The opinion in support of the decision being entered today was ***not*** written for publication and is ***not*** binding precedent of the Board.

Paper No. 13

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE BOARD OF PATENT APPEALS
AND INTERFERENCES

Ex parte WILLARD A. CUTLER,
J. PAUL DAY, SHAHID G. LAKHWANI
and STEVEN B. OGUNWUMI

Appeal No. 2004-2294
Application 10/002,343

ON BRIEF

Before WARREN, DELMENDO and PAWLIKOWSKI, *Administrative Patent Judges*.

WARREN, *Administrative Patent Judge*.

Decision on Appeal

This is an appeal under 35 U.S.C. § 134 from the decision of the examiner finally rejecting claims 1 through 4 and 8 through 21. Also of record are claims 22 and 23, which are withdrawn from consideration by the examiner under 37 CFR § 1.142(b), and claims 24 through 26, which stand allowed.

Claims 1 and 3[1] illustrate appellants' invention of a catalyst for purification of exhaust gases, and are representative of the claims on appeal:

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[1] We copy appealed claim 3 as it stands of record in the amendment of December 17, 2002 (Paper No. 5; page 1).

1. A catalyst for purification of exhaust gases in oxygen-rich atmospheres in which oxygen concentrations of the exhaust gases are at the stoichiometric point or more required for oxidizing components to oxidized therein, consisting essentially of:

(1) a catalysis-promoting coating comprising a noble metal catalyst and a NOx storage component loaded onto a carrier material, wherein the NOx storage component comprises an alkali metal and,

(2) a ceramic substrate for supporting the catalysis-promoting coating, wherein the ceramic substrate exhibits resistance to alkali metal migration below 1000°C, and a coefficient of thermal expansion of less than about $25x10^{-7}$/°C (25-800°C).

3. The catalyst according to claim 2 wherein the substrate comprises a material selected from the group consisting of calcium aluminate, magnesium dititanate, iron titanate, zirconium titanate, and mixtures and solid solutions thereof.

The references relied on by the examiner are:

Nishino et al. (Nishino)	4,350,613	Sep. 21, 1982
Mitsui et al. (Mitsui)	5,082,820	Jan. 21, 1992
Miyoshi et al. (Miyoshi)	5,948,376	Sep. 7, 1999

The examiner has rejected appealed claims 1 through 3 and 8 through 20 under 35 U.S.C. § 103(a) as being unpatentable over Miyoshi in view of Mitsui (answer, pages 4-6), and appealed claims 1 through 4 and 8 through 21 under 35 U.S.C. § 103(a) as being unpatentable over Miyoshi in view of Nishino (answer, pages 7-9;).

Appellants group the appealed claims as claims 1 and 8 through 20 and claims 2 through 4 and 21 (brief, page 4). Thus, we decide this appeal based on appealed claims 1 and 3 as representative of the grouping of claims and the two grounds of rejection. 37 CFR § 1.192(c)(7) (2003); *see also* 37 CFR § 41.37(c)(1)(vii) (effective September 13, 2004; 69 Fed. Reg. 49960 (August 12, 2004); 1286 Off. Gaz. Pat. Office 21 (September 7, 2004)).

We affirm.

Rather than reiterate the respective positions advanced by the examiner and appellants, we refer to the answer and to the brief for a complete exposition thereof.

Opinion

We have carefully reviewed the record on this appeal and based thereon find ourselves in agreement with the supported position advanced by the examiner that, *prima facie*, the claimed catalysts encompassed by appealed claims 1 and 3 would have been obvious over the combined

teachings of Miyoshi and Mitsui and of Miyoshi and Nishino to one of ordinary skill in this art at the time the claimed invention was made.

Accordingly, since a *prima facie* case of obviousness has been established by the examiner, we have again evaluated all of the evidence of obviousness and nonobviousness based on the record as a whole, giving due consideration to the weight of appellants' arguments in the brief. *See generally, In re Johnson*, 747 F.2d 1456, 1460, 223 USPQ 1260, 1263 (Fed. Cir. 1984); *In re Piasecki*, 745 F.2d 1468, 1472, 223 USPQ 785, 788 (Fed. Cir. 1984).

The principal issues in this appeal are whether it would have been obvious to one of ordinary skill in this art to modify the catalyst of Miyoshi by replacing the cordierite substrate thereof with the zirconium titanate ceramic substrate of Mitsui and/or the calcium aluminate ceramic substrate of Nishino, and if so whether either or both of the said ceramic substrates have the properties of resistance to alkali metal migration below 1000°C, and a coefficient of thermal expansion of less than about 25×10^{-7}/°C (25-800°C), which characterize the ceramic substrates of the claimed catalysts encompassed by appealed claims 1 and 3. Indeed, there is no dispute that the catalysts disclosed by Miyoshi satisfy all of the limitations of appealed claims 1 and 3 except for the ceramic substrate.

Appellants acknowledge that "Mitsui teaches that in . . . harsh [exhaust gas] environments carrier supports made of cordierite and coated with alumina suffer from corrosion by sulfur oxides, and carriers made of titanium oxide are not heat resistant," and thus teaches the use of a zirconium titanate ceramic support "which offers resists [sic] to sulfur oxide and has heat resistance" (brief, page 5). Appellants further acknowledge that "Nishino teaches that carriers made with calcium aluminate, titanium oxide . . . or alumina-coated cordierite do not have heat resistance and long life," and teaches "an improved catalyst carrier composed of a solid mass or core of calcium aluminate" with a layer of titanium oxide formed on the surface of the calcium aluminate (*id.*, page 7).

Appellants argue with respect to the combined teachings of Miyoshi and Mitsui (*id.*, page 5), and apparently would have similarly argued with respect to the combined teachings of Miyoshi and Nishino (*cf. id.*, page 7), that Miyoshi is not concerned with improving the NOx trap support substrate, or for otherwise modifying the support, and thus one of ordinary skill in this

art would not have replaced the cordierite support of Miyoshi with the zirconium titanate carrier of Mitsui.

Appellants further argue that "Nishino requires a combination of calcium aluminate and titanium oxide, whereas in the present invention, calcium aluminate has been found to meet the requirements of resistance to alkali metal migration in a NOx trap below 1000°C," and thus in teaching "a catalyst using calcium aluminate as a base material deteriorates and does not provide long life teaches away from the present claimed invention" (*id.*, page 7).

Thus, appellants submit that Miyoshi and either Mitsui or Nishino recognize that cordierite NOx trap supports react with alkali metal during use, and it is only appellants who have recognized the properties of alkali metal migration resistance and coefficient of thermal expansion specified in appealed claims 1 and 3. Accordingly, appellants contend that the examiner has used hindsight in combining the references to arrive at the claimed catalyst encompassed by appealed claims 1 and 3 (*id.*, pages 5-6 and 8).

Appellants further submit that neither Mitsui nor Nishino discloses the problem of alkali migration below 1000°C with a cordierite NOx adsorber support, and thus there is no certainty in the examiner's finding that this property is inherent in the ceramic carriers of these references. Appellants further argue that inherency is not permissible in an obviousness rejection, citing *Kloster Speedsteel AB v. Crucible, Inc.*, 793 F.2d 1565, 230 USPQ 81 (Fed. Cir. 1986) (*id.*, pages 8-9).

The examiner points to the disclosure of the disadvantages of cordierite carriers in both Mitsui and Nishino and submits that the advantages taught by each of these references for the respective ceramic carriers taught therein "provide the motivation to modify the Miyoshi structure to include" the respective ceramic carriers (answer, pages 10-11 and 13-14). The examiner further argues that while none of the references disclose the two properties of the ceramic carrier specified in appealed claim 1, the recognition of a new property does not distinguish the references (*id.*, pages 11-12 and 14-15). The examiner further points out that the teachings of the references are relied on to combine the references and not appellants' claimed invention (*id.*, pages 11-12 and 14-15).

With respect to the specified properties of the ceramic carrier in appealed claims 1 and 3, the examiner argues that the claimed and prior art compositions appear to be the same and the "claimed properties or functions are presumed to be inherent," thus shifting the burden to appellants to prove otherwise. The examiner points out that appellants have not presented any evidence distinguishing the claimed catalysts over the references, and that the claimed new function or property does not make the claimed catalysts again patentable (*id.*, pages 16-17). The examiner relies on *In re Spada*, 911 F.2d 705, 708-09, 15 USPQ2d 1655, 1657-58 (Fed. Cir. 1990), and *In re Best*, 562 F.2d 1252, 1255-56, 195 USPQ 430, 433-34 (CCPA 1977).

We find that both Mitsui (e.g., cols. 1-2) and Nishino (e.g., cols. 1-2) would have disclosed to one of ordinary skill in the art that the respective ceramic substrates would provide improved properties over cordierite substrates for catalysts used for exhaust gas treatments and thus, these references individually combined with Miyoshi would have suggested to one of ordinary skill in this art to modify the catalysts for exhaust gas treatments disclosed by Miyoshi by interchanging the cordierite substrate thereof with a ceramic substrate of each of Mitsui and Nishino in the reasonable expectation of obtaining a catalysts with a ceramic substrate that at least has the properties disclosed by Mitsui and Nishino. *See In re Dow Chem. Co.*, 837 F.2d 469, 473, 5 USPQ2d 1529, 1531 (Fed. Cir. 1988) ("The consistent criterion for determination of obviousness is whether the prior art would have suggested to one of ordinary skill in the art that [the claimed process] should be carried out and would have a reasonable likelihood of success viewed in light of the prior art. [Citations omitted] Both the suggestion and the expectation of success must be founded in the prior art, not in the applicant's disclosure."); *In re Keller*, 642 F.2d 413, 425, 208 USPQ 871, 881 (CCPA 1981)("The test for obviousness is not whether the features of a secondary reference may be bodily incorporated into the structure of the primary reference; nor is it that the claimed invention must be expressly suggested in any one or all of the references. Rather, the test is what the combined teachings of the references would have suggested to those of ordinary skill in the art.").

We further find that while the combined teachings of the applied references may not have expressly addressed the claimed properties of ceramic substrates, as appellants point out, the combination of references nonetheless would have reasonably suggested to one of ordinary skill

in this art to use such substrates in place of the cordierite substrate of Miyoshi. It is well settled that "the motivation in the prior art to combine [prior art] references does not have to be identical to that of the applicant to establish obviousness." *In re Kemps*, 97 F.3d 1427, 1429-30, 40 USPQ2d 1309, 1311 (Fed. Cir, 1996), citing *In re Dillon*, 919 F.2d 688, 693, 16 USPQ2d 1897, 1901 (Fed. Cir. 1990)(*in banc*); *see also In re Beattie*, 974 F.2d 1309, 1312, 24 USPQ2d 1040, 1042 (Fed. Cir. 1992).

We cannot agree with appellants' argument that Nishino teaches away from the claimed invention in disclosing that substrates of calcium aluminate must include titanium oxide to provide heat resistance. The difficulty that we have with this argument is that the claim language "a ceramic substrate" in appealed claim 1 does not exclude the ceramic substrate of Nishino if that ceramic substrate has the specified properties. Similarly, the language "the substrate comprises a material selected from the group consisting of . . . " in appealed claim 3 specifies that the ceramic substrate of this claim must have at least one of the four members of the Markush group that includes calcium aluminate, and through the use of the openended term "comprising," can include any other ingredient. *In re Baxter*, 656 F.2d 679, 686-87, 210 USPQ 795, 802-03 (CCPA 1981) ("As long as one of the monomers in the reaction is propylene, any other monomer may be present, because the term 'comprises' permits the *inclusion* of other steps, elements, or materials."). The additional ingredient(s) thus permitted by claim 3 opens the claim to include the ceramic substrate of Nishino if it satisfies the properties required by claim 1. Indeed, it is well settled that the language of a claim must be interpreted by giving the claim terms their broadest reasonable interpretation consistent with the written description provided in appellants' specification as it would be interpreted by one of ordinary skill in this art, without reading into the claim any limitation or particular embodiment which is disclosed in the specification. *See In re Morris*, 127 F.3d 1048, 1054-55, 44 USPQ2d 1023, 1027 (Fed. Cir. 1997); *In re Zletz*, 893 F.2d 319**,** 321-22, 13 USPQ2d 1320, 1322 (Fed. Cir. 1989); *In re Priest*, 582 F.2d 33, 37, 199 USPQ 11, 15 (CCPA 1978).

We also cannot agree with appellants that the absence of a disclosure of the specific properties specified for the ceramic substrate in appealed claims 1 and 3, in the references is a matter of inherency which cannot be considered where the ground of rejection involves

obviousness under § 103(a). It is apparent from the authority cited by the examiner above and we cite here, that where the examiner reasonably establishes that the claimed and prior art materials reasonably appears to be identical or substantially identical even though the prior art does not disclose a particular property claimed or asserted for the claimed product, the burden shifts to appellants to establish that the claimed material patentably distinguishes over the applied prior art, regardless of the statutory provision under which the rejection is made. *See generally, In re Spada*, 911 F.2d 705, 708-09, 15 USPQ2d 1655, 1657-58 (Fed. Cir. 1990) ("The Board held that the compositions claimed by Spada 'appear to be identical' to those described by Smith. While Spada criticizes the usage of the word 'appear', we think that it was reasonable for the PTO to infer that the polymerization by both Smith and Spada of identical monomers, employing the same or similar polymerization techniques, would produce polymers having the identical composition."). *In re Best*, 562 F.2d 1252, 1254-56, 195 USPQ 430, 432-34 1254-55, 195 USPQ 430, 432-33 (CCPA 1977)("Where, as here, 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. See *In re Ludtke*, [441 F.2d 660, 169 USPQ 563 (CCPA 1971)]. Whether the rejection is based on "inherency" under 35 USC 102, on "prima facie obviousness" under 35 USC 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. [Footnote and citation omitted.]"); *In re Skoner*, 517 F.2d 947, 950-51, 186 USPQ 80, 82-83 (CCPA 1975) ("Appellants have chosen to describe their invention in terms of certain physical characteristics . . . . Merely choosing to describe their invention in this manner does not render patentable their method which is clearly obvious in view of [the reference]. [Citation omitted.]").

Here, we find no evidence in the record, and none is relied on in the brief, establishing that the claimed catalysts containing the specified ceramic carriers patentably distinguishes over the applied prior art including the ceramic carriers disclosed by each of Mitsui and Nishino. Thus, on this record, the specified properties of the claimed ceramic substrates appear to be the mere discovery of a new property of the ceramic substrates of Mitsui and Nishino which, without

more, is not dispositive of the nonobviousness of the claimed catalysts over the applied combinations of references. *See, e.g., Spada*, 911 F.2d at 708, 15 USPQ2d at 1657; *Titanium Metals Corp. v. Banner*, 778 F.2d 775, 782-83, 227 USPQ 773, 779 (Fed. Cir. 1985).

Accordingly, based on our consideration of the totality of the record before us, we have weighed the evidence of obviousness found in the combined teachings of Miyoshi and Mitsui and of Miyoshi and Nishino with appellants' countervailing evidence of and argument for nonobviousness and conclude that the claimed invention encompassed by appealed claims 1 through 4 and 8 through 21 would have been obvious as a matter of law under 35 U.S.C. § 103(a).

The examiner's decision is affirmed.

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 September 13, 2004; 69 Fed. Reg. 49960 (August 12, 2004); 1286 Off. Gaz. Pat. Office 21 (September 7, 2004)).

AFFIRMED

CHARLES F. WARREN Administrative Patent Judge	)	
ROMULO H. DELMENDO Administrative Patent Judge	)	BOARD OF PATENT APPEALS AND INTERFERENCES
BEVERLY A. PAWLIKOWSKI Administrative Patent Judge	)	

Corning Incorporated
SP-TI-3-1
Corning, NY 14831