

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

3M COMPANY,
Petitioner,

v.

BAY MATERIALS, LLC,
Patent Owner.

IPR2022-01215
Patent 10,870,263 B2

Before GRACE KARAFFA OBERMANN, CHRISTOPHER L. CRUMBLEY,
and KRISTINA M. KALAN, *Administrative Patent Judges*.

OBERMANN, *Administrative Patent Judge*.

DECISION
Granting Institution of *Inter Partes* Review
35 U.S.C. § 314

I. INTRODUCTION

3M Company (“Petitioner”) filed a Petition (Paper 2, “Pet.”) for *inter partes* review of claims 1–4, 7, 11–14, 18, and 31 of U.S. Patent No. 10,870,263 B2 (Ex. 1001, “the ’263 patent”). Bay Materials, LLC (“Patent Owner”) filed a Preliminary Response. Paper 6 (“Prelim. Resp.”). With Board pre-authorization, Petitioner filed a Reply (Paper 11) and Patent Owner filed a Sur-reply (Paper 13) limited to addressing an alleged “unanticipated claim construction dispute raised” in the Preliminary Response as well as certain “priority arguments.” Ex. 1036, 1–2.

Except as noted in Section III.D, *infra* 8–12, the information presented in the Petition, Preliminary Response, Reply, and Sur-reply forms the basis for our preliminary findings and conclusions of law, which are provided for the sole purpose of explaining our reasons for instituting an *inter partes* review. Any final determinations shall be based on the full trial record.

A. Real Parties-in-Interest and Related Matters

Petitioner asserts 3M Company is the real party-in-interest for Petitioner. Pet. 2. Patent Owner asserts the real party-in-interest is Bay Materials, LLC, a wholly-owned subsidiary of Straumann Manufacturing, Inc. Paper 4, 1. Both parties identify as a related matter co-pending district court litigation in *Bay Materials LLC v. 3M Company*, No. 1:21-cv-1610-RGA (D. Del.) (“the District Court action”). Pet. 2; Paper 4, 1.

Both parties discuss IPR2022-01214 in their identification of related matters. Pet. 3; Paper 4, 1–2. Concurrently herewith, we enter a decision instituting an *inter partes* review in IPR2022-01214.

II. BACKGROUND

A. *The '263 Patent (Ex. 1001)*

The '263 patent, titled “Dual Shell Dental Appliance and Material Constructions,” relates to “[a] polymeric sheet composition” having “at least two outer layers” and “an elastomeric inner layer.” Ex. 1001, code (54) (Title), 25:2–4 (claim 1). A further limitation requires that “one or both of the outer layers” must “individually comprise a thermoplastic polymer having a flexural modulus of from about 1,000 MPa to 2,500 MPa.” *Id.* at 22:4–7. The term “flexural modulus” relates “to the rigidity of a material and/or resistance of the material to deformation in bending” or “stretching.” Ex. 1001, 6:54–56; 7:3–5. “The higher the flexural modulus of the material, the more resistant to bending it is.” *Id.* at 6:56–57.

In addition, each independent challenged claim requires, and each other challenged claim inherits by dependence, a limitation that requires “an elastomeric material having a hardness from about A 60 to D 85.” *Id.* at 25:7–9 (claim 1), 26:7–8 (claim 11), 31:49–51 (claim 31).

We reproduce below Figure 1A from the '263 patent, which illustrates a three-layer sheet composition of the claimed invention.

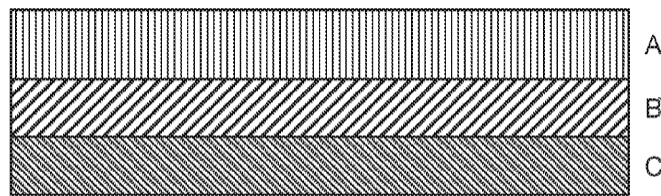
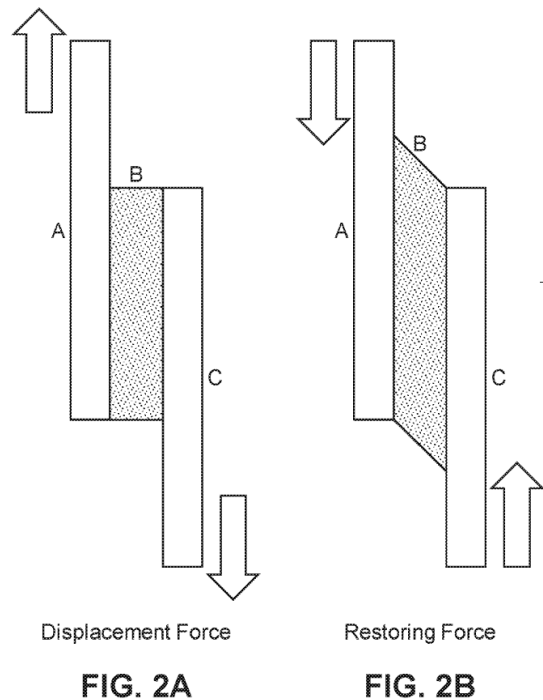


FIG. 1A

Figure 1A depicts “a cross sectional view of a three-layer sheet of the invention with a simple ABC construction.” *Id.* at 3:41–43. The two outer layers are labeled A and C, whereas an inner layer is labeled B.

The '263 patent illustrates “exemplary test samples for determining displacement” in Figure 2A, “and lateral restoring force” in Figure 2B. *Id.* at 3:56–58. We reproduce those figures below.



Figures 2A and 2B illustrate “a simple 3-layer sheet comprised of two rigid outer layers,” labeled A and C, “and an inner elastomeric layer,” labeled B. *Id.* at 3:59–61. “In this example, layers A and C are reversibly translated relative to each other and layer B provides a restoring force.” *Id.* at 3:61–63.

The '263 patent identifies “a need for improved orthodontic and dental appliances capable of facilitating orthodontic tooth movements, stabilizing tooth positions or protecting teeth from potentially damaging outside forces.” *Id.* at 1:28–30. For example, aligners are dental appliances fabricated as “plastic shells which fit over teeth” that are “designed to apply translational or rotational forces to teeth.” The ability of aligners “to accurately move teeth is limited by their effective modulus, elasticity and ability to resist creep and stress relaxation.” *Id.* at 1:35–38. In addition,

aligners “generally should be resistant to staining and environmental stress cracking.” *Id.* at 1:39–40. The ’263 patent discusses requirements for other dental appliances, including sports guards and dental splints. *Id.* at 1:41–46.

The ’263 patent indicates that the polymeric sheets of the invention “are useful, for example, in a dental appliance, and are constructed of layers that impart flexibility and strength and stain resistance.” *Id.* at 1:19–23.

B. Challenged Claims

The Petition challenges claims 1–4, 7, 11–14, 18, and 31, of which claims 1, 11, and 31 are independent. Claim 1, which we reproduce below, is representative of the subject matter of the claimed invention.

1. A polymeric sheet composition comprising:

at least two outer layers A and C and an elastomeric inner layer B, wherein one or both of the outer layers A and C individually comprise a thermoplastic polymer having a flexural modulus of from about 1,000 MPa to 2,500 MPa, and the inner layer B is comprised of *an elastomeric material having a hardness from about A60 to D85.*

Ex. 1001, 22:8–34 (Board’s emphasis). The other independent challenged claims specify the same hardness range for the elastomeric inner layers. *Id.* at 26:7–8 (claim 11), 31:49–51 (claim 31). We refer to that feature as the “hardness limitation.”

C. Asserted Grounds of Unpatentability

All of the grounds asserted in the Petition are based on anticipation under 35 U.S.C. § 102(a).¹ We provide below a chart that reproduces the asserted grounds as identified in the Petition.

¹ The Leahy-Smith America Invents Act (“AIA”), Pub. L. No. 112-29, 125

Ground	Claims Challenged	References
1	11–14, 16, 18	Yu ² (Example 1)
2	1–4, 7, 31	Yu ³ (Example 1)
3	1–4, 7, 31	Stewart ⁴ (Sample 2)

Pet. 3. The Petition is supported by the Declaration of Dr. Alan Jeffrey Giacomini. Ex. 1002.

III. ANALYSIS

A. Level of Ordinary Skill in the Art

The level of ordinary skill in the art at the time of the invention is a factual determination that provides a primary guarantee of objectivity in an obviousness analysis. *Al-Site Corp. v. VSI Int’l Inc.*, 174 F.3d 1308, 1324 (Fed. Cir. 1999) (citing *Graham v. John Deere Co.*, 383 U.S. 1, 17–18 (1966); *Ryko Mfg. Co. v. Nu-Star, Inc.*, 950 F.2d 714, 718 (Fed. Cir. 1991)).

The parties disagree about whether the ordinarily skilled artisan would have had specific “experience with dental appliances or access to individuals with such experience.” Prelim. Resp. 17; see Pet. 14–15 n.1 (disagreeing with that proposition). Neither party explains why a resolution of that

Stat. 284 (September 16, 2011), includes revisions to Section 102(a) that became effective on March 16, 2013. For reasons explained in this Decision, on this record it appears Petitioner is correct that the challenged claims are entitled to an effective filing date no earlier than December 18, 2019 and, therefore, the AIA provisions apply in this proceeding. See Pet. 22, 39–40; Ex. 1001, code (60).

² WO 20010/043419 A1, published Apr. 22, 2010, with English Translation (Ex. 1015).

³ We take notice that the first and second grounds identified in the Petition assert anticipation based on the same prior art disclosure.

⁴ US Pub. 2004/0224283 A1, published Nov. 11, 2004 (Ex. 1008).

dispute is necessary to this Decision to institute review. *See, e.g.*, Prelim. Resp. 17 n.2 (“even under Petitioner’s proposed definition, the Petition fails to show a reasonable likelihood that any claim is unpatentable”); Pet. 14–15 & n.1 (arguing about the issue without explaining how a resolution of the dispute would change the outcome of the decision on institution). If either party believes that the difference in level of skill would have a material effect on the analysis of the patentability of the challenged claims, that issue should be specifically addressed in briefing during the trial. We will resolve that dispute only to the extent necessary in any final written decision.

Based on the information presented, we find that the asserted prior art itself is sufficient to demonstrate the level of skill in the art at the time of the invention. *See Okajima v. Bourdeau*, 261 F.3d 1350, 1355 (Fed. Cir. 2001) (prior art itself can reflect the appropriate level of ordinary skill in the art).

B. Claim Construction

In an *inter partes* review, the Board construes the terms of a patent claim “in accordance with the ordinary and customary meaning of such claim as understood by one of ordinary skill in the art and the prosecution history pertaining to the patent.” 37 C.F.R. § 42.100(b). Under that standard, claim terms generally are given their plain and ordinary meaning as would have been understood by the ordinarily skilled artisan at the time of the invention and within the context of the entire patent disclosure. *See Phillips v. AWH Corp.*, 415 F.3d 1303, 1313 (Fed. Cir. 2005) (en banc).

We construe terms in controversy only to the extent necessary to resolve the controversy. *See Nidec Motor Corp. v. Zhongshan Broad Ocean Motor Co.*, 868 F.3d 1013, 1017 (Fed. Cir. 2017) (quoting *Vivid Techs., Inc. v. Am. Sci. & Eng’g, Inc.*, 200 F.3d 795, 803 (Fed. Cir. 1999)). “Petitioner

discusses the terms “layer A,” “layer B,” “layer C,” “layer C,” “layer B’,” “inner layer B,” “inner layer B’,” and “inner layer D.” Pet. 15–20. Patent Owner discusses the terms “layer” and “inner.” Prelim. Resp. 19–22.

Taking account of the information presented, we determine that no claim term requires express construction for purposes of deciding whether to institute review. *Compare* Pet. 15–20 (addressing issues of claim construction, without demonstrating that an express construction is necessary to resolve whether to institute review), *with* Prelim. Resp. 19–22 (same).

C. Effective Filing Date of the Challenged Claims

The central dispute, at this preliminary stage of the proceeding, is the effective filing date to which the challenged claims are entitled. *See generally* Prelim. Resp. (focusing exclusively on the effective filing date issue without otherwise opposing the merits of Petitioner’s patentability challenges). Based on the record presented, we preliminarily find the challenged claims are not entitled to the benefit of the filing date of U.S. Patent Application No. 16/211,176 (Ex. 2001, “the ’176 application”) because its disclosure does not support the hardness limitation. Any final determination will be based on the full trial record in a final written decision.

The ’263 patent issued from U.S. Patent Application No. 16/719,256 (“the ’256 application”), filed on December 18, 2019. Ex. 1001, codes (21), (22), (63). The ’256 application was a continuation-in-part of the ’176 application, filed on December 5, 2018. *Id.* The ’263 patent specification supports the hardness limitation by specifically disclosing that inner layers of the polymeric sheet compositions of the invention may have “a hardness

of from about A 60 to D 85.” *Id.* at 12:64–67. No corresponding language appears in the ’176 application. *See generally* Ex. 2001.

As Petitioner points out, the ’176 application mentions the specified hardness range only in the context of an unclaimed prior art embodiment. Pet. 39 (citing Ex. 1028 ¶ 109). Specifically, when describing the prior art, the ’176 application explains that a prior U.S. patent teaches the use of a soft layer “having a hardness of from about 60 A to about 85 D” in a *soft-hard-soft* layer configuration. Ex. 1028 ¶ 198. The claimed invention, by contrast, is directed to a soft layer in a *hard-soft-hard* configuration. Ex. 1001, 22:8–34, 26:7–8, 31:49–51 (independent challenged claims).

We take account of Patent Owner’s countervailing view that the ’176 application adequately describes the use of elastomeric materials that meet the hardness limitation. *See* Prelim. Resp. 37–41. The ’176 application refers to elastomeric materials “having a hardness of from about 60A to about 85D,” as Patent Owner contends, but only in the context of distinguishing the claimed invention from a prior art embodiment in which “a ‘hard polymer layer’” is “disposed between two soft polymer layers,” an unclaimed and disfavored soft-hard-soft layer configuration that results in “poor stain resistance” and “poor tear resistance.” Ex. 2001 ¶ 109.

That prior art disclosure of elastomeric materials for use as the *outer layers* in an unclaimed and disfavored *soft-hard-soft* layer configuration does not convey, with reasonable clarity, that the inventors had possession of the claimed subject matter, in which the elastomeric material forms the *inner layer* of a polymeric sheet in a *hard-soft-hard* layer configuration. *See id.* ¶¶ 7, 33–35, 109–110. Even if the hardness limitation of the challenged claims would have been obvious from the relied-upon disclosure of the ’176

application (Ex. 2001 ¶ 109), that circumstance is insufficient to establish written description support. “Entitlement to a filing date does not extend to subject matter which is not disclosed, but would be obvious over what is expressly disclosed.” *PowerOasis, Inc. v. T-Mobile USA, Inc.*, 522 F.3d 1299, 1306 (Fed. Cir. 2008) (quotations omitted); see Pet. 21 (quoting that precedent).

Accordingly, we agree with Petitioner that the invention that Patent Owner seeks to protect in the ’263 patent does not appear to be “part of the invention” described in the ’176 application. Pet. 40; see Ex. 2001 ¶ 109 (describing elastomeric materials, having the specified hardness, only in the context of an unclaimed prior art soft-hard-soft embodiment). On this record, we preliminarily agree with Petitioner that the earliest effective filing date to which the ’263 patent appears to be entitled is December 18, 2019, namely, the filing date of the ’256 application, from which the ’263 patent issued. Ex. 1001, codes (21), (22). Patent Owner may contest this issue in a timely response to the Petition.

In the interest of providing guidance to the parties and streamlining the issues for trial, we address Petitioner’s alternative contention that the ’176 application falls short of supporting the claims that are directed to five-layer embodiments of the invention. See Pet. 23–28. We agree with Petitioner that the ’176 application, when discussing the five-layer embodiments, does not refer to the alphabetical labels—specifically, A, B, B’, C, and D—which appear in claims 11–14, 16, and 18. Pet. 23–28. Controlling precedent, cited by Patent Owner, however, instructs that “a priority application does not have to use the same words as the claim to satisfy the written description requirement.” Prelim. Resp. 23; see *id.* at 23–

25 (citing *Pozen v. Par Pharm., Inc.*, 696 F.3d 1151, 1166 (Fed. Cir. 2012) (citation omitted); *Ariad Pharms., Inc. v. Eli Lilly & Co.*, 598 F.3d 1336, 1352 (Fed. Cir. 2010) (en banc)).

On this record, we agree with Patent Owner that, although the '176 application does not assign alphabetical labels to any layer when discussing five-layer embodiments, the disclosure nonetheless describes adequately hard-soft-hard-soft-hard layer configurations as specified in the challenged claims. In particular, the '176 application explains that the “polymeric sheet” of the invention “may be comprised of more than two rigid layers, for example a third rigid layer may be disposed between two or more elastomeric layers.” Ex. 2001 ¶ 34. The only reasonable reading of that disclosure is that the inventors had possession of a five-layer embodiment of the invention in the specified hard-soft-hard-soft-hard configuration. *See id.*

On that point, Petitioner emphasizes, and we agree, that much of the '176 application disclosure is concerned with a three-layer, hard-soft-hard embodiment. *See, e.g., id.* ¶¶ 22–28; Pet. 31 (citing Ex. 1002 ¶ 93). But Petitioner fails to come to terms with the additional disclosure of a “third rigid layer,” which plainly indicates an embodiment having three hard layers. Ex. 2001 ¶ 34. The further explanation that this third hard layer “may be disposed between two” soft layers conveys that the inventors were in possession of a hard-soft-hard-soft-hard, five-layer configuration at the time the '176 application was filed. *See id.* at 25–36 (Patent Owner’s arguments and evidence supporting this finding); Ex. 2001, Abstract, ¶¶ 24, 28–35, 53, 81 (other supporting disclosures from the '176 application).

D. Sufficiency of the Patentability Challenges

The Preliminary Response, Reply, and Sur-reply are limited to disputes surrounding the effective filing date of the challenged claims. Our preliminary findings regarding the sufficiency of the patentability challenges, therefore, are based on the information set forth in the Petition, which provides that Yu (Example 1) and Stewart (Sample 2) are prior art to the claimed invention, where the effective filing date of the challenged claims is December 18, 2019. *See* Pet. 43–49 (Petitioner’s information as to Yu (Sample 1)), 49 (Petitioner’s information as to Stewart (Example 2)).

The Petition includes detailed arguments that map the limitations of the challenged claims to specific disclosures in Yu (Sample 1). *Id.* at 50–62. The Petition also maps adequately the limitations of the challenged claims to specific disclosures in Stewart (Example 2). *Id.* at 62–66.

For example, Petitioner shows sufficiently that Yu (Example 1) coextrudes “a multilayered polymeric film,” that is, a “sheet,” arranged in the hard-soft-hard-soft-hard, five-layer configuration required by claim 11. Pet. 50–51; Ex. 1002 ¶¶ 124, 126–128; Ex. 1012 ¶¶ 63, 78, 92. Petitioner also shows sufficiently that the hard layers in that configuration of Yu (Example 1) are “hard” and the hard layers are “hard” within the meaning of claim 11. Pet. 53; Ex. 1002 ¶ 131; Ex. 1012 ¶ 78. In other words, Petitioner shows sufficiently, on this record, that Yu (Example 1) anticipates claim 11.

Based on the information presented, we find that Petitioner shows sufficiently, for purposes of trial institution, that at least one challenged claim of the ’263 patent is anticipated by Yu (Sample 1).

E. Notices

The Board shall deem waived any issue not raised in a timely response to the Petition, or as permitted in another manner during trial, even if asserted in the Preliminary Response or discussed in this Decision.

Nothing in this Decision authorizes Petitioner, in a manner not otherwise permitted by order or the Board's rules, to supplement the information supporting any ground advanced in the Petition.

IV. CONCLUSION

For the above reasons, we institute an *inter partes* review of all challenged claims based on all asserted grounds of unpatentability set forth in the Petition. 35 U.S.C. § 314(a)(1) (2018).

V. ORDER

It is

ORDERED that, pursuant to 35 U.S.C. § 314(a), an *inter partes* review of claims 1–4, 7, 11–14, 18 and 31 of the '263 patent is hereby instituted based on all grounds set forth in the Petition; and

FURTHER ORDERED that, pursuant to 35 U.S.C. § 314(c) and 37 C.F.R. § 42.4(b), an *inter partes* review of claims 1–4, 7, 11–14, 18, and 31 of the '263 patent shall commence on the entry date of this Decision, and notice is hereby given of the institution of trial.

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