis for the designing of other structures, methods and systems for carrying out the several purposes of the present invention. It is important, therefore, that the claims be regarded as including such equivalent constructions. insofar as they do not depart from the spirit and scope of the present invention.

BRIEF DESCRIPTION OF THE DRAWINGS

[0009] FIG. 1 depicts a networked system capable of allowing users to access AVM technology.

[0010] FIG. 2 is a block diagram of a system capable of performing AVM-related services.

[0011] FIG. 3 depicts various geographic regions of interest.

[0012] FIG. 4 depicts AVM database information.

[0013] FIG. 5 is a flowchart outlining an exemplary operation for performing AVM related services.

[0014] FIG. 6 is a flowchart outlining a second exemplary operation for performing AVM-related services.

DETAILED DESCRIPTION

[0015] Automated Valuation Methodology (AVM) is a computer-based technology that has been used to determine the market value of real estate for nearly a decade. Unfortunately, AVM technology is very expensive. As a result, the available AVM providers are generally limited to a very few large corporations. The downside of having such limited pool of AVM providers keeps the price extremely high and the availability extremely limited. For example, one web-based service will provide an AVM valuation of a specific residential property for $25. While this may be appropriate if one desires to look at a limited number of properties or determine a mortgage limit for a specified property, its utility as a market analysis tool to the small investor is practically nil as performing a comparative analysis of properties in even a small geographic can cost tens of thousands of dollars.

[0016] Another downfall of the limited availability of AVM providers is quality. In a study of four AVMs, Standard & Poor's found that, while known AVM can (in many circumstances) provide decent property estimates, known AVM systems are documented as over-estimating property values by as much as two-hundred percent. As a result of the sporty nature of AVMs, lenders are forced to continue to rely heavily

upon appraisers, who in turn rely on what is known as the "Appraisal Institute Residential Database" (AIRD). As the AIRD is basically of use only to professional appraisers and only for specific identified properties, its usefulness *as* a marketing tool to the small investor is also practically nil due to the high expense of the human element.

[0017] In view of these circumstances, the inventors of the disclosed methods and systems have created an entirely new approach to empower buyers and sellers of real estate property. Against industry trends and traditions, the inventors have invested greatly in their own AVM technology, and applied it in unconventional and novel ways. Accordingly, the inventors have a unique standing in the relevant industry with the ability to perform massive numbers of AVM valuations at negligible costs. As a result, the inventors have created novel applications that can take advantage of the strengths of AVM technology while limiting their known liabilities. For example, by employing AVM technology not against various specific properties, but against practically every property in a given geographical region, entirely new approaches for investing can be formulated with negligible costs and before any substantial money is ever invested by a given consumer.

[0018] FIG. 1 depicts an exemplary networked-system 100 configured to enable individual consumers/investors to effectively utilize AVM .technology. As shown in FIG. 1, the networked-system 100 includes a provider 130 coupled to a network 110 via link 132, as well as a number of

terminals 120 coupled to the network 100 via respective links 122.

[0019] In operation, the provider 130 can first perform a number of set-up operations, such as creating and maintaining a database of all (or substantially all) known properties in a particular geographical region, performing an AVM valuation of such properties and identifying all such properties that are offered for sale. Once the appropriate information is amassed and prepared, the provider 130 can service anyone who may desire to employ any of a number of property-related services made available by the provider 130. In the present embodiment, such services can be accessed using any of the available terminals 120.

[0020] The terminals 120 of the immediate example are personal computers capable of interfacing with a network. However, in various embodiments the terminals 120 can include any of a variety of communication devices, such as personal computers, PDAs, telephones and cell-phones (with and without graphic displays), television sets with special two-way interfaces or any other known or later-developed communication device capable of communicating with an automated service provider without departing from the spirit and scope of the present disclosure.

[0021] The exemplary provider 13~ is a computer-based server capable of accessing the Internet. However, as with the terminals 120, it should be appreciated that the provider 130 can take any number of forms, such as a server, a personal computer, a mainframe and so on.

[0022] The exemplary network 110 is a publicly available portion of the Internet. However, in other embodiments the network 110 can be any viable combination of devices and systems capable of linking computer-based systems including a wide area network, a local area network, a connection over an intranet or extranet, a connection over any number of distributed processing networks or systems, a virtual private network, the Internet, a private network, a public network, a value-added network, an intranet, an extranet, an Ethernet-based system, a Token Ring, a Fiber Distributed Datalink Interface (FDDI), an Asynchronous Transfer Mode (ATM) based system, a telephony-based system including Tl and E 1 devices, a wired system, an optical system, a wireless system and so on.

[0023] The various links 122 and 132 of the present embodiment are a combination of devices and software/firmware configured to couple computer-based systems to the Internet over a wired line. However, it should be appreciated that, in differing embodiments, the links 122 and 132 can take the forms of modems, networks interface card, serial buses, parallel busses, WAN or LAN interfaces, wireless or optical interfaces and the like as may be desired or otherwise dictated by design choice.

[0024] Returning to FIG. 1, once the provider 130 has performed the above-mentioned initial tasks, the provider 130 can then provide a variety of services to potential users via the terminals 120. In order to service such users and enable various features, the provider 130 of the present embodiment can provide a number of web-pages formatted using HTML, XML, Flash or any other viable publishing standard,

such that users accessing the web-pages can do so using nothing more than a commercially available web-browser. However, it also should be appreciated that the provider 130 can also use any number of standard commercialized or specially designed software packages as may be necessary or otherwise desired under a given set of particular circumstances. For example, users accessing the provider 130 using a telephone might use a Voice XML interface, users accessing the provider 130 using a PDA or FAX-based interface might use a custom program and so on.

[0025] A first available service provided by the provider 130 includes the capacity to allow users to query its databases to identify and list all real properties in a given geographic region (such as a region defined by a zip-code, a state, city or county, a school zone, a housing development etc.) as well as identify all known properties offered for sale in such region. The provider 130 can further perform queries to identify different types of properties (e.g., single family dwellings, townhouses, condos, duplexes etc.), identify properties based on sale price, tax valuation, number of bedrooms, number of bathrooms, acreage or any other aspect of a property that a consumer/investor might care about and that can be described on a computer medium.

[0026] Additionally, the provider 130 can perform queries and identify properties based on AVM valuation. For example, given that the provider 130 can access a database of substantially all known properties in a particular city, and given that the database contains an AVM value for each property, the provider 130 could identify all properties within

the city having an AVM value between $150,000 and $100,000, identify all townhouses having an AVM value between $150,000 and $100,000 and so on.

[0027] Still further, the provider 130 can perform a "Differential Valuation Search" (DVS) to identify properties based on both their respective AVM values and sale prices. That is, a particular user may wish to identify various properties in a particular region that are offered for sale at a price substantially below their AVM values. For example, by formulating a query to include a preferred school district and an interest in townhouses that are offered for sale at a price at least 20% below their respective AVM values, the provider 130 can appropriately respond and identify any such properties with but a short wait and modest fee.

[0028] In the present embodiment, the provider 130 can identify such properties by issuing a literal list of such properties in any number of ordered ways, e.g., ascending/descending sale prices, ascending/descending AVM values, ascending/descending DVS values etc. In other embodiments, however, results can be reported using any combination of lists, graphics (e.g., maps), voiced responses (using, for example, Voice XML technology) and so on.

[0029] In addition of a percentage-based DVS query, the provider 130 can also perform DVS queries based on the absolute difference in sale price and AVM value. Still further, DVS queries can be formed based on a "modified absolute difference" in sale price and AVM value, i.e., the absolute difference discounting various financial factors, such as condo fees, insurance rates, tax assessments, reported utility

rates or any other known or later acknowledged item that can affect the investment value of a property. For instance, while a particular user may wish to identify all single-family dwellings in a city that are for sale for at least $10,000 below their AVM value, the user may desire to discount, change the ordering of, highlight or completely eliminate properties that might pass the differential valuation requirement but are encumbered by housing association fees, unusual insurance requirements, reside in high-crime neighborhoods and so on.

[0030] Another optional feature of the provider 130 is its ability to perform AVM or DVS searches on dissimilar properties to compare unlike properties for value. For example, a user may wish to identify all condos of a specific type (e.g., 2 bedrooms, 2 bathrooms and 1200+ sq. ft) in a specific price range with a DVS of20% simultaneously with all single-family dwellings of a given DVS (or AVM) range having at least three bedrooms and located on at least two acres. By allowing such complex queries, the provider 130 can issue important financial data to investors thus allowing them to compare and contrast various investment opportunities, as well as present attractive options to potential buyers more interested in living in one of several types of (well-priced) properties than investing merely for profit.

[0031] FIG. 2 is an exemplary provider 130 capable of providing a variety of property related services including services that use AVM technology. As shown in FIG. 2, the exemplary provider 130 includes a controller 210, a memory 220, an AVM device 230, a spatial information device 232 (with optional spatial database 234) supported by a

Geographical Information Service (GIS) 235, a property database 240, an AVM database 250, a query device 260, a display controller 270 and an input/output device 290. The above components 210-290 are coupled together by control/data bus 202.

[0032] Although the exemplary provider 130 of FIG. 2 uses a bussed architecture, it should be appreciated that any other architecture may be used as is well known to those of ordinary skill in the art. For example, in various embodiments, the various components 210-290 can take the form of separate electronic components coupled together via a series of separate busses.

[0033] Still further, in other embodiments, one or more of the various components 210-290 can take form of separate servers coupled together via one or more networks. Additionally, it should be appreciated that each of components 210-290 advantageously can be realized using multiple computing devices employed in a cooperative fashion. For example, by employing two or more separate computing devices, e.g., servers, to provide spatial information for each computing device used to make AVM calculations, a processing bottleneck can be reduced/eliminated and the overall computing time to produce AVM valuations and other services can be drastically reduced.

[0034] It also should be appreciated that some of the above-listed components can take the form of software/firmware routines residing in memory 220 and be capable of being executed by the controller 210, or even software/firmware routines residing in separate memories in separate .servers/computers being executed by different controllers. Further, it

should be understood that the functions of any or all of components 230-270 can be accomplished using object-oriented software, thus increasing portability, software stability and a host of other advantages not available with non-object-oriented software.

[0035] In operation, the provider 130 can first perform a number of setup operations including populating the property database 240 with information about every property within a geographic region of interest as well as identify which properties are offered for sale and the method of sale (e.g., for sale by owner, via an agent etc.). While the exemplary provider 130 uses a collection of public and private records (e.g., MLS database~. secondary databases, tax databases, newspaper ads and ads placed specifically with the provider 130) the particular sources of information can vary as required or otherwise found advantageous.

[0036] Once the property database 240 is populated, the AVM device 230, under control of the controller 210, can perform an AVM valuation on each property in the property database 240. The exemplary AVM device 230 is based on a combination of heuristic and statistical technologies. However, it should be appreciated that the particular form and functionality of the AVM device 230 can vary from embodiment to embodiment as the technology evolves or as otherwise can be found advantages in various circumstances.

[0037] In order to support the AVM device 230, the exemplary provider 130 employs its spatial information device 232 to provide high-resolution spatial data for the various properties of interest, such as high-resolution spatial data including

absolute position data, relative position data (e.g., from one property to another), relative direction data etc.

[0038] The exemplary spatial information device 232 provides an advantage over conventional AVM systems in that the inventors of the present methods and systems have found a way to reliably and consistently provide absolute and relative spatial information measured in increments of feet (or meters). This is in stark contrast to conventional AVM systems which can only provide distance resolutions literally measured in miles and having negligible, if any. directional information. This is because unlike the exemplary GIS 235, which derives position information using GPS global positioning data to perform high-resolution surveys, conventional systems rely on position approximations based on township, range, section and subdivision information that may or may not be contained in property databases.

[0039] While the exemplary spatial information device 232 can provide spatial resolution down to a meter or less, it should be appreciated that more coarse resolutions may be employed with varying degrees of performance. For example, by using a resolution often meters, one-hundred meters, two-hundred meters, five-hundred meters and even a kilometer AVM valuation accuracies may be expected to degrade, but may still provide better

performance than conventional techniques due to superior resolution. consistency and/or the availability of vector information.

[0040] While GIS is a known technology used for land use planning, transportation planning, environmental management and other uses, the exemplary methods and systems are unique in that there are no known instances where a GIS has ever been used for any form of property valuation whether it be by AVM or other means. Similarly, there are no known instances where any form of survey data (by GIS, GPS or other means) has ever been used for any form of property valuation.

[0041] In various embodiments, a Geographic Information System can be a combination of computer hardware, software, personnel, survey equipment and data that can enable one to do one or more of store, create, and analyze spatial data. Spatial data can be any information that is referenced to a location. In short. a GIS can be more than a map in that it can hold an underlying database. In order to assure consistent, reliable high-resolution spatial data, the exemplary GIS 235 derives spatial positioning information using survey data, such as survey data derived in part from GPS equipment.

[0042] By incorporating a GIS into the exemplary provider 130, a plethora of advantages over other systems are gained, including the availability of a visual representation of the geographic region under analysis. For example, the GIS of the exemplary embodiment can provide a map-like display of objects, such as parcels, schools, police stations, fire hydrants, churches etc. Another advantage to using a GIS is that the above map-like representation is more than a collection of spatially distributed symbols as each symbol/icon has a variety of

information associated with it. For example, by referencing a particular "house" symbol, an operator can pull up a host of (1) geographic information, such as latitude, longitude, elevation, county, school district etc., (2) structural information, such as acreage, age, number of bedrooms etc., and various miscellaneous items of information, such as sale history, mortgage etc.

[0043] Another advantage of the exemplary system is that it has the ability to highlight on a map the comparables selected for a given target property, and the ability to highlight on a map the comparables selected for AVM valuation.

[0044] Still another advantage of the present GIS system is its ability to provide distance calculations down to meters/feet between any two objects as well as directional information. The fine resolution of distances and/or direction can provide an incredible advantage in that, the closer that two structurally comparable houses are, the more likely the sale price of one property will reflect on the value of the other property. Accordingly, the exemplary GIS system can make it possible to weight various sale values as a function of distance in a way that was never possible before.

[0045] Additionally, by using true spatial vector information (distance plus angle (or other coordinate system)), AVM calculations can be further refined. For example, if a particular house is structurally comparable to four other houses; and the four houses have values that vary (1) as a function of how far west each house lies and (2) as a function of their proximity to a river or train station, it should be appreciated that high-resolution distance

information and angular information may be valuable.

[0046] Although the use of GIS (or equivalent spatial) information can be invaluable, processing such, information can be relatively expensive in terms of the computation power required to derive accurate AVM valuations via GIS information. As making computationally expensive determinations is rarely acceptable in a web environment, the present AVM system overcomes this problem by pre-processing AVM valuations, preprocessing spatial information and using multiple computer systems to alleviate processing bottlenecks, then allowing users to access some or all of the preprocessed data.

[0047] Returning to FIG. 2, as each property in the property database 240 is processed and an AVM value is determined, the AVM device 230 can place the AVM data, along with other data of interest, Into the AVM database 250. In the present embodiment, the exemplary AVM device 230 can update the AVM database 250 often and, in some embodiments, van update the AVM database after every sale of a property.

[0048] For example, in a particular embodiment, the controller 210 can update the property database 240 to signal that a townhouse in a particular neighborhood recently sold for a given amount of money along with other useful information about the transaction, such as concessions made by the buyer or seller (e.g., points paid by seller) that might better reflect the actual sale value of the property. The AVM device 230 can then subsequently update the AVM values of properties that might be affected by the sale, such as comparable townhouses and other

properties in the immediate area, then update the AVM database 250 appropriately.

[0049] FIG. 2 is an exemplary provider 130 capable of providing a variety of property related services including services that use AVM technology. As shown in FIG. 2, the exemplary provider 130 includes a controller 210, a memory 220, an AVM device 230, a spatial information device 232 (with optional spatial database 234) supported by a Geographical Information Service (GIS) 235, a property database 240, an AVM database 250, a query device 260, a display controller 270 and an input/output device 290. The above components 210-290 are coupled together by control/data bus 202.

[0050] Although the exemplary provider 130 of FIG. 2 uses a bussed architecture, it should be appreciated that any other architecture may be used as is well known to those of ordinary skill in the art. For example, in various embodiments, the various components 210-290 can take the form of separate electronic components coupled together via a series of separate busses.

[0051] Still further, in other embodiments. one or more of the various components 210-290 can take form of separate servers coupled together via one or more networks. Additionally. it should be appreciated that each of components 210-290 advantageously can be realized using multiple computing devices employed in a cooperative fashion. For example, by employing two or more separate computing devices, e.g., servers, to provide spatial information for each computing device used to make AVM calculations, a processing bottleneck can be reduced/eliminated and the overall computing time

to produce AVM valuations and other services can be drastically reduced.

[0052] It also should be appreciated that some of the above-listed components can take the form of software/firmware routines residing in memory 220 and be capable of being executed by the controller 210, or even software/firmware routines residing in separate memories in separate servers/computers being executed by different controllers. Further, it should be understood that the functions of any or all of components 230-270 can be accomplished using object-oriented software, thus increasing portability, software stability and a host of other advantages not available with non-object--oriented software.

[0053] ln operation, the provider 130 can first perform a number of setup operations including populating the property database 240 with information about every property within a geographic region of interest as well as identify which properties are offered for sale and the method of sale (e.g., for *sale* by owner, via an agent etc). While the exemplary provider 130 uses a collection of public and private records (e.g., MLS databases, secondary databases, tax databases, newspaper ads and ads placed specifically with the provider 130) the particular sources of information can vary as required or otherwise found advantageous.

[0054] Once the property database 240 is populated, the AVM device 230, under control of the controller 210. can perform an AVM valuation on each property in the property database 240. The exemplary AVM device 230 is based on a combination of heuristic and statistical technologies. However, it should be appreciated that the particular

form and functionality of the AVM device 230 can vary from embodiment to embodiment as the technology evolves or as otherwise can be found advantages in various circumstances.

[0055] In order to support the AVM device 230, the exemplary provider 130 employs its spatial information device 232 to provide high-resolution spatial data for the various properties of interest, such as high-resolution spatial data including absolute position data, relative position data (e.g., from one property to another), relative direction data etc.

[0056] The exemplary spatial information device 232 provides an advantage over conventional AVM systems in that the inventors of the present methods and systems have found a way to reliably and consistently provide absolute and relative spatial information measured in increments of feet (or meters). *This* is in stark contrast to conventional AVM systems which can only provide distance resolutions literally measured in miles and having negligible, if any. directional information. This is because unlike the exemplary GIS 235, which derives position information using GPS global positioning data to perform high resolution surveys, conventional systems rely on position approximations based on township, range, section and subdivision information that may or may not be contained in property databases.

[0057] While the exemplary spatial information device 232 can provide spatial resolution down to a meter or less, it should be appreciated that more coarse resolutions may be employed with varying degrees of performance. For example, by using a

resolution of ten meters, one-hundred meters, two-hundred meters, five-hundred meters and even a kilometer AVM valuation accuracies may be expected to degrade, but may still provide better performance than conventional techniques due to superior resolution, consistency and/or the availability of vector information.

[0058] While GIS is a known technology used for land use planning, transportation planning, environmental management and other uses, the exemplary methods and systems are unique in that there are no known instances where a GIS has ever been used for any form of property valuation whether it be by AVM or other means. Similarly, there are no known instances where any form of survey data (by GIS, GPS or other means) has ever been used for any form of property valuation.

[0059] In various embodiments, a Geographic Information System can be a combination of computer hardware, software, personnel, survey equipment and data that can enable one to do one or more of store, create, and analyze spatial data. Spatial data can be any information that is referenced to a location. In short, a GIS can be more than a map in that it can hold an underlying database. In order to assure consistent, reliable high-resolution spatial data, the exemplary GIS 235 derives spatial positioning information using survey data, such as survey data derived in part from GPS equipment.

[0060] By incorporating a GIS into the exemplary provider 130, a plethora of advantages over other systems are gained, including the availability of a visual representation of the geographic region under

analysis. For example, the GIS of the exemplary embodiment can provide a map-like display of objects, such as parcels, schools, police stations, fire hydrants, churches etc. Another advantage to using a GIS is that the above map-like representation is more than a collection of spatially distributed symbols as each symbol/icon has a variety of information associated with it. For example, by referencing a particular "house" symbol, an operator can pull up a host of (1) geographic information, such as latitude, longitude, elevation, county, school district etc, (2) structural information, such as acreage, age, number of bedrooms etc, and various miscellaneous items of information. such as sale history, mortgage etc.

[0061] Another advantage of the exemplary system is that it has the ability to highlight on a map the comparables selected, or a given target property, and the ability to highlight on a map the comparables selected for AVM valuation.

[0062] Still another advantage of the present GIS system is its ability to provide distance calculations down to meters/feet between any two objects as well as directional information. The fine resolution of distances and/or direction can provide an incredible advantage in that, the closer that two structurally comparable houses are, the more likely the sale price of one property will reflect on the value of the other property. Accordingly, the exemplary GIS system can make it possible to weight various sale values as a function of distance in a way that was never possible before.

[0063) Additionally, by using true spatial vector information (distance plus angle (or other coordinate

system)), AVM calculations can be further refined. For example, if a particular house is structurally comparable to four other houses, and the four houses have values that vary (1) as a function of how far west each house lies and (2) as a function of their proximity to a river or train station, it should be appreciated that high-resolution distance information and angular information may be valuable.

[0064] Although the use of GIS (or equivalent spatial) infom1ation can be invaluable, processing such information can be relatively expensive in terms of the computation power required to derive accurate AVM valuations via GIS information. As making computationally expensive determinations is rarely acceptable in a web environment, the present AVM system overcomes this problem by pre-processing AVM valuations, preprocessing spatial information and using multiple computer systems to alleviate processing bottlenecks, then allowing users to access some or all of the preprocessed data.

[0065] Returning to FIG. 2, as each property in the property database 240 is processed and an AVM value is determined, the AVM device 230 can place the AVM data, along with other data of interest, into the AVM database 250. In the present embodiment, the exemplary AVM device 230 can update the AVM database 250 often and, in some embodiments, can update the AVM database after every sale of a property.

[[0066] For example, in a particular embodiment. the controller 210 can update the property database 240 to signal that a townhouse in a particular neighborhood recently sold for a given amount of

money along with other useful information about the transaction, such as concessions made by the buyer or seller (e.g., points paid by seller) that might better reflect the actual sale value of the property. The AVM device 230 can then subsequently update the AVM values of properties that might be affected by the sale, such as comparable townhouses, other properties in the immediate area and/or properties within a certain distance etc., then update the AVM database 250 appropriately.

[0067] Another approach to updating AVM databases includes update (automatic/periodic or by command) of an entire database. However, as an such an update process can be computationally expensive, use of multiple processing systems might be necessary in order to reduce the overall processing time.

[0068] Another approach to updating AVM databases includes update of a database for a specified region, e.g., a township or a predefined region defined by X-Y boundaries. In various embodiments, such an update can occur on command, automatically on the basis of a regular period or automatically on a basis of whenever a given number of properties (like or not) are sold within the region.

[0069] Still another approach to updating AVM databases includes automatically update of like properties, e.g., condos, within a given region with such update occurring on the basis of a regular period or on a basis of whenever a given number of properties (like or not) are sold within the region etc.

[0070] Yet another approach to updating AVM databases includes update of individual properties. A first variant of this approach is to update individual

properties automatically on a regular periodic basis. For example, for a particular property put on the market, the property AVM value can be recomputed every N-number of days and optionally scheduled for early morning hours (or other low-usage periods) to alleviate computer processing bandwidth. Other variants can include update by command or a combination of automatic and command approaches.

[0071] In yet other embodiments to updating AVM databases, AVM update can occur on any combination of local market activity, predefined periods, similarity of properties, by region, by command and so on.

[0072] FIG. 3 depicts various types of geographical regions of interest. As shown in FIG. 3, a first region 310 (Florida) can be considered as a definable region of interest as well as a county 320 (Palm Beach). While the county may a better region to work with given its specificity, FIG. 3 shows that the county 320 can be conceptually divided into a zip-code region 322, a region of an incorporated city 324, an exemplary school district 328 or beachfront property 326. Noting that the various regions 310-328 can overlap, it should be appreciated that it can be useful to define regions by multiple, overlapping geographical attributes, e.g., beachfront property 326 found in school district 328.

[0073] FIG. 4 depicts an exemplary entry 410 of an AVM database, such as, the database 250 of FIG. 2. As depicted in FIG. 4, the exemplary entry 410 contains a variety of fields, each of which can have use in executing a query/search of real estate properties. For example, a first useful field can be a "property identifier", which can be a unique code

associated with the property at interest. Other related fields can be the address of the property (which may also serve as a property identifier) and various geographic identifiers, which can serve to provide exact geographic information (latitude and longitude), school district information, zip code, housing development information. zoning information or any other information having geographic significance. Such fields, which can define a wide range of geographic regions can add value to a database by enabling unique geographic searches.

[0074] A second group of fields include an AVM value field, the date that the AYM value was calculated and various AVM confidence identifiers, which can provide a measure of confidence as to the accuracy of the AYM value. Such AVM confidence identifiers can include a number of similar properties on the market that have recently sold, a number of similar properties upon which an A YM value was determined and so on. Such AVM confidence identifiers may also consist of a set of one or more codes or values (e.g., a statistical variance) reflecting the above-mentioned (or similar) data.

[0075] Other information of interest can include various sale information fields, such as indicators as to whether the property is presently offered for sale, the offering/sale price, the date/time on market, the method of sale (e.g., for sale by owner, bankruptcy sale), the sales agent if any and so on. Still other information can include detailed description information of the property, such as the number of bedrooms, total square feet etc.

[0076] Again returning to FIG. 1, it should be appreciated that in view of FIGS. 3 & 4 the query

device 260 can perform AVM-based queries on any number of regions defined by attributes such *as* a state, a city, a set of nearby cities a county or parish, adjacent counties, a zip code, proximity to a resource (e.g., a beach) or proximity to a specific location (e.g., within a 4 block radius of a train/subway station), a school district, a particular neighborhood, adjacent neighborhoods or a set of neighborhoods, a geographic region governed by a particular government body, a set of geographic regions governed by different government bodies and so on.

[0077] It should also be appreciated that the query device might also perform queries based on a geographic region provided by a user, such *as* a hand-drawn region provided using a computer mouse and a computer-generated map backdrop or area defined by latitude and longitude coordinates.

[0078] Still further, it should be appreciated that the query device 260 can perform queries based on certain information regarding the character of the property, such *as* acreage, type of property, number of bedrooms, etc.

[0079] Using the available information provided by the AVM database 250 and the services provided by the query device 260, it should be apparent that users of the provider 130 can identify properties of interest in a large number of new and useful ways. While such novel functionality can be of consequence by itself, it should also be appreciated that such functionality can be augmented by new and useful displays and interfaces.

[0080] For instance, in various embodiments, a number of properties identified by the query device

260 can be provided to the display device 270 of FIG. I. The display device 270, in tum, can provide a variety of useful displays to a terminal, such as a personal computer, to aid in the review of such properties. In a first embodiment, such a display can take the form of an ordered list. i.e., a literal display. However, even straightforward literal displays can be augmented by hyperlinks to detailed descriptions of respective properties, to maps, to driving directions, to sale histories of the property or comparable/neighboring properties etc.

[0081] In addition to literal displays, electronic and printable maps (graphic displays) of one, some or all identified properties can be generated with superimposed icons or with other identifiers representing the identified properties. Such displays can also be augmented by interactive display tools. For example, in a particular embodiment, the display device 270 can provide a "pop up" window to a terminal in order to provide information of interest. For instance, in various embodiments a user accessing the provider 130 via a PC can "click" on a property icon embedded in an electronic map displayed on his screen. In response, the display device 270 can provide a window containing useful information, such as address, sale price and AVM data.

[0082] In still other embodiments, the display device 270 can provide specialized displays and interfaces for use in mobile terminals such that the provider 130 can provide interactive driving directions, which may be especially useful for users having a GPS device integrated into their terminal. Alternatively, the display device may provide comparable audio

information including addresses, driving instructions etc., or information that might be displayed on the relatively tiny displays found on many mobile phones and PDAs.

[0083] FIG. 5 is a flowchart outlining an exemplary operation according to the present disclosure for first creating an AVM-database, then updating the database to reflect changes in a particular market that may occur with each property sale. The process starts in step 502 where a database containing information about all, or substantially all, known properties in a particular geographic region of interest is created.

[0084] While the database of step 502 contains information about all known properties within a geographic region, it should be appreciated that, on other embodiments, the AVM database can be limited to only properties offered for sale, only properties sold in a particular fashion, e.g., for sale by owner or bankruptcy sale, properties of a particular type (e.g., townhouses). existing (not new) properties, properties proffered by a particular developer or builder, etc.

[0085] Still further, while the exemplary database contains only residential properties, it should be appreciated that the property database (and respective queries) can be expanded or changed to include any combination of undeveloped land, commercial properties, residential properties and so on. Control continues to step 504.

[0086] In step 504, AVM valuations are performed for each property of the database of step 502. In the exemplary step, AVM valuations can include AVM

values, the date that the AVM value was determined and optionally include AVM confidence indicators. Next, in step 506, an AVM database is cre:1ted using the database of step 502 and the AVM information produced in step 504. Control continues to step 508.

[0087] In step 508, sale information relating to a particular property is received. Next, in step 510, the AVM database of step 506 can be updated to reflect the new market value of the sold property based on the sale price. In various embodiments, the new AVM value can be the sale value. However, in view that circumstances occur where the sale value of the property may not reflect the actual market value, it should be appreciated that a new AVM value might be generated and the AVM database updated appropriately. Still further, the AVM value can be modified based on other financial considerations, e.g., points paid for by the seller and so on. Control continues to step 510.

[0088] In step 510, the AVM database of step 506 can be further updated to reflect the new market value of other properties based on the sale price, an adjusted sale price (i.e., the sale price adjusted based on concessions made by the buyer or seller (or other value) that might better reflect the actual sale value of the property) and/or modified AVM value of the sold property. As discussed above, such properties to be updated may include only properties in a same development, properties within a same locality, properties within a certain distance from the sold property, properties having similar structural features, such as acreage, area, builder, number of bedrooms etc.

(0089] Still further, AVM property adjustments can be "weighted" according to structural, geographical, spatial (distance and/or vector) and other differences. For example, if two properties are identical to a third sold property, the AVM valuation updates for each of the two may nonetheless be different if one property is closer to the sold property than the other. That is, AVM valuation can be weighted as a function of geographic proximity. Control continues to step 512.

[0090] In step 514, a determination is made as to whether to further modify the database. If the database is to be further modified, control jumps back to step 508 where new sale information is received; otherwise, control continues to step 550 where the process stops.

[0091] FIG. 6 is a flowchart outlining a second exemplary operation according to the present disclosure for first creating an AVM-database, then updating the database to reflect changes in a particular market that may occur with each property sale. The process starts with steps 602-606, which are substantially similar to steps 502-506 discussed above, with control progressing to step 608.

[0092] In step 608, information relating to both new properties offered for sale and sale information relating to recently sold properties is received. Next, in step 610, the AVM database of step 606 can be updated to reflect the new market value of the both new properties offered for sale and the sold properties. Then, in step 612, the AVM database of step 506 can be periodically updated according to any of the techniques described above. Control continues to step 614

[0093] ln step 614, a determination is made *as* to whether to further modify the database. If the database is to be further modified, control jumps back to step 608 where new sale informa.t ion is received; otherwise, control continues to step 650 where the process stops.

[0094] ln various embodiments where the above-described systems and/or methods are implemented using a programmable device, such *as* a computer-based system or programmable logic, it should be appreciated that the above-described systems and methods can be implemented using any of various known or later developed programming languages, such as "C", "C++", "FORTRAN", Pascal", "VHDL" and the like.

[0095] Accordingly, various storage media, such as magnetic computer disks, optical disks, electronic memories and the like, can be prepared that can contain information that can direct a device, such as a computer, to implement the above-described systems and/or methods. Once an appropriate device has access to the· information and programs contained on the storage media, the storage media can provide the information and programs to the device, thus enabling the device to perform the above-described systems and/or methods.

[0096] For example, if a computer disk containing appropriate materials, such as a source file, an object file, an executable file or the like, were provided to a computer, the computer could receive the information, appropriately configure itself and perform the functions of the various systems and methods outlined in the diagrams and flowcharts above to implement the various functions. That is,

the computer could receive various portions of information from the disk relating to different elements of the above-described systems and/or methods, implement the individual systems and/or methods and coordinate the functions of the individual systems and/or methods related to AVM-related services.

[0097] The many features and advantages of the invention are apparent from the detailed specification, and thus, it is intended by the appended claims to cover all such features and advantages of the invention which fall within the true spirit and scope of the invention. Further, since numerous modifications and variations will readily occur to those skilled in the art, it is not desired to limit the invention to the exact construction and operation illustrated and described, and accordingly, all suitable modifications and equivalents may be resorted to, falling within the scope of the invention

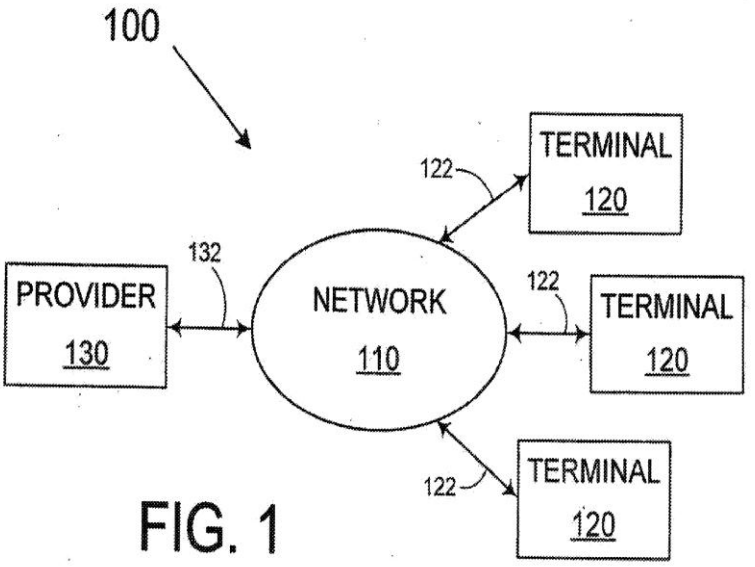
100
TERMINAL
120
122
132
PROVIDER
130
NETWORK
110
122
TERMINAL
120
122
TERMINAL
120

FIG. 1

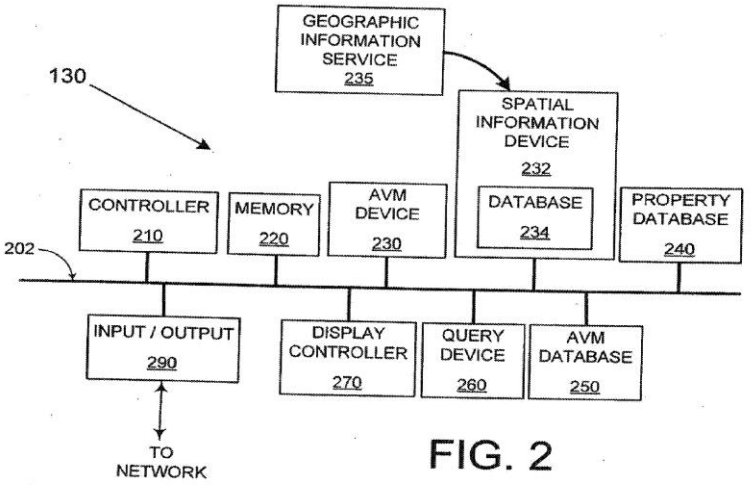
GEOGRAPHIC INFORMATION SERVICE
235
130
SPATIAL INFORMATION DEVICE
232
CONTROLLER
210
MEMORY
220
AVM DEVICE
230
DATABASE
234
PROPERTY DATABASE
240
202
INPUT / OUTPUT
290
DISPLAY CONTROLLER
270
QUERY DEVICE
260
AVM DATABASE
250
TO NETWORK

FIG. 2

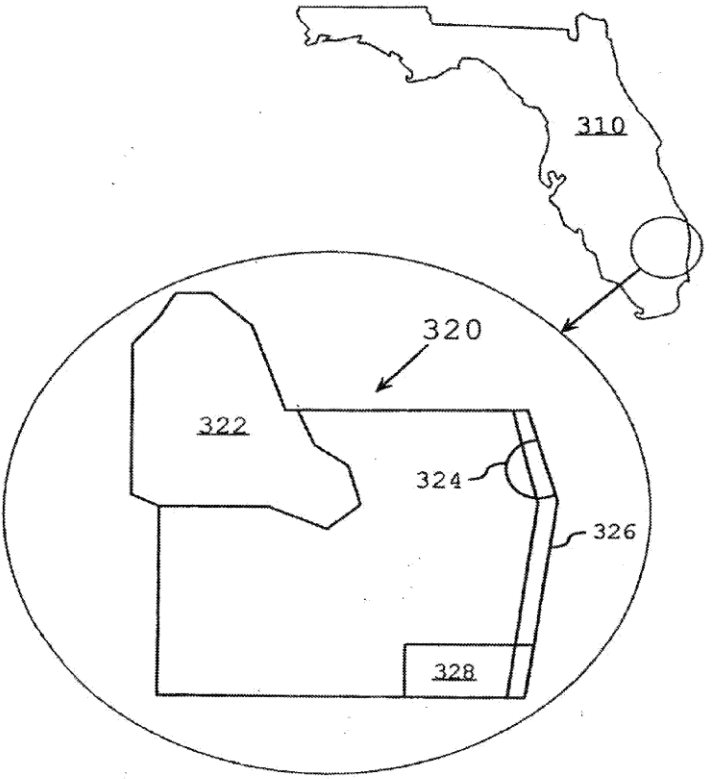

FIG. 3

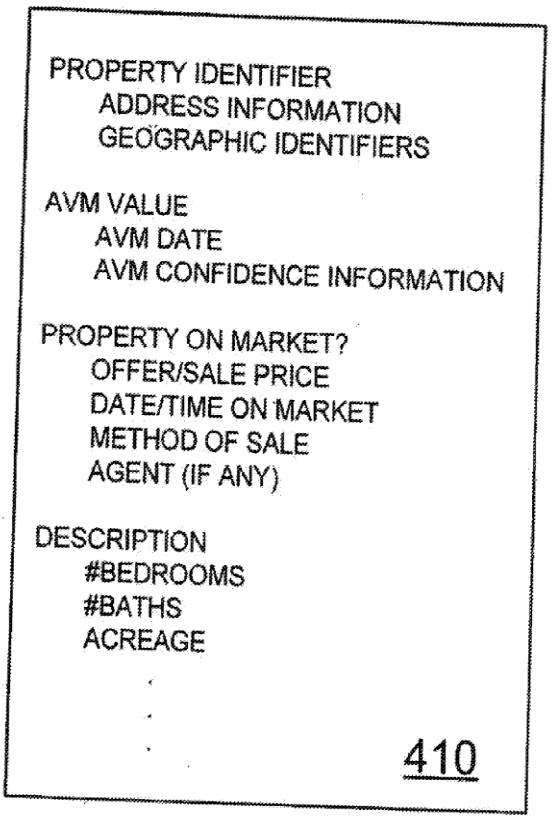
PROPERTY IDENTIFIER
ADDRESS INFORMATION
GEOGRAPHIC IDENTIFIERS
AVM VALUE
AVM DATE
AVM CONFIDENCE INFORMATION
PROPERTY ON MARKET?
OFFER/SALE PRICE
DATE/TIME ON MARKET
METHOD OF SALE
AGENT (IF ANY)
DESCRIPTION
#BEDROOMS
#BATHS
ACREAGE
410

FIG. 4

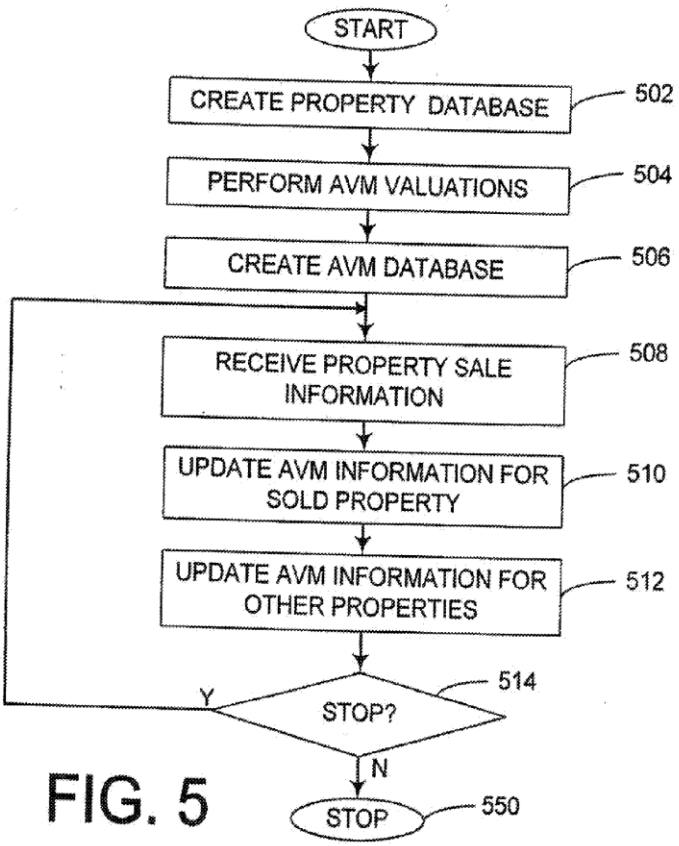
START
CREATE PROPERTY DATABASE
502
PERFORM AVM VALUATIONS
504
CREATE AVM DATABASE
506
RECEIVE PROPERTY SALE INFORMATION
508
UPDATE AVM INFORMATION FOR SOLD PROPERTY
510
UPDATE AVM INFORMATION FOR OTHER PROPERTIES
512
STOP?
514
Y
N
STOP
550

FIG. 5

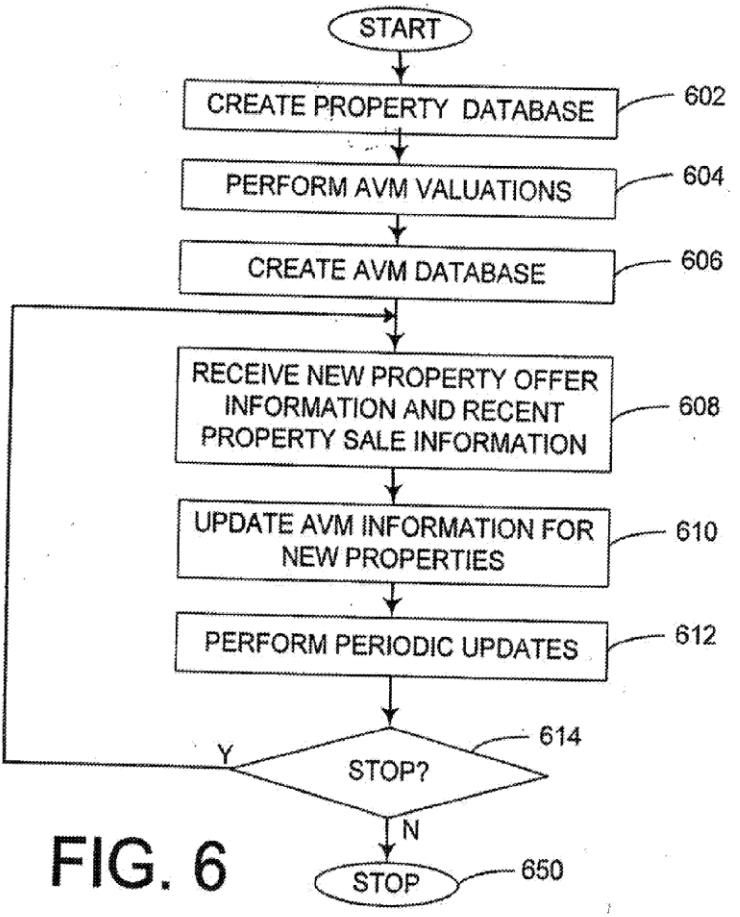
START
CREATE PROPERTY DATABASE
602
PERFORM AVM VALUATIONS
604
CREATE AVM DATABASE
606
RECEIVE NEW PROPERTY OFFER INFORMATION AND RECENT PROPERTY SALE INFORMATION
608
UPDATE AVM INFORMATION FOR NEW PROPERTIES
610
PERFORM PERIODIC UPDATES
612
614
STOP?
Y
N
STOP
650

FIG. 6

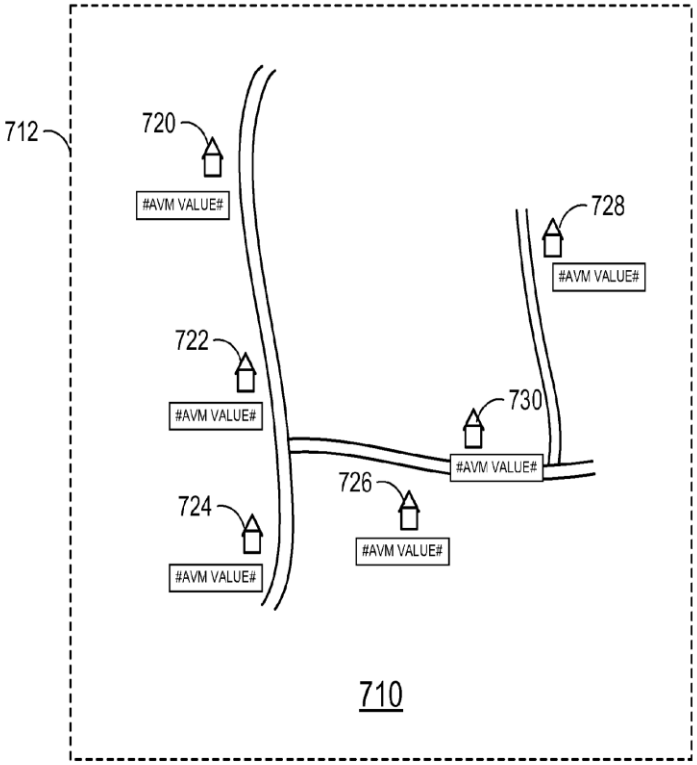
712
720
#AVM VALUE#
722
#AVM VALUE#
724
#AVM VALUE#
726
#AVM VALUE#
728
#AVM VALUE#
730
#AVM VALUE#
710

FIG. 7

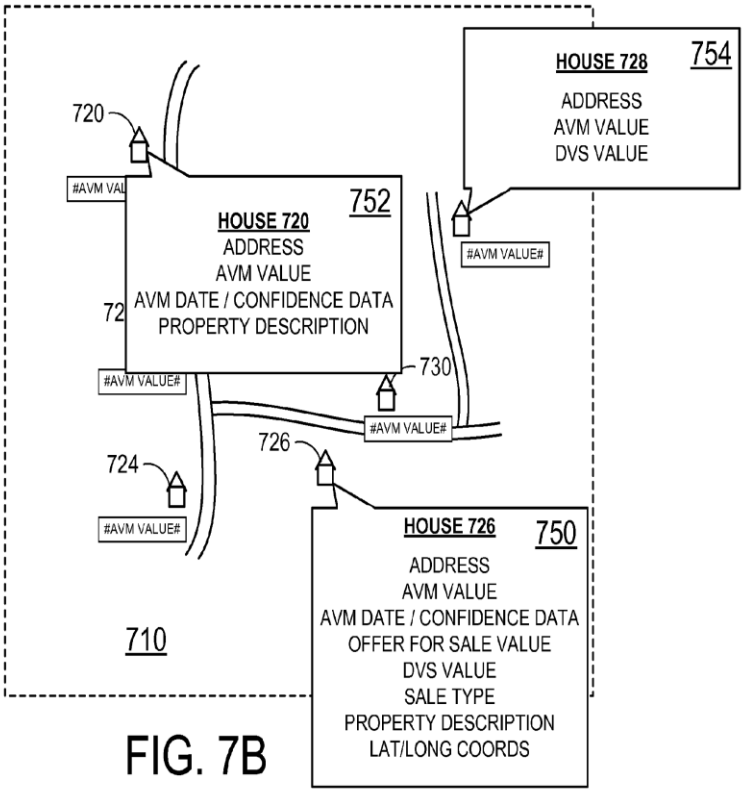
HOUSE 728
754
ADDRESS
AVM VALUE
DVS VALUE
720
#AVM VAL
752
HOUSE 720
ADDRESS
AVM VALUE
AVM DATE / CONFIDENCE DATA
PROPERTY DESCRIPTION
72
#AVM VALUE#
730
#AVM VALUE#
726
724
#AVM VALUE#
HOUSE 726
750
ADDRESS
AVM VALUE
AVM DATE / CONFIDENCE DATA
OFFER FOR SALE VALUE
DVS VALUE
SALE TYPE
PROPERTY DESCRIPTION
LAT/LONG COORDS
710

FIG. 7B

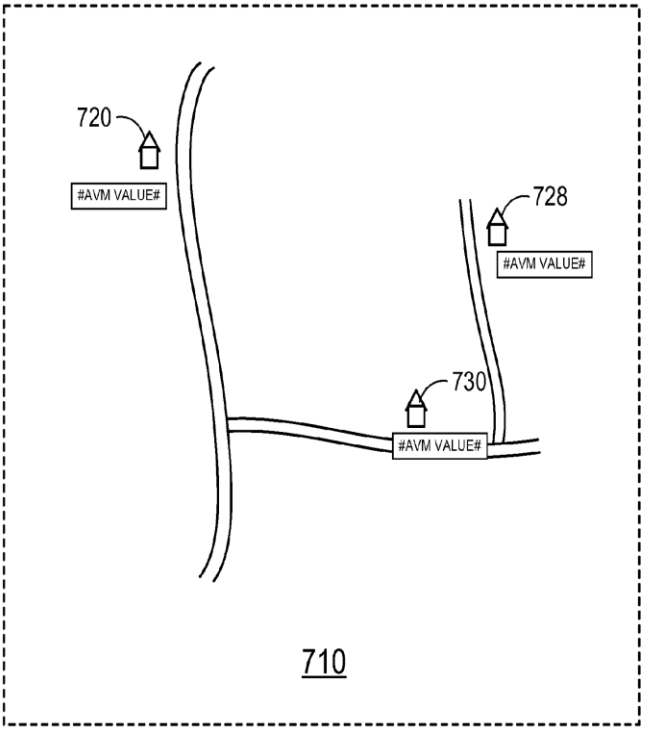

FIG. 8

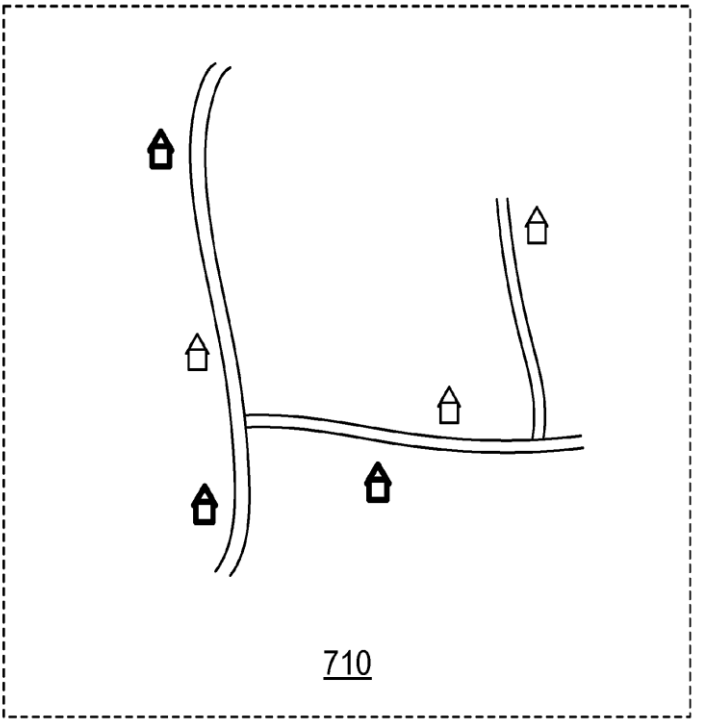

FIG. 8B