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UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

Ex parte GORDON POOLE

Appeal 2017-008530
Application 14/050,064
Technology Center 2800

Before DONNA M. PRAISS, BRIAN D. RANGE, and
JENNIFER R. GUPTA, *Administrative Patent Judges*.

PRAISS, *Administrative Patent Judge*.

DECISION ON APPEAL¹

STATEMENT OF THE CASE

Appellant² seeks our review under 35 U.S.C. § 134(a) from the Final rejection of claims 1–20. We have jurisdiction under 35 U.S.C. § 6(b).

We AFFIRM.

THE INVENTION

The invention relates to geophysical data acquisition and processing, specifically processing data collected during a geophysical survey, such as a

¹ In this Opinion, we refer to the Specification filed October 9, 2013 (“Spec.”), the Final Office Action entered July 8, 2016 (“Final Act.”), the Appeal Brief filed December 1, 2016 (“Br.”), and the Examiner’s Answer entered February 3, 2017 (“Ans.”).

² Applicant CGG Services SA is the Appellant and also identified in the Brief as the real party in interest. Br. 2.

seismic survey. Spec. ¶ 2. According to the Specification, seismic data acquisition and processing can be used to generate a profile (image) of the geophysical structure under the ground to suggest the presence or absence of oil and gas reservoirs. *Id.* ¶ 4. Claim 1 is illustrative, and is reproduced below from the Claims Appendix to the Appeal Brief:

1. A method for processing seismic data corresponding to a subsurface, the method comprising:

receiving input seismic data (d_i) characterized by N spatial coordinates, wherein the input seismic data is in a first spatial domain;

expanding with a computer the N spatial coordinates of the input seismic data (d_i) to N' modified spatial coordinates, where N' is greater than N , to provide spatially expanded seismic data (d_e) that is in a second spatial domain;

transforming the spatially expanded seismic data (d_e) to a model domain to provide model domain data (d_m); and

generating a final image (d_f) of the subsurface using the model domain data (d_m).

Br. 17 (Claims Appendix).

THE REJECTION

The Examiner maintains and Appellant appeals the rejection of claims 1–20 under 35 U.S.C. § 101 as being directed to non-statutory subject matter. Ans. 2; Br. 5–16.

ANALYSIS

Appellant argues the claims as a group. Br. 5–16. We select claim 1 as the representative claim for this group, and the remaining claims stand or fall with claim 1. 37 C.F.R. § 41.37(c)(1)(iv).

Alice Corp. Pty. Ltd. v. CLS Bank Int'l, 134 S. Ct. 2347 (2014) identifies a two-step framework for determining whether claimed subject matter is judicially-excepted from patent eligibility under § 101.

According to *Alice* step one, “[w]e must first determine whether the claims at issue are directed to a patent-ineligible concept,” such as an abstract idea. *Alice*, 134 S. Ct. at 2355.

In that regard, the Examiner determined that the claims are directed to an abstract idea because “[t]he gathering and combining data [process steps] merely employ[] mathematical relationships to manipulate existing information to generate additional information in the form of an ‘image’ without limit to any use of the image.” Final Act. 3 (citing *Diamond v. Diehr*, 450 U.S. 175 (1981); *Parker v. Flook*, 457 US 584 (1978); *Gottschalk v. Benson*, 409 U.S. 63 (1972); *Digitech Image Tech., LLC v Electronics for Imaging, Inc.*, 758 F.3d 1344 (Fed. Cir. 2014); *In re Grams*, 888 F. 2d 835 (Fed. Cir. 1989)). The Examiner found that the step of receiving input seismic data (d_i) is routine data gathering and the step of expanding with a computer the N spatial coordinates of the input seismic data (d_i) to N’ modified spatial coordinates is merely a mathematical algorithm performed by a computer that does not amount to significantly more than the abstract idea. *Id.* at 2–3. The Examiner also found that the step of “generating a final image (d_f) of the subsurface using the domain data (d_m)” does not show any tangible result in the real world that would qualify as significantly more, nor is there any indication that the combination of elements improves the functioning of a computer or any other technology. *Id.* at 4.

Appellant contends that the Examiner erred in applying the first step to conclude that claim 1 is directed to an abstract idea. Br. 6–7. According to Appellant, the Examiner erred because “the claimed methods provide a novel framework for seismic data processing yielding unexpected superior results.” *Id.* at 7 (citing Spec. ¶¶ 62–64). *Id.* at 7. Appellant contends that “none of the claimed steps refer to ‘gathering,’ ‘combining’ or ‘mathematical relationships.’” *Id.* Appellant further argues that the claimed image is a “meaningful recited feature of the image representing the subsurface, as the input seismic data which is processed.” *Id.* According to Appellant, the pending claims are like those of *Research Corp. Tech. Inc. v. Microsoft Corp.*, 627 F.3d 859 (Fed. Cir. 2010) because the 2014 Interim Guidance on Patent Subject Matter Eligibility hypothetical example claims based on that decision “show an improvement in the functionality of the computer itself and also show an improvement to another technology/technical field, either of which can show eligibility.” Br. 8–9.

“In determining the eligibility of respondents’ claimed process for patent protection under § 101, their claims must be considered as a whole.” *Diamond v. Diehr*, 450 U.S. 175, 188 (1981). The question is whether the claims as a whole “focus on a specific means or method that improves the relevant technology” or are “directed to a result or effect that itself is the abstract idea and merely invoke generic processes and machinery.” *McRO, Inc. v. Bandai Namco Games Am. Inc.*, 837 F.3d 1299, 1314 (Fed. Cir. 2016).

According to *Enfish v. Microsoft Corp.*, 822 F.3d 1327 (Fed. Cir. 2016), the question is “whether the focus of the claims is on [a] specific asserted improvement in computer capabilities . . . or, instead, on a process

that qualifies as an ‘abstract idea’ for which computers are invoked merely as a tool.” *Id.* at 1335–36. The court found in that case that the “plain focus of the claims” was on “an improvement to computer functionality itself, not on economic or other tasks for which a computer is used in its ordinary capacity.” *Id.* at 1336.

Here claim 1 sets forth the following four steps:

[1] receiving input seismic data (d_i) characterized by N spatial coordinates, wherein the input seismic data is in a first spatial domain;

[2] expanding with a computer the N spatial coordinates of the input seismic data (d_i) to N' modified spatial coordinates, where N' is greater than N , to provide spatially expanded seismic data (d_e) that is in a second spatial domain;

[3] transforming the spatially expanded seismic data (d_e) to a model domain to provide model domain data (d_m); and

[4] generating a final image (d_f) of the subsurface using the model domain data (d_m).

Claim 1, as a whole, is plainly focused on collecting and processing data in order to produce results. Claim 1 is not focused on an improvement to the recited “computer” or other tools used to perform the claimed receiving, expanding, transforming, and generating operations. *Cf. In re TLI Communications LLC Patent Litigation*, 823 F.3d 607, 613 (Fed. Cir. 2016) (The claims’ focus “was not on an improved telephone unit or an improved server.”).

In addition, “[t]he ‘abstract idea’ step of the inquiry calls upon us to look at the ‘focus of the claimed advance over the prior art’ to determine if the claim’s ‘character as a whole’ is directed to excluded subject matter.” *Affinity Labs of Texas, LLC v. DirectTV, LLC*, 838 F.3d 1253, 1257 (Fed. Cir. 2016) (citing *Elec. Power Grp., LLC v. Alstom S.A.*, 830 F.3d 1350,

1353 (Fed. Cir. 2016)); *see also* *Enfish*, 822 F.3d at 1335, quoted in *Apple, Inc. v. Ameranth, Inc.*, 842 F.3d 1229, 1241 (Fed. Cir. 2016).

In that regard, the Specification discusses the problem as being that of de-noising or improving the signal-to-noise ratio of data received from seismic sources to generate high-resolution images of the subsurface from acoustic reflection measurements made by receivers. Spec. ¶¶ 7–26.

According to the Specification, the novelty in Appellant’s data processing method is receiving input seismic data comprising N spatial coordinates in a first spatial domain, expanding the N spatial coordinates of the input seismic data to N' modified spatial coordinates, where N' is greater than N , and providing spatially expanded seismic data that is in a second spatial domain.

Id. ¶ 42. The Specification further describes the process of transforming the expanded data to a model domain as a mathematical operation. Spec. ¶ 54.

The step of generating a final image is described in the Specification as a stacking operation on the output domain data or subtracting the output seismic data from the input seismic data or the spatially expanded seismic data in order for the final image to communicate information about the subsurface. *Id.* ¶ 60. In light of the Specification’s description of the problem and solution, the invention’s advance over the prior art is in improving the collection and evaluation of data using mathematical operations for de-noising seismic data.

Given that the plain focus of claim 1, as a whole, is on data collection and processing activities³ and the Specification's description of the problem and the solution is improving the collection and analysis of seismic data of a subsurface, claim 1 is properly characterized as being "directed to" a mathematical concept or algorithm for evaluating data to generate an image of the subsurface. Algorithms or mathematical formulas are, like a law of nature, abstract ideas. *Diamond v. Diehr*, 450 U.S. at 191; *Parker v. Flook*, 437 U.S. 584, 589 (1978); *Gottschalk v. Benson*, 409 U.S. 63, 71–72 (1972). Accordingly, we agree with the Examiner that claim 1 is directed to an abstract idea. *Cf. Elec. Power Grp., LLC v. Alstom S.A.*, 830 F.3d at 1354 (claims directed to a "process of gathering and analyzing information of a specified content," i.e., data describing operations in a power grid, and then displaying the results were directed to an abstract idea).⁴

Step two of the *Alice* framework is "a search for an 'inventive concept' — i.e., an element or combination of elements that is 'sufficient to ensure that the patent in practice amounts to significantly more than a patent upon the [ineligible concept] itself.'" *Alice*, 134 S. Ct. at 2355 (alteration in

³ *Cf. Elec. Power Grp., LLC*, 830 F.3d at 1353 (When "the focus of the asserted claims" is "on collecting information, analyzing it, and displaying certain results of the collection and analysis," the claims are directed to an abstract idea.)

⁴ We note that *Research Corp. Tech. Inc.* was decided in 2010, prior to the Supreme Court's *Alice* decision of 2014. The Abstract Idea Examples issued by the United States Patent and Trademark Office on January 27, 2015 ("2015 Examples"), cited on page 8 of the Appeal Brief, similarly concluded that, under the framework set forth in *Alice*, the example modeled after *Research Corp. Tech. Inc.* is directed to a judicial exception in view of the iterative mathematical operation of generation a "blue noise mask." 2015 Examples at 8.

original) (quoting *Mayo Collaborative Servs. v. Prometheus Labs., Inc.*, 566 U.S. 66, 73 (2012)).

In that regard, the Examiner found that:

There is no indication that the combination of elements [recited in claim 1] improves the functioning of a computer or improves any other technology.

Final Act. 4. The Examiner further found that:

The final step ‘generating a final image (df) of the subsurface using the model domain data (dm)’ is quite general. It does not show any tangible result in the real world that [would] lean towards significantly more. There is no indication that the combination of elements improves the functioning of a computer or improves any other technology.

Ans. 4–5.

According to Appellant, the Examiner erred because:

One or more of [the claimed steps of (1) receiving input seismic data, (2) transforming the spatially expanded seismic data, and (3) generating a final image of the subsurface] “amounts to significantly more than the mathematical operation” of expanding the N spatial coordinates because these additional steps tie the mathematical operation of expanding the N spatial coordinates to the computer’s capability of processing seismic data.” These steps, similar to the claims in RCT add significantly more to the abstract idea [than] computer implementation.

Br. 10. Appellant asserts that the claims “recite patent-eligible subject matter based on their similarity to RCT” and specifically because “[s]teps (1) to (3) identified above cannot be said to be merely generic functions because calculating an image based on model domain data is not a generic function.” *Id.* at 11. But claim 1, as currently drafted, is not directed to a technological process for generating a final image of a subsurface. Rather, “generating a final image (d_r) of the subsurface using the model domain data

(d_m)” as claimed gives the claimed evaluation of seismic data scheme a particular context for its application. *Cf. CyberSource Corp. v. Retail Decisions, Inc.*, 654 F.3d 1366, 1371 (Fed. Cir. 2011) (“The Court[, in *Parker v. Flook*, 437 U.S. 584 (1978),] rejected the notion that the recitation of a practical application for the calculation could alone make the invention patentable.”).

Also, *Research Corp. Tech.* is distinguishable from Appellant’s claimed process in that the Federal Circuit determined the claim at issue directed to a halftoning process incorporated algorithms and formulas that controlled the halftoning and the masks involved in the process. *Research Corp. Tech.*, 627 F.3d at 869. The Court characterized the invention as “present[ing] functional and palpable applications in the field of computer technology.” *Id.* at 868. Appellant’s method, on the other hand, is directed to processing seismic data. In addition, Appellant has not adequately explained how its steps (1) to (3) improve imaging of a subsurface or computer functionality itself. The portions of the Specification to which Appellant directs us for “unexpected superior results” does not attribute improvements to any of steps (1) to (3) to support Appellant’s position that these steps are significantly more than the abstract idea discussed above. Br. 7; Spec. ¶¶ 62–64. Rather, the Specification generally states that “the embodiments disclosed herein may be used to reduce noise, regularize data to bin centers, fill gaps in data acquisition coverage,” etc., which does not suggest that steps (1) to (3) transform the abstract idea into a patent-eligible invention. Spec. ¶ 64.

Therefore, considering all the elements recited in claim 1 both individually and in an ordered combination, we agree with the Examiner that

the claim is patent ineligible subject matter because the claimed method employs mathematical relationships to manipulate existing information to generate additional information in the form of an image and uses a generic computer to perform generic computer functions. *See Elec. Power Grp., LLC*, 830 F.3d at 1353 (finding patent-ineligible claims to a method of detecting events on an interconnected electric power grid in real time that included the steps of displaying the event analysis results and displaying concurrent visualization of measurements from data streams); *SmartGene, Inc. v. Advanced Biological Labs., SA*, 555 Fed. Appx. 950, 955 (Fed. Cir. 2014) (finding patent-ineligible claims to a method performed by or with a computer using expert rules for evaluating and selecting from a stored plurality of different therapeutic treatment regimens).

We have fully considered Appellant's arguments. For the foregoing reasons, they are unpersuasive as to error in the rejection of claim 1, and claims 2–20 which stand or fall with it.

The rejection is sustained.

CONCLUSION

Appellant have not shown that the Examiner erred in rejecting claims 1–20 under 35 U.S.C. § 101 as being directed to non-statutory subject matter.

DECISION

The decision of the Examiner to reject claims 1–20 is affirmed.

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

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AFFIRMED