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UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

Ex parte ZOE DEMOU and ANTONIO LUIZ SILVA FERREIRA

Appeal 2023-004366
Application 16/296,510
Technology Center 3700

Before STEFAN STAICOVICI, BENJAMIN D. M. WOOD, and
BRETT C. MARTIN, *Administrative Patent Judges*.

STAICOVICI, *Administrative Patent Judge*.

DECISION ON APPEAL

STATEMENT OF THE CASE

Appellant¹ appeals under 35 U.S.C. § 134(a) from the Examiner’s decision in the Final Office Action (dated Oct. 11, 2022, hereinafter “Final Act.”) to reject claims 32–52 under 35 U.S.C. § 101 as being directed to

¹ We use the word “Appellant” to refer to “applicant” as defined in 37 C.F.R. § 1.42. HeartWare, Inc. is identified as the real party in interest in Appellant’s Appeal Brief (filed May 16, 2023, hereinafter “Appeal Br.”). Appeal Br. 3.

patent-ineligible subject matter.² We have jurisdiction over this appeal under 35 U.S.C. § 6(b).

SUMMARY OF DECISION

We AFFIRM.

INVENTION

Appellant’s invention is directed to a system and computer program product for predicting an “occurrence of an adverse cardiovascular or cerebrovascular health condition.” Spec. para. 8.

Claims 32 and 42 are independent. Claim 32 is illustrative of the claimed invention and is reproduced below (with indentations and reference indicators added in brackets):

32. A system comprising:
- [1] an implantable pump comprising:
 - [a] a rotor;
 - [b] one or more sensors configured to sense electrical signals from the rotor; and
 - [c] first communications circuitry coupled to the one or more sensors and configured to transmit sensed electrical signals from the one or more sensors; and
 - [2] one or more computing devices comprising:
 - [a] a memory;
 - [b] second communications circuitry;
 - [c] an input/output interface; and

² The nonstatutory double patenting rejection of claims 32–52 as unpatentable over claims 1–8 of U.S. Patent 10,368,757 B2 (Demou et al., issued Aug. 6, 2019) is withdrawn by the Examiner due to the filing and acceptance of a Terminal Disclaimer on Nov. 11, 2022. Examiner Answer (dated July 28, 2023, hereinafter “Ans.”) 6; Final Act. 7.

[d] a processor coupled to the memory, the input/output interface, and the second communications circuitry, the processor configured to:

[i] receive, via the second communications circuitry, the sensed electrical signals from the first communications circuitry;

[ii] determine operation data of the implantable pump based on the sensed electrical signals;

[iii] successively estimate, based on the operation data, operational values indicative of an operation parameter of the implantable blood pump;

[iv] determine, for each operational value, a difference between the operational value and a function of at least one previously estimated operation value to produce a divergence of the operational value;

[v] sum divergences of the estimated operational values over time to create a sequence of divergence sums constituting a time-domain waveform;

[vi] determine at least one feature of the time-domain waveform;

[vii] compare at least one feature of the time-domain waveform to a corresponding feature of confirmed waveform features corresponding to prior occurrences and prior non-occurrences of adverse events;

[viii] predict a likelihood of a future cardiac event based at least in part on the comparison; and

[ix] output, using the input/output interface, a notification comprising the

prediction of the likelihood of the future
cardiac event to an output device.

See Appeal Br. 18–19 (Claims App.).

ANALYSIS

Section 101 states, “[w]hoever invents or discovers any new and useful process, machine, manufacture, or composition of matter, or any new and useful improvement thereof, may obtain a patent therefor, subject to the conditions and requirements of this title.” 35 U.S.C. § 101 (2012).

However, the Supreme Court has “long held that this provision contains an important implicit exception: [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* 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, 67 (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))).

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.* (alteration in the original) (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 has published revised guidance on the application of § 101. 2019 Revised Patent Subject Matter Eligibility Guidance, 84 Fed. Reg. 50 (Jan. 7, 2019) (hereinafter “2019 Guidance”).³ Under Step 2A of that guidance, we first look to whether the claim *recites*:

³ The Manual of Patent Examining Procedure (“MPEP”) now incorporates this revised guidance and subsequent updates at § 2106 (9th ed. Rev. 07.2022, Feb. 2023).

- (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 (1) recites a judicial exception and (2) does not integrate that exception into a practical application, do we then look, in Step 2B, 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.

Claims 32–41 and 51

Appellant does not present arguments for the patentability of claims 33–41, and 51 apart from claim 32. *See* Appeal Br. 5, 16 (“Dependent claims 33–41, and 51–52 are patentable for at least the reasons independent claim 32 is patentable.”).⁴ Therefore, in accordance with 37 C.F.R. § 41.37(c)(1)(iv), we select claim 32 as the representative claim to decide

⁴ We view Appellant’s omission of claims 33 and 34, and inclusion of claim 52, in the grouping subheading on page 5 of the Appeal Brief, as a typographical error. Claim 52 depends from independent claim 42. *See* Appeal Br. 24 (Claims App.).

the appeal of the rejection of these claims, with claims 33–41 and 51 standing or falling with claim 32.

Step 1 – Statutory Category

We first determine whether independent claim 32 recites one or more of the enumerated statutory classes of subject matter, i.e., process, machine, manufacture, or composition of matter, eligible for patenting under 35 U.S.C. § 101. Claim 32 recites “[a] system.” *See* Appeal Br. 18 (Claims App.). Thus, claim 32 is directed to a “machine,” which is a recognized statutory category under 35 U.S.C. § 101.

Step 2A, Prong 1 – Recitation of Judicial Exception

We next look to whether independent claim 32 recites any judicial exceptions, including certain groupings of abstract ideas, i.e., mathematical concepts, certain methods of organizing human activity, or mental processes. Here, claim 32 recites, *inter alia*, “receive . . . sensed electrical signals” (limitation [2][d][i]), “determine operation data of the implantable pump” (limitation [2][d][ii]), “estimate . . . operational values indicative of an operation parameter of the implantable blood pump” (limitation [2][d][iii]), “determine, for each operational value, a difference between the operational value and a function of at least one previously estimated operational value to produce a divergence of the operational value” (limitation [2][d][iv]), “sum divergences of the estimated operational values over time” (limitation [2][d][v]), “determine at least one feature of the time-domain waveform” (limitation [2][d][vi]), “compare at least one feature of the time-domain waveform to a corresponding feature of confirmed waveform features

corresponding to prior occurrences and prior non-occurrences of adverse events” (limitation [2][d][vii]), “*predict* a likelihood of a future cardiac event” (limitation [2][d][viii]), and “*output . . . a notification* comprising the prediction of the likelihood of the future cardiac event” (limitation [2][d][ix]). *See* Appeal Br. 18–19 (Claims App.) (emphasis added).

In determining that claim 32 recites an abstract idea, the Examiner identifies the “abstract idea” as limitations [2][d][ii] through [2][d][ix] and finds that the identified abstract idea falls within the subject matter grouping of mental processes. *See* Final Act. 3; Ans. 7. The Examiner explains that the limitations [2][d][ii] through [2][d][ix] recite “processes that, under their broadest reasonable interpretation, covers performance of the limitations in the mind but for the recitation of generic computer components.” Final Act. 3. According to the Examiner, “other than reciting ‘a processor’, nothing in the claim element precludes the steps from practically being performed in the mind.” *Id.*

In response, Appellant argues “that the Examiner erred in characterizing claim 32 as reciting a mental process” because “complex data manipulation would not constitute a mental process.” Appeal Br. 10 (citing *Synopsys, Inc. v. Mentor Graphics Corp.*, 839 F.3d 1138, 1142 (Fed. Cir. 2016); *TQP Dev., LLC v. Intuit Inc.*, 2014 U.D. Dist. LEXIS 20077, pp. 4–5 (E.D. Tex. 2014)). Appellant explains that in *Synopsys* “[t]he Federal Circuit held that the claims recite a mental process because merely generating mathematical representations of circuit components is a simple and basic task that does not require data manipulation,” whereas in *TQP*, the “claims were not drawn to a mental process, because they involved a multi-step manipulation of data that could not conceivably be performed in the

human mind.” Appeal Br. 11. Thus, in this case, Appellant asserts that limitations [d][ii] through [d][viii] “recite[] multiple data manipulation steps that are not simple or basic” because such steps describe “a multi-step process for transforming data (e.g., sensed electrical signals) to achieve a result (e.g., to determine a likelihood of a future cardiac event).” *Id.* at 11–12. As such, according to Appellant, “claim 32 recites data manipulation steps that are more similar to the steps of the claims in *TQP* and less similar to the claims in *Synopsys*.” *Id.* at 12.

We are not persuaded that the Examiner erred in determining that claim 32 recites a judicial exception. We agree with the Examiner that many of the claimed steps could be performed in the human mind but for the recitation of a generic computing device, and therefore recite patent-ineligible abstract ideas. *See CyberSource Corp. v. Retail Decisions, Inc.*, 654 F.3d 1366, 1372 (Fed. Cir. 2011) (holding the claims that could be “performed in the human mind . . . or by a human using a pen and paper” were directed to patent-ineligible mental processes). For example, claim 32 requires determining a *divergence* of an operational value (i.e., blood flow rate)⁵ by determining a *difference* between an *estimated* operational value (i.e., current blood flow rate) and a *function* of a previously estimated operational value (i.e., average blood flow rate over a time period), *summing* the divergences to *create* a time-domain waveform (i.e., changes of blood flow rate over a time period), *comparing* a feature of the time-domain waveform to a prior confirmed feature (feature confirmed to correspond to an adverse event that did or did not occur) to predict the likelihood

⁵ Parenthetical nomenclature refers to the description in Appellant’s Specification.

occurrence of a future cardiac event, and outputting a “notification.” (limitations [d][iii]–[d][ix]). *See* Appeal Br. 18–19 (Claims App.); Spec. paras. 39, 49–54, Fig. 6.

The Examiner is correct that “estimating” operational values of the claimed implantable pump “could be a user mentally determining (or with the aid of pen-and-paper) rotor speeds, power requirements, on state, off state, etc. from data obtained from a pump (this could simply be reading data from a printout or on a display).” *Ans. 7.* Determining a “difference,” “summing,” and “averaging” (to obtain a “function”)⁶ represent simple subtraction, addition, and division between values, which can be performed “mentally or with the aid of pen-and-paper.” *Id.* “Creating” a time-domain waveform “could be simply plotting . . . data points over time using pen-and-paper.” *Id.* Furthermore, the steps of “determining” and “comparing” features of the time-domain waveform “could be a mental acknowledgement or selection of data from a printout or display” and a “mental comparison,” respectively. *Id.* Lastly, “[t]he prediction and notification steps could . . . [be] the mental, verbal or written acknowledgments form [sic] a person performing the simple subtractions and additions required by the claim.” *Id.*

Hence, as claim 32 does not specify any *particular* analytic techniques to perform the recited steps, claim 32 is therefore broad enough to encompass straightforward situations that involve little more than mental observations, calculations, and comparisons of features from a plot. We, thus, agree with the Examiner that claim 32 is readily distinguishable from the claims in *TQP* because it “does not involve complex data

⁶ *See* Spec. paras. 9, 17, 41, 45, 49, 50, 52.

manipulations,” such as “[e]ncryption, decryption, generation of pseud-random key values, etc.” Ans. 6.

Furthermore, we appreciate Appellant’s position that because blood flow rate varies in a patient it is necessary to determine summed divergence values over a period of time in order to build an appropriate waveform that can predict an adverse event. *See* Reply Brief (filed Sept. 25, 2023, hereinafter “Reply Br.”) 5–6. However, we do not agree with Appellant that the *quantity* of the “data manipulation steps” recited in claim 32 would be beyond the capability of a human mind. *See id.* at 4–5, 7 (“[T]he quantity of data required to ‘create a sequency of divergence sums constituting a time-domain waveform’ would require manipulation of a quantity of data that cannot feasibly be performed in the human mind or via pencil and paper.”). In particular, Appellant’s Figures 6 and 8 illustrate a time-domain waveform plot for predicting an adverse event, which includes about 14 daily summed divergence values over a period of one week (June 20–26, 2011). As only fourteen calculations per day are required, we agree with the Examiner that “a large amount of data is not required to be processed by the claim.” Ans. 8. Accordingly, we are not persuaded that claim 32 requires so *many* of the above discussed simple observations, calculations, and comparisons that a different result would be compelled.

Accordingly, for the foregoing reasons, we are not persuaded that the Examiner erred in determining that independent claim 32 recites the abstract idea of mental processes. Thus, we proceed to Prong 2 of Step 2A.

Step 2A, Prong 2 – Integrated Into a Practical Application

If a claim recites a judicial exception, then, in *Prong 2*, we determine whether the recited judicial exception is integrated into a practical application of that exception by: (a) identifying whether there are any additional elements recited in the claim *beyond the judicial exception(s)*; and (b) evaluating those additional elements individually and in combination to determine whether they integrate the exception into a practical application. *See* 2019 Guidance, 84 Fed. Reg. at 54–55. This evaluation 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. *See id.* at 54.

The Examiner finds claim 32 recites additional elements “of a rotor connected to sensors; first and second communication circuitry for transferring data from sensors to a processor; and a processor for executing the steps.” Final Act. 4. The Examiner further finds that limitation [d][i] “of obtaining electrical signals from a sensor coupled to the rotor is insignificant, extra-solution activity in the form of mere data gathering.” *Id.* The Examiner also finds that the first and second communication circuitry and the processor are recited generically to perform generic functions such as data communication and information processing, respectively. *Id.* The Examiner concludes that “these additional elements do not integrate the

abstract idea into a practical application because they do not impose any meaningful limits on practicing the abstract idea.” *Id.* at 4–5.

In response, Appellant argues that,

Claim 32 limits the alleged abstract idea to the practical application of determining a time-domain waveform of divergences between operational values derived from sensed electrical signals from a rotor of an implantable pump and estimated operational values, and predicting a likelihood of a future cardiac event based on the time-domain waveform.

Appeal Br. 13. Appellant further contends “that claim 32 recites [additional] elements that clearly *improve* the capabilities of a medical system to predict a likelihood of a future cardiac event.” *Id.* (emphasis added); Reply Br. 7–8. According to Appellant, “[c]laim 32 recite[s] elements that describe a *specific way of improving* the capabilities of a medical system to predict a likelihood of a future cardiac event,” namely, “improvements to the diagnostic capabilities for predicting future cardiac event.” Appeal Br. 14 (emphasis added); Reply Br. 9 (citing *CardioNet, LLC v. InfoBionic, Inc.*, 955 F.3d 1358, 1368–69 (Fed. Cir. 2020)⁷ and *Thales Visionix Inc. v. United States*, 850 F.3d 1343, 1348–49 (Fed. Cir. 2017)⁸).

⁷ The Federal Circuit determined that “the claims ‘focus on a specific means or method that improves’ cardiac monitoring technology” because “the device more accurately detects the occurrence of atrial fibrillation and atrial flutter” and “it effectively avoids false positives and false negatives, respectively, in detecting these two conditions.”

⁸ The Federal Circuit determined that the claims “are not merely directed to the abstract idea of using ‘mathematical equations for determining the relative position of a moving object to a moving reference frame,’” but rather “are directed to systems and methods that *use inertial sensors in a non-conventional manner* to reduce errors in measuring the relative position

We are not persuaded by Appellant’s arguments because “Appellant is relying on the abstract idea itself (the mental process of summing divergence values; estimating operational values and predicting likelihoods of future events) as the practical application and not any additional elements beyond the abstract idea.” Ans. 9; *see id.* at 10. Here, the recited additional elements of claim 32 (beyond the abstract idea) are as follows:

- (1) “a rotor” (limitation [1][a]), but “the operation of the pump/rotor are not controlled or affected by the outcome of the calculations” (*see* Ans. 9);
- (2) “one or more sensors . . . to sense electrical signals” (limitation [1][b]), which are used for insignificant, extra-solution activity in the form of data gathering (*see* Final Act. 4);
- (3) “first communications circuitry” (limitation [1][c]) and “second communications circuitry” (limitations [2][b]), which are recited generically and perform the generic function of communicating data (*see* Final Act. 4);
- (4) “a memory” (limitation [2][a]), which is recited generically and performs the generic function of storing data and instructions (*see* Spec. para. 35);
- (5) “an input/output interface” (limitations [2][c] and [2][d][ix]), which is recited generically and performs the generic function of inputting and outputting data/information (*see* Spec. para. 34);

and orientation of a moving object on a moving reference frame” (emphasis added).

(6) “a processor” (limitation [2][d]), which is recited generically and performs generic computer functions (*see* Final Act. 4).

As such, the process steps set forth in claim 32 that people can perform mentally or by hand are set forth as being performed with generic components, such as, one or more sensors, first and second communication circuitry, a memory, an input/output interface, and a processor, and the Specification does not describe them in any *specific* manner. *See, e.g., Enfish, LLC v. Microsoft Corp.*, 822 F.3d 1327, 1335–36 (Fed. Cir. 2016) (distinguishing between “claims . . . directed to an improvement to computer functionality versus being directed to an abstract idea” or whether “the focus of the claims is 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.”).

In particular, we note that using a generic “processor” to perform the process steps set forth in claim 32 (limitations [2][d][i] through [2][d][ix]) is no more than mere instruction to implement an abstract idea on a generic computer, which fails to integrate the judicial exception into a practical application. *See* 2019 Guidance, 84 Fed. Reg. at 55, n.30 (citing MPEP § 2106.05(f)). The use of “one or more sensors” fails to integrate the judicial exception into a practical application because gathering data is insignificant, extra-solution activity (limitations [1][b] and [2][d][i]), and, moreover, Appellant’s claim 32 does not use a “sensor” in a non-conventional manner, as per *Thales Visionix* (*see* Reply Br. 9, 10). Similarly, the use of a generic “input/output device” to “output . . . a notification” likewise fails to integrate the judicial exception into a practical application because displaying data is insignificant extra-solution activity

(limitation [2][d][ix]). Claim 32 does not require any particular manner in which the “notification” is made. *See* 2019 Guidance, 84 Fed. Reg. at 55, n.31 (citing MPEP § 2106.05(g), which states that “[a]n example of post-solution activity is . . . a printer that is used to output a report.”).

We also find nothing in the Specification that the claimed invention effects a transformation or reduction of a particular article to a different state or thing. Nor do we find anything of record that attributes an *improvement* in technology and/or a technical field to the claimed invention or that otherwise indicates that the claimed invention integrates the abstract idea into a “practical application,” as that phrase is employed in the 2019 Guidance. The focus of claim 32, as a whole, does not purport to *improve* the claimed medical system, but merely uses generic elements as tools to perform the abstract idea of predicting the likelihood of a future cardiac event. *See* 2019 Guidance, 84 Fed. Reg. at 55. In contrast to *CardioNet*, where the Specification described multiple technological improvements, here, we find nothing in Appellant’s Specification that supports an *improvement* to the diagnostic technology used to predict future cardiac events. *See* Reply Br. 9. Appellant’s reliance on paragraph 55 of the Specification is untenable because “the divergence and summing operations . . . essentially function as a *filter* for the operation data” (emphasis added), and, thus, occur in the context of processing data *within* the abstract idea. *See id.* Moreover, filtering data is an abstract idea. *See BASCOM Glob. Internet Servs., Inc. v. AT&T Mobility LLC*, 827 F.3d 1341, 1348 (Fed. Cir. 2016) (“filtering content is an abstract idea because it is a longstanding, well-known method of organizing human behavior”).

We further agree with the Examiner that “[t]here is not a practical application of the abstract idea” because claim 32 “concludes with a data construct/output that is not used for any purpose or application.” Ans. 9. That is, as “the operation of the pump is not affected or controlled by the abstract idea,” the claimed “implantable pump” “is merely a particular technological environment/field of use for the abstract idea.” *Id.* at 11. Moreover, the Examiner is correct that “[a]ny benefits regarding monitoring of this particular parameter (blood flow rate) are moot given the claim does not require such a feature and is not solely limited to this embodiment.” *Id.* at 10.

As such, for the foregoing reasons, we determine that claim 32 of Appellant’s invention: (1) does not improve the functioning of a computer or other technology; (2) is not applied with any particular machine; (3) does not affect a transformation of a particular article to a different state; and (4) is not applied in any meaningful way beyond generally linking the use of the judicial exception to a particular technological environment. *See* MPEP § 2106.05(a)–(c), (g), (h). Therefore, we are not persuaded of error in the Examiner’s determination that independent claim 32 is directed to an abstract idea, and we find that the claimed additional elements do not integrate the abstract idea into a practical application. *See Alice*, 573 U.S. at 223–24 (“[W]holly generic computer implementation is not generally the sort of ‘additional featur[e]’ that provides any ‘practical assurance that the process is more than a drafting effort designed to monopolize the [abstract idea] itself.’”) (alterations in original) (quoting *Mayo*, 566 U.S. at 77).

Step 2B – Well-Understood, Routine, Conventional Activity

Having determined that claim 32 recites a judicial exception, and does not integrate that exception into a practical application, under *Step 2B* we determine whether the claims provide an inventive concept. *See* 2019 Guidance, 84 Fed. Reg. at 56. In particular, *Step 2B* determines whether claim 32 adds a specific limitation beyond the judicial exception that is not “well-understood, routine, conventional” in the field. *See id.* “The question of whether a claim element or combination of elements is well-understood, routine and conventional to a skilled artisan in the relevant field is a question of fact.” *Berkheimer v. HP Inc.*, 881 F.3d 1360, 1368 (Fed. Cir. 2018).

The Examiner finds that the additional elements of one or more sensors, first and second communication circuitry, and a processor, when considered alone and in combination amount to nothing more than insignificant, extra-solution activity and mere instructions to apply the exception using generic computer components, which “cannot provide an inventive concept.” *See* Final Act. 5; *see also* MPEP § 2106.05(d).

In response, Appellant argues that limitations [2][d][i] through [2][d][iii] of claim 32 “clearly limit the scope of claim 32 to a specific application of the alleged abstract idea on electrical signals from an implantable pump and does not have broad applicability across many fields of endeavor and does not merely recite an effect of the alleged.” Appeal Br. 15–16.

We are not persuaded by Appellant’s arguments because the recited one or more sensors, first and second communication circuitry, and processor are recited at a high level of generality such that in combination

with the abstract idea amounts to using a generic computer to implement the abstract idea, to merely limiting the abstract idea in a field of use/particular technology, and does not provide significantly more to the abstract idea. *See* Ans. 12. “The written description is particularly useful in determining what is well-known or conventional.” *Intellectual Ventures I LLC v. Symantec Corp.*, 838 F.3d 1307, 1317 (Fed. Cir. 2016). Here, the Specification does not indicate in any manner that the recited “one or more sensors,” first and second “communication circuitry,” and “processor” of claim 32 are anything other than *generic, off-the-shelf* components, which are used in a *conventional* manner to gather, transmit, and process/analyze data, respectively. *See, e.g.*, Spec. paras. 34 (“one or more sensors for detecting voltages on the pump coils”; pump “interface 250 may be an analog interface or a digital interface), 35 (“processor 210 may be any well-known processor, such as commercially available processors.”).

In particular, we agree with the Examiner that “an implantable pump with a rotor is a well-understood, routine and conventional structure in the art of cardiac assist devices.” Ans. 12. We find the Examiner’s reliance on the description of class 600, subclass 16 of the Class Schedule of the U.S. Patent and Trademark Office, to be sufficient evidence for establishing that “an implantable pump with a rotor” is well-understood, routine, and conventional. *Id.*; *see also* Reply Br. 11. Moreover, Appellant’s reliance on *BASCOM*, 827 F.3d at 1350,⁹ is misplaced because Appellant’s claim 32 is

⁹ The Federal Circuit determined that “its particular arrangement of elements is a technical improvement over prior art ways of filtering such content” because “[b]y taking a prior art filter solution (one-size-fits-all filter at the ISP server) and making it more dynamic and efficient (providing individualized filtering at the ISP server), the claimed invention represents a

not rooted in computer technology to improve performance of the computer itself. *See* Reply Br. 11.

We further agree with the Examiner that “the sensors for sensing electrical signals amount to the insignificant extra-solution activity of data gathering.” *Ans. 12; see also CyberSource*, 654 F.3d at 1370 (“[M]ere ‘[data-gathering] step[s] cannot make an otherwise nonstatutory claim statutory.’”) (quoting *In re Grams*, 888 F.2d 835, 840 (Fed. Cir. 1989)). We are not persuaded that *In re Abele*, 684 F.2d 902 (CCPA 1982), supports Appellant’s position. *See* Reply Br. 12 (“Similarly [to *Abele*], the alleged pre-solution data gathering elements recited in claim 32 are not mere antecedent steps to obtain necessary values for the alleged abstract idea.”). The Federal Circuit stated that “[i]n *Abele* . . . the algorithm served to improve the CAT-scan process.” *Grams*, 888 F.2d at 840 (emphasis added). In *Bilski*, 545 F.3d at 963, the Federal Circuit also discussed *Abele* and explained that “the transformation of that raw data into a particular visual depiction of a physical object on a display was sufficient to render that more narrowly-claimed process patent-eligible” (emphasis added). Thus, in *Abele*, the claims were eligible because they recited an improvement to a technical process and because they transformed raw data into a visual depiction of a physical object, whereas, in this case, Appellant does not persuasively identify any such technical improvement or transformation. “[S]imply appending conventional steps [using sensors to monitor the rotor rotor], specified at a high level of generality, to laws of nature, natural

‘software-based invention[] that improve[s] the performance of the computer system itself.’” *BASCOM*, 827 F.3d at 1350–51 (emphasis added).

phenomena, and abstract ideas cannot make those laws, phenomena, and ideas patentable.” *Mayo*, 566 U.S. at 82.

Accordingly, the additional elements of claim 32, considering all elements both individually and as an ordered combination, do not amount to significantly more than the abstract idea of predicting the likelihood of a future cardiac event. In other words, the additional elements of claim 32, both individually and as an ordered combination, are not *sufficient* to amount to significantly more than the abstract idea itself. Therefore, we conclude that none of the limitations of claim 32, viewed “both individually and as an ordered combination,” amount to significantly more than the judicial exception in order to sufficiently transform the nature of the claims into patent-eligible subject matter. *See Alice*, 573 U.S. at 217 (internal quotations omitted) (quoting *Mayo*, 566 U.S. at 77–78).

Lastly, we note MPEP § 2106.06 states that “examiners *may* use a streamlined eligibility analysis . . . when the eligibility of the claim is self-evident, *e.g.*, because the claim *clearly* improves a technology or computer functionality. However, if there is *doubt* as to whether the applicant is effectively seeking coverage for a judicial exception itself, the full eligibility analysis . . . should be conducted” (emphasis added). Thus, because employing a streamlined analysis is at the discretion of the Examiner depending on whether there is doubt that the eligibility of the claim is self-evident, we are not persuaded by Appellant’s arguments that “the Examiner erred by not conducting a streamlined eligibility analysis,” as per MPEP § 2106.06. *See Appeal Br.* 7–8.

In conclusion, for the reasons discussed *supra*, we sustain the rejection of claim 32 under the judicial exception to 35 U.S.C. § 101 as

directed to patent-ineligible subject matter. Claims 33–41 and 51 fall with claim 32.

Claims 42–50 and 52

Independent claim 42 recites “[a] non-transitory computer-readable data storage medium.” *See* Appeal Br. 21 (Claims App.). However, “the basic character of a process claim drawn to an abstract idea is not changed by claiming only its performance by computers, or by claiming the process embodied in program instructions on a computer readable medium.” *See CyberSource*, 654 F.3d at 1375–76 (citing *In re Abele*, 684 F.2d 902 (CCPA 1982)). The introduction of generic elements into an apparatus claim has been deemed insufficient by the Supreme Court to transform a patent-ineligible claim into one that is patent-eligible. *See Alice*, 573 U.S. at 222.

Appellant relies on the same unpersuasive arguments discussed *supra* in the rejection of independent claim 32. *See* Appeal Br. 17 (“Claim 42 recites similar elements and therefore recites eligible subject matter under the SME analysis for at least the same reasons as discussed above in Group 1.”); *see also* Final Act. 5 (“Independent claim 42 has the same issues highlighted above with respect to Claim 32.”).

Accordingly, for the foregoing reasons, we also sustain the rejection of independent claim 42, and its respective dependent claims 43–50 and 52 under the judicial exception to 35 U.S.C. § 101 as directed to patent-ineligible subject matter.

DECISION SUMMARY

In summary:

Claim(s) Rejected	35 U.S.C. §	Reference(s)/Basis	Affirmed	Reversed
32-52	101	Eligibility	32-52	

TIME PERIOD FOR RESPONSE

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

AFFIRMED