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UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

Ex parte DHAVAL PATEL, GORDON W. FRISKE, and
WILFREDO E. COLON VELAZQUEZ

Appeal 2019-005015
Application 14/507,928
Technology Center 2800

Before JEFFREY T. SMITH, KAREN M. HASTINGS, and
MERRELL C. CASHION JR., *Administrative Patent Judges*.

SMITH, *Administrative Patent Judge*.

DECISION ON APPEAL

Pursuant to 35 U.S.C. § 134(a), Appellant¹ appeals from the Examiner's decision to reject claims 1–4, 6–9, 11, 12, 14, and 15. We have jurisdiction under 35 U.S.C. § 6(b).

We AFFIRM.

STATEMENT OF THE CASE

Claim 1 illustrates the subject matter on appeal and is reproduced below (format added):

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 Hamilton Sundstrand Corporation. Appeal Br. 1.

1. A generator comprising:

a rotor to be driven for rotation adjacent a stator;

said stator including laminated core having circumferentially intermediate slots, and a conductor received within said slots, said conductor having an outer copper layer and an inner aluminum core; and

said outer copper layer extends inwardly for a skin depth which is determined, at least in part, based upon a calculation of the skin depth, and the calculation relying upon at least one of a resistivity of the conductor and a relative magnetic permeability of the conductor.

Appeal Br. 5, Claims App.

Appellant requests review of the following rejections from the Examiner's Final Office Action:²

I. Claims 1–4, 6–9, 11, 12, 14, and 15 rejected under 35 U.S.C. § 112(a), as failing to comply with the written description requirement.

II. Claims 7 and 12 rejected under 35 U.S.C. § 112(b), as indefinite.

III. Claims 1–4, 6–9, 11, 12, 14, and 15 rejected under 35 U.S.C. § 103 as unpatentable over Baldwin et al. (US 5,227,687; issued July 13, 1993, “Baldwin”) in view of Knerr et al. (US 2015/0243410 A1; Aug. 27, 2015, “Knerr”), Shinmoto et al. (US 2013/0162097 A1; issued June 27, 2013, “Shinmoto”) and Erden et al. (“Improvement of Thermal Performance of 36kV DAF-30 Type Bushing,” 2013 3rd International Conference on Electric Power and Energy Conversion Systems (EPECS), October 2013, “Erden”).

² The complete statement of the rejections on appeal appears in the Final Office Action. (Final Act. 2–15).

OPINION

Written Descriptive Support

The test for determining compliance with the written description requirement of 35 U.S.C. § 112(a) is whether the disclosure of the application as originally filed reasonably conveys to the artisan that the inventor had possession at that time of the later claimed subject matter. *In re Kaslow*, 707 F.2d 1366, 1375 (Fed. Cir. 1983). The Examiner bears the initial burden of establishing that the original application disclosure as a whole would not have reasonably conveyed to those skilled in the art that the inventors had possession of the claimed subject matter at the time the instant application was filed. *Ariad Pharm., Inc. v. Eli Lilly & Co.*, 598 F.3d 1336, 1351 (Fed. Cir. 2010) (en banc); *In re Alton*, 76 F.3d 1168, 1172, 1175–76 (Fed. Cir. 1996) (citing *In re Wertheim*, 541 F.2d 257, 262–64 (CCPA 1976)); *In re Wright*, 866 F.2d 422, 425 (Fed. Cir. 1989).

In rejecting claims 1–4, 6–9, 11, 12, 14, and 15 under 35 U.S.C. § 112(a) as lacking written descriptive support, the Examiner determines:

It is not clear applicant had possession of the invention since there are no working examples disclosed. Applicant only discusses aluminum with a copper layer that extends to the skin depth and the formula for calculating skin depth. Applicant does not provide any detailed examples of the resulting conductor, such as any specific dimensions of the copper layer and aluminum core or what structure of the conductor applicant would employ for best performance.

Additionally the formula is dependent on the angular frequency of the current. Applicant does not discuss a specific frequency, but a range of frequencies (300-800 Hz). The copper layer is fixed once the conductor is made. Since applicant provides no working example or specific frequency, this implies that the dimension of the copper layer changes when currents of different angular frequencies are applied or when

slight variations in current occur.

(Final Act. 3–4.)

In response to the Examiner’s rejection, Appellant argues the overall teaching of the application would inform a skilled worker in this art how to provide a conductor for a generator. (Appeal Br. 2.)

We do not sustain the rejection of the claims under 35 U.S.C. § 112(a) for lack of written descriptive support based on this reasoning. The Examiner has not established that the original Specification as a whole would not have reasonably conveyed to those skilled in the art that the inventors had possession of the claimed subject matter. There is no requirement that the Specification contains working examples of the invention. The Examiner has not disputed the Specification discloses a generator comprising a stator having an outer copper layer that extends inwardly for a skin depth.

Indefiniteness

The Examiner determines the phrase, “the frequency of the generator is 300-800 Hz” is unclear and therefore rejects claims 7 and 12 under 35 U.S.C. § 112(b) as indefinite. (Final Act. 3.)

Appellant argues this rejection is erroneous because a person of ordinary skill in the art would have understood how the frequency impacts the formula and skin depth and, thus, the disputed language is not indefinite when read in light of the Specification. (Appeal Br. 4.)

We do not sustain the rejection of the claims under 35 U.S.C. § 112(b) as indefinite based on this reasoning. According to the Specification, generators operating in a range of 300–800 Hz are suitable for the disclosed invention. (Spec. ¶ 20.)

Prior Art rejection

After review of the respective positions Appellant and the Examiner provide, we determine that Appellant has not demonstrated reversible error in the Examiner's rejection under 35 U.S.C. § 103. We limit our discussion to independent claim 1 and Appellant's separate arguments directed to claims 6, 11, and 14 together as a group. 37 C.F.R. § 41.37(c)(1)(iv). Claims 1–4, 6–9, 11, 12, 14, and 15 will stand or fall with independent claim 1.

The Examiner finds the combination of Baldwin, Knerr, and Shinmoto renders obvious the claimed generator comprising a conductor having an outer copper layer, having a skin depth, and an inner aluminum core. (Final Act. 5–6.) The Examiner finds the combination is silent with respect to how the skin depth is calculated. (Final Act. 6.) The Examiner finds Erden discloses it is well known in the art to calculate a skin depth based on the resistivity and the permeability of the conductor. (Final Act. 6; Erden 2 (2nd column to last paragraph)).

Appellant argues nothing within Shinmoto utilizes or mentions determining the skin depth, at least in part, based upon the resistivity of the conductor or the relative magnetic permeability of the conductor. (Appeal Br. 3.) Appellant argues “Erden merely recites the formula, admitted in Appellant's application, about the skin depth through which current will normally pass. Nothing within Erden suggests modifying the references, that have already been twice modified, to meet the claims depth.” (Appeal Br. 3.)

Appellant's arguments are not persuasive of reversible error.

It is a well-known proposition that process steps in a product claim are limiting to the extent they further define the structure of the product. *In re Thorpe*, 777 F.2d 695, 697 (Fed. Cir. 1985). Further, it has long been held that “[i]f the product in a product by process claim is the same as or obvious from a product of the prior art, the claim is unpatentable even though the prior product was made by a different process.” *Smithkline Beecham Corp. v. Apotex Corp.*, 439 F.3d 1312, 1317 (Fed. Cir. 2006) (quoting *In re Thorpe*, 777 F.2d 695, 697 (Fed. Cir. 1985)). It is also well settled that when a claimed product reasonably appears to be substantially the same as a product disclosed in the prior art, the burden of proof is on the applicant to prove that the prior art product does not inherently or necessarily possess the characteristics attributed to the claimed product. *Cf. In re Spada*, 911 F.2d 705, 708 (Fed. Cir. 1990) (holding that similarity in terms of reactants and reaction conditions amounted to a prima facie case of unpatentability and that the burden was properly shifted to applicants to show that the prior art product does not have the claimed property); see also *In re Best*, 562 F.2d 1252, 1255 (CCPA 1977). Whether the rejection is based on inherency under 35 U.S.C. § 102 or on obviousness under 35 U.S.C. § 103, jointly or alternatively, the burden of proof is the same, and its fairness is evidenced by the PTO’s inability to manufacture products or to obtain and compare prior art products. *Best*, 562 F.2d at 1255.

In the present case the claimed subject matter is directed to a product, specifically a generator comprising a rotor and a stator wherein the stator includes a conductor having an outer copper layer that extends inwardly for a skin depth. Claim 1 specifically states the “outer copper layer extends inwardly for a skin depth which is determined, at least in part, based upon a

calculation of the skin depth, and the calculation relying upon at least one of a resistivity of the conductor and a relative magnetic permeability of the conductor.” Appellant’s arguments for patentability are limited to the failure of the cited art to disclose the skin depth is determined, at least in part, based upon resistivity of the conductor or relative magnetic permeability of the conductor. (Appeal Br. 3.) However, Appellant has not disputed the Examiner’s determination that the combination of Baldwin, Knerr, and Shinmoto renders obvious a generator comprising a rotor and a stator wherein the stator includes a conductor having an outer copper layer, having a skin depth, and an inner aluminum core.

As stated above and acknowledged by Appellant (Appeal Br. 3), Erden discloses the formula for determining the skin depth through which current will normally pass was known. Given Shinmoto’s disclosure of a copper layer of a copper-cladded aluminum conductor extending inwardly for a skin depth (Final Act 6; Shinmoto ¶ 221), a person of ordinary skill determining the appropriate skin depth to achieve the desired current flow would have reasonably sought to use known formulas for determining current flow through skin depth. “Obviousness does not require absolute predictability of success . . . all that is required is a reasonable expectation of success.” *In re Kubin*, 561 F.3d 1351, 1359-60 (Fed. Cir. 2009) (*citing In re O’Farrell*, 853 F.2d 894, 903–04 (Fed. Cir. 1988)).

Appellant has not directed us to evidence that establishes the skin depth which is determined, at least in part, based upon a calculation of the skin depth, and the calculation relying upon at least one of a resistivity of the conductor and a relative magnetic permeability of the conductor—the process of making the claimed product—results in a patently distinct

product.

Claims 6, 11, and 14

Appellant argues claims 6, 11, and 14 require the skin depth to be calculated using the specified formula. Appellant argues “the only prior art (Shinmoto) that locates the two layers at the location merely instructs dividing the two thicknesses. Nowhere is there a suggestion to look to this formula.” (Appeal Br. 4.)

These arguments are not persuasive for the reasons we provide above. Appellant has not disputed the Examiner’s position that Erden discloses a formula for determining the skin depth through which current will normally pass was known.

Accordingly, we sustain the Examiner’s 35 U.S.C. § 103 rejection of all the claims on appeal.

CONCLUSION

In summary:

Claims Rejected	35 U.S.C. §	Reference(s)/Basis	Affirmed	Reversed
1-4, 6-9, 11, 12, 14, 15	112(a)	Written Description Requirement		1-4, 6-9, 11, 12, 14, 15
7, 12	112(b)	Indefiniteness		7, 12
1-4, 6-9, 11, 12, 14, 15	103	Baldwin, Knerr, Shinmoto, Erden	1-4, 6-9, 11, 12, 14, 15	
Overall Outcome			1-4, 6-9, 11, 12, 14, 15	

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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