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Table with 5 columns: APPLICATION NO., FILING DATE, FIRST NAMED INVENTOR, ATTORNEY DOCKET NO., CONFIRMATION NO.
14/359,692 05/21/2014 Kinnosuke Itabashi 140709.03601 3919

136404 7590 10/23/2018
Pepper Hamilton LLP/Boston
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125 High Street
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Boston, MA 02110-2736

EXAMINER

TRISCHLER, JOHN T

ART UNIT PAPER NUMBER

2859

NOTIFICATION DATE DELIVERY MODE

10/23/2018

ELECTRONIC

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UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

Ex parte KINNOSUKE ITABASHI
and SHUICHI ADACHI

Appeal 2017-011814
Application 14/359,692
Technology Center 2800

Before GEORGE C. BEST, DONNA M. PRAISS, and
SHELDON M. McGEE, *Administrative Patent Judges*.

BEST, *Administrative Patent Judge*.

DECISION ON APPEAL

The Examiner rejected claims 1–6 of Application 14/359,692 under 35 U.S.C. § 101 as directed to patent-ineligible subject matter, § 112, ¶ 1, as failing to comply with the written description requirement, and § 103(a) as obvious. Non-Final Act. (December 2, 2016). Appellants¹ seek reversal of these rejections pursuant to 35 U.S.C. § 134(a). We have jurisdiction under 35 U.S.C. § 6.

For the reasons set forth below, we *affirm*.

¹ Calsonic Kansei Corp. and Keio University are identified as the patent applicants and the real parties in interest. Appeal Br. 1.

BACKGROUND

The '692 Application describes an apparatus for battery state estimation that can accurately estimate the internal state of a battery. Spec. ¶ 1.² When rechargeable batteries are used in electric vehicles, it is useful to know the drivable distance on the current charge, the current rates at which charge and discharge are possible, and the like. *Id.* ¶ 2. To determine these quantities, however, it is necessary to know the battery's internal state properties. *Id.* Because these properties cannot be directly detected, two methods are used to estimate them. *Id.* The first method, a current integration method, is very accurate over the short run, but over the long run it accumulates error and becomes less accurate. *Id.* ¶¶ 2–3. The second method, open circuit voltage estimation, provides poor estimation accuracy over short periods of time, but is superior to the current integration method over long periods of time. *Id.* Conventional apparatus for battery state estimation, therefore, uses a combination of these two methods. *Id.* ¶ 3.

Sole independent claim 1 is representative of the '692 Application's claims and is reproduced below from the Claims Appendix of the Appeal Brief.

1. An apparatus for battery state estimation comprising:
 - [A] a charge/discharge current detection unit configured to detect a charge/discharge current value of a battery;
 - [B] a terminal voltage detection unit configured to detect a terminal voltage value of the battery;

² We note that Appellants cite the published version of the '692 Application. *E.g.*, Reply Br. 5, 6. Such citations are inappropriate and against our rules. Citation should be to the originally filed version of the Specification, which is part of the record on appeal. 37 C.F.R. §§ 41.30, 41.37(c)(1)(iv).

[C] an equivalent circuit model including a fast response portion at the interface where the charge-transfer process takes place in a slow response portion that becomes the diffusion process in the diffusion layer between the electrolyte interface and the bulk region of the battery;

[D] a sequential parameter estimation unit configured to perform sequential parameter estimation, using only the fast response portion among the response portions of the equivalent circuit model, based on a charge/discharge current value input from the charge/discharge current detection unit and the terminal voltage value input from the terminal voltage detection unit;

[E] a constant setting unit configured to set a constant representing resistance and capacitance in the slow response portion of the equivalent circuit model;

[F] a first multiplication unit configured to obtain an overvoltage value of the fast response portion by multiplying a parameter estimated by the sequential parameter estimation unit by the charge/discharge current value;

[G] a second multiplication unit configured to obtain an overvoltage value of the slow response portion by multiplying the constant set by the constant setting unit by the charge/discharge current value; and

[H] an addition unit configured to obtain an overvoltage value of the battery by adding the overvoltage value of the fast response portion obtained by the first multiplication unit and the overvoltage value of the slow response portion obtained by the second multiplication unit.

Appeal Br. 19 (reference letters added).

REJECTIONS

On appeal, the Examiner maintains the following rejections:

1. Claims 1–6 are rejected under 35 U.S.C. § 101 because the claimed invention is directed to a judicial exception—i.e., an abstract idea—without significantly more. Non-Final Act. 3.
2. Claims 1–6 are rejected under 35 U.S.C. § 112, ¶ 1, as failing to comply with the written description requirement. Non-Final Act. 8.
3. Claims 1–6 are rejected under 35 U.S.C. § 103(a) as unpatentable over the combination of Gütlein³ and Yoshioka.⁴ Non-Final Act. 13.

DISCUSSION

Rejection 1. The Patent Act defines patent-eligible subject matter as including “any new and useful process, machine, manufacture, or composition of matter, or any new and useful improvement thereof.” 35 U.S.C. § 101. In particular, laws of nature, natural phenomena, and abstract ideas are not patent-eligible. *Mayo Collaborative Servs. v. Prometheus Labs., Inc.*, 566 U.S. 66, 71 (2012).

Since the Supreme Court’s decision in *Alice Corp. v. CLS Bank International*, 134 S. Ct. 2347 (2014), patent-eligible subject matter has been distinguished from patent-ineligible laws of nature, natural phenomena, and abstract ideas using a two-step process. *Id.* at 2355. The first step requires us to “determine whether the claims at issue are directed to one of those

³ US 7,872,449 B2, issued January 18, 2011.

⁴ US 2013/0027047 A1, published January 31, 2013.

patent-ineligible concepts.” *Id.* If they are, we must then analyze whether the claim elements, both individually and “as an ordered combination,” contain an “inventive concept” that “transform[s] the nature of the claim’ into a patent-eligible application.” *Id.* (quoting *Mayo*, 566 U.S. at 72–73).

Appellants do not distinguish between the claims in arguing for the reversal of this rejection. We, therefore, select claim 1 as representative of the claims on appeal. 37 C.F.R. § 41.37(c)(1)(iv) (2015). Claims 2–6 stand or fall with claim 1 with respect to this ground of rejection.

Appellants argue that the rejection of claim 1 should be reversed because the rejection misapplies precedent and fails to consider the manner in which the claimed invention as a whole improves the performance of known state of charge monitoring technology. Appeal Br. 6–8. We address these arguments in turn.

First, Appellants argue that the cases cited in the Non-Final Action address claims directed to manipulating intangible data. On the other hand, claim 1’s apparatus is “a tangible system that provides a technical solution to the problem recognized by the inventors in the particular context in which the system operates.” *Id.* at 6. Appellants argue that this renders claim 1 distinct from claims directed to manipulation of intangible or disembodied information like those found to be patent-ineligible subject matter in the cases relied upon by the Examiner. *Id.*

As part of the *Alice* step 1 analysis, the Examiner analogized the various elements of claim 1 to abstract ideas found to be patent-ineligible subject matter in *Digitech Image Technologies, LLC v. Electronics for Imaging, Inc.*, 758 F.3d 1344 (Fed. Cir. 2014), *SmartGene, Inc. v. Advanced Biological Laboratories, SA*, 555 F. App’x 950 (Fed. Cir. 2014), and

CyberSource Corp. v. Retail Decisions, Inc., 654 F.3d 1366 (Fed. Cir. 2011).
See Non-Final Act. 7.

Appellants assert that the Examiner's misplaced reliance on these cases requires reversal of this rejection. Appeal Br. 6–7.

For the following reasons, we are not persuaded by Appellants' attempt to distinguish *Digitech*, *SmartGene*, and *CyberSource*.

The Federal Circuit has described the inquiry in *Alice* step 1 as looking at the focus of the claims and determining whether their character as a whole is directed to patent-ineligible subject matter. *Elec. Power Grp., LLC v. Alstom S.A.*, 830 F.3d 1350, 1353 (Fed. Cir. 2016); *Enfish, LLC v. Microsoft Corp.*, 822 F.3d 1327, 1335 (Fed. Cir. 2016). In doing so, “courts ‘must be careful to avoid oversimplifying the claims’ by looking at them generally and failing to account for the specific requirements of the claims.” *McRO, Inc. v. Bandai Namco Games Am. Inc.*, 837 F.3d 1299, 1313 (Fed. Cir. 2016) (quoting *In re TLI Commc’ns LLC Patent Litig.*, 823 F.3d 607, 611 (Fed. Cir. 2016)); *see also Diamond v. Diehr*, 450 U.S. 175, 189 n.12 (1981). Finally, as part of step 1, we must also “look to whether the claims in these patents focus on a specific means or method that improves the relevant technology or are instead 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 (citing *Enfish*, 822 F.3d at 1336).

In determining whether claim 1 is focused upon an abstract idea, the Examiner correctly applied precedent that identifies data-gathering (*SmartGene*), mental processes (*SmartGene*, *CyberSource*), data manipulation (*Digitech*), and mathematical models (*Parker v. Flook*, 437 U.S. 584, 595 (1978)) as patent-ineligible abstract ideas. *See Non-Final Act. 3–5.* The Examiner also correctly determined that the claimed

charge/discharge current detection unit and the terminal voltage detection unit are well-known sensors that are widely used in the art. *Id.* at 4.

Appellants present no evidence to the contrary.

The Examiner, therefore, correctly determined that Appellants' claims recite a combination of well-known physical elements and abstract ideas. In this regard, they are similar to the claims at issue in *Digitech*, *SmartGene*, and *CyberSource*. The Examiner did not misapply precedent in the manner alleged by Appellants.

Second, Appellants argue that the Examiner erred by determining that claim 1, taken as a whole, does not amount to significantly more than a generic, abstract mathematical relationship. Appeal Br. 7. In particular, Appellants argue that “[i]n performing step [2] of the *Alice* analysis, the Office Action impermissibly analyzes the claimed system as individual elements.” *Id.* Appellants argue that,

when taken as a whole, claim 1 does not merely provide an abstract idea that can be implemented on any general purpose computer . . . , but rather cites an apparatus that integrates a charge/discharge detection unit and a terminal voltage detection unit that result in the improved performance of the sensors in estimating the [State of Charge].

Id.

This argument is not persuasive. In the second step of the *Alice* test, we consider the elements of each claim, individually and as an ordered combination, to determine whether additional elements may transform the nature of the claim into a patent-eligible application of the law of nature, natural phenomenon, or abstract idea. *See Mayo*, 566 U.S. at 77–80. “The Supreme Court has described the second step of this analysis as 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.’” *Ariosa Diagnostics Inc. v. Sequenom, Inc.*, 788 F.3d 1371, 1375 (Fed. Cir. 2015) (quoting *Mayo*, 566 U.S. 72–73).

The Examiner determined that the charge/discharge current detection unit and the terminal voltage detection unit (claim elements A and B) are described at a high level of generality and are in common use. The Examiner, therefore, determined that they do not, individually or in combination, make the claim more than the abstract idea itself. Non-Final Act. 7–8. We agree with the Examiner.

Moreover, Appellants’ argument that the claimed invention in result in improved function of the sensors is unsupported by any evidence. Appellants’ briefing points to no evidence in the Specification or in any declaration demonstrating the alleged improvement in function. As a result, Appellants’ contention is nothing more than unsupported attorney argument and has no persuasive value. *Icon Health & Fitness, Inc. v. Strava, Inc.*, 849 F.3d 1034, 1043 (Fed. Cir. 2017) (“Attorney argument is not evidence.”). It is well settled that arguments of counsel cannot take the place of factually supported objective evidence. *See, e.g., In re Huang*, 100 F.3d 135, 139–40 (Fed. Cir. 1996); *In re De Blauwe*, 736 F.2d 699, 705 (Fed. Cir. 1984).

In view of the foregoing, we affirm the rejection of claims 1–6 as directed to patent-ineligible subject matter.

Rejection 2. The Examiner rejected claims 1–6 as lacking written description support. Non-Final Act. 8–10. In particular, the Examiner determined that the following claim terms should be construed as means-plus-function elements according to 35 U.S.C. § 112, ¶ 6:

- (a) sequential parameter estimation unit

- (b) constant setting unit
- (c) first multiplication unit
- (d) second multiplication unit
- (e) addition unit
- (f) subtraction unit
- (g) open circuit voltage/state of charge estimation unit.

Id. at 8–9. The Examiner determined that these terms used the generic place holder “unit” coupled with functional language. *Id.* at 9. The Examiner further determined that the claims failed to “recite sufficient structure to achieve the function. Further, the generic place holder is not preceded by a structural modifier.” *Id.*

Applying § 112, ¶ 6, the Examiner looked to the Specification to determine the structure that performs the recited functions. *Id.* at 9–10. The Examiner determined that the Specification failed to set forth structure sufficient to perform the recited functions. *Id.* The Examiner, therefore, rejected the claims under 35 U.S.C. § 112, ¶ 1, as lacking written description support. *Id.* at 10.

We cannot sustain the Examiner’s rejection. As an initial matter, we note that the Examiner’s rejection is based upon an incorrect provision of law. As the Federal Circuit has explained, when a specification does not describe sufficient structure to perform the recited function of a means-plus-function claim element, the claim is properly rejected as indefinite under 35 U.S.C. § 112, ¶ 2 (pre-AIA) or 35 U.S.C. § 112(b) (post-AIA):

[I]f one employs means-plus-function language in a claim, one must set forth in the specification and adequate disclosure showing what is meant by that language. If an applicant fails to set forth an adequate disclosure, the applicant has in effect

failed to particularly point out and distinctly claim the invention as required by the second paragraph of section 112.

In re Donaldson Co., 16 F.3d 1189, 1195 (Fed. Cir. 1994) (en banc); *see also In re Dossel*, 115 F.3d 942, 946 (Fed. Cir. 1997).

We reverse this rejection on this basis alone.

We also reverse this rejection because the Examiner erred in construing claim 1 as invoking § 112, ¶ 6.

We begin by recognizing the rebuttable presumption that claims 1–6 are not intended to invoke § 112, ¶ 6, and should not be construed as having means-plus-function elements. *See Williamson v. Citrix Online, LLC*, 792 F.3d 1339, 1348 (Fed. Cir. 2015) (“[T]he failure to use the word ‘means’ . . . creates a rebuttable presumption . . . that § 112, para. 6, does not apply.”). To rebut this presumption, the Examiner must find that the *claim term* fails to recite sufficiently definite structure or recites function without reciting sufficient structure for performing that function. *Id.* (citing *Watts v. XL Sys., Inc.*, 232 F.3d 877, 880 (Fed. Cir. 2000)). The Federal Circuit has further explained:

To determine whether the claim recites sufficient structure, “it is sufficient if the claim term is used in common parlance or by persons of skill in the pertinent art to designate structure, even if the term covers a broad class of structures and even if the term identifies the structures by their function.”

Skky, Inc. v. MindGeek, s.a.r.l., 859 F.3d 1014, 1019 (Fed. Cir. 2017) (quoting *TecSec, Inc. v. Int’l Bus. Machs. Corp.*, 731 F.3d 1336, 1347 (Fed. Cir. 2013) (internal quotation marks and citations omitted)).

In this case, the Examiner erred by finding that the presumption had been overcome with respect to the seven claim terms identified. Our review of the ’692 Application’s Specification and Figures, general and technical

dictionaries, and the prior art convince us that the terms used in claims 1–6 designate sufficient structure to perform the functional language proceeding the term “unit.” We explain further with respect to each of the claim terms below.

First, the Specification demonstrates that a person of ordinary skill in the art at the time of the invention would have understood that “sequential parameter estimation unit” recited in claim 1 refers to a known structure from one of the known methods of estimating a battery’s state of charge. For example, the Specification states:

The open circuit voltage estimation method establishes a battery model, compares the input/output with an actual battery, estimates sequential parameters of the battery model while reducing the differences with an adaptive filter such as a Kalman filter, and estimates the open circuit voltage of the battery in order to estimate the state of charge.

Spec. ¶ 2; *see also id.* ¶¶ 4, 6–11, 27. Based upon this disclosure, we determine that a person of ordinary skill in the art at the time of the invention would have understood a range of possible structures for the sequential parameter estimation unit recited in claim 1.

Second, the Specification also indicates that the constant setting unit is a portion of the apparatus that sets a constant representing resistance and capacitance in the slow response portion of the equivalent circuit model based upon prior experimentation. *See* Spec. ¶¶ 13, 33; Figs. 1, 4. The description provided is sufficient to define possible structures, e.g., a lookup table, used for the constant setting unit in the mind of a person of ordinary skill in the art.

Third, an examination of general purpose dictionaries demonstrates that the terms “multiplier,” “adder,” and “subtractor” are recognized terms

for designating particular structures within computers or other devices. *See, e.g., Shorter Oxford English Dictionary*, 25 (6th ed. 2007) (defining adder: “in a computer, a unit which adds together to input variables”); *id.* at 1864 (defining multiplier: “a calculating instrument for use in multiplication”); *Webster’s Ninth New Collegiate Dictionary*, 779 (1983) (defining multiplier: “a key-operated machine or mechanism or circuit on a machine that multiplies figures and records the products”); *Shorter OED*, 3090 (defining subtractor: “a circuit or device the produces an output dependent on the difference of two input or of multiples of them”).

Fourth, the Specification states:

The open circuit voltage / state of charge conversion unit 10 stores data representing the relationship between the open circuit voltage and the state of charge obtained in advance by experiment as a look up table, takes the open circuit voltage value OCV obtained by the subtractor 9 as input, and outputs a corresponding state of charge SOC_{OCV} .

Note that the open circuit voltage / state of charge conversion unit 10 corresponds to the open circuit voltage / state of charge estimation unit of the present invention.

Spec. ¶ 32.

In sum, we are persuaded that the Examiner erred by construing the claim elements set forth above under 35 U.S.C. § 112, ¶ 6. We, therefore, reverse this rejection.

Rejection 3. The Examiner rejected claims 1–6 as unpatentable over the combination of Gütlein and Yoshioka. Non-Final Act. 13–19. As discussed above, however, the Non-Final Action contains errors in construction of multiple terms in claims 1 – 6. Because this rejection is

Appeal 2017-011814
Application 14/359,692

premised upon these erroneous claim interpretations, we are constrained to reverse this rejection.

CONCLUSION

For the reasons set forth above, we affirm the rejection of claims 1–6 of the '692 Application under 35 U.S.C. § 101 as directed to patent-ineligible subject matter. We reverse the rejections of claims 1–6 under 35 U.S.C. § 112, ¶ 1, and 35 U.S.C. § 103(a).

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