

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

UNITED STATES PATENT AND TRADEMARK OFFICE

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BEFORE THE BOARD OF PATENT APPEALS  
AND INTERFERENCES

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*Ex parte CAN ERKEY and HIROAKI S. HARA*

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Appeal 2007-1375  
Application 10/327,300  
Technology Center 1700

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Decided: May 11, 2007

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Before BRADLEY R. GARRIS, CHARLES F. WARREN, and  
THOMAS A. WALTZ, *Administrative Patent Judges*.

WALTZ, *Administrative Patent Judge*.

DECISION ON APPEAL

This is a decision on an appeal under 35 U.S.C. § 134 from the Primary Examiner's final rejection of claims 33 and 34, which are the only claims pending in this application (see the Amendment accompanying the Reply Brief dated Sep. 28, 2006, entered as per the Communication from the Examiner dated Nov. 24, 2006). We have jurisdiction pursuant to 35 U.S.C. § 6.

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According to Appellants, the invention is directed to an aerogel having a specified pore volume, with metallic particles such as platinum dispersed on a surface of the aerogel in an amount of at least 10 wt.% with an average particle size of about 2.5 nanometers or less (Supp. Reply Br. 2).<sup>1</sup> The claims on appeal are reproduced below:

33. A composition comprising an aerogel having a pore volume of at least 0.5 cm<sup>3</sup>/g, as determined using a nitrogen adsorption/desorption technique or equivalent, and metallic particles dispersed on a surface of said aerogel such that said composition comprises at least 10 wt. % of metallic particles based on the total weight of the composition, wherein said metallic particles include platinum and wherein said metallic particles having an average particle diameter of about 2.5 nanometers or less.

34. The composition of claim 33, wherein said aerogel is a carbon aerogel.

The Examiner has relied on the following references as evidence of unpatentability:

Hammerschmidt US 6,010,798 Jan. 4, 2000

Siyu Ye et al. (hereafter Ye), "A new electrocatalyst consisting of a molecularly homogeneous platinum-aerogel nanocomposite," 75 Can. J. Chem., 1666-1673 (1997)

Maldonado-Hódar et al. (hereafter Maldonado), "Synthesis and textural characteristics of organic aerogels, transition-metal-containing organic aerogels and their carbonized derivatives," 37 Carbon 1199-1205 (1999)

<sup>1</sup> We note that two Supplemental Reply Briefs have been submitted by Appellants, dated Nov. 9, 2006 and Nov. 13, 2006, respectively. These Supplemental Reply Briefs appear to be duplicates. We will refer to and cite from the Supplemental Reply Brief dated Nov. 9, 2006.

## ISSUES ON APPEAL

Claims 33-34 stand rejected under 35 U.S.C. § 102(b) as anticipated by or, in the alternative, under 35 U.S.C. § 103(a) as unpatentable over Ye in view of Maldonado and Hammerschmidt (Answer 5).<sup>2</sup>

Appellants contend that Ye does not expressly or inherently disclose the claimed weight % of metallic particles or the pore volume (Br. 8; Reply Br. 3).

Appellants contend that the claimed “at least about 10 wt.%” does not read on Ye’s disclosed 5 wt.%, and there is no basis in fact or technical reasoning to support the Examiner’s “inherency” assertion regarding the pore volume (Reply Br. 4-6).

Appellants contend that there is no suggestion or motivation to combine Ye and Maldonado since they are directed to completely different chemistries, and, even if properly combined, these references fail to disclose or suggest all the claim limitations (Br. 11-12; Reply Br. 7-8).

The Examiner contends that Ye discloses mean particle sizes of 2.7 nm, which reads on “about 2.5 nm” as claimed, and the disclosure of 5 wt.% of platinum particles reads on the claim limitation of “at least about 10 wt.%” (Answer 10). The Examiner also contends that the pore volume

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<sup>2</sup> Although not explicitly stated by the Examiner, it implicitly appears that this rejection is actually two rejections, the first rejection being based on § 102(b) over Ye alone, where the second rejection is based on § 103(a) over Ye in view of Maldonado and Hammerschmidt. See the Brief, page 3; the Reply Brief, page 2; and the Answer, pages 10-12. Accordingly, we will consider this rejection as argued by both Appellants and the Examiner.

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limitation of the claims on appeal would have been “inherent” to the Ye materials since the claimed pore volume is “a property of conventionally known aerogel materials” (*id.*).

The Examiner contends that Ye and Maldonado “are combinable because they teach Pt containing aerogels” (Answer 5) and each reference teaches carbon aerogels containing platinum particles formed by a gel stage (Answer, paragraph bridging pages 11-12).

Accordingly, the issues presented on the record in this appeal are as follows: (1) does Ye disclose, either expressly or inherently, the limitations of claim 33 on appeal, namely the particle size range, the pore volume range, and the range of weight of metallic particles?; (2) is there a sufficient suggestion or technical reasoning for the references to be combined as proposed by the Examiner?; and (3) if properly combined, do the references disclose or suggest all the claim limitations?

We determine that the Examiner has failed to establish a *prima facie* case of anticipation over Ye, and failed to establish a *prima facie* case of obviousness over Ye, Maldonado, and Hammerschmidt.<sup>3</sup> Therefore, we REVERSE all grounds of rejection present in this appeal essentially for the reasons stated in the Brief and Reply Brief, as well as those reasons set forth below.

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<sup>3</sup> Since Hammerschmidt was only applied by the Examiner against claim 15 (Answer 5-6), which now has been cancelled, we need not discuss this reference (Reply Br. 7).

## OPINION

We determine the following factual findings from the record in this appeal:

- (1) Ye discloses a platinum-aerogel nanocomposite in which the platinum nanoparticles are uniformly incorporated as part of the molecular architecture of the composite, prepared by mixing a platinum salt or an organometallic compound with polyacrylonitrile to form a polymer gel, reducing the salt, exchanging the remaining solvent with acetone or ethanol, removing the latter solvent with carbon dioxide supercritical extraction, followed by pyrolysis (Ye 1667, Abstract and left column);
- (2) Ye discloses that in a typical experiment 5 wt.% of platinum is used to prepare the aerogel composite (Ye 1667, right column), and the surface mean particle size of the platinum particles can be “estimated” to be 2.7 nanometers (nm) (Ye 1669, left column; see Figure 3; Answer 5);
- (3) Maldonado discloses the preparation of transition-metal-containing aerogels and their carbonized derivatives, where the transition metal may be platinum, and the aerogels are RF aerogels, i.e., made by polycondensation of resorcinol with formaldehyde in aqueous solution to form gels that can be

supercritically dried with carbon dioxide to form organic aerogels (Maldonado 1199); and

- (4) Maldonado discloses that a very small amount of platinum particles (“around 0.5%”) present in the aerogel matrix produces a large increase in the pore volume (Maldonado 1203; see Table 5; 1204, right column).

Under § 102(b), anticipation requires that the prior art reference disclose, either expressly or inherently, every limitation of the claim. *See In re King*, 801 F.2d 1324, 1326, 231 USPQ 136, 138 (Fed. Cir. 1986). The Examiner, if relying upon the theory of inherency, must provide a basis in fact and/or technical reasoning to reasonably support a determination that the allegedly inherent characteristic necessarily flows from the teachings of the prior art. *See In re Robertson*, 169 F.3d 743, 745, 49 USPQ2d 1949, 1950-51 (Fed. Cir. 1999); and *In re Oelrich*, 666 F.2d 578, 581-82, 212 USPQ 323, 326 (CCPA 1981). The meaning of the word “about” is dependent on the facts of the case, the nature of the invention, and the knowledge imparted by the totality of the earlier disclosure to those skilled in the art. *See Eiselstein v. Frank*, 52 F.3d 1035, 1040, 34 USPQ2d 1467, 1471 (Fed. Cir. 1995). When relying on numerous references, it is incumbent upon the Examiner to identify a sufficient reason or detailed analysis of why the references should be combined. *See In re Mayne*, 104 F.3d 1339, 1342, 41 USPQ2d 1451, 1454 (Fed. Cir. 1997).

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Applying the preceding legal principles to the factual findings in the record of this appeal, we determine that the Examiner has failed to establish a *prima facie* case of anticipation or obviousness in view of the reference evidence. Therefore we need not address Appellants' evidence of unobviousness, i.e., the Dong Declaration (Br. 8-9, 11-12; Reply Br. 6). *See In re Geiger*, 815 F.2d 686, 688, 2 USPQ2d 1276, 1278 (Fed. Cir. 1987).

As shown by factual finding (2) listed above, Ye discloses a mean particle size of 2.7 nm which is reasonably within the scope of "about 2.5 nanometers or less" as required by claim 33 on appeal (Answer 10).<sup>4</sup> However, the Examiner has simply provided no reasonable basis for interpreting the phrase "at least 10 wt.%" to read on the value of 5 wt.% disclosed by Ye (*id.*). Contrary to the Examiner's claim interpretation, claim 33 does not require an amount of "at least *about* 10%" (*id.*, italics added). Furthermore, we determine that the Examiner has not provided any facts and/or technical reasons to support the assertion that the pore volume recited in claim 33 on appeal would have been "inherent" to the aerogel of Ye (*id.*). Making an assertion that the pore volume "is a property of conventionally known aerogel materials" without any evidence or reasoning does not meet the initial burden of the Examiner (*id.*).

For the foregoing reasons and those stated in the Brief and Reply Brief, we reverse the Examiner's rejection based on § 102(b) over Ye.

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<sup>4</sup> Appellants do not dispute this claim interpretation by the Examiner (see the Brief and Reply Brief in their entirety).

As shown by factual findings (1) and (3) listed above, Ye and Maldonado are directed to carbon aerogels containing platinum, but these aerogels are prepared by totally different methods. We determine that the Examiner has not provided a sufficient reason or explicit analysis of why the disclosures of the references should be combined.<sup>5</sup> Merely stating that both references “teach Pt containing aerogels” is not a sufficient reason for modifying the aerogel of Ye to have the pore volume taught by Maldonado (Answer 5). Contrary to the Examiner’s assertion on pages 11-12 of the Answer, the processes of preparation for each reference are vastly different.

As shown by factual finding (4) listed above, Maldonado teaches the use of a very small amount of platinum (“around 0.5 %”). Thus, we determine that Maldonado does not cure the deficiency of Ye as discussed above, and would not have led one of ordinary skill in this art to higher levels of platinum particles incorporated in the aerogel of Ye.

Finally, we note that the Examiner has not identified where the basis occurs in Maldonado for the factual finding that this reference teaches aerogels containing platinum with a pore volume greater than 0.5 cm<sup>3</sup>/g (Answer 5). We determine that Maldonado discloses the properties of many types of aerogels, and the Examiner has not established the specific carbonized aerogels containing platinum that have been treated with supercritical carbon dioxide, similarly to those of Ye, have pore volumes within the claimed range (see Table 5 on page 1203 of Maldonado).

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<sup>5</sup> See *KSR Int'l Co. v. Teleflex, Inc.*, 550 U.S. \_\_, 82 USPQ2d 1385, 1396 (2007).

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For the foregoing reasons and those stated in the Brief and Reply Brief, we reverse the Examiner's rejection based on § 103(a) over Ye in view of Maldonado and Hammerschmidt.

The decision of the Examiner is reversed.

REVERSED

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