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Paper 54
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UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

VOLKSWAGEN GROUP OF AMERICA, INC.,
Petitioner,

v.

EMERACHEM HOLDINGS, LLC,
Patent Owner.

Case IPR2014-01555
Patent 5,451,558

Before JAMES T. MOORE, SHERIDAN K. SNEDDEN, and KRISTINA M. KALAN[1], *Administrative Patent Judges*.

MOORE, *Administrative Patent Judge*.

DECISION ON REHEARING

I. Introduction

Pending before the Board is a request for rehearing filed February 22, 2016. Paper 51. The request for rehearing seeks reconsideration of the Board's Final Written Decision of January 22, 2016. Paper 50. We invited

[1] Judge Frederick E. McKelvey authored the Final Written Decision, but passed away prior to the Decision on Rehearing.

response by the Petitioner to the request for rehearing. Paper 52. A response was filed March 29, 2016. Paper 53.

Familiarity with the Final Written Decision is presumed.

II. Background

A. The Patent and Claims

The involved patent is expired U.S. Patent 5,451,558 ("the '558 patent") issued 19 September 1995, based on an application filed 4 February 1994. Ex. 1001. Because the '558 patent has expired, we did not interpret the claims using the broadest reasonable interpretation. 37 C.F.R. § 42.100(b); *Ex parte Papst-Motoren*, 1 USPQ2d 1655 (BPAI 1986) (narrow construction will be given to claims in proceeding where patent has expired). Paper 50, 2.

Independent composition claim 1 of the '558 patent reads as follows (indentation and matter in brackets added):

> 1. A material for removing gaseous pollutants from combustion exhaust comprising
>
> [1] an oxidation catalyst specie[s] selected from platinum, palladium, rhodium, cobalt, nickel, iron, copper, molybdenum or combinations thereof
>
> [2] disposed on a high surface area support,

> [3] said catalytic component[2] being intimately and entirely coated with an absorber selected from a hydroxide, carbonate, bicarbonate or mixture[s] thereof of an alkali or alkaline earth or mixtures thereof.

Ex. 1001, col. 12:30–38.

Independent method claim 33 of the '558 patent reads (indentation and matter in brackets added):

> 33. A process of preparing a material for removing gaseous pollutants comprising
>
> [1] depositing an oxidation catalyst specie[s] selected from platinum, palladium, rhodium, cobalt, nickel, iron, copper, molybdenum or combination[s] thereof from a solution onto a high surface area support,
>
> [2] drying said support and
>
> [3] depositing from a solution over said oxidation catalyst specie[s] an absorber selected from a hydroxide, carbonate or bicarbonate and mixtures thereof of an alkali or alkaline [earth] or mixture thereof and
>
> [4] drying the support thereby coating said oxidation catalyst specie[s] with said absorber.

Ex. 1001, col. 14:3–13.

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[2] There is no antecedent for "said catalytic component" in claim 1; we construed "said catalytic component" to refer to "an oxidation catalyst." Paper 50, 8.

III. The Adverse Patentability Determinations

We determined that Petitioner established by a preponderance of the evidence that claims 1, 7, 8, 12, 14, 21, 22, 32–35, and 38–42 of the '558 patent are unpatentable under 35 U.S.C. § 102(b) and claims 9–11 and 23 of the '558 patent are unpatentable under 35 U.S.C. § 103(a). (Ground 2, Hoekstra). Paper 50, 78.

We also determined that Petitioner established by a preponderance of the evidence that claims 33–40, 42, and 44 of the '558 patent are anticipated by Kinoshita. (Ground 3, Kinoshita). *Id.* at 79.

We additionally determined that Petitioner established by a preponderance of the evidence that claims 1, 2, 7–10, 14, 15, 17, 19, 24, 31, 33–37, 39, and 40 of the '558 patent are unpatentable under 35 U.S.C. § 102(b). (Ground 4, Inui). *Id.*

We finally determined that Petitioner established that claims 1, 7, 8, 14–17, 19, and 31 of the '558 patent are unpatentable under 35 U.S.C. § 102(b) and that claims 21–23 of the '558 patent are unpatentable under 35 U.S.C. § 103(a). (Ground 5, Stiles). *Id.*

We therefore entered judgment that claims 1, 2, 7–12, 14–17, 19, 21–24, and 31–42 of the '558 patent were unpatentable.[3] *Id.*

[3] Claim 44 was inadvertently omitted in the judgment, that typographical error is corrected in section V herein.

IV. Grounds for Rehearing

Patent Owner raises three principal grounds in the request for rehearing, as regards to claims 1, 2, 7–12, 14–17, 19, 21-24 and 31–32[4]. First, that Patent Owner did not have opportunity to address the Board's findings concerning claim construction of claim 1. Reh'g Req. 2. Second, that the Board's factual findings are clearly erroneous. *Id.* at 4–10. Third, that the Board misconstrued the claims and as a consequence found the claims unpatentable. *Id.* at 10–15. We address these grounds below.

A. Rehearing Requests

A rehearing request for a final decision is governed by 37 CFR § 42.71 (d), which provides that a party dissatisfied with a decision must specifically identify all matters believed to have been misapprehended or overlooked, and the place where each matter was previously addressed.[5]

We therefore consider Patent Owner's request for rehearing to determine whether we misapprehended or overlooked a matter, and whether it makes a difference to our determination in the Final Written Decision.

B. Claim Construction

We initially recognized in the institution decision that the term "intimately and entirely coated," inserted during prosecution of claim 1 of the patent, was subject to interpretation. Paper 21, 14. The potential of the

[4] Accordingly, claims 33–42 and 44 are not part of the rehearing request.
[5] Patent Owner suggests an abuse of discretion standard. Paper 51, 1. That standard is applicable to requests for rehearing on the initial decision to institute on a petition. 37 CFR § 42.71(c).

claim term interpretation changing was highlighted in the institution decision:

> With respect to the "intimately and entirely coated" limitation, we find Petitioner's explanation *on this record* that "intimately and entirely coated" means "coated over the metal" based on representations made when the limitation was first inserted into claim 57 of the application maturing into the '558 patent. *See* Ex. 1002A, 82–85.

Paper 21, 14 (emphasis in original). The representations made during prosecution were that the "absorber materials are now clearly recited as being coated over the metal specie. This is a significant clarification since Wan, et al[.] is clear that their alkaline earth oxide stabilizer is coated below the metal catalyst. The present absorber is coated above the metal specie." Ex. 1002, 84–85.

In this trial proceeding, Patent Owner in its Response (Paper 29) asserted that:

> With regard to Petitioner's proposed construction of "being intimately and entirely coated with," EmeraChem agrees that this requires that the absorber material must be disposed over, or on top of, the catalytic component relative to the high surface area support. The experts for both parties have interpreted the term 'entirely coated' as meaning that the amount of absorber must be sufficient to form a monolayer on the surface area presented by the high surface area support [Ex. 2003, Farrauto Depo. at 28:7–30:9 and Ex. 2002, Crocker ¶19], which itself is at least partially coated with the oxidation catalyst specie. EmeraChem also agrees that the combustion exhaust must nevertheless have access to the catalyst, either directly, or by diffusion through the overlaying absorber.

Paper 29, 8. Patent Owner therefore also advanced the position that a proper claim interpretation included a coating which is not complete, i.e. one where the catalyst and gas access each other directly.

In contrast, in the Patent Owner's Response addressing the grounds based upon Hoekstra, Patent Owner asserted:

> Specifically, with regard to claim 1, Hoekstra does not disclose an oxidation catalyst specie selected from platinum, palladium, rhodium, cobalt, nickel, iron, copper, molybdenum, or combinations thereof **intimately and entirely coated** with an absorber selected from a hydroxide, carbonate, bicarbonate, or mixture thereof of an alkali or alkaline earth or mixtures thereof. Similarly, with regard to claim 33, Hoekstra does not disclose depositing an absorber over an oxidation catalyst specie thereby coating the oxidation catalyst specie with the absorber.

Id. at 14 (emphasis added). It may well be that the Patent Owner was simply parroting the claim language, but there is no doubt that the terms "intimately and entirely" were relied upon.

Similarly, Patent Owner also asserted in addressing the grounds based upon Kinoshita that:

> Kinoshita does not disclose an oxidation catalyst specie selected from platinum, palladium, rhodium, cobalt, nickel, iron, copper, molybdenum, or combinations thereof **intimately and entirely coated** with an absorber selected from a hydroxide, carbonate, bicarbonate, or mixture thereof of an alkali or alkaline earth or mixtures thereof.

Paper 29, 19–20 (emphasis added).

In our final written decision we observed that "'intimately and entirely coated' mean[s] exactly what it says. In other words, it means the embodiment shown in Figs. 1a through 1c of the '558 patent drawings and associated discussion in the written description portion of the specification." Paper 50, 23. In doing so, we relied principally on the intrinsic evidence of record in the specification.

On rehearing, Patent Owner asserts that the claim interpretation used by the Board is not part of the record and was not presented by Petitioner. Reh'g Req. 3. We are not persuaded by this argument. First, the Patent Owner itself advocated in the Patent Owner's response that Kinoshita did not contain oxidation catalyst species "intimately and entirely coated with an absorber." Paper 29, 19–20. Second, the Board is not bound by the Petitioner and Patent Owner's interpretation of the claim language, which may have inherent favoring of a particular interpretation for strategic reasons, as discussed in the final written decision. *See* Paper 50, 23.

Patent Owner states that it has had no opportunity to address the claim construction and that it is fundamentally unfair and unreasonable that Patent Owner has not had a chance to address this claim construction. Reh'g Req. 2–3. We take such a statement seriously. However, we are unable to discern how the Board overlooked or misapprehended any fact or argument, let alone how the claim interpretation adversely affected the outcome of this proceeding for the Patent Owner.

C. The Board's Findings

Patent Owner asserts that the Final Written Decision is inconsistent with the evidence of record before the Board. Reh'g Req. 1. More specifically, Patent Owner asserts that "figures 1a through 1c do not depict reality." *Id*. at 4. Patent Owner asserts that its expert and the Petitioner's expert testified that the oxidation catalyst and the oxidation catalyst's coating are each not present as a continuous layer, citing us to the cross examination of Patent Owner's witness Dr. Mark Crocker, Ex. 1056, Crocker transcript, 35:25–36:16. Reh'g Req. 6. Patent Owner also points to the testimony of Dr. Farrauto, the Petitioner's witness, that the coating is porous. Ex. 2003, Farrauto transcript, 21:3–17. Reh'g Req. 7.

The Patent Owner asserts it was improper for the Board to ignore the testimony of the witnesses. Reh'g Req. 8.

In the final written decision, we did not ignore the witness testimony. We discussed the testimony at some length. Paper 50, 17–24. We chose to credit the precise plain and ordinary meaning of the language of the claim, aided by the prosecution history, and the intrinsic evidence of the specification (including the figures). We credited the intrinsic evidence in combination with the testimony of Patent Owner's witness, Dr. Crocker, that combustion exhaust could have access to the catalyst by diffusion through the overlaying absorber. *Id.* at 18–19 (citing Ex.1056, 45:6–46:5; Paper 32, 5). As it is the Patent Owner who drafted the claim language, specification, and figures upon which we relied in rendering the Final Written Decision,

we are not now swayed by the present contention that the figures do not reflect reality.

D. Anticipation - Claim 1

Patent Owner asserts that there is no evidence in the record to support the Board's findings that Hoekstra, Inui, and Stiles meet the "intimately and coated" limitation. Reh'g Req. 10.

More specifically, Patent Owner asserts that, based upon platinum loading, Hoekstra has insufficient catalyst to form a continuous layer, and there is no evidence the method of Hoekstra results in all platinum being entirely covered. *Id.* at 11–12. As we have not interpreted claim 1 as requiring a continuous catalyst layer, we are unpersuaded by the first assertion. As to the second, we relied upon evidence from Hoekstra example 1, Dr. Crocker, and Dr. Farrauto. For example, Dr. Farrauto testified that barium oxide completely coated the platinum group metal. Ex. 1003A.

More specifically, Dr. Farrauto testified:

> 39. Hoekstra also discloses that prior to calcining the platinum group metal-impregnated carrier material, the composite is further impregnated with a compound of an alkaline earth metal in solution with a reducing agent. Ex. 1005 at col. 3, ln. 51-55. The reducing agent prevents the leaching of the platinum group metal component from the carrier into the alkaline earth metal solution. See Ex. 1005 at col. 1, ln. 37-59; col. 3, ln. 55-59; col. 5, ln. 4-8.
>
> 40. Because the platinum group metal component does not leach from the carrier, the alkaline earth metal compound will be coated over the platinum group metal component.

Ex. 1003, 11–12.

> We also specifically noted that Hoekstra describes this prevention of leaching.
>
> Hoekstra *explicitly* states in describing the result of process steps described in Example 1 that "[t]his example demonstrates that the inclusion of a reducing agent, e.g., hydrazine hydrate, *obviates leaching of the platinum group metal component from the carrier material during the second impregnation step* [i.e., adding a barium oxide layer]." Ex. 1005, col. 5:4–8 (italics added).

Paper 50, 38.

We therefore are unpersuaded that we overlooked or misapprehended any facts in this instance, despite Patent Owner's assertion that the experts "contemplate the possibility" that some platinum may be uncovered. Reh'g Req. 12.

Patent Owner asserts roughly the same arguments regarding Inui. *Id.* at 12–14. In sum, Patent Owner's position is – "there is no evidence that the amount of platinum in Inui is sufficient to form a monolayer" and "there is no evidence that the method of Inui results in all platinum being entirely covered." Paper 51, 13–14. As observed by Petitioner, the first portion of this statement misreads the claim requirement regarding the amount of platinum. Paper 53, 13.

We also are not persuaded by the statement that there is no evidence to support the platinum being entirely coated. *See, e.g.*, Ex. 1003, 16–17, reproduced below:

> 57. With respect to Exemplary Embodiment 4, the "[c]ompleted catalyst (D) was obtained in the same way as in Exemplary Embodiment 1, except that a 2.5 mol/l aqueous solution of potassium carbonate was used instead of the 4.3 mol/l aqueous solution of sodium nitrate in Exemplary Embodiment 1." Ex. 1007 at p. 10, Paragraph [0026].
>
> 58. At the completion of the drying step at 120° C, but before being fired at 500° C, Inui's Exemplary Embodiment 4 product would comprise Pt disposed on a high surface area alumina support, with a coating of potassium carbonate completely covering the Pt.
>
> 59. If this coating of potassium carbonate was subjected to the exhaust conditions described in the '558 patent at column 2, lines 38-55, the potassium carbonate would absorb NO_2 exposed within that exhaust in the same manner that the counterpart potassium carbonate absorbent disclosed in the '558 patent would.

We relied upon Exemplary embodiment 4 and Dr. Farrauto's declaration (Ex. 1003A) in determining that an absorber entirely coated the catalytic component. Paper 50, 54–55. Accordingly, we are unpersuaded by this contention that no evidence supports the conclusion.

Lastly, the Patent Owner asserts that, as regards to the Stiles reference, "[t]here is no evidence in the record that all oxidation catalyst atoms are covered by the absorber." Reh'g Req. 14. In part this stems from Patent Owner's assertion that Stiles prepares the catalyst by co-precipitation of aluminum oxide and catalyst. *Id*.

This assertion is expressly negated by our reliance upon Stiles to describe exactly that. Ex. 1008[A] 5:40–44. Paper 50, 64. ("The granules are further treated by adding a solution of potassium carbonate which, on drying, leaves the potassium carbonate *completely covering* the interior and exterior of the granules.").

Accordingly, we are unpersuaded that we misapprehended or overlooked the issues raised by the Patent Owner in its request for rehearing. It is, therefore, denied, except to correct the judgment as follows on page 79, lines 12–13 to include claim 44 and to read as follows:

FURTHER ORDERED that claims 1, 2, 7–12, 14–17, 19, 21–24, 31–42, and 44 of the '558 patent are unpatentable.

DENIED

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