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UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

Ex parte QINGLIN LIU and KAMBIZ IRANPOUR

Appeal 2014-009218
Application 12/694,375
Technology Center 3600

Before LYNNE H. BROWNE, THOMAS F. SMEGAL, and
LISA M. GUIJT, *Administrative Patent Judges*.

GUIJT, *Administrative Patent Judge*.

DECISION ON APPEAL

STATEMENT OF THE CASE

Appellants seek our review under 35 U.S.C. § 134 of the Examiner's decision rejecting claims 1–12, 14–20, and 22–24.¹ App. Br. 5.

¹ Claims 13 and 21 have been withdrawn. Appellants indicate that only claims 1, 6, 8, 9, 14, 16, 17, 22, and 24 are subject to this appeal, however, we review claims 1–12, 14–20, and 22–24 as subject to standing rejections set forth in the Final Office Action dated June 7, 2013 (“Final Act.”), as further modified in the Advisory Action dated September 27, 2013 (“Adv. Act.”), from which this appeal is taken.

We AFFIRM-IN-PART and enter a NEW GROUND OF REJECTION pursuant to our authority under 37 C.F.R. § 41.50(b).

CLAIMED SUBJECT MATTER

Claims 1, 9, and 17, reproduced below, are the independent claims on appeal. Claim 1, reproduced below, is representative of the claims on appeal.

1. A method comprising:
receiving seismic data acquired in a seismic survey, the seismic data representing energies from multiple seismic sources overlapping in at least one of time and space; and
performing quality control analysis on a given trace indicated by the seismic data, the performing comprising:
determining a median trend of amplitudes determined from other traces associated with sensor positions near a sensor position associated with the given trace, the determining comprises determining the median trend over a time window shared in common by the given trace and the other traces; and
selectively accepting or rejecting the given trace based on the median trend.

9. A system comprising:
an interface to receive seismic data acquired in a seismic survey, the seismic data representing energies from multiple seismic sources overlapping in at least one of time and space; and
a processor to perform quality control analysis on a given trace indicated by the seismic data, the processor adapted to:
determine a median trend of amplitudes determined from other traces associated with sensor positions near a sensor position associated with the given trace;
determine the median trend over a time window shared in common by the given trace and the other traces; and
selectively accept or reject the given trace based on the median.

17. An article comprising a computer readable storage medium storing instructions that when executed by a computer cause the computer to:

receive seismic data acquired in a seismic survey, the seismic data representing energies from multiple seismic sources overlapping in at least one of time and space; and

perform quality control analysis on a given trace indicated by the seismic data by determining a median trend of amplitudes determined from other traces associated with sensor positions near a sensor position associated with the given trace, determining the median trend over a time window shared in common by the given trace and the other traces, and selectively accepting or rejecting the given trace based on the median trend.

REJECTIONS

I. Claims 1, 3–5, and 7 stand rejected under 35 U.S.C. § 103(a) as unpatentable over Laake (US 6,772,068 B2; iss. Aug. 3, 2004), Tulett (US 7,359,282 B2; iss. Apr. 15, 2008), and Houck (US 6,148,264; iss. Nov. 14, 2000).

II. Claims 2 and 6 stand rejected under 35 U.S.C. § 103(a) as unpatentable over Laake, Tulett, Houck, and Jones (US 6,697,737 B2; iss. Feb. 24, 2004).

III. Claim 8 stands rejected under 35 U.S.C. § 103(a) as unpatentable over Laake, Tulett, Houck, and Jeffryes (US 6,519,533 B1; iss. Feb. 11, 2003).

IV. Claims 9, 11, 12, and 15 stand rejected under 35 U.S.C. § 103(a) as unpatentable over Laake, Tulett, Houck, and Ahern (US 4,759,636; iss. July 26, 1998).

V. Claims 10 and 14 stand rejected under 35 U.S.C. § 103(a) as unpatentable over Laake, Tulett, Houck, Ahern, and Jones.

VI. Claim 16 stands rejected under 35 U.S.C. § 103(a) as unpatentable over Laake, Tulett, Houck, Ahern, and Jeffryes.

VII. Claims 17 and 23 stand rejected under 35 U.S.C. § 103(a) as unpatentable over Laake, Tulett, Houck, and Burkholder (US 6,934,219 B2; iss. Aug. 23, 2005).

VIII. Claims 18–20 and 22 stand rejected under 35 U.S.C. § 103(a) as unpatentable over Laake, Tulett, Houck, Burkholder, and Jones.

IX. Claim 24 stands rejected under 35 U.S.C. § 103(a) as unpatentable over Laake, Tulett, Houck, Burkholder, and Jeffryes.

ANALYSIS

Rejection I

Regarding independent claim 1, the Examiner found, *inter alia*, that Laake teaches the step of “performing quality control analysis on a given trace indicated by the seismic data.” Final Act. 5 (citing Laake 1:66–2:10). The Examiner determined that Laake “does not teach that in the seismic survey, energy from multiple seismic sources overlaps in at least one of time and space,” as required by claim 1, and relied on Tulett for teaching “energy from multiple seismic sources overlapping in at least one of time and space.” *Id.* (citing Tulett 9:19–30). The Examiner reasoned that it would have been obvious

to utilize a method comprising: receiving seismic data acquired in a seismic survey; and performing quality control analysis on a given trace indicated by the seismic data as taught by Laake, in combination with energy from multiple seismic sources overlapping in at least one of time and space as taught by Tulett, since such combination provides higher quality seismic data for quality control efforts.

Id.

The Examiner also determined, *inter alia*, that Laake does not teach “selectively accepting or rejecting the given trace based on a median trend,” as required by claim 1, and relied on Houck for teaching “selectively accepting or rejecting the given trace based on a median trend of other amplitudes determined from other traces associated with sensor positions near a sensor position associated with the given trace” (*id.* at 5–6 (citing Houck, Abstract, 3:59–61, 9:8–26, Figs. 4, 8)), and therefore, suggesting that “the determining comprises determining the median trend over a time window shared in common by the given trace and the other traces,” as required by claim 1 (*id.* at 6). The Examiner reasoned that it would have been obvious

to utilize a method . . . [for] performing quality control analysis on a given trace indicated by the seismic data as taught by Laake, in combination with determining a median trend of amplitudes . . . as suggested by Houck, since such combination provides improved techniques for efficiently processing the data and for real time data quality control.

Id. at 6.

First, Appellants argue that “Houck fails to disclose performing quality control analysis on a given trace, which includes selectively accepting or rejecting the given trace based on a determined median trend of amplitudes determined from other traces.” App. Br. 12. In support, Appellants submit that “Houck discusses ‘editing the target trace’” by “modifying a trace to remove a ‘noisy’ portion of the trace.” *Id.* (citing Houck 6:63–67, 7:1–9, 9:34–35, 49–53, 66–67, 10:1); *see also* Reply Br. 1. However, we determine that a preponderance of the evidence supports the Examiner’s finding that Houck discloses selectively accepting or rejecting *a given trace*, in addition to selectively accepting or rejecting (or modifying) *a*

portion of a given trace. In particular, Houck states that “[o]nce a determination is made that noise is present in part *or all* of a trace, *that trace*, or at least the ‘noisy’ portion, is *modified* to reduce the detrimental effect of the noise.” Houck 6:65–7:1 (emphasis added). Moreover, Houck discloses that such modification includes removal. *Id.* at 7:2, *see also id.* at 5:19.

Second, Appellants argue that Houck’s method for removing seismic noise is not a quality control analysis, and more specifically, that Houck’s discussion of “a purported prior art algorithm . . . is for [the] purpose[] of noise reduction in the context of stacking, not in the context of a quality control analysis.” App. Br. 12 (citing Houck 3:59–61). However, Appellants’ argument fails to address the Examiner’s reliance on Laake, not Houck, for the disclosure of performing quality control analysis on a given trace indicated by the seismic data, and the Examiner’s proposed modification of Laake’s quality control analysis, in view of Houck’s teachings, as stated *supra*. *See also* Ans. 14.

Third, again referring to the prior art algorithm for noise reduction that is presented in the Background Section of Houck, Appellants contend that “Houck teaches away from discarding samples in a quality control analysis, and furthermore, the ‘samples’ . . . are not traces, but rather, samples of a given trace,” concluding that “[a]s such, the skilled artisan would not have derived selectively accepting or rejecting a given trace based on a median trend of amplitudes determined from other traces.” App. Br. 12–13 (citing Houck 3:59–61). However, Appellants fail to explain how Houck’s discussion of the prior art demonstrates error in the Examiner’s findings with respect to Houck’s disclosure of making a selective

determination with regard to the target trace based on a median trend of amplitudes determined from other traces, in that Houck states that “[t]he RMS average of the target trace in each time window is compared to the median of the RMS averages of the comparison traces from the comparable time windows” and that “[i]f the RMS average of the target trace in a given time window exceeds the comparison traces’ median value by more than a user-specified threshold factor, that window in the target trace is classified as noise and flagged for removal.” Houck 9:41–44, 49–53. Although in this preferred embodiment Houck refers to the “window” in the target trace, Houck also states more generally, as discussed *supra*, that “[o]nce a determination is made that noise is present in part *or all* of a trace, *that trace*, or at least the ‘noisy’ portion, is *modified* to reduce the detrimental effect of the noise.” Houck 6:65–7:1 (emphasis added). A reference disclosure is not limited only to its preferred embodiments, but is available for all that it discloses and suggests to one of ordinary skill in the art. *In re Lamberti*, 545 F.2d 747, 750 (CCPA 1976). Thus, we determine that a preponderance of evidence supports the Examiner’s findings with respect to Houck.

Accordingly, we sustain the Examiner’s rejection of independent claim 1. Appellants chose not to present separate arguments for the patentability of claims 3–5 and 7 depending from claim 1, and therefore, we also sustain the Examiner’s rejection of claims 3–5 and 7. App. Br. 5, 11–19; Reply Br. 1–2.

Rejections II, V, and VIII

Claim 6, which depends from independent claim 1, recites “selectively performing the quality control analysis based on proximity of

the given trace to a seismic source.” App. Br. 20 (Claims App.). Regarding claim 6, the Examiner relied on Jones for teaching “enhancing quality control of acquired seismic data . . . including arranging the data in a quality control cube, whose axes can contain one or more of source position, receiver position, or source-receiver offset,” reasoning that Jones therefore suggests “selectively performing the quality control analysis based on proximity of the given trace to a seismic source.” Final Act. 10–11 (citing Jones 1:13–17, claim 1). Additionally, the Examiner determined that Jones teaches “perform[ing] subsequent analysis on signals [arranged in a quality control cube].” Ans. 16 (citing Jones 6:1–22, Fig. 6). Alternatively, the Examiner found that “Houck appears to teach [the limitation of claim 6].” *Id.* (citing Houck [7]:42–55, equation (1)).

Appellants correctly argue that Jones teaches “performing control analysis and visually representing this analysis as a function of distance from the source,” but fails to disclose “selectively performing the quality control analysis based on proximity of the given trace to a seismic source,” as recited in claim 6. Further, the Examiner fails to provide support for reasoning that Jones suggests the limitations of claim 6. In addition, although the coordinates of the source location for the target trace are used as variables in Houck’s equation (1), Houck’s equation (1) is used to select the comparison traces, not the target trace, for performing quality control analysis. *See* Houck 7:9–12 (equation (1) is used “to select the traces for comparing to the target trace to be analyzed for the presence of noise”). Houck simply discloses that “each trace in the survey is analyzed for the presence of noise.” Houck 6:63–65.

Accordingly, we do not sustain the Examiner's rejection of claim 6. The Examiner relied on the same findings with respect to Jones for rejecting claims 14 and 22, which depend from independent claims 9 and 17, as the Examiner relied upon for rejecting claim 6. Final Act. 18–19, 26. Therefore, for the reasons stated *supra* with respect to claim 6, we also do not sustain the Examiner's rejection of claims 14 and 22.

Appellants chose not to present arguments for the patentability of claims 2, 10, and 18–20, which depend from independent claims 1, 9, and 17. App. Br. 5, 11–19; Reply Br. 1–2. Because we sustain the Examiner's rejections of independent claims 1 *supra* and independent claims 9 and 17 *infra*, we also sustain the Examiner's rejection of claims 2, 10, and 18–20. *Rejections III, VI, and IX*

Claim 8, which depends from independent claim 1, recites “wherein the seismic survey comprises one of the following: an independent simultaneous source survey, a slip sweep survey and a distant separated simultaneous source survey.” App. Br. 20 (Claims App.). The Examiner found that “Jeffryes teaches a seismic survey that comprises . . . an independent simultaneous source survey, a slip sweep survey [or] a distant separated simultaneous source survey.” Final Act. 11 (citing Jeffryes 1:26–35, 2:16–21). The Examiner reasoned that it would have been obvious

to utilize the method of claim 1 as taught by Laake as modified by Tulett and Houck, in combination with a seismic survey that comprises one of the following: an independent simultaneous source survey, a slip sweep survey and a distant separated simultaneous source survey as taught by Jeffryes, since such combination effectively reduces delay time, e.g., between seismic sweeps, without the detrimental effects of increased noise, which could result in significant cost savings.

Id. at 11–12.

Appellants argue that claim 8 “requires that the survey of claim 1 is one in which the sources purposefully overlap in at least one of time and space” (App. Br. 14) and therefore, “one source for each shot is not assumed for the data” (App. Br. 15 (citing Spec. ¶ 20)). Appellants submit that Houck discusses two instances involving multiple sources: (i) “other seismic ships in the same general vicinity;” and (ii) a “3D seismic survey.” App. Br. 14–15 (citing Houck 6:4–5, 9:8–10). Appellants argue that

[a]lthough “noise” due to other seismic ships may hypothetically be due to seismic source energies that overlap in time and/or space, Houck does not contemplate application of its noise removal technique to a seismic survey in which energies from multiple seismic sources overlap in time and/or space, such [as] any of the surveys enumerated in claim 8.

Id. at 15; Reply Br. 1–2. Appellants also argue that, with regard to the 3D seismic survey, “Houck focuses on first sorting the data to form shot records and then using comparison traces from different shot records: ‘the traces selected in the 3D case for comparison to a target trace preferably do not include traces from the same shot record which product the target trace.’” App. Br. 15 (citing Houck 9:27–31). Appellants conclude that “no plausible reason has been advanced [by the Examiner] to explain why the skilled artisan would have applied Houck’s shot record-based analysis to data acquired in any of the surveys expressly recited in claim 8.” *Id.*

Appellants’ argument does not address the Examiner’s finding that Tulett, not Houck, teaches seismic data representing energy from multiple seismic sources overlapping in at least one of time and space or the Examiner’s proposed combination, as stated *supra*. Moreover, Houck’s 3D seismic ship 200, as depicted in Figure 6, contemplates two sources 212 (*see* Houck 8:66–67), and although Houck discloses that “[o]mitting traces from

the same shot record as the target trace is *preferred* because those traces will likely also be infected with the noise if the target trace is so infected,” one of ordinary skill in the art would understand that Houck discloses using traces from the same shot record as a viable (albeit less preferred) option. Houck 7:18–22 (emphasis added). Appellants’ arguments also do not apprise us of error in the Examiner’s reliance on Jeffryes or persuade us of error in the Examiner’s stated reasoning for combining Jeffryes with Laake, Houck, and Tulett.

Accordingly, we sustain the Examiner’s rejection of claim 8. Claims 16 and 24, which depend from independent claims 9 and 17, recite the same limitation as claim 8, and the Examiner relied on the same findings with respect to Laake, Houck, Tulett, and Jeffryes for rejecting claims 16 and 24 as the Examiner relied upon for rejecting claim 8. Final Act. 19, 26–27. Therefore, for the reasons stated *supra* with respect to claim 6, we also sustain the Examiner’s rejection of claims 16 and 24.

Appellants chose not to present arguments for the patentability of claims 2, 10, and 18–20, which depend from independent claims 1, 9, and 17. App. Br. 5, 11–19; Reply Br. 1–2. Because we sustain the Examiner’s rejections of independent claim 1 *supra* and independent claims 9 and 17 *infra*, we also sustain the Examiner’s rejection of claims 2, 10, and 18–20.

Rejections IV and VII

Regarding independent claims 9 and 17, the Examiner relied on similar findings with respect to Laake, Tulett, and Houck, as discussed *supra*, with respect to independent claim 1. Final Act. 12–14, 20–21. Appellants argue that “Houck fails to disclose or render obvious” the claim limitation of “performing quality control analysis by selectively accepting or

rejecting the given trace,” for the same reasons stated for claim 1, *supra*. App. Br. 16, 18. Because we sustain the Examiner’s rejection of claim 1, we also sustain the Examiner’s rejection of claims 9 and 17 for the reasons stated *supra*.

Appellants chose not to present separate arguments for the patentability of claims 11, 12, 13, and 23, which depend from independent claims 9 and 17, and therefore, we also sustain the Examiner’s rejection of claims 11, 12, 13, and 23. App. Br. 5, 11–19; Reply Br. 1–2.

NEW GROUND OF REJECTION

Section 101 of the Patent Act defines the subject matter eligible for patent protection: “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.” 35 U.S.C. § 101. The Supreme Court has explained that laws of nature, natural phenomena, and abstract ideas fall outside the scope of this provision and are not patentable subject matter. *Alice Corp. Pty. Ltd. v. CLS Bank Int’l*, 134 S. Ct. 2347, 2354 (2014). For example, abstract ideas include, but are not limited to, fundamental economic practices, methods of organizing human activities, an idea of itself, and mathematical formulas or relationships. *Id.* at 2355–57.

The Court in *Alice* emphasized the use of the two-step framework for analysis of patentability set forth in *Mayo Collaborative Services v. Prometheus Laboratories, Inc.*, 132 S. Ct. 1289, 1297 (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.

Alice, 134 S. Ct. at 2355 (quoting *Mayo*, 132 S. Ct. at 1298, 1297).

We begin our analysis by applying the first step of the *Mayo* test. As stated *supra*, the independent claims recite, in relevant part (i) a method comprising the steps of receiving seismic data and performing quality control analysis on a given trace indicated by the seismic data by determining a median trend and selectively accepting or rejecting the given trace based on the median trend (claim 1); (ii) a system comprising an interface and a processor for receiving seismic data and performing quality control analysis, according to the steps of claim 1 (claim 9); and (iii) an article comprising a computer readable storage medium storing instructions that, when executed by a computer, cause the computer to receive seismic data and perform quality control analysis, according to the steps of claim 1 (claim 17). Dependent claims 2–8, 10–12, 14–16, 18–20, and 22–24 further qualify the data collection or further limit the steps of the analysis.

Stating that “information as such is an intangible,” the Federal Circuit has “treated collecting information, including when limited to particular content (which does not change its character as information), as within the realm of abstract ideas.” *Electric Power Group, LLC v. Alstom S.A.*, p. 3, 2016 WL 4073318 (Aug. 1, 2016) (citations omitted). The Federal Circuit has also “treated analyzing information by steps people go through in their minds, or by mathematical algorithms, without more, as essentially mental processes within the abstract category.” *Id.* (citations omitted). Here, the Specification describes the invention as “a technique” which “may be used for quality control where the seismic data overlaps in time and/or space”

(Spec. ¶ 21), and the claims are directed to the abstract idea of collecting seismic data and analyzing the data by applying a mathematical algorithm and/or mental steps. Thus, we conclude that the claims are directed to an abstract idea under step one of the *Alice* analysis.

Applying the second step of the *Mayo* test, we find nothing sufficient to remove the claims from the class of subject matter ineligible for patenting.

Independent claim 1, which claims a method as stated *supra*, specifies data: “seismic data acquired in a seismic survey, the seismic data representing energies from multiple seismic sources overlapping in at least one of time and space,” including “a given trace indicated by the seismic data,” and also “other traces associated with sensor positions near a sensor position associated with the given trace.” Claim 1 limits the data to a particular content, which does not change its character as information. Claim 1 further includes an analyzing step that applies a mathematical algorithm and/or mental steps: “determining a median trend of amplitudes determined from other traces . . . , the determining compris[ing] determining the median trend over a time window shared in common by the given trace and the other traces; and selectively accepting or rejecting the given trace based on the median trend.” App. Br. 20 (Claims App.). The mathematical algorithm and/or mental steps of claim 1 specifies a calculation (i.e., determining a median trend of amplitudes), which is performed on a subset of the data (i.e., the other traces), and a subsequent comparison of a subset of the data (i.e., the target trace) to the mathematical determination or result of the calculation, wherein the target trace is accepted or rejected. We determine that these claim elements, individually and as an ordered combination, do not transform the nature of the claim into a patent-eligible

application, but rather specify collecting and analyzing information, without changing the character of the information and according to a mathematical algorithm and/or mental steps, which as discussed *supra*, is within the abstract category. We further determine that the claims depending from claim 1 also either further qualify the data or data collection (claims 7 and 8), or further limit the mathematical algorithm (claims 2–6), but also fail to transform the nature of the claim into a patent-eligible application when considered individually and as an ordered combination.

Independent claim 9, which claims a system as stated *supra*, requires “an interface to receive seismic data acquired in a seismic survey” and “a processor to perform quality control analysis on a given trace indicated by the seismic data,” according to the method steps recited in claim 1. The only disclosure of an “interface” in the Specification is “interface 18 between subsurface impedances Im_1 and Im_2 [that] reflects the signal 15 at points I_1 , I_2 , I_3 and I_4 to produce a reflected signal 19 that is detected by the geophones D_1 , D_2 , D_3 and D_4 .” Spec. ¶ 12. However, this interface in the earth does not “receive seismic data acquired in a seismic survey,” as required by claim 9 (as originally filed). Rather, we understand the claim term “interface” to be a data acquisition system, such as data acquisition system 14, which “gathers the raw seismic data acquired by the geophones D_1 , D_2 , D_3 , and D_4 , [such that] the raw seismic data may be processed to yield information about subsurface reflectors and the physical properties of subsurface formations.”

Id. The Specification further discloses that

processor system 400 includes a processor 404, which executes program instructions 412 that are stored in a system memory 410 for purposes of causing the processor 404 to perform some or all of the [disclosed] techniques. As non-limiting examples,

the processor 404 may include one or more microprocessors and/or microcontrollers.

Id. ¶ 29. We determine that the claim elements “an interface” and “a processor,” which are computer components, do not add anything that would transform the nature of the claims from the abstract idea into a patent-eligible application, because as the Court explained in *Alice*, implementation of an abstract idea by a computer does not transform the abstract idea into a patent-eligible application. *Alice*, 134 S.Ct. at 2358 (“stating an abstract idea ‘while adding the words “apply it” is not enough for patent eligibility.’”) (citations omitted). Thus, when the elements of claim 9 are considered, either individually or as an ordered combination, the elements fail to transform the abstract idea into a patent-eligible application. We further determine that the claims depending from claim 9 either further qualify the data or data collection (claims 15 and 16), or further limit the mathematical algorithm (claims 10–12 and 14), but also fail to transform the nature of the claim into a patent-eligible application when considered individually and as an ordered combination.

Independent claim 17, stated *supra*, claims “[a]n article comprising a readable storage medium storing instructions that when executed by a computer cause the computer to” collect and analyze seismic data according to the method steps recited in claim 1. The Specification does not use the claim term “computer” or describe a “readable storage medium.” Although those of ordinary skill in the art may understand the claim term “readable storage medium,” which is readable by a computer, to include signals *per se*, such that claim 17 would cover nonstatutory subject matter (*see In re Nuijten*, 500 F.3d 1346, 1356–57 (Fed. Cir. 2007) (transitory embodiments are not directed to statutory subject matter)), we determine, more generally,

that implementation of an abstract idea by a computer that executes instructions stored on a readable storage medium does not transform the abstract idea into a patent-eligible application, for the reasons stated *supra* with respect to computer implementation and claim 9. Thus, when the elements of claim 17 are considered, either individually or as an ordered combination, the elements fail to transform the abstract idea into a patent-eligible application. We further determine that the claims depending from claim 17 either further qualify the data or data collection (claims 23 and 24), or further limit the mathematical algorithm (claims 18–22), but also fail to transform the nature of the claim into a patent-eligible application when considered individually and as an ordered combination.

Accordingly, we enter a new ground of rejection of claims 1–12, 14–20, and 22–24 under 35 U.S.C. § 101 as being directed to non-statutory subject matter.

DECISION

The Examiner’s decision to reject claims 1–5, 7–12, 15–20, 23, and 24 under 35 U.S.C. § 103(a) is AFFIRMED.

The Examiner’s decision to reject claim 6, 14, and 22 under 35 U.S.C. § 103(a) is REVERSED.

Pursuant to 37 C.F.R. § 41.50(b), we enter a NEW GROUND OF REJECTION of claims 1–12, 14–20, and 22–24 under 35 U.S.C. § 101 as being directed to non-statutory subject matter.

This decision contains a new ground of rejection pursuant to 37 C.F.R. § 41.50(b). Section 41.50(b) provides “[a] new ground of rejection pursuant to this paragraph shall not be considered final for judicial review.” Section 41.50(b) also provides:

When the Board enters such a non-final decision, the appellant, within two months from the date of the decision, must exercise one of the following two options with respect to the new ground of rejection to avoid termination of the appeal as to the rejected claims:

(1) *Reopen prosecution.* Submit an appropriate amendment of the claims so rejected or new Evidence relating to the claims so rejected, or both, and have the matter reconsidered by the examiner, in which event the prosecution will be remanded to the examiner. The new ground of rejection is binding upon the examiner unless an amendment or new Evidence not previously of Record is made which, in the opinion of the examiner, overcomes the new ground of rejection designated in the decision. Should the examiner reject the claims, appellant may again appeal to the Board pursuant to this subpart.

(2) *Request rehearing.* Request that the proceeding be reheard under § 41.52 by the Board upon the same Record. The request for rehearing must address any new ground of rejection and state with particularity the points believed to have been misapprehended or overlooked in entering the new ground of rejection and also state all other grounds upon which rehearing is sought.

Further guidance on responding to a new ground of rejection can be found in the Manual of Patent Examining Procedure § 1214.01.

No time period for taking any subsequent action in connection with this appeal may be extended under 37 C.F.R. § 1.136(a). *See* 37 C.F.R. § 1.136(a)(1)(iv).

AFFIRMED-IN-PART; 37 C.F.R. § 41.50(b)