UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE BOARD OF PATENT APPEALS
AND INTERFERENCES

Ex parte MOHAMMED Y. SAIDI
AND HAITAO HUANG

Appeal 2007-2044
Application 10/116,450
Technology Center 1700

Decided: November 16, 2007

Before EDWARD C. KIMLIN, BRADLEY R. GARRIS, and CHARLES F. WARREN, *Administrative Patent Judges*.

GARRIS*, Administrative Patent Judge*.

DECISION ON APPEAL

Appellants appeal under 35 U.S.C. § 134 from the Examiner's decision rejecting claims 52-57, 59-83, and 87. We have jurisdiction under 35 U.S.C. § 6.

We AFFIRM-IN-PART and REMAND.

Appellants claim an electrode active material represented by a general formula which defines lithium based compounds having an olivine structure (Spec. 19).

Representative claims 52 and 76 read as follows:

52. An electrode active material represented by the general formula

$$LiM(PO_{4-x}Y'_x)$$

wherein M is $Co_eM^1{}_gM^2{}_hM^3{}_iM^4{}_{j,}$ and

(a) M^1 is one or more transition metals, comprising Fe;

(b) M^2 is one or more +2 oxidation state non-transition metals;

(c) M^3 is one or more +3 oxidation state non-transition elements;

(d) M^4 is one or more +1 oxidation state non-transition metals; and

(e) Y' is selected from the group consisting of a halogen, S, N, and mixtures thereof; and

each of e, g, h and $i > 0$; $j \geq 0$; $(e + g + h + i + j) \leq 1$; and $0 \leq x \leq 0.5$.

76. An electrode active material according to Claim 52, wherein $0 < x \leq 0.1$.

The references set forth below are relied upon by the Examiner as evidence of obviousness:

Armand	CA 2,200,998	Sep. 25, 1998
Kariru (as translated)	JP 11-25983	Jan. 29, 1999
Barker	WO 01/84655 A1	Nov. 8, 2001
Morishima	US 2003/0054353 A1	Mar. 20, 2003

Under 35 U.S.C. § 103(a): claims 52-57, 59-75, 83, and 87 are rejected as being unpatentable over Armand in view of Morishima; claims

52-57, 59-75, 83, and 87 are rejected as being unpatentable over Armand in view of Kariru; and claims 76-82 are rejected as being unpatentable over Armand in view of Morishima or Kariru and further in view of Barker.

THE REJECTIONS BASED ON ARMAND IN VIEW OF MORISHIMA AND ARMAND IN VIEW OF KARIRU

The facts relevant to these rejections are not in dispute.

Each of the above noted references discloses lithium based electrode material having an olivine structure. Claim 52 distinguishes from Armand by requiring the combined presence of cobalt and a +2 oxidation state non-transition metal such as magnesium. Armand teaches using cobalt and magnesium in the electrode material but does not teach that these two elements may be used in combination (Abstract; claim 1). Both Morishima and Kariru expressly teach using the combination of cobalt and magnesium in lithium based electrode material having an olivine structure (Morishima: ¶¶ 0027-0042 and Examples 1-3 *et. seq*.; Kariru: Abstract, claim 1).

These findings support the Examiner's conclusion that it would have been obvious for one with ordinary skill in this art to formulate Armand's lithium based electrode material of olivine structure with a cobalt and magnesium combination in view of the respective teachings in Morishima and Kariru that it was known in the prior art to use such a combination in forming lithium based electrode materials having olivine structure.

Appellants argue there is no teaching or suggestion in these applied references to select from their teachings the particular elements required by claim 52 and then combine these elements in order to obtain the claimed electrode active material (Br. 14-15, 19-21). This argument is unpersuasive.

Contrary to Appellants' apparent belief, the fact that the generic teachings of the applied references encompass a large number of combinations does not evince nonobviousness with respect to the individual electrode material compounds disclosed therein. *See Merck & Co. v. Biocraft Labs.*, 874 F.2d 804, 806 (Fed. Cir. 1989).

As for the above proposed combination of these prior art teachings, it is prima facie obvious to combine the ingredients of the primary and secondary reference compounds, each of which is useful for the same purpose (i.e., lithium based electrode material having olivine structure), in order to form a third compound which is to be used for the very same purpose since combining these ingredients flows logically from their having being individually taught in the prior art. *Compare In re Kerkhoven*, 626 F.2d 846, 850 (CCPA 1980). Stated differently, cobalt and magnesium are familiar elements in this art, both individually and in combination, and the combination of these familiar elements with the electrode material of Armand according to known methods is likely to be obvious when it does no more than yield predictable results as here (i.e., an effective electrode material). *See KSR Int'l Co. v. Teleflex, Inc.,* 127 S. Ct. 1727, 1739 (U.S. 2007).

Finally, Appellants seem to believe that the applied prior art must contain an express teaching that adding magnesium to the cobalt of Armand's electrode material would produce a beneficial effect on the properties of the electrode material (Br. 14, 20). However, an obviousness analysis need not seek out precise teachings directed to the specific subject matter of a claim, for it is proper to take account of the inferences and creative steps that a person of ordinary skill in the art would employ.

KSR, 127 S. Ct. at 1741. In this instance, a beneficial effect from using magnesium in combination with cobalt is inferred by the fact that this combination is used in the respective electrode materials of Morishima and Kariru. Moreover, this inference is validated by Morishima's express teachings of beneficial effects produced by magnesium such as shortened baking time (¶ 0053) and increased lithium diffusion rate (¶ 0061 in comparison with ¶ 0064).

For the above stated reasons, the Examiner has established a primary facie case of obviousness with respect to the subject matter of appealed claim 52 which Appellants have failed to successfully rebut with argument or evidence of nonobviousness. *See In re Oetiker*, 977 F.2d 1443, 1445 (Fed. Cir. 1992). We hereby sustain, therefore, the § 103 rejections of claims 52-57, 59-75, 83, and 87 as being unpatentable over Armand in view of Morishima and of claims 52-57, 59-75, 83, and 87 as being unpatentable over Armand in view of Kariru.

THE REJECTION BASED ON ARMAND IN VIEW OF MORISHIMA OR KARIRU AND FURTHER IN VIEW OF BARKER

The Examiner acknowledges that the here rejected claims distinguish over Armand's electrode material, as modified above, by requiring a constituent Y' such as fluorine but finds that Barker discloses the use of fluorine in lithium based electrode materials having "*olivinic structures*" (Ans. 12). Based on these findings, the Examiner concludes that it would have been obvious to one skilled in the art to provide Armand's modified electrode material with fluorine in view of Barker's teaching of using this element in "olivine structure positive electrode materials" *(id.*).

Thus, the obviousness conclusion for this rejection is based on the Examiner's finding that Barker's lithium based electrode material, like the material of the other applied references and of the appealed claims, possesses an olivine structure.

Appellants contest the Examiner's finding on the grounds that Barker's electrode materials are expressly disclosed as having a triclinic structure whereas olivine has an othorhombic-dipyramidal structure (Br. 21).
In this regard, Appellants argue that "one with ordinary skill in the art would not presume the advantages of doping the triclinic structures of [Barker] would similarly apply to other crystal structures [i.e., the olivine structure of the other applied references and of the appealed claims], absent some teaching or suggestion to the contrary" (*id.*).

Significantly, the Examiner's Answer contains no response to the Appellants' above-noted argument (*see* Ans. 13-27).

For a number of reasons, the record before us is insufficient to permit an informed disposition of the subject rejection. First and foremost, the record contains no response by the Examiner to the Appellants' challenge of the Examiner's finding that Barker's electrode material possesses an olivine structure. Second, while Appellants are correct that Barker's materials are disclosed as having a triclinic structure (Barker: p. 5, ll. 16-17; p. 35, ll. 18-19; p. 36, ll. 5-6 and p. 17-18; p. 37, ll. 7-11), the record of this appeal contains no evidence to support the Appellants' assertion that an olivine structure has an orthorhombic-dipyramidal structure which excludes the triclinic structure of Barker.

In light of the foregoing, we hereby remand this application to the Examiner, via the Office of the Director for Technology Center 1700, in

order to express on the written record whether Appellants' arguments concerning the subject rejection (Br. 21-23) are persuasive, and if not, why not. Accordingly, the Examiner must respond to this Remand by either withdrawing the rejection or, if maintaining it, by providing the written record of this appeal with a rebuttal to Appellants' arguments concerning the rejection.

This Remand to the Examiner pursuant to 37 C.F.R. § 41.50 (a)(1) is made for further consideration of a rejection. Accordingly, 37 C.F.R. § 41.50(a)(2) applies if a Supplemental Examiner's Answer is written in response to this Remand by the Board.

CONCLUSION

We affirm the § 103 rejections based on Armand in view of Morishima and based on Armand in view of Kariru, but we remand this application with respect to the rejection based on Armand in view of Morishima or Kariru and further in view of Barker.

The effective date of our above-noted affirmance is deferred until conclusion of the proceedings before the Examiner unless, as a mere incident to the limited proceedings, the affirmed rejections are overcome. If the proceedings before the Examiner do not result in allowance of the application, abandonment, or a second appeal, this case should be returned to the Board of Patent Appeals and Interferences for final action on the affirmed rejections, including any timely request for rehearing thereof.

The decision of the Examiner is affirmed-in-part.

The application is Remanded to the Examiner.

AFFIRMED-IN-PART
REMANDED

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VALENCE TECHNOLOGY, INC.
1889 E. MAULE AVE., SUITE A
LAS VEGAS, NV 89119