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UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

Ex parte KOUJI OONO and TAKAO KITAGAWA

Appeal 2018-006693
Application 14/608,812
Technology Center 1700

BEFORE BRIAN D. RANGE, MERRELL C. CASHION, JR., and
JANE E. INGLESE, *Administrative Patent Judges*.

RANGE, *Administrative Patent Judge*.

DECISION ON APPEAL

STATEMENT OF THE CASE

Pursuant to 35 U.S.C. § 134(a), Appellant¹ appeals from the Examiner's decision to reject claims 1, 3, and 5–8. We have jurisdiction under 35 U.S.C. § 6(b).

We AFFIRM.

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 SUMITOMO OSAKA CEMENT CO., LTD. Appeal Br. 3.

CLAIMED SUBJECT MATTER²

Appellant describes the invention as relating to an electrode material useful for a lithium ion battery. Spec. 1:10–4:9. The electrode material is said to have “excellent electron conductivity, load characteristics, and cycle characteristics.” *Id.* at 4:2–8. Claim 1 is illustrative:

1. A positive electrode material comprising:
an electrode active material represented by $\text{Li}_x\text{Fe}_y\text{Mn}_{z1}\text{Co}_{z2}\text{BO}_4$ as a main component, wherein B represents one or more selected from a group consisting of P, Si, and S, $0 \leq x < 4$, $0 < y < 1.5$, $z1 > 0$ and $0 < (z1 + z2) < 1.5$; and
nickel,
wherein a content by weight of the nickel with respect to the electrode material is in a range of 1 ppm to 100 ppm; and
a content by weight of the manganese with respect to the electrode material is in a range of 243 ppm to 4604 ppm.

REJECTION AND REFERENCE

On appeal, the Examiner maintains the rejection of claims 1, 3, and 5–8 under 35 U.S.C. § 103 as obvious over Nippon Chemical Industrial Co., Ltd., KR 10-0898236, May 18, 2009 (“Nippon Chemical”). Ans. 3.

OPINION

We review the appealed rejections for error based upon the issues identified by Appellant and in light of the arguments and evidence produced thereon. *Ex parte Frye*, 94 USPQ2d 1072, 1075 (BPAI 2010) (precedential),

² In this Decision, we refer to the Final Office Action mailed September 14, 2017 (“Final Act.”), the Appeal Brief filed March 6, 2018 (“Appeal Br.”), the Examiner’s Answer mailed April 12, 2018 (“Ans.”), and the Reply Brief filed June 12, 2018 (“Reply Br.”).

(cited with approval in *In re Jung*, 637 F.3d 1356, 1365 (Fed. Cir. 2011) (“[I]t has long been the Board’s practice to require an applicant to identify the alleged error in the examiner’s rejections.”)). After considering the evidence presented in this Appeal and each of Appellant’s arguments, we are not persuaded that Appellant identifies reversible error. Thus, we affirm the Examiner’s rejections for the reasons expressed in the Final Office Action and the Answer. We add the following primarily for emphasis.

The Appellant does not argue any dependent claims separately. We therefore limit our discussion to claim 1, and all other claims stand or fall with that claim. 37 C.F.R. § 41.37(c)(1)(iv) (2013).

The Examiner finds that Nippon Chemical teaches a positive electrode material comprising LiFeMePO_4 where Me can be Manganese, Cobalt, or Nickel. Ans. 3 (citing Nippon Chemical). The Examiner finds that the amount of Manganese or Cobalt present is preferably at most 0.8% by weight. *Id.*; *see also* Nippon Chemical 3, ¶ 4³. The Examiner finds that Nippon Chemical does not disclose a single example that anticipates the claimed ranges but determines that the amount of the metals in the precursor material will naturally form a final product with overlapping ranges. Ans. 3.

Appellant first argues unexpected results. Appeal Br. 12. Our reviewing court has explained that “an applicant may overcome a *prima facie* case of obviousness by establishing that the [claimed] range is critical, generally by showing that the claimed range achieves unexpected results relative to the prior art range.” *In re Peterson*, 315 F.3d 1325, 1330 (Fed.

³ Citations are to the machine translation of Nippon Chemical dated May 17, 2017.

Cir. 2003) (internal quotes and citation omitted). We have carefully considered Appellant's evidence and arguments, but the proffered evidence is ultimately unpersuasive.

Appellant's burden requires Appellant to identify factual evidence that shows unexpected results relative to the closest prior art. *See In re Baxter Travenol Labs.*, 952 F.2d 388, 392 (Fed. Cir. 1991). Here, Appellant does not compare any results from inventive examples to the closest art.

Evidence of unexpected results also must also be reasonably commensurate with the scope of the claims. *In re Peterson*, 315 F.3d at 1330–31 (explaining that showing of unexpected results “must be commensurate in scope with the claims which the evidence is offered to support”) (internal quotes and citation omitted). We agree with the Examiner that the Appellant has not demonstrated unexpected results over, for example, the various ranges recited by claim 1 (for example, the x, y, z1, and z2 ranges as well as the nickel and manganese weight ranges). Appeal Br. 4.

The Reply Brief argues that evidence is commensurate in scope for claim 6 because claim 6 requires a PO₄ component. Reply Br. 5. Even with respect to claim 6, however, Appellant does not demonstrate unexpected results as compared to the cited art over the ranges permitted by the claim.

Appellant also argues that a person of skill in the art would not reach claim 1's recited nickel content. Appeal Br. 13–14. In particular, Appellant argues that nickel is not a result-effective variable, that Nippon Chemical does not suggest optimizing nickel content, and that Nippon Chemical does not suggest retaining nickel in an electrode in claim 1's recited amounts. *Id.* The Examiner, however, finds that Nippon Chemical teaches an exemplary final product (lithium iron phosphate rather than precursor material) with 20

ppm nickel. Ans. 5. This nickel content overlaps with claim 1's recited range of 1 ppm to 100 ppm. Appellant does not persuasively dispute this finding. Our reviewing court has held that "even a slight overlap in range establishes a *prima facie* case of obviousness." *See Peterson*, 315 F.3d at 1329.

Appellant argues, for similar reasons, that a person of skill in the art would not reach claim 1's recited manganese content. Appeal Br. 13–16; Reply Br. 6–8. The Examiner, however, finds that Nippon Chemical teaches that manganese may be present at 8000 ppm or less "as a dopant." Ans. 5; Nippon Chemical 3, ¶ 4. Appellant argues that this portion of Nippon Chemical refers to the manganese content of a precursor. Reply Br. 7–8. The preponderance of the evidence, however, indicates that Nippon Chemical indicates this range for a final product. Nippon Chemical refers to its final electrode product as a "ferrous box whisker." Nippon Chemical 2 ("The following describes the manufacturing method of the phosphate of ferrous box whisker according to the present invention."). The paragraph of Nippon Chemical that provides the 8000 ppm or less manganese range refers to this range as being for "phosphate ferrous obtained whisker." Nippon Chemical 3, ¶ 4. Moreover, reference to manganese "as a dopant" suggests that manganese has utility in the final product. The overlapping manganese range for Nippon Chemical (0 to 8000 ppm) and claim 1 (243 to 4604 ppm), therefore, supports obviousness.

Alternatively, even if Appellant were correct that Nippon Chemical's teaching of the manganese range is only in the context of a precursor (Reply Br. 7–8), this argument does not identify harmful error. If, as Appellant argues, Nippon Chemical teaches a precursor with zero to 8000 ppm manganese, Nippon Chemical as a whole reasonably suggests final products

with manganese content overlapping that of claim 1. In particular, Nippon Chemical Table 1 indicates 3900 ppm manganese for a precursor (Table data available in original document) and 6100 ppm manganese for a final product. Nippon Chemical Table 1, 4–5 (explaining Table 1), Table 4 (indicating 0.61 weight percent manganese which is the equivalent of 6100 ppm), 6–7 (explaining Table 4); *see also* certified translation of Nippon Chemical ¶¶ 79–84 (explaining Table 1). Less manganese in the precursor will lead to less manganese in the final product. Ans. 3 (finding that a final product will “naturally form” with an amount of metal that is impacted by the amount of metal in the precursor). Therefore, adjustment of Table 1’s 3900 ppm within the range of zero to 8000 ppm would result in many final product compositions within claim 1’s recited manganese range.

Because Appellant’s arguments do not identify reversible error, we sustain the Examiner’s rejection.

CONCLUSION

In summary:

Claims Rejected	35 U.S.C. §	Reference(s)/Basis	Affirmed	Reversed
1, 3, 5–8	103	Nippon Chemical	1, 3, 5–8	

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).

Appeal 2018-006693
Application 14/608,812

AFFIRMED