

NOTE: This disposition is nonprecedential.

**United States Court of Appeals  
for the Federal Circuit**

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**EMERACHEM HOLDINGS, LLC,**  
*Appellant*

v.

**VOLKSWAGEN GROUP OF AMERICA, INC.,**  
*Appellee*

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2016-2619

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Appeal from the United States Patent and Trademark  
Office, Patent Trial and Appeal Board in No. IPR2014-  
01555.

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Decided: October 23, 2017

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JACOBUS C. RASSER, Marras Amsterdam BV, Amster-  
dam, The Netherlands, argued for appellant. Also repre-  
sented by MICHAEL J. BRADFORD, Luedeka Neely Group,  
PC, Knoxville, TN.

STEVEN F. MEYER, Locke Lord LLP, New York, NY,  
argued for appellee. Also represented by SETH J. ATLAS,  
JOSEPH ANTHONY FARCO.

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Before LOURIE, REYNA, and HUGHES, *Circuit Judges*.

HUGHES, *Circuit Judge*.

EmeraChem Holdings, LLC appeals from the final written decision of the Patent Trial and Appeal Board finding that claims 1, 2, 7–12, 14–17, 19, 21–24, 31–42, and 44 of U.S. Patent No. 5,451,558 are unpatentable. Because the Board’s findings regarding anticipation are supported by substantial evidence, we *affirm*.

## I

U.S. Patent No. 5,451,558 relates to materials and methods for reducing the emission of environmentally harmful compounds. Burning hydrocarbons (i.e., gasoline) produces exhaust gas that contains pollutants such as nitrogen oxides, sulfur oxides, and carbon monoxide. To prevent these harmful chemicals from being released into the atmosphere, the ’558 patent discloses a combined catalyst/absorber material for treating exhaust gas.

In particular, the ’558 Patent discloses catalysts to drive oxidation reactions that convert nitrogen monoxide to nitrogen dioxide and carbon monoxide to carbon dioxide. These reaction products are in turn absorbed by another material to prevent their release into the atmosphere. The absorber material is coated on top of the catalyst.

Claim 1 of the ’558 patent recites

A material for removing gaseous pollutants from combustion exhaust comprising an oxidation catalyst specie selected from platinum, palladium, rhodium, cobalt, nickel, iron, copper, molybdenum or combinations thereof disposed on a high surface area support, said catalytic component ***being 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.<sup>1</sup>

Volkswagen Group of America, Inc. petitioned for inter partes review (IPR) to invalidate the '558 Patent claims. After construing the claims, the Board found claims 1, 2, 7–12, 14–17, 19, 21–24, 31–42, and 44 invalid. EmeraChem appeals. We have jurisdiction under 28 U.S.C. § 1295(a)(4)(A).

## II

EmeraChem argues the Board's construction of the term "intimately and entirely coated" was wrong. Further, EmeraChem also contends the Board erred in finding that various claims of the '558 patent are anticipated by U.S. Patent No. 3,849,343 (Hoekstra), Japanese Patent Application Publication No. H4-367724 (Inui), and U.S. Patent No. 5,362,463 (Stiles).

## A

We review the Board's ultimate claim construction de novo and any underlying factual determinations involving extrinsic evidence for substantial evidence. *In re Cuozzo Speed Techs., LLC*, 793 F.3d 1268, 1280 (Fed. Cir. 2015). Claim terms, however, are construed to resolve a "controversy, and only to the extent necessary to resolve the controversy." *Vivid Techs., Inc. v. Am. Sci. & Eng'g, Inc.*, 200 F.3d 795, 803 (Fed. Cir. 1999). Claim construction is "not an obligatory exercise in redundancy." *U.S. Surgical Corp. v. Ethicon, Inc.*, 103 F.3d 1554, 1568 (Fed. Cir. 1997).

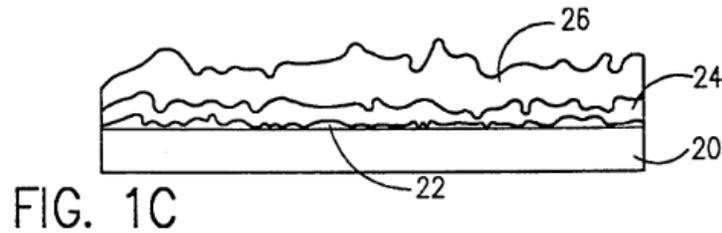
In this case, EmeraChem seeks a *broader* construction than what the Board ultimately adopted. We need not

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<sup>1</sup> We treat claim 1 as representative because EmeraChem did not make particularized arguments to support the validity of the other claims found invalid.

decide if EmeraChem's broader construction is ultimately correct because the prior art would anticipate the '558 patent claims regardless of which construction we apply.

In its final written decision, the Board construed the term "intimately and entirely coated" to require a continuous layer of absorber on top of the catalyst. In doing so, the Board explained that "'intimately and entirely coated' mean[s] exactly what is says. In other words, it means the embodiment shown in Figs 1a through 1c . . . and associated discussion." J.A. 23. Figure 1c, reproduced below, depicts absorber (26) coated on top of the catalyst (24).



EmeraChem argues that the term "intimately and entirely coated" does not require the absorber to form a continuous layer on top of the catalyst, as depicted in the '558 patent figures. Instead, EmeraChem contends the claim can encompass materials in which the exhaust gas directly contacts the catalyst through cracks or porous openings in the absorber coating. EmeraChem's construction, however, would necessarily encompass materials that have a continuous absorber layer *without* cracks or openings, which is what the Board's construction requires. In other words, a prior art reference that anticipates the '558 patent under the Board's construction would also anticipate under EmeraChem's proposed construction.

We need not resolve whether the Board should have adopted a broader construction because it would not affect the outcome of the IPR. *See U.S. Surgical*, 103 F.3d at 1568. The Board found that Hoekstra, Inui, and Stiles each disclose an absorber that forms a continuous layer on top of the catalyst. As explained below, we conclude that the Board's findings on the prior art disclosures are supported by substantial evidence. Therefore, Hoekstra, Inui, and Stiles would each anticipate the '558 patent claims even under EmeraChem's proposed construction.

## B

Next, we turn to the Board's findings on anticipation with respect to Hoekstra, Inui, and Stiles. Hoekstra discloses a composite material for the catalytic oxidation of exhaust gases. The composite material includes a high surface area alumina carrier, a platinum component that functions as the catalyst, and an alkaline earth metal component that acts as the absorber.

First, EmeraChem argues that Hoekstra does not teach a composite material with a continuous layer of oxidation catalyst. That argument, however, is irrelevant because the '558 patent claims do not require *the catalyst* to form a continuous monolayer. Instead, the claims only require the *absorber* to entirely coat the catalyst.

Second, EmeraChem contends that the absorber in Hoekstra does not form a continuous layer over the catalyst. Hoekstra, however, provides a process for creating a composite material that prevents leaching of the catalyst. The Board concluded, based on Volkswagen's expert testimony, that the absorber must completely cover the catalyst to prevent the catalyst from leaching. For example, Volkswagen's expert testified that "[b]ecause the platinum group metal component does not leach from the carrier, the alkaline earth metal compound will be coated over the [catalyst]." J.A. 605. The Board also noted that Hoekstra teaches a process that "obviates leaching of the

platinum group metal component from the carrier material.” J.A. 38 (emphasis omitted). Accordingly, the record supports the Board’s conclusion that Hoekstra discloses a continuous layer of absorber on the platinum catalyst.

Third, EmeraChem asserts that Hoekstra does not disclose an absorber selected from hydroxides, carbonates, and bicarbonates of alkali metals and alkaline earth metals, as the ’558 patent claims require. According to EmeraChem, Hoekstra discloses barium oxide, which only converts to barium carbonate in the presence of carbon dioxide. We find this argument unpersuasive. Hoekstra discloses barium oxide that is exposed to air. And as Volkswagen’s expert testified, it is reasonable to conclude that “air” typically contains carbon dioxide. Aside from its disclosure of barium oxide, Hoekstra also teaches a composite material with an outer coating of “barium hydroxide, calcium hydroxide or strontium hydroxide covering the platinum group metal.” J.A. 28 (emphasis omitted). Each of these materials fall within the category of absorbers recited in the ’558 patent claims. Because the Board’s decision is supported by substantial evidence, we affirm the Board’s findings of anticipation based on Hoekstra.

Next, we turn to the Board’s finding of anticipation based on Inui, which discloses a catalyst for removing nitrogen oxide from an exhaust system. Inui teaches a method for covering a support structure with platinum catalyst. The platinum covered structure is immersed in a solution with nitrate, carbonate, or other materials, which acts as the absorber.

EmeraChem asserts “there is no evidence that the method of Inui results in all platinum being entirely covered.” Appellant Br. at 37. We disagree. Volkswagen’s expert testified that Inui discloses an embodiment with “a coating of potassium carbonate *completely covering* the [platinum].” J.A. 610 (emphasis added). Volkswagen’s

expert testimony is further supported by Inui's disclosure, which provides an exemplary embodiment in which the catalyst is coated with potassium carbonate. Accordingly, there is substantial evidence to support the Board's decision.

Additionally, EmeraChem argues that Inui does not anticipate the '558 patent claims because Inui discloses a platinum component that acts as a reduction catalyst, not as an oxidation catalyst. According to EmeraChem, platinum only acts as an oxidation catalyst "[i]f placed in a reaction mixture comprising oxygen . . .," which allows the platinum to "react[] with oxygen to form a monolayer of platinum oxide." Appellant Br. at 54. This argument rests on a flawed premise. Because the claims at issue recite a composition of matter, they are anticipated if the composition was known in the prior art, regardless of what environment the compositions were used in. *In re Spada*, 911 F.2d 705, 708 (Fed. Cir. 1990). Ultimately, the Board found that "Inui describes a composition comprising three ingredients arranged in the same manner" as claimed in the '558 Patent. J.A. 60. Therefore, the Board's conclusions with respect to Inui are supported by substantial evidence.<sup>2</sup>

Finally, the Board also found that Stiles anticipates the '558 patent claims. Stiles discloses catalysts that can be "impregnated onto and into a support such as alumina" or other materials. J.A. 783. EmeraChem again asserts that Stiles does not provide a continuous layer of oxidation catalyst or absorber. However, Stiles expressly discloses embodiments in which the absorber "completely coats" the catalyst. For example, Stiles explains that

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<sup>2</sup> To the extent EmeraChem contends the claim term "oxidation catalyst specie" is limited to the oxide form of the recited elements, it is a claim construction argument that EmeraChem did not raise on appeal.

“[t]he 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.” J.A. 780 (emphasis added). Accordingly, the Board’s findings of anticipation with respect to Stiles are supported by substantial evidence.

Because the Board’s findings of anticipation are supported by substantial evidence, we affirm the Board’s decision.

**AFFIRMED**