

The opinion in support of the decision being entered today was not written for publication and is not binding precedent of the Board.

## UNITED STATES PATENT AND TRADEMARK OFFICE

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### BEFORE THE BOARD OF PATENT APPEALS AND INTERFERENCES

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Ex parte JORG HOFMANN, STEPHAN EHLERS,  
BERND KLINKSIEK, THORSTEN FECHTEL,  
MATTHIAS RUHLAND, JURGEN SCHOLZ,  
FRANZ FOHLES, and ULRICH ESSER

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Appeal No. 2007-0093  
Application No. 10/924,119

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#### ON BRIEF

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Before GRIMES, LINCK, and LEBOVITZ, Administrative Patent Judges.

LEBOVITZ, Administrative Patent Judge.

#### DECISION ON APPEAL

This appeal involves claims to methods of preparing double-metal cyanide catalysts. The Examiner has rejected the claims as obvious. We have jurisdiction under 35 U.S.C. § 134. We affirm.

#### Background

“Double metal cyanide (DMC) catalysts for the polyaddition of alkylene oxides on to starter compounds containing active hydrogen atoms have been known for a long time.” Specification, page 1, lines 7-9. “DMC catalysts are usually obtained by reacting an aqueous solution of a metal salt with the aqueous solution of a metal cyanide salt in

the presence of an organic complexing ligand[s].” Id., page 1, lines 17-19. “According to the prior art, DMC catalysts are prepared e.g. by mixing aqueous solutions of a metal salt (preferably of a zinc salt, such as e.g. zinc chloride) and a metal cyanide salt (e.g. potassium hexacyanocobaltate) in the presence of an organic complexing ligand (preferably tert-butanol).” Id., page 1, line 29-page 2, line 1. The resulting catalyst is isolated by centrifugation or filtration, and then washed with an aqueous solution comprising the organic complexing ligand. Id., page 2, lines 2-5. “According to the prior art the further washing steps are also carried out by redispersing with subsequent isolation of the catalyst. Finally, the DMC catalyst must be dried. This form of catalyst preparation is exceptionally time-consuming and cost-intensive.” Id., page 2, lines 12-15. Appellants have found that “highly active DMC catalysts can be obtained by a considerably simplified process” in which the catalyst is separated by filtration to form a filter cake, and then washing the filter cake, without re-dispersing it. Id., page 2, lines 20-31.

#### Discussion

#### Claim status

Claims 12-19, which are all the pending claims, are on appeal. Brief, page 2. The claims stand or fall together because Appellants did not provide separate reasons for patentability for any of the individual claims. 37 CFR § 41.37(c)(vii). We select claim 12 as representative:

12. A process for preparing a double-metal cyanide catalyst comprising:  
combining with a mixing nozzle in the presence of at least one  
organic complexing ligand,  
(a) at least one aqueous solution of at least one metal salt;  
with  
(b) at least one aqueous solution of at least one metal  
cyanide salt;  
to form a double-metal cyanide catalyst dispersion;  
filtering the double-metal cyanide catalyst dispersion to obtain a  
filter cake;  
washing the filter cake at least once with the at least one organic  
complexing ligand by a filter cake washing;  
mechanically removing moisture in the washed filter cake; and  
drying the filter cake  
wherein the steps of filtering, washing and mechanically removing  
are conducted in a filter press.

Obviousness under 35 U.S.C. § 103

Claims 12-19 stand rejected under 35 U.S.C. § 103(a) as obvious over Le-Khac '428<sup>1</sup> in view of Le-Khac '908,<sup>2</sup> and further in view of Hinney,<sup>3</sup> Heckl,<sup>4</sup> and Hoch.<sup>5</sup>

Le-Khac '428 teaches a method of preparing a double metal cyanide catalyst by reacting aqueous solutions of a metal salt (such as zinc chloride) and a metal cyanide salt (such as potassium hexacyanocobaltate). Le-Khac '428, column 3, lines 16-18, 30, and 53; column 7, lines 11-13. Compare instant claims 12((a) and (b)), 13 ("the metal salt is zinc chloride"), and 14 ("the metal cyanide salt is potassium hexacyano-cobaltate"). The metal salt and metal cyanide salt are reacted in the presence of an organic complexing agent. Id., column 7, lines 11-28. The resulting catalyst can be isolated by simple filtration. Id., column 6, lines 26-28. Compare instant claim 12

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<sup>1</sup> Le-Khac, U.S. Patent No. 5,714,428, Feb. 3, 1998.

<sup>2</sup> Le-Khac, U.S. Patent No. 5,482,908, Jan. 9, 1996.

<sup>3</sup> Hinney, U.S. Patent No. 5,158,922, Oct. 27, 1992.

<sup>4</sup> Heckl, U.S. Patent No. 6,387,282, May 14, 2002.

<sup>5</sup> Hoch, U.S. Patent No. 6,103,786, Aug. 15, 2000.

(“filtering the double-metal cyanide catalyst dispersion”). The isolated catalyst “is preferably washed with an aqueous solution that contains additional organic complexing agent.” Id., column 7, lines 42-44. Compare instant claim 12 (“washing the [double-metal cyanide catalyst] filter cake with the at least one organic complexing ligand”). Tert-butyl alcohol is a preferred complexing agent of Le-Khac ‘428. Id., column 4, line 13. Compare instant claim 15 (“where the organic complexing ligand is tert-butanol”). Finally, the catalyst mixture is washed and filtered using a pressure filter, and then dried in a vacuum oven. Id., column 8, Example 1, especially lines 41-48. See also Answer, page 3.

Le-Khac ‘428 is described by the Examiner as teaching the “combining”, “filtering”, “washing”, and “drying” of steps of claim 12, but not where these steps are carried out in a filter press as required by the claim. See Answer, page 4, lines 1-2. However, the Examiner states that Le-Khac<sup>6</sup> teaches that the double-metal cyanide catalyst can be isolated “by any convenient means, such as filtration.” Id., page 3; page 4. Hinney is further cited for its teaching “that a filter press is a suitable filtration apparatus for separating a double metal cyanide catalyst from slurry (see column 7, lines 6-37).” Id., page 4, lines 3-5. The Examiner concludes:

One having ordinary skill in the art at the time the invention was made would have found it obvious to utilize a filter press, as taught by Hinney et al., as the filtering, washing and mechanical removal apparatus in the process of Le-Khac ‘428, since Le-Khac teach[es] that any convenient means of separating the double metal cyanide catalyst may be utilized, including filtration, and Hinney et al. teach that a filter press is a

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<sup>6</sup> The Examiner relies on Le-Khac ‘428 and Le-Khac ‘908, the latter which is incorporated by reference in Le-Khac ‘428. In this instance where the Examiner cites “Le-Khac” for teaching that “any convenient means” can be used to isolate the catalyst, the Examiner does not specify which Le-Khac is intended; consequently, we assume both, especially in view of the incorporation by reference of Le-Khac ‘908 into Le-Khac ‘428.

suitable filtering apparatus for separating a double metal cyanide catalyst from slurry.

Answer, page 4.

Citing In re Roufett, 149 F.3d 1350, 1357, 47 USPQ2d 1453, 1458-59 (Fed. Cir. 1998), Appellants assert that the Examiner used “impermissible hindsight reconstruction using the Appellants’ specification as a blueprint to supply the missing motivation or suggestion to combine references in the manner indicated.” Brief, page 5. However, they do not specifically challenge any of the Examiner’s findings regarding the cited prior art. Appellants also “aver that absent the teaching of their specification, such suggestion or motivation does not exist.” Id., page 5.

The Examiner bears the initial burden of showing unpatentability. See, e.g., In re Rijckaert, 9 F.3d 1531, 1532, 28 USPQ2d 1955, 1956 (Fed. Cir. 1993). To establish a prima facie case of obviousness, there must be some suggestion or motivation, either in the references themselves or in the knowledge generally available to one of ordinary skill in the art, to modify the reference or to combine reference teachings. In re Vaeck, 947 F.2d 488, 20 USPQ2d 1438 (Fed. Cir. 1991); In re Dembiczak, 175 F.3d 994, 999, 50 USPQ2d 1614, 1617 (Fed. Cir. 1999). “The prima facie case is a procedural tool of patent examination, allocating the burdens of going forward as between examiner and applicant. In re Spada, 911 F.2d 705, 707 n.3, 15 USPQ2d 1655, 1657 n.3 (Fed. Cir. 1990). . . . As discussed in In re Piasecki [745 F.2d 1468, 1472, 223 USPQ 785, 788 (Fed. Cir. 1984)], the examiner bears the initial burden . . . of presenting a prima facie case of unpatentability. If that burden is met, the burden of coming forward with evidence or argument shifts to the applicant.” In re Oetiker, 977 F2d 1443, 1445,

24 USPQ2d 1443, 1444 (Fed. Cir. 1992).

Here, we find that the Examiner has presented sufficient evidence to establish a prima facie case of obviousness. Le-Khac '428, as explained above and on page 3 of the Answer, clearly discloses all the elements of the claimed method, with the exception of using a filter press for "the steps of filtering, washing and mechanically removing" as required by claim 12. As discussed in the Background section above, it appears that Appellants have admitted that the basic process of preparing the double-metal cyanide catalyst is in the prior art, albeit not using a filter press. The Examiner relies on Hinney (column 7, line 31) for its teaching to use filter press to meet the remaining claim limitation, and articulates a reason why the skilled worker would have been motivated to have modified Le-Khac '428 with Hinney's teaching. Answer, page 4.

Appellants argue that the Examiner has used hindsight to supply the motivation or suggestion from Appellants' specification to combine the references. Brief, page 5. We do not agree. The Examiner states that "Le-Khac teach[es] that any convenient means of separating the double metal cyanide catalyst may be utilized" which provides the motivation to have turned to Hinney's filter press for isolating and washing the double metal salt as required by claim 12. Answer, page 4. It would have been logical for the skilled worker to have combined Le-Khac '428 with Hinney because Hinney, as pointed out by the Examiner, is also concerned with making double metal cyanide salts, including the same type of salts disclosed in Le-Khac '428 and which are claimed. See Hinney, column 9, Example 1, describing a salt of zinc chloride (compare instant claim 13) and potassium hexacyanocobaltate (compare instant claim 14). Appellants do not identify a defect in this reasoning. We also note that Le-Khac '908, which is incorporated by

reference into Le-Khac '428, specifically teaches that the filter cake can be washed with the organic complexing agent tert-butyl alcohol in a filtration apparatus (Le-Khac '908, column 10, lines 16-33), providing further motivation to have used Hinney's filter press for the filtering, washing and mechanically removing steps of claim 12. Accordingly, we do not find that the Examiner inappropriately invoked hindsight or Appellants' specification in setting forth a prima facie case of obviousness. We affirm the rejection of claim 12. Claims 13-19 fall with claim 12 because Appellants did not provide separate arguments for patentability.

In reaching this decision, we have found it unnecessary to address the Heckl and Hoch patents which appear to have been relied upon by the Examiner to meet limitations recited in dependent claims which Appellants did not separately argue. See Answer, page 4, especially ¶¶ 4-8.

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

AFFIRMED

Eric Grimes )  
Administrative Patent Judge )  
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