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UNITED STATES PATENT AND TRADEMARK OFFICE

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BEFORE THE PATENT TRIAL AND APPEAL BOARD

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*Ex parte* BILGE YILMAZ,  
ULRICH MÜLLER, BIBIANA ANDREA BETANCUR MORENO,  
HERMANN GIES, FENG-SHOU XIAO, TAKASHI TATSUMI,  
XINHE BAO, WEIPING ZHANG, DIRK DE VOS, MEIKE PFAFF,  
BIN XIE, and HAIYAN ZHANG

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Appeal 2015-004858  
Application 13/163,430  
Technology Center 1700

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Before KAREN M. HASTINGS, GEORGE C. BEST, and  
N. WHITNEY WILSON, *Administrative Patent Judges*.

BEST, *Administrative Patent Judge*.

DECISION ON APPEAL

The Examiner finally rejected claims 1–32 of Application 13/163,430 under 35 U.S.C. § 103(a) as obvious and provisionally rejected those claims on the ground of nonstatutory obviousness-type double patenting (OTDP). Final Act. 12–21 (July 2, 2014). Appellants<sup>1</sup> seek reversal of these

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<sup>1</sup> BASF SE is identified as the real party in interest. Appeal Br. 4.

rejections pursuant to 35 U.S.C. § 134(a). We have jurisdiction under 35 U.S.C. § 6(b).

For the reasons set forth below, we AFFIRM.

## BACKGROUND

The '430 Application describes a method for the production of a zeolitic material having an LEV-type framework structure. Spec. 1:12–14. The Specification describes the improved zeolitic material as particularly useful as a molecular sieve and/or a catalyst or as a catalyst support. *Id.* at 12:15–17.

Claim 1 is representative of the '430 Application's claims and is reproduced below from the Claims Appendix to the Appeal Brief:<sup>2</sup>

1. A process for the production of a zeolitic material having an LEV-type framework structure comprising  $YO_2$  and optionally comprising  $X_2O_3$ , wherein said process comprises:

(3) preparing a mixture comprising one or more sources for  $YO_2$ , one or more solvents, and optionally comprising seed crystals; and

(4) crystallizing the mixture obtained in step (1);

wherein Y is a tetravalent element, and X is a trivalent element, wherein the zeolitic material optionally comprises one or more alkali metals M, wherein the molar ratio of the total amount of the one or more solvents to the total amount of the one or more sources for  $YO_2$  based on  $YO_2$  is from 7 to 1, and

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<sup>2</sup> In claim 1, there is no antecedent step “(1)” recited for the limitation “crystallizing the mixture obtained in step (1).” There is, moreover, no recitation in the claim of an antecedent step “(2)” for the limitation reciting “wherein step (2).” We interpret the recitation of process steps “(3)” and “(4)” as specifying steps “(1)” and “(2),” respectively. This interpretation appears to be consistent with the arguments made by Appellants and the Examiner in this appeal.

wherein step (2) is conducted at a temperature ranging from 120 to 170 °C for a period ranging from 0.5 to 7 days.

Appeal Br. 26.

## REJECTIONS

On appeal, the Examiner maintains<sup>3</sup> the following rejections:

1. Claims 1–12, 15–25, 31, and 32 are rejected under 35 U.S.C. § 103(a) as unpatentable over Kuehl.<sup>4</sup> Final Act. 12.
2. Claims 13 and 14 are rejected under 35 U.S.C. § 103(a) as unpatentable over the combination of Kuehl and De Luca.<sup>5</sup> Final Act. 14.
3. Claims 26, 27, and 30 are rejected under 35 U.S.C. § 103(a) as unpatentable over the combination of Kuehl and Rosinski.<sup>6</sup> Final Act. 17.

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<sup>3</sup> The Examiner has withdrawn the obviousness rejections of: (i) claims 1–12, 15–25, 31, and 32 as unpatentable over Yamamoto et al., *Synthesis and structure analysis of RUB-50, an LEV-type aluminosilicate zeolite*, 128 *Microporous and Mesoporous Materials* 150–57 (2010) (hereinafter “Yamamoto”); (ii) claims 13 and 14 as unpatentable over the combination of Yamamoto and De Luca (*see fn. 5*); (iii) claims 26, 27, and 30 as unpatentable over the combination of Yamamoto and Rosinski (*see fn. 6*); and (iv) Claims 28 and 29 as unpatentable over the combination of Yamamoto and Verduijn (*see fn. 7*). Ans. 2–3.

<sup>4</sup> US 4,495,303, issued Jan. 22, 1985.

<sup>5</sup> P. De Luca et al., *Synthesis and characterization of Al,B-levyne type crystals from gels containing methyl-quinuclidinium ions*, 71 *Microporous and Mesoporous Materials* 39–49 (2004) (hereinafter “De Luca”).

<sup>6</sup> US 5,334,367, issued Aug. 2, 1994.

4. Claims 28 and 29 are rejected under 35 U.S.C. § 103(a) as unpatentable over the combination of Kuehl and Verduijn.<sup>7</sup> Final Act. 17.
5. Claims 1–32 are provisionally rejected for OTDP over the combination of claims 1–32 of copending Application No. 13/163,377 and Kuehl. Final Act. 20.

#### DISCUSSION

Appellants argue for the reversal of the obviousness and OTDP rejections to claims 2–32 on the basis of limitations present in independent claim 1. *See* Appeal Br. 16–24; Reply Br. 3–7. We, therefore, limit our analysis to claim 1. Claims 2–32 will stand or fall with claim 1. 37 C.F.R. § 41.37(c)(1)(iv).

The Examiner relies on Kuehl in whole or in part for the rejections made under 35 U.S.C. § 103(a) (**Rejections 1–4**), Final Act. 12–20, and the provisional OTDP rejection (**Rejection 5**). *Id.* at 20–21.

**Rejections 1–4.** The Examiner found that Kuehl describes or suggests every process step and limitation recited in independent claim 1. Final Act. 12–13. In particular, the Examiner found that Kuehl suggests each wherein clause limitation specifying: (i) the requisite molar ratio of the total amount of the solvent to the total amount of YO<sub>2</sub> and (ii) the requisite time and temperature parameters for the crystallization step. *Id.* at 13.

Regarding (i), the Examiner interpreted the solvent as H<sub>2</sub>O and YO<sub>2</sub> as SiO<sub>2</sub> in view of the Specification. Ans. 4 (citing Spec. 43:15; 43:18). The Examiner found Kuehl “teaches [that] the total amount of solvent to the

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<sup>7</sup> US 6,974,889 B1, issued Dec. 13, 2005.

total amount of YO<sub>2</sub> is 6 to 80[, which] is contained within the claim[ed] range of 7 to 1.” Final Act. 13 (citing Kuehl claim 1). The Examiner derived the molar ratio of 6 to 80 from Kuehl’s teaching that the useful source of an oxide of silicon falls within the range of 0.4–0.8, while the useful source of H<sub>2</sub>O/OH<sup>-</sup> ions falls within the range of 15–100. *See* Ans. 4–5 (citing Kuehl 3:25). The Examiner determined that because the molar ratio range of 6 to 80 overlaps the claimed range of 7 to 1, a prima facie case of obviousness is established. Ans. 5.

With regard to (ii), the Examiner found that Kuehl teaches the crystallization temperature in the range of 80 °C to about 350 °C, which overlaps the claimed range of 120 °C to 175 °C. Final Act. 13 (citing Kuehl 3:42). The Examiner found that Kuehl further teaches the crystallization duration of 1/2 to 145 days, which overlaps the claimed range of 0.5 to 7 days. Final Act. 13 (citing Kuehl 3:43). The Examiner determined that because Kuehl teaches crystallization temperature and duration ranges which overlap the requisite crystallization parameters recited in claim 1, a prima facie case of obviousness is established. Final Act. 13.

Appellants argue that the rejection to claims 1–12, 15–25, 31, and 32 under this rejection should be reversed because the Examiner has not established a prima facie case of obviousness for two reasons. Appeal Br. 16. According to Appellants: (1) Kuehl fails to teach or suggest the specific combination of solvent: YO<sub>2</sub> ratio (7 to 1); crystallization temperature (120 to 170 °C); and crystallization time period (0.5 to 7 days), as recited in claim 1, Appeal Br. 16–18; Reply Br. 5, and (2) the Examiner has not established why this specific combination would have been particularly chosen from a genus of crystallization temperatures from about 80 °C to about 350 °C and

crystallization durations of about 12 hours to about 145 days. Appeal Br. 18–19.

Appellants' arguments (1) and (2) are not persuasive because Kuehl discloses a solvent: YO<sub>2</sub> ratio range and crystallization temperature and duration ranges that encompass the claimed ranges. The Examiner, therefore, correctly concluded that the claimed ranges were described or suggested by Kuehl. Thus, we agree with the Examiner that Kuehl establishes a prima facie case of obviousness of claim 1. *See, e.g., In re Peterson*, 315 F.3d 1325, 1329 (Fed. Cir. 2003) (a prima facie case of obviousness typically exists when the ranges of a claimed composition overlap the ranges disclosed in the prior art); *In re Harris*, 409 F.3d 1339, 1341 (Fed. Cir. 2005); *In re Boesch*, 617 F.2d 272, 275 (CCPA 1980).

Appellants further argue that unexpected results in Examples 1–6 of the Specification sufficiently rebut any established prima facie case. Appeal Br. 20. According to Appellants, the record evidence demonstrates that if the claimed solvent and YO<sub>2</sub> mixture is formulated at the requisite molar ratio and, thereafter, crystallized at the requisite temperature, “the crystallization period for obtaining an LEV-type product may be tremendously shortened to be in a range of from only 0.5 to 7 days.” *Id.* Appellants contrast these results to 21 or 23 day crystallization periods, *inter alia*, exemplified by Kuehl. *Id.*

Unexpected results must be established by clear and convincing evidence. *In re Heyna*, 360 F.2d 222, 228 (CCPA 1966) (“It was incumbent upon appellants to submit clear and convincing evidence to support their allegation of unexpected property.”); *see also McClain v. Ortmyer*, 141 U.S. 419, 429 (1891) (conclusive evidence needed to establish new function). For the reasons stated by the Examiner in the Answer, Appellants

have not met their burden in providing clear and convincing evidence of unexpected results. *See* Ans. 7–8. The parameters tested are not commensurate in scope with the scope of the instant claims or the prior art reference. For example, Appellants have not provided evidence of unexpected results showing the criticality of the endpoints of: (i) the solvent: YO<sub>2</sub> ratio of 7 to 1, (ii) the crystallization temperature of 120 to 170 °C, and (iii) the crystallization time period of 0.5 to 7 days, as recited in claim 1. Spec. 43:11–48:6. Accordingly, Appellants’ assertion of unexpected results is unconvincing.

“[T]he existence of overlapping or encompassing ranges shifts the burden to the applicant to show that his invention would not have been obvious.” *In re Peterson*, 315 F.3d at 1330. Appellants have not met this burden. Thus, we affirm **Rejection 1**.

**Rejections 2–4.** Appellants rely on arguments (1) and (2) and the allegation of unexpected results above for their assertion that the rejection of claims 13, 14, and 26–30 under these rejections should be reversed. Appeal Br. 20–22. For the reasons set forth above, we are not persuaded by Appellants’ arguments.

Appellants further argue that **Rejection 3** should be reversed because the relied upon “Rosinski also employ[s] considerably longer crystallization periods, such as **197 days** for Example 1, and **21 days** in Example 4” in comparison to the range required by claim 1. *Id.* at 22 (emphasis in original). Appellants’ argument is not persuasive because the Examiner relies on Rosinski for teaching the seed crystals limitation recited in claim 26. Furthermore, as set forth above, Appellants have presented insufficient evidence of unexpected results to rebut the Examiner’s prima facie case of

obviousness with respect to the claimed crystallization time period. Thus, we affirm **Rejections 2–4**.

**Rejection 5.** The Examiner provisionally rejected claims 1–32 for OTDP over the combination of claims of copending Application No. 13/163,377 and Kuehl. Final Act. 20.

Claim 1 of the '377 Application has not been substantively amended since the initial provisional ODP rejection. '377 Prosecution History, Amendment & Remarks 3–6, 9 (May 12, 2014). On May 10, 2016, claims 1–3 and 5–32 of the '377 Application issued as claims 1–31 in U.S. Patent No. 9,334,171 B2. '377 Prosecution History, Index of Claims (Jan. 25, 2016).

In view of the substantial similarity in the claims and the Examiner's grounds since the initial entry of the provisional ODP rejection, there is no need to conduct a patentability analysis *ab initio*. Likewise, there is no need to consider the OTDP rejection as provisional. Accordingly, our disposition of this rejection follows.

Appellants argue that the rejection to claims 1–32 under this rejection should be reversed for reasons substantially similar to Appellants' arguments urging reversal of **Rejections 1–4**: (1) Kuehl does not explicitly teach or suggest the specific combination of solvent: YO<sub>2</sub> ratio, crystallization temperature, and crystallization time period recited in the claims, and (2) the record fails to articulate a rational reason as to why the combination of parameters would have been particularly chosen from the broad recitation of ranges cited by Kuehl. Appeal Br. 24. Appellants admit that “the '377 Application does not teach a molar ratio of the total amount of the one or more solvents to the total amount of the one or more sources for YO<sub>2</sub> based on YO<sub>2</sub> is 7 to 1” and that “Kuehl is relied upon for this teaching.” *Id.*

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For the reasons set forth above, we are not persuaded by any of Appellants' arguments for reversal of the OTDP rejection of claims 1–32. Thus, we affirm **Rejection 5**.

#### CONCLUSION

For the reasons set forth above, we affirm the rejections of claims 1–32 of the '430 Application.

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)(iv).

AFFIRMED