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KILPATRICK TOWNSEND & STOCKTON LLP
Mailstop: IP Docketing - 22
1100 Peachtree Street
Suite 2800
Atlanta, GA 30309

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UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

Ex parte ANDREAS MAI, BORIS IWANSCHITZ,
MARKUS LINDER, and HANSPETER KURATLI

Appeal 2018-005371
Application 13/871,790
Technology Center 1700

Before KAREN M. HASTINGS, MICHAEL P. COLAIANNI, and
GEORGE C. BEST, *Administrative Patent Judges*.

COLAIANNI, *Administrative Patent Judge*.

DECISION ON APPEAL

Pursuant to 35 U.S.C. § 134(a), Appellant¹ appeals from the Examiner's decision to reject claims 1–12. We have jurisdiction under 35 U.S.C. § 6(b). Appellant waived oral arguments in the appeal.

We REVERSE.

Appellant's invention is directed to a method and regulation apparatus for regulating a fuel cell or a fuel cell stack (Spec. 1:10-11; Claim 1).

¹ We use the word "Appellant" to refer to "applicant" as defined in 37 C.F.R. § 1.42. Appellant identifies the real party in interest as Hexis AG. Appeal Br. 3.

Claim 1 is representative of the subject matter on appeal:

1. A method for regulating a fuel cell or a fuel cell stack comprising: detecting a current-voltage characteristic of the fuel cell or of the fuel cell stack at time intervals during operation of the fuel cell or of the fuel cell stack, wherein the detected current-voltage characteristic has a gradient with a minimum; determining an operation point of the fuel cell or of the fuel cell stack by determining a first value corresponding to a value for the minimum of the gradient or a resistance value related to the minimum of the gradient, from the detected current-voltage characteristic, and adding a predefined offset value to the first value; and
regulating the fuel cell or the fuel cell stack using the determined operation point.

Appellant argues the claims as a group (App. Br. 6–10). We select claim 1 as representative of the group. 37 CFR § 41.37(c)(iv).

Appellant appeals the following rejections:

1. Claims 1–7 and 9–12 are rejected under 35 U.S.C. § 102(b) as anticipated by Senoue et al. (US 2010/173212 A1, published July 8, 2010 (“Senoue”)).
2. Claim 8 is rejected under 35 U.S.C. § 103 as unpatentable over Senoue in view of Gyoten et al. (US 6,881,510 B1, issued April 19, 2005 (“Gyoten”)).

FINDINGS OF FACT & ANALYSIS

§ 102(b) Rejection

The Examiner’s findings regarding Senoue are located on pages 3 to 5 of the Final Action.

Appellant argues that Senoue’s linear functions X’, Y’ and Z’ do not have a gradient with a minimum since the gradient of a straight line is a

constant value (App. Br. 8). Appellant contends that Senoue does not disclose determining an operation point by determining a first value corresponding to a value for the minimum of the gradient or a resistance value related to the minimum of the gradient (App. Br. 9).

Appellant discloses in the Specification that the value of the minimum of the gradient is mathematically determined from the current-voltage characteristic (Spec. 7:13–16). Appellant discloses that the value of the minimum of the gradient can be the value of the internal resistance or the area specific resistance (ASR) of the fuel cell or the value R_{min} related to the minimum of the gradient can from case to case be linked to the value of the internal resistance or the area specific resistance of the fuel cell or of the fuel cell stack in the minimum of the gradient (Spec. 7:1–7). Appellant shows in Figures 6 to 8 determining a minimum value of the ASR (ASR_{min}) in an ASR versus current density (I) plot (Spec. 14–15). The ASR versus current density plot is determined from a plot of output voltage as a function of current density I (Spec. 14:27–29). The Specification discloses that at the minimum, a single value is determined from a plot and that single minimum value is used to determine operation point for the fuel cell.

Claim 1 recites, “the detected current-voltage characteristic has a gradient with *a* minimum” and “determining an operation point of the fuel cell . . . by determining *a* first value corresponding to *a* value for the minimum of the gradient” (emphasis added). Claim 1 interpreted in light of the Specification requires determining a single minimum value for the current-voltage gradient and using that value to determine an operation point of the fuel cell. *See In re Am. Acad. of Sci. Tech. Ctr.*, 367 F.3d 1359, 1364 (Fed. Cir. 2004) (explaining that the words used in a claim must be read in

light of the specification, as it would have been interpreted by one of ordinary skill in the art at the time of the invention). We are mindful that:

[t]he correct inquiry in giving a claim term its broadest reasonable interpretation in light of the specification is not whether the specification proscribes or precludes some broad reading of the claim term adopted by the examiner. And it is not simply an interpretation that is not inconsistent with the specification. It is an interpretation that corresponds with what and how the inventor describes his invention in the specification, i.e. an interpretation that is consistent with the specification.

In re Smith Int'l, Inc., 871 F.3d 1375, 1382–83 (Fed. Cir. 2017) (internal quotation omitted); *see also In re Baker Hughes, Inc.*, 215 F.3d 1297, 1303 (Fed. Cir. 2000) (the PTO cannot adopt a construction that is “beyond that which was reasonable in light of the totality of the written description” in the Specification).

The Examiner finds that Senoue teaches that the minimum gradient of each curve shown in Senoue’s Figure 5 is the linear portion of each curve (Final Act. 3). The Examiner finds that Senoue’s first current α corresponds to the claimed operating point that is used to determine a first value α which corresponds to a value of the minimum gradient (Final Act. 3). The Examiner finds that the slope of the linear portion of current (I)-voltage (V) is a minimum gradient for the curve X shown in Senoue’s Figure 5 (Ans. 7-8). The Examiner finds that Senoue teaches that the first constant current load circuit 201 outputs a specific current of α amperes from the fuel cell generation unit 101 based upon the operation of the transistor 201B (Ans. 8). The Examiner finds that Senoue teaches that an output voltage V_a is generated when the α current is applied (Ans. 8). The Examiner finds that a “determined” point is not required to be a variable (i.e., it may be

predetermined) (Ans. 8). The Examiner finds that the operation point recited in claim 1 corresponds to the point α , V_a data point because that data point is part of the linearly fit portion of curve X' which is related to the minimum of the gradient (Ans. 8).

As properly construed above, claim 1 requires determining a first value corresponding to a value for the minimum of the gradient. As noted above, our construction of that claim phrase requires using the minimum of the gradient to determine the corresponding first value. Senoue does not appear to use a minimum of the gradient to determine a first value for an operation point of the fuel cell as required by claim 1. Although the Examiner finds that Senoue outputs a specific current of α amperes from the fuel cell generation unit 101 based upon the operation of the transistor 201B (Ans. 8), Senoue discloses that the constant current load circuit 201 outputs a specific current (i.e., α amperes) from the fuel cell generation unit 101 through the constant current load 201A based on operation of the transistor element 201B (§ 59). Missing from Senoue is any disclosure the current value is based upon the minimum of the gradient. Rather, Senoue appears to teach simply applying a constant current without regard to first determining a minimum of the gradient.

The Examiner's findings have not shown that Senoue anticipates the subject matter of claims 1–7 and 9–12 within the meaning of 35 U.S.C. § 102. We reverse the Examiner's § 102(b) rejection.

The Examiner's 35 U.S.C. § 103 rejection of dependent claim 8 over Senoue in view of Gyoten, relies on the same faulty findings made in the § 102 rejection. Therefore, we reverse the Examiner's rejection of claim 8 over Senoue in view of Gyoten for the same reasons.

CONCLUSION

In summary:

Claims Rejected	Basis	Affirmed	Reversed
1-7, 9-12	§ 102(b) Senoue		1-7, 9-12
8	§ 103(a) Senoue in view of Gyoten		8
Overall Outcome			1-13

REVERSED