

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

HUHTAMAKI FLEXIBLE PACKAGING GERMANY GMBH & CO. KG,
Petitioner,

v.

ADAPA FLEXIBLES DENMARK SLAGELSE A/S
f/k/a DANAPAK FLEXIBLES A/S,¹
Patent Owner.

PGR2023-00008
Patent 11,260,624 B2

Before JO-ANNE M. KOKOSKI, KRISTINA M. KALAN, and
BRIAN D. RANGE, *Administrative Patent Judges*.

KALAN, *Administrative Patent Judge*.

JUDGMENT
Final Written Decision
Determining All Challenged Claims Unpatentable
35 U.S.C. § 328
Granting-in-Part and Denying-in-Part Patent Owner's
Revised Motion to Amend
35 U.S.C. § 326

ORDER
Dismissing Petitioner's Motion to Exclude
37 C.F.R. § 42.64(c)

¹ Patent Owner represents that "Danapak Flexibles A/S has changed its name to adapa flexibles Denmark Slagelse A/S." Paper 23, 2.

I. INTRODUCTION

Huhtamaki Flexible Packaging Germany GmbH & Co. KG (“Petitioner”) filed a Petition (Paper 1, “Pet.”) requesting post-grant review of claims 1–13 of U.S. Patent No. 11,260,624 B2 (Ex. 1001, “the ’624 patent”). Danapak Flexibles A/S (now known as adapa flexibles Denmark Slagelse A/S) (“Patent Owner”) filed a Preliminary Response to the Petition (Paper 6). With Board authorization, Petitioner filed a Preliminary Reply to the Preliminary Response (Paper 11) and Patent Owner filed a Preliminary Sur-Reply (Paper 13).

We instituted post-grant review of claims 1–13 of the ’624 patent on the grounds of unpatentability alleged in the Petition. Paper 14 (“Dec.”). After institution of trial, Patent Owner filed a Patent Owner Response. Paper 21 (“PO Resp.”). Petitioner filed a Reply. Paper 27 (“Reply”). Patent Owner filed a Sur-Reply. Paper 30 (“Sur-Reply”).

Patent Owner also filed a Motion to Amend. Paper 22 (“Mot.”). Petitioner filed an Opposition. Paper 26 (“Opp.”). We issued Preliminary Guidance. Paper 29. Patent Owner filed a Revised Motion to Amend. Paper 31 (“RMTA”). Petitioner filed an Opposition to the Revised Motion to Amend. Paper 36 (“RMTA Opp.”). Patent Owner filed a Reply to Petitioner’s Opposition. Paper 41 (“RMTA Reply”). Petitioner filed a Sur-Reply. Paper 51 (“RMTA Sur-Reply”).

Petitioner also filed a Motion to Exclude. Paper 43 (“Mot. Excl.”). Patent Owner filed an Opposition to Petitioner’s Motion to Exclude. Paper 44 (“Opp. Mot. Excl.”). Petitioner filed a Response to the Opposition. Paper 53 (“Resp. Opp. Mot. Excl.”).

We held an oral hearing on April 12, 2024, and a transcript of the hearing is included in the record. Paper 57 (“Tr.”).

We have jurisdiction over this post-grant review under 35 U.S.C. § 6. This Final Written Decision is issued pursuant to 35 U.S.C. § 328(a). We grant Patent Owner’s Revised Motion to Amend to the extent it requests cancellation of challenged claims 2 and 3 of the ’624 patent. We find that Petitioner has shown that original claims 1 and 4–13 would have been unpatentable. We also find that Petitioner has shown, by a preponderance of the evidence, that proposed substitute claims 14–24 of the ’624 patent are unpatentable. Accordingly, we deny Patent Owner’s Revised Motion to Amend with respect to proposed substitute claims 14–24.

A. Related Proceedings

Petitioner states that it “is not aware of any related matter.” Pet. 3. Patent Owner identifies U.S. Application No. 17/675,647 as a related matter. Paper 4, 2.

B. Real Parties-in-Interest

Each party identifies itself as the real party-in-interest. Pet. 3; Paper 4, 2.

C. The ’624 Patent

The ’624 patent, titled “Method for Providing an Extreme Chemical Resistant Film, a Film and Laminate Obtainable Therefrom,” is directed to a method for providing a film and a laminate to wrap aggressive chemical substances such as nicotine, fentanyl, lidocaine, and rivastigmine. Ex. 1001, code (54), 1:27–30. Packaging nicotine in the form of skin patches is problematic for consumer safety and product durability because nicotine is highly volatile and aggressive towards its environment. *Id.* at 1:38–41. The

disclosed methods for providing an extreme chemical resistant film and laminate address a need in the pharmaceutical industry to prevent adverse degradation of packaged aggressive chemical substances. *Id.* at 1:31–36.

A method of the '624 patent can provide a film product comprising a base layer coated with a coextrusion layer comprising a tie layer and a contact layer. *Id.* at 11:64–67. Figure 2 is reproduced below:

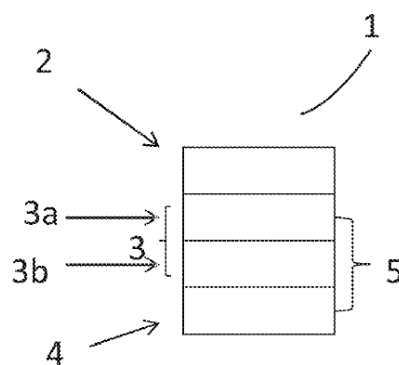


Fig. 2

Figure 2 is a cross section of an embodiment of a chemical resistant film produced by a method of the '624 patent. *Id.* at 11:39–40. Extreme chemical resistant film 1 is produced by first providing base layer 2. *Id.* at 13:35–37. Coextrusion layer 5 is coated onto one side of base layer 2 and is allowed to adhere and dry. *Id.* at 13:3, 13:39–41. Coextrusion layer 5 comprises contact layer 4 and tie layer 3, which further comprises first layer 3a and second layer 3b. *Id.* at 13:37–39. First layer 3a may be made of ethyl acetoacetate (“EAA”) and second layer 3b may be made of polyethylene. *Id.* at 13:42–46. The exposed side of base layer 2 is intended to face the exterior environment and the exposed side of coextrusion layer 5 is intended to face the highly aggressive substance to be sealed or wrapped. *Id.* at 13:7–10.

Another method disclosed in the '624 patent can provide a laminate in which outer layers may be laminated to the film product. *Id.* at 11:64–67, 12:6–8. Figure 3 is reproduced below:

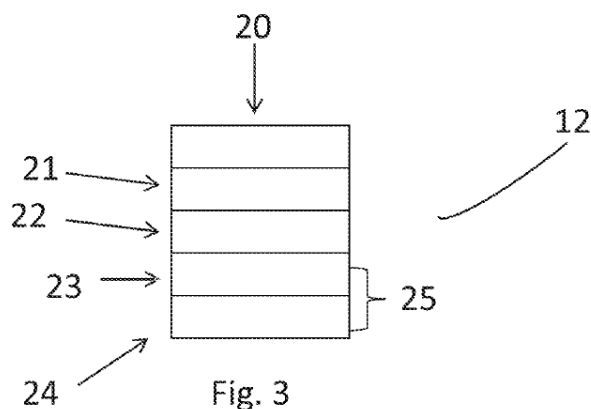


Figure 3 is a cross section of an embodiment of a laminate produced by a method of the '624 patent. *Id.* at 11:41–42. Laminate 12 comprises first outer layer 21, base layer 22, and coextrusion layer 25. *Id.* at 13:55–57. To improve mechanical wear resistance, a first outer layer 21 may be laminated to base layer 22. *Id.* at 13:51–53. First outer layer 21 and base layer 22 may be laminated together before, during, or after coextrusion layer 25 is applied/coated to base layer 22. *Id.* at 13:57–60. First outer layer 21 may be made of a material that can be sealed in a manner that is difficult for children to open. *Id.* at 13:61–66. Second outer layer 20 may be added to improve the stiffness of the packaging in addition to providing a printing platform. *Id.* at 14:1–6.

D. Illustrative Claim

Claims 1 and 13 are the only independent claims in the original '624 patent, and are reproduced below.

1. A method for providing an aggressive chemical-resistant film, wherein the film is resistant to a chemical

selected from nicotine, fentanyl, rivastigmine, or lidocaine, said method comprising:

- providing a base layer, wherein the base layer comprises aluminum and is resistant to one or more of water or oxygen;
- coextruding a tie layer and a contact layer to provide a coextrusion layer, wherein the contact layer consists of a cycloolefin copolymer (COC);
- coating the coextrusion layer consisting of the tie layer and the COC of the contact layer directly to the base layer comprising the aluminum; and
- allowing the coextrusion layer coated to the base layer to adhere to form the aggressive chemical-resistant film, wherein the aggressive chemical-resistant film consists of: the base layer comprising the aluminum, and the coextrusion layer consisting of the tie layer, and the contact layer consisting of COC,
- wherein the tie layer comprises one or more layers, and wherein the tie layer, or the one or more layers of the tie layer, has a loading in the range of 7 to 20 g/m².

Ex. 1001, 18:11–32.

13. A method for providing a laminate, wherein the laminate comprises an aggressive chemical-resistant film, said method comprising:

- providing a base layer, wherein the base layer comprises aluminum and is resistant to one or more of water or oxygen;
- coextruding a tie layer and a contact layer to provide a coextrusion layer, wherein the contact layer consists of a cycloolefin copolymer (COC);
- coating the coextrusion layer consisting of the tie layer and the COC of the contact layer directly to the base layer comprising the aluminum; and
- allowing the coextrusion layer coated to the base layer to adhere to form the aggressive chemical-resistant film, wherein the aggressive chemical-resistant film consists of:

the base layer comprising the aluminum, and the coextrusion layer consisting of the tie layer, and the contact layer consisting of COC, wherein the aggressive chemical-resistant film is resistant to a chemical selected from nicotine, fentanyl, rivastigmine, or lidocaine, wherein the tie layer comprises one or more layers, and wherein the tie layer, or the one or more layers of the tie layer, has a loading in the range of 7 to 20 g/m².

Ex. 1001, 18:62–19:19.

Proposed substitute claim 14, proposed to replace original claim 1, is reproduced below. Underlining indicates additions to claim 1, and strike-through and bracketing indicates deletions from claim 1:

14. A method for providing an aggressive chemical-resistant film, wherein the aggressive chemical-resistant film is resistant to a chemical selected from nicotine, fentanyl, rivastigmine, or lidocaine, said method comprising:
providing a base layer, wherein the base layer ~~comprises~~ consists of aluminum and is resistant to one or more of water or oxygen;
coextruding a tie layer and a contact layer to provide a coextrusion layer, wherein the contact layer consists of a cycloolefin copolymer (COC);
coating the coextrusion layer consisting of the tie layer and the COC of the contact layer directly to the base layer ~~comprising~~ consisting of the aluminum; and
allowing the coextrusion layer coated to the base layer to adhere to form the aggressive chemical-resistant film, wherein the aggressive chemical-resistant film consists of:
the base layer ~~comprising~~ consisting of the aluminum, and
the coextrusion layer consisting of the tie layer[[,]]
and the contact layer consisting of the COC, wherein:
the tie layer comprises ~~one or more layers~~ a first layer and a second layer, and wherein the tie layer, or each of the one or more layers first layer of the tie layer

and the second layer of the tie layer, has a loading in the range of 7 to 20 g/m².

RMTA 26; *see also id.* at 31 (clean version of claim 14).

Proposed substitute claim 24, proposed to replace claim 13, is reproduced below. Underlining indicates words added to claim 13 and strike-through and bracketing indicates deletions from claim 13:

24. A method for providing a laminate, wherein the laminate comprises an aggressive chemical-resistant film, said method comprising:

- providing a base layer, wherein the base layer ~~comprises~~ consists of aluminum and is resistant to one or more of water or oxygen;
- coextruding a tie layer and a contact layer to provide a coextrusion layer, wherein the contact layer consists of a cycloolefin copolymer (COC);
- coating the coextrusion layer consisting of the tie layer and the COC of the contact layer directly to the base layer ~~comprising~~ consisting of the aluminum; and
- allowing the coextrusion layer coated to the base layer to adhere to form the aggressive chemical-resistant film, wherein the aggressive chemical-resistant film consists of:
 - the base layer ~~comprising~~ consisting of the aluminum, and
 - the coextrusion layer consisting of the tie layer[[,]] and the contact layer consisting of the COC, wherein:
 - the aggressive chemical-resistant film is resistant to a chemical selected from nicotine, fentanyl, rivastigmine, or lidocaine, and
 - [wherein] the tie layer comprises ~~one or more layers~~ a first layer and a second layer, and wherein the tie layer, or each of the ~~one or more layers~~ first layer of the tie layer and the second layer of the tie layer, has a loading in the range of 7 to 20 g/m².

RMTA 30; *see also id.* at 35 (clean version of claim 24).

E. Instituted Grounds of Unpatentability

We instituted post-grant review of claims 1–13 on the following grounds:

Claims Challenged	35 U.S.C. § ²	Reference(s)/Basis
1–13	112(b)	Indefiniteness
1–13	103	Riis ³
1–13	103	Riis, Wypych, ⁴ Tatarka ⁵

In support of those unpatentability arguments, Petitioner relied on the declaration testimony of Richard J. Spontak, Ph.D. Ex. 1003.

After Patent Owner’s request to cancel claims 2 and 3 (RMTA 1), and Petitioner’s Opposition to the Revised Motion to Amend, the following grounds remain in this proceeding.

Claims Challenged	35 U.S.C. §	Reference(s)/Basis
1, 4–13	112(b)	Indefiniteness
1, 4–13	103	Riis
1, 4–13	103	Riis, Wypych, Tatarka
14, 15, 20–24	103	Riis, Wypych
16–18	103	Riis, Wypych, Holzmuller ⁶
19	103	Riis, Wypych, Rivers ⁷

In support of these unpatentability arguments, Petitioner relies on the Second Declaration and the Third Declaration of Richard J. Spontak, Ph.D.

² The Leahy-Smith America Invents Act (“AIA”), Pub. L. No. 112-29, 125 Stat. 284 (2011), amended 35 U.S.C. § 103, effective March 16, 2013. Because applications from which the ’624 patent claims priority were filed after this date, the AIA version of § 103 applies.

³ PCT App. Pub. No. WO 2015/123211 A1 (Ex. 1004).

⁴ Wypych, G., *Handbook of Polymers*, ChemTec Publishing (2012) (Ex. 1005).

⁵ U.S. Patent No. 9,452,593 B2 (Ex. 1008).

⁶ U.S. Patent App. Pub. No. 2008/0286512 A1 (Ex. 1034).

⁷ WO 2009/105205 A1 (Ex. 1035).

Ex. 1037; Ex. 1038. Patent Owner relies on the declarations of Dr. Stephen McCarthy. Ex. 2014; Ex. 2016; Ex. 2022.

II. ANALYSIS

A. *Legal Standards*

1. *Indefiniteness*

“The specification [of a patent] shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the inventor or a joint inventor regards as the invention.” 35 U.S.C. § 112(b). A patent “is invalid for indefiniteness if its claims, read in light of the specification delineating the patent, and the prosecution history, fail to inform, with reasonable certainty, those skilled in the art about the scope of the invention.” *Nautilus, Inc. v. Biosig Instruments, Inc.*, 572 U.S. 898, 901 (2014); *see* USPTO Memorandum on the Approach to Indefiniteness Under 35 U.S.C. § 112 in AIA Post-Grant Proceedings (Jan. 6, 2021), *available at* https://www.uspto.gov/sites/default/files/documents/IQ_No_816318--Indefiniteness_Memo--Signed--01-06-21.pdf.

2. *Obviousness*

A claim is unpatentable under 35 U.S.C. § 103 if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious to a person of ordinary skill in the art at the time the invention was made. *KSR Int’l Co. v. Teleflex Inc.*, 550 U.S. 398, 406 (2007). Obviousness is resolved based on underlying factual determinations, including: (1) the scope and content of the prior art; (2) differences between the prior art and the claims at issue; (3) the level of ordinary skill in the art; and (4) when in evidence, objective

indicia of nonobviousness, i.e., secondary considerations.⁸ *Graham v. John Deere Co.*, 383 U.S. 1, 17–18 (1966). A decision on the ground of obviousness must include “articulated reasoning with some rational underpinning to support the legal conclusion of obviousness.” *In re Kahn*, 441 F.3d 977, 988 (Fed. Cir. 2006). The obviousness analysis “should be made explicit” and it “can be important to identify a reason that would have prompted a person of ordinary skill in the relevant field to combine the elements in the way the claimed new invention does.” *KSR*, 550 U.S. at 418.

Petitioner bears the burden of proving unpatentability of the challenged claims, and the burden of persuasion never shifts to Patent Owner. *Dynamic Drinkware, LLC v. Nat’l Graphics, Inc.*, 800 F.3d 1375, 1378 (Fed. Cir. 2015). Petitioner must demonstrate unpatentability by a preponderance of the evidence. 35 U.S.C. § 326(e); 37 C.F.R. § 42.1(d); *see also Harmonic Inc. v. Avid Tech., Inc.*, 815 F.3d 1356, 1363 (Fed. Cir. 2016) (citing 35 U.S.C. § 312(a)(3) (2012) (requiring petitions to identify “with particularity . . . the evidence that supports the grounds for the challenge to each claim”)).

B. Level of Ordinary Skill in the Art

In our Institution Decision, we adopted Petitioner’s uncontested proposal that a person of ordinary skill in the art (“POSITA”) at the time of the invention “would have had a relevant technical degree in Chemical Engineering, Polymer Science, Materials Science, or the like, and 2–3 years of experience in laminate or film manufacture or similar packaging

⁸ Neither Patent Owner nor Petitioner appears to present any evidence directed to secondary considerations. *See* Pet.; PO Resp.; Mot.; Opp.; RMTA; RMTA Opp.; RMTA Reply; RMTA Sur-Reply.

manufacture and that less experience may be necessary with additional education and vice versa.” Dec. 17; Pet. 17 (citing Ex. 1003 ¶¶ 66–72).

Patent Owner argues that Petitioner’s definition is “overly broad.” PO Resp. 21. Patent Owner specifies that “hands-on experience with coextrusion processing technique would be required to appreciate the ’624 Patent.” *Id.* at 22 (citing Ex. 2014 ¶ 48). More particularly, Patent Owner argues that one skilled in the art “would instead have had a relevant technical degree in Chemical Engineering, Polymer Science, Materials Science, or the like, and two (2) to three (3) years of experience in manufacturing flexible films *using coextrusion processing techniques*,” and “in no event would one skilled in the art have less than one (1) year of experience in manufacturing flexible films using coextrusion coating/lamination techniques.” *Id.* (citing Ex. 2014 ¶ 49).

Petitioner replies that Patent Owner’s proposal “is overly narrow and unsupported.” Reply 16. Petitioner argues that Patent Owner does not demonstrate “why ‘hands-on’ experience is necessary in view of Petitioner’s proffered definition of a skilled artisan” nor “how any substantive difference between the level of skill applied by Dr. Spontak and that asserted by Dr. McCarthy renders any of Dr. Spontak’s testimony erroneous.” *Id.* at 16–17. Petitioner avers that “Dr. Spontak qualifies as a POSITA under either definition proposed by the parties.” *Id.* at 18 (citing Ex. 1003 ¶¶ 6–12; Ex. 1010, 1–5, 8).

Patent Owner responds that its “proposed level of ordinary skill in the art is properly suited to the coextrusion of COC at the thin levels disclosed” in the ’624 patent, and Dr. Spontak’s “lack of hands-on experience with coextrusion renders him unable to appreciate the difficulties associated with

achieving successful coextrusion layers with such thin layers (especially when the intricacies of COC resins are involved).” Sur-Reply 19–20.

We adopt Petitioner’s proposal regarding the level of one of ordinary skill in the art, because Petitioner’s position is more consistent with the ’624 patent Specification and the prior art. Our ultimate determination, however, would be the same under either party’s proposal. The two levels of skill in the art put forth by Petitioner and Patent Owner are not substantially different and, in fact, overlap significantly. Neither party has persuasively explained how, if at all, the proposals of their respective experts regarding the level of ordinary skill change the analysis in this case. The Board, sitting as a non-jury tribunal with administrative expertise, is well-positioned to determine and assign appropriate weight to evidence presented by each declarant in this case. *Gnosis S.P.A. v. S. Ala. Med. Sci. Found.*, IPR2013-00118, Paper 64 at 43 (PTAB June 20, 2014). Accordingly, we evaluate each declarant’s testimony along with the remainder of the evidence before us to reach our conclusions. Moreover, an express definition of the level of ordinary skill is not required in all situations, as the level of ordinary skill in the art usually is evidenced by the references themselves. *Cf. Okajima v. Bourdeau*, 261 F.3d 1350, 1355 (Fed. Cir. 2001) (explaining that “specific findings on the level of skill in the art . . . [are not required] ‘where the prior art itself reflects an appropriate level and a need for testimony is not shown’” (quoting *Litton Indus. Prods., Inc. v. Solid State Sys. Corp.*, 755 F.2d 158, 163 (Fed. Cir. 1985))).

C. Claim Construction

We apply the claim construction standard articulated in *Phillips v. AWH Corp.*, 415 F.3d 1303 (Fed. Cir. 2005) (en banc). 37 C.F.R.

§ 42.200(b). Under *Phillips*, claim terms are afforded “their ordinary and customary meaning.” *Phillips*, 415 F.3d at 1312. The “ordinary and customary meaning of a claim term is the meaning that the term would have to a person of ordinary skill in the art in question at the time of the invention.” *Id.* at 1313. Only terms that are in controversy need to be construed, 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).

Petitioner states that it “does not believe any specific constructions are required at this time” and that “all terms of the ’624 patent claims have been given their ordinary and customary meaning as understood by one of ordinary skill in the art in light of the specification and the prosecution history pertaining to the patent.” Pet. 22–23. Patent Owner does not appear to disagree with Petitioner’s position. *See generally* PO Resp; Mot.; RMTA; Opp. RMTA Reply; Tr. 9:1–7 (Patent Owner stating “we weren’t advocating for a claim construction position at all,” but “we’ve been advocating for the plain and ordinary meaning”). We determine we need not expressly construe any claim terms. *See Vivid Techs.*, 200 F.3d at 803.

D. Asserted Indefiniteness of Original Claims (Ground 1)

1. Aggressive Chemical-Resistant Film

Petitioner asserts that the term “aggressive chemical-resistant film” is indefinite because the ’624 patent does not provide consistent definitions of the term, but, rather, specifies “different standards for determining whether a film is an aggressive chemical-resistant film.” Pet. 25. Petitioner states that “precedents indicate that ‘a claim may be invalid as indefinite’” for three reasons, “when (1) different known methods exist for calculating a claimed parameter, (2) nothing in the record suggests using one method in particular,

and (3) application of the different methods result in materially different outcomes for the claim's scope.” *Id.* at 24 (citing *Saso Golf, Inc. v. Nike, Inc.*, 843 Fed. App'x. 291, 296 (Fed. Cir. 2021) (citing *Ball Metal Beverage Container Corp. v. Crown Packaging Tech., Inc.*, 838 Fed. App'x. 538, 542 (Fed. Cir. 2020))).

With respect to reason (1), Petitioner points to three instances in the specification where this term is discussed:

[Definition 1] In the context of the present disclosure aggressive chemical resistant film means that no more than 1% of the original amount of API [active pharmaceutical ingredient] to be packaged (or sometimes no more than 10%) is migrated into the packaging material after 24 weeks.

[Ex. 1001], 5:8-13.

[Definition 2] The term “aggressive chemical resistant film” means a film which when in contact with an aggressive substance does not allow more than 10%, such as 5% w/w or 1.5% w/w based on the nominal content of the aggressive chemical to migrate to the packaging material.

Id., 7:21-25.

[Definition 3] [T]he term “aggressive chemical resistant film” means a film which when in contact with an aggressive substance does not allow more than 1.5% w/w of nominal content to migrate to the packaging material or that 90-110% w/w of the aggressive chemical substance remains in the product when compared to Barex® as index 100.

Id., 12:16-22; EX1003, ¶¶[101]-[105].

Pet. 25. Petitioner argues that each definition recites a different amount of permissible migration of the aggressive chemical into the packaging; and the definitions themselves are internally inconsistent. *Id.* at 25–26.

With respect to reason (2), Petitioner argues that “nothing in the record suggests which method should be used.” *Id.* at 26.

With respect to reason (3), Petitioner argues that “application of the different methods results in materially different outcomes for the claim’s scope” and the ’624 patent “fails to provide specific parameters for carrying out the test methodologies suggested by the definitions,” providing examples of Petitioner’s calculations that result in different outcomes. *Id.* at 26–28.

Patent Owner argues that “one skilled in the art would understand, with reasonable certainty, that the term ‘aggressive chemical-resistant film’ refers to films that:

- 1) allow less than 10% of the active pharmaceutical ingredient (API) in a packaged nicotine, fentanyl, rivastigmine, or lidocaine product to be absorbed into the film after 24 weeks (*see* EX1001, 5:1–14; *see also* EX2014 ¶¶ 129, 136, 137); and
- 2) when used to package a nicotine, fentanyl, rivastigmine, or lidocaine patch product, yield packaging that maintains an amount of the API in a respective patch product that is 90% to 110% of a corresponding amount of the API that remains when the patch product is packaged in packaging manufactured with a Barex® film (*see* EX1001, 7:5–9, 17:50–67; *see also* EX2014 ¶¶ 129, 137–139).

PO Resp. 2. We note that Patent Owner’s first cited section is similar to Petitioner’s Definition 1 and Definition 2, and Patent Owner’s second cited section is generally similar to Petitioner’s Definition 3. Patent Owner argues that the “mere fact that two definitions are provided for a claim term does not render the claim term indefinite.” *Id.*

Petitioner’s Reply and Patent Owner’s Sur-Reply do not directly address the term “aggressive chemical-resistant film.” *See generally* Reply, Sur-Reply.

We find that Petitioner has not shown that the '624 patent is internally inconsistent among its definitions of the term “aggressive chemical-resistant film” in terms of percentages. In Definitions 1 and 2, the absorption rate is no more than 10%. Definitions 1 and 2 also provide that the absorption rate can be “no more than 1%,” 1.5%, or 5%, which is consistent with the definition that the absorption rate is no more than 10%. Definition 3 provides that either no more than 1.5% w/w of the aggressive chemical migrates, which is consistent with Definitions 1 and 2, or that the film performs comparably with a Barex film. Ex. 1001, 12:16–22. Petitioner has not shown that this latter “Barex” definition would take the absorption above the 10% upper limit specified in Definitions 1 and 2. Moreover, the location of Definition 3 within the “Detailed Description” section of the '624 patent indicates that it is directed to a more specific example than the more general Definitions 1 and 2, which are located in the “Summary of the Invention” section of the '624 patent. We also disagree that the various testing methods of the '624 patent give rise to indefiniteness (Pet. 26–28); Petitioner does not demonstrate that the various testing methods “result in materially different outcomes for the claim’s scope” or result in absorption rates outside of the definitions.

a. Barex

In our Institution Decision, we invited the parties to address, to the extent permitted under our rules, whether there are any other reasons that the “Barex” standard discussed in Definition 3 would render the term “aggressive chemical-resistant film” indefinite. Dec. 21. Petitioner, in its Reply, argues that “Patent Owner’s reliance on the Barex® standard (at POR, 25-30) renders the term ‘aggressive chemical-resistant film’

indefinite” because a POSITA “would be unable to determine the metes and bounds of an aggressive chemical-resistant film based upon a trademark source designation.” Reply 18–19. Petitioner argues that the ’624 patent fails to “indicate with clarity the materials that fall under aggressive chemical-resistant films covered by Barex®” and does not “disclose any well-known or identifiable features of Barex® that would inform a POSITA of an accepted standard at the time of the claimed invention.” *Id.* at 20.

Patent Owner responds that “Petitioner’s new indefiniteness argument should not be considered by the Board because it is nonresponsive to the Decision in Institution and could have already been presented.” Sur-Reply 21. The Board, however, expressly invited both parties to address this matter. Dec. 21. Therefore, Petitioner’s argument was directly responsive to the Institution Decision and was, thus, presented in a timely manner. Even though Patent Owner did not raise an argument about the indefiniteness of Barex® in its Response, we find that Patent Owner had ample notice of and, moreover, an express invitation to present an argument.

Patent Owner also responds:

(1) the Barex standard provides a POSITA with objective boundaries for understanding the scope of the claims (indeed Riis also uses a Barex comparison method); (2) the ’624 Patent provides the “absorption” method and the “Barex” method as internally consistent alternatives, either of which may be used to identify an aggressive chemical-resistant film; (3) Barex is not used in the claims; and (4) paragraph [0005] of the ’624 Patent identifies polyacrylonitrile (PAN) as the generic form of Barex.

Sur-Reply 22–23 (footnotes omitted).

We determine that use of the trademark Barex® in the ’624 patent specification does not render the term “aggressive chemical-resistant film”

indefinite. As pointed out by Patent Owner, the term Barex® is not used in the claims, so the cases Petitioner relies on to support its argument are not on point. Sur-Reply 22–23; Reply 18–19 (citing cases that discuss use of trademarked terms or trade names in patent claims). Both the '624 patent and Riis use the Barex® method for comparison, indicating that using such a method was not uncommon or unknown in this area of art. *See, e.g.*, Ex. 1004 ¶¶ 129, 132–133; Ex. 1001, 5:5–7, 7:22–24. Additionally, the '624 patent states that “(PAN) based film” is sold “as resins under the trademark Barex®” (Ex. 1001, 1:58–62), so a POSITA would know how to identify the basis of the Barex® film (as of the time of the '624 patent's filing) or its equivalent for future testing and comparison.

Accordingly, we find that the term “aggressive chemical-resistant film” reasonably informs the public regarding the scope of the claimed invention and is not indefinite.

2. *Loading*

Petitioner asserts that the “loading” terms are indefinite because “they fail to inform a [person of ordinary skill in the art] how to determine if the loading range limitations are met.” Pet. 29. According to Petitioner, “loading” is “not a term that has an ordinary and customary meaning in the art, and the specification does not inform a skilled artisan how to determine ‘loading.’” *Id.*

Patent Owner argues that one skilled in the art would understand, with reasonable certainty, the meaning of the term “loading.” PO Resp. 3. More particularly, Patent Owner argues that “loading” “refers to an amount of polymer in a layer of film that is measured after manufacture of the film is completed” and a POSITA would understand, with reasonable certainty,

“that the amount of the polymer in the layer is expressed as a mass (in grams) of the polymer in the layer within a unit area (a square meter)— i.e., as a mass per unit area, or grammage— and would understand how to determine a ‘loading’ of a layer.” *Id.* at 3–4 (citing Ex. 2014 ¶¶ 142–145).

We agree with Patent Owner that Petitioner has not shown that the “loading” term is indefinite. The “loading” discussed in the ’624 patent is expressed in definite terms and definite units, namely, grams per meter squared of polymer in film. Whether or not the term has customary meaning in the art, the loading of a layer could be determined by calculating the grams per meter squared of polymer, once the thickness of the layer and density of the polymer are known. PO Resp. 3–4 (noting that Petitioner uses this very approach in its calculations supporting its arguments in its obviousness analysis (citing Pet. 41; *see also* Ex. 1003 ¶¶ 151–158)).

Thus, we find that the term “loading” is not indefinite.

3. *Melting Point*

Petitioner asserts that, to the extent Patent Owner “argues that Tatarka’s ‘melting point’ means something different than the ‘melting point’ recited in the claims, claims 2 and 3 are indefinite” because one of ordinary skill in the art “would not have understood which of the many other temperature properties of polymers is equivalent to ‘melting point.’” Pet. 30.

Patent Owner argues that Petitioner fails to put forth a cognizable assertion of indefiniteness with respect to the term “melting point.” PO Resp. 4. As such, Patent Owner argues, “Petitioner acknowledges that this term is not indefinite but instead speculates that the term would be indefinite

if Patent Owner asserts that this term means something different than ‘melting point,’ which Patent Owner has not done. *Id.*

We agree with Patent Owner. We do not discern a cognizable assertion of indefiniteness by Petitioner as to the term “melting point” and, accordingly, we need not make a determination as to whether this term is indefinite. Additionally, as noted herein, we cancel claims 2 and 3 in accordance with Patent Owner’s request, so this issue is moot.

E. Asserted Obviousness of Original Claims 1 and 4–13 based on Riis (Ground 2)

1. Cancelled Claims

Our rules provide for cancellation of challenged claims. *See* 37 C.F.R. § 42.221(a)(3) (“A motion to amend may cancel a challenged claim”). As set forth in Patent Owner’s Revised Motion to Amend, Patent Owner “respectfully requests that the Board grant this Motion, thereby canceling claims 2 and 3 prior to rendering its decision.” RMTA 1. As noted herein, we grant Patent Owner’s Revised Motion to Amend as to the cancellation of claims 2 and 3. Thus, we do not address cancelled claims 2 and 3 in our analysis of the original challenged claims.

2. Riis (Ex. 1004)

Riis is a PCT Application Publication titled “Anti-Scalping Pharmaceutical Packaging Film.” Ex. 1004, code (54). Riis relates to “packaging suitable for packaging an article for collecting or administering a physiologically active substance,” such as transdermal fentanyl or nicotine delivery patches. *Id.* ¶¶ 2, 3. Riis explains that “migration of the drug or patch components from the patch to the package structure is referred to as ‘scalping.’” *Id.* ¶ 4. Riis discloses that its “films resist migration of chemicals, such as pharmacological active agents or excipients, between the

product and the film. Thus, the films are anti-scalping films.” *Id.* ¶ 5. One embodiment of the Riis anti-scalping film is depicted in Figure 1, reproduced below.

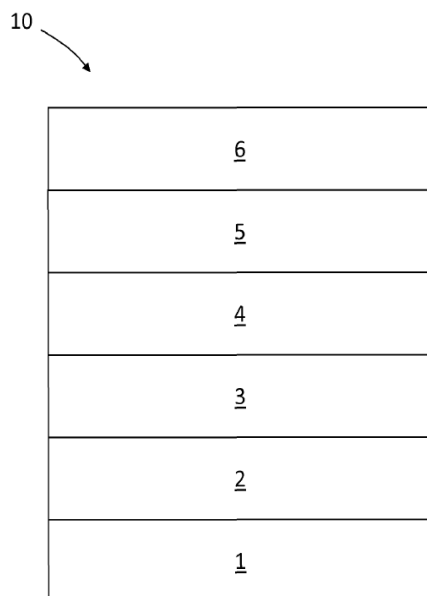


FIG. 1

Figure 1 is a schematic cross-sectional view of multilayer film 10. *Id.* ¶¶ 14, 135. Figure 1 depicts product contacting layer 1 that comprises an ethylene norbornene copolymer, which is a cyclic olefin copolymer (COC). *Id.* ¶¶ 7, 135. Adjacent and in contact with product contacting layer 1 is polyolefin bulk layer 2. *Id.* ¶ 135. Adjacent and in contact with polyolefin bulk layer 2 is first intermediate adhesive layer 3. *Id.* Adjacent and in contact with first intermediate adhesive layer 3 is oxygen barrier layer 4. *Id.* Adjacent and in contact with oxygen barrier layer 4 is second intermediate adhesive layer 5. *Id.* Adjacent and in contact with second intermediate adhesive layer 5 is exterior protective layer 6. *Id.*

Example 5 describes an inventive film. *Id.* ¶ 174. Riis discloses that the exemplified eight-layer film includes a “a three-layer coextrusion of

EAA, LDPE [low-density polyethylene] and Ethylene-norbornene copolymer (COC) which was extrusion coated onto the aluminum foil surface of the multilayer base film to produce an eight layer film.” *Id.*

3. *Petitioner’s Arguments*

Petitioner presents arguments identifying where it believes every element of the disputed claims is found in Riis, including reasons to combine those elements of the prior art with a reasonable expectation of success (Pet. 30–53). We begin with an analysis of claim 1.

- a. *“A method for providing an aggressive chemical-resistant film, wherein the film is resistant to a chemical selected from nicotine, fentanyl, rivastigmine, or lidocaine, said method comprising:”⁹*

Petitioner asserts that Riis discloses a method for making films used in the packaging of products containing a pharmaceutical active agent such as nicotine, fentanyl, and lidocaine. Pet. 31 (citing Ex. 1004 ¶¶ 2–6, 11, 81–89; Ex. 1003 ¶¶ 121–123).

- b. *“providing a base layer, wherein the base layer comprises aluminum and is resistant to one or more of water or oxygen;”*

Petitioner asserts that Riis discloses that suitable moisture barrier layers and oxygen barrier layers of a film may include “aluminum foil,” such as in Example 5, which has a “three-layer coextrusion of EAA, LDPE, and Ethylene-norbornene copolymer (COC) which was extrusion coated onto the aluminum foil surface of the multilayer base film.” Pet. 31–32 (citing Ex. 1004 ¶¶ 62–63, 174; Ex. 1003 ¶¶ 124–125).

⁹ We express no opinion on whether the preamble is limiting.

- c. “coextruding a tie layer and a contact layer to provide a coextrusion layer,”

Petitioner asserts that Riis discloses use of “one or more adhesive layers, also known in the art as ‘tie layers,’” as well as a “product contact layer” in Example 5. Pet. 32–34 (citing Ex. 1004 ¶¶ 18, 27, 52–53, 69, 71, 74, 174; Ex. 1003 ¶¶ 126–131). Petitioner’s annotated Figure 2 of the ’624 patent is reproduced below.

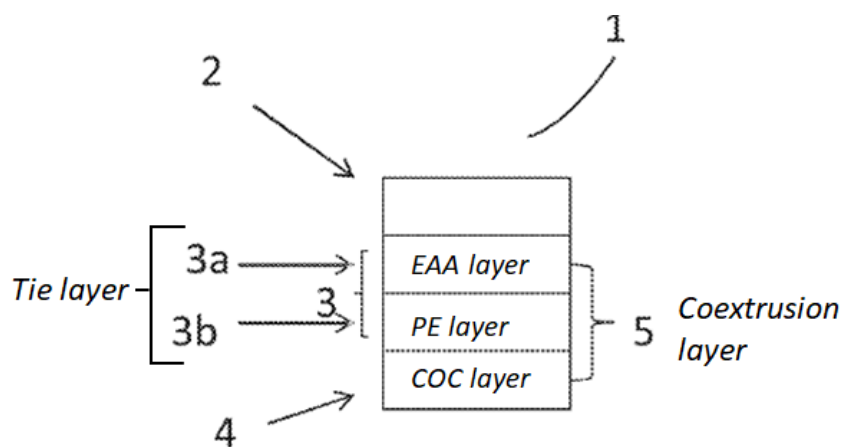


Fig. 2

Id. at 33. Figure 2 of the ’624 patent is a cross section of an embodiment of a chemical resistant film. Ex. 1001, 11:39–40. According to Petitioner, “Riis’s Example 5 is identically configured” to the ’624 patent’s Figure 2, with Riis’s EAA and LDPE layers being a “tie layer” and Riis’s “‘product contact layer’ including ethylene norbornene copolymer” being a “contact layer,” each of which “are coextruded onto the aluminum foil base layer.” Pet. 33–34 (citing Ex. 1003 ¶¶ 128–130).

- d. “wherein the contact layer consists of a cycloolefin copolymer (COC);”

Petitioner asserts that Riis discloses a “product contact layer” of a cyclic olefin copolymer, namely, ethylene norbornene copolymer, as the

only polymer component of Riis's contact layer. Pet. 34 (citing Ex. 1004 ¶¶ 52–53, 55; Ex. 1003 ¶¶ 132–135).

- e. *“coating the coextrusion layer consisting of the tie layer and the COC of the contact layer directly to the base layer comprising the aluminum; and”*

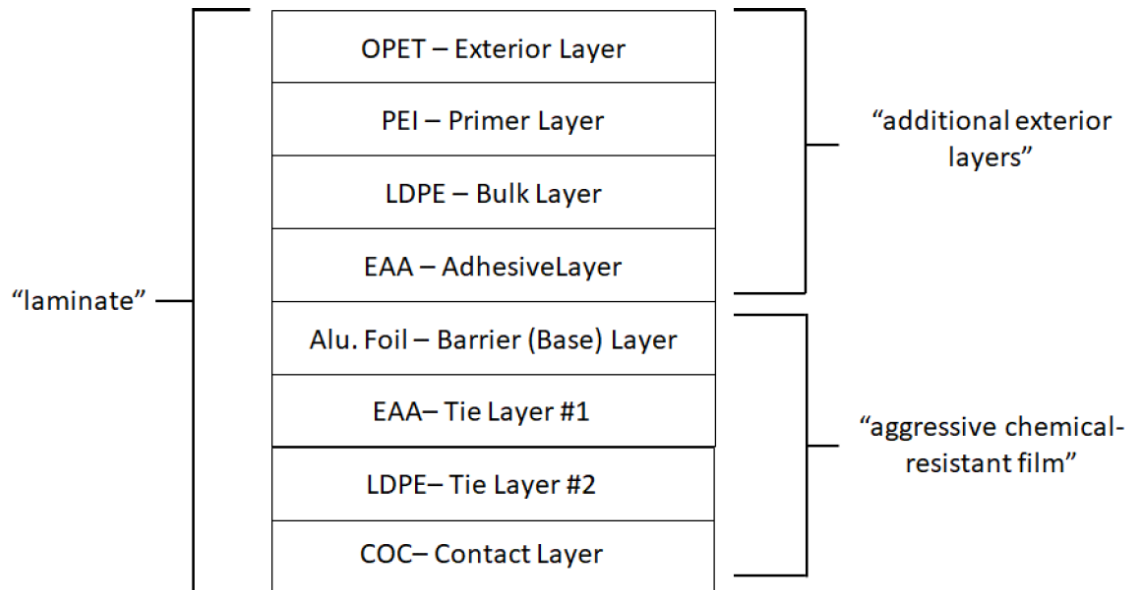
Petitioner asserts that Riis teaches “a three-layer coextrusion of EAA, LDPE, and Ethylene-norbornene copolymer (COC) which was extrusion coated onto the aluminum foil surface of the multilayer based film.” Pet. 34 (citing Ex. 1004 ¶ 174; Ex. 1003 ¶ 136).

- f. *“allowing the coextrusion layer coated to the base layer to adhere to form the aggressive chemical-resistant film,”*

Petitioner argues that “Riis teaches that the sealant film of Example 5 was created by coextrusion of EAA, LDPE, and COC,” and one of ordinary skill in the art “would have found it obvious to cool the coextrusion of Riis's Example 5 to cause it to adhere to form an aggressive chemical-resistant film.” Pet. 35–36 (citing Ex. 1004 ¶ 158; Ex. 1003 ¶¶ 138–140).

- g. *“wherein the aggressive chemical-resistant film consists of: the base layer comprising the aluminum, and the coextrusion layer consisting of the tie layer, and the contact layer consisting of COC,”*

Petitioner argues that Riis's Example 5 comprises a “sealant film” consisting of a product contact layer and a multi-layer tie layer coextruded to a base layer. Pet. 36–40 (citing Ex. 1004 ¶¶ 18, 66–78, 160–174; Ex. 1003 ¶¶ 141–148). Petitioner's interpretation of Riis's eight-layer Example 5 laminate is reproduced below.



Pet. 38. Petitioner’s annotated schematic of the Example 5 laminate features, in order from top to bottom, OPET, PEI (polyethyleneimine), LDPE, and EAA as the “additional exterior layers,” followed by aluminum foil, EAA, LDPE, and COC as the “aggressive chemical-resistant film.” *Id.* Petitioner argues that one of ordinary skill in the art “would have understood that the aluminum foil serves as a water and oxygen resistant ‘base layer,’” and “also would have understood that PEI, LDPE, and EAA serve as intermediate or adhesive layers arranged on the side of the aluminum base layer opposite the tie layer and COC layer.” *Id.* Petitioner also argues that “even if the exterior and intermediate/adhesive layers are considered part of the ‘base layer,’ Riis’s Example 5 still meets the limitation” because the claim language “requires only ‘the base layer *comprising the* aluminum,’” and “the composition of the base layer is therefore open-ended.” *Id.* at 39.

- h. “wherein the tie layer comprises one or more layers, and”*

Petitioner asserts that Riis’s tie layer further comprising EAA and LDPE meets this limitation. Pet. 40 (citing Ex. 1004 ¶ 174; Ex. 1003 ¶ 149).

- i. “wherein the tie layer, or the one or more layers of the tie layer, has a loading in the range of 7 to 20 g/m². ”*

Petitioner asserts that Riis’s teachings regarding Example 5 and preferred commercially available polymers would have rendered this limitation obvious. Pet. 39–43 (citing Ex. 1004 ¶¶ 93, 95, 174; Ex. 1003 ¶¶ 151–158, 160–165, 186). Petitioner presents calculations provided by its declarant to support Petitioner’s argument that Riis’s metrics would have led one of ordinary skill in the art to determine “loading” within the claimed range. *Id.* at 41–42 (citing Ex. 1003 ¶¶ 151–157).

- j. Motivation to Combine and Reasonable Expectation of Success*

Petitioner argues that “a skilled artisan would have been motivated to follow Riis’s disclosure to recreate the film of Example 5 and would have had a reasonable expectation of doing so to arrive at the claimed invention.” Pet. 43. Regarding the aluminum base layer, Petitioner argues that all of Riis’s examples use aluminum foil as the base layer, and one of ordinary skill in the art “would have been motivated to use aluminum foil as the base layer because (1) Riis taught success in doing so, (2) aluminum foil provides suitable oxygen and moisture barrier properties with a single material, and (3) aluminum foil provides costs savings over other barrier materials.” *Id.* at 43–44 (citing Ex. 1004 ¶¶ 159–174; Ex. 1003 ¶ 161). Regarding the tie layer, Petitioner argues that all of Riis’s examples “coextrude an LDPE layer and EAA layer onto an aluminum base layer,” which “is consistent with

known tie layers in the art used to join layers to metal foil barrier layers.” *Id.* at 44 (citing Ex. 1004 ¶¶ 159–174; Ex. 1003 ¶ 162). Regarding the COC contact layer, Petitioner argues that one of ordinary skill in the art would have been motivated to use “Topas COCs as a suitable product contact layer to be implemented in multi-layer films.” *Id.* at 44–45 (citing Ex. 1004 ¶¶ 7, 52, 54, 97, 158; Ex. 1003 ¶ 163).

k. Claims 4–13

Petitioner also alleges that claims 4–13 would have been obvious in view of Riis, pointing to portions of Riis that Petitioner asserts disclose the limitations of the challenged dependent claims.. Pet. 48–53. For claims 4–7, Petitioner presents calculations and arguments to support its assertions that Riis meets the loading ranges specified in those dependent claims. *Id.* at 48–49 (citing Ex. 1003 ¶¶ 171–193). For claim 8, Petitioner points to the tie layer of Example 5 consisting of two layers. *Id.* at 50 (citing Ex. 1003 ¶ 194; Ex. 1004 ¶ 174). For claims 9–12, Petitioner refers back to its claim 1 arguments to argue that a POSITA would have found these claims obvious. *Id.* at 50–51 (citing Ex. 1003 ¶¶ 195–200). Petitioner’s allegations with respect to independent claim 13 are substantively similar to those of independent claim 1. *Compare* Pet. 51–54, *with id.* at 31–45.

4. Patent Owner’s Arguments

Patent Owner disputes Petitioner’s contentions. PO. Resp. 5–7, 33–69. Patent Owner presents several separately enumerated arguments as to why Riis would not have rendered the challenged claims obvious. PO Resp. 10–16, 40–69. Patent Owner presents its arguments as follows:

1. Riis fails to disclose that the .65 mil Low Density Polyethylene (LDPE) layer in the sealant film of the eight-layer film disclosed in example 5 of Riis is a “tie” layer.

- Instead, Riis discloses that the .65 mil LDPE layer primarily serves the purpose of a bulk layer, and thus, would be understood by one skilled in the art as a “bulk” layer. PO Resp. 10–11, 43–57.
2. Riis fails to teach or suggest a “coextrusion layer consisting of [a] tie layer [that] . . . has a loading in the range of 7 to 20 g/m².” PO Resp. 11–12, 57–59.
 - a. Loading “of the tie layer in the coextrusion layer of the eight-layer film is limited to the loading of the .17 mil EAA layer.” PO Resp. 58 (citing Ex. 2014 ¶ 165).
 3. Riis fails to teach or suggest a “coextrusion layer consisting of [a] tie layer[] and . . . [a] contact layer.” PO Resp. 12, 59.
 - a. A coextrusion layer that includes a “tie” layer, “bulk” layer (.65 mil LDPE layer), and “contact” layer fails to teach or suggest this limitation. PO Resp. 59.
 4. Petitioner fails to set forth any arguments in support of modifying (and of a motivation to modify) the recreation of the eight-layer film disclosed in example 5 of Riis. PO Resp. 13–14, 60–61.
 - a. “After recreating the eight-layer film, Petitioner does not contemplate any modification to any aspect of the eight-layer film, let alone to the loading ranges and melting characteristics of the layers, or the configuration of the layers themselves.” PO Resp. 60–61.
 5. Petitioner’s failure to set forth any arguments in support of modifying (and of a motivation to modify) the recreation of the eight-layer film disclosed in example 5 of Riis precludes Petitioner from providing any arguments in support of modifying the recreated eight-layer film in its Reply to this Response. PO Resp. 14–15, 61–63.
 - a. “Petitioner’s arguments stand or fall on whether the *unmodified* recreation of the eight-layer film . . . discloses the aggressive chemical-resistant film claimed in the ’624 Patent.” PO Resp. 62–63.
 6. The unmodified recreation of the eight-layer film disclosed in example 5 of Riis fails to disclose the aggressive chemical-resistant film claimed in the ’624

Patent. PO Resp. 15–16, 63–64.

- a. The “coextrusion layer including the .17 mil EAA tie layer of the sealant film having a loading of 3.97 to 4.15 g/m², as described in Riis, fails to disclose a ‘coextrusion layer consisting of [a] tie layer [that] . . . has a loading in the range of 7 to 20 g/m²,’ as recited in independent claim 1.” PO Resp. 63.

Regarding Petitioner’s characterization of Riis, Patent Owner asserts:

1. One skilled in the art “would understand the .65 mil LDPE layer to be serving as a bulk layer — e.g., given its thickness, its material properties, and the thicknesses and material properties of the adjacent .17 mil EAA layer and the adjacent .43 mil COC layer.” PO Resp. 43–45.
2. One skilled in the art “would not consider the .65 mil LDPE layer as primarily serving as a tie layer and would instead acknowledge the .65 mil LDPE layer as primarily serving as a bulk layer.” PO Resp. 46–47.
3. One skilled in the art “would find the thickness of the .17 mil EAA layer to be consistent with Riis’s disclosure in paragraph [0071] of a layer that primarily serves as a tie layer.” PO Resp. 47–48.
4. The “.65 mil LDPE layer is approximately four times as thick as the .17 mil EAA layer” and, thus, “the thickness (relative to the .17 mil EAA layer) of the bulk layer is consistent with a layer primarily serving as a bulk layer.” PO Resp. 48.
5. One skilled in the art would “find the combined thickness of the .17 mil EAA layer and .65 mil LDPE layer to be inconsistent with a desired thickness of a layer used to primarily serve as a tie layer.” PO Resp. 48–49.
6. “Based on the similarities between the .42 mil LDPE layer [in the base film] and the .65 mil LDPE layer, one skilled in the art would understand the layers to serve similar primary purposes.” PO Resp. 49–51.
7. “Riis teaches away from using multiple adjacent tie layers.” PO Resp. 51–52.
8. “Riis teaches away from having an LDPE layer primarily

serve as a tie layer.” PO Resp. 52–54.

Patent Owner also challenges Dr. Spontak’s testimony as failing to cure Petitioner’s assertedly deficient allegations. PO Resp. 54–56.

Patent Owner also asserts that Riis fails to render obvious dependent claim 4, relying in large part on its earlier claim 1 arguments. PO Resp. 66–69. Patent Owner also asserts, referring to its earlier claim 1 arguments, that Riis fails to render obvious dependent claims 5–12 “at least for their dependence on independent claim 1.” PO Resp. 69. Finally, Patent Owner asserts that Riis fails to render obvious independent claim 13, relying on its earlier claim 1 arguments. PO Resp. 64–66.

5. *Petitioner’s Reply Arguments*

Petitioner replies that, even under Patent Owner’s application of the term “tie layer,” Riis’s Example 5 includes a tie layer comprising an EAA layer and an LDPE layer, and renders obvious the challenged claims. Reply 8–16.

First, Petitioner argues that Riis “never labels Example 5’s LDPE layer a ‘bulk layer.’” *Id.* at 8.

Second, Petitioner argues that Riis teaches that a “bulk layer” can also be a “tie layer,” and it was well known in the art to use LDPE as a tie layer. *Id.* at 9. Additionally, to refute Dr. McCarthy’s position that LDPE could not bond to polar materials, Petitioner argues that a “POSITA would have understood that Example 5’s LDPE layer of Riis could bond to polar materials and consequently constitutes the claimed ‘tie layer.’” *Id.* at 9–10 (citing Ex. 1036, 89).

Third, Petitioner argues that Patent Owner’s thickness arguments lack support, lead to absurd results when taken to their logical conclusion, and

ignore that Riis's Example 5 meets the thickness-dependent loading ranges of the challenged claims. *Id.* at 11–13.

Finally, Petitioner argues that Patent Owner's teaching away arguments are legally incorrect. Reply 13–16.

6. *Patent Owner's Sur-Reply Arguments*

Patent Owner's Sur-Reply arguments largely mirror its enumerated arguments in the Response. Sur-Reply 6–19. Namely, Patent Owner reiterates its “primary purpose” arguments, i.e., that “Riis's disclosure, a POSITA's knowledge, and Petitioner's own interpretation of Riis all confirm that Riis's .65 mil LDPE layer's primary purpose is as a bulk layer.” *Id.* at 7. Patent Owner also argues that Riis's disclosure confirms “that the .65 mil LDPE layer is a polyolefin ‘Riis-bulk’ layer” and “that the .65 mil LDPE polyolefin Riis-bulk layer does not also serve as a Riis-tie layer.” *Id.* at 7–12. Under the plain and ordinary meaning of “tie layer,” argues Patent Owner, Riis's .65 mil LDPE layer serves a “primary purpose” as a bulk layer and does not serve a “primary purpose” as a tie layer. *Id.* at 12–13. Although LDPE may, in theory, be suitable for use as a tie layer, Patent Owner argues, Riis's .65 mil LDPE layer is not. *Id.* at 13–14. Patent Owner also argues that its arguments “find direct support in Petitioner's expert's own testimony” and “do not lead to absurd results.” *Id.* at 15–17. Finally, Patent Owner argues that Riis's definition of a Riis-tie layer (1) excludes Riis's .65 mil LDPE layer from being a polyolefin Riis-tie (or Riis-bulk/Riis-tie) layer and (2) “teaches away” from multi-layer tie layers. *Id.* at 18–19.

7. *Analysis*

a. *Meaning of “Tie Layer”*

The parties’ dispute centers, in large part, on whether Riis discloses a “tie layer” as claimed. In arguing that Riis does not disclose the tie layer as claimed, both parties advocate for an application of this term in accordance with its “plain and ordinary meaning.” *See, e.g.*, Reply 4; Sur-Reply 1 n.3 (“Petitioner mistakenly alleges Adapa has *construed* the term “tie layer;” however, the parties have agreed to use the POM [plain and ordinary meaning] of “tie layer” so no *construction* is needed, nor has one been provided by Adapa, for “tie layer.”). Neither party advocates for an express claim construction. Tr. 9:5–7 (Patent Owner’s counsel stating: “So we weren’t advocating for a claim construction position at all, but we’re advocating, obviously, for what we think the plain ordinary meaning is at this point.”), 35:11–14 (Petitioner’s counsel stating: “So I don’t have a specific position to tell the Board that we think this requires claim construction. I will say neither party treated it as such. We both proceeded as if we -- our respective plain and ordinary meanings are what they are and that we are correct.”).

The ’624 patent provides: “According to the disclosure the tie layer is selected to provide sufficient adhesion between the base layer and the coextrusion layer.” Ex. 1001, 4:35–37.¹⁰ Petitioner asserts that the plain

¹⁰ According to Petitioner: “This is also consistent with Riis: ‘The term ‘adhesive layer,’ or ‘tie layer,’ refers to a layer or material placed on one or more layers to promote the adhesion of that layer to another surface;” and an “adhesive layer can have any suitable composition that provides a desired level of adhesion with the one or more surfaces in contact with the adhesive layer material.” Reply 4 (quoting Ex. 1004 ¶ 20).

and ordinary meaning of “tie layer” is “simply a layer that provides adhesion between layers or surfaces.” Reply 5. Petitioner notes that Patent Owner’s declarant Dr. McCarthy agrees that a “tie layer” is “something that provides sufficient adhesion between the base layer and the coextrusion layer.” *Id.* at 4 (citing Ex. 1032, 99:14–100:18). Patent Owner responds, in its Sur-Reply, that the plain and ordinary meaning of “tie layer” is a layer “(1) that serves the primary purpose of providing sufficient adhesion between adjacent layers; (2) that has properties known by a POSITA as being consistent with serving that purpose; and (3) for which a primary reason for including the layer in the film was to serve that purpose.” Sur-Reply 2.

Patent Owner’s advancement of a “primary purpose” theory does not persuade us to adopt a narrower interpretation of the “tie layer” term that incorporates a “primary purpose” requirement. Patent Owner appears to argue that a tie layer can have only one “primary purpose.” Sur-Reply 2. Patent Owner reasons that “the analysis for determining the [plain and ordinary meaning] of the tie layer does not end with reading a single sentence of the ’624 Patent,” but “a POSITA’s understanding of a tie layer must also be considered.” *Id.* at 3. Patent Owner’s declarant Dr. McCarthy supports and applies the “primary purpose” theory. *See, e.g.*, Ex. 2014 ¶¶ 83, 94, 97, 100, 109, 155, 156, 159, 188, 195, 205. Patent Owner argues that Petitioner’s declarant Dr. Spontak acknowledged that the “tie layer serves only one primary purpose, and that is basically to behave as an adhesive.” Sur-Reply 4 (quoting Ex. 2015, 76:7–20; *see also* Ex. 2015, 79:24–81:12 (“[t]he adhesive layer serves the purpose of ensuring that the contact layer doesn’t come apart from the base layer . . . [t]hat is its primary function”)).

Petitioner responds that Patent Owner's attempt to "limit the scope of tie layer to the primary purpose of the layer" is "overly narrow," that "[n]o documentary evidence uses this 'primary purpose' terminology or synonymous language," and "[n]othing in the specification or claims of the '624 patent suggests that the tie layer is limited to a primary purpose." Reply 5. At the hearing, Petitioner's counsel stated that the use of the "primary purpose" terminology in Dr. Spontak's deposition transcript "was not something in the specification nor in the file history" and was responsive to a line of questioning about another topic, namely, "thin tie layers," and describing how those might work. Tr. 57:14–58:6.

The text of the '624 patent itself and the lack of any "primary purpose" requirement in the case law persuade us that there is no "primary purpose" required of the tie layer, or any other layer. More particularly, we are unpersuaded of the existence of a "primary purpose" requirement that excludes other possible functions of a layer. As noted above, the '624 patent provides: "According to the disclosure the tie layer is selected to provide sufficient adhesion between the base layer and the coextrusion layer." Ex. 1001, 4:35–37. Petitioner also notes that, contrary to Patent Owner's insistence that a layer can only be defined by its "primary purpose," "[c]ommon sense teaches [] that familiar items may have obvious uses *beyond their primary purposes*." Reply 5 (citing *KSR*, 550 U.S. at 420 (emphasis added)); *see also Merck & Co. v. Biocraft Labs., Inc.*, 874 F.2d 804 (Fed. Cir. 1989) (a prior art reference is relied upon for all that it teaches). Therefore, a tie layer with sufficient adhesion, per the '624 patent, may also serve a purpose other than a so-called "primary purpose." We agree that Patent Owner's "primary purpose" test or terminology has

insufficient support in the case law or record. *Id.* at 5–6 (“Any assignment of a ‘primary purpose’ by Patent Owner is arbitrary and based solely on subjective intent, not on the layer’s functionality.”). Regarding Dr. Spontak’s testimony, we do not find that the statement regarding “primary purpose,” provided in the context of a line of questioning regarding particular aspects of Riis, rises to the level of a definition of “tie layer” that we must adopt. This is especially true when Petitioner provides its own countervailing testimony from Dr. McCarthy, demonstrating the subjectivity and difficulty in attempting to apply Patent Owner’s “primary purpose” approach. Reply 6 (citing Ex. 1032, 126:14–19; 119:15–121:14).

On this complete record, we determine that that the ’624 patent’s explanation and Petitioner’s explanation of a “tie layer” are reasonable—namely, a layer that provides sufficient adhesion between layers or surfaces. Patent Owner’s proposal of the plain and ordinary meaning in its Sur-Reply attempts to import too many extraneous elements. A portion of the first part of Patent Owner’s plain and ordinary meaning proposal, however, tracks the explanation in the ’624 patent (i.e., the portion that has the tie layer “providing sufficient adhesion between adjacent layers”) and is consistent with Petitioner’s understanding and Dr. McCarthy’s understanding of the term. We also are not persuaded that a “primary purpose” test is properly part of the “tie layer” term. The ’624 patent’s explanation is succinct, sufficient, and does not import additional qualifiers into the plain and ordinary meaning of “tie layer.” Having considered the record and the parties’ arguments, these definitions and the law support that a tie layer is a layer that provides sufficient adhesion between layers or surfaces.

b. Whether Riis Discloses a Tie Layer

Having discussed the meaning of the “tie layer” limitation, above, we turn to the question of whether Petitioner has established by a preponderance of the evidence that Riis discloses a tie layer or one or more layers of a tie layer having a loading in the range of 7 to 20 g/m². *See, e.g.*, Pet. 40–43.

Riis provides: “The term ‘adhesive layer,’ or ‘tie layer,’ refers to a layer or material placed on one or more layers to promote the adhesion of that layer to another surface.” Ex. 1004 ¶ 20. Riis discloses that a “multilayer packaging film can further comprise one or more adhesive layers, also known in the art as ‘tie layers,’ which can be selected to promote the adherence of adjacent layers to one another in a multilayer film.” *Id.* ¶¶ 70–71. Riis expressly discloses that “tie layers may be formed of any suitable thermoplastic materials, for example, polyamides, polystyrenes, styrenic copolymers e.g. styrene-butadiene copolymer, polyolefins, and in particular members of the polyethylene family such as LLDPE, VLDPE, HDPE, LDPE.” *Id.* ¶ 74. Riis also provides that “an adhesive layer can have any suitable composition that provides a desired level of adhesion with the one or more surfaces in contact with the adhesive layer material.” *Id.* ¶ 20. Importantly, Riis teaches that “a polyolefin bulk layer” such as the LDPE layer identified by Petitioner as a claimed “tie layer” “can serve as an adhesive or tie layer.” Ex. 1004 ¶ 135; *see also id.* ¶¶ 69, 74 (teaching that LDPE is particularly suitable for an “interior, exterior, intermediate or tie layer” and can provide other advantageous characteristics).

Petitioner relies on Riis’s disclosure of a 0.17 mil layer of EAA (Dupont 3990-L), which has a density of 0.94 g/cm³, and a 0.65 mil layer of LDPE (Dow 4012), which has a density of 0.918 g/cm³, to meet the tie layer

limitation of claim 1 (“wherein the tie layer, or the one or more layers of the tie layer, has a loading in the range of 7 to 20 g/m²). Pet. 39–43 (citing Ex. 1003 ¶ 156). These two layers, by Petitioner’s calculations, “would have had a loading of 19.22 g/m².” *Id.* Petitioner further argues that all of Riis’s examples, including Example 5, “coextrude an LDPE layer and EAA layer onto an aluminum base layer” (citing Ex. 1004 ¶¶ 159–174), and that use of an LDPE/EAA coextrusion layer “is consistent with known tie layers in the art used to join layers to metal foil barrier layers” such that “a POSITA would have been motivated to coextrude an LDPE layer and EAA layer onto an aluminum base layer.” *Id.* at 44 (citing Ex. 1003 ¶ 162; Ex. 1013, Ex. 1015).

Patent Owner argues that one skilled in the art “would understand and refer to a layer by its primary purpose for the target application — e.g., one skilled in the art would understand and refer to the .17 mil EAA layer as a .17 mil EAA ‘adhesive’ layer or a .17 mil EAA ‘tie’ layer.” PO Resp. 9 (citing Ex. 2014 ¶ 83). Patent Owner argues, however, that “the .65 mil LDPE layer primarily serves the purpose of a bulk layer and, thus, would be understood by one skilled in the art as a ‘bulk’ layer (not a ‘tie’ layer).” *Id.* at 11, 45. Patent Owner argues that even though Riis discloses that a polyolefin bulk layer such as LDPE can serve as a tie layer (Ex. 1004 ¶ 135 (“In some embodiments, a polyolefin bulk layer can serve as an adhesive or tie layer.”)), Petitioner “relies exclusively on this statement to baselessly conclude that the .65 mil LDPE layer *is* serving as a ‘tie’ layer.” *Id.* at 44. Patent Owner counters that “one skilled in the art would understand the .65 mil LDPE layer to be serving as a bulk layer — e.g., given its thickness, its

material properties, and the thicknesses and material properties of the adjacent .17 mil EAA layer and the adjacent .43 mil COC layer.” *Id.* at 45.

Petitioner argues that even under Patent Owner’s proposed interpretation of “tie layer,” Riis’s Example 5 includes a tie layer comprising an EAA layer and an LDPE layer, rendering obvious the challenged claims. Reply 8–16. Replying to Patent Owner’s argument that Riis’s LDPE layer is primarily a bulk layer, Petitioner argues that Riis never labels “the 0.65 mil LDPE layer of Example 5 as a bulk layer.” *Id.* at 8–9. Petitioner also argues that Riis teaches that a “bulk layer” can also be a “tie layer,” and it was well known in the art that LDPE functions as a tie layer. *Id.* at 9–11. Additionally, to refute Dr. McCarthy’s position that LDPE could not bond properly to function as a tie layer, Petitioner argues that a “POSITA would have understood that Example 5’s LDPE layer of Riis could bond to polar materials and consequently constitutes the claimed ‘tie layer.’” *Id.* at 10. Relying on Morris, upon which Dr. McCarthy also relies, Petitioner argues that “Morris describes LDPE as ‘the workhorse resin used to bond to aluminum foil, paper, and other substrates in extrusion lamination.’” *Id.* at 9 (citing Ex. 1036, 89).

Patent Owner responds with its proposed interpretation of “tie layer” that incorporates its “primary purpose” theory, which we discussed above. Sur-Reply 2. Patent Owner reiterates that Riis’s LDPE layer is not suitable for use as a tie layer due to its properties, and that its “primary purpose” as a bulk layer. *Id.* at 6–14.

Given Riis’s express disclosure that Riis’s tie layers may be formed of any suitable thermoplastic material, including LDPE (Ex. 1004 ¶ 74), and that a polyolefin bulk layer can serve as an adhesive or tie layer (*id.* ¶ 135), a

preponderance of the evidence supports Petitioner's assertion that Riis's LDPE layer is one of two layers of Riis's tie layer. We agree with Petitioner that only by relying on Patent Owner's more narrow "primary purpose" interpretation can Patent Owner attempt to argue that the LDPE in Riis's Example 5 does not meet the claimed "tie layer" limitation because its alleged primary purpose is as a "bulk layer." Reply 3. As discussed above, we disagree with the "primary purpose" theory proffered by Patent Owner, and, thus, even if we were to accept Patent Owner's characterizations of the LDPE layer's properties, we disagree that only the so-called "primary purpose" of the LDPE layer determines whether or not it is a "tie layer." We also agree with Petitioner that Riis does not label Example 5's LDPE layer a "bulk layer," but, rather, provides that Riis's film "may have any number of one or more layers" in which "a polyolefin bulk layer can serve as an adhesive or tie layer." Reply 8–9 (citing Ex. 1004 ¶ 135). None of the properties of LDPE highlighted by Patent Owner render inoperable Petitioner's identified role of LDPE as part of the tie layer. On the contrary, Petitioner, on this record, provides ample evidence that Riis's two-layer tie layer of EAA and LDPE meets the "tie layer" limitation of claim 1, because LDPE can serve many purposes as described in Riis and elsewhere, and is not limited to just one "primary purpose" such as *only* serving as a bulk layer. For the reasons and evidence provided by Petitioner, we are persuaded by the totality of Petitioner's arguments that not only can LDPE serve as a tie layer, but that one of ordinary skill in the art would understand it to function as such in the proposed ground based on Riis. Accordingly, Petitioner's identified tie layer of Riis, including LDPE and EAA, meets the tie layer limitation of claim 1.

c. Thickness

Patent Owner's arguments relating to thickness include, *inter alia*, that the thickness of the .17 mil EAA layer relative to the overall thickness of Riis's eight-layer film would be "consistent" with "a layer that primarily serves as a tie layer." PO Resp. 47. Additionally, Patent Owner argues that the "relative thicknesses of the .17 mil EAA tie layer and the .65 mil LDPE bulk layer" would lead a POSITA to understand that the relative thickness of the LDPE layer "is consistent with a layer primarily serving as a bulk layer." *Id.* at 48. Additionally, Patent Owner argues that the thickness of the "multi-layer adhesive layer" made up of the .17 mil EAA layer and the .65 mil LDPE layer would be "inconsistent with a desired thickness of a layer used to primarily serve as a tie layer." *Id.* at 48–49.

Petitioner argues that Patent Owner's thickness arguments lack support, lead to "absurd" results when taken to their logical conclusion, and ignore that Riis's Example 5 meets the thickness-dependent loading ranges of the challenged claims. Reply 11–13. More particularly: "Taken to its logical conclusion, according to Patent Owner, a layer's primary purpose can change solely based on changes in thickness of other layers in a multilayer film." *Id.* at 12. Petitioner also argues: "Patent Owner cannot show that the function of an LDPE layer—which meets the claimed "polyethylene layer" (e.g., claim 11) and the claimed loading ranges—functions differently in Riis than it does in the '624 patent." *Id.* at 13.

We agree with Petitioner. As a preliminary matter, the "primary purpose" theory advanced by Patent Owner lacks merit for the reasons explained above; thus, to the extent Patent Owner's "thickness" arguments rely on a "primary purpose" based on thickness, the arguments similarly fail.

Additionally, premising a layer's function on its thickness alone leads to an illogical result, as argued by Petitioner, and we find illogical that "a layer's primary purpose can change solely based on changes in thickness of other layers in a multilayer film." Reply 12. Many factors contribute to the function of a layer, and ascribing meaning to a layer's thickness in the manner proposed by Patent Owner is overly limiting and fails to account for other factors contributing to the layer's functionality.

d. Teaching Away

Patent Owner argues that "Riis teaches away from using multiple adjacent tie layers" and instead "discloses that the use of a *single* multifunctional adhesive layer is preferred." PO Resp. 51. Patent Owner also argues that "Riis teaches away from having an LDPE layer primarily serve as a tie layer" and "Riis's disclosed preference for a single multifunctional tie layer teaches away from characterizing an LDPE layer (let alone the .65 mil LDPE layer) as an 'adhesive' layer." *Id.* at 52.

Petitioner argues that Patent Owner's teaching away arguments are legally incorrect. Reply 13–16. First, Petitioner argues, Patent Owner's teaching away arguments reflect "optional or preferred embodiments of Riis." *Id.* at 14. Second, Petitioner argues, LDPE is known to bond to polar materials, and, therefore, Riis does not teach away from using an LDPE layer adjacent to an EAA layer. *Id.* at 15. Third, Petitioner argues, Patent Owner's argument rests on its flawed interpretation of "tie layer." *Id.* Fourth, Petitioner argues that Patent Owner fails to explain its arguments about a peelable tie layer. *Id.* at 16.

We agree with Petitioner. Teaching away requires that a reference criticize, discredit, or otherwise discourage the solution claimed. *In re*

Fulton, 391 F.3d 1195, 1201 (Fed. Cir. 2004). Optional or preferred embodiments of particular configurations disclosed in Riis do not rise to the level of teaching away. Additionally, our reviewing court has explained that a reference must be “considered for all it taught, disclosures that diverged and taught away from the invention at hand as well as disclosures that pointed towards and taught the invention at hand.” *Ashland Oil, Inc. v. Delta Resins & Refractories, Inc.*, 776 F.2d 281, 296 (Fed. Cir. 1985). Riis’s teaching of using LDPE, an acknowledged adhesive layer and a “workhorse” among layers, points towards and teaches the invention at hand. We already addressed, above, the interpretation of “tie layer” and the function of Riis’s LDPE layer as a tie layer, and for similar reasons, disagree that Riis’s disclosure of an LDPE layer constitutes a “teaching away” as argued by Patent Owner. Finally, Patent Owner’s “peelable” arguments are insufficiently explained, as noted by Petitioner, to persuasively support Patent Owner’s teaching away arguments. Reply 16. Accordingly, we do not find any teaching away in Riis of using LDPE as a tie layer.

e. Motivation to Modify, Preclusion

Patent Owner argues that “Petitioner does not contemplate any modification to any aspect of the eight-layer film, let alone to the loading ranges and melting characteristics of the layers.” PO Resp. 13. Accordingly, Patent Owner argues, Petitioner is “prohibited from submitting new evidence or argument in reply that it could have presented earlier, e.g., to make out a prima facie case of unpatentability.” *Id.* at 14. Thus, according to Patent Owner, “Riis is constrained to only those loadings and melting points that are derivable from the materials that are disclosed in the eight-layer film as well as to the layer configurations of the eight-layer

film,” and “Petitioner’s arguments stand or fall on whether the *unmodified* recreation of the eight-layer film” discloses the claimed film. *Id.* at 15.

We note the Petition’s section titled “Motivation to Combine and Reasonable Expectation of Success,” explaining Petitioner’s support for why “a skilled artisan would have been motivated to follow Riis’s disclosure to recreate the film of Example 5 and would have had a reasonable expectation of doing so to arrive at the claimed invention.” Pet. 43. Petitioner elaborates on its reasons for arguing that Riis discloses, *inter alia*, the claimed aluminum base layer, coextruding an LDPE/EAA tie layer, a COC contact layer, and for reasonable expectation of success. *Id.* at 43–45. Petitioner provides additional reasoning for its motivation and reasonable expectation of success for other claims challenged under this ground. *See, e.g., id.* at 49–51, 52–53 (discussing “Motivation to Combine and Reasonable Likelihood of Success” for claim 13). We find Petitioner’s arguments to be amply present in the Petition, and also supported by the evidence of record. Accordingly, we disagree with Patent Owner’s contention that the modifying arguments, or motivation to modify arguments, are missing. Because Petitioner has satisfactorily presented its arguments in the first instance in the Petition, Patent Owner’s preclusion argument is moot.

f. Loading

Patent Owner argues, invoking its “primary purpose” theory, that a POSITA “would understand the .65 mil LDPE layer to be primarily serving as a bulk layer, the sealant film of the eight-layer film discloses a coextrusion layer including a .17 mil EAA ‘tie’ layer (that primarily serves the purpose of a tie layer),” and, thus, “the coextrusion layer including

the .17 mil EAA ‘tie’ layer with a loading of 3.97 g/m^2 to 4.15 g/m^2 fails to disclose a ‘coextrusion layer consisting of [a] tie layer [that] . . . has a loading in the range of 7 to 20 g/m^2 .’” PO Resp. 11–12; *see also id.* at 57–59 (arguing that “the loading of the tie layer in the coextrusion layer of the eight-layer film is limited to the loading of the .17 mil EAA layer” (citing Ex. 2014 ¶ 165)).

Patent Owner looks only at the EAA layer of Riis, which “has a density within the range of .92 to .96 g/cm^3 ” to argue that, by Petitioner’s calculations, Riis discloses a tie layer with a loading of $3.97\text{--}4.15 \text{ g/m}^2$, which Patent Owner asserts is not within the claimed range. *Id.* at 58. This argument, however, does not address Petitioner’s argument that the tie layer of Riis is made up of both the EAA layer and the LDPE layer. Pet. 40–43 (relying on Ex. 1003 ¶¶ 149–165). We have addressed, above, the interpretation of “tie layer” and the function of Riis’s LDPE layer as one of the tie layers. Petitioner’s calculations of the loading limitation based on both the EAA and LDPE layers as the tie layer result in a loading within the claimed range. *Id.* at 42 (“loading” is “represented by the sum of the ‘loading’ of the two layers” of EAA and LDPE). We find Dr. Spontak’s testimony to be credible with respect to these calculations because the calculations are well explained and well supported by evidence. Ex. 1003 ¶¶ 149–159 (citing, *inter alia*, Ex. 1001, Ex. 1004, Ex. 1005, Ex. 1011, Ex. 1012). Based on the information presented by Petitioner, which is supported by the explanation and calculations of Dr. Spontak, we are persuaded that Petitioner has demonstrated by a preponderance of the evidence that it has made its case as to this limitation.

g. Coextrusion Layer

Patent Owner argues that, based on its premise that the LDPE layer is “primarily serving as a bulk layer,” the “coextrusion layer including the .17 mil EAA ‘tie’ layer, the .65 mil LDPE ‘bulk’ layer, and the .43 mil COC ‘contact’ layer fails to disclose ‘a coextrusion layer **consisting of** [a] tie layer[] and . . . [a] contact layer.’” PO Resp. 12.

We have addressed, above, the interpretation of “tie layer” and the function of Riis’s LDPE layer as one of the tie layers. Given that the LDPE layer can and does serve as a tie layer in Riis, Petitioner’s inclusion of the LDPE layer in this argument about the coextrusion layer is proper and supported. Based on the information presented in the Petition, which is supported by the explanation of Petitioner’s declarant, we are persuaded that Petitioner has demonstrated by a preponderance of the evidence that it has made its case as to this limitation.

h. Additional Challenged Claims and Limitations

Petitioner contends that the additional limitations of claims 4–13 are taught or suggested by Riis. Pet. 48–53. Patent Owner presents arguments for the patentability of claims 4–13, but those arguments are derivative of and referential to Patent Owner’s arguments for patentability of claim 1. *See* PO Resp. 66–69. We have reviewed the arguments and evidence presented by Petitioner, and we find that Riis teaches or suggests the additional limitations of claims 4–13, and we find that a person of ordinary skill in the art would have been motivated to make any required modifications in the manner asserted by Petitioner with a reasonable expectation of success. Pet. 48–53; Ex. 1003 ¶¶ 171–210. For the same reasons set forth above for independent claim 1, we determine that Petitioner has met its burden of

proof for the disputed limitations of the remaining challenged claims, whether expressly recited in independent claim 13 or incorporated by reference into the dependent claims. *See* 35 U.S.C. 112(d) (“A claim in dependent form shall be construed to incorporate by reference all the limitations of the claim to which it refers.”). Therefore, based on the full record developed during the trial, we determine that Petitioner has met its burden to demonstrate unpatentability of the challenged claims.

F. Asserted Obviousness of Original Claims 1 and 4–13 based on Riis, Wypych, and Tatarka (Ground 3)

1. Wypych (Ex. 1005)

Wypych is titled “Handbook of Polymers” and includes information of interest to the plastics industry and other industries, and information on polymeric materials, such as the properties of COC, EAA, and LDPE. Ex. 1005, 4–12, 20–25.

2. Tatarka (Ex. 1008)

Tatarka is titled “Melt Blends of Amorphous Cycloolefin Polymers and Partially Crystalline Cycloolefin Elastomers with Improved Toughness,” and is directed to a “melt-blend resin composition prepared by melt-blending.” Ex. 1008, codes (54), (57). A preferred embodiment “is directed to melt blends of norbornene/ethylene resins which provides an improved property profile; especially improved toughness.” *Id.* at 1:20–23.

3. Analysis

Petitioner presents arguments identifying where it believes every element of claim 1 is found in the combination of Riis, Wypych, and Tatarka, including reasons to combine those elements of the prior art with a reasonable expectation of success. Pet. 53–64. Petitioner relies in large part on its arguments for Ground 2, obviousness based on Riis alone, but adds

reasoning for certain limitations based on Wypych. *Id.* at 59–62. More particularly, Petitioner argues that the limitation “wherein the tie layer, or the one or more layers of the tie layer, has a loading in the range of 7 to 20 g/m²” would have been obvious over Riis in view of Wypych, which is a polymer handbook that provides relevant material properties. *Id.* at 59. A POSITA “would have known that polymers disclosed by Riis have known properties and processing parameters and such polymers come from commercial suppliers,” “would have also recognized that Wypych, as a Handbook of Polymers, provides relevant polymer data for use in practical problem solving,” and “would have had a reasonable expectation of success of arriving at the claimed invention.” *Id.* at 63–64 (citing Ex. 1003 ¶¶ 237–238, 240).

Petitioner also alleges that the subject matter of claims 4–13 is rendered obvious by Riis, Wypych, and Tatarka. Pet. 67–71. Petitioner’s allegations for independent claim 13 are based largely on its arguments for independent claim 1. *Compare* Pet. 53–64 *with id.* at 71.

Patent Owner disputes Petitioner’s contentions. *See* PO Resp. 69–75. Patent Owner argues that because “the addition of Wypych and Tatarka does not alter the 35 U.S.C. 103 analysis” based on Riis alone, “it follows that Riis, Wypych, Tatarka, or any combination thereof similarly fails to render obvious claims 1 through 13 of the ’624 Patent.” *Id.* at 70. More particularly, Patent Owner argues: (a) Riis, Wypych, and Tatarka — alone or in any combination — fail to teach or suggest a “coextrusion layer consisting of [a] tie layer [that] . . . has a loading in the range of 7 to 20 g/m²”; (b) Riis, Wypych, and Tatarka — alone or in any combination — fail to teach or suggest “a coextrusion layer consisting of [a] tie layer[] and . . .

[a] contact layer,” as recited in independent claims 1 and 13; (c) Petitioner fails to provide any arguments supporting modifying (and of a motivation to modify) the recreation of the eight-layer film disclosed in example 5 of Riis (in view of Wypych and/or Tatarka); (d) Petitioner’s failure to set forth any arguments in support of modifying (and of a motivation to modify) the recreation of the eight-layer film disclosed in example 5 of Riis precludes Petitioner from providing any arguments in support of modifying the recreated eight-layer film in its Reply; and (e) the .65 mil LDPE layer in the coextrusion layer of the unmodified eight-layer film disclosed in example 5 of Riis primarily serves the purpose of a bulk layer and, thus, the unmodified recreation of the eight-layer film fails to disclose the aggressive chemical-resistant film claimed in the ’624 Patent. PO Resp. 70–74. These arguments each refer back to Patent Owner’s arguments based on Riis alone (Ground 2), and generally mirror those arguments.

We have reviewed the information Petitioner provides, including Petitioner’s arguments and evidence, and determine that Petitioner has established by a preponderance of the evidence that the combination of Riis, Wypych, and Tatarka (if needed) would have rendered obvious claims 1 and 4–13. Petitioner identifies every element of claim 1 in its combination of Riis, Wypych, and Tatarka, and explains reasons to combine those elements with a reasonable expectation of success. Pet. 54–64 (relying on Ex. 1003 ¶¶ 212–240). Petitioner relies in large part on its arguments for Ground 2, obviousness based on Riis alone, but adds reasoning for certain limitations based on Wypych. *Id.* at 60–64.

Regarding Patent Owner’s argument that “Petitioner fails to provide any arguments supporting modifying (and of a motivation to modify) the recreation of the eight-layer film disclosed in example 5 of Riis (in view of Wypych and/or Tatarka)” (PO Resp. 71), we note that the Petition’s section titled “Motivation to Combine and Reasonable Likelihood of Success” explains Petitioner’s support for why, in view of Riis’s Example 5, “a skilled artisan would have been motivated to look to Wypych to learn more about the properties and characteristics of exemplary polymers and to identify suitable commercial sources to obtain polymers for a desired film attribute.” Pet. 62–63 (citing Ex. 1003 ¶ 235). “In view of Riis’s disclosure of polymers used to make the film of Example 5 and Wypych’s teachings of relevant polymer properties, commercial sources, and processing parameters, a POSITA would have had a reasonable expectation of success of arriving at the claimed invention.” *Id.* at 63–64 (citing Ex. 1003 ¶ 240). Referring back to its Ground 2 arguments, Petitioner also argues that a POSITA “would have been motivated to follow Riis’s Example 5 to arrive at the claimed inventive film and would have had a reasonable expectation of success in doing so.” *Id.* at 63 (citing Ex. 1003 ¶ 236). Petitioner provides additional reasoning for its motivation to combine and reasonable expectation of success for other claims challenged under this ground. *See, e.g., id.* at 67–71. We find Petitioner’s arguments to be amply present in the Petition, and also supported by the evidence of record. Accordingly, we also disagree with Patent Owner’s contention that the motivation to combine arguments is missing. Additionally, by arguing that “the addition of Wypych and Tatarka does not alter the 35 U.S.C. 103 analysis” based on Riis alone, and that “it follows that Riis, Wypych, Tatarka, or any

combination thereof, similarly fails to render obvious claims 1 through 13 of the '624 Patent" (PO Resp. 70), Patent Owner signals that its arguments for this Ground 3 are coextensive with those already presented in Ground 2, concerning obviousness based on Riis alone, which we have already addressed.

III. PATENT OWNER'S REVISED MOTION TO AMEND

Pursuant to 35 U.S.C. § 326(d) and 37 C.F.R. § 42.221, Patent Owner filed a contingent Revised Motion to Amend stating that if claims 1 and 4–13 are found unpatentable, Patent Owner "requests that the Board grant this Motion," and issue the corresponding substitute claims 14–24. RMTA 1. The Revised Motion to Amend also requests cancellation of claims 2 and 3 prior to rendering our decision. *See id.* Because we are cancelling claims 2 and 3 in accordance with Patent Owner's request, and because we determine, as explained above, that Petitioner has shown by a preponderance of the evidence that original claims 1 and 4–13 of the '624 patent would have been unpatentable, we proceed to address Patent Owner's Revised Motion to Amend. Patent Owner proposes substitute claims 14–24 to replace challenged patent claims 1 and 4–13; a copy of proposed substitute claims 14–24 is provided by Patent Owner in the Claims Appendix of the Motion. *Id.* at 26–30 ("RMTA Claims App.").

For the reasons discussed below, Patent Owner has shown that proposed substitute claims 14–24 meet the statutory and regulatory requirements set forth in 35 U.S.C. § 326(d) and 37 C.F.R. § 42.221. For the reasons discussed below, however, Petitioner has proven by a preponderance of the evidence that proposed substitute claims 14–24 are unpatentable over prior art. Therefore, although we grant the Revised

Motion to Amend as to cancelling original claims 2 and 3, we deny the Revised Motion to Amend as to adding proposed substitute claims 14–24 to the '624 patent.

A. Principles of Law

In a post-grant review, amended claims are not added to a patent as of right, but rather must be proposed as a part of a motion to amend claims. 35 U.S.C. § 326(d). Ordinarily, the petitioner “bears the burden of persuasion to show, by a preponderance of the evidence, that any proposed substitute claims are unpatentable.” 37 C.F.R. § 42.221(d)(2); *Lectrosonics, Inc. v. Zaxcon, Inc.*, IPR2018-01129 Paper 15, 3–4 (PTAB Feb. 25, 2019) (precedential). “Before considering the patentability of any substitute claims, however, the Board first must determine whether the motion to amend meets the statutory and regulatory requirements set forth in 35 U.S.C. § 316(d) and 37 C.F.R. § 42.121.” *See Lectrosonics*, Paper 15 at 4 (in post-grant review proceedings, 35 U.S.C. § 316(d) has a counterpart in 35 U.S.C. § 326(d), and 37 C.F.R. § 42.121 has a counterpart in 37 C.F.R. § 42.221); *see also Notice Regarding a New Pilot Program Concerning Motion to Amend Practice and Procedures in Trial Proceedings under the America Invents Act before the Patent Trial and Appeal Board*, 84 Fed. Reg. 9,497 (Mar. 15, 2019).

Patent Owner bears the burden of persuasion to show, by a preponderance of the evidence, that the Motion meets those requirements. 37 C.F.R. § 42.221(d)(1). In that regard, Patent Owner bears the burden of persuasion to show that: (1) the amendment proposes a reasonable number of substitute claims; (2) the amendment responds to a ground of unpatentability involved in the trial; (3) the amendment does not seek to

enlarge the scope of the claims of the patent or introduce new subject matter; and (4) the original disclosure sets forth written description support for each proposed substitute claim. 35 U.S.C. § 326(d); 37 C.F.R. § 42.221(d)(1).

A motion to amend “may not enlarge the scope of the claims of the patent or introduce new matter.” 35 U.S.C. § 326(d)(3). New subject matter is any addition to the claims that lacks sufficient support in the subject patent’s original disclosure. *See TurboCare Div. of Demag Delaval Turbomach. Corp. v. Gen. Elec. Co.*, 264 F.3d 1111, 1118 (Fed. Cir. 2001) (“When the applicant adds a claim, [the new claim] must find support in the original specification.”). Corresponding Rule 42.221 requires a motion to amend to “set forth: (1) The support in the original disclosure of the patent for each claim that is added or amended; and (2) The support in an earlier-filed disclosure for each claim for which benefit of the filing date of the earlier filed disclosure is sought.” 37 C.F.R. § 42.221(b). A motion to amend may be denied where the “amendment seeks to enlarge the scope of the claims of the patent or introduce new subject matter.” 37 C.F.R. § 42.221(a)(2)(ii).

Sufficiency of a specification’s written description is a fact question, and “the test for sufficiency is whether the disclosure of the application relied upon reasonably conveys to those skilled in the art that the inventor had possession of the claimed subject matter as of the filing date.” *Ariad Pharm., Inc. v. Eli Lilly & Co.*, 598 F.3d 1336, 1351 (Fed. Cir. 2010) (en banc). “And while the description requirement does not demand any particular form of disclosure, or that the specification recite the claimed invention *in haec verba*, a description that merely renders the invention

obvious does not satisfy the requirement.” *Id.* at 1352 (internal citations omitted).

When an explicit limitation in a claim “is not present in the written description whose benefit is sought it must be shown that a person of ordinary skill would have understood, at the time the patent application was filed, that the description requires that limitation.” *Hyatt v. Boone*, 146 F.3d 1348, 1353 (Fed. Cir. 1998). In other words, where the written description fails to disclose an element explicitly, “the applicant must show that any absent text is necessarily comprehended in the description provided and would have been so understood at the time the patent application was filed.” *Id.* at 1354–55.

B. The Proposed Substitute Claims

Patent Owner proposes to amend the ’624 patent by adding new claims 14–24 as respective substitutes for original claims 1 and 4–13. *See* RMTA 1; *see also* RMTA Claims App. Claim 14 is proposed as a substitute for original independent claim 1. RMTA Claims App. Claims 15–23 depend directly or indirectly from claim 14, and are proposed as substitutes for original claims 4–12, respectively. *Id.* Claim 24 is proposed as a substitute for original independent claim 13. *Id.*

Claim 14 is reproduced above.

Claim 15 is a proposed substitute for claim 4 and changes the dependency to claim 14.

Claim 16 is a proposed substitute for claim 5 and changes the dependency to claim 14, and also adds the limitation, wherein a loading of

the first layer of the tie layer is in the range of 1 to 14 g/m² and a loading of the second layer of the tie layer is in the range of 1 to 14 g/m².¹¹

Claim 17 is a proposed substitute for claim 6 and changes the dependency to claim 14, as well as clarifies that the entirety of the tie layer is in the range of 7 to 20 g/m², and also adds the limitation, wherein the first layer of the tie layer is adjacent to the base layer, wherein the second layer of the tie layer is adjacent to the first layer and the contact layer, and wherein a loading of the first layer of the tie layer is in the range of 5 to 19 g/m² and a loading of the second layer of the tie layer is in the range of 1 to 14 g/m².

Claim 18 is a proposed substitute for claim 7 and changes the dependency to claim 14, as well as clarifies that the plurality of layers consist[] of the first layer of the tie layer and the second layer of the tie layer, and that both the first and second tie layer have a loading in the range of 7 to 20 g/m².

Claim 19 is a proposed substitute for claim 8 and changes the dependency to claim 14, and also adds the limitation, the aggressive chemical-resistant film is resistant to the chemical based at least in part on allowing less than 10% of the chemical to migrate into the aggressive chemical-resistant film.

Claim 20 is a proposed substitute for claim 9 and changes the dependency to claim 14.

¹¹ In amending patent claims, language added is underlined and language deleted is struck through.

Claim 21 is a proposed substitute for claim 10 and changes the dependency to claim 14, as well as changes ~~one or more layers~~ to first layer of the tie layer and second layer.

Claim 22 is a proposed substitute for claim 11 and changes the dependency to claim 14, as well as changes ~~one or more layers~~ to first layer of the tie layer and the second layer, and adds the limitation the chemical is provided in a first patch, and the aggressive chemical-resistant film is resistant to the chemical based at least in part on allowing 90% to 110% of the chemical in the first patch to migrate into a first pouch formed by the aggressive chemical-resistant film relative to an amount of the chemical in a second patch allowed to migrate into a second pouch formed by a second film comprising a contact layer that comprises polyacrylonitrile.

Claim 23 is a proposed substitute for claim 12 and changes the dependency to claim 22.

Independent claim 24 is reproduced above.

C. Statutory and Regulatory Requirements

1. Reasonable Number of Substitute Claims

A motion to amend must “propose a reasonable number of substitute claims.” 35 U.S.C. § 326(d)(1)(B); *see also* 37 C.F.R. § 42.221(a)(3) (“A motion to amend may cancel a challenged claim or propose a reasonable number of substitute claims.”). “There is a rebuttable presumption that a reasonable number of substitute claims per challenged claim is one (1) substitute claim.” *Lectrosonics*, Paper 15 at 4; *see also* 37 C.F.R. § 42.221(a)(3). Patent Owner proposes no more than one substitute claim for each challenged claim. RMTA 1–2, RMTA Claims App. In particular, Patent Owner moves to: (i) cancel claims 2 and 3 and (ii) enter claims 14–

24 as substitutes for claims 1 and 4–13. *Id.* In other words, Patent Owner proposes to replace two independent claims and nine dependent claims with two independent claims and nine dependent claims. Petitioner does not contend that Patent Owner proposes more than a reasonable number of substitute claims. *See generally* RMTA Opp. We determine that Patent Owner proposes a reasonable number of substitute claims.

2. *Support in the Original Disclosure*

An amendment may not introduce new matter. 35 U.S.C. § 326(d)(3); 37 C.F.R. §§ 42.221(b)(1), 42.221(b)(2). New subject matter is any addition to the claims that lacks sufficient support in the subject patent’s original disclosure. *See TurboCare*, 264 F.3d at 1118 (“When [an] applicant adds a claim . . . , the new claim[] must find support in the original specification.”). Patent Owner also is required to show written description support in “the original disclosure of the patent for each claim that is . . . amended,” and in “an earlier-filed disclosure for each claim for which benefit of the filing date of the earlier filed disclosure is sought.” 37 C.F.R. § 42.221(b).

According to Patent Owner, the original disclosure of the ’624 patent corresponds to U.S. Patent App. 16/835,018 (“the ’018 application”). RMTA 2 (citing Ex. 1002). Patent Owner asserts that the ’018 application is a continuation of U.S. Patent App. 15/780,999, which is a 35 U.S.C. § 371 national stage application of Int’l App. PCT/EP2016/082876, and claims benefit to EP App. 15202962.5. *Id.* (citing Ex. 2012). Having considered the original disclosure of the ’624 patent and the disclosure in the priority applications, we find Patent Owner has sufficiently set forth adequate written description support for proposed substitute claims 14–24, and does not introduce new matter. Petitioner does not argue otherwise. *See*

generally RMTA Opp. Accordingly, we determine that Patent Owner has shown that the proposed substitute claims meet the statutory and regulatory requirements set forth in 35 U.S.C. § 326(d) and 37 C.F.R. § 42.221.

3. Respond to a Ground of Unpatentability

“A motion to amend may be denied where . . . [t]he amendment does not respond to a ground of unpatentability involved in the trial.” 37 C.F.R. § 42.221(a)(2)(i). The Petition asserts that challenged claims 1–13 are unpatentable over prior art. Through the Revised Motion to Amend, Patent Owner seeks to change the substantive features of the challenged claims by substituting new claims. “A revised MTA includes one or more new proposed substitute claims in place of previously presented substitute claims, and may provide new arguments and/or evidence as to why the revised MTA meets statutory and regulatory requirements for an MTA.” 84 Fed. Reg. at 9501. At least one amendment presented is responsive to a ground of unpatentability, in that Patent Owner seeks to “introduce features that add additional distinguishing features that are not rendered obvious by the asserted references.” *See* RMTA 8. Petitioner does not argue otherwise. *See generally* RMTA Opp. Because the amendments attempt to distinguish over at least Riis, we determine that the proposed amendments are responsive to a ground of unpatentability involved in this trial.

4. Scope of the Claims

An amendment may not enlarge the scope of the claims of the patent. 35 U.S.C. § 326(d)(3); 37 C.F.R. § 42.221(a)(2)(ii). Patent Owner asserts that the proposed substitute claims do not enlarge the scope of the challenged claims. RMTA 7–8. Petitioner does not contend that any proposed substitute claim enlarges the scope of any challenged patent claim.

See generally RMTA Opp. We determine that each proposed substitute claim includes narrowing limitations and does not violate the statutory and regulatory prohibition of enlarging the scope of patent claims.

D. Petitioner’s Assertions of Unpatentability

Petitioner contends that the proposed substitute claims are unpatentable under 35 U.S.C. § 103 based on three grounds. RMTA Opp. 1–25. First, Petitioner contends that substitute claims 14, 15, and 20–24 would have been obvious over Riis (Ex. 1004) and Wypych (Ex. 1005). *Id.* at 1–7. Petitioner also contends that substitute claims 16–18 would have been obvious over Riis, Wypych, and Holzmuller (Ex. 1034). *Id.* at 7–24. Finally, Petitioner contends that claim 19 would have been obvious over Riis, Wypych, and Rivers (Ex. 1035). *Id.* at 24–25.

1. Asserted Obviousness of Claims 14, 15, and 20–24 Based on Riis and Wypych

a. Claim 14

i. wherein the base layer consists of aluminum

Proposed substitute claim 14 changes “comprises aluminum” to “consists of aluminum” (or changes “comprising” to “consisting of”) for each of the three occurrences of this recitation. Petitioner asserts:

The limitations for amended substitute claim 14 not addressed specifically below have been previously argued by Petitioner and are rendered obvious by Riis in view of Wypych. *See* Opp. MTA 8–11 (addressing “a base layer consisting of aluminum”); *see also* Prelim. Guidance 9–10 (finding “a base layer consisting of aluminum” to be met by *Riis* at the preliminary stage)).

RMTA Opp. 2

In the Opposition to the original Motion to Amend, Petitioner argued that “Patent Owner’s interpretation of *Riis* is limited to Example 5,” but

that “interpretation is flawed,” because “Riis teaches ‘a flexible, multilayer packaging film suitable for packaging an article . . . such as transdermal drug delivery patches’ that includes multiple layers, including a barrier layer that is preferably an oxygen and moisture barrier.”

Opp. 8–9 (citing Ex. 1004 ¶¶ 12, 58–63). Petitioner also argued that “Riis further teaches that the barrier layer may be made of ‘any suitable material,’ including aluminum foil.” *Id.* at 9 (citing Ex. 1004 ¶¶ 57–59, 62, 63, 85–87, 157, 174). Petitioner further argued that “Riis discloses ‘the sealant film was a three-layer coextrusion of EAA, LDPE, and Ethylene-norbornene [cyclic olefin] copolymer (COC) which was extrusion coated *onto the aluminum foil surface* of the multilayer base film.’” *Id.* at 9–10 (citing Ex. 1004 ¶ 174). Petitioner concluded that “Patent Owner’s substitute claim 14 limitation requiring ‘coating the coextrusion layer consisting of the tie layer and the COC of the contact layer directly to the base layer consisting of the aluminum,’ is met by Riis,” and because Riis does not require any additional layers in that “Riis discloses the optional nature of such layers,” and that the layers need not have “any specific ordering,” the limitations of proposed substitute “claim 14 with respect to a base layer consisting of aluminum foil are rendered obvious.” *Id.* at 10–11.

In the Preliminary Guidance, we agreed with Petitioner. Preliminary Guidance 9–10. Here, too, we agree that Riis discloses that Figure 1 depicts multilayer film 10 that “may have any number of one or more layers and that the six-layered film depicted in FIG. 1 is shown for purposes of example.” Ex. 1004 ¶ 135. As noted by Petitioner’s expert,

an ordinary artisan “would understand that Riis discloses the optional nature of the exterior protective layer and associated adhesive layer” and thus “would understand that Riis discloses leaving off the exterior protective layer and second intermediate adhesive layer from the film [], leaving only a film consisting of a barrier layer consisting of aluminum foil and a three-layer coextrusion of LDPE and EAA tie layers and a COC contact layer.” Ex. 1037 ¶¶ 88–89.

ii. first and second tie layer

Petitioner contends that proposed substitute claim 14 requires “the coextrusion layer to include a tie layer having a first layer and a second layer.” RMTA Opp. 1 (citing RMTA 17–18). According to Petitioner, “Riis discloses an exemplary film having a tie layer made with two individual layers, the first being EAA and the second being LDPE.” *Id.* at 2 (citing Pet. 40 (quoting Ex. 1004 ¶ 174; Ex. 1003 ¶¶ 149, 154)). Petitioner contends that because Riis uses “a three-layer coextrusion with EAA and LDPE combined with COC as a ‘sealant film,’ which is adhered to an aluminum barrier layer of a base film to form a multilayer film or laminate,” a “POSITA would understand the LDPE layer of Riis to meet the claimed tie layer for providing sufficient adhesion to promote adherence of adjacent layers in a multilayer film.” *Id.* (citing Pet. 31–45, 53–64 (quoting Ex. 1004 ¶¶ 159–62, 173–74); Reply 4–16; Ex. 1004 ¶¶ 69, 71, 74). Petitioner thus contends that “Riis provides a sealant film as the claimed coextrusion layer, with EAA as a first layer of the tie layer and LDPE as a second layer of the tie layer, and COC being the contact layer.” RMTA Opp. 2.

Patent Owner contends that Riis “discloses that the .65 mil LDPE layer in Riis’s Film primarily serves as a bulk layer and does not serve as a

tie layer.” RMTA Reply 1 (citing Ex. 1004 ¶¶ 65, 71; Ex. 2014 ¶¶ 83, 91–95, 100; Ex. 2015, 83:9–22; Ex. 2016 ¶ 151; Ex. 1036, 196). Patent Owner asserts that although Petitioner contends that Riis’s 0.65 mil LDPE layer is a tie layer, Petitioner has taken contrary positions before the Office. *Id.* In particular, Patent Owner asserts that in prosecuting one of Petitioner’s own applications, Petitioner identified a polyolefin film such as PE or LLDPE as a bulk layer. *Id.* at 1–2 (citing Ex. 2006, 12:11–12) (noting that Ex. 2006 (Osborn) “provides priority for Riis and reproduces much of Riis’s disclosure”). Patent Owner contends that although Petitioner’s declarant asserts that Riis’s 0.65 LDPE layer is a tie layer, this assertion is contrary to the statements of Petitioner’s own inventor, Manuella Herb, that “the bond between the regular LDPE layer and a COC layer weak such that the COC layer ‘*more or less easily delaminates* or can be peeled off from the neighboring LDPE layer.”” *Id.* at 3–4 (citing Ex. 2019 ¶ 10).

Petitioner responds that Patent Owner presents new arguments and that “the Board should deny Patent Owner’s RMTA” in part because Patent Owner’s arguments are “addressed by briefing outside of the motion to amend.” RMTA Sur-Reply 3. Petitioner contends, nonetheless, there is no evidence that “Petitioner has represented Riis’s LDPE layer to be a bulk layer, exclusive of a tie layer.” *Id.* at 4. Petitioner contends, moreover, that any discussion of Osborn, including Dr. Herb’s assertions, is with respect to an LLDPE layer, whereas Riis discloses an LDPE layer, and “Riis makes clear that such layers ‘can serve as an adhesive or tie layer.’” *Id.* at 5–9 (citing Ex. 1004 ¶ 135).

As discussed *supra* in connection with the claim 1 limitation discussing a “tie layer,” Petitioner has established by a preponderance of the

evidence that Riis discloses a tie layer having a first layer (EEA) and a second layer (LDPE), and that the tie layer has a loading in a range of 7 to 20 g/m². *See* Pet. 40–43. Even if we consider the newly-relied-upon declaration as properly presented evidence, we are not persuaded that it supports Patent Owner’s assertions. Dr. Herb’s statements about Osborn’s layers were made in the context of a different application and a different proceeding, and Patent Owner’s extension of those statements to the present proceedings fall short, because of the many unreconcilable differences between the two proceedings. We agree with Petitioner that even if Petitioner did contend that a layer of Osborn is a bulk layer in the other proceeding, the assertion of unpatentability set forth by Petitioner here is based on Riis, not Osborn. Riis explicitly discloses that the “interior, exterior, intermediate or tie layers may be formed of any suitable thermoplastic materials,” including “LDPE.” Ex. 1004 ¶ 74. Given this explicit disclosure, and Petitioner’s additional arguments and evidence discussed herein, a preponderance of the evidence supports Petitioner’s assertion that Riis’s identified LDPE layer is a tie layer.

b. Claims 15 and 20–23

Substitute claims 15 and 20–23 depend from claim 14. RMTA Claims App. 27–29. Petitioner asserts that the subject matter of claims 15 and 20–23 would have been obvious over Riis and Wypych, and provides a detailed analysis of each of these claims with argument and evidence in support thereof. RMTA Opp. 2–6. Patent Owner does not raise any arguments specifically directed to claims 15 and 20–23 aside from the arguments Patent Owner directs to claim 14. *See* RMTA Reply 6. For the same reasons explained above in our discussion of claim 14, we determine

that Petitioner has shown by a preponderance of the evidence that the combination of Riis and Wypych teaches each limitation of claims 15 and 20–23. We adopt Petitioner’s arguments and cited evidence as to these claims and limitations as our own determination and basis. *See* RMTA Opp. 2–6.

c. Claim 24

As discussed above, substitute claim 24 is substantially the same as substitute claim 14, and Patent Owner does not raise any arguments specifically directed to claim 24 aside from the arguments Patent Owner directs to claim 14. *See* RMTA Reply 6. Thus, for the same reasons set forth above as to claim 14, we conclude that Petitioner has shown, by a preponderance of the evidence, that the limitations of proposed substitute claim 24 are rendered obvious by the combination of Riis and Wypych.

2. Asserted Obviousness of Claims 16–18 Based on Riis, Wypych, and Holzmuller

i. Claim 16

Petitioner contends that proposed substitute claim 16 requires two loading ranges, a first loading for the entirety of the tie layer that is between 7 and 20 g/m² and a second loading for each of the first layer and the second layer of the tie layer that is within a range of 1–14 g/m². RMTA Opp. 7 (citing RMTA Claims App. 27). Petitioner contends that although Riis’s EAA layer “falls within the claimed 1–14 g/m² range,” the LDPE layer “falls just outside of the claimed 14 g/m² upper bound of the loading range of the second layer.” *Id.* (citing RMTA 19).

According to Petitioner, a POSITA would have found it “obvious to modify Riis’s films with Holzmuller to optimize the interacting thicknesses

of the layers of the tie layer to prevent undesirable lamination, provide both mechanical and chemical stability, have a high tear resistance, and a high level of diffusion resistance which can be achieved through routine experimentation.” *Id.* at 7–8 (citing Ex. 1038 ¶¶ 87–88). Petitioner contends that Holzmuller “teaches the advantages of utilizing various thicknesses for intermediate bonding layers,” including the tie layer materials disclosed by Riis, to provide “improved barrier properties as well as optimized mechanical and chemical properties.” *Id.* at 8 (citing Ex. 1034 ¶¶ 18–20, 23). Petitioner contends that using Dr. Spontak’s conversion calculations, “Holzmuller teaches loading ranges of LDPE from 4.6–130.1 g/m²” and “teaches loading ranges from 4.6–134.4 g/m²” for EAA. *Id.* at 8–9 (citing Ex. 1038 ¶¶ 91–97).

Petitioner contends that because Riis teaches “a wide range of possible thicknesses that can be used for layers,” and because “Holzmuller teaches the need to balance materials and thicknesses of intermediate bonding layers,” a POSITA would have optimized “the thicknesses, and thus the loadings, of the intermediate bonding layers as applied to Riis’s LDPE and EAA tie layers to achieve desired properties of the multilayered intermediate tie layers disclosed in Holzmuller.” *Id.* at 9–10 (citing Ex. 1038 ¶¶ 98–101). According to Petitioner, because Riis and Holzmuller both relate to “multilayer films exposed to chemicals that may leach through the film laminate,” and because their films are “structurally, functionally, and polymerically similar,” a “skilled artisan would look to Holzmuller for its disclosure of the intermediate bonding layers and have a reasonable expectation of success in implementing different layer thicknesses.” *Id.* at 12–13 (citing Ex. 1038 ¶¶ 100–103).

Patent Owner asserts that an ordinary artisan “would be discouraged from increasing the .17 mil EAA layer’s thickness” because “doing so would compromise the delamination strength of Riis’s Film.” RMTA Reply 7. Patent Owner similarly contends that an ordinary artisan “would be discouraged from decreasing the .65 mil LDPE layer’s thickness to meet the claimed loading ranges” because “doing so would compromise the structure, heat sealability, and barrier properties of Riis’s Film.” *Id.* (citing Ex. 2022 ¶ 85). We disagree.

Patent Owner’s declarant Dr. McCarthy’s testimony as to the delamination strength of Riis’s film relies on paragraph 71 of Riis. Ex. 2014 ¶¶ 153–154 (first declaration); *see also* Ex. 2022 ¶¶ 84–85 (third declaration). There, Riis discloses “one or more adhesive layers, also known in the art as ‘tie layers,’ which can be selected to promote the adherence of adjacent layers to one another in a multilayer film and prevent undesirable delamination.” Ex. 1004 ¶ 71. Riis discloses that a “multifunctional layer is preferably formulated to aid in the adherence of one layer to another layer without the need of using separate adhesives.” *Id.* Riis further discloses that “[a]dhesive resins are often more expensive than other polymers so the tie layer thickness is usually kept to a minimum consistent with the desired effect.” *Id.* Based on this disclosure, tie layers are used to prevent delamination, and if the thickness is minimized, it is often to reduce cost, not necessarily only to prevent delamination. *Id.*

As to the thickness of the LDPE layer, Dr. McCarthy’s testimony relies on Dr. Spontak’s deposition testimony, in which Dr. Spontak opines that the thickness of a bulk layer “depends on how you want to use this layer.” Ex. 2015, 83:16–17. “[I]f you wanted to contribute to machinability,

mechanical properties, et cetera, then you might want it to be slightly thicker.” *Id.* at 83:17–19. “If you want it to be used in concert with another adhesive like EAA, then you probably want it to be on the thinner side.” *Id.* at 83:20–22. Thus, contrary to Dr. McCarthy’s assertions, Dr. Spontak does not discourage decreasing the LDPE thickness. Rather, we find credible Dr. Spontak’s testimony that Holzmuller teaches that “varying the thicknesses of intermediate bonding layers would produce an additive effect, yielding multiple positive benefits for the end laminate or film, including ‘high mechanical stability and high chemical stability.’” Ex. 1038 ¶ 88 (citing Ex. 1034 ¶ 20); *see also id.* ¶ 98. We also find credible Dr. Spontak’s testimony that Holzmuller teaches varying the thicknesses of intermediate bonding layers, and also “provides ‘a high degree of stretchability combined at the same time with high tear resistance, a high level of resistance to diffusion and the possibility of achieving good drive [and] good haptic properties.’” *Id.* (citing Ex. 1034 ¶ 20). Understanding that Holzmuller teaches varying the thickness to obtain an “additive effect yielding multiple positive benefits” (Ex. 1038 ¶ 88), a preponderance of the evidence supports Petitioner’s contention that an ordinary artisan would have optimized “the thicknesses, and thus the loadings, of the intermediate bonding layers as applied to Riis’s LDPE and EAA tie layers to achieve desired properties of the multilayered intermediate tie layers disclosed in Holzmuller.” RMTA Opp. 10 (citing Ex. 1038 ¶¶ 98–101).

Patent Owner also contends that Petitioner acknowledges that Riis does not disclose the claimed ranges, and that Holzmuller fails to remedy the deficiencies of Riis. RMTA Reply 8–9. Specifically, Patent Owner contends that “Petitioner’s combination of Riis and Holzmuller relies on

the .65 mil LDPE layer being a tie layer to have compatibility with the intermediate bonding layers in Holzmuller,” but “the .65 mil LDPE layer is not a tie layer.” *Id.* at 9 (citing Ex. 2022 ¶¶ 95–101). We disagree. As discussed *supra*, Riis explicitly discloses that “tie layers may be formed of any suitable thermoplastic materials, for example, polyamides, polystyrenes, styrenic copolymers e.g. styrene-butadiene copolymer, polyolefins, and in particular members of the polyethylene family such as LLDPE, VLDPE, HDPE, LDPE.” Ex. 1004 ¶ 74. We have also discussed *supra* why we are persuaded by this disclosure and by Petitioner’s additional arguments and evidence supporting that Riis’s .65 mil LDPE layer is a tie layer.

Patent Owner also contends that because Riis’s film “represents an end point of experimentation,” an ordinary artisan “would not begin experimentation anew with Riis’s Film, haphazardly modifying thicknesses in view of Holzmuller’s thickness ranges.” RMTA Reply 10. Petitioner responds that Patent Owner’s argument “is a ‘backwards approach’” because “Patent Owner’s argument is that a POSITA would never seek to modify an exemplary embodiment.” RMTA Sur-Reply 11. We agree with Petitioner. Riis’s Example 5 is just that, an example. Riis discloses various layers formed from “suitable thermoplastic materials” and having a range of thicknesses. *See* Ex. 1004 ¶¶ 70–74. Given that Riis discloses what an adhesive layer “may suitably be” within a range, and Holzmuller discloses optimizing thicknesses of intermediate bonding layers, an ordinary artisan would have sufficient reason to modify Riis’s thicknesses in view of Holzmuller’s thickness ranges.

Patent Owner contends that “a POSITA would not have a reasonable expectation of success in modifying or combining Riis’s Film with

Holzmuller.” RMTA Reply 10. According to Patent Owner, Holzmuller does not teach that “modifying *the thicknesses* of bonding layers results in synergistic effects,” but rather, “polymer materials may be blended to form intermediate bonding layers having high mechanical and chemical stability.” *Id.* at 11 (citing Ex. 2022 ¶¶ 109–114). Patent Owner contends, moreover, that there is no evidence “that layer thicknesses achieved for the intermediate bonding layers in Holzmuller using joint extrusion techniques can simply be applied to the .17 mil EAA and .65 mil LDPE layer in Riis formed using three-layer coextrusion techniques.” *Id.* (citing Ex. 2022 ¶¶ 35–37, 104–108). We disagree.

As Petitioner correctly notes, Holzmuller discloses that using both the “multilayered construction” and “the materials according to the invention it is possible to create layer thicknesses in the indicated thickness ranges” to “achieve a laminate thickness considerably thinner than in the prior art, the multilayered laminate simultaneously having improved barrier properties as well as optimised mechanical and chemical properties.” RMTA Sur-Reply 11–12 (citing Ex. 1034 ¶¶ 20, 23). As Petitioner further notes, Holzmuller discloses that “extrusion steps can be carried out as co-extrusion steps” and that “the layers forming the intermediate layer material are co-extruded.” *Id.* at 12 (citing Ex. 1024 ¶¶ 24, 26). Given that Holzmuller teaches that using the disclosed “thickness *ranges*” provides “optimised mechanical and chemical properties,” and that the layers can be formed by “co-extrusion,” a preponderance of the evidence supports Petitioner’s contention that an ordinary artisan “would look to Holzmuller for its disclosure of the intermediate bonding layers and have a reasonable

expectation of success in implementing different layer thicknesses.” RMTA Opp. 13.

Patent Owner lastly contends that the criticality of the tie loading ranges is evidenced by Petitioner’s submission in another proceeding “that (as late as July 24, 2018) it would have been unexpected for a film structure like Riis’s Film (i.e., including a coextrusion layer of ethylene acrylic acid [(EAA)] copolymer/LDPE/COC coated to an aluminum layer) to exhibit mechanical robustness.” RMTA Reply 12 (citing Ex. 2022 ¶¶ 119–122). We disagree. The submission to which Patent Owner refers is a declaration of Dr. Manuella Herb, the inventor of the patent at issue in that other proceeding. *See* Ex. 2019 ¶ 1. In the declaration, Dr. Herb declares that a “regular LDPE allows to create a multilayer structure, but the COC-layer more or less easily delaminates or can be peeled off of the neighboring regular LDPE-layer,” whereas a metallocene C8 LLDPE “increases the ties (lamination forces) between the polyethylene layer and the COC-layer.” *Id.* ¶¶ 10–11. As Petitioner correctly notes, however, “the ’624 Patent merely requires the tie layer to provide sufficient adhesion between layers in order to form the claimed multilayer film.” RMTA Sur-Reply 7–8. “Neither the Herb Declaration nor Patent Owner’s expert provides any documentary evidence that the ‘strength per length’ of LDPE in the experimental film is insufficient to provide adhesion to produce a film.” *Id.* at 8. Rather, Dr. Herb declares that a “regular LDPE allows [one] to create a multilayer structure.” Ex. 2019 ¶ 10. In addition, Petitioner’s challenge is based on a combination of Riis and Holzmuller, with Holzmuller modifying the thicknesses of Riis’s loading ranges. Patent Owner does not provide evidence that the modification to Riis would not result in a coextrusion layer

as claimed, and does not provide evidence of the asserted criticality of the tie loading ranges adequate to rebut the presumption of obviousness established by Petitioner's information regarding the overlapping ranges. *See Ormco Corp. v. Align Tech., Inc.*, 463 F.3d 1299, 1311 (Fed. Cir. 2006) ("Where a claimed range overlaps with a range disclosed in the prior art, there is a presumption of obviousness.").

ii. Claims 17 and 18

Substitute claims 17 and 18 depend from claim 14. RMTA Claims App. 27–28. Petitioner asserts that the subject matter of claims 17 and 18 would have been obvious over Riis, Wypych, and Holzmuller, and provides a detailed analysis of each of these claims with argument and evidence in support thereof. RMTA Opp. 19–24 (arguing that even with the adjusted ranges in claims 17 and 18, Holzmuller would have motivated a POSITA to tailor and optimize the loadings as applied to Riis's LDPE and EAA tie layers, and further discussing motivation to combine and reasonable expectation of success (citing Ex. 1038 ¶¶ 94–100, 118–122, 128–130, 137–139, 148–150)). Patent Owner does not raise any arguments specifically directed to claims 17 and 18 aside from the arguments Patent Owner directs to claims 14 and 16. *See* RMTA Reply 7–12. For the same reasons explained above in our discussion of claims 14 and 16, we determine that Petitioner has shown by a preponderance of the evidence that the combination of Riis, Wypych, and Holzmuller teaches each limitation of claims 17 and 18. We adopt Petitioner's arguments and cited evidence as to these claims and limitations as our own determination and basis. *See* RMTA Opp. 19–24.

3. *Asserted Obviousness of Claim 19 Based on Riis, Wypych, and Rivers*

Substitute claim 19 depends from claim 14. RMTA Claims App. 28. Petitioner asserts that the subject matter of claim 19 would have been obvious over Riis, Wypych, and Rivers and provides a detailed analysis of this claim with argument and evidence in support thereof. RMTA Opp. 24–25 (arguing that Rivers verifies the anti-scalping properties of COCs recognized by Riis, and discussing motivation to combine and reasonable expectation of success (citing Ex. 1037 ¶¶ 152–155)). Patent Owner does not raise any arguments specifically directed to claim 19 aside from the arguments Patent Owner directs to claim 14. *See generally* RMTA Reply. For the same reasons explained above in our discussion of claim 14, we determine that Petitioner has shown by a preponderance of the evidence that the combination of Riis, Wypych, and Rivers teaches each limitation of claim 19. We adopt Petitioner’s arguments and cited evidence as to claim 19 and its limitations as our own determination and basis. *See* RMTA Opp. 24–25.

4. *Conclusion as to Revised Motion to Amend*

We determine that Petitioner has met its burden of proof for the disputed limitations of the proposed substitute claims, whether expressly recited in the independent claims or incorporated by reference in the dependent claims. *See* 35 U.S.C. § 112(d) (“A claim in dependent form shall be construed to incorporate by reference all the limitations of the claim to which it refers.”). Therefore, based on the full record developed during the trial, we determine that Petitioner has met its burden to demonstrate unpatentability of the proposed substitute claims. More particularly, we

determine that Petitioner demonstrates by a preponderance of the evidence that proposed substitute claims 14–24 are obvious over Riis, Wypych, Holzmuller, and Rivers under 35 U.S.C. § 103, and, thus, we deny Patent Owner’s Revised Motion to Amend as to those substitute claims. We grant the Revised Motion to Amend as to cancellation of original claims 2 and 3.

G. Identification of Allegedly New Arguments

With Board authorization, Petitioner filed an Identification of alleged new arguments and evidence in the Reply to Opposition to Revised Motion to Amend (Paper 49), to which Patent Owner responded (Paper 50). Petitioner’s Identification identifies the new arguments as “Paper 41, page 1, line 1 – page 5, line 5.” Paper 49. Patent Owner’s response identifies “the material contained in any earlier-filed document (by paper, page, and line number only) that represents material to which each challenged portion properly responds.” Paper 50.

Also with Board authorization, Patent Owner filed an Identification of alleged new arguments and evidence in Petitioner’s Opposition to the Revised Motion to Amend (Paper 48), to which Petitioner replied (Paper 54). Patent Owner’s Identification identifies all but a few pages and lines of the 25-page Opposition that Patent Owner alleges are new arguments. Paper 48, 1–2. Petitioner identifies the portions of Paper 31 and Paper 22 to which its Opposition responds. Paper 54, 1–2.

Having reviewed the parties’ points and responses, we are persuaded that the identified arguments, many of which relate to application of the plain and ordinary meaning of the “tie layer” limitation, were sufficiently presented in the first instance, or are properly responsive to a party’s

argument in the Opposition or Reply, and do not exceed the scope of a proper reply in violation of 37 C.F.R. § 42.23(b).

IV. MOTION TO EXCLUDE

Petitioner filed a Motion to Exclude Exhibit 2019 (“Herb Declaration”). Mot. Excl. 1–5. Patent Owner’s Opposition to the Motion to Exclude argues that the Herb Declaration is admissible at least under Fed. R. Evid. 801(d)(2). Opp. Mot. Excl. 1–10. Petitioner’s Response to the Opposition argues that the Herb Declaration is inadmissible. Resp. Opp. Mot. Excl. 1–5.

Exhibit 2019 is a declaration “made by Manuella Herb in a 37 CFR 1.132 Declaration made during prosecution of a patent application assigned to Petitioner,” namely, the prosecution of Application No. 16/516,792. Mot. Excl. 1; Ex. 2019. Petitioner alleges that the Herb Declaration should be excluded under Fed. R. Evid. 801, and that no hearsay exception applies. Fed. R. Evid. 801, 803(1)–(23), 804, 807; Mot. Excl. 1–5. Patent Owner responds that, under Fed. R. Evid. 801(d)(2), Dr. Herb’s declaration “qualifies as an opposing party’s statement in multiple ways” and, therefore, is not hearsay. Opp. Mot. Excl. 6–8. Petitioner replies that, to “the extent the Board finds the Herb Declaration to be lay testimony according to the Patent Owner, the Declaration should be accorded little weight,” and if “the Board finds the technical and scientific aspects of the Herb Declaration to constitute expert testimony, such testimony should be excluded as hearsay.” Resp. Opp. Mot. Excl. 1.

We find limited merit in Petitioner’s Motion to Exclude with respect to Exhibit 2019, but also find the record sufficient with or without the Herb Declaration to establish Petitioner’s contentions by a preponderance of the

further corroborating evidence. Dr. Herb's contentions from the prosecution of Application No. 16/516,792 not only concern another patent application altogether, but are merely a portion of the evidence we have before us concerning the tie layer arguments and the interpretation of that term. Other evidence suffices to corroborate Petitioner's contentions, and the Herb Declaration is ineffective, in view of the totality of the evidence, to refute Petitioner's positions. Even if the disputed evidence is considered, we have accorded it its proper weight and we are nevertheless unpersuaded that Patent Owner has prevailed in its arguments. Thus, Petitioner's Motion to Exclude is dismissed as moot as to Exhibit 2019.

V. CONCLUSION

We grant Patent Owner's Revised Motion to Amend as to the cancellation of original claims 2 and 3. For the reasons discussed above, we find that Petitioner has not shown by a preponderance of the evidence that that claims 1 and 4–13 are unpatentable as indefinite, but has shown by a preponderance of the evidence that claims 1 and 4–13 are unpatentable as obvious. We deny Patent Owner's Revised Motion to Amend as to proposed substitute claims 14–24. We provide the following tables summarizing our disposition.

Claims	35 U.S.C. §	Reference(s)/ Basis	Claims Shown Unpatentable	Claims Not Shown Unpatentable
1, 4–13	§ 112(b)	Indefiniteness		1, 4–13
1, 4–13	§ 103	Riis	1, 4–13	
1, 4–13	§ 103	Riis, Wypych, Tatarka	1, 4–13	

Claims	35 U.S.C. §	Reference(s)/ Basis	Claims Shown Unpatentable	Claims Not Shown Unpatentable
Overall Outcome ¹²			1, 4–13	

Revised Motion to Amend Outcome	Claims
Original Claims Cancelled by Amendment	2, 3
Substitute Claims Proposed in the Amendment	14–24
Substitute Claims: Revised Motion to Amend Granted	
Substitute Claims: Revised Motion to Amend Denied	14–24
Substitute Claims: Not Reached	

VI. ORDER

In consideration of the foregoing, it is hereby:

ORDERED that Patent Owner's Revised Motion to Amend is *granted* as to the request to cancel original claims 2 and 3 of the '624 patent;

FURTHER ORDERED that claims 1 and 4–13 of the '624 have been shown to be unpatentable;

FURTHER ORDERED that Patent Owner's Revised Motion to Amend is *denied* as to the request to add proposed substitute claims 14–24 to the '624 patent;

FURTHER ORDERED that Petitioner's motion to exclude is dismissed as moot; and

¹² For the reasons stated herein, because Patent Owner has moved to cancel originally challenged claims 2 and 3, we do not reach the alleged unpatentability of those claims.

FURTHER ORDERED that this is a Final Written Decision;
therefore, parties to the proceeding seeking judicial review of the decision
must comply with the notice and service requirements of 37 C.F.R. § 90.2.

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