

The opinion in support of the decision being entered today is *not* binding precedent of the Board.

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE BOARD OF PATENT APPEALS
AND INTERFERENCES

Ex parte MICHAEL D. GANDRUD, TORBEN FREDERIKSEN,
and JEFF HERRIN

Appeal 2007-0904
Application 11/025,331
Technology Center 2800

Decided: June 26, 2007

Before JAMES D. THOMAS, JOSEPH F. RUGGIERO, and
JEAN R. HOMERE, *Administrative Patent Judges*.

HOMERE, *Administrative Patent Judge*.

DECISION ON APPEAL
STATEMENT OF THE CASE

Appellants appeal under 35 U.S.C. § 134 from the Examiner's Final Rejection of claims 1, 3 through 7, and 9 through 22. Claims 2 and 8 have been canceled. We have jurisdiction under 35 U.S.C. § 6(b) to decide this appeal.

Appellants invented an alternating current inverter for use in an electrically powered fork lift truck. Particularly, the invention uses an inverter to drive a plurality of electric motors. (Specification 1.)

Claim 1 is illustrative and representative of the claimed invention. It reads as follows:

1. An alternating current inverter comprising:

a housing;

a power module within the housing;

a direct current source in electrical communication with the housing;

a plurality of electric motors in electrical communication with the power module; and

the power module having two separate and independently drivable power stages for driving the electric motors.

In rejecting the claims on appeal, the Examiner relied upon the following prior art:

Katagiri	US 5,619,111	Apr. 8, 1997
Cook	US 5,789,879	Aug. 4, 1998
Okushima	US 6,486,632 B2	Nov. 26, 2002
Xu	US 6,906,479 B2	Jun. 14, 2005

The Examiner rejected the claims on appeal as follows:

- A. Claims 1, 6, 9, 16, 18, and 21 are rejected under 35 U.S.C. § 102(b) as being anticipated by Katagiri.
- B. Claims 3 through 5, 7, 19, and 20 are rejected under 35 U.S.C. § 103(a) as being unpatentable over Katagiri.

C. Claims 1, 3 through 7, 9 through 13, and 17 through 21 are rejected under 35 U.S.C. § 103(a) as being unpatentable over Okushima in view of Xu.

D. Claims 14 and 15 are rejected under 35 U.S.C. § 103(a) as being unpatentable over Okushima in view of Xu, and further in view of Cook.

E. Claim 22 is rejected under 35 U.S.C. § 103(a) as being unpatentable over Okushima in view of Xu, and further in view of Cook.

First, Appellants contend¹ that Katagiri does not anticipate claims 1, 6, 9, 16, 18 and 21. Particularly, Appellants contend that Katagiri does not fairly teach or suggest an inverter having an electrical communication with more than one motor, as recited in representative claim 1. (Br. 6.)

Similarly, Appellants contend that Katagiri does not teach a power module having two independent power stages for driving a plurality of motors, as recited in representative claim 1. (Reply Br. 2.) In response, the Examiner contends that Katagiri teaches the cited limitations, and therefore anticipates representative claim 1. (Answer 3 and 11.)

Second, Appellants contend that Katagiri does not render claims 3 through 5, 7, 19, and 20 unpatentable. Particularly, Appellants reiterate that, among other things, Katagiri does not teach an inverter having a power module with two separate power stages for driving a plurality of electric motors, as claimed. (Br. 7.) The Examiner, in contrast, contends that

¹ This decision considers only those arguments that Appellants submitted in the Appeal and Reply Briefs. Arguments that Appellants could have made but chose not to make in the Briefs are deemed to have been waived. See 37 C.F.R. § 41.37(c)(1) (vii)(eff. Sept. 13, 2004). See also *In re Watts*, 354 F.3d 1362, 1368, 69 USPQ2d 1453, 1458 (Fed. Cir. 2004).

Katagiri's teachings render claims 3 through 5, 7, 19, and 20 unpatentable. (Answer 5 and 6.)

Third, Appellants contend that Okushima taken in combination with either Xu and/or Cook does not render claims 1, 3, 6, 7, 9 through 15, and 17 through 22 unpatentable. Particularly, Appellants contend that Okushima does not teach a plurality of motors connected to a single inverter. (Br. 7.) Similarly, Appellants contend that, among other things, neither Okushima nor Xu teaches an inverter having a power module with two separate power stages for driving a plurality of electric motors, as claimed. (Reply Br. 4 and 5.) The Examiner, in contrast, contends that both Xu and Cook complement Okushima's teachings to yield the invention as recited in claims 1, 3, 6, 7, 9 through 15, and 17 through 22. (Answer 6 through 10 and 12.) Therefore, the Examiner concludes that it would have been obvious to one of ordinary skill in the art to combine the teachings of the cited references to render the cited claims unpatentable. (*Id.*)

We affirm-in-part.

ISSUES

The *pivotal* issues in the appeal before us are as follows:

- (1) Have Appellants shown that the Examiner failed to establish that the disclosure of Katagiri anticipates the claimed invention under 35 U.S.C. § 102(b), when Katagiri teaches a biaxial inverter unit having two inverters for separately driving a plurality of electric motors?
- (2) Have Appellants shown that the Examiner failed to establish that one of ordinary skill in the art, at the time of the present invention, would have found that Katagiri's disclosure renders the claimed invention unpatentable under 35 U.S.C. § 103(a)?

- (3) Have Appellants shown that the Examiner failed to establish that one of ordinary skill in the art, at the time of the present invention, would have found that the combined disclosures of Okushima with Xu and Cook render the claimed invention unpatentable under 35 U.S.C. § 103(a)?

FINDINGS OF FACT

The following findings of fact are supported by a preponderance of the evidence.

The Invention

1. Appellants invented an alternating current inverter² (12) to power a plurality of electric motors (16). (Specification 5.)
2. As depicted in Figure 2, the inverter (12) has a housing (18) connected with a direct current source (14). (*Id.*)
3. The housing (18) includes a transistor power module (40) having two separate and independently drivable power stages for driving the electric motors (16). (*Id.* 6.)

The Prior Art Relied Upon

4. As depicted in Figure 4, Katagiri teaches a wiring circuit using a biaxial inverter unit (6) for controlling a plurality of servo motors (M1, M2) using a plurality of inverters (52, 56). (Abstract, col. 6, ll. 24-27.)
5. Katagiri teaches that the inverter unit (6) has a housing, which includes two inverters³ (52, 56), dead time forming sections (51, 55), a

² Battery powered inverters are electronic devices that convert the battery's direct current energy into three phase alternating current energy of an adjustable voltage level to create the desired performance of an electrical motor. (Specification 1.)

³ Katagiri indicates that inverters (52, 56) include power devices such as power transistors. (Col. 5, ll. 11-12.) Further, Katagiri indicates that the

current detector (54), an A/D converter (53), and a microprocessor (57), all working together as a unit to separately and independently power the electric motors (M1 and M2). (Col. 8, ll. 5-54.)

6. Katagiri teaches a direct current voltage source (DC280 Line) connected to the biaxial inverter unit. (Col. 6, ll. 14-17, ll. 24-27.)

7. As depicted in Figure 5, Okushima teaches a control device for powering a hybrid vehicle with two motors/generators (11, 21) and an inverter set. (Col. 7, ll. 36-41.)

8. Okushima teaches that the inverter set includes first and second inverters (10, 20) for respectively powering the electric motors (11, 21) and for respectively controlling inverter control circuits 12 and 22. (Col. 7, ll. 37-44.)

PRINCIPLES OF LAW

1. ANTICIPATION

It is axiomatic that anticipation of a claim under § 102 can be found only if the prior art reference discloses every element of the claim. *See In re King*, 801 F.2d 1324, 1326, 231 USPQ 136, 138 (Fed. Cir. 1986) and *Lindemann Maschinenfabrik GMBH v. American Hoist & Derrick Co.*, 730 F.2d 1452, 1458, 221 USPQ 481, 485 (Fed. Cir. 1984).

In rejecting claims under 35 U.S.C. § 102, a single prior art reference that discloses, either expressly or inherently, each limitation of a claim invalidates that claim by anticipation. *Perricone v. Medicis Pharmaceutical Corp.*, 432 F.3d 1368, 1375-76, 77 USPQ2d 1321, 1325-26 (Fed. Cir. 2005), citing *Minn. Mining & Mfg. Co. v. Johnson & Johnson Orthopaedics, Inc.*,

reason why one inverter unit includes a plurality of inverters is to simplify circuitry and to reduce the manufacturing cost. (Col. 8, ll. 9-11.)

976 F.2d 1559, 1565, 24 USPQ2d 1321, 1326 (Fed. Cir. 1992). Anticipation of a patent claim requires a finding that the claim at issue “reads on” a prior art reference. *Atlas Powder Co. v. IRECO, Inc.*, 190 F.3d 1342, 1346, 51 USPQ2d 1943, 1945 (Fed Cir. 1999) (“In other words, if granting patent protection on the disputed claim would allow the patentee to exclude the public from practicing the prior art, then that claim is anticipated, regardless of whether it also covers subject matter not in the prior art.”) (internal citations omitted).

2. OBVIOUSNESS

The Supreme Court in *Graham v. John Deere*, 383 U.S. 1, 17-18, 148 USPQ 459, 467 (1966), stated that three factual inquiries underpin any determination of obviousness:

Under § 103, (1) the scope and content of the prior art are to be determined; (2) differences between the prior art and the claims at issue are to be ascertained; and (3) the level of ordinary skill in the pertinent art resolved. Against this background, the obviousness or nonobviousness of the subject matter is determined. Such secondary considerations as commercial success, long felt but unsolved needs, failure of others, etc., might be utilized to give light to the circumstances surrounding the origin of the subject matter sought to be patented. As indicia of obviousness or nonobviousness, these inquiries may have relevancy.

In rejecting claims under 35 U.S.C. § 103, the Examiner bears the initial burden of establishing a prima facie case of obviousness. *In re Oetiker*, 977 F.2d 1443, 1445, 24 USPQ2d 1443, 1444 (Fed. Cir. 1992). See also *In re Piasecki*, 745 F.2d 1468, 1472, 223 USPQ 785, 788 (Fed. Cir. 1984). Where the claimed subject matter involves more than the simple substitution of one known element for another or the mere application of a

known technique to a piece of prior art ready for the improvement, a holding of obviousness must be based on “an apparent reason to combine the known elements in the fashion claimed.” *KSR Int'l v. Teleflex, Inc.*, 127 S. Ct. 1727, 1740-41, 82 USPQ2d 1385, 1396 (2007). That is, “there must be some articulated reasoning with some rational underpinning to support the legal conclusion of obviousness.” *Id.*, 127 S. Ct. at 1741, 82 USPQ2d at 1396 (quoting *In re Kahn*, 441 F.3d 977, 987, 78 USPQ2d 1329, 1336 (Fed. Cir. 2006)). Such reasoning can be based on interrelated teachings of multiple patents, the effects of demands known to the design community or present in the marketplace, and the background knowledge possessed by a person having ordinary skill in the art. *KSR*, 127 S. Ct. at 1740-41, 82 USPQ2d at 1396. Only if this initial burden is met does the burden of coming forward with evidence or argument shift to the Appellant. *Oetiker*, 977 F.2d at 1445, 24 USPQ2d at 1444. *See also Piasecki*, 745 F.2d at 1472, 223 USPQ at 788. Thus, the Examiner must not only assure that the requisite findings are made, based on evidence of record, but must also explain the reasoning by which the findings are deemed to support the Examiner’s conclusion.

ANALYSIS

A. 35 U.S.C. § 102(b) REJECTION

As set forth above, representative claim 1 requires a power module, comprised within the housing of an inverter, having two separate and independently drivable power stages for driving a plurality of electric motors. As detailed in the findings of fact section above, we have found that Katagiri discloses an inverter unit that includes a circuitry for separately powering motors M1 and M2. (Finding of Fact 5). We find that the

disclosed circuitry inside the inverter unit operates as two separate stages for driving motors M1 and M2. Particularly, we find that the first stage of the circuit includes a dead time forming section (51), which forwards the incoming DC voltage to the first inverter (52) to power the motor M1. Similarly, we find the second stage of the circuit includes another dead time forming section (55) which forwards the received DC voltage to the second inverter (56) to drive the second motor M2. Consequently, we find that these two stages of the circuit inside the inverter unit constitute a power module for separately driving the two motors M1 and M2. In light of these findings, it is our view that Katagiri does teach the cited limitations of representative claim 1. It follows that the Examiner did not err in rejecting claims 1 and 21 as being anticipated by Katagiri.

Appellants did not provide separate arguments with respect to the rejection of dependent claims 6, 9, 16 and 18 as being anticipated by Katagiri. Therefore, they fall together with representative claim 1. *See In re Young*, 927 F.2d 588, 590, 18 USPQ2d 1089, 1091 (Fed. Cir. 1991). *See also* 37 C.F.R. § 41.37(c)(1)(vii).

B. 35 U.S.C. § 103(a) REJECTIONS

Now, we turn to the rejection of claims 3 through 5, 7, 19, and 20 as being unpatentable Katagiri. We note that these dependent claims also require a power module, comprised within the housing of an inverter, having two separate and independently drivable power stages for driving a plurality of electric motors. As detailed in the discussion of representative claim 1 above, we have found that Katagiri teaches such limitations. In light of these findings, it is our view that one of ordinary skill in the art would have found obvious these limitations over Katagiri's disclosure to yield the

invention as claimed. Therefore, it follows that the Examiner did not err in rejecting claims 3 through 5, 7, 19, and 20 as being unpatentable over Katagiri.

Now, we turn to the rejection of claims 1, 3 through 5, 6, 7, 9 through 15, and 17 through 22 as being unpatentable over Okushima in combination with Xu and/or Cook. As set forth above, representative claim 1 requires a power module, comprised within the housing of an inverter, having two separate and independently drivable power stages for driving a plurality of electric motors. As detailed in the findings of fact section above, we have found that Okushima teaches an inverter set with two individual inverters, each separately driving a motor. (Finding of Fact 8.) We do not find, however, any teaching in Okushima of a power module within an inverter, wherein the power module includes two separate stages for independently driving the motors. We further find that neither Xu nor Cook cures such deficiencies.⁴ In light of these findings, it is our view that one of ordinary skill in the art would not have found it obvious to combine the teachings of Okushima with Xu and/or Cook to yield the invention as claimed. Therefore, it follows that the Examiner erred in rejecting claims 1, 3 through 5, 6, 7, 9 through 15, and 17 through 22 as being unpatentable over the combination of Okushima with Xu and/or Cook.

⁴ We note that, unlike Katagiri's inverter unit, Okushima's inverter set merely includes the two inverters without any other supporting components that would cause each of the inverters in the set to function like a separate stage of a power module. In Katagiri, the inverter unit itself can be viewed as the claimed inverter while the individual inverters in conjunction with other supporting components make up the stages of the power module that separately drive the motors. However, In Okushima, the inverter set cannot be viewed as being both the inverters and the power module.

CONCLUSION OF LAW

On the record before us, Appellants have not shown that the Examiner failed to establish that Katagiri anticipates claims 1, 6, 9, 16, 18, and 21 under 35 U.S.C. § 102(b). Additionally, Appellants have not shown that the Examiner failed to establish that Katagiri renders claims 3 through 5, 7, 19, and 20 unpatentable under 35 U.S.C. § 103(a). However, Appellants have shown that the Examiner failed to establish that the combination Okushima, Xu and/or Cook renders claims 1, 3 through 5, 6, 7, 9 through 15, and 17 through 22 unpatentable under 35 U.S.C. § 103(a).

DECISION

We have affirmed the Examiner's decision rejecting claims 1, 3 through 7, 9, 16, and 18 through 21 over Katagiri. We have, however, reversed the Examiner's decision rejecting claims 1, 3 through 5, 6, 7, 9 through 15, and 17 through 22 over the combination of Okushima, Xu and/or Cook.

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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