UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE BOARD OF PATENT APPEALS
AND INTERFERENCES

Ex parte EVANGELOS TRIFON LASKARIS,
JAMES PELLIGRINO ALEXANDER,
and KIRUBA SIVASUBRAMANIAM

Appeal 2008-5352
Application 10/249,641[1]
Technology Center 2800

Decided: November 28, 2008

Before KENNETH W. HAIRSTON, JOHN A. JEFFERY,
and MARC S. HOFF, *Administrative Patent Judges*.

HAIRSTON, *Administrative Patent Judge*.

DECISION ON APPEAL

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[1] Application filed April 28, 2003. The real party in interest is General Electric Company. We note that Application Serial No. 11/076,359, filed March 9, 2005, is a divisional of the instant application and is also currently pending before the Examiner on appeal (Appeal Brief filed Jun. 30, 2006).

STATEMENT OF THE CASE

Appellants appeal under 35 U.S.C. § 134 from a final rejection of claims 1 to 12.[2] We have jurisdiction under 35 U.S.C. § 6(b).

We will affirm-in-part.

The Invention

Appellants' claimed invention is directed to a superconducting electrical motor/generator, and more specifically, to a rotor for such a motor/generator (100 in Fig. 1) and an associated coil (120 and 130 in Fig. 2) employing cryogenic cooling which are connected together so as to allow for thermal contraction and so as to provide isolation of the coil from the rest of the parts of the motor/generator (Spec. 2; App. Br. 2).

Claim 1 is representative of the claims on appeal, and it reads as follows:

1. A rotor for an electrical motor/generator, comprising:

at least one cryogenic-temperature coil wound around a coil form, the coil form being fixed to a pole tip of the rotor in such a manner as to accommodate thermal contraction of the at least one cryogenic-temperature coil relative to the pole tip.

The Rejections

The prior art relied upon by the Examiner in rejecting the claims on appeal is:

Baumann	US 4,275,320	June 23, 1981
Gillet	US 4,329,602	May 11, 1982

[2] Claims 13 to 31 have been canceled.

Herd	US 5,672,921	Sep. 30, 1997
Laskaris	US 6,605,885 B2	Aug. 12, 2003 (filed May 15, 2001)

The Examiner rejected claims 1, 2, 5, 6, 10, and 11 under 35 U.S.C. § 102(e) as being anticipated based upon the teachings of Laskaris.

The Examiner rejected claim 3 under 35 U.S.C. § 103(a) as being unpatentable based upon the teachings Laskaris and Gillet.

The Examiner rejected claims 4, 7, and 8 under 35 U.S.C. § 103(a) as being unpatentable based upon the teachings Laskaris alone.

The Examiner rejected claim 9 under 35 U.S.C. § 103(a) as being unpatentable based upon the teachings Laskaris and Baumann.

The Examiner rejected claim 12 under 35 U.S.C. § 103(a) as being unpatentable based upon the teachings Laskaris and Herd.

Rather than repeat the arguments of Appellants or the Examiner, we refer to the Brief[3] and the Answer[4] for their respective details. In this decision, we have considered only those arguments actually made by Appellants. Arguments which Appellants could have made but did not make in the Brief have not been considered and are deemed to be waived. *See* 37 C.F.R. § 41.37(c)(1)(vii).

[3] We refer to the Appeal Brief filed November 16, 2006, throughout this opinion.

[4] We refer to the most recent Examiner's Answer mailed April 26, 2007, throughout this opinion.

ISSUES

The anticipation and obviousness issues before us primarily concern whether or not the applied reference to Laskaris teaches:

(1) a "coil wound around a coil form" and a "pole tip" as set forth in claim 1 on appeal;

(2) a "bracket slidably attached to the pole tip" as set forth in claim 2 on appeal; and

(3) a "plurality of pole pieces disposed within the coil form" as set forth in claim 5 on appeal.

The principal issues before us, then, are whether Appellants have shown that the Examiner erred in rejecting each of claims 1, 2, and 5 under § 102(e), and as a result thereby also erred in rejecting each of claims 6, 10, and 11 under § 102(e) and each of claims 3, 4, 7 to 9, and 12 under § 103(a).

FINDINGS OF FACT

1. As indicated *supra*, Appellants describe and claim a rotor (100) for a superconducting electric motor/generator (10) which has a cryogenic-temperature coil (120 and 130), coil form (166), and pole tip (170) arranged and connected together so as to allow for thermal contraction (Figs. 1 and 2; Spec. 3-4).

2. Laskaris teaches a rotor 14 for an electrical motor/generator 10 having a cryogenic-temperature coil 34 wound around a coil form 44 (Figs. 1-4). Laskaris discloses that the coil form 44 is fixed to a pole tip (section of the rotor core 22 to either side of the tension rods 42 extending to the outer curved surface 50 of the rotor core 22) by a fixed bracket 52 so as to allow for thermal contraction of the coil 34 relative to the pole tip (col. 2, l. 62 to

col. 3, l. 7; col. 8, ll. 23-29; Fig. 1-4). Laskaris further teaches a plurality of pole pieces 43 disposed within the coil form 44 (Fig. 3; col. 5, l. 57 to col. 6, l. 11).

We will address the anticipation and obviousness issues in turn below.

ANTICIPATION

Principles of Law

Appellants have the burden on appeal to the Board to demonstrate error in the Examiner's position. *See In re Kahn*, 441 F.3d 977, 985-86 (Fed. Cir. 2006).

Analysis of whether a claim is patentable over the prior art under 35 U.S.C. § 102 begins with a determination of the scope of the claim. We determine the scope of the claims in patent applications not solely on the basis of the claim language, but upon giving claims their broadest reasonable construction in light of the specification as it would be interpreted by one of ordinary skill in the art. *In re Am. Acad. of Sci. Tech Ctr.*, 367 F.3d 1359, 1364 (Fed. Cir. 2004); *In re Morris*, 127 F.3d 1048, 1054 (Fed. Cir. 1997).

Anticipation is established when a single prior art reference discloses expressly or under the principles of inherency each and every limitation of the claimed invention. *Atlas Powder Co. v. IRECO, Inc.*, 190 F.3d 1342, 1347 (Fed. Cir. 1999); *In re Paulsen*, 30 F.3d 1475, 1478-79 (Fed. Cir. 1994). "A claim is anticipated only if each and every element as set forth in the claim is found, either expressly or inherently described, in a single prior art reference." *Verdegaal Bros., Inc., v. Union Oil Co. of Calif.*, 814 F.2d 628, 631 (Fed. Cir. 1987).

Analysis

Claim 1

Regarding the Examiner's anticipation rejection of representative claim 1,[5] Appellants argue that Laskaris' fails to disclose (1) a "'***coil wound around a coil form***,'" and (2) a "coil form fixed to a pole tip of the rotor" (App. Br. 5-6). According to Appellants, Laskaris discloses the reverse structural relationship, that of the *coil form* being assembled around the *coil* (App. Br. 5-6), and Laskaris "does not disclose a coil form that is fixed to a pole tip of the rotor" (App. Br. 6).

The Examiner interprets Laskaris' coil 34 (Figs. 1-4) as being wound around a coil form 44 (Figs. 3 and 4) (Ans. 4-5), and interprets Laskaris' core portions to the left and right of tension rod 42 (bounded by outer curved surfaces 50) as being pole tips (Ans. 10; *see* Fig. 4; *also see* the Examiner's mark-up of Fig. 4 at Ans. 9).

Although we find some merit in Appellants' contention that "the channel housings 44 are assembled over the winding 34" (at least in one direction), we cannot agree with Appellants that the channel housings 44 are more accurately characterized as being around the coil and not vice versa (App. Br. 5). Although the channel housing 44 may be assembled over the winding 34 in one direction, it is our view that Figures 1 through 4 of

[5] Appellants argue claims 1, 2, 5, 6, 10, and 11 together as a group. *See* App. Br. 4-7. Although Appellants nominally argue claims 6, 10, and 11 separately (App. Br. 7), the arguments presented are commensurate with those presented for their respective base claims 1 and 5. Accordingly, we select claim 1 as representative of the grouping comprising claims 1, 10, and 11, and we select claim 5 as representative of the grouping comprising claims 5 and 6. *See* 37 C.F.R. § 41.37(c)(1)(vii).

Laskaris show a coil 34 which is wound around the channel housings 44 and rotor core 22 in a direction perpendicular to the one direction just mentioned above. In other words, we find that the coil 34 of Laskaris is disclosed as being "wound around" the coil form 44 (Finding of Fact 2).

We also cannot agree with Appellants' arguments that "Laskaris does not disclose pole tips," that "Laskaris does not disclose a coil form that is fixed to a pole tip of the rotor," or that the rotor of Laskaris does not include pole tips (App. Br. 6). We are persuaded by the Examiner's argument that the pole tips are shown in Figure 4 of Laskaris as being the portions of the rotor core 22 which are to the left and right hand side of the tension rod 42 (Ans. 10) (*see* Ans. 9 for the Examiner's marked-up version of Fig. 4 with the pole tips labelled). We agree with the Examiner's findings as to Laskaris (Ans. 4-5 and 9-10), and additionally find that the pole tips extend to, and include, the outer curved surfaces 50 of the rotor core 22 (Finding of Fact 2).

For the foregoing reasons, we are not persuaded that the Examiner erred in rejecting representative claim 1 on appeal.

Claim 2

Regarding the Examiner's anticipation rejection of claim 2,[6] Appellants argue that element 52 in Figure 3 of Laskaris (cited by the Examiner as teaching the "bracket" of claim 2) fails to disclose a "bracket slidably attached to the pole tip" (App. Br. 6). Appellants contend that element 52 of Laskaris "is an insulating tube that fastens the coil support

[6] Although Appellants nominally argue claims 3 and 4 separately (App. Br. 8-9), the arguments presented are commensurate with those presented for claims 1 and 2 from which claims 3 and 4 depend. Accordingly, we select claim 2 as representative of the grouping comprising claims 2, 3, and 4. *See* 37 C.F.R. § 41.37(c)(1)(vii).

structure to the hot rotor" (citing col. 9, ll. 5-7), and that "tube 52 is ***locked in place*** by a retainer locking nut 84" (citing col. 9, ll. 22-24) (App. Br. 6) (emphasis in original).

The Examiner cites column 9, lines 10-23 of Laskaris as supporting the proposition that insulating tube 52 and lock nut 84 are "slidably inserted to the expanded end 88 of each conduit 46" (Ans. 10), and replies that claim 2 "does not require the bracket to be movable after being assembled." (Ans. 10). However, our close review of column 9, lines 10-23 reveals that the insulator tube 52 "is *placed in* the expanded end 88" and "*locked in place* by a retainer *locking*-nut 84" (col. 9, ll. 21-23) (emphasis added). Accordingly, we find that even if the insulator tube 52 were interpreted to be a "bracket," it is not "slidably attached." Quite to the contrary, it is locked in place (Finding of Fact 2).

Since we interpret claim 2 as requiring that the bracket be "slidably attached to the pole tip," and since we agree with Appellants' characterization of tube 52 as not being slidable, we are persuaded that the Examiner erred by relying upon fixed tube 52 as providing the limitation of a "slidably attached" bracket as recited in claim 2.

Claim 5

Regarding the Examiner's anticipation rejection of claim 5, Appellants argue that Laskaris' bolts 43 are not pole pieces (App. Br. 7). Appellants contend that "the bolts 43 cannot be pole pieces because the bolts 43 are perpendicular to the pole axis, so they are not even aligned with the pole." (App. Br. 7).

The Examiner replies that bolts 43 are pole pieces because (1) "component 43 is a component of an assembly to mount the coil form 44 to

the rotor core (including the rotor pole)," and because (2) claim 5 "does not require[][sic] the orientation of the pole pieces with respect to the pole axis or the alignment of the pole pieces with the pole." (Ans. 11).

We agree with the Examiner. In our view, the bolts 43 are "disposed within the coil form" as recited in claim 5, and bolts 43 are pieces because they perform the same function as Appellants' pole pieces of mounting the coil form to the rotor core/pole (*see* Finding of Fact 2). In our view, the broadest reasonable construction of claim 5, in light of the specification, does not require a particular direction or orientation of the pole pieces with respect to the coil form. *Am. Acad. of Sci. Tech Ctr.*, 367 F.3d at 1364; *Morris*, 127 F.3d at 1054. Claim 5 merely states that the pole pieces be "*disposed within* the coil form." (Claim 5 on appeal) (emphasis added).

For the foregoing reasons, we are not persuaded that the Examiner erred in rejecting representative claim 5 on appeal.

OBVIOUSNESS

Principles of Law

The Examiner bears the initial burden of presenting a prima facie case of obviousness, and Appellants have the burden of presenting a rebuttal to the prima facie case. *In re Oetiker*, 977 F.2d 1443, 1445 (Fed. Cir. 1992).

"Section 103 forbids issuance of a patent when 'the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains.'" *KSR Int'l Co. v. Teleflex Inc.*, 127 S. Ct. 1727, 1734 (2007). The question of obviousness is resolved on the basis of

underlying factual determinations including (1) the scope and content of the prior art, (2) any differences between the claimed subject matter and the prior art, (3) the level of skill in the art, and (4) where in evidence, so-called secondary considerations. *Graham v. John Deere Co.*, 383 U.S. 1, 17-18 (1966). *See also KSR*, 127 S. Ct. at 1734 ("While the sequence of these questions might be reordered in any particular case, the [*Graham*] factors continue to define the inquiry that controls.")

The Examiner's articulated reasoning in the rejection must possess a rational underpinning to support the legal conclusion of obviousness." *Kahn*, 441 F.3d at 988. The Supreme Court, citing *Kahn*, 441 F.3d at 988, stated that "'rejections on obviousness grounds cannot be sustained by mere conclusory statements; instead, there must be some articulated reasoning with some rational underpinning to support the legal conclusion of obviousness.'" *KSR*, 127 S. Ct. at 1741.

Analysis

We conclude that the Examiner has established a prima facie case of obviousness with respect to claims 3, 4, 7 to 9, and 12 (Ans. 6-9). We now examine whether Appellants have met their burden of rebutting the prima facie case, thereby showing that the Examiner erred in rejecting these claims under § 103(a).

Appellants' arguments with respect to the obviousness rejections of claims 3, 4, 7 to 9, and 12 (App. Br. 7-9), are variations of, or are premised on, the major contentions applied to the other claims on appeal discussed above with respect to the anticipation rejections (we refer to the anticipation rejections of claims 1, 2, and 5 from which claims 3, 4, 7 to 9, and 12 depend).

With regard to claims 3 and 4, we consider these arguments sufficiently addressed in our analysis of the anticipation rejection of representative claim 2 above (finding error in the Examiner's anticipation rejection of claim 2), and we are persuaded of the error in the Examiner's obviousness rejection for at least the reason that Laskaris fails to disclose all of the limitations of representative claim 2 from which claims 3 and 4 depend.

With regard to claims 7 to 9 and 12, the Examiner has adequately articulated the differences between the subject matter of the claims and the teachings and suggestions of Laskaris and the other applied prior art (Ans. 4-5 and 9 to 11, discussing the teachings of Laskaris with regard to claims 1 and 5 from which claims 7 to 9 and 12 depend; Ans. 7-9, discussing the teachings and suggestions of Laskaris and the other applied prior art with regard to claims 7 to 9 and 12), and has established a prima facie case that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. *KSR*, 127 S. Ct. at 1734. The articulated reasoning in the rejection (Ans. 7-9), possesses a rational underpinning which supports the legal conclusion of obviousness. *Kahn*, 441 F.3d at 988. We consider Appellants' arguments as to claims 7 to 9 and 12 to be sufficiently addressed in our analysis of the anticipation rejection of representative claims 1 and 5 above, and we do not find error in the Examiner's obviousness rejection.

In view of the foregoing, Appellants have sufficiently rebutted the Examiner's prima facie case of obviousness with respect to claims 3 and 4, but not with respect to claims 7 to 9 and 12.

CONCLUSIONS OF LAW

Appellants have not shown that the Examiner erred in rejecting claims 1, 5, 6, 10, and 11 under § 102(e). Nor have Appellants shown that the Examiner erred in rejecting claims 7-9 and 12 under § 103(a). However, Appellants' arguments have persuaded us that the Examiner erred in rejecting claim 2 under § 102(e) and claims 3 and 4 under § 103(a).

DECISION

The anticipation rejection of claims 1, 5, 6, 10, and 11 is affirmed, and the anticipation rejection of claim 2 is reversed. The obviousness rejections of claims 3 and 4 are reversed, and the obviousness rejections of claims 7, 8, 9, and 12 are 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)(1)(iv).

AFFIRMED-IN-PART

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