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UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

Ex parte LEMNA J. HUNTER, LEANNE JAURIQUI, and
GREG WEAVER

Appeal 2018-007989
Application 13/278,380
Technology Center 2800

Before MICHAEL P. COLAIANNI, JAMES C. HOUSEL, and
GRACE KARAFFA OBERMANN, *Administrative Patent Judges*.

HOUSEL, *Administrative Patent Judge*.

DECISION ON APPEAL

Appellants¹ appeal under 35 U.S.C. § 134(a) from the Examiner’s decision finally rejecting claims 37 and 60–70 under 35 U.S.C. § 101 as directed to patent ineligible subject matter. We have jurisdiction over the appeal under 35 U.S.C. § 6(b).

We REVERSE.²

¹ Appellants identify Vibrant Corporation as the real party in interest (Appeal Br. 1).

² Our Decision refers to the Specification (“Spec.”) filed October 21, 2011, Appellants’ Appeal Brief (“Appeal Br.”) filed February 21, 2018, the Examiner’s Answer (“Ans.”) dated June 1, 2018, and Appellants’ Reply Brief (“Reply Br.”) filed July 31, 2018.

STATEMENT OF THE CASE

The invention relates to “the field of resonance inspection of parts that involves exciting a part at a number of different frequencies and obtaining the frequency response of the part to the various excitations.” Spec. 1:10–12. Appellants describe a variety of nondestructive testing methodologies enabling defects to be identified without causing damage to a part, including by acoustic radiation, which can identify the position, size, and shape of defects both within the bulk and near the surface of the part. *Id.* at 1:15–26. Appellants disclose that a first manufacturing defect in a first in-service part may become more evident as the part is put into service. *Id.* at 9:4–5. Therefore, Appellants disclose, in one aspect of the invention, a method of evaluating new production parts by resonance inspection, wherein a resonance inspection is performed on a first in-service part and a first manufacturing defect is identified in this part. *Id.* at 8:15–19. Data from the resonance inspection of this part corresponding to the first manufacturing defect is selected and a new production part sort functionality is updated based upon this selected data. *Id.* at 8:19–23. Appellants further disclose that the sort functionality may be directed to providing the resonance inspection tool or system with the ability to determine whether an in-service part should be accepted or rejected after a resonance inspection has been conducted. *Id.* at 7:17–20. Thus, the new production part functionality of the resonance inspection tool will reject a new production part that has the first manufacturing defect. *Id.* at 9:1–3.

Sole independent claim 37, reproduced below from the Claims Appendix to the Appeal Brief, is illustrative of the subject matter on appeal.

37. A method of evaluating new production parts, wherein a resonance inspection comprises exciting a part at a plurality of

input frequencies and obtaining a frequency response of the part at said plurality of input frequencies, wherein said method comprises the steps of:

performing said resonance inspection on a first new production part using a new production part sort functionality of a resonance inspection tool;

performing said resonance inspection on a first in-service part after said resonance inspection has been performed on said first new production part;

identifying a first manufacturing defect in said first in-service part;

selecting resonance inspection data from said resonance inspection on said first in-service part that corresponds with said first manufacturing defect and that defines selected resonance inspection data;

generating an updated new production part sort functionality of said resonance inspection tool based upon said selected resonance inspection data, wherein said updated new production part sort functionality is adjusted based upon said selected resonance inspection data from said resonance inspection of said first in-service part and where said selected resonance inspection data corresponds with said first manufacturing defect; and

performing said resonance inspection on a second new production part, wherein said resonance inspection of said second new production part uses said updated new production part sort functionality of said resonance inspection tool after said generating step, wherein said first and second new production parts are in a common part class, and wherein said first in-service part is in a different part class from said common part class of said first and second new production parts.

OPINION

The Examiner maintains the rejection of claims 37 and 60–70 under 35 U.S.C. § 101 as being directed to patent ineligible subject matter.

The Examiner determines that claim 37 is directed to an abstract idea comprising:

identifying a first manufacturing defect in said first in-service part; selecting resonance inspection data from said resonance inspection on said first in-service part that corresponds with said first manufacturing defect and that defines selected resonance inspection data; generating an updated new production part sort functionality of said resonance inspection tool based upon said selected resonance inspection data, wherein said updated new production part sort functionality is adjusted based upon said selected resonance inspection data from said resonance inspection of said first in-service part and where said selected resonance inspection data corresponds with said first manufacturing defect.

Final Act. 2 (underlining omitted). The Examiner determines that these limitations are about organizing data through mathematical correlations or algorithms. *Id.*

The Examiner finds that claim 37 recites the following additional elements:

performing said resonance inspection on a first new production part using a new production part sort functionality of a resonance inspection tool; performing said resonance inspection on a first in-service part after said resonance inspection has been performed on said first new production part; performing said resonance inspection on a second new production part, wherein said resonance inspection of said second new production part uses said updated new production part sort functionality of said resonance inspection tool after said generating step, wherein said first and second new production parts are in a common part class, and wherein said first in-service part is in a different part class from said common part class of said first and second new production parts.

Final Act. 3 (underlining omitted). The Examiner determines that these additional elements are insufficient to amount to significantly more than the judicial exception because the additional elements “are recited at a high level of generality, well-understood, routine, or conventional to facilitate the application of the abstract idea.” *Id.* The Examiner considers that the steps of performing the resonance inspection on a first new production part and a first in-service part “are necessary for collecting data for the application of the abstract idea.” *Id.* In addition, the Examiner considers that the step of performing the resonance inspection on a second new production part using the updated new production part sort functionality is “a conventional or well-understood post-solution after obtaining a result of the abstract idea.” *Id.* at 3–4. The Examiner concludes that, “[w]hen considered separately and in combination, the additional elements do not add significantly more to the exception.” *Id.* at 4.

Appellants argue that the above analysis “demonstrates that the claims, at most, involve an abstract idea, but fall short of being ‘directed to’ an abstract idea.” Appeal Br. 6. Appellants contend that the Examiner’s analysis fails to consider the claims as a whole in considering whether the claims are directed to an abstract idea. *Id.* at 6–8. Appellants also argue that the claims neither recite an abstract idea nor preempt an abstract idea. *Id.* at 8. Although “Appellant[s do] not contend that the claim does not involve mathematical correlations or algorithms or organizing data,” Appellants stress that the claims do not expressly recite organizing data nor specific mathematical correlations or algorithms. *Id.* at 9. Appellants also assert that the claims do not seek to tie up all organization of data through

mathematical correlations or algorithms, but are narrowly focused on a limited application of data organization and/or mathematical correlations for nondestructive testing of parts using resonance inspection. *Id.* at 10.

Appellants further argue that the subject matter of claim 37 is directed to an improvement in another technology or technical field and is, therefore, not directed to an abstract idea. Appeal Br. 11. Appellants contend that the claims provide an improvement to nondestructive part inspection, not merely an improvement to an algorithm. *Id.* at 12. In particular, Appellants note that the Specification illustrates a scenario in which a previous new production part sort functionality would have passed a new production part having a defect, but by performing a resonance inspection of an in-service part with an identified defect, the new production part sort functionality may be modified so as to identify the defect in subsequently tested new production parts. *Id.* Appellants urge that this scenario is an improvement to the new part testing using resonance inspection because it allows identified manufacturing defects that occur in in-service parts to be correlated to resonance data regarding the defects so as to improve subsequent new part testing. *Id.* As such, Appellants argue that the claims here are more like the patent eligible claims of *Diehr* than the patent ineligible claims of *Flook*. *Id.* at 13–15, discussing *Diamond v. Diehr*, 450 U.S. 175 (1981) and *Parker v. Flook*, 437 U.S. 584, 594–95 (1978).

Thus, the issues before us on appeal are whether the claims are directed to an abstract idea, and if so, whether the claims are directed to an improvement to another technology or technical field. For the reasons given in the Appeal and Reply Briefs, and below, we answer these questions in the negative.

Legal Framework

An invention is patent eligible if it claims a “new and useful process, machine, manufacture, or composition of matter.” 35 U.S.C. § 101. However, the Supreme Court has long interpreted 35 U.S.C. § 101 to include implicit exceptions: “Laws of nature, natural phenomena, and abstract ideas” are not patentable. *E.g.*, *Alice Corp. v. CLS Bank Int’l*, 573 U.S. 208, 216 (2014).

In determining whether a claim falls within an excluded category, our inquiry focuses on the Supreme Court’s two-step framework, described in *Mayo* and *Alice*. *Id.* at 217–18 (citing *Mayo Collaborative Servs. v. Prometheus Labs., Inc.*, 566 U.S. 66, 75–77 (2012)). In accordance with that framework, we first determine what concept the claim is “directed to.” *See Alice*, 573 U.S. at 219 (“On their face, the claims before us are drawn to the concept of intermediated settlement, *i.e.*, the use of a third party to mitigate settlement risk.”); *see also Bilski v. Kappos*, 561 U.S. 593, 611 (2010) (“Claims 1 and 4 in petitioners’ application explain the basic concept of hedging, or protecting against risk.”).

Concepts determined to be abstract ideas, and thus patent ineligible, include certain methods of organizing human activity, such as fundamental economic practices (*Alice*, 573 U.S. at 219–20; *Bilski*, 561 U.S. at 611); mathematical formulas (*Flook*, 437 U.S. at 594–95); and mental processes (*Gottschalk v. Benson*, 409 U.S. 63, 69 (1972)). Concepts determined to be patent eligible include physical and chemical processes, such as “molding rubber products” (*Diehr*, 450 U.S. at 191); “tanning, dyeing, making water-proof cloth, vulcanizing India rubber, smelting ores” (*id.* at 182 n.7 (quoting *Corning v. Burden*, 56 U.S. 252, 267–68 (1854))); and manufacturing flour

(*Benson*, 409 U.S. at 69 (citing *Cochrane v. Deener*, 94 U.S. 780, 785 (1876))).

In *Diehr*, the claim at issue recited a mathematical formula, but the Supreme Court held that “[a] claim drawn to subject matter otherwise statutory does not become nonstatutory simply because it uses a mathematical formula.” *Diehr*, 450 U.S. at 176; *see also id.* at 191 (“We view respondents’ claims as nothing more than a process for molding rubber products and not as an attempt to patent a mathematical formula.”). Having said that, the Supreme Court also indicated that a claim “seeking patent protection for that formula in the abstract . . . is not accorded the protection of our patent laws, . . . and this principle cannot be circumvented by attempting to limit the use of the formula to a particular technological environment.” *Id.* (citing *Benson* and *Flook*); *see, e.g., id.* at 187 (“It is now commonplace that an *application* of a law of nature or mathematical formula to a known structure or process may well be deserving of patent protection.”).

If the claim is “directed to” an abstract idea, we turn to the second step of the *Alice* and *Mayo* framework, where “we must examine the elements of the claim to determine whether it contains an ‘inventive concept’ sufficient to ‘transform’ the claimed abstract idea into a patent-eligible application.” *Alice*, 573 U.S. at 221 (quotation marks omitted). “A claim that recites an abstract idea must include ‘additional features’ to ensure ‘that the [claim] is more than a drafting effort designed to monopolize the [abstract idea].’” *Id.* (quoting *Mayo*, 566 U.S. at 77). “[M]erely requir[ing] generic computer implementation[] fail[s] to transform that abstract idea into a patent-eligible invention.” *Id.*

The Office recently published revised guidance on the application of § 101. USPTO’s January 7, 2019 Memorandum, *2019 Revised Patent Subject Matter Eligibility Guidance* (“Memorandum”), 84 Fed. Reg. 50.

Under that guidance, we first look to whether the claim recites:

- (1) any judicial exceptions, including certain groupings of abstract ideas (i.e., mathematical concepts, certain methods of organizing human activity such as a fundamental economic practice, or mental processes); and
- (2) additional elements that integrate the judicial exception into a practical application (*see* MPEP § 2106.05(a)–(c), (e)–(h)).

Only if a claim recites a judicial exception and does not integrate that exception into a practical application, do we then look to whether the claim:

- (3) adds a specific limitation beyond the judicial exception that is not “well-understood, routine, conventional” in the field (*see* MPEP § 2106.05(d)); or
- (4) simply appends well-understood, routine, conventional activities previously known to the industry, specified at a high level of generality, to the judicial exception.

See generally Memorandum.

Analysis

Applying the guidance set forth in the Memorandum, we conclude under 35 U.S.C. § 101 that claims 37 and 60–70 recite patent-eligible subject matter.

Revised Step 2A, Prong One—Directed to a Judicial Exception

The Memorandum instructs us first to determine whether each claim recites any judicial exception to patent eligibility. 84 Fed. Reg. at 54. The Memorandum identifies three judicially-expected groupings:

(1) mathematical concepts, (2) certain methods of organizing human activity such as fundamental economic practices, and (3) mental processes. *Id.* at 52.

The Examiner does not find, nor do we, that any of the steps of claim 37, alone or in combination, are a mental process or one of certain methods of organizing human activity. We thus primarily focus here on the first grouping—mathematical concepts. Appellants do not dispute that the claims involve mathematical correlations or algorithms or organizing data, but instead assert that such are not expressly recited in the claims. However, express recitations are not required for us to find that a claim recites a mathematical concept. Therefore, we determine that the claims here recite a mathematical concept given Appellants’ concession that the claims “involve” such.

Nonetheless, as Appellants recognize, a claim that recites a mathematical concept is not necessarily “directed to” that mathematical concept. Here, although the claims recite a mathematical concept, the claims are not directed to a mathematical concept because the claims recite not only resonance inspection of a new production part and an in-service part having an identified defect for updating the new production part sort functionality, they also recite resonance inspection of a subsequent new production part using the updated new production part sort functionality. Thus, the claims are directed, not to a mathematical concept, but to a process of resonance inspection of new production parts utilizing resonance data correlated to a defect in an in-service part so as to prevent new production parts having that defect from being placed into service.

Accordingly, we agree with Appellants that the claims are not directed to a judicial exception to patent eligibility.

Revised Step 2A, Prong Two – Practical Application

Having determined that claims 37 and 60–70 are not directed to a judicial exception to patent eligibility, we nevertheless look to determine whether the claims recite “additional elements that integrate the judicial exception into a practical application.” MPEP § 2106.05(a)–(c), (e)–(h); Memorandum, 84 F.3d at 53–54. Integration into a practical application requires an additional element or a combination of additional elements in the claim to “apply, rely on, or use the judicial exception in a manner that imposes a meaningful limit on the judicial exception, such that the claim is more than a drafting effort designed to monopolize the exception.” Memorandum, 84 Fed. Reg. at 53–54; *see also id.* at 55 (setting forth exemplary considerations indicative that an additional element or combination of elements may have integrated the judicial exception into a practical application).

Here, we find that the additional recited elements of claims 37 and 60–70 integrate the judicial exception into a practical application. Claim 37 recites performing a resonance inspection on both a new production part as well as an in-service part with an identified defect. In addition, this claim recites performing a third resonance inspection on a subsequent new production part utilizing a new production part sort functionality that has been modified using the resonance inspection data from the in-service part corresponding to the defect. The Specification discloses that performing a resonance inspection on an in-service part with an identified defect and modifying the new production sort functionality with the resonance data corresponding to the defect enables pre-service identification of parts that may have manufacturing defects that could cause failure in service. Spec. 9:1–11.

We agree with Appellants that these facts are more akin to *Diehr* than to *Flook*. We note that in *Diehr*, the claimed invention improved on conventional rubber-molding processes by constantly monitoring temperature data from a thermocouple inside the mold and opening the mold in response thereto in a manner to reduce under- and over-curing problems in the prior art. Likewise, here, process claim 37 improves on conventional resonance inspection processes by performing a resonance inspection on both a new production part as well as an in-service part with an identified defect, then performing a third resonance inspection on a subsequent new production part utilizing a new production part sort functionality that has been modified using the resonance inspection data from the in-service part corresponding to the defect.

On the other hand, in *Flook*, the claims recited a method for updating alarm limits, although those alarm limits were on at least one process variable involved in a process comprising the catalytic chemical conversion of hydrocarbons. The Court stated that “[a]n ‘alarm limit’ is a number.” *Flook*, 437 U.S. at 585. The Court further stated that “[t]he chemical processes involved in catalytic conversion of hydrocarbons are well known, as are the practice of monitoring the chemical process variables, the use of alarm limits to trigger alarms, the notion that alarm limit values must be recomputed and readjusted, and the use of computers for ‘automatic monitoring-alarming.’” *Id.* at 594. *Flook* was simply providing a new and presumably better method for calculating alarm limit values. *Id.* Unlike *Flook*, claim 37 recites an improvement, not to the calculation of a number, but to the process of resonance inspection of new production parts using a new production part sort functionality.

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Therefore, we agree with Appellants that claim 37 recites an improvement to another technology or technical field. *See* MPEP § 2106.05(a).

Accordingly, because we determine that claims 37 and 60–70 are not directed to a judicial exception to patent eligibility and recite an improvement to another technology or technical field, we need not proceed to Step 2B of the analysis, i.e., a determination of whether the claims provide an inventive concept. 84 Fed. Reg. at 56.

DECISION

Upon consideration of the record, and for the reasons given above and in the Appeal and Reply Briefs, the decision of the Examiner rejecting claims 37 and 60–70 under 35 U.S.C. § 101 as directed to patent ineligible subject matter is *reversed*.

REVERSED