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UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

Ex parte YASUHIRO NAKAOKA and
TADAYOSHI YANAGIHARA

Appeal 2012-000641
Application 12/179,080
Technology Center 1700

Before RICHARD E. SCHAFER, LINDA M. GAUDETTE, and
DEBORAH KATZ, *Administrative Patent Judges*.

GAUDETTE, *Administrative Patent Judge*.

DECISION ON APPEAL

Appellants appeal under 35 U.S.C. § 134(a) from the Examiner's decision¹ finally rejecting claims 1-4 under 35 U.S.C. § 103(a) as unpatentable over Hemmer (US 2004/0151649 A1, published Aug. 5, 2004).² We have jurisdiction under 35 U.S.C. § 6(b).

We AFFIRM.

“The [] invention relates to a method for manufacturing a lithium-iron-phosphorus compound oxide carbon complex useful as a lithium secondary battery positive electrode active material.” (Spec.³ 1, Field of the Invention.) Appellants do not present separate arguments in support of patentability of any particular claim or claim grouping. (*See generally*, App. Br. 6-15.) Accordingly, we decide the appeal on the basis of claim 4⁴, which is reproduced below from the Claims Appendix to the Appeal Brief (footnote added):

4. A method for manufacturing a coprecipitate containing lithium, iron, and phosphorus, the method comprising the step of:

adding a solution containing lithium ions (Solution B) to a solution containing phosphate ions (Solution C) while a solution containing divalent iron ions (Solution A) is added to Solution C⁵ so as to produce a coprecipitate containing lithium, iron, and phosphorus in a first step;

¹ Final Office Action mailed Jan. 4, 2011 (“Final”).

² Appeal Brief filed Jun. 22, 2011 (“App. Br.”).

³ Specification filed Jul. 24, 2008.

⁴ *See* 37 C.F.R. § 41.37(c)(1)(vii) (“When multiple claims subject to the same ground of rejection are argued as a group by appellant, the Board may select a single claim from the group of claims that are argued together to decide the appeal with respect to the group of claims as to the ground of rejection on the basis of the selected claim alone.”).

⁵ “In the present invention, the phrase ‘Solution B is added to Solution C while Solution A is added to Solution C’ refers to that the addition time of Solution A to Solution C and the addition time of Solution B to Solution C are equal or overlapped.” (Spec. 10: 15-19.)

wherein during the adding step, the amount of addition of Solution A to Solution C is such that the ratio (Fe/P) of the number of moles of divalent iron atom in Solution A to the number of moles of phosphorus atom in Solution C is 0.8 to 1.2, and the amount of addition of Solution B to Solution C is such that the ratio (Li/P) of the number of moles of lithium atom in Solution B to the number of moles of phosphorus atom in Solution C is 1 to 3.

The principal issue⁶ raised by Appellants in this appeal is: did the Examiner reversibly err in finding Appellants' evidence insufficient to establish unexpected results/criticality in the mixing order recited in the claims?

Hemmer discloses forming a homogenous mixture of lithium dihydrogen phosphate and iron (II) sulfate heptahydrate. (Hemmer Example 2, ¶ [0036] and Example 4, ¶ [0046].)⁷ In Hemmer Examples 2 and 4, a lithium hydroxide monohydrate is trickled into the homogenous mixture of lithium dihydrogen phosphate and iron (II) sulfate heptahydrate over a period of 4 minutes. (*Id.*) The Examiner finds the solution of lithium hydroxide monohydrate serves as the source of lithium ions (solution B as claimed), while the lithium dihydrogen phosphate serves as the source of phosphate ions (solution C as claimed) and the iron (II) sulfate heptahydrate serves as the source of iron ions (solution A as claimed). (Final 2; Ans.⁸ 4-5.)⁹ The Examiner acknowledges Hemmer fails to disclose or

⁶ Any additional issues raised by Appellants and not discussed herein have been fully addressed by the Examiner and are unpersuasive of error in the Examiner's obviousness determination for the reasons stated in the Answer.

⁷ Mr. Yanagihara (*see* citation to, and discussion of, Declaration *infra* p. 4) testified that combining a source of lithium and phosphorous (i.e., a mixture of solutions B and C as claimed) with a source of iron (solution A as claimed) in this manner would not result in the formation of a coprecipitate as claimed. (Decl. 4, last para.-5.)

⁸ Examiner's Answer mailed Jul. 28, 2011.

⁹ We note the case law supports the Examiner's determination that the ratios of Fe/P and Li/P in Hemmer's examples "overlap [] or are close enough to those [] claimed in the instant claims . . . [so as to] render[] a prima facie case of

suggest equal or overlapping times for the additions of solution A and solution B to solution C, but maintains the “selection of any order of performing process steps (i.e. mixing order in the instant case) is prima facie obvious in the absence of new or unexpected results.” (Ans. 5 (citing *Ex parte Rubin*, 128 USPQ 440, 442 (BPAI 1959)); see also *In re Hampel*, 162 F.2d 483, 485-86 (CCPA 1947) (“There is nothing in the instant record which indicates that the particular order of steps produces results differing in any way from those which would be brought about if another order of steps were followed.”); *In re Burhans*, 154 F.2d 690, 692 (CCPA 1946) (explaining the selection of any order of performing process steps is prima facie obvious in the absence of new or unexpected results.); *In re Gibson*, 39 F.2d 975, 976 (CCPA 1930) (noting the selection of any order of mixing ingredients is prima facie obvious.).

Appellants rely on the Declaration under 37 C.F.R. § 1.132 of Mr. Tadayoshi Yanagihara (executed Mar. 17, 2010 (“Decl.”)) to establish criticality in the mixing order recited in the claims. (See App. Br. 8-14.)¹⁰ Mr. Yanagihara is one of the named inventors in the present Application. As of the date on which Mr. Yanagihara made his Declaration, he indicates he was employed as a lab worker by Nippon Chemical Industrial Co., Ltd. of Tokyo, Japan (Decl. 1, ¶ 2), the real party in interest in this appeal (App. Br. 1). The Yanagihara Declaration does

obviousness” (Ans. 6; cf. App. Br. 14-15 (contending a more explicit analysis is required)). See *In re Peterson*, 315 F.3d 1325, 1329 (Fed. Cir. 2003) (“In cases involving overlapping ranges, we and our predecessor court have consistently held that even a slight overlap in range establishes a *prima facie* case of obviousness. . . . We have also held that a *prima facie* case of obviousness exists when the claimed range and the prior art range do not overlap but are close enough such that one skilled in the art would have expected them to have the same properties.” (citing *Titanium Metals Corp. v. Banner*, 778 F.2d 775, 783 (Fed. Cir. 1985))).

¹⁰ It does not appear that a copy of the Declaration was included in the Evidence Appendix to the Appeal Brief as required under 37 C.F.R. § 41.37(c)(1)(ix).

not include experimental evidence/test data (*see generally* Decl. 1-5), but refers to the Examples and Comparative Example in the Specification (*see id.* at 3-4).

Mr. Yanagihara testified that “if one adds solution B after one has finished first adding solution A [to solution C], the coprecipitate compositions become inadequate.” (Decl. 4 (discussing Case 4, out of five possible cases for mixing orders of solutions A, B, and C).) Mr. Yanagihara likewise describes the coprecipitate formed in Specification Comparative Example 1 as “inadequate” (*see* Decl. 3-4 (discussing Case 2/ Specification Comparative Example 1)). (Ans. 7 (finding the only other coprecipitate described as inadequate in the Declaration is that of Case 2).) Mr. Yanagihara does not identify the criteria by which a coprecipitate is judged inadequate. (*Id.*) However, the Specification includes data by which Comparative Example 1 is compared to Examples 1-3 (wherein coprecipitates were obtained by combining solutions A, B, and C in the manner claimed). (*See* Spec. 27-30, Tables 1-3.) In Comparative Example 1, a solution was prepared by dissolving lithium sulfate monohydrate (as a source of Li atoms), ferrous sulfate heptahydrate (as a source of Fe atoms), and phosphoric acid (as a source of P atoms) in water. (Spec. 26.) Lithium hydroxide monohydrate was added to the solution over a period of 40 minutes. (*Id.*; *cf.* Hemmer Examples 2 and 4 (adding the solution over a period of 4 minutes) *supra* p. 3.)

In the Response to Argument, the Examiner provides a detailed analysis of Appellants’ evidence (i.e., the Declaration and Specification Examples and Comparative Example), clearly explaining why the evidence fails to provide a comparison with the closest prior art¹¹ and is not commensurate in scope with the claims¹² (*see* Ans. 7-12). As noted above, Mr. Yanagihara is one of the named

¹¹ *See In re Baxter Travenol Labs.*, 952 F.2d 388, 392 (Fed. Cir. 1991).

¹² *See In re Kao*, 639 F.3d 1057, 1068 (Fed. Cir. 2011).

inventors and was an employee of the real party in interest at the time of his Declaration. (*See supra* p. 4.) The Declaration does not include experimental evidence/test data beyond that referenced in the Specification. (*See supra* pp. 4-5.) The Board is entitled to weigh declarations expressing opinions as to fact and conclude that the lack of factual corroboration warrants discounting the opinions expressed in the declarations. *In re Am. Acad. of Sci. Tech. Ctr.*, 367 F.3d 1359, 1368 (Fed. Cir. 2004). “[A]n affidavit by an applicant or co-applicant as to the advantages of his invention is less persuasive than one made by a disinterested person.” *In re Bulina*, 362 F.2d 555, 559 (CCPA 1966).

For the foregoing reasons, we agree with the Examiner that Appellants’ evidence is insufficient to establish unexpected results/criticality in the mixing order recited in the claims. Having considered the evidence of record in its entirety, we further agree with the Examiner that a preponderance of the evidence supports a conclusion of obviousness as to appealed claims 1-4. *See Tokai Corp. v. Easton Enters., Inc.*, 632 F.3d 1358, 1371 (Fed. Cir. 2011) (“A strong case of prima facie obviousness, such as that presented here, cannot be overcome by a far weaker showing of objective indicia of nonobviousness.”). Accordingly, we sustain the rejection of claims 1-4 under 35 U.S.C. § 103(a) as unpatentable over Hemmer.

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).

AFFIRMED

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