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UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

Ex parte JENS MUHLSTEFF, GEERT GUY GEORGES MORREN, and XAVIER LOUIS MARIE ANTOINE AUBERT[1]

Appeal 2017-010782
Application 13/059,133
Technology Center 3700

Before FRANCISCO C. PRATS, RYAN H. FLAX, and TIMOTHY G. MAJORS, *Administrative Patent Judges*.

FLAX, *Administrative Patent Judge*.

DECISION ON APPEAL

This is a decision on appeal under 35 U.S.C. § 134(a) involving claims directed to monitoring the blood pressure of a patient. Claims 1, 2, 4, 5, 7, 8, 10–14, 16–19, and 21–25 are on appeal as rejected under 35 U.S.C. § 101 and § 112, second paragraph. We have jurisdiction under 35 U.S.C. § 6(b).

We affirm-in-part.

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[1] Appellants identify the Real Party in Interest as "Koninklijke Philips N.V." Appeal Br. 1.

STATEMENT OF THE CASE

Claim 1 is representative and is reproduced below:

1. A method for monitoring the blood pressure of a patient, comprising the following steps:

(a) determining a pulse arrival time signal from the patient with a pulse wave velocity unit based on a pulse wave velocity method;

(b) determining an accelerometer signal from the patient with an accelerometer sensor after determining the pulse arrival time signal;

(c) detecting a DC component of the accelerometer signal indicative of a posture of the patient with a monitoring device;

(d) normalizing the pulse arrival time signal with a reference pulse arrival time value with the monitoring device by dividing the determined pulse arrival time signal by a reference pulse arrival time value to generate a normalized pulse arrival time signal;

(e) comparing a value of the normalized pulse arrival time signal with predefined upper and lower pulse arrival time threshold values with the monitoring device;

(f) determining if the value of the normalized pulse arrival time signal exceeds the upper reference threshold value or under-runs the lower reference threshold value with the monitoring device;

(g) checking for a change in the posture of the patient based on a change of the DC component of the accelerometer signal;

at least one of:

(h) repeating steps (a)-(g) when the value of the normalized pulse arrival time signal exceeds or under-runs the predefined pulse arrival time threshold value;

> (i) in response to the normalized pulse arrival time signal exceeding or underrunning the predefined pulse arrival time threshold values and the DC component change not being detected, at least one of:
>
> controlling an alarm to generate an alarm signal; and
>
> controlling a blood pressure cuff to measure the blood pressure of the patient, and
>
> (j) in response to the normalized pulse arrival time signal exceeding or underrunning the predefined pulse arrival time threshold values and the DC component change being detected, updating the reference pulse arrival time value; and
>
> (k) deriving and displaying a blood pressure value with the monitoring device from the normalized pulse arrival time signal and the DC component of the accelerometer signal when the value of the normalized pulse arrival time signal does not exceed or under-run the predefined pulse arrival time threshold values.

Appeal Br. 17–18 (Claims Appendix) (formatting added for clarity).

Independent claim 10 is similar, but directed to an apparatus having an alarm unit, pulse wave velocity unit, accelerometer, monitoring device, and blood pressure cuff, collectively configured to operate similarly to the method of claim 1. Independent claims 17 and 21 are directed to methods similar to that of claim 1. Appellants argue the claims as a group and, therefore, we address the claims similarly. *See generally* Appeal Br.

The following rejections are appealed:

Claims 10–14, 16–19, and 22–24 stand rejected under 35 U.S.C. § 112, second paragraph, as indefinite. Final Action 4.

Claims 1, 2, 4, 5, 7, 8, 10–14, 16–19, and 21–25 stand rejected under 35 U.S.C. § 101 as patent-ineligible as directed to an abstract idea without significantly more. *Id.* at 5.

DISCUSSION

"[T]he examiner bears the initial burden, on review of the prior art ***or on any other ground***, of presenting a *prima facie* case of unpatentability. If that burden is met, the burden of coming forward with evidence or argument shifts to the applicant." *In re Oetiker*, 977 F.2d 1443, 1445 (Fed. Cir. 1992) (emphasis added). Arguments made by Appellants in the Appeal Brief and properly presented in the Reply Brief have been considered; arguments not so-presented in the Briefs are waived. *See* 37 C.F.R. § 41.37(c)(1)(iv) (2015); *see also Ex parte Borden*, 93 USPQ2d 1473, 1474 (BPAI 2010) (informative) ("Any bases for asserting error, whether factual or legal, that are not raised in the principal brief are waived.").

I. PATENT ELIGIBILITY

"Phenomena of nature, though just discovered, mental processes, and abstract intellectual concepts are not patentable, as they are the basic tools of scientific and technological work." *Mayo Collaborative Servs. v. Prometheus Labs, Inc.*, 566 U.S. 66, 71 (2012) (quoting *Gottschalk v. Benson*, 409 U.S. 63, 67 (1972)). Claims directed to *nothing more* than abstract ideas (such as mathematical algorithms), natural phenomena, and laws of nature are not eligible for patent protection. *Diamond v. Diehr*, 450 U.S. 175, 185 (1981); *accord* MPEP § 2106 (II) (discussing *Diehr*); *see also Parker v. Flook*, 437 U.S. 584, 592–94 (1978) (if, once the mathematical algorithm is removed from consideration, nothing patentable remains, the claims are not patent-eligible).

In analyzing patent-eligibility questions under 35 U.S.C. § 101, the Supreme Court instructs us to "first determine whether the claims at issue are directed to a patent-ineligible concept." *Alice Corp. Pty. Ltd. v. CLS Bank Int'l*, 134 S. Ct. 2347, 2355 (2014). If the claims are so directed, we then move to a second step and "consider 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." *Id.* (quoting *Mayo*, 566 U.S. at 78–79).

Here, under *Alice's* step one, the Examiner determined the claims are directed to "the concept of applying mathematical operations, which corresponds to concepts identified as abstract ideas by the courts," and further determined,

> the claims pertain to the abstract idea of comparing new and stored information and using rules to identify options (i.e. normalized pulse arrival time signal is compared to upper and lower threshold values continuously until a value exceeds or under-runs the predefined pulse arrival time threshold values, in which a blood pressure value is derived or a cuff measurement is triggered) and thus is not patent eligible for the same reasons set forth in *SmartGene* [*v. Advanced Biological Laboratories, SA*, 555 Fed. Appx. 950 (Fed. Cir. 2014), *cert denied*, 135 S. Ct. 58 (2014)].

Final Action 6–7 (italics added).

Under *Alice's* step two, the Examiner determined that:

> The claims do not include additional elements that are sufficient to amount to significantly more than the judicial exception because the additional elements when considered both individually and as an ordered combination do not amount to significantly more than the abstract idea. The claim recites the additional limitations of a "a pulse wave velocity unit", "an

> accelerometer", "a monitoring device", "a blood pressure cuff', "an alarm unit", "an electrocardiogram", "a plethysmograph", all of which are conventional as evidence by prior art set forth in previous office actions. Furthermore, the processor is recited at a high level of generality and are recited as performing generic computer functions routinely used in computer applications. Generic computer components recited as performing generic computer functions that are well-understood, routine and conventional activities amount to no more than implementing the abstract idea with a computerized system. Thus, taken alone, the additional elements do not amount to significantly more than the above-identified judicial exception (the abstract idea). Looking at the limitations as an ordered combination adds nothing that is not already present when looking at the elements taken individually. There is no indication that the combination of elements improves the functioning of a computer or improves any other technology. Their collective functions merely provide conventional computer implementation.

Id. at 7. As evidence that the additionally claimed subject matter (beyond the identified abstract idea) does not go beyond routine and conventional things or activities, the Examiner (without specific citation) pointed to prior art identified in previous office actions, generally. *Id.*[2]

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[2] The Examiner did not specify in the Final Action, but looking to the prosecution record we identified the following references, each cited only in rejections for obviousness:

> US 2002/0183627 A1 (published Dec. 5, 2002) ("Nishii") (Jan 22, 2013 Office Action);
> US 2007/0142730 A1 (published June 21, 2007) ("Laermer") (Jan 22, 2013 Office Action);
> US 2005/0209512 A1 (published Sept. 22, 2005) ("Heruth") (Apr. 14, 2014 Office Action);
> US 2006/0200011 A1 (published Sept. 7 2006) ("Suzuki") (Aug. 15, 2014 Office Action; Mar. 13, 2015 Final Action);

It is without question that "[t]he line between a patentable 'process' and an unpatentable 'principle' is not always clear." *Flook*, 437 U.S. at 589; *see also Synopsys, Inc. v. Mentor Graphics Corp.*, 839 F.3d 1138, 1150 (Fed. Cir. 2016) ("defining the precise abstract idea of patent claims in many cases is far from a 'straightforward' exercise") (quoting *DDR Holdings, LLC v. Hotels.com, L.P.*, 773 F.3d 1245, 1257 (Fed. Cir. 2014)). Here, a reasonable case could be made that the Examiner's determination under *Alice's* step one is without error on the basis that the claims are directed to a mathematical calculations and an algorithm where data is compared. As noted by the Supreme Court, however, "all inventions at some level embody, use, reflect, rest upon, or apply laws of nature, natural phenomena, or abstract ideas" and "a process is not unpatentable simply because it contains a law of nature or a mathematical algorithm." *Mayo*, 566 U.S. at 71 (quoting *Diehr*, 450 U.S. at 187).

Regarding the Examiner's *Alice* step two determination, Appellants argue "[t]he Office Action states that the additional elements recited in the claims do not amount to 'significantly more.' Applicants respectfully disagree." Appeal Br. 9. Appellants further distinguish what *was* routine and conventional in the field from their invention, stating, "existing blood pressure measurements in clinical setting are conventionally mainly based on the sphygmo-manometric occlusive arm-cuff, which is clumsy,

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US 2009/0062667 A1 (published Mar. 5, 2009) ("Fayram") (Aug. 15, 2014 Office Action; Mar. 13, 2015 Final Action);
CN101234016 A (published Aug. 6, 2008) ("Zhang") (Aug. 15, 2013 Office Action); and
US 5,778,879 (issued July 14, 1998) ("Ota") (Answer 8).

uncomfortable and only allows for intermittent measurements at intervals of several minutes." *Id.* at 10. Appellants present other points, but only this argument is persuasive.

Even if the claims on appeal are "directed to" an abstract idea under the first step of the *Alice* framework as determined by the Examiner, we conclude that the Examiner has not *established* that the additional elements recited in the claims, considered individually and as an ordered combination, were well-understood, routine, and conventional. Regarding a determination that non-abstract-idea claim elements are merely routine and conventional, the Federal Circuit has explained that,

> Whether something is well-understood, routine, and conventional to a skilled artisan at the time of the patent is a factual determination. Whether a particular technology is well-understood, routine, and conventional goes beyond what was simply known in the prior art. The mere fact that something is disclosed in a piece of prior art, for example, does not mean it was well-understood, routine, and conventional.

Berkheimer v. HP Inc., 881 F.3d 1360, 1369 (Fed. Cir. 2018).

Here, after we strip away the alleged abstract idea (comparing new and stored information and using rules to identify options (i.e. normalized pulse arrival time signal is compared to upper and lower threshold values continuously until a value exceeds or under-runs the predefined pulse arrival time threshold values, in which a blood pressure value is derived or a cuff measurement is triggered), as indicated by the Examiner), we are left with the claims' required coordinated elements of, *inter alia*, using a pulse wave velocity unit to measure/determine a pulse arrival time signal and using an accelerometer to sense movement/posture. The Examiner concluded that the

references generally cited during prosecution evidenced that such additional subject matter, as an ordered combination was no more than routine and conventional. Final Action 7; Answer 3–9.

Although we agree with the Examiner that the prior art references previously cited during prosecution may *disclose*, individually or even in some combination, using a pulse wave velocity measuring device and/or an accelerometer during blood pressure measurements, we conclude that the references alluded to by the Examiner to support prior obviousness rejections (no evidence was previously cited to support an *Alice* step two determination under 35 U.S.C. § 101) do not indicate that the claimed individual steps (or elements), much less the ordered combination thereof, were necessarily *routine* and/or *conventional* in the art. To the contrary, the cited references describe the relevant techniques as inventive.

For example, Nishii evidences that using a cuff with a pressure sensor to measure blood pressure was conventional and also discloses measuring blood flow rate as pulse waves and detecting body motion in measuring blood pressure, but it does not evidence that the combination of these latter two elements was routine or customary, only that it was known. *See* Nishii ¶¶ 4, 38, 41. Laermer discloses that using pulse waves and ECG to measure blood pressure was known, and that use of pressure cuffs for blood pressure measurements was routine and customary, and even discloses the use of an ECG and accelerometer on a single device for measuring blood pressure *as an invention*, but does not evidence that combining a pulse wave velocity measuring device and an accelerometer for blood pressure measurement was routine and conventional. *See* Laermer ¶¶ 2–7, 27, 31, claim 1. Heruth

discloses using accelerometers to detect sleep conditions, but does not evidence that the claim elements as an ordered combination were routine and conventional. Heruth ¶ 50. Suzuki discloses measuring pulse wave data and ECG data to determine sleep, and that its invention takes into consideration body posture when measuring blood pressure, but does not evidence that the claim elements as an ordered combination were routine and conventional. Suzuki ¶¶ 5–7, 148. Fayram discloses using ECG signals (P wave) in blood pressure measurement, and even combining such a system with an accelerometer to detect posture during the measurement, but these are described as a part of its *invention*, not as routine and conventional. Fayram ¶¶ 7, 11, 27, 59. Zhang discloses pulse wave propagation to measure blood pressure as "theory" and that an accelerometer can be used (attached to a handrail of a couch) when measuring blood pressure as a part of its *invention*, but does not evidence that the claim elements as an ordered combination were routine and conventional. Zhang 2–4. Ota indicates that it may have been conventional to use a cuff to measure blood pressure and also discloses using pulsewave data and inclination sensors to measure blood pressure *as its invention*, but these are not described as routine and conventional. Ota 1:11–2:37.

While these prior art teachings may be relevant in analyzing obviousness, where routineness and conventionality are not critical determinations, they do not establish the routineness or conventionality of the claimed subject matter when analyzing patent eligibility. *See Diehr*, 450 U.S. at 189–90 (novelty and patent eligibility are wholly separate considerations); *Classen Immunotherapies, Inc. v. Biogen IDEC*, 659 F.3d

1057, 1064–65 (Fed. Cir. 2011) (quoting *Diehr*: "rejection on either of [§ 102 or 103] does not affect the determination that respondents' claims recited subject matter which was eligible for patent protection under § 101"); *see also MySpace, Inc. v. GraphOn Corp.*, 672 F.3d 1250, 1261 (Fed. Cir. 2012) ("Following the Supreme Court's lead, [we] should avoid reaching for interpretations of broad provisions, such as § 101, when more specific statutes, such as §§ 102, 103, and 112, can decide the case.").

Thus, while the claims may be directed to an abstract idea and the prior art might teach or suggest the individual steps or elements recited by the appealed claims, or components thereof, the evidence on appeal does not support the conclusion that the claimed steps or elements, as an ordered combination, constitute mere routine and customary actions or elements that do not provide the "something more" than the abstract idea upon which they may rely so as to provide an inventive concept.

For these reasons, we find the rejection insufficiently supported on the record before us. We reverse the rejection.

II. INDEFINITENESS

For claims under examination, "a claim is indefinite when it contains words or phrases whose meaning is unclear," i.e., "ambiguous, vague, incoherent, opaque, or otherwise unclear in describing and defining the claimed invention." *In re Packard*, 751 F.3d 1307, 1310–13 (Fed. Cir. 2014); *see also* MPEP § 2173.02(I) (Rev. 07.2015, Nov. 2015) (advising examiners that a rejection for indefiniteness is appropriate "after applying the broadest reasonable interpretation to the claim, if the metes and bounds of the claimed invention are not clear"). As explained in the MPEP

§ 2173.05(e), a "lack of clarity could arise [for example] where a claim refers to 'said lever' or 'the lever,' where the claim contains no earlier recitation or limitation of a lever and where it would be unclear as to what element the limitation was making reference."

The Examiner stated, "[e]very ground of rejection set forth in the [Final] Office action dated August 26, 2016 from which the appeal is taken is being maintained by the examiner except for the grounds of rejection (if any) listed under the subheading 'WITHDRAWN REJECTIONS.'" Answer 2. The indefiniteness rejection from the Final Action was not withdrawn. Appellants did not argue, or even mention, the indefiniteness rejection in their Appeal Brief.

"When the appellant fails to contest a ground of rejection to the Board, . . . the Board may treat any argument with respect to that ground of rejection as waived. In the event of such a waiver, the PTO may affirm the rejection of the group of claims that the examiner rejected on that ground without considering the merits of those rejections." *Hyatt v. Dudas*, 551 F.3d 1307, 1314 (Fed. Cir. 2008). Therefore, we affirm this rejection.

SUMMARY

The rejection of the claims as directed to patent-ineligible subject matter is reversed.

The indefiniteness rejection is affirmed.

No time period for taking any subsequent action in connection with this appeal may be extended under 37 C.F.R. § 1.136(a)(1)(iv).

AFFIRMED-IN-PART