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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
13/879,135	05/07/2013	Hiroaki Tanaka	2013_0550A	4783

513 7590 03/27/2019

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ART UNIT	PAPER NUMBER
3791	

NOTIFICATION DATE	DELIVERY MODE
03/27/2019	ELECTRONIC

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UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

Ex parte HIROAKI TANAKA and TAKURO MATSUDA

Appeal 2018-004095
Application 13/879,135[1]
Technology Center 3700

Before MURRIEL E. CRAWFORD, JOSEPH A. FISCHETTI, and PHILIP J. HOFFMANN, *Administrative Patent Judges*.

HOFFMANN, *Administrative Patent Judge*.

DECISION ON APPEAL

STATEMENT OF THE CASE

Pursuant to 35 U.S.C. § 134(a), Appellants appeal from the Examiner's rejection of claims 8–10, 12–17, 19–24, and 26–28.[2] We have jurisdiction under 35 U.S.C. § 6(b).

We AFFIRM.

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[1] Appellants identify "FUKUOKA UNIVERSITY" as the real party in interest. Appeal Br. 2.

[2] The Final Office Action erroneously refers to claims 8–10 and 12–20. *See, e.g.*, Final Action 2.

According to Appellants, "[t]he invention relates to a technology for measuring various somatic data concerning heart, exercise intensity, etc." Spec. ¶ 1. Claims 8, 15, and 22 are the independent claims on appeal. Below, we reproduce claim 8, with additional formatting, as illustrative of the appealed claims.

> 8. An apparatus for detecting somatic data, comprising:
>
> a sensor for sampling heart sound of a target person while the target person is exercising;
>
> a non-transitory memory storing a program; and
>
> a hardware processor for executing the program so that the apparatus:
>
> detects a first heart sound on the basis of the heart sound;
>
> measures an amplitude of the first heart [sound];
>
> counts a heart rate of the target person while the target person is exercising;
>
> stores in a non-volatile memory a heart rate of the target person to be measured when the target person is resting, and an amplitude of first heart sound of the target person to be measured when the target person is resting; and
>
> computes a double product of a ratio between the heart rate of the target person to be measured when the target person is resting and the heart rate to be measured when the target person exercises, and a ratio between the amplitude of first heart sound of the target person to be measured when the target person is resting and the amplitude of first heart sound of the target person to be measured when the target person exercises, detects an optimal exercise intensity of the target person on the basis of the double product, and outputs the optimal exercise intensity detected as a relational expression derived from a correlation between the optimal exercise intensity and a

> maximum volume of oxygen taken by a target person during grade exercise, obtained by measuring a plurality of target persons, to thereby determine a maximum volume of oxygen taken by the target person during grade exercise.

REJECTION

The Examiner rejects claims 8–10, 12–17, 19–24, and 26–28 under 35 U.S.C. § 101 as patent-ineligible.

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. Pty. Ltd. 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* and *Alice*. *See Alice*, 573 U.S. 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 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" (*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*, 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."). 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 (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 PTO recently published revised guidance on the application of § 101. *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 a fundamental economic practice, 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)).

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:

> (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 Guidance.

ANALYSIS

Initially, we note that Appellants argue against the Examiner's rejection of claims 8–10, 12–17, 19–24, and 26–28 as a group. Appeal Br. 5–8. We choose independent claim 8 for our analysis, and remaining claims 9, 10, 12–17, 19–24, and 26–28 stand or fall with claim 8. *See* 37 C.F.R. § 41.37 (c)(1)(iv). For the following reasons, we sustain the Examiner's rejection of the claims as patent-ineligible.

For the reasons set forth below, we determine that in accordance with point (1) of the Guidance referenced above, independent claim 8 recites at least one judicial exception, including an abstract idea. More specifically, as described in further detail, the abstract idea includes mathematical concepts, as well as mental processes.

As set forth above, independent claim 8 recites an "apparatus for detecting somatic data, comprising": (1) "a sensor for sampling heart sound of a target person while the target person is exercising"; (2) "a non-transitory memory storing a program"; and (3) "a hardware processor for executing the program so that the apparatus": (4) "detects a first heart sound on the basis of the heart sound"; (5) "measures an amplitude of the first heart sound"; (6) "counts a heart rate of the target person while the target person is exercising"; (7) "stores in a non-volatile memory a heart rate of the target person to be measured when the target person is resting, and an amplitude of first heart sound of the target person to be measured when the target person is resting"; and (8) "computes a double product of a ratio between the heart

rate of the target person to be measured when the target person is resting and the heart rate to be measured when the target person exercises, and a ratio between the amplitude of first heart sound of the target person to be measured when the target person is resting and the amplitude of first heart sound of the target person to be measured when the target person exercises, detects an optimal exercise intensity of the target person on the basis of the double product, and outputs the optimal exercise intensity detected as a relational expression derived from a correlation between the optimal exercise intensity and a maximum volume of oxygen taken by a target person during grade exercise, obtained by measuring a plurality of target persons, to thereby determine a maximum volume of oxygen taken by the target person during grade exercise." Appeal Br., Claims App. (Claim 8).

Here, claim 8 recites mathematical concepts of computing the "double product" of two ratios, as well as the derived "relational expression," as specifically set forth in claim 8's recitation (8). *Id.* Restated in further detail, it is claim 8's recitation that the processor executes a program so that the apparatus "computes a double product of a ratio between the heart rate of the target person to be measured when the target person is resting and the heart rate to be measured when the target person exercises, and a ratio between the amplitude of first heart sound of the target person to be measured when the target person is resting and the amplitude of first heart sound of the target person to be measured when the target person exercises, detects an optimal exercise intensity of the target person on the basis of the double product, and outputs the optimal exercise intensity detected as a relational expression derived from a correlation between the optimal exercise intensity and a maximum volume of oxygen taken by a target

person during grade exercise, obtained by measuring a plurality of target persons, to thereby determine a maximum volume of oxygen taken by the target person during grade exercise" that recites the mathematical concepts.

Also in accordance with point (1) of the Guidance referenced above, claim 8 recites the abstract idea of mental processes. Specifically, each of the claimed detection, counting, storage, and computation, as specifically described in claim 8's recitations (4) and (6)–(8) may be done by a person using mental processes. *See SmartGene, Inc. v. Advanced Biological Laboratories, SA*, 555 Fed. App'x. 950, 955 (Fed. Cir. 2014) (Going through the "mental steps of comparing new and stored information[,] and using rules to identify medical [treatment] options" is an abstract idea.). More specifically, one may mentally (4) "detect[] a first heart sound"; (6) "count[] a heart rate of the target person while the target person is exercising"; (7) store "a heart rate of the target person to be measured when the target person is resting, and an amplitude of first heart sound of the target person to be measured when the target person is resting"; as well as (8) "compute[] a double product of a ratio between the heart rate of the target person to be measured when the target person is resting and the heart rate to be measured when the target person exercises, and a ratio between the amplitude of first heart sound of the target person to be measured when the target person is resting and the amplitude of first heart sound of the target person to be measured when the target person exercises," determine "an optimal exercise intensity of the target person on the basis of the double product," and provide "the optimal exercise intensity detected as a relational expression derived from a correlation between the optimal exercise intensity and a maximum volume of oxygen taken by a target person during grade exercise,

obtained by measuring a plurality of target persons, to thereby determine a maximum volume of oxygen taken by the target person during grade exercise."

In accordance with point (2) of the Guidance referenced above, claim 8 does not recite any additional element that integrates the judicial exception into a practical application. We note that the claim only generically recites the use of certain hardware—a sensor, memory, and processor. Appellants do not describe the claimed hardware in such a way as to indicate that the hardware is anything other than generic. *See* Spec. ¶ 25 ("Any type of the acceleration sensor . . . can be employed."); ¶ 36 ("[S]torage means 517 is comprised of nonvolatile memory into which data can be written and from which data can be read. As . . . storage means 517, a hard disc device having a high capacity and enabling high-speed access can be employed."); ¶ 28 "([C]ontrolling means 5 measures central blood pressure, secretion volume of adrenalin, and load exerted on the heart by computation, and may be comprised of a personal computer.").

Appellants argue that "like the claims in [*McRO, Inc. v. Bandai Namco Games Am. Inc.*, 837 F.3d 1299 (Fed. Cir. 2016)], independent claims 8, 15, and 22 recite features that provide an improvement in the relevant technology (e.g., obtaining and utilizing somatic data)." Appeal Br. 6 (emphasis omitted). We disagree with Appellants, however. Claim 8, unlike the claims in *McRO*, as we found above, uses generic hardware to detect, measure, count, store, and compute data, and, therefore, does not recite an improvement to a particular computer technology. *See McRO*, 837 F.3d at 1314–15 (Finding claims not abstract because they "focused on a specific asserted improvement in computer animation."). Restated, the

claims "are not tied to any particular novel machine or apparatus" capable of rescuing them from the realm of abstraction. *See Ultramercial, Inc. v. Hulu, LLC*, 772 F.3d 709, 716 (Fed. Cir. 2014). Thus, claim 8 is directed to the above-discussed abstract ideas, and does not integrate the judicial exception into a practical application.

In accordance with points (3) and (4) of the Guidance referenced above, claim 8 fails to recite a specific limitation beyond the judicial exception which is not well-understood, routine, and conventional in the field, but instead simply appends well-understood, routine, and conventional activities previously known to the industry, specified at a high level of generality, to the judicial exception. Taking the claim elements separately, the functions performed by the claimed hardware are purely conventional. Specifically, the claim uses known, generic components—such as a sensor to sense data, a memory to store data, and a processor to compute based on the sensed and stored data—to perform their known, basic functions. Restated, the claim recites only well-understood, routine, and conventional functions. *See Elec. Power Grp. v. Alstom S.A.*, 830 F.3d 1350, 1353 (Fed. Cir. 2016); *see also In re Katz Interactive Call Processing Patent Litig.*, 639 F.3d 1303, 1316 (Fed. Cir. 2011) ("Absent a possible narrower construction of the terms 'processing,' 'receiving,' and 'storing,' . . . those functions can be achieved by any general purpose computer without special programming."). There is no unconventional use of the claimed hardware, and the hardware does not produce any unexpected result. Considered as an ordered combination, claim 8's hardware does not add anything that is not already present when we consider the steps separately.

DECISION

We AFFIRM the Examiner's rejection of claims 8–10, 12–17, 19–24, and 26–28.

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