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UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

Ex parte JIN-SYUNG CHEN, PEI-CHIN LIN, OSAMU NISHIMANIWA,
KATSUSHI SUZUKI, LAI-PHENG GAN, JUI-KANG CHIANG, and
CHIN-YIN LEE

Appeal 2018-004575
Application 14/555,844
Technology Center 2800

Before DONNA M. PRAISS, JULIA HEANEY, and
JENNIFER R. GUPTA, *Administrative Patent Judges*.

PRAISS, *Administrative Patent Judge*.

DECISION ON APPEAL¹

STATEMENT OF THE CASE

Appellant² seeks our review under 35 U.S.C. § 134(a) from the non-final rejection of claims 1–16 and 18–20. We have jurisdiction under 35 U.S.C. § 6(b).

We AFFIRM.

¹ In this Opinion, we refer to the Specification filed Nov. 28, 2014 (“Spec.”), the Non-Final Office Action entered Nov. 4, 2016 (“Non-Final Act.”), the Appeal Brief filed Dec. 4, 2017 (“App. Br.”), the Examiner’s Answer entered Jan. 26, 2018 (“Ans.”), and the Reply Brief filed Mar. 26, 2018 (“Reply Br.”).

² Applicant UKC Electronics (H.K.) Co., Limited is the Appellant and also identified in the Brief as the real party in interest. App. Br. 1.

THE INVENTION

The invention relates to a solar power generation monitoring method that instantly monitors power generation loss of a solar cell array.

Spec. 1:14–17. According to the Specification, the goal is to monitor a power generation efficiency of a solar cell module on a long-term basis and to provide reference information about whether or not the module has deteriorated. *Id.* at 6:10–12. Claim 1 is illustrative, and is reproduced below from the Claims Appendix to the Appeal Brief:

1. A method for monitoring solar power generation, comprising:

determining the value of a DC power meter;

calculating, by a computer based solar power generating system, a cable loss based on difference in numerical values between DC power meters in a solar power generation system comprising a solar cell array and a plurality of sensors or based on wire resistance and the numerical value of the DC power meter, the cable loss being a power loss that occurs from the solar cell array to an inverter;

calculating, by the computer based solar power generating system, a maximum power point tracking loss based on difference in numerical values between the DC power meter and a voltage-current measuring device in the solar power generation system or based on a numerical value of an actinometer and a numerical value of the DC power meter in the solar power generation system;

calculating an inverter loss based on difference in numerical values between the DC power meter and an AC power meter;

calculating a system output coefficient;

determining module temperature loss based on a rated output power of the solar cell array, a temperature coefficient of the solar cell array, a numerical value of the voltage-current measuring device, a numerical value of the actinometer, a

numerical value of a thermometer and a numerical value of the AC power meter;

determining module loss based on the cable loss, the maximum power point tracking loss, the inverter loss, the system output coefficient and the module temperature loss; and

displaying and monitoring, on the computer based solar power generating system, the cable loss, the maximum power point tracking loss, the inverter loss, the module temperature loss and the module loss.

App. Br. 18 (Claims Appendix).

THE REJECTION

The Examiner maintains and Appellant appeals the rejection of claims 1–16 and 18–20 under 35 U.S.C. § 101 as being directed to non-statutory subject matter.³ Ans. 2; App. Br. 5.

ANALYSIS

Appellant argues the claims as a group. App. Br. 5–10. We select claim 1 as the representative claim for this group, and the remaining claims stand or fall with claim 1. 37 C.F.R. § 41.37(c)(1)(iv).

Alice Corp. Pty. Ltd. v. CLS Bank International, 134 S. Ct. 2347 (2014), identifies a two-step framework for determining whether claimed subject matter is judicially excepted from patent eligibility under § 101.

According to *Alice* step one, “[w]e must first determine whether the claims at issue are directed to a patent-ineligible concept,” such as an abstract idea. *Alice*, 134 S. Ct. at 2355.

³ The rejections of claims 1–16 and 18–20 under 35 U.S.C. § 103 stand withdrawn. Ans. 2–3.

In that regard, the Examiner determines that the claims are directed to an abstract idea because the steps of calculating a cable loss, calculating a maximum power point tracking loss, calculating an inverter loss, calculating a system output coefficient, determining module temperature loss, and determining module loss amount to organizing information through mathematical correlations, implementing a principle, algorithm, or mathematical formula known in the art, and obtaining and comparing intangible data. Non-Final Act. 10 (citing *Parker v. Flook*, 437 U.S. 584 (1978); *Digitech Image Tech., LLC v Electronics for Imaging, Inc.*, 758 F.3d 1344 (Fed. Cir. 2014); *CyberSource Corp. v. Retail Decisions, Inc.*, 654 F.3d 1366 (Fed. Cir. 2011)). The Examiner finds that the calculating steps, which are based on differences in numerical values, recite the mathematical concept of subtraction and that the subsequent “displaying” limitation is post solution activity in order for the result of the abstract idea, i.e., the results of the calculations, to be useful. Ans. 4. The Examiner also finds that the claim language does not reflect an improvement in the field of solar module power monitoring nor does it disclose an improvement to the functioning of the claimed computer itself. *Id.* (citing *Enfish LLC v. Microsoft Corp.*, 822 F.3d 1327 (Fed. Cir. 2016); *McRO, Inc. v. Bandai Namco Games America Inc.*, 837 F.3d 1299 (Fed. Cir. 2016)).

Appellant contends that the Examiner erred in applying the first step to conclude that claim 1 is directed to an abstract idea. App. Br. 5–8. According to Appellant, the Examiner erred because the claim “also recite[s] interactivity with a user (the displaying element) which is further evidence that the claims are not directed to any abstract idea.” *Id.* at 7. Appellant contends that “[t]here is no mathematical relationship recited in Claim 1, nor

are the features provided in Claim 1 capable of being performed by human analog.” *Id.* at 8. Appellant also asserts that “[t]he elements of Claim 1 clearly relate to improvement in a technology.” *Id.* at 7.

In the Reply Brief, Appellant contends that the pending claims are like those of *Core Wireless Licensing S.A.R.L. v. LG Electronics, Inc.*, 880 F.3d 1356 (Fed. Cir. 2018), because they “are directed to a particular manner of summarizing and presenting information to a user of the computer based solar power generating system.” Reply Br. 2. In this regard, Appellant relies on the “displaying” limitation in claim 1 “that displays the various calculated values” which Appellant asserts is displayed in a “unique combination of calculated parameters for solar power generation” and distinct from conventional user interface methods. *Id.* Appellant also asserts that the claims recite calculations like the representative claim found to be patent eligible in a non-precedential decision of this Board in which the panel found a method sufficiently concrete and outside the broad definition of abstract idea. *Id.* at 3–4 (citing *Ex parte Wegman III*, 2015 WL 5578687, at * 3 (PTAB Sept. 18, 2015)).⁴

Appellant’s argument is unpersuasive because Appellant does not adequately rebut the Examiner’s findings that the claimed steps of calculating, which are based on differences in numerical values, merely

⁴ The *Ex parte Wegman* decision is not precedential, therefore, we need not consider it in our analysis. We note, however, that the asserted similarity with *Ex parte Wegman* is that Appellant’s claims “recite the calculation of the various solar energy generation parameters” (Reply Br. 3), which is not persuasive reasoning for establishing reversible error by the Examiner in determining that claim 1 is directed to an abstract idea of a mathematical relationship/formula.

recite the mathematical concept of subtraction and that the subsequent “displaying” limitation is post solution activity in order for the result of the abstract idea to be shown. Appellant does not dispute that the differences claimed reflect the mathematical operation of subtraction. Instead, Appellant broadly asserts without support or explanation that “[t]here is no mathematical relationship recited in claim 1” (App. Br. 8). Such conclusory arguments are unpersuasive of error by the Examiner. We find the preponderance of the evidence in this record supports the Examiner’s finding that claim 1 is directed to an abstract idea because the claim as a whole is focused on mathematically organizing information through mathematical correlations, implementing a principle, algorithm, or mathematical formula known in the art and displaying the result.

The “directed to” inquiry applies a stage-one filter to the claims which, when considered in light of the Specification, is based on whether “their character as a whole is directed to excluded subject matter.” *Internet Patents Corp. v. Active Network, Inc.*, 790 F.3d 1343, 1346 (Fed. Cir. 2015); *see also Genetic Techs. Ltd. v. Merial L.L.C.*, 818 F.3d 1369, 1376 (Fed. Cir. 2016); *Enfish*, 822 F.3d at 1335 (“inquiring into ‘the focus of the claimed advance over the prior art’” (citation omitted)).

“In determining the eligibility of respondents’ claimed process for patent protection under § 101, their claims must be considered as a whole.” *Diamond v. Diehr*, 450 U.S. 175, 188 (1981). The question is whether the claims as a whole “focus on a specific means or method that improves the relevant technology” or are “directed to a result or effect that itself is the abstract idea and merely invoke generic processes and machinery.” *McRO*, 837 F.3d at 1314. Post-solution activity or implementing a principle in some

specific fashion does not automatically transform an unpatentable principle into patentable subject matter. *Parker v. Flook*, 437 U.S. at 590–93 (new and presumably better method for calculating alarm limit values in a process for monitoring chemical process variables held to be unpatentable subject matter).

According to *Enfish*, the question is “whether the focus of the claims is on [a] 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.” *Enfish*, 822 F.3d at 1335–36. The court found in that case that the “plain focus of the claims” was 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.

Here, claim 1 sets forth the following steps:

- [1] determining the value of a DC power meter;
- [2] calculating, by a computer based solar power generating system, a cable loss based on difference in numerical values between DC power meters in a solar power generation system comprising a solar cell array and a plurality of sensors or based on wire resistance and the numerical value of the DC power meter, the cable loss being a power loss that occurs from the solar cell array to an inverter;
- [3] calculating, by the computer based solar power generating system, a maximum power point tracking loss based on difference in numerical values between the DC power meter and a voltage-current measuring device in the solar power generation system or based on a numerical value of an actinometer and a numerical value of the DC power meter in the solar power generation system;
- [4] calculating an inverter loss based on difference in numerical values between the DC power meter and an AC power meter;
- [5] calculating a system output coefficient;

[6] determining module temperature loss based on a rated output power of the solar cell array, a temperature coefficient of the solar cell array, a numerical value of the voltage-current measuring device, a numerical value of the actinometer, a numerical value of a thermometer and a numerical value of the AC power meter;

[7] determining module loss based on the cable loss, the maximum power point tracking loss, the inverter loss, the system output coefficient and the module temperature loss; and

[8] displaying and monitoring, on the computer based solar power generating system, the cable loss, the maximum power point tracking loss, the inverter loss, the module temperature loss and the module loss.

Claim 1, as a whole, is plainly focused on calculating differences in measured values in a solar power generating system to display and monitor losses in various parameters. Claim 1 is not focused on an improvement to the recited “computer based solar power generating system” or other tools used to perform the claimed calculating, determining, and displaying operations. *Cf. In re TLI Communications LLC Patent Litigation*, 823 F.3d 607, 613 (Fed. Cir. 2016) (The claims’ focus “was not on an improved telephone unit or an improved server.”).

In addition, “[t]he ‘abstract idea’ step of the inquiry calls upon us to look at the ‘focus of the claimed advance over the prior art’ to determine if the claim’s ‘character as a whole’ is directed to excluded subject matter.” *Affinity Labs of Texas, LLC v. DirectTV, LLC*, 838 F.3d 1253, 1257 (Fed. Cir. 2016) (citing *Elec. Power Grp., LLC v. Alstom S.A.*, 830 F.3d 1350, 1353 (Fed. Cir. 2016)); *see also Enfish*, 822 F.3d at 1335, *quoted in Apple, Inc. v. Ameranth, Inc.*, 842 F.3d 1229, 1241 (Fed. Cir. 2016).

In that regard, the Specification describes the solar power generation monitoring method as a series of calculations of losses. Spec. 5–10.

According to the Specification, a system output coefficient is calculated from the numerical value of the AC power meter and used to calculate a module loss. *Id.* at 9. The Specification also describes an “instant display monitoring device . . . by performing analysis, instantly performs monitoring with respect to the various power generation losses.” *Id.* at 10:19–26. In light of the Specification’s description of the “calculating,” “determining,” and “displaying and monitoring” steps, we find that the invention’s advancement over the prior art is in improving the calculation of losses that affect a power generation amount of a solar cell array, and based on those calculations, including a calculated system output coefficient, losses are calculated and monitored.

Given that the plain focus of claim 1, as a whole, is on calculating differences in measured values in a solar power generating system⁵ in support of displaying and monitoring power generation losses of a solar cell array and the Specification’s description of the method is calculating a variety of losses on a device that displays and monitors the losses, claim 1 is properly characterized as being “directed to” a mathematical concept or algorithm. Algorithms or mathematical formulas are, like a law of nature, abstract ideas. *Diamond v. Diehr*, 450 U.S. at 191; *Parker v. Flook*, 437 U.S. at 589; *Gottschalk v. Benson*, 409 U.S. 63, 71–72 (1972). As such, the method of claim 1 is directed to an abstract idea. Accordingly, we agree with the Examiner that claim 1 is directed to an abstract idea. *Cf. Elec.*

⁵ *Cf. Elec. Power Grp., LLC*, 830 F.3d at 1353 (When “[t]he focus of the asserted claims” is “on collecting information, analyzing it, and displaying certain results of the collection and analysis,” the claims are directed to an abstract idea.).

Power Grp., LLC, 830 F.3d at 1354 (claims directed to a “process of gathering and analyzing information of a specified content,” i.e., data describing operations in a power grid, and then displaying the results were directed to an abstract idea).

The facts of *Core Wireless Licensing S.A.R.L. v. LG Electronics*, cited in the Reply Brief, are distinguishable from the facts and arguments in the cited record on appeal. The claim in *Core Wireless* was directed to “an improved user interface for electronic devices, particularly those with small screens” where the improvement was in “the efficiency of using the electronic device by bringing together ‘a limited list of common functions and commonly accessed stored data,’ which can be accessed directly from the main menu.” *Core Wireless Licensing S.A.R.L.*, 880 F.3d at 1363. The Specification supported these improvements over “the prior art interfaces [that] had many deficits relating to the efficient functioning of the computer, requiring a user ‘to scroll around and switch views many times to find the right data/functionality.’” *Id.* The Court found that the disclosure in the Specification regarding the speed of a user’s navigation through various views and windows was improved and that this disclosure “clearly indicates that the claims are directed to an improvement in the functioning of computers, particularly those with small screens.” *Id.*

Appellant has not directed us to any disclosure in the instant Specification that similarly supports a finding that claim 1 is directed to an improvement in the functioning of computers. Instead, Appellant merely asserts without support that “the current claims recite an improvement in user interfaces for solar power generation computer systems.” Reply Br. 2.

Step two of the *Alice* framework is “a search for an ‘inventive concept’ — *i.e.*, an element or combination of elements that is ‘sufficient to ensure that the patent in practice amounts to significantly more than a patent upon the [ineligible concept] itself.’” *Alice*, 134 S. Ct. at 2355 (alteration in original) (quoting *Mayo Collaborative Servs. v. Prometheus Labs., Inc.*, 566 U.S. 66, 73 (2012)).

In that regard, the Examiner found:

The claim recites the additional elements comprising the step(s) of determining the value of a DC power meter which is/are merely data gathering required by the abstract idea, and the step(s) of displaying and monitoring losses which is/are merely extra-solution activity required to evaluate the resultant values of the abstract idea, and the component(s): DC power meters, a the computer based solar power generation system, a solar cell array, a voltage-current measuring device, a plurality of sensors, a voltage-current measuring device, an actinometer, a thermometer, a module, and an AC power meter is/are generically recited in that it is well understood, routine and conventional in the art and do not amount to significantly more. Thus, taken alone, the additional elements do not amount to significantly more than the above-identified judicial exception (the abstract idea).

Non-Final Act. 10–11. The Examiner further found:

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 11.

Appellant makes the following assertions: (1) “the claims include various elements that show the claims are directed to significantly more than a patent upon any alleged abstract idea itself,” (2) “Claim 1 as a whole amounts to significantly more than simply the Office’s alleged abstract

idea,” and (3) “[t]he above-quoted features are also steps/functions that confine the claims to a particular useful application or are otherwise meaningful elements beyond generally linking the use of a judicial exception to a particular technological environment.” App. Br. 8, 10. Appellant’s arguments are unpersuasive of reversible error by the Examiner because they are conclusory and not supported by the evidence, including the Specification.

We note that Appellant does not dispute the Examiner’s finding (Non-Final Act. 10–11) that DC power meters, the computer based solar power generation system, a solar cell array, a voltage-current measuring device, a plurality of sensors, a voltage-current measuring device, an actinometer, a thermometer, a module, and an AC power meter are generically recited in that they are well understood, routine, and conventional in the art and do not amount to significantly more. Nor does Appellant dispute the Examiner’s finding (Ans. 6) that the claim limitations teach well-understood energy balancing calculations involving the first law of thermodynamics (i.e., energy cannot be created or destroyed, only modified in form).

Appellant’s argument that claim 1 recites “steps/functions that confine the claims to a particular useful application” is not persuasive of error because claim 1, as currently drafted, is not directed to an improved user interface nor to improving the functioning of a computer. *See* our analysis under *Alice* step 1. Rather, the solar power generation monitoring process claimed gives the claimed data organization and calculation scheme a particular context for its application. *Cf. CyberSource*, 654 F.3d at 1371 (“The Court [in *Parker v. Flook*, 437 U.S. 584 (1978)] rejected the notion

that the recitation of a practical application for the calculation could alone make the invention patentable”).

Therefore, considering all the elements recited in claim 1 both individually and in an ordered combination, we agree with the Examiner that the claim is patent ineligible subject matter because the claimed method uses a computer to perform a series of calculations using mathematical formulas and to display the results of the calculations. *See Elec. Power Grp., LLC*, 830 F.3d at 1354 (finding patent-ineligible claims to a method performed by or with a computer that collects information, analyzes it, and displays certain results of the collection and analysis even though limited to the particular technological environment of power-grid monitoring).

We have fully considered Appellant’s arguments. For the foregoing reasons, they are unpersuasive as to error in the rejection of claim 1, and claims which stand or fall with it.

The rejection is sustained.

CONCLUSION

Appellant has not shown that the Examiner erred in rejecting claims 1–16 and 18–20 under 35 U.S.C. § 101 as being directed to non-statutory subject matter.

DECISION

The decision of the Examiner to reject claims 1–16 and 18–20 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).

AFFIRMED