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UNITED STATES PATENT AND TRADEMARK OFFICE

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BEFORE THE PATENT TRIAL AND APPEAL BOARD

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*Ex parte* DOUGLAS FIELDBINDER,  
ERIC WAYDICK, and ISSA V. DRAME

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Appeal 2019-000987  
Application 14/263,565  
Technology Center 2800

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Before MICHAEL P. COLAIANNI, MICHAEL G. McMANUS, and  
MERRELL C. CASHION, JR., *Administrative Patent Judges*.

CASHION, *Administrative Patent Judge*.

DECISION ON APPEAL

STATEMENT OF THE CASE

Pursuant to 35 U.S.C. § 134(a), Appellant<sup>1</sup> appeals from the Examiner's decision to reject claims 1–17 under 35 U.S.C. § 101 as directed to patent-ineligible subject matter.<sup>2</sup> We have jurisdiction under

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<sup>1</sup> We use the word Appellant to refer to “applicant” as defined in 37 C.F.R. § 1.42(a). Appellant identifies the real party in interest as Rockwell Automation Technologies, Inc. Appeal Brief (“Appeal Br.”) filed June 11, 2018, p. 2.

<sup>2</sup> The Examiner has withdrawn the rejections of claims 1–32 under 35 U.S.C. § 112(a) and of claims 18–32 under 35 U.S.C. § 101, leaving the rejection of claims 1–17 under 35 U.S.C. § 101 as the sole rejection

35 U.S.C. § 6(b).

We AFFIRM.

### CLAIMED SUBJECT MATTER<sup>3</sup>

The invention relates to calculating line-to-neutral voltage without a connection to a system neutral or earth ground. Spec. ¶ 1. The Specification discloses that three-phase power systems can supply power to three-phase loads, such as motors, where the loads are balanced under normal operating conditions and do not require a neutral connection. *Id.* ¶ 2. The Specification further discloses that a grounding conductor is run with power conductors to a load for safety reasons. *Id.* ¶ 3. According to the Specification, “[t]he safety ground is often nearly the same potential as the neutral, however, when current flows in the neutral, voltage drop from the load to the neutral to ground connection, which is usually at a three-phase power source for a system, can be substantial.” *Id.* The Specification also discloses that determining line-to-neutral voltage by simply measuring line-to-ground at a load voltage between a neutral and a safety ground can be inaccurate, especially under fault conditions. *Id.* When it comes to three-phase power systems that are isolated from a grounded structure (that is, ungrounded systems that do not have a neutral available), the Specification discloses that having a line-to-neutral voltage available for loads with no available neutral connection is desirable for safety reasons. *Id.* ¶ 4. The invention provides a

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remaining against the pending claims. Examiner’s Answer (“Ans.”) dated September 19, 2018, p. 3.

<sup>3</sup> Our Decision additionally refers to the Specification (“Spec.”) filed April 28, 2014 and the Non-Final Office Action (“Non-Final Act.”) dated December 26, 2017. Appellant did not file a Reply Brief.

method, an apparatus, and a computer program product (computer readable storage medium) for determining a voltage, including measuring three line-to-line voltages for the phases in a three-phase power system, where each line-to-line voltage includes a voltage magnitude. *Id.* ¶ 5.

Claim 1, reproduced below from the Claims Appendix to the Appeal Brief, is illustrative of the claimed subject matter (formatting added):

1. A method for determining voltage, the method comprising:
  - measuring three line-to-line voltages for the phases in a three-phase power system, each line-to-line voltage comprising a voltage magnitude;
  - constructing on a two-dimensional coordinate system with an origin, a phasor triangle comprising the three line-to-line voltages represented as phasors, wherein a first phasor  $V_{ab}$  originates at a first point and extends in a direction along a horizontal axis of the coordinate system to the origin, a second phasor  $V_{bc}$  extends between the origin and a second point, the second point in a direction vertically and horizontally from the origin, and a third phasor  $V_{ca}$  extends between the second point and the first point, the origin comprising a first vertex of the phasor triangle, the first point comprising a second vertex of the phasor triangle and the second point comprising a third vertex of the phasor triangle;
  - adding a first line segment that extends from a point that bisects the second phasor  $V_{bc}$  in a direction perpendicular to the second phasor  $V_{bc}$  and away from the phasor triangle, the first line segment terminating at a third point;
  - adding a second line segment that extends from a point that bisects the third phasor  $V_{ca}$  in a direction perpendicular to the third phasor  $V_{ca}$  and away from the phasor triangle, the second line segment terminating at a fourth point;
  - adding a third line segment from the third point to the first point;
  - adding a fourth line segment from the fourth point to the origin, wherein the third line segment intersects the fourth line segment at a neutral point;

determining a line-to-neutral voltage, the line-to-neutral voltage comprising a line from the neutral point to one of the first vertex of the phasor triangle, the second vertex of the phasor triangle, and the third vertex of the phasor triangle; and  
reporting the line-to-neutral voltage.

#### OPINION

The Examiner maintains the rejection of claims 1–17 under 35 U.S.C. § 101 as directed to patent-ineligible subject matter. Non-Final Act. 4–6.

We review the appealed rejection for error based upon the issues identified by Appellant and in light of the arguments and evidence produced thereon. 37 C.F.R. § 41.37(c)(1)(iv); *Ex parte Frye*, 94 USPQ2d 1072, 1075 (BPAI 2010) (precedential), *cited with approval in In re Jung*, 637 F.3d 1356, 1365 (Fed. Cir. 2011) (explaining that even if the Examiner had failed to make a prima facie case, “it has long been the Board’s practice to require an applicant to identify the alleged error in the examiner’s rejections”).

After considering the argued claims relative to case law presented in this Appeal and each of Appellant’s arguments, we are not persuaded that Appellant identifies reversible error. Thus, we affirm the Examiner’s rejection for the reasons expressed in the Non-Final Office Action and the Answer. We add the following primarily for emphasis.

Appellant presents arguments for claim 1 and does not present separate arguments for claims 2–17. Appeal Br. 19. Accordingly, we select independent claim 1 as representative of the subject matter claimed. In accordance with 37 C.F.R. § 41.37(c)(1)(iv), dependent claims 2–17 stand or fall with claim 1.

The Examiner identifies the abstract idea of a mathematical concept and a mental process for calculating a line-to-neutral voltage as the judicial exception recited in claim 1. Non-Final Act. 4–6. The Examiner further finds that the additional elements/steps of measuring three line-to-line voltages for the phases in a three-phase power system, each line-to-line voltage comprising a voltage magnitude and reporting the line-to-neutral voltage do not add significantly more to this abstract idea because these elements/steps are, respectively, an insignificant extra solution activity of data gathering and a post-solution activity. *Id.* at 6. In addition, the Examiner finds that the claims implement the abstract idea on a conventional three- phase power system and computer which does not amount to significantly more than the abstract idea. *Id.*

Appellant raises a number of arguments with regard to this rejection that we address throughout the opinion. Appeal Br. 11–18.

### *Legal Framework*

An invention is patent eligible if it claims a “new and useful process, machine, manufacture, or composition of matter.” 35 U.S.C. § 101. However, the Supreme Court has long interpreted 35 U.S.C. § 101 to include implicit exceptions: “[l]aws of nature, natural phenomena, and abstract ideas” are not patentable. *E.g., Alice Corp. v. CLS Bank Int’l*, 573 U.S. 208, 216 (2014).

In determining whether a claim falls within an excluded category, our inquiry focuses on the Supreme Court’s two-step framework, described in *Mayo* and *Alice*. *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.” *See Alice*, 573 U.S. at 219 (“On their face, the claims before us are drawn to the concept of intermediated settlement, *i.e.*, the use of a third party to mitigate settlement risk.”); *see also Bilski v. Kappos*, 561 U.S. 593, 611 (2010) (“Claims 1 and 4 in petitioners’ application explain the basic concept of hedging, or protecting against risk.”).

Concepts determined to be abstract ideas, and thus patent ineligible, include certain methods of organizing human activity, such as fundamental economic practices (*Alice*, 573 U.S. at 219–20; *Bilski*, 561 U.S. at 611); mathematical concepts (*Flook*, 437 U.S. at 594–95); 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))).

In *Diehr*, the claim at issue recited a mathematical formula, but the Supreme Court held that “a claim drawn to subject matter otherwise statutory does not become nonstatutory simply because it uses a mathematical formula.” *Diehr*, 450 U.S. at 187; *see also id.* at 191 (“We view respondents’ claims as nothing more than a process for molding rubber products and not as an attempt to patent a mathematical formula.”). Having said that, the Supreme Court also indicated that a claim “seeking patent protection for that formula in the abstract . . . is not accorded the protection of our patent laws, and this principle cannot be circumvented by attempting

to limit the use of the formula to a particular technological environment.” *Id.* (citing *Benson* and *Flook*); *see, e.g., id.* at 187 (“It is now commonplace that an *application* of a law of nature or mathematical formula to a known structure or process may well be deserving of patent protection.”).

If the claim is “directed to” an abstract idea, we turn to the second step of the *Alice* and *Mayo* framework, where “we must examine the elements of the claim to determine whether it contains an ‘inventive concept’ sufficient to ‘transform’ the claimed abstract idea into a patent-eligible application.” *Alice*, 573 U.S. at 221 (quotation marks omitted). “A claim that recites an abstract idea must include ‘additional features’ to ensure ‘that the [claim] is more than a drafting effort designed to monopolize the [abstract idea].’” *Id.* (quoting *Mayo*, 566 U.S. at 77). “[M]erely requir[ing] generic computer implementation[] fail[s] to transform that abstract idea into a patent-eligible invention.” *Id.*

The Office recently published revised guidance on the application of § 101. USPTO’s January 7, 2019 Memorandum, *2019 Revised Patent Subject Matter Eligibility Guidance* (“Memorandum”), 84 Fed. Reg. 50.<sup>4</sup> 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* MPEP § 2106.05(a)–(c), (e)–(h)).

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<sup>4</sup> We recognize that the Memorandum was not available to the Examiner and Appellant during the prosecution of the instant Application.

Only if a claim recites a judicial exception and 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 generally* Memorandum.

### *Analysis*

#### *Claims 1–17*

##### *Determination of Claims’ Statutory Category*

Before any consideration as to whether a claim 1 is directed to a patent-ineligible subject matter, such as an abstract idea, we must first determine if the claim falls under a statutory category, a “new and useful process, machine, manufacture, or composition of matter.” 35 U.S.C. § 101.

There is no dispute between Appellant and the Examiner that claim 1 falls under a statutory category under 35 U.S.C. § 101. *See generally* Appeal Br.; *see generally* Non-Final Act. For completeness, we note that independent claim 1 is a method claim falling under the statutory category of a “process.”

Having established that the claim falls in a statutory category, we now follow the Memorandum to analyze claim 1 to determine if they are directed to a patent-ineligible subject matter.

*Determination of Patent Subject Matter Eligibility*

Applying the guidance set forth in the Memorandum, we conclude that claims 1–17 do not recite patent-eligible subject matter.

*Revised Step 2A, Prong One—Directed to a Judicial Exception*

The Memorandum instructs us first to determine whether each claim recites any judicial exception to patent eligibility. 84 Fed. Reg. at 54. The Memorandum identifies three judicially-excepted groupings: (1) mathematical concepts, (2) certain methods of organizing human activity such as fundamental economic practices, and (3) mental processes. *Id.* at 52. The Examiner finds claim 1 recites a mathematical relationship for calculating a line-to-neutral voltage and a mental process. Non-Final Act. 4–6.

Claim 1 recites a method for determining a line-to-neutral voltage by measuring three line-to-line voltages for the phases in a three-phase power system and using trigonometric functions to construct a phasor triangle comprising the measured voltages represented as phasors on a two-dimensional coordinate system with an origin, wherein each phasor originates from a specific point and extends to the origin in a specific orientation. The method further adds line segments to determine a neutral point from which to determine a line-to-neutral voltage. This method recites the abstract ideas of a mathematical concepts and a mental process, wherein the measuring step merely provides information used to construct the phasor triangle that will be used in the determining the calculated values for the line-to-neutral voltage.

*The step of measuring the three line-to-line voltages for a three-phase power system* is recited at a high level of generalization and merely provides

information to be used in the process. Providing information is a step that can be performed in the human mind. As such, this measuring step is a mental step directed to a mental process.

*The step of constructing the phasor triangle* relies on the measured line-to-line voltages as phasors for its construction on a two-dimensional coordinate system that includes the positional arrangement, based on the dimensional x, y coordinates, of the first, second, and third phasors, first and second points, and first, second and third vertexes that further defines the phasor triangle. Spec. ¶¶ 7–11; Application Figures 3–10. The step of constructing the phasor triangle is also recited at a high level of generalization and merely involves creation of a geometric platform (schematic) for subsequent trigonometric functions. *See* Application Figures 3–10. As illustrated, creation of a geometric platform (schematic) is a step that can be performed in the human mind. As such, this measuring step is a mental step directed to a mental process.

In addition, the Specification describes that this step involves mathematical operations to calculate the coordinates for the first and second points using equations including the magnitudes of first, second and third phasors. Spec. ¶¶ 8, 10. Therefore, the step of constructing the phasor triangle also performs and sets forth a mathematical concept.

The claim further recites a *third and fourth points as well as a neutral point* that, like the first and second points, further define the framework of the phasor triangle and are also directed to a mental processes and mathematical concepts for the reasons given above. *See* Spec. ¶ 12.

The various *steps of adding first, second, third and fourth line segments* further defines the framework of the phasor triangle to determine

the line-to-neutral voltage. This step is also recited at a high level of generalization. Addition of line segments to arrive at a trigonometric solution is a step that can be performed in the human mind. As such, this measuring step is a mental step directed to a mental process.

In addition, the Specification describes mathematical operations to calculate the lengths of the first and second line segments using equations including the magnitudes of the second and third phasors. Spec. ¶ 9. Therefore, the steps of adding the first and second line segments also perform and set forth a mathematical concept.

*The step of determining a line-to-neutral voltage* relies on adding a line through the vertexes generated from the earlier steps. The Specification discloses that the line-to-neutral is determined by obtaining a line-to-neutral voltage for phasor V for each phase of the three phases which includes determining a line from the neutral point to the origin, the first point, and the second point. Spec. ¶ 16. The Specification further discloses that the magnitude of each phasor is determined according to equations related to a number of specific two dimensional coordinates. *Id.* Therefore, this step is also directed to mental processes and mathematical concepts for the reasons given above.

*The step of reporting the line-to-neutral voltage* is recited at a high level of generalization and merely presents information. Presenting information is a step that can be performed in the human mind. As such, this reporting step is a mental step directed to a mental process.

As the Examiner indicates, Appellant’s method of claim 1 is similar to *Digitech’s*<sup>5</sup> concept of organizing information through mathematical correlations, which is recognized as an abstract idea. Non-Final Act. 4–5; Ans. 6.

In *Digitech*, the Federal Circuit summarized the latter issue in the following way:

As noted by the Supreme Court, “an *application* of a law of nature or mathematical formula to a known structure or process may well be deserving of patent protection.” *Diamond v. Diehr*, 450 U.S. 175, 187, 101 S.Ct. 1048, 67 L.Ed.2d 155 (1981). A claim may be eligible if it includes additional inventive features such that the claim scope does not solely capture the abstract idea. *Alice Corp.*, 573 U.S. —, 134 S.Ct. 2347. But a claim reciting an abstract idea does not become eligible “merely by adding the words ‘apply it.’” *Bancorp Servs., LLC v. Sun Life Assurance Co. of Can. (U.S.)*, 687 F.3d 1266, 1276 (Fed.Cir.2012).

*Digitech*, 758 F.3d at 1350 (Fed. Cir. 2014). The Federal Circuit further stated:

Without additional limitations, a process that employs mathematical algorithms to manipulate existing information to generate additional information is not patent eligible. “If a claim is directed essentially to a method of calculating, using a mathematical formula, even if the solution is for a specific purpose, the claimed method is nonstatutory.” *Parker v. Flook*, 437 U.S. 584, 595, 98 S.Ct. 2522, 57 L.Ed.2d 451 (1978) (internal quotations omitted).

*Id.* at 1351.

Accordingly, applying the guidance in the Memorandum, we conclude that claim 1 recites an abstract idea, i.e., a mental process and a

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<sup>5</sup> *Digitech Image Techs., LLC v. Elecs. for Imaging, Inc.*, 758 F.3d 1344

mathematical concept, and thus recites a judicial exception for the reasons the Examiner presents and we give above.

*Revised Step 2A, Prong Two – Practical Application*<sup>6</sup>

Having determined that claim 1 recites the abstract concepts of a mental process and mathematical concept, we next look to determine whether the claims recite “additional elements that integrate the [judicial] exception into a practical application.” MPEP § 2106.05(a)–(c), (e)–(h); Memorandum, 84 F.3d at 53–54. Integration into a practical application 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 judicial exception.” Memorandum, 84 Fed. Reg. at 53–54; *see also id.* at 55 (setting forth exemplary considerations indicative that an additional element or combination of elements may have integrated the judicial exception into a practical application).

Appellant argues that the claimed invention, when viewed as an ordered combination, provides a specific improvement to the ability to determine line-to-neutral voltages in an unbalanced three-phase system where only line-to-line measurements may not be available. Appeal Br. 12 (citing Spec. ¶¶ 2–4). Thus, Appellant contends that the subject matter of claim 1 does not recite an abstract idea similar to the ideas in *Digitech. Id.* at

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<sup>6</sup> We acknowledge that some of these considerations may be properly evaluated under Step 2 of *Alice* (Step 2B of Office Memorandum). Solely for purposes of maintaining consistent treatment within the Office, we evaluate it under Step 1 of *Alice* (Step 2A of Office Memorandum). *See generally* Memorandum, 84 Fed. Reg. 50.

13. According to Appellant, the claimed invention improves voltage measurement technology by using a trigonometric solution to provide a quicker method of determining line-to-neutral voltages, which aids in situations where time is of the essence, such as fault analysis using in circuit breaker coordination, fault isolation, protective relaying and the like. *Id.* at 12 (citing Spec. ¶¶ 3, 77). Thus, Appellant contends that, similar to the claims in *Enfish, LLC v. Microsoft Corp.*, 822 F.3d 1327 (Fed. Cir. 2016), the claimed invention is not merely directed to mathematical equations, but instead provides a real-world line-to-neutral value that has been tested to show that the determined line-to-neutral values are very close to actual line-to-neutral values. *Id.* at 11, 12 (citing Spec. ¶¶ 95–97, Tables 1–5, Figures 13–14). Appellant also argues that the claimed invention, like the eligible claims in *Classen Immunotherapies, Inc. v. Biogen IDEC*, 659 F.3d 1057 (Fed. Cir. 2011) and unlike the claims in *Digitech*, is not directed merely to organizing, storing, and transmitting information, but to practical steps to produce accurate line-to-neutral voltages where a neutral voltage may not be measurable or measurement of a neutral voltage is not desired. Appeal Br. 13–14. Appellant further points to *Klaustech, Inc. v. AdMob, Inc.*, 2015 WL 10791915 (N.D. Cal. 2015), and *McRO, Inc. v. Bandai Namco Games Am. Inc.*, 837 F.3d 1299 (Fed. Cir. 2016), in support of the subject matter eligibility of the claimed invention. *Id.* at 14–15.

The premise of Appellant’s arguments is that the use of a trigonometric solution that provides a quicker method of determining line-to-neutral voltages improves the operation of a computer<sup>7</sup> (Appeal Br. 11–12

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<sup>7</sup> The subject matter of claim 1 does not specifically recite a tool, computer, or processor. However, the Specification discloses that the invention relies

(citing *Enfish*)) and provides practical steps to produce accurate line-to-neutral voltages where a neutral voltage may not be measurable or measurement of a neutral voltage is not desired (*id.* at 13–14 (citing *Classen*)).

Appellant’s arguments do not point to reversible error in the Examiner’s determination that the subject matter of claim 1 is directed to a judicial exception.

The subject matter of *Enfish* is directed to “a specific type of data structure designed to improve the way a computer stores and retrieves data in memory.” *Enfish*, 822 F.3d at 1339. The Federal Circuit concluded that the claims in *Enfish* were not directed to an abstract idea because “the plain focus of the claims is on an improvement to computer functionality itself, not on economic or other tasks for which a computer is used in its ordinary capacity.” *Id.* at 1336.

In this case, Appellant directs attention to paragraphs 2–4, 77, and 95–97 of the Specification to assert a disclosure that claim 1 is directed to an improvement to computer functionality itself like *Enfish*. Appeal Br. 12. According to Appellant, the cited portions of the Specification disclose that the invention “provide[s] an improvement to the ability in an unbalanced three-phase system to determine line-to-neutral voltages where only line-to-line measurements may not be available.” *Id.* Appellant asserts that a “trigonometric solution provides a quicker method of determining line-to-neutral voltages, which aids in situations where time is of the essence, such as fault analysis using in circuit breaker coordination, fault isolation,

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on processors/modules and a computer program product to carry out the claimed method. Spec. ¶¶ 22–23.

protective relaying and the like.” *Id.* However, we agree with the Examiner that the portions of the Specification relied upon to assert an improvement to computer functionality do not mention such an improvement. Ans. 6–7. Nor does Appellant explain how the use of a trigonometric solution improves computer functionality so as to improve voltage measurement technology.

In *Classen*, the Court held that, although the analysis step was an abstract mental process that collected and compared known information, the *immunization step* was meaningful in that it integrated the results of the analysis into a specific and tangible method that resulted in the method “moving from the abstract scientific principle to [the] specific application.” MPEP § 2106(e) (citing *Classen*, 659 F.3d at 1066–68).

While Appellant contends that any collection or comparison of information made in the claimed invention is not used merely to understand a principle as in *Classen*, we agree with the Examiner’s determination that claim 1 does not set forth a further action that moves the claim into a specific application of the calculated line-to-neutral voltage. Ans. 7–9. Nor does Appellant explain how the determination of a line-to-neutral voltage results in a specific and tangible method that moves from the abstract scientific principle of a trigonometric solution to the specific application.

Appellant argues that the claim is not directed to human activity, such as hedging, but to subject matter that produces a line-to-neutral voltage although certain steps relating to the recited invention may be duplicated on paper. Appeal Br. 14. We understand this argument as directed to the Examiner’s determination that the claim is directed to a mental process. *See* Non-Final Act. 5–6.

We find this argument unavailing in view of Appellant's acknowledgement that certain claim steps may be duplicated on paper. The argument does not address the Examiner's determination that the claim includes mental processes.

Here, the steps recited in claim 1 employ geometric and trigonometric mathematical operations but recite these steps with a high level of generality that, when considered individually and as an ordered combination, do not provide additional limitations beyond the abstract idea sufficient to transform the subject matter into a patent-eligible application. Although Appellant asserts the method of claim 1 provides an improvement or advantage for a specific purpose, it appears that claim 1 would essentially capture the abstract idea it is directed to, which the Supreme Court and Federal Circuit have cautioned against.

Therefore, after considering Appellant's arguments and all case laws relied upon, Appellant has not identified reversible error.

While Appellant asserts an improvement to the functioning of a computer (Appeal Br. 11–12), independent claim 1 does not recite any additional elements, such as a computer or processor, nor does Appellant point to any additional elements in the claim. In addition, the Specification does not describe the asserted improvement nor does Appellant direct us to any portion of the Specification that describes the asserted improvement. Instead, Appellant argues that the claimed invention recites a novel approach using a trigonometric solution that improves the technology or technical field of voltage metering over prior art methods that rely on sines and cosines or the “square root of three,” particularly for unbalanced systems. Appeal Br. 15 (citing Spec. ¶ 67), 16 (citing Spec. ¶ 77). According to

Appellant, the claimed invention is computationally simple when compared to other methods that use sine and cosine functions. Appeal Br. 16.

However, Appellant does not explain how the use of equations that are computationally simple improves the functionality of a computer such that the computer is used in other than “its ordinary capacity.” *Enfish*, 822 F.3d at 1336.

Therefore, we find that claim 1 does not integrate the judicial exception into a practical application.

Accordingly, we conclude, as did the Examiner, that claim 1 recites a judicial exception, i.e., the abstract ideas of a mental process and a mathematical concept, and does not integrate this judicial exception into a practical application.

*Step 2 B–Inventive Concept*

Because we determine that claim 1 recites an abstract idea and does not include additional elements that integrate the abstract idea into a practical application, we look to whether the claim provides an inventive concept, i.e., adds a specific limitation beyond the judicial exception that is not “well-understood, routine, conventional” in the field. Memorandum, 84 Fed. Reg. at 56.

As we indicated previously, independent claim 1 does not recite any additional elements, such as a computer or processor, nor does Appellant point to any additional elements in the claim. In addition, the Specification discloses that the method can be practiced using a general purpose computer. Spec. ¶ 55. Thus, even if a computer or processor would have been recited in the claim, it would not add a specific limitation beyond the judicial

exception that is not “well-understood, routine, conventional” in the field, taken individually or as an ordered combination with the claimed steps.

Appellant asserts that the claimed invention is most similar to the invention of *Diehr* because Appellant is not patenting the various trigonometric equations recited in the claims, but instead seeks to patent a method of measuring line-to-line voltages and then determining line-to-neutral voltages in a three-phase power system that may be unbalanced and does not have a neutral available for measurement. Appeal Br. 16.

This argument lacks persuasive merit.

As we discussed previously, the Supreme Court in *Diehr* 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.” *Diehr*, 450 U.S. at 176, 187, 191.

We agree with the Examiner that claim 1 preempts any use of the abstract idea because it is directed to using mathematical equations to calculate a line-to-neutral voltages and the calculated line-to-neutral voltages are not used in a tangible application/process as in *Diehr*. Ans. 13.

Accordingly, the instant claims preempt any use of the abstract idea.

Appellant has not argued adequately otherwise.

Appellant also argues that the claimed invention, like the invention in *Amdocs Ltd. v. Openet Telecom, Inc.*, 841 F.3d 1288 (Fed. Cir. 2016), uses a trigonometric method to derive accurate line-to-neutral voltages from line-to-line voltages in a manner that is unconventional. Appeal Br. 17. Appellant further argues that there is no evidence that this method or anything similar has been used for voltage measurement and, therefore, the claimed invention

solves a technology-based problem in an unconventional manner when viewed as a whole and the unconventionality of the claimed solution indicates the presence of an “inventive concept” amounting to “significantly more” than an abstract idea itself. *Id.*

These arguments are also unavailing for the reasons the Examiner presents. Ans. 14.

In *Amdocs*, the Federal Circuit found the representative claim to entail an unconventional technological solution to a problem and was “narrowly drawn to not preempt any and all generic enhancement of data in a similar system.” *Amdocs*, 841 F.3d 1288, 1300–1301. The Examiner cites to Fu<sup>8</sup> as evidence that it is known to determine line-to-neutral voltages where line-to-neutral measurements may not be available. Ans. 4 (citing Fu ¶¶ 1, 6). Moreover, Fu illustrates the use of equations in combination with geometrical/trigonometrical functions to determine this variable. Fu Figure 2, ¶¶ 22–24. In view of this, Appellant has not explained adequately how the claimed method to derive accurate line-to-neutral voltages from line-to-line voltages using geometric/trigonometric functions is unconventional. Appeal Br. 17. Nor has Appellant explained adequately how the claimed invention is “narrowly drawn to not preempt any and all” applications of the trigonometric equations.

We also disagree with Appellant’s argument that the lack of a novelty or obviousness rejection is evidence that the claimed invention is not directed to an abstract idea and recite significantly more than the alleged

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<sup>8</sup> US 2005/0207198 A1, published September 22, 2005.

abstract idea. Appeal Br. 16. We note that the mere fact an abstract idea is novel or non-obvious does not render the subject matter eligible under § 101.

In response to an argument that a claim contained an inventive concept because it was not shown to be anticipated under § 102 or obvious under § 103, the Federal Circuit has stated:

[t]hat position misstates the law. It is true that “the § 101 patent-eligibility inquiry and, say, the § 102 novelty inquiry might sometimes overlap.” *Mayo*, 132 S. Ct. at 1304. But, a claim for a *new* abstract idea is still an abstract idea. The search for a § 101 inventive concept is thus distinct from demonstrating § 102 novelty.

*Synopsys, Inc. v. Mentor Graphics Corp.*, 839 F.3d 1138, 1151 (Fed. Cir. 2016).

Therefore, we find no element or ordered combination of elements recited in claim 17 contains any “inventive concept” or adds anything “significantly more” to transform the abstract concept (i.e., mental processes and mathematical concepts) into a patent-eligible application.

Accordingly, we conclude that method claims 1–17 are directed to patent-ineligible subject matter under 35 U.S.C. § 101. They ensnare the abstract ideas of a mental process and mathematical concept for determining a line-to-neutral voltage and do not recite additional elements, individually or as an ordered combination, that integrate this mental process and mathematical concept into a practical application.

#### CONCLUSION

Upon consideration of the record, and for the reasons given above and in the Non-Final Office Action and the Examiner’s Answer, the decision of the Examiner rejecting claims 1–17 under 35 U.S.C. § 101 as directed to patent ineligible subject matter is *affirmed*.

DECISION SUMMARY

In summary:

<b>Claims Rejected</b>	<b>35 U.S.C. §</b>	<b>Reference(s)/Basis</b>	<b>Affirmed</b>	<b>Reversed</b>
1-17	101	Ineligible subject matter	1-17	

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