

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. 37

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE BOARD OF PATENT APPEALS
AND INTERFERENCES

Ex parte FUMIKAZU MACHINO, TSUYOSHI HIGO, TOSHINOBU KATAOKA,
RYOICHI ONOUE, TOSHIO DATE and TOMINORI SATO

Appeal No. 2004-0052
Application No. 09/180,432

ON BRIEF

Before WALTZ, DELMENDO, and JEFFREY T. SMITH, Administrative Patent Judges.

WALTZ, Administrative Patent Judge.

DECISION ON APPEAL

This is a decision on an appeal from the primary examiner's final rejection of claims 1 through 12 and 15 through 43, which are the only claims pending in this application. Claims 11, 12 and 43 were indicated as allowed by the examiner in the Answer (page 2). Therefore the claims on appeal are claims 1 through 10 and 15 through 42. We have jurisdiction pursuant to 35 U.S.C. § 134.

According to appellants, the invention is directed to a thermal acoustic insulation material comprising a multiplicity of

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anisotropic pitch-based carbon fibers having a specified average fiber length and diameter, being bonded by a thermosetting resin so as to form a carbon fiber aggregate which is non-galvanic corrosive with a specified bulk density, as well as methods for the preparation of this insulation material (Brief, pages 2-5).

Appellants state that the claims stand or fall together in three groups (Brief, page 6). Appellants' third group (claims 11, 12 and 43) is moot since the examiner has indicated that these claims are allowed (Answer, page 2). Appellants have presented reasonably specific, substantive arguments for the separate patentability of claims 1 and 10 (e.g., Brief, page 14). Therefore we select claims 1 and 10 from appellants' two groups and decide the ground of rejection based on consideration of these two claims alone. See 37 CFR § 1.192(c)(7)(2000). Illustrative independent claim 1 is reproduced below:

1. A thermal acoustic insulation material comprising:

a multiplicity of anisotropic pitch-based carbon fibers having an average fiber diameter of not less than 0.5 μm but less than 2 μm and an average fiber length of 1 mm to 15 mm, said carbon fibers being non-galvanic corrosive and being bonded by a thermosetting resin at contact points of said carbon fibers so as to form a carbon fiber aggregate having a bulk density of from 3 kg/m^3 to 10 kg/m^3 ;

wherein said thermal-acoustic insulation material is non-galvanic corrosive.

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The examiner relies upon the following references as evidence of obviousness:

Otani et al. (Otani)	4,504,455	Mar. 12, 1985
McCullough, Jr. et al. (McCullough)	4,997,716	Mar. 05, 1991

Claims 1-10 and 15-42¹ stand rejected under 35 U.S.C. § 103(a) as unpatentable over McCullough in view of Otani (Answer, page 3).² We *affirm* the examiner's rejection essentially for the reasons stated in the Answer and those reasons set forth below.

OPINION

The examiner finds that McCullough discloses a fire retarding and fire shielding structural panel for a vehicle comprising a

¹We note that this rejection in the final Office action (Paper No. 24) was applied to claims 1-9, 11-41 and 43 (page 3). Appellants were aware of the addition of claims 10 and 42 to this rejection in the Answer (see the Reply Brief, pages 2, 3 and 8). However, appellants did not petition the examiner's decision to include claims 10 and 42 to this rejection (see 37 CFR § 1.181). Furthermore, appellants specifically discuss the section 103(a) rejection over McCullough in view of Otani with regard to claims 10 and 42 (Brief, page 9). Accordingly, we determine that appellants have had the opportunity to respond to the examiner's rejection of claims 10 and 42 under section 103(a) and we consider these claims in the rejection under appeal.

²The rejections of claims 1-12 and 15-43 under 35 U.S.C. § 112, ¶1, and claims 10 and 42 under 35 U.S.C. § 112, ¶2, in the final Office action (Paper No. 24) have been withdrawn by the examiner (Answer, page 2).

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composite of a thermosetting resin matrix and a multiplicity of non-flammable carbonaceous fibers, with these fibers having a length of 0.5 to 20 mm and a diameter of 2 to 25 microns, and a bulk density of the batting ranging from 6.4 to 96 kg per cubic meter (Answer, page 3). The examiner also finds that McCullough teaches that these carbonaceous fibers are prepared by carbonizing the fibers at a temperature of 600 to 700 °C. (*id.*). The examiner recognizes that McCullough does not specifically teach the use of anisotropic pitch-based carbon fibers nor the specific method of preparing these fibers (Answer, page 4). Therefore the examiner applies Otani for the teaching that anisotropic pitch-based carbon fibers have superior strength and modulus, as well as the disclosure of how to prepare these carbon fibers (*id.*). From these findings, the examiner concludes that it would have been obvious to one of ordinary skill in this art at the time of appellants' invention to have used anisotropic pitch-based carbon fibers as taught by Otani as the carbon fibers in the composite of McCullough to form a fire resistant panel with increased strength and modulus (*id.*). We agree.

Appellants note that all pending claims require fibers having an average fiber diameter of less than 2 microns while McCullough teaches a fiber diameter of 2 to 25 microns (Brief, page 10). Thus

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appellants argue that there is no overlap in the fiber diameter ranges of the claims and McCullough,³ and the preferred range of McCullough (4 to 12 microns) clearly argues against a suggestion in the reference to use fibers less than 2 microns (*id.*).

Appellants' arguments are not well taken for the following reasons. When the claimed range and the prior art range are very similar (i.e., less than 2 microns and 2 microns), the range of the prior art establishes *prima facie* obviousness because one of ordinary skill in the art would have expected the similar ranges to have the same properties. See *In re Peterson*, 315 F.3d 1325, 1329-30, 65 USPQ2d 1379, 1382 (Fed. Cir. 2003), citing *Titanium Metals Corp. v. Banner*, 778 F.2d 775, 783, 227 USPQ 773, 779 (Fed. Cir. 1985). Furthermore, the disclosure by McCullough of a preferred embodiment does not teach away from the entire disclosure of the patent, all of which must be considered in the analysis of obviousness. See *In re Burckel*, 592 F.2d 1175, 1179, 201 USPQ 67, 70 (CCPA 1979).

³Appellants and the examiner make no distinction between "average fiber diameter" as recited in the claims on appeal and "fiber diameter" as disclosed and taught by the prior art (see the Brief, Reply Brief, and Answer in their entirety). Accordingly, for purposes of this appeal, we assume there is no difference or no substantial difference between these two terms.

Appellants argue that there is no indication in McCullough that there is a need for increased strength, which was given by the examiner as the motivation for combining McCullough and Otani (Brief, page 13). Appellants also argue that there is no teaching in either reference to indicate that such a substitution would result in increased strength in the panel member of McCullough (*id.*).

Appellants' arguments are not well taken since McCullough specifically discloses the desire for anisotropic character of both fibers and the binder phase to achieve improved strength, with the fiber contributing the major portion of this strength (col. 1, ll. 32-36). In view of the similar teachings in Otani that pitches of anisotropic nature used as precursors for carbon fibers have a strength and modulus much higher than isotropic pitch-based carbon fibers (col. 1, ll. 19-28), we determine that one of ordinary skill in this art would have been motivated to use anisotropic pitch-based carbon fibers in the composite of McCullough. As taught by McCullough, the fiber contributes the major portion of the strength of the composite (col. 1, ll. 35-36), and thus substitution of the higher strength anisotropic pitch-based carbon fiber of Otani in the composite of McCullough would have been expected to increase the strength of the composite.

The examiner has found that the bulk density taught by McCullough overlaps the bulk density range recited in claim 10 on appeal (Answer, page 5). Appellants agree with the examiner that claim 10 requires a bulk density of 3 to 10 kg/cubic meter while McCullough discloses a range of bulk densities of 6.4 to 96 kg/cubic meter, but argues that this is "only slight overlap" (Brief, page 14).⁴ This argument is not well taken since it is well settled that even a slight overlap in ranges establishes *prima facie* obviousness. See *In re Peterson, supra*.

Appellants argue that the claimed properties are not "inherent" upon the combination of McCullough and Otani (Reply Brief, pages 4-5). This argument is not persuasive since the examiner has applied references which establish the *prima facie* obviousness of the limitations in claim 1 on appeal regarding fiber diameter, fiber length, bulk density, and the use of anisotropic pitch-based carbon fibers, as well as establishing that the prior art method of preparation of the carbon fibers is the same as

⁴Since appellants have not challenged the examiner's finding regarding the "bulk density" taught by McCullough, we accept this as a fact. See *In re Kunzmann*, 326 F.2d 424, 425 n.3, 140 USPQ 235, 236 n.3 (CCPA 1964). We note that the bulk densities taught by McCullough in Example 1 relate to the "batting," not the carbon fibers in a thermosetting resin matrix (see col. 2, ll. 3-6; and col. 5, ll. 53-62).

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appellants' method of preparation (Answer, pages 3-4).

Accordingly, it would have been reasonable to one of ordinary skill in this art that the only remaining claim limitation found in claim 1 on appeal ("non-galvanic corrosive") would have been present in the carbon fibers and composite of McCullough and Otani. See *In re Best*, 562 F.2d 1252, 1255, 195 USPQ 430, 433 (CCPA 1977).

For the foregoing reasons and those stated in the Answer, we determine that the examiner has established a *prima facie* case of obviousness in view of the reference evidence. Based on the totality of the record, including due consideration of appellants' arguments, we determine that the preponderance of evidence weighs most heavily in favor of obviousness within the meaning of section 103(a). Accordingly, we affirm the examiner's rejection of claims 1-10 and 15-42 under 35 U.S.C. § 103(a) over McCullough in view of Otani.

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No time period for taking any subsequent action in connection with this appeal may be extended under 37 CFR § 1.136(a).

AFFIRMED

THOMAS A. WALTZ)	
Administrative Patent Judge)	
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)	BOARD OF PATENT
ROMULO H. DELMENDO)	APPEALS
Administrative Patent Judge)	AND
)	INTERFERENCES
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JEFFREY T. SMITH)	
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