

The opinion in support of the decision being entered today was not written for publication and is not binding precedent of the Board.

Paper No. 26

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE BOARD OF PATENT APPEALS
AND INTERFERENCES

Ex parte VIJAY CHANDRAKANT MEHTA

Appeal No. 2001-1440
Application 08/931,635

ON BRIEF

Before OWENS, KRATZ and PAWLIKOWSKI, *Administrative Patent Judges*.

OWENS, *Administrative Patent Judge*.

DECISION ON APPEAL

This appeal is from the final rejection of claims 1 and 3-33, which are all of the claims remaining in the application.

THE INVENTION

The appellant's claimed invention is directed toward a method for preparing a lithium salt by metathesis of a lithium

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salt and a sodium salt or a potassium salt. Claims 1 and 27 are illustrative:

1. A method for preparing a lithium salt of formula LiX, comprising:

reacting lithium salt selected from lithium chloride, lithium sulfate, and combinations thereof with NaX or KX in an aqueous solution;

adding an organic solvent to the aqueous solution to produce a semiaqueous solution; and

removing the precipitated solids from the semiaqueous solution to obtain a LiX solution.

27. A method for preparing a lithium salt of formula LiX, comprising:

reacting lithium salt selected from lithium chloride, lithium sulfate, and combinations thereof with NaX or KX in a semiaqueous solution comprising water and an organic solvent to produce LiX, the amount of water in the semiaqueous solution being between about 1 and about 4 moles per mole of LiX; and

removing the precipitated solids from the solution to obtain a LiX solution.

THE REFERENCE

Hermann

3,278,260

Oct. 11, 1966

THE REJECTION

Claims 1 and 3-33 stand rejected under 35 U.S.C. § 103 as being unpatentable over Hermann.

OPINION

We reverse the rejection of claims 1 and 3-26 and affirm the rejection of claims 27-33.

Claim construction

During patent prosecution, claims are to be given their broadest reasonable interpretation consistent with the specification, as the claim language would have been read by one of ordinary skill in the art in view of the specification and prior art. See *In re Zletz*, 893 F.2d 319, 321, 13 USPQ2d 1320, 1322 (Fed. Cir. 1989); *In re Sneed*, 710 F.2d 1544, 1548, 218 USPQ 385, 388 (Fed. Cir. 1983); *In re Herz*, 537 F.2d 549, 551, 190 USPQ 461, 463 (CCPA 1976); *In re Okuzawa*, 537 F.2d 545, 548, 190 USPQ 464, 466 (CCPA 1976).

The appellant's specification divides solutions into three groups: aqueous, semiaqueous (containing water and organic solvent), and organic (page 3, lines 14-21; page 5, lines 6-10; page 7, lines 5-11; page 9, lines 5-11). Hence, we interpret "aqueous solution" in the appellant's claims as being a solution which contains no organic solvent.

Rejection of claims 1, 3-6 and 8-26

Hermann discloses a method for preparing lithium chloride by reacting lithium sulfate with sodium chloride or potassium

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chloride in alcohol (col. 2, lines 21-69). The alcohol preferably contains a small amount of dissolved water to cause the reaction to proceed at a much more rapid rate (col. 2, lines 40-44; col. 4, lines 39-41 and 59-61). Precipitated solids are separated from the semiaqueous solution to obtain a lithium chloride solution (col. 2, lines 25-32 and 58-65; col. 4, lines 28-31). Hermann does not disclose reacting the lithium sulfate with the sodium chloride or potassium chloride in an aqueous solution and adding an organic solvent to the aqueous solution (independent claims 1, 9 and 26) or dissolving the lithium sulfate and sodium chloride or potassium chloride in an aqueous solution, and adding an organic solvent to the aqueous solution (independent claims 10 and 15).

The examiner argues that the methods of Hermann and the appellant differ only in the order in which the reactants are contacted with the water and the organic solvent, i.e., Hermann contacts the reactants simultaneously with water and organic solvent, whereas the appellant first contacts the reactants with water and then adds organic solvent to the reaction mixture (brief, page 4). Merely reversing the order of adding the water and organic solvent, the examiner argues, is not a patentable modification. See *id.*

Hermann, however, adds the water for the purpose of increasing the rate of the reaction which takes place in the organic solvent (col. 2, lines 40-44). The examiner has not explained, and it is not apparent, how the disclosure of using water for this purpose would have led one of ordinary skill in the art to react the lithium sulfate and sodium chloride or potassium chloride in an aqueous solution and to add an organic solvent to the aqueous solution. Consequently, the examiner has not carried the burden of establishing a *prima facie* case of obviousness of the method recited in the appellant's claims 1, 3-6 and 8-26. Accordingly, we reverse the rejection these claims.

Rejection of claim 7

Claim 7 requires that lithium nitrate or lithium bromide is made in an aqueous, semiaqueous or organic solution.

The examiner argues that one of ordinary skill in the art would have expected lithium nitrate and lithium bromide to react similarly to Hermann's lithium chloride (answer, page 4). This is mere speculation, and such speculation is not a sufficient basis for a *prima facie* case of obviousness. See *In re Warner*, 379 F.2d 1011, 1017, 154 USPQ 173, 178 (CCPA 1967), *cert. denied*, 389 U.S. 1057 (1968); *In re Sporck*, 301 F.2d 686, 690, 133 USPQ

360, 364 (CCPA 1962). We therefore reverse the rejection of claim 7.

Rejection of claims 27-33

The appellant states that claims 27-33 stand or fall together (brief, page 5). We therefore limit our discussion of the rejection of claims 27-33 to one claim in this group, i.e., claim 27. See *In re Ochiai*, 71 F.3d 1565, 1566 n.2, 37 USPQ2d 1127, 1129 n.2 (Fed. Cir. 1995); 37 CFR § 1.192(c)(7) (1997).

In Hermann's example II, 21.8 g KCl are reacted with 16.5 g Li_2SO_4 at 25°C in 100 ml n-butanol saturated with water, and solids are removed from the solution. At 25°C the solubility of water in n-butanol is 20.5 wt%.¹ Hence, the n-butanol contains 16.6 g or 0.92 moles water. Based upon complete reaction of the Li_2SO_4 to LiCl, the product contains 0.30 moles LiCl. The molar ratio of water to LiCl, therefore, is 3, which falls within the scope of the appellant's claim 27.² Hermann's example II, therefore, at least would have fairly suggested, to one of ordinary skill in the art, water/LiCl molar ratios within the

¹ 21 *Kirk-Othmer Encyclo. Chem. Tech.* 378-79 (John Wiley & Sons, 3rd ed. 1983). A copy of this reference is provided to the appellant with this decision.

² This ratio would be higher for incomplete reaction of Li_2SO_4 to LiCl.

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range of about 1 to about 4 as recited in the appellant's claim 27.

The appellant argues that Hermann discloses use of a small amount of water, not about 1 to about 4 moles per mole of LiX as recited in claim 27 (brief, page 8). As discussed above, the water/LiCl molar ratios which would have been fairly suggested to one of ordinary skill in the art by Hermann include values within the range of about 1 to about 4.

For the above reasons we conclude that the method recited in the appellant's claim 27 would have been obvious to one of ordinary skill in the art within the meaning of 35 U.S.C. § 103. Accordingly, we affirm the rejection of this claim and claims 28-33 which stand or fall therewith.

DECISION

The rejection of claims 1 and 3-33 under 35 U.S.C. § 103 over Hermann is reversed as to claims 1 and 3-26 and affirmed as to claims 27-33.

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No time period for taking any subsequent action in connection with this appeal may be extended under 37 CFR § 1.136(a).

AFFIRMED-IN-PART

TERRY J. OWENS)	
Administrative Patent Judge)	
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)	BOARD OF PATENT
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