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UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

Ex parte HERMANN BRUGGENDICK and MAIK BLOHM

Appeal 2015-004387
Application 12/384,159
Technology Center 1700

Before LINDA M. GAUDETTE, MICHELLE N. ANKENBRAND, and MONTÉ T. SQUIRE, *Administrative Patent Judges*.

GAUDETTE, *Administrative Patent Judge*.

DECISION ON APPEAL

Appellants[1] appeal under 35 U.S.C. § 134(a) from the Examiner's decision[2] finally rejecting claims 22, 23, 25, 27, 28, and 32 under 35 U.S.C. § 102(b) as anticipated by or, in the alternative, under 35 U.S.C. § 103(a) as obvious over Rikimaru et al. (US 4,977,127, iss. Dec. 11, 1990 ("Rikimaru")), as evidenced by Parmar et al. (*Viscosities of oxalic acid and its salts in water and binary aqueous mixtures of tetrahydrofuran at different temperature*, 117 J. Chem. Sci. 351–357 (July 2005) ("Parmar")). App. Br. 13. We have jurisdiction under 35 U.S.C. § 6(b).

We AFFIRM.

"The invention relates to a method for treating a flue gas catalyst base (substrate/carrier)." Specification filed April 1, 2009 ("Spec.") ¶ 2. In order to accelerate chemical reactions in fluid streams, catalysts are applied on or contained in the catalyst base. *Id.* ¶ 3. The catalyst base comprises a porous material having a contact area that "is understood as a macroscopic boundary of the base material adjacent to the fluid stream." *Id.* "Th[e] contact area is . . . distinguished from the pore wall areas that have smaller, sometimes microscopic dimensions and are formed by areas defining the boundaries of the pore spaces/volumes." *Id.* Pore wall areas that lead to an opening in the contact area enlarge the surface that is accessible by the fluid stream. *Id.* According to the Specification, a known problem with catalysts used to reduce nitrogen oxides in flue gas is that competing

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[1] Appellants identify the real party in interest as STEAG Energy Services GmbH. Appeal Brief filed September 3, 2014 ("App. Br."), 1.

[2] Final Office Action mailed December 4, 2013 ("Final Act."); Examiner's Answer mailed January 2, 2015 ("Ans.") 2, 5 (concurring in Appellants' statement of the status of the claims (*see* App. Br. 13), and stating that the rejections under 35 U.S.C. § 112 have been withdrawn in view of Appellants' after-final amendment filed March 21, 2014).

reactions can occur, such as the undesired oxidization of sulfur dioxide to sulfur trioxide. *Id.* ¶ 9. The invention is directed to a method that provides a catalyst with high activity but with reduced susceptibility to undesired side reactions. *Id.* ¶ 13. "The invention is based on the knowledge that most of the desired catalytic reactions take place in the pores' regions close to the contact area . . . , whereas the undesired reactions prevail in the deeper pore regions." *Id.* ¶ 15.

Of the appealed claims, claims 22, 28, and 32 are independent. Claim 22 is representative of the claimed invention, and is reproduced below:

> 22. A method for treating a catalyst base, wherein the catalyst base comprises at least one contact area of a porous material, and wherein a fluid is adapted to be conducted along said contact area, the method comprising the steps of:
>
> introducing at least one catalytically relevant substance into pores of the catalyst base comprising ceramic, titanium dioxide, or zeolite by means of a transport fluid having a viscosity higher than water;
>
> removing the transport fluid, wherein the at least one catalytically relevant substance remains on pore wall areas after removal of the transport fluid, wherein said step of introducing at least one catalytically relevant substance is carried out in such a way that, in at least a plurality of pores, an amount of the at least one catalytically relevant substance relative to the surface remaining on the pore wall areas is a function of location within each pore such that the amount of the at least one catalytically relevant substance relative to the surface decreases within the pore after exceeding a specific pore depth; and
>
> heat treating the at least one catalytically relevant substance to convert the at least one catalytically relevant substance to at least one catalytically active substance selected from the group consisting of tungsten oxide, vanadium pentoxide, molybdenum oxide, copper oxide, and iron oxide,
>
> wherein said step of introducing at least one catalytically relevant substance comprises:

> treating the catalyst base for a first predetermined period of time with the transport fluid having a viscosity higher than water that contains the at least one catalytically relevant substance, wherein the first predetermined period of time is selected such that the transport fluid penetrates essentially up to the specific pore depth; and
>
> removing the transport fluid from the catalyst base such that the at least one catalytically relevant substance remains in the pores.

App. Br. 27 (Claims App'x).

As an initial matter, Appellants contend it was improper for the Examiner to rely on both Rikimaru and Parmar in rejecting the claims under 35 U.S.C. § 102(b). App. Br. 16.

Although anticipation does not permit an additional reference to supply a missing claim limitation, additional references may be used to confirm the content of the allegedly anticipating reference. *Studiengesellschaft Kohle, m.b.H. v. Dart Indus., Inc.*, 726 F.2d 724, 727 (Fed. Cir. 1984).

Appellants' argument fails to persuade us that the Examiner relied on Parmar to supply a missing feature in Rikimaru rather than simply as evidence that Rikimaru describes "a transport fluid having a viscosity higher than water," as recited in independent claims 22, 28, and 32. *See* Final Act. 7.

In traversing the Examiner's rejection under 35 U.S.C. § 103(a), Appellants argue Parmar actually evidences that at the temperatures used in Rikimaru's process, the aqueous oxalic acid transport fluid has a lower viscosity than water. App. Br. 21–22. Appellants agree the aqueous oxalic acid transport fluid would have a higher viscosity than water at room temperature, but argue neither Rikimaru nor Parmar discloses or suggests conducting Rikimaru's process at room temperature. *Id.* at 22.

In the Answer, the Examiner persuasively explains why Appellants' argument is unreasonable. *See* Ans. 8–9. In their Reply Brief, Appellants do not

address the Examiner's findings with respect to the viscosity of Rikimaru's transport fluid directly, but present arguments related to differences in the claimed method and the method of Rikimaru that were not raised in the Appeal Brief. *See* Reply Brief filed Feb. 27, 2015 ("Reply Br."), 11–12. Appellants do not explain why these arguments were not raised in the Appeal Brief. *See generally id.* at 3–12. We, therefore, decline to consider them. "The reply brief is not an opportunity to make arguments that could have been made during prosecution, but were not. Nor is the reply brief an opportunity to make arguments that could have been made in the principal brief on appeal to rebut the Examiner's rejections, but were not." *Ex parte Borden*, 93 USPQ2d 1473, 1474 (Bd. Pat. App. & Int. 2010) (Informative); *see also Cross Med. Prods., Inc. v. Medtronic Sofamor Danek, Inc.*, 424 F.3d 1293, 1320–21 n.3 (Fed. Cir. 2005) (stating that arguments not raised in the opening brief are deemed waived). Accordingly, we are not persuaded of error in the facts and reasons relied on by the Examiner in finding that Rikimaru's transport fluid inherently has a higher viscosity than water. *See* Final Act. 7; Ans. 8–9.

Appellants also contend the Examiner reversibly erred in finding Rikimaru describes a method that includes treating the catalyst base with a transport fluid for a predetermined period of time such that there is either no deposition, or a significantly reduced deposition, of a catalytically relevant substance on the pore wall areas after a specific depth within the pores is exceeded, as required by independent claims 22, 28, and 32. *See* App. Br. 14–15.

The Examiner finds the claim limitations relating to the amount of catalytically relevant substance in the pores are met by Rikimaru's disclosure that "vanadium (catalytically relevant substance) is contained in the surface layer of the catalyst in concentrations of at least about 1.5 times as much as the concentrations

of vanadium throughout the catalyst." Final Act. 6 (citing Rikimaru, Abstract); *see also* Rikimaru 4:38–50 ("The catalyst in the form of honeycombs has walls of about 0.6–1.8 mm . . . in thickness, . . . and the vanadium is concentratedly contained in the surface layer of the catalyst up to 200 μm, preferably up to 100 μm, in depth from the surface of the catalyst in concentrations of at least about 1.5 times as much as the concentrations of vanadium throughout the catalyst."). The Examiner contends Appellants fail to define the terms "specific pore depth" and "predetermined period of time," and, therefore, the specific pore depth could be any pore depth, including the maximum pore depth of the catalyst, and the "predetermined time" could be any period of time. Ans. 5–7.

Appellants argue the term "specific pore depth" is defined in paragraph 16 of the Specification as "the depth into the pore where the amount of catalytically relevant substances decreases in proportion to the coverage area." Reply Br. 5–6. Appellants contend one of ordinary skill in the art would understand from reading the Specification (e.g. ¶¶ 9, 15, 16, 20) that the "specific pore depth" is that location within the pore at which undesired competing reactions take place, i.e., a location deeper in the pore, as opposed to regions close to the pore opening. *Id.* at 6–7.

According to the Specification,

> [i]t is preferred that the specific pore depth, beyond which the amount of the catalytically relevant substance decreases (in proportion to the covered area), depends on the form of the pore, e.g. that it is greater for a pore having a greater diameter than for a narrow pore. It is preferred that the specific pore depth corresponds to an entering depth that is reached by a given fluid in a predetermined time.

Spec. ¶ 16. The Specification describes, in connection with Figures 1–7, an embodiment in which the specific pore depth is dependent on the form of the pore. *See id.* ¶¶ 58–74). As described in paragraph 74, and illustrated in Figure 7, the

catalytically relevant substance may be deposited up to the maximum depth of some pores (*see* pore 15) such that the specific pore depth corresponds to the maximum pore depth, and up to lesser, varying depths in other pores depending on their respective shapes (*see* pores 16, 17, and 19). The Specification also discloses, however, that the "specific pore depth" can be unrelated to the shape of the pore, i.e., it can "be the same for all pores leading into the contact area irrespective of the diameter and the form of the pore." *Id.* ¶ 16.

Having considered the argued claim limitations in light of the claims and Specification, we agree with the Examiner's determination that the claims do not exclude necessarily a method in which the catalyst base is treated with a transport fluid in a manner that results in the deposition of a catalytically relevant substance up to the same depth in each pore as measured from the catalyst surface/pore opening and/or up to the maximum pore depth. Rikimaru describes a process wherein "vanadium is concentratedly contained in the surface layer of a catalyst up to 200 μm, preferably up to 100 μm, in depth from the surface of the catalyst in concentrations of at least about 1.5 times as much as the concentrations of vanadium throughout the catalyst." Rikimaru 4:45–50. The Examiner had a reasonable basis, therefore, for concluding that Rikimaru's method results in the deposition of a catalytically relevant substance up to the same depth in each pore as measured from the catalyst surface/pore opening and/or up to the maximum pore depth and, therefore, that Rikimaru's method is identical to the processes recited in claims 22, 28, and 32.

> Where . . . the claimed and prior art products are identical or substantially identical, or are produced by identical or substantially identical processes, the PTO can require an applicant to prove that the prior art products do not necessarily or inherently possess the characteristics of his claimed product. Whether the rejection is based on 'inherency' under 35 U.S.C. § 102, on 'prima facie obviousness'

> under 35 U.S.C. § 103, jointly or alternatively, the burden of proof is the same, and its fairness is evidenced by the PTO's inability to manufacture products or to obtain and compare prior art products.

In re Best, 562 F.2d 1252, 1255 (CCPA 1977) (citations omitted). *See also, In re Spada*, 911 F.2d 705, 708 (Fed. Cir. 1990).

Appellants have not provided persuasive evidence that shows Rikimaru's process would not result in the deposition of catalytically relevant substance within the catalyst pores in the manner recited in independent claims 22, 28, and 32. Accordingly, we are not persuaded of error in the Examiner's finding of anticipation.

For the reasons stated above and in the Final Office Action and the Answer we affirm the rejection of claims 22, 23, 25, 27, 28, and 32 under 35 U.S.C. § 102(b) as anticipated by Rikimaru. We also affirm the rejection of these claims under 35 U.S.C. § 103(a) as obvious over Rikimaru. *See In re McDaniel*, 293 F.3d 1379, 1385 (Fed. Cir. 2002) ("[A]nticipation is the epitome of obviousness.").

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).

<u>AFFIRMED</u>