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UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

Ex parte VICTOR AARRE

Appeal 2016-005811
Application 12/963,906
Technology Center 2800

Before MARK NAGUMO, GEORGE C. BEST, and LILAN REN,
Administrative Patent Judges.

BEST, Administrative Patent Judge.

DECISION ON APPEAL

The Examiner finally rejected claims 1 and 3–21 of Application 12/963,906 under 35 U.S.C § 101 as directed to patent-ineligible subject matter. Final Act. (January 30, 2015). Appellant¹ seeks reversal of these rejections pursuant to 35 U.S.C. § 134(a). We have jurisdiction under 35 U.S.C. § 6.

For the reasons forth below, we *affirm*.

¹ Schlumberger Technology Corporation is identified as the real party in interest. Appeal Br. 2.

BACKGROUND

The '906 Application describes methods for modeling a geological reservoir. Spec. ¶ 2. As the Specification explains:

Conventional approaches to geological reservoir modeling rely on three-dimensional Cartesian grids that can be iterated over time (e.g., to provide a four-dimensional model). A reservoir may span hundreds of square kilometers and be located in depth. The expansive nature of a typical oil reservoir brings various types of physical phenomena into play. Such phenomena may exhibit macroscale, microscale or a combination of macro-and microscale behavior. However, attempts to capture microscale phenomena via increased grid density or grid densities causes an increase in computational and other resource requirements. For example, increasing two-dimensional grid density by decreasing grid spacing from 10 meters by 10 meters to 5 meters by 5 meters will increase computational requirements significantly (e.g., a four-fold increase). Accordingly, most conventional models sacrifice microscale accuracy to maintain reasonable resource requirements. Various techniques described [in the '906 Application's Specification] can allow for more accurate modeling of microscale phenomena (e.g., one meter resolution or less) without necessarily increasing grid density.

Id. ¶ 1.

Claims 1 and 13 are representative of the '906 Application's claims and are reproduced below from the Claims Appendix to the Appeal Brief:

1. One or more computer-readable non-transitory media comprising computer-executable instructions stored therein to instruct a computing system to:

for a given time, solve the elastic wave equation in tensorial form for a geological reservoir model of a geological reservoir subject to stated conditions to provide a solution that comprises strain-related displacements associated with resource production from the geological reservoir; and

adjust a grid associated with the geological reservoir model based at least in part on the strain-related displacements.

Appeal Br. 16.

13. A method comprising:

providing a geological reservoir model that comprises a Cartesian grid;

solving the elastic wave equation in tensorial form for at least a portion of the geological reservoir model subject to certain conditions using a computing device to provide one or more oh displacements; and

adjusting the Cartesian grid based at least in part on the one or more displacements.

Id. at 18.

Claim 19, the third independent claim on appeal, is directed to a computing system configured to carry out the method set forth in claim 13.

REJECTION

Claims 1 and 3–21 are rejected under 35 U.S.C. § 101 as directed to patent-ineligible subject matter. Final Act. 2.

DISCUSSION

As defined by the Patent Act, patent-eligible subject matter includes “any new and useful process, machine, manufacture, or composition of matter, or any new and useful improvement thereof.” 35 U.S.C. § 101. The courts have created certain exceptions to the literal scope of § 101. In particular, laws of nature, natural phenomena, and abstract ideas are not patent-eligible. *Alice Corp. v. CLS Bank Int’l*, 134 S. Ct. 2347, 2354 (2014).

Since *Alice*, patent-eligibility has been determined using a two-step process. In step one, we determine whether the claims at issue are directed

to a judicial exception, such as an abstract idea. *Alice*, 134 S. Ct. at 2355. If the claims are not directed to one of the judicial exceptions, the inquiry ends. *See Enfish, LLC v. Microsoft Corp.*, 822 F.3d 1327, 1339 (Fed. Cir. 2016). If the claims are held to be directed to one of the judicial exceptions, we proceed to step two. In this step, we determine whether the claims contain “an ‘inventive concept’ . . . 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 (quoting *Mayo Collaborative Servs. v. Prometheus Labs., Inc.*, 566 U.S. 66, 72–73 (2012)) (alteration in original, emphasis added).

The Examiner rejected claims 1 and 3–21 of the ’906 Application as directed to patent-ineligible subject matter. Final Act. 2–5. Appellant divides the claims on appeal into eight different groups. *See* Appeal Br. 5–14. We address Appellant’s arguments with respect to each group of claims in turn.

Claim 1. In rejecting claim 1, the Examiner found that the claim is directed to the abstract idea of adjusting a mathematical model of a geological reservoir. Final Act. 2. The Examiner further found that claim 1, which is specifically directed to “[o]ne or more computer-readable non-transitory media comprising computer-executable instructions,” did not include additional elements sufficient to transform the abstract idea into patentable subject matter. *Id.* at 2–3. Thus, the Examiner concluded that the subject matter of claim 1 is within the scope of the judicially-created exception that places abstract ideas outside of the scope of patent-eligible subject matter.

Appellant argues that the Examiner erred by finding that claim 1 is directed to an abstract idea and, therefore, does not satisfy *Alice* step one. In

particular, Appellant contends that the subject matter of claim 1 is patent-eligible because it is directed to the use of mathematics to describe a physical, real-world phenomenon. Appeal Br. 8–10 (citing *Diamond v. Diehr*, 450 U.S. 175 (1981); *Research Corp. Tech., Inc. v. Microsoft Corp.*, 627 F.3d 859 (Fed. Cir. 2010); distinguishing *Parker v. Flook*, 437 U.S. 584 (1978)).

We are not persuaded by this argument.

We begin *Alice* step one by noting that claim 1 is a claim to a computer readable medium containing program instruction for computer to perform a particular process. Such claims—often referred to as Beauregard claims after *In re Beauregard*, 53 F.3d 1583 (Fed. Cir. 1995)—are treated as process claims for the purpose of step 1 of the *Alice* test. *CyberSource Corp. v. Retail Decisions, Inc.*, 654 F.3d 1366, 1375 (Fed. Cir. 2011) (“[D]espite its Beauregard claim format, . . . we treat claim 2 as a process claim for patent-eligibility purposes.”).

Considered as a process claim, the ’906 Application’s claim 1 is directed to a process for manipulating a mathematical model of a geological reservoir as it evolves over time. We, therefore, agree with the Examiner that claim 1 is directed to an abstract idea rather than a physical, real-world phenomenon. See *Elec. Power Grp., LLC v. Alstom S.A.*, 830 F.3d 1350, 1353–54 (Fed. Cir. 2016) (“[W]e have treated analyzing information by steps people go through in their minds, or by mathematical algorithms, without more, as essentially mental processes within the abstract-idea category.”).

Appellant argues that the Federal Circuit’s decision in *Enfish, LLC v. Microsoft Corp.*, 822 F.3d 1327 (Fed. Cir. 2016), compels a different answer to this question. See Reply Brief 2.

In *Enfish*, the claims were “directed to an innovative logical model for a computer database.” *Id.* at 1330. The logical model was said to provide multiple benefits, including an indexing technique that allowed for faster searching of data than would be possible in a conventional relational database, the more effective storage of data other than structured text, and flexibility in database configuration. *Id.* at 1333. The claims at issue in *Enfish* were directed to a specific improvement in the way computers operate as embodied in the logical model. *Id.* at 1336. For example, one of the claims at issue was directed to a particular configuration of a computer system’s memory. *See id.* (quoting claim 17 of U.S. 6,151,604).

Appellant contends that claim 1 resembles the claims at issue in *Enfish* because the modeling method described in the ’906 Application’s Specification conserves computational resources. *See Reply Br.* 6–8.

This argument is not persuasive.

First, we note that Federal Circuit has explained that “any given analysis in a § 101 ‘abstract idea’ case is hardly a clear guidepost for future cases arising under § 101—each case stands on its own, and requires separate analysis by the judges who must make the decision.” *Versata Dev. Group, Inc. v. SAP Am., Inc.* 793 F.3d 1306, 1336 (Fed. Cir. 2015).

Second, an examination of Federal Circuit decisions demonstrates that the subject matter of claim 1 does not conserve computational resources in a manner that renders the subject matter patent-eligible rather than a patent-ineligible abstract idea. As the Federal Circuit explained, the relevant question to ask regarding claims directed to software is “whether the claims are directed to an improvement to computer functionality versus being directed to an abstract idea.” *Enfish*, 822 F.3d at 1335.

In *Enfish*, the claims at issue were directed to “a specific type of data structure designed to improve the way a computer stores and retrieve data in memory.” *Enfish*, 822 F.3d at 1339. The Federal Circuit concluded that the claims in *Enfish* were not directed to an abstract idea because “the plain focus of the claims is 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.

In this case, however, the plain focus of the subject matter of claim 1 is on the abstract idea of mathematical modeling of geological reservoirs. Any conservation of computational resources that occurs results from the model’s design and is not due to any improvements in the way the computer used to carry out the modeling functions. In this way, claim 1 is similar to the claims that the Federal Circuit has concluded were directed to abstract ideas. *See, e.g., Elec. Power Grp.*, 830 F.3d at 1354 (finding claims directed to an abstract idea because “the focus of the claimed and not on such an improvement in computers as tools, but uncertain independently abstract ideas that use computers as tools.”).

For the reasons set forth above, we conclude that claim 1 is directed to an abstract idea. Thus, we proceed to *Alice* step two.

We also are unpersuaded that the Examiner erred by determining that claim 1 fails *Alice* step two. In particular, the Examiner concluded that claim 1 lacks a sufficient inventive concept to transform the abstract idea into patent-eligible subject matter. *See Answer 7–19.*

In *Alice* step two, we consider the elements of the claim, both individually and as an ordered combination, to assess whether the good additional elements transform the nature of the claim into patent-eligible subject matter. *Content Extraction & Transmission LLC v. Wells Fargo*

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Bank, 776 F.3d 1343, 1347 (Fed. Cir. 2014). “To save a patent at step two, an inventive concept must be evident in the claims.” *RecogniCorp, LLC v. Nintendo Co.*, 855 F.3d 1322, 1327 (Fed. Cir. 2017). “An inventive concept that transforms the abstract idea into a patent-eligible invention must be significantly more than the abstract idea itself, and cannot simply be an instruction to implement or apply the abstract idea on a computer.” *Bascom Global Internet Servs., Inc. v. AT&T Mobility LLC*, 827 F.3d 1341, 1349 (Fed. Cir. 2016).

The Examiner stated:

Taking all the additional claim elements individually, and in combination, the claim as a whole does not amount to significantly more than the abstract idea of adjusting a model by using realistic test data to see how a reservoir may change over time. . . . Thus, the claim does not amount to significantly more than the judicial exception itself.

Answer 7. We agree with the Examiner.

As the Examiner explains, claim 1 of the '906 Application is distinguishable from the claims at issue in *Research Corp. Technologies v. Microsoft Corp.*, 627 F.3d 859 (Fed. Cir. 2010). Viewed as a process claim, claim 1 of the '906 Application is an abstract idea not limited to the computer environment, nor is it directed to an innovation in computer technology.

In sum, claim 1 of the '906 Application encompasses the use of known mathematical algorithms to model the evolution of a geological reservoir as a function of time. Such claims are not directed to patent-eligible subject matter. We, therefore, affirm the rejection of claim 1 as not directed to patentable subject matter.

Claims 3–10 and 21. In the Appeal Brief, Appellant argues that the rejection of claims 3–10 and 21 should be reversed because these claims “are patent-eligible for at least the same reasons as claim 1.” Appeal Br. 11. For the reasons set forth above, we have affirmed the rejection of claim 1. Thus, this argument is not persuasive.

Appellant further argues that “the record of the Office is lacking as to reasons why dependent claims 3–10 and 21 are rejected under 35 U.S.C. § 101.” *Id.* Citing 37 C.F.R. § 1.104(b), Appellant argues that the rejection of these claims should be reversed for this reason. *Id.* at 11–12.

The Examiner responds that the Final Action complied with Rule 104. In particular, the Examiner points to the statement that “[t]he additional recited limitations of dependent claims 3–12 and 21 fail to establish that the claims are not directed to an abstract idea. Following the same reasoning given above, claims 3–12 and 21 are also held to be ineligible under 35 USC [§] 101.” Final Act. 3.

We agree with the Examiner that the Final Action contains a sufficient explanation of the reasons for the rejection of claims 3–10 and 21. Thus, we are not persuaded to reverse the rejection of these claims for failure to comply with Rule 104.

Finally, Appellant’s Reply Brief contains, for the first time, specific arguments tied to the limitations recited in claims 3–5 and 21. Reply Br. 9. These arguments are untimely. We, therefore, refuse to entertain them. *Ex parte Nakashima*, 93 USPQ2d 1834 (BPAI 2010) (informative) (explaining that arguments and evidence not timely presented in the principal Brief will not be considered when filed in a Reply Brief, absent a showing of good cause explaining why the argument could not have been presented in the Principal Brief); *Ex parte Borden*, 93 USPQ2d 1473, 1477 (BPAI 2010)

(informative) (“Properly interpreted, the Rules do not require the Board to take up a belated argument that has not been addressed by the Examiner, absent a showing of good cause.”).

Claims 11 and 12. Appellant’s Appeal Brief reproduces portions of the limitations in dependent claims 11 and 12. Appeal Br. 12. This is an insufficient basis for reversal. *See* 37 C.F.R. § 41.37(c)(1)(iv) (“A statement which merely points out what a claim recites will not be considered an argument for separate patentability of the claim.”).

Appellant also argues that the rejection of claims 11 and 12 should be reversed for at least the same reasons as claim 1. Appeal Br. 12. As discussed above, we have affirmed the rejection of claim 1. Thus, we do not reverse the rejection of claims 11 and 12 for this reason.

Appellant further argues that the Final Action failed to comply with the Rule 104 and that the rejection of claims 11 and 12 should be reversed for this reason. *Id.* As we discussed in connection with claims 3–10 and 21 above, the Final Action contains a sufficient statement of the reasons for the rejection of claims 11 and 12. Thus, we do not reverse the rejection of claims 11 and 12 for this reason.

Finally, the Reply Brief contains new arguments for the reversal of the rejection of claims 11 and 12. *See* Reply Br. 9–10. These arguments are untimely and we do not consider them.

Claim 13. Claim 13 is an independent process claim. As we discussed above, claim 1—a Beauregard claim—is analyzed as if it were a process claim for purposes of the *Alice* analysis. The process limitations recited in claim 1 are substantially the same as the process limitations set forth in claim 13.

Thus, we affirm the rejection of claim 13 as directed to patent-ineligible subject matter for the same reasons we affirmed the rejection of claim 1 on this basis.

Claims 14–16. Appellant’s Appeal Brief reproduces portions of the limitations in dependent claims 14–16. Appeal Br. 13. This is an insufficient basis for reversal. 37 C.F.R. § 41.37(c)(1)(iv).

Appellant also argues that the rejection of claims 14–16 should be reversed for at least the same reasons as claim 13. Appeal Br. 13. As discussed above, we have affirmed the rejection of claim 13. Thus, we do not reverse the rejection of claims 14–16 for this reason.

Appellant further argues that the Final Action failed to comply with the Rule 104 and that the rejection of claims 14–16 should be reversed for this reason. *Id.* The Final Action contains a sufficient statement of the reasons for the rejection of claims 14–16. *See* Final Act. 4. Thus, we do not reverse the rejection of claims 14–16 for this reason.

Finally, the Reply Brief contains a new argument with respect to the rejection of claim 14. *See* Reply Br. 10. For the reasons discussed above, we will not consider this argument.

Claims 17 and 18. Appellant argues that the rejection of claims 17 and 18 should be reversed for at least the same reasons as claim 13. Appeal Br. 13. As discussed above, we have affirmed the rejection of claim 13. Thus, we do not reverse the rejection of claims 14–16 for this reason.

Appellant further argues that the Final Action failed to comply with the Rule 104 and that the rejection of claims 14–16 should be reversed for this reason. *Id.* at 13–14. The Final Action contains a sufficient statement of the reasons for the rejection of claims 14–16. *See* Final Act. 4. Thus, we do not reverse the rejection of claims 14–16 for this reason.

Claim 19. Independent claim 19 is reproduced below:

19. A computing device comprising:

one or more processors;

memory operatively coupled to the one or more processors; and

modules stored in the memory that comprise processor-executable instructions configured to

for a given time, solve the elastic wave equation in tensorial form for a geological reservoir model subject to stated conditions;

adjust a grid associated with the geological reservoir model based on [the²] solution of the elastic wave equation in tensorial form for the given time; and

increment the given time.

Appeal Br. 19–20.

As can be seen, claim 19 is directed to a computing device comprising generic, standard components. The claimed computing device is programmed to carry out a process that is substantially the same as that recited in claims 1 and 13. For the reasons set forth in our discussion of those claims, we have concluded that they are directed to patent-ineligible subject matter. We, therefore, conclude that claim 19 also is directed to patent-ineligible subject matter. *See Two-Way Media Ltd. v. Comcast Cable Commc'ns, LLC*, 874 F.3d 1329, 1337 (Fed. Cir. 2017) (“Claims directed to generalized steps to be performed on a computer using conventional computer activity are not patent eligible.”); *Bancorp Servs., LLC v. Sun Life*

² We assume that the omission of the article “the” is inadvertent. If prosecution of the '906 Application continues, we respectfully suggest that this apparent oversight be corrected.

Assur. Co. of Canada (US), 687 F.3d 1266, 1279 (Fed. Cir. 2012) (“Using a computer to accelerate an ineligible mental process does not make that process patent-eligible.”).

We, therefore, affirm the rejection of claim 19.

Claim 20. Appellant argues that the rejection of claim 20 should be reversed for at least the same reasons as claim 19. Appeal Br. 14. As discussed above, we have affirmed the rejection of claim 19. Thus, we do not reverse the rejection of claim 20 for this reason.

Appellant further argues that the Final Action failed to comply with the Rule 104 and that the rejection of claim 20 should be reversed for this reason. *Id.* The Final Action contains a sufficient statement of the reasons for the rejection of claim 20. *See* Final Act. 4. Thus, we do not reverse the rejection of claim 20 for this reason.

CONCLUSION

For the reasons set forth above, we affirm the rejection of claims 1, and 3–21 as being directed to patent-in eligible subject matter.

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

AFFIRMED