Paper No. 44

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE BOARD OF PATENT APPEALS
AND INTERFERENCES

Ex parte JEAN-PIERRE DATH, LUC DELORME, JACQUES-FRANCOIS GROOTJANS, XAVIER VANHAEREN, and WALTER VERMEIREN

Appeal No. 2005-0183
Application No. 09/206,218

HEARD: Feb. 9, 2005

Before WARREN, WALTZ, and DELMENDO, Administrative Patent Judges.

WALTZ, Administrative Patent Judge.

DECISION ON APPEAL

This is a decision on an appeal from the primary examiner's final rejection of claims 1 through 12, 14, 15, and 18 through 21, which are the only claims remaining in this application. We have jurisdiction pursuant to 35 U.S.C. § 134.

According to appellants, the invention is directed to a process for increasing the stability of a MFI crystalline silicate catalyst where the catalyst is pretreated by steaming followed by de-aluminating through use of a complexing agent for

aluminum, as well as a process for the production of olefins by catalytic cracking of a hydrocarbon feedstock using these pretreated catalysts (Brief, pages 3-4). A copy of representative independent claim 1 is attached as an Appendix to this decision.

The examiner relies upon the following references as evidence of obviousness:

Eberly, Jr., et al. (Eberly)	3,506,400	Apr. 14, 1970
Colombo et al. (EP '060) (published European Patent Application)	0 109 060	May 23, 1984

Claims 1-12, 14 and 19 stand rejected under 35 U.S.C. § 103(a) as unpatentable over EP '060 in view of Eberly (Answer, page 3). Claims 15, 18, 20 and 21 stand rejected under 35 U.S.C. § 103(a) as unpatentable over Eberly (Answer, page 5). Claims 1-12, 14 and 19 stand provisionally rejected under the judicially created doctrine of obviousness-type double patenting as unpatentable over claims 1, 2, 4-10, 12-14, 16-20, 22, 24 and 27 of co-pending Application No. 09/206,216 (Answer, page 8).[1]

[1]The examiner also provisionally rejects many of the claims on appeal under the judicially created doctrine of obviousness-type double patenting over the claims of Application Nos. 09/206,207, 206,208, and 206,210 (Answer, pages 6-8). As noted by appellants, these applications have now matured into patents and terminal disclaimers have been submitted (Reply Brief, pages 1-2). The examiner has accepted the terminal disclaimers and

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We *affirm* the examiner's provisional rejection for obviousness-type double patenting essentially for the reasons stated in the Answer. *See Ex parte Karol,* 8 USPQ2d 1771, 1773 (Bd. Pat. App. & Int. 1988)(a provisional rejection may properly be made over rejected claims of a co-pending application). We *reverse* the examiner's rejections based on prior art under section 103(a) essentially for the reasons stated in the Brief, Reply Brief, and those reasons set forth below. Accordingly, the decision of the examiner is *affirmed-in-part.*

OPINION

A. The Obviousness-type Double Patenting Rejection

The examiner states the findings and conclusion of law with regard to the obviousness-type double patenting rejection over the claims of Application No. 09/206,216 on pages 8-9 of the Answer. Appellants do not dispute or contest the facts or conclusion set forth in this provisional rejection (see the Brief and Reply Brief in their entirety). Appellants note their intention to file an appropriate terminal disclaimer upon

[1](...continued)
therefore the obviousness-type double patenting rejections over each of these applications have been withdrawn (Letter dated July 30, 2004, Paper No. 38). Accordingly, these rejections are not on appeal before this merits panel.

allowance of Application No. 09/206,216 (Brief, page 6). Accordingly, we summarily affirm the examiner's rejection.

B. The Rejections under § 103(a)

The examiner finds that EP '060 discloses a process for producing olefins by catalytic cracking of a hydrocarbon feed using a zeolitic catalyst including silicalite and ZSM-5 with silicon/aluminum atomic ratios equal to or greater than 175 (corresponding to a molar ratio of equal to or greater than 350)(Answer, page 3). The examiner also finds that EP '060 fails to disclose, *inter alia*, that the catalyst has been pretreated to increase the silicon/aluminum ratio and increase the stability of the catalyst (Answer, page 4).

The examiner finds that Eberly discloses a process for treating a zeolite by steaming followed by contact with a complexing agent to remove aluminum from the gross structure of the zeolite thereby increasing the silicon/aluminum ratio of the zeolite (*id.*). From these findings, the examiner concludes that it would have been obvious to one of ordinary skill in the art at the time of appellants' invention to have modified the process of EP '060 "by dealuminating the zeolite to achieve the desired silicon:aluminum atomic ratio as suggested by Eberly because the resulting zeolite will have higher stability" (Answer, page 5).

With regard to the rejection of claims 15, 18, 20 and 21 over Eberly alone, the examiner makes the same findings from Eberly as discussed above (Answer, paragraph bridging pages 5-6). The examiner recognizes that Eberly does not disclose any treatment of a MFI crystalline silicate as claimed by appellants, nor does the reference disclose a post-treatment silicon:aluminum atomic ratio of at least 180 (Answer, page 6).[2] The examiner concludes that it would have been obvious to one of ordinary skill in the art to treat MFI crystalline silicates in the process of Eberly since Eberly does not limit the process to any specific zeolite (Answer, page 6). The examiner also concludes that it would have been obvious to one of ordinary skill in the art to treat a zeolite with any silica:alumina ratio since Eberly discloses treating zeolites having "extremely high" silica:alumina ratios, including ratios greater than 20, as well as disclosing several examples where the treated zeolites "are essentially free of alumina" (*id.*).

[2]Claims 15, 18, 20 and 21 require a silicon:aluminum atomic ratio of at least 300 (e.g., see claim 15 on appeal). Therefore we presume the examiner mistakenly states that a ratio of "at least 180" would have been obvious in view of Eberly, but meant to state a ratio of "at least 300." However, this error is moot in view of our disposition of the rejections *infra.*

The initial burden of establishing a *prima facie* case of obviousness rests with the examiner. *See In re Oetiker,* 977 F.2d 1443, 1445, 24 USPQ2d 1443, 1444 (Fed. Cir. 1992). Whether employing a single reference or a combination of references to establish *prima facie* obviousness, the examiner must show evidence that any proposed modification would have been desirable to those of ordinary skill in the art. *See B.F. Goodrich Co. v. Aircraft Braking Sys. Corp.,* 72 F.3d 1577, 1582, 37 USPQ2d 1314, 1318 (Fed. Cir. 1996); *In re Gordon,* 733 F.2d 900, 902, 221 USPQ 1125, 1127 (Fed. Cir. 1984). "[T]here must be some logical reason apparent from positive, concrete evidence of record which justifies a combination of primary and secondary references." *See In re Regel,* 526 F.2d 1399, 1403 n.6, 188 USPQ 136, 139 n.5 (CCPA 1975).

As correctly argued by appellants (Brief, page 10; Reply Brief, page 4), the examiner has not presented any convincing reasoning, suggestion or motivation as to why one of ordinary skill in this art would have modified the process of EP '060, where the catalyst already possess silicon:aluminum atomic ratios of greater than 175, with the catalyst pretreatment of Eberly, where Eberly teaches that silica:alumina mole ratios of up to 29 (i.e., atomic ratios of up to 14.5) provide sufficiently

increased stability to the zeolite catalyst. Similarly, with regard to the rejection over Eberly alone, the examiner has not presented any convincing reasoning, suggestion or motivation as to why one of ordinary skill in this art would have employed the pretreatment taught by Eberly to MFI crystalline silicate catalysts to yield silicon/aluminum atomic ratios of from 300 to 1000.

As also correctly argued by appellants (Brief, pages 7-8; Reply Brief, page 2), Eberly does not disclose pretreatment of the MFI crystalline silicate catalysts required by all the claims on appeal. Eberly discloses pretreatment of "crystalline aluminosilicate zeolites of the molecular sieve type" in general having the formula recited at col. 2, ll. 3-4 (see also col. 1, ll. 34-35). The value of X in this formula requires silica:alumina mole ratios of 1.5 to 12 (i.e., atomic ratios of 0.75 to 6; see col. 2, ll. 7-8). Eberly further teaches the use of many natural and synthetic zeolites, none of which has been identified by the examiner as a MFI crystalline silicate catalyst (col. 2, ll. 9-18).

Eberly teaches "extremely high" silica:alumina mole ratios of "15 to 1 or greater" with an example of an "extremely high" mole ratio of 29 (col. 4, ll. 35-38; col. 7, ll. 35-37; col. 7,

ll. 74-75; and Table IV in col. 8). As correctly noted by appellants (Reply Brief, pages 2-3), Examples 3 and 4 of Eberly disclose a catalyst "essentially free" of alumina (see also Example 6) but do not disclose or suggest any pretreatment other than that previously used to produce silica:alumina molar ratios of up to 29. Therefore we agree with appellants that the silicon:aluminum atomic ratios required by the claims on appeal would not have been suggested as desirable by Eberly since the much lower values taught by Eberly gave the desired catalyst stability.

For the foregoing reasons and those stated in the Brief and Reply Brief, we determine that the examiner has not established a *prima facie* case of obviousness in view of the reference evidence. Therefore we need not consider the sufficiency of appellants' evidence of non-obviousness (Brief, pages 13-14). *See In re Geiger,* 815 F.2d 686, 688, 2 USPQ2d 1276, 1278 (Fed. Cir. 1987). Accordingly, the rejections on appeal based on section 103(a) cannot be sustained.

C. Summary

The provisional rejection of claims 1-12, 14 and 19 under the judicially created doctrine of obviousness-type double

patenting over claims 1, 2, 4-10, 12-14, 16-20, 22, 24, and 27 of co-pending Application No. 09/206,216 is affirmed.

The rejection of claims 1-12, 14 and 19 under 35 U.S.C. § 103(a) over EP '060 in view of Eberly is reversed. The rejection of claims 15, 18, 20 and 21 under 35 U.S.C. § 103(a) over Eberly is also reversed.

The decision of the examiner is affirmed-in-part.

No time period for taking any subsequent action in connection with this appeal may be extended under 37 CFR § 1.136(a)(1)(iv)(effective Sep. 13, 2004; 69 Fed. Reg. 49960 (Aug. 12, 2004); 1286 Off. Gaz. Pat. Office 21 (Sep. 7, 2004)).

AFFIRMED-IN-PART

Charles F. Warren Administrative Patent Judge	)	
Thomas A. Waltz Administrative Patent Judge	)	BOARD OF PATENT APPEALS AND INTERFERENCES

Romulo H. Delmendo)
Administrative Patent Judge)

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APPENDIX

1. A process for the production of olefins by catalytic cracking, the process comprising feeding a hydrocarbon feedstock containing at least one olefin of C_4 or greater over an MFI crystalline silicate catalyst to produce an effluent containing at least one olefin of C_2 or greater by catalytic cracking which is selective towards light olefins in the effluent, whereby for increasing the catalyst stability by limiting formation of coke thereon during the cracking process the catalyst has a silicon/aluminum atomic ratio of from 300 to 1000, the olefin partial pressure is from 0.1 to 2 bars, and the feedstock contacts the catalyst at an inlet temperature of from 500 to 600°C, wherein the catalyst has been pretreated by heating the catalyst in steam to reduce the tetrahedral aluminum in the crystalline silicate framework of said catalyst and convert the tetrahedral aluminum to octahedral aluminum in the form of amorphous alumina causing partial obstruction in the pores of said crystalline silicate framework and thereafter dealuminating the catalyst by treating the catalyst with a complexing agent for aluminum to remove amorphous alumina from the pores of said crystalline silicate framework and at least partially recover the micropore volume to increase the silicon/aluminum atomic ratio of the catalyst to a value of from 300 to 1000.