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UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

Ex parte JACKSON R. HEAVENER and JUSTIN J. MAY

Appeal 2019-004991
Application 14/931,156
Technology Center 3700

Before HUBERT C. LORIN, PHILIP J. HOFFMANN, and
CYNTHIA L. MURPHY, *Administrative Patent Judges*.

HOFFMANN, *Administrative Patent Judge*.

DECISION ON APPEAL

STATEMENT OF THE CASE

Pursuant to 35 U.S.C. § 134(a), Appellant¹ appeals from the Examiner's rejection of claims 21–35.² We have jurisdiction under 35 U.S.C. § 6(b).

We REVERSE.

¹ We use the word “Appellant” to refer to “applicant” as defined in 37 C.F.R. § 1.42. Appellant identifies the real party in interest as Zimmer, Inc. Appeal Br. 2.

² Although claims 36–40 are pending, these claims are withdrawn from consideration. *See, e.g.*, Final Action 1.

According to Appellant, the invention “relates to a computer assisted surgery system and method for preparing an anatomical structure to receive an implant.” Spec. ¶ 2. Claims 21 and 31 are the independent claims on appeal. Below, we reproduce independent claim 21 as representative of the appealed claims.

21. A method operating within a computer aided surgical (CAS) system, the method comprising:
receiving, within the CAS system, identification of a region of a surface of an anatomical structure for replacement by an implant;
acquiring, using data received from a tracking device within the CAS system tracking a pointer probe, a plurality of data points obtained as the pointer probe temporarily contacts at least a portion of the region of the surface of the anatomical structure, each data point of the plurality of data points representing a discrete location on the surface of the region; and
approximating a surface contour of the region of the surface based on the plurality of data points at least in part by correlating each data point of the plurality of data points to a three-dimensional coordinate system generated by the CAS system.

REJECTIONS AND PRIOR ART

The Examiner rejects the claims as follows:

- I. Claims 21–35 under 35 U.S.C. § 101 as reciting only patent-ineligible subject matter;

- II. Claims 21–25, 27, and 31–33 under Pre-AIA 35 U.S.C. § 103(a) as unpatentable over Hodorek³ and McGinley⁴;
- III. Claims 26 and 34 under 35 U.S.C. § 103(a) as unpatentable over Hodorek, McGinley, and Song⁵; and
- IV. Claims 28–30 and 35 under 35 U.S.C. § 103(a) as unpatentable over Hodorek, McGinley, and Delp.⁶

PRINCIPLES OF LAW CONCERNING 35 U.S.C. § 101

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 has long interpreted 35 U.S.C. § 101 to include implicit exceptions, however: “[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) (citation omitted).

In determining whether a claim falls within an excluded category, the Supreme Court’s two-step framework, described in *Mayo* and *Alice*, guides us. *See 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.” *Id.* at 219 (“On their face, the claims before us are drawn to the concept of intermediated

³ Hodorek et al., US 2007/0066917 A1, published Mar. 22, 2007 (“Hodorek”).

⁴ McGinley et al., US 2004/0153062 A1, published Aug. 5, 2004 (“McGinley”).

⁵ Song et al., US 2008/0183086 A1, published July 31, 2008 (“Song”).

⁶ Delp et al., US 5,682,886, issued Nov. 4, 1997 (“Delp”).

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 that the courts 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, 67 (1972)). Concepts that the courts determined to be patent eligible include physical and chemical processes, such as “molding rubber products” (*Diamond v. Diehr*, 450 U.S. 175, 191 (1981)); “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 (1853))); and manufacturing flour (*Benson*, 409 U.S. at 69 (citing *Cochrane v. Deener*, 94 U.S. 780, 785 (1876))).

In *Diehr*, although the claim at issue recited a mathematical formula, 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.”). Nonetheless, 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 (citation 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.*

2019 Revised Patent Subject Matter Eligibility Guidance

In early 2019, the U.S. Patent and Trademark Office published revised guidance on the application of § 101. *See 2019 Revised Patent Subject Matter Eligibility Guidance*, 84 Fed. Reg. 50 (Jan. 7, 2019) (“Guidance”). 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 i) a fundamental economic practice, or ii) managing personal behavior or relationships or interactions between people, or mental processes); and

(2) additional elements that integrate the judicial exception into a practical application (*see* MANUAL OF PATENT EXAMINING PROCEDURE (“MPEP”) § 2106.05(a)–(c), (e)–(h) (9th Ed., Rev. 08.2017, Jan. 2018)).

A practical application “appl[ies], rel[ies] on, or use[s] 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 judicial exception.” Guidance, 84 Fed. Reg. at 54.

Only if a claim (1) recites a judicial exception and (2) does not integrate that exception into a practical application, do we then look to whether the claim either:

(3) adds a specific limitation beyond the judicial exception which is not “well-understood, routine, [or] conventional” in the field (*see* MPEP § 2106.05(d)); or

(4) simply appends well-understood, routine, and conventional activities previously known to the industry, specified at a high level of generality, to the judicial exception.

See generally Guidance.

ANALYSIS

Rejection I—§ 101 rejection of claims 21–35

Initially, we note that Appellant argues against the Examiner’s § 101 rejection of the claims as a group. *See* Appeal Br. 7–9. We choose independent claim 21 for our analysis, and the remaining claims stand or fall with claim 21. *See* 37 C.F.R. § 41.37 (c)(1)(iv). For the following reasons, based on our review of the record, we do not sustain the Examiner’s rejection of the claims as patent-ineligible.

The Examiner undertakes an analysis of the claims in accordance with the above-discussed § 101 Guidance. *See, e.g.*, Answer 3. The Examiner’s entire analysis under point (1) of the Guidance is as follows:

Independent Claim 21 recites *a method operating with in a computer aided surgical (CAS) system, the method comprising . . . approximating a surface contour of the region of the surface based on the plurality of data points at least in part by correlating each data point of the plurality of data points to a three-dimensional coordinate system generated by*

the GAS system. The step of approximating a surface contour, identified as the inventive concept, is considered an abstract idea. As no information is provided in the [S]pecification as to how the surface contour is approximated, it is interpreted that the step of approximating the contour is a mental process and therefore an abstract idea.

Id. at 3–4.

This characterization by the Examiner of what the claim is “directed to” is inaccurate. In summary, the Examiner indicates that the claim is directed merely to “a mental process” of “approximating a surface contour.” *Id.* at 4. But there is more going on in the claim than that. Independent claim 21 recites, in relevant part, “a tracking device . . . tracking a pointer probe.” Appeal Br., Claim App. As the claim further describes, “the pointer probe temporarily contacts at least a portion of the region of the surface of the anatomical structure” to “acquir[e] . . . a plurality of data points . . . , each data point of the plurality of data points representing a discrete location on the surface of the region” of an anatomical structure that is to be replaced by an implant. *Id.* The claim further recites “approximating a surface contour of the region of the surface based on the plurality of data points.” *Id.* Consequently, characterizing claim 21 as directed to “a mental process” of “approximating a surface contour” misses a focus of the invention and, given what Appellant’s Specification describes, glosses over the advance over the prior art.

“The ‘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 Tex., LLC v. DirectTV, LLC*, 838 F.3d 1253, 1257 (Fed. Cir. 2016) (quoting *Elec. Power Grp., LLC*, 830 F.3d 1350, 1353 (Fed. Cir. 2016)); *see*

also Enfish, LLC v. Microsoft Corp., 822 F.3d 1327, 1335 (Fed. Cir. 2016). As the Federal Circuit states in *Ancora Technologies, Inc. v. HTC America, Inc.*, 908 F.3d 1343, 1347 (Fed. Cir. 2018):

We examine the patent’s “‘claimed advance’ to determine whether the claims are directed to an abstract idea.” *Finjan, Inc. v. Blue Coat System, Inc.*, 879 F.3d 1299, 1303 (Fed. Cir. 2018). “In cases involving software innovations, this inquiry often turns on whether the claims focus on ‘the 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.* (quoting *Enfish*, 822 F.3d at 1335–36); *see BSG Tech LLC v. Buyseasons, Inc.*, 899 F.3d 1281, 1285–86 (Fed. Cir. 2018). Computers are improved not only through changes in hardware; “[s]oftware can make non-abstract improvements to computer technology” *Enfish*, 822 F.3d at 1335; *see Finjan*, 879 F.3d at 1304. We have several times held claims to pass muster under *Alice* step one when sufficiently focused on such improvements.

The discussion of the related art and Appellant’s invention in Appellant’s Specification shows the advance over the prior art by the claimed invention is not in the realm of “a mental process” of “approximating a surface contour” as the Examiner states. As Appellant explains with respect to the related art,

[o]rthopaedic procedures for the replacement of at least a portion of a bone or other anatomical structure of a patient typically require preparing the anatomical structure to receive an implant. Such preparation may involve determining a desired size, type, and shape of the implant based on the size and shape of the anatomical structure. For example, determination of the type and size of implants for a total knee arthroplasty procedure are typically based on sizing measurements taken of the knee, e.g., anterior/posterior and medial/lateral dimensions, as well as by the location of the mechanical axis of the femur.

Spec. ¶ 3. In contrast to the types of measurements taken previously, Appellant’s invention acquires data in three dimensions, allowing the computer aided surgical system “to provide a best fit approximation of a contour of the anatomical structure,” thereby allowing “selecting an orthopaedic implant substantially matching the contour of the anatomical structure.” *Id.* ¶¶ 4, 27, 28. Thus, when we look at the focus of the claimed advance over the prior art, we determine that the claim’s character as a whole is not directed to excluded subject matter.

Accordingly, we agree with Appellant that the Examiner errs in determining that the claims are directed to an abstract idea of “a mental process.” Appeal Br. 7–9. Therefore, we do not sustain the Examiner’s § 101 rejection of claims 21–35.

Rejection II—§ 103 rejection of claims 21–25, 27, and 31–33

As set forth above, independent claim 21 recites, in relevant part,

acquiring, using data received from a tracking device within the CAS [computer aided surgical] system tracking a pointer probe, a plurality of data points obtained as the pointer probe temporarily contacts at least a portion of the region of the surface of the anatomical structure, each data point of the plurality of data points representing a discrete location on the surface of the region; and

approximating a surface contour of the region of the surface based on the plurality of data points at least in part by correlating each data point of the plurality of data points to a three-dimensional coordinate system generated by the CAS system.

Appeal Br., Claims App.

In support of claim 21’s obviousness rejection, the Examiner relies on Hodorek’s paragraph 37 to disclose approximating a surface contour of an

anatomical structure's surface region based on the plurality of data points. *See, e.g.*, Answer 6–7. However, the Examiner does not support adequately that this portion of Hodorek discloses approximating a surface contour, and thus does not support that Hodorek does so based on a plurality of data points.

Hodorek's paragraph 37 is thirty-four lines in length. Neither the Final Office Action nor the Answer identifies, with specificity, which portion of the paragraph discloses approximating a surface contour of an anatomical structure's surface region. *See generally* Final Action, Answer. Although we agree with the Examiner that Hodorek's paragraph 37 discloses selecting a femoral implant, it is not clear to us that in Hodorek implant selection occurs based on a surface contour, or even that the implant approximates the surface contour. The identified paragraph mentions neither "surface" nor "contour." *See* Hodorek ¶ 37.

In the Answer, the Examiner explains:

Regarding [Appellant's] argument that Hodorek[']s [paragraph 37] does not disclose approximating a surface contour . . . [,] the [E]xaminer disagrees as Hodorek describes the selection of a simulated femoral implant that would approximate the surface contour based on the data acquired. Please note: the claimed element does not recite approximating "curves" as argued, merely "approximating a surface contour." Without further description in [Appellant's] [S]pecification, this limitation is interpreted [by the Examiner] as being met by Hodorek, as *matching the femoral component in any way* would approximate a surface contour.

Answer 10–11 (emphasis added). Without further findings or explanation by the Examiner, we disagree with the Examiner that "matching the femoral component in any way would approximate a surface contour." *Id.* at 11. For example, we do not see how matching an implant based on length

approximates a surface contour. Instead, without further explanation from the Examiner, based on the portions of Hodorek that the Examiner cites, it appears that Hodorek may measure length. This is because the Examiner relies on Hodorek's paragraph 28 and Figure 1 to disclose and illustrate the claim's recitation of "acquiring . . . a plurality of data points." *See, e.g., id.* at 6–7. Hodorek's Figure 1 shows a single reference array 40 adjacent one end of a femur, and a single reference array 40 adjacent the other end of the femur. While one may use such an arrangement to determine a femur's length, it is unclear how such an arrangement may determine a surface contour.

Consequently, we do not sustain the Examiner's obviousness rejection of independent claim 21. For similar reasons, we do not sustain the Examiner's obviousness rejection of independent claim 31. Further, we do not sustain the Examiner's rejection of claims 22–25, 27, 32, and 33 that depend from, and the Examiner rejects with, independent claims 21 and 31.

Rejection III—§ 103 rejection of claims 26 and 34

Claims 26 and 34 depend from independent claims 21 and 31, respectively. As discussed above, we do not sustain the independent claims' obviousness rejection. The Examiner does not rely on Song to disclose anything that would remedy the independent claims' rejection. Accordingly, we do not sustain the Examiner's obviousness rejection of claims 26 and 34.

Rejection IV—§ 103 rejection of claims 28–30 and 35

Claims 28–30 and 35 depend from independent claims 21 and 31, respectively. As discussed above, we do not sustain the independent claims' obviousness rejection. The Examiner does not rely on Delp to disclose

anything that would remedy the independent claims' rejection. Accordingly, we do not sustain the Examiner's obviousness rejection of claims 28–30 and 35.

CONCLUSION

We REVERSE the Examiner's §§ 101 and 103 rejections of claims 21–35.

In summary:

Claims Rejected	35 U.S.C. §	Basis/Reference(s)	Affirmed	Reversed
21–35	101	Eligibility		21–35
21–25, 27, 31–33	103(a)	Hodorek, McGinley		21–25, 27, 31–33
26, 34	103(a)	Hodorek, McGinley, Song		26, 34
28–30, 35	103(a)	Hodorek, McGinley, Delp		28–30, 35
Overall Outcome				21–35

REVERSED