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BEFORE THE PATENT TRIAL AND APPEAL BOARD

Ex parte DENNIS BUSHMITCH and RICHARD COZBY

Appeal 2018-008667
Application 14/499,297
Technology Center 2100

Before JENNIFER S. BISK, LARRY J. HUME, and
JULIET MITCHELL DIRBA, *Administrative Patent Judges*.

BISK, *Administrative Patent Judge*.

DECISION ON APPEAL[1]

Pursuant to 35 U.S.C. § 134(a), Appellant[2] appeals from the Examiner's decision to reject claims 10, 11, 16–18, and 22. Claims 1–9, 12–

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[1] Throughout this Decision we have considered the Specification filed September 29, 2014 ("Spec."), the Final Rejection mailed December 6, 2017 ("Final Act."), the Appeal Brief filed May 7, 2018 ("Appeal Br."), the Examiner's Answer mailed June 20, 2018 ("Ans."), and the Reply Brief filed August 20, 2018 ("Reply Br.").

[2] We use the word "Appellant" to refer to "Applicant" as defined in 37 C.F.R. § 1.42(a). Appellant identifies the real party in interest as the

15, and 19–21 have been canceled. Appeal Br. 16–17 (Claims App.). We have jurisdiction under 35 U.S.C. § 6(b).

We reverse.

BACKGROUND

Appellant's disclosed embodiments and claimed invention relate to an adaptive learning system that "can be trained by correlation between a first set of raw technical performance data and a set of actual operational effectiveness assessment data." Abstract. "Once trained, the adaptive learning system can be deployed," and, while deployed, "the adaptive learning system can produce a set of predicted operational effectiveness assessment data from a second set of raw technical performance data." *Id.*

Claim 22, the only independent claim, reproduced below, is illustrative of the subject matter on appeal:

> 22. A computer-implemented method, comprising:
>
> accessing a set of raw technical performance data;
>
> accessing a set of actual operational effectiveness data;
>
> training an adaptive learning system based on a relationship between at least part of the set of raw technical performance data and the set of actual operational effectiveness data; and
>
> deploying the adaptive learning system once trained;
>
> further training the adaptive learning system while the adaptive learning system is deployed;
>
> collecting a set of actual technical performance data; and

Government of the United States, as represented by the Secretary of the Army. Appeal Br. 2.

making an actual operation effectiveness prediction through use of the set of actual technical performance data by way of the adaptive learning system while the adaptive learning system is deployed,

where the adaptive learning system is a deep learning system that employs at least five layers,

where the set of raw technical performance data is from an initial duration of a test and evaluation event,

where the set of actual technical performance data is from a remaining duration of the test and evaluation event,

where the adaptive learning system, when online, is configured to predict a set of predicted operational assessment data based, at least in part, on the set of raw technical performance data and

where the adaptive learning system trained while the adaptive learning system is online.

Appeal Br. 17 (Claims App.).

REJECTION[3]

Claims 10, 11, 16–18, and 22 stand rejected under 35 U.S.C. § 101 as being directed to patent-ineligible subject matter. Final Act. 2–3.

ANALYSIS

We review the appealed rejections for error based upon the issues identified by Appellant, and in light of the arguments and evidence produced thereon. *Ex parte Frye*, 94 USPQ2d 1072, 1075 (BPAI 2010) (precedential). To the extent Appellant has not advanced separate, substantive arguments

[3] The final rejection also contains a rejection under 35 U.S.C. § 112. Final Act. 3–4. The Examiner, however, withdrew this rejection prior to the filing of the Appeal Brief. *See* Advisory Action mailed Feb. 7, 2018.

for particular claims, or other issues, such arguments are waived. 37 C.F.R. § 41.37(c)(1)(iv).

We have considered all of Appellant's arguments and any evidence presented. We highlight and address specific findings and arguments for emphasis in our analysis below.

Rejection of Claims 10, 11, 16–18, and 22 under 35 U.S.C. § 101

Section 101 of the Patent Act provides that "any new and useful process, machine, manufacture, or composition of matter, or any new and useful improvement thereof" is patent eligible. 35 U.S.C. § 101. But the Supreme Court has long recognized an implicit exception to this section: "'Laws of nature, natural phenomena, and abstract ideas are not patentable.'" *Alice Corp. v. CLS Bank Int'l*, 573 U.S. 208, 216 (2014) (quoting *Ass'n for Molecular Pathology v. Myriad Genetics, Inc.*, 569 U.S. 576, 589 (2013)). To determine whether a claim falls within one of these excluded categories, the Court has set out a two-part framework. The framework requires us first to consider whether the claim is "directed to one of those patent-ineligible concepts." *Alice*, 573 U.S. at 217. If so, we then examine "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*, 573 U.S. at 217 (quoting *Mayo Collaborative Servs. v. Prometheus Labs., Inc.*, 566 U.S. 66, 78, 79 (2012)). That is, we examine the claims for an "inventive concept," "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*, 573 U.S. at 217–18 (alteration in original) (quoting *Mayo*, 566 U.S. at 72–73).

The Patent Office recently issued guidance regarding this framework. *See* USPTO, *2019 Revised Patent Subject Matter Eligibility Guidance*, 84 Fed. Reg. 50 (Jan. 7, 2019) ("Revised Guidance"). Under the Revised Guidance, to decide whether a claim is "directed to" an abstract idea, we evaluate whether the claim (1) recites subject matter falling within an abstract idea grouping listed in the Revised Guidance and (2) fails to integrate the recited abstract idea into a practical application. *See* Revised Guidance, 84 Fed. Reg. at 51. If the claim is "directed to" an abstract idea, as noted above, we then determine whether the claim recites an inventive concept. The Revised Guidance explains that when making this determination, we should consider whether the additional claim elements add "a specific limitation or combination of limitations that are not well-understood, routine, conventional activity in the field" or "simply append[] well-understood, routine, conventional activities previously known to the industry." Revised Guidance, 84 Fed. Reg. at 56.

Noting the claim 22 recites a method and, therefore, falls within the process category of § 101, we turn to the Examiner's § 101 rejection.

The Judicial Exception—Abstract Idea

The Examiner determined that the claims recite subject matter "similar to the collecting information, analyzing it, and displaying certain results of the collection and analysis . . . and/or organizing and manipulating information through mathematical correlations" of the claims found to be unpatentable by the Federal Circuit. Final Act. 2–3 (citing *Elec. Power Grp., LLC v. Alstom, S.A.*, 830 F.3d 1350 (Fed. Cir. 2016); *Digitech Image Techs., LLC v. Electronics for Imaging, Inc.*, 758 F.3d 1344 (Fed. Cir. 2014)). The Examiner adds that the dependent claims "include additional

operations," which added to the abstract idea of claim 22 do not make the claims non-abstract. *Id.* at 3 (citing *RecogniCorp, LLC v. Nintendo Co.*, 855 F.3d 1322 (Fed. Cir. 2017)). For the reasons explained below, we do not agree that the claims recite an abstract idea.

Although the subject matter recited by claim 22 includes collecting and analyzing data, as indicated by the Examiner, we do not agree that the recited training,[4] deploying,[5] and predicting[6] steps fall within any of the categories of the agency's guidelines.[7] Despite the Examiner's determination to the contrary (Final Act. 2–3), the recited training, deploying, and predicting steps do not reasonably fall within the mathematical concept category of the agency's guidelines, which include "mathematical relationships, mathematical formulas or equations, [and] mathematical calculation." *See* Guidance, 84 Fed. Reg. at 52.

On October 17, 2019, the Office issued further guidance clarifying the Revised Guidance. USPTO, October 2019 Update: Subject Matter Eligibility (the "October 2019 Update") (available at https://www.uspto.gov/

[4] The training steps include "training an adaptive learning system based on a relationship between at least part of the set of raw technical performance data and the set of actual operational effectiveness data" and "further training the adaptive learning system while the adaptive learning system is deployed."
[5] The deploying step is "deploying the adaptive learning system once trained."
[6] The predicting step is "making an actual operation effectiveness prediction through use of the set actual technical performance data by way of the adaptive learning system while the adaptive learning system is deployed."
[7] The Revised Guidance lists three grouping of subject matter identified by the courts as abstract ideas: (a) mathematical concepts, (b) certain methods of organizing human activity, and (c) mental processes. Revised Guidance, 84 Fed. Reg. at 52.

sites/default/files/documents/peg_oct_2019_update.pdf). The October 2019 Update clarifies that a claim does not fall within the mathematical concepts grouping "if it is only based on or involves a mathematical concept," but "the mathematical concept itself is not recited in the claim." October 2019 Update, 3. Because the claims here do not recite (1) a relationship between variables or numbers, (2) a numerical formula or equation, or (3) a mathematical calculation, they do not fall within the mathematical concepts grouping. *Id.* at 3–4.

Moreover, as the guidelines indicate, exemplary fundamental economic practices include hedging, insurance, and mitigating risk. *See* Revised Guidance, 84 Fed. Reg. at 52, n.13 (citing supporting cases including *Alice*, 573 U.S. at 219–20 (holding that using a third party to mediate settlement risk and risk hedging are abstract ideas), and *Bilski*, 561 U.S. at 611–12 (concluding that hedging is a fundamental economic practice)). Although fundamental economic practices are not limited to these particular examples in the guidelines, the recited training, deploying, and predicting steps, nonetheless, have nothing to do with organizing human activity, let alone fundamental economic practices. Rather, these limitations recite functions that use a "deep learning system" with "at least five layers" to train the computerized adaptive learning system to make "a successful prediction of operational performance factors of complex systems" in order to "greatly reduce event evaluation costs, by eliminating human evaluators for the entire event duration." Spec. ¶¶ 17, 34.

To be sure, as noted by the Examiner (Final Act. 2–3), merely collecting and analyzing information may not, without more, render claims non-abstract. *See Electric Power Group*, 830 F.3d at 1351–53 (holding

claims that focus on collecting information, analyzing it, and displaying certain results is an abstract idea). But here, the claimed invention does not merely collect, analyze, and display information. Rather, the claimed invention achieves a technical improvement by using the collected information to train and deploy an adaptive learning system that makes "actual operation effectiveness." *See* Spec. ¶¶ 17, 34, 46–48. As was the case in *McRO, Inc. v. Bandai Namco Games America, Inc.*, 837 F.3d 1299, 1314–16 (Fed. Cir. 2016), the claimed invention here recites a process designed specifically to achieve an improved technological result, namely operation effectiveness prediction.

In short, the recited steps do not organize human activity under any reasonable interpretation of the agency's guidelines. Nor do these functions fall within the guidelines' other category of abstract ideas, namely mental processes for these functions cannot be performed mentally or by pen and paper. *See* October 2019 Update, 7–8 (listing exemplary mental process, "for example, observations, evaluations, judgments, and opinions"). The claimed subject matter here is similar to Example 39 of the Revised Guidance, which describes a "computer-implemented method of training a neural network for facial detection." USPTO, Subject Matter Eligibility Examples: Abstract Ideas (available at https://www.uspto.gov/sites/default/files/documents/101_examples_37to42_20190107.pdf).

Because the training, deploying, and predicting steps do not fit in any of the categories of abstract ideas in the agency's guidelines, we determine they do not recite an abstract idea. *See* Guidance, 84 Fed. Reg. at 54. Accordingly, the claimed invention, when considered as a whole, is not

directed to an abstract idea and is, therefore, eligible under § 101 for that reason alone.

Integration of the Judicial Exception into a Practical Application

If a claim recites a judicial exception, we determine whether the recited judicial exception is integrated into a practical application of that exception by: (a) identifying whether there are any additional elements recited in the claim beyond the judicial exception(s); and (b) evaluating those additional elements individually and in combination to determine whether they integrate the exception into a practical application. If the recited judicial exception is integrated into a practical application, the claim is not directed to the judicial exception.

Although we found, above, that the claims do not recite a judicial exception because of the training, deploying, and predicting limitations, we further find that these limitations integrate any recited abstract idea into a practical application of that abstract idea. For example, even assuming the collecting data limitations[8] constitute an abstract idea, the additional limitations of training, deploying, and predicting limitations integrate the abstract idea of collecting data into a practical application.

As discussed above, these limitations recite functions that use a "deep learning system" with "at least five layers" to train the computerized adaptive learning system. These functions are used to make "successful prediction of operational performance factors of complex systems" (Spec. ¶ 17) and "greatly reduce event evaluation costs, by eliminating human

[8] The collecting data limitations include "accessing a set of raw technical performance data," "accessing a set of actual operational effectiveness data," and "collecting a set of actual technical performance data."

evaluators for the entire event duration" (*id.* ¶ 34), which achieve an improved technological result, namely operation effectiveness prediction. *See* MPEP 2106.05(a). In addition, these functions apply the collected data in a meaningful way, such that it is more than a drafting effort designed to monopolize the abstract idea of collecting data and is beyond generally linking the use of the abstract idea of collecting data to a particular technological environment. *See* MPEP 2106.05(e).

Inventive Concept

Because we found, above, that the claims are not recited to an abstract idea, we need not address whether any additional recited elements add significantly more to the abstract idea to provide an inventive concept under *Alice*/*Mayo* step two.

CONCLUSION

We reverse the Examiner's rejection of claims 10, 11, 16–18, and 22 under 35 U.S.C. § 101.

DECISION SUMMARY

In summary:

Claims Rejected	35 U.S.C. §	References/Basis	Affirmed	Reversed
10, 11, 16–18, 22	101	Eligibility		10, 11, 16–18, 22

REVERSED