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UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

Ex parte RICHARD LING, KEVIN MOECKLY, and LARRY YEE

Appeal 2019-002728
Application 13/772,014
Technology Center 2800

Before ROMULO H. DELMENDO, JEFFREY B. ROBERTSON, and
JANE E. INGLESE, *Administrative Patent Judges*.

DELMENDO, *Administrative Patent Judge*.

DECISION ON APPEAL

The Appellant¹ appeals under 35 U.S.C. § 134(a) from the Primary Examiner’s final decision to reject claims 1, 2, 4–10, 12–17, and 19.² We have jurisdiction under 35 U.S.C. § 6(b).

We affirm.

I. BACKGROUND

¹ We use the word “Appellant” to refer to “applicant” as defined in 37 C.F.R. § 1.42—namely, Honeywell International, Inc. (Application Data Sheet filed February 20, 2013 at 4), which is also identified as the real party in interest (Appeal Brief filed August 22, 2018 (“Appeal Br.”) at 2).

² *See* Appeal Br. 14–26; Reply Brief filed February 20, 2019 (“Reply Br.”) at 4–13; Final Office Action entered June 1, 2018 (“Final Act.”) at 2–18; Examiner’s Answer entered December 21, 2018 (“Ans.”) at 3–29.

The subject matter on appeal relates to “a system and method of conducting a continuous performance analysis for systems that exhibit variable performance characteristics at different operating conditions” (Specification filed February 20, 2013 (“Spec.”) ¶ 1). Representative claim 1 is reproduced from the Claims Appendix to the Appeal Brief, as follows:

1. A method of operating a system, the method comprising the steps of:
continuously, and in real-time throughout operation of the system:

sensing, at a current system condition, a first system performance parameter and a second system performance parameter, the first and second system performance parameters corresponding to a measured performance characteristic value of the system;

retrieving, from a memory, a first reference performance curve associated with the first and second system performance parameters at the current system condition;

evaluating, in a processor, the first reference performance curve at the measured performance characteristic value of the system to retrieve a first reference performance datum therefrom;

retrieving, from the memory, a second reference performance curve associated with the first and second system performance parameters at a selected reference system condition;

evaluating, in the processor, the second reference performance curve at the measured performance characteristic value of the system to retrieve a second reference performance datum therefrom;

calculating, in the processor, a difference between the first reference performance datum and the second reference performance datum, to thereby generate a translation value;

translating, in the processor, the measured performance characteristic value of the system an amount equal to the translation value, to thereby

generate a corrected performance characteristic value of the system at the selected reference system condition; for the corrected performance characteristic value, calculating an estimate of the first system performance parameter at a predetermined value of the second system performance parameter using two previously stored performance characteristic curves representative of the steady state relationship between the first and second system performance parameters; and operating the system based at least in part on the estimate of the first system performance parameter.

(Appeal Br. 27–28 (emphases added)).

II. REJECTION ON APPEAL

Claims 1, 2, 4–10, 12–17, and 19 stand rejected under 35 U.S.C. § 101 as directed to a judicial exception (i.e., a law of nature, a natural phenomenon, or an abstract idea) without significantly more (Ans. 3–29; Final Act. 2–18).

III. DISCUSSION

1. *Grouping of Claims*

Referring to independent claims 1, 9, 16, and 19, collectively, the Appellant relies on the same arguments for all claims on appeal (Appeal Br. 14–26). Therefore, we decide this appeal on the basis of claim 1, which we designate as representative pursuant to 37 C.F.R. § 41.37(c)(1)(iv). Claims 2, 4–10, 12–17, and 19 stand or fall with claim 1.

2. *The Examiner's Position*

The Examiner finds that the evaluating, calculating, and translating limitations in reproduced claim 1 above constitute abstract idea limitations whereas the remaining limitations are not (Ans. 3–5; Final Act. 2–3). The Examiner explains that the evaluating, calculating, and translating (adding) steps are mathematical operations, which have been identified by the courts as abstract ideas (Ans. 5). The Examiner finds further that the claim does not include additional elements that add to the claim significantly more than the judicial exception (*id.*). In this regard, the Examiner emphasizes “that there is no specific practical application which is recited by the claim: the system is not identified, the performance parameters are not identified, and the manner in which the system is operated in the last limitation of the claim is not identified” (*id.*). The Examiner concludes that, therefore, “[t]he claim would preempt the abstract idea it recites over a broad range of applications” (*id.*). According to the Examiner, the retrieving steps “merely describe generic computer structures (i.e. memory) and performing generic computer functions (i.e. retrieving from memory) that are well-understood, routine, and conventional activities known in the art” (*id.* at 6). Further, the Examiner states that the operating step “is considered insignificant extra-solution activity using conventional equipment since there is no positive recitation that basing the ‘operating’ at least in part on the first system performance parameter improves or even affects the operation of the system” (*id.*). The Examiner states that “[l]ooking at the limitations as an ordered combination adds nothing that is not already present when looking at the elements taken individually” and that “[t]here is no indication that the

combination of elements improves the functioning of a computer or improves any other technology” (*id.* at 6–7).

3. *The Appellant’s Contentions*

Relying on *Diamond v. Diehr*, 450 U.S. 175, 193 n.15 (1981), the Appellant contends:

The independent claims each provide the *technological benefit of accurately and efficiently translating system/engine performance characteristics of a variable geometry system/engine* from various system/flight operating conditions to the rating point condition as system/flight operating conditions change throughout operation/flight. This overcomes a technological problem of limiting the operations of such systems/engines at less than maximum operating conditions, and the problems associated with requiring daily, pre-operational/pre-flight power assurance tests, and is accurate regardless of geometry.

(Appeal Br. 19 (emphasis added)). According to the Appellant, “independent claims 1, 9, 16, and 19 relate to the automated updating and control of a variable geometry system/engine” and, therefore, are not directed to an abstract idea (*id.* at 20). In the Appellant’s view, the “[E]xaminer overgeneralizes the independent claims” in determining whether the claims are directed to an abstract idea—i.e., describes claim 1 “at too high a level of abstraction and ignores considering the **claim as a whole**” (*id.*). In addition, the Appellant argues that the “claims each recites features that are non-conventional, non-routine, and not well-understood in the industry, thereby constituting an inventive concept for purposes of Section 101” (*id.* at 21). The Appellant argues that the “claimed subject matter is non-conventional as evidenced by none of the cited references disclosing such subject matter” and that the Examiner’s statements to the contrary are not in accordance with the April 19, 2018 Memorandum to the

Patent Examining Corps, entitled “Changes in Examination Procedure Pertaining to Subject Matter Eligibility, Recent Subject Matter Eligibility Decision (*Berkheimer v. HP, Inc.*)” (*id.*). Furthermore, the Appellant argues that *SiRF Technology v. ITC*, 601 F.3d 1319, 1332 (Fed. Cir. 2010) is controlling (*id.* at 22–23). Lastly, the Appellant argues that under the machine-or-transformation test, the claims satisfy this test because the claimed subject matter is both tied to a particular machine and transforms data representative of physical object or substances into a different state or thing (*id.* at 23–24).

4. *Opinion*

The Appellant’s arguments fail to identify reversible error in the Examiner’s rejection. *In re Jung*, 637 F.3d 1356, 1365 (Fed. Cir. 2011).

As a preliminary matter, we observe that the Examiner’s Answer, Final Action, and the Appeal Brief were filed prior to the USPTO’s 2019 *Revised Patent Subject Matter Eligibility Guidance* (“*Revised Guidance*”), 84 Fed. Reg. 50 (Jan. 7, 2019), as updated in October 2019. The Appellant does, however, provide arguments under the *Revised Guidance* in its Reply Brief (Reply Br. 4–12).

A. *Claim Construction*

We start with claim construction. *MyMail, Ltd. v. ooVoo, LLC*, 934 F.3d 1373, 1379 (Fed. Cir. 2019) (“Determining patent eligibility requires a full understanding of the basic character of the claimed subject matter.”).

As the Examiner correctly points out, “there is no specific practical application which is recited by the claim: the system is not identified, the performance parameters are not identified, and the manner in which the system is operated in the last limitation of the claim is not identified” (Ans.

5). Claim 1 recites any “system,” any “first system performance parameter,” any “second system performance parameter,” any “first reference performance curve,” any “second reference performance curve,” any “translating” to “generate a corrected performance characteristic value of the system at the selected reference system condition,” any “memory,” and any “processor” (Appeal Br. 27–28). Indeed, claim 1 lacks any limitations regarding any system “geometry”—let alone “variable geometry”—that forms the basis of the Appellant’s key arguments (*id.* at 19–20). Additionally, the claim does not limit the degree or nature of the correction in the performance characteristic value. Although the Appellant relies on paragraphs 23 and 43 of the Specification (*id.* at 19 n. 4), these paragraphs relate to preferred embodiments—not definitions that positively limit claim 1’s scope to that argued by the Appellant. *In re ICON Health & Fitness, Inc.*, 496 F.3d 1374, 1379 (Fed. Cir. 2007) (“[W]e look to the specification to see if it provides a definition for claim terms, but otherwise apply a broad interpretation. As this court has discussed, this methodology produces claims with only justifiable breadth.”).

B. Principles of Law

Having construed certain key limitations recited in claim 1, we turn to patent eligibility. An invention is patent-eligible if it claims a “new and useful process, machine, manufacture, or composition of matter.” 35 U.S.C. § 101. The Supreme Court, however, has long interpreted 35 U.S.C. § 101 to include implicit exceptions: “[l]aws 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, we are guided by the Supreme Court’s two-step framework, described in *Mayo Collaborative Servs. v. Prometheus Labs., Inc.*, 566 U.S. 66, 75–77 (2012) and *Alice*. *Alice* at 217–18 (citing *Mayo*, 566 U.S. at 75–77). 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 (*Parker v. Flook*, 437 U.S. 584, 594–95 (1978)); 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 187; *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.*

As indicated above, the PTO recently published revised guidance on the application of § 101 with regard to the first step of the *Alice/Mayo* test (i.e., Step 2A of the USPTO’s Subject Matter Eligibility Guidance as incorporated into MPEP § 2106 and as updated in October 2019). Thus, under Step 1 of the Guidance, as revised, we determine whether the claimed

subject matter falls within the four statutory categories: process, machine, manufacture, or composition of matter. Step 2A of the Guidance is two-pronged, under which we 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)).

See 84 Fed. Reg. at 54–55.

Only if a claim (1) recites a judicial exception and (2) does not integrate that exception into a practical application, do we then, under Step 2B, 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 84 Fed. Reg. at 56.

C. Analysis

Guidance Step 1

We find that, under Step 1 of the Guidance, claim 1 falls within the four statutory categories of patent subject matter identified by 35 U.S.C. § 101. Specifically, claim 1 recites a “method of operating a system” that includes several steps. That, however, does not end our inquiry. *Alice*, 573

U.S. at 224 (“[M]any computer-implemented claims are formally addressed to patent-eligible subject matter. But if that were the end of the § 101 inquiry, an applicant could claim any principle of the physical or social sciences by reciting a computer system configured to implement the relevant concept.”).

Guidance Step 2A, Prong 1

Under the first prong of Step 2A, we find that claim 1 sets forth or describes judicial exceptions (i.e., abstract ideas) by reciting mathematical concepts. Specifically, claim 1 recites evaluating, calculating, and translating steps. Under the Revised Guidance, concepts performed in the human mind such as evaluation constitute mental processes that are regarded as abstract ideas. 84 Fed. Reg. at 52 n. 15 (citing, e.g., *In re BRCA1 & BRCA2-Based Hereditary Cancer Test Patent Litig.*, 774 F.3d 755, 763 (Fed. Cir. 2014) (concluding that concept of “comparing BRCA sequences and determining the existence of alterations” is an “abstract mental process”)). In addition, mathematical calculations (i.e., calculating or translating) are mathematical concepts that are also regarded as abstract ideas. 84 Fed. Reg. at 52. *See also SAP Am., Inc. v. InvestPic, LLC*, 898 F.3d 1161, 1163 (Fed. Cir. 2018) (holding that claims to a “series of mathematical calculations based on selected information” are directed to abstract ideas). Thus, we conclude claim 1 recites judicial exceptions in the form of abstract ideas.

Guidance Step 2A, Prong 2

Next, we address the second prong of Step 2A to determine whether additional elements in the claim integrate the judicial exception into a

practical application. We agree with the Examiner that the “additional elements” in claim 1 include the sensing, retrieving, and operating steps that add insignificant extra-solution activity. 84 Fed. Reg. at 55 n. 31 (explaining that, e.g., “mere data gathering such as a step of obtaining information about credit card transactions so that the information can be analyzed in order to detect whether the transactions were fraudulent” constitutes insignificant extra-solution activity; also citing *Flook*, 437 U.S. at 590, to explain that a step of adjusting an alarm limit based on the output of a mathematical formula was post-solution activity that did not render method patent eligible).

Although the Appellant alleges that the “[t]he independent claims each provide the technological benefit of accurately and efficiently translating system/engine performance characteristics of a variable geometry system” (Appeal Br. 19),³ claim 1 is not directed to any particular system—let alone any particular type of engine operating under particular conditions—and lacks any limitations directed to any “variable geometry” as alleged (*id.* at 27–28). Here, the Appellant does not direct us to facts establishing, e.g., an additional element that applies or uses the abstract ideas in an improvement in a computer’s function(s) or an improvement to other technology or technical field, particularly with respect to claim 1’s broad scope that does not limit the “system” and/or its operational environment or conditions. *Revised Guidance*, 84 Fed. Reg. at 55.

³ *Revised Guidance*, 84 Fed. Reg. at 55 (explaining that “[a]n additional element reflect[ing] an improvement in the functioning of a computer, or an improvement to other technology or technical field” may be indicative of integrating the judicial exception into a practical application).

Also, the Appellant argues that the current facts resemble those in *Diehr*, which the Revised Guidance cites as exemplifying an additional element effecting a transformation or reduction of a particular article to a different state or thing indicative of integrating the judicial exception into a practical application⁴ (*id.* at 19). In its Reply Brief, the Appellant urges that data representative of physical objects and substances are transformed into a corrected performance characteristic value of the system at a selected reference condition (i.e., rating point) and into an estimate of the first performance parameter at a predetermined value of the second performance parameter to control operation (Reply Br. 8). But the Appellant does not direct us to any facts that tie the judicial exception to any “particular machine or manufacture that is integral to the claim,” *Revised Guidance*, 84 Fed. Reg. at 55, let alone establish that transformation occurs for every “system” as broadly recited in claim 1. As the Examiner correctly observes, “there is no specific practical application which is recited by the claim: the system is not identified, the performance parameters are not identified, and the manner in which the system is operated in the last limitation of the claim is not identified” (Ans. 5). We do not find any language in claim 1 that even specifies the degree of correction, the nature of the previously stored performance characteristic curves, or the boundaries of the operation. Therefore, as drafted, claim 1’s additional elements “merely recite[] the words ‘apply it’ (or an equivalent) with the judicial exception, or . . . uses a computer as a tool to perform an abstract idea.” *Revised Guidance*, 84 Fed. Reg. at 55. *See also Benson*, 409 U.S. at 71–72 (concluding that permitting a patent on the claimed invention “would wholly pre-empt the mathematical

⁴ *Revised Guidance*, 84 Fed. Reg. at 55 n. 28.

formula and in practical effect would be a patent on the algorithm itself.”). Therefore, the Appellant’s allegation has no foundation.

Because the judicial exception recited in claim 1 merely amounts to generic mathematical operations that fail to impart, in any meaningful way, an effect on, or be integrated into, any practical application, we find that the claim fails at Step 2A, Prong 2.

Guidance Step 2B

Under Step 2B, we also discern no error in the Examiner’s determination that the additional elements, taken individually and in combination, do not result in the claim, as a whole, amounting to significantly more than the judicial exception (Ans. 14; Final Act. 10). Claim 1 recites conventional devices such as a “memory” to retrieve data (a “first reference performance curve” or “second reference performance curve”) in order to evaluate, calculate, and translate the sensed system performance parameters in a generic “processor” taking into account reference data to obtain a corrected performance characteristic value by calculating an estimate of the first system performance parameter at a predetermined value of the second system performance parameter in order to operate the system.

The Appellant appears to disagree with the Examiner’s finding (Ans. 6) that using memory to retrieve data and performing generic computer functions were well-understood, routine, and conventional activities in the art (Appeal Br. 21–22). Nevertheless, we do not understand the Appellant’s argument to be that memories and processors *per se* for performing generic computer functions (e.g., calculations) are new, as these tools are instantly recognizable as conventional and well-understood devices. To the extent

that the Appellant is arguing that the abstract idea in claim 1 makes the additional features non-conventional, non-routine, and not well-understood (*id.* at 21 (“Such claimed subject matter is non-conventional as evidenced by none of the cited references disclosing such subject matter.”)), the fact that the claim recites a more specific abstract idea or mental process that avoids a rejection under 35 U.S.C. § 102 or 35 U.S.C. § 103 does not alter our analysis because “a claim for a *new* abstract idea is still an abstract idea.” *Synopsys, Inc. v. Mentor Graphics Corp.*, 839 F.3d 1138, 1151 (Fed. Cir. 2016).

Here, the additional elements, individually and in combination, are recited at such a high level of generality as insignificant extra-solution activity to the judicial exception and, therefore, are indicative that an inventive concept is not present in claim 1. *Mayo*, 566 U.S. at 82 (“[S]imply appending conventional steps, specified at a high level of generality, to laws of nature, natural phenomena, and abstract ideas cannot make those laws, phenomena, and ideas patentable.”). *See also Flook*, 437 U.S. at 590 (“[T]he Pythagorean theorem would not have been patentable, or partially patentable, because a patent application contained a final step indicating that the formula, when solved, could be usefully applied to existing surveying techniques.”).

The Appellant’s reliance on *Diehr* and *SiRF*, cited above, are misplaced. In *Diehr*, the invention applied the Arrhenius equation, without pre-empting its use, to provide a specific improved rubber molding process that significantly lessened the possibility of overcuring or undercuring by constantly determining the temperature of the mold, constantly recalculating the appropriate cure time through the use of the formula and a digital

computer, and automatically opening the mold press at the proper time. *Diehr*, 450 U.S. at 187. *SiRF* involved “pseudoranges” that estimate the distance from “[a] GPS receiver to a plurality of GPS satellites” requiring an estimation of “states” that are “associated with a satellite signal receiver,” and the formation of a “dynamic model . . . to compute [the] position of the satellite signal receiver.” *SiRF*, 601 F.2d at 1331–32. In *SiRF*, the claimed method could not be performed without the specific use of a GPS receiver. *Id.* at 1332. The key circumstances dictating the results in *Diehr* and *SiRF* are not present in current claim 1, which broadly recite a “system” with other broad limitations.

In view of our analysis under the steps of the PTO’s Revised Guidance as updated in October 2019, we conclude that claim 1 is directed to patent ineligible subject matter. For the foregoing reasons, and those well-stated by the Examiner, we uphold the Examiner’s rejection as maintained against representative claim 1, and, consequently by rule, all claims on appeal.

IV. CONCLUSION

In summary:

Claims Rejected	35 U.S.C. §	Reference(s)/ Basis	Affirmed	Reversed
1, 2, 4–10, 12–17, 19	101	Patent Ineligibility	1, 2, 4–10, 12–17, 19	

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