

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

TEKNI-PLEX, INC.,
Petitioner,

v.

CONVERTER MANUFACTURING, LLC,
Patent Owner.

IPR2021-00919
Patent 10,562,680 B2

Before GRACE KARAFFA OBERMANN, JAMES A. TARTAL, and
AVELYN M. ROSS, *Administrative Patent Judges*.

TARTAL, *Administrative Patent Judge*.

JUDGMENT
Final Written Decision
Determining All Challenged Claims Unpatentable
35 U.S.C. § 318(a)

ORDER
Denying Patent Owner's Motion to Exclude (Paper 66)
37 C.F.R. § 42.64(c)

ORDER
Entering Stipulated Protective Order and
Granting Patent Owner’s Motions to Seal (Papers 18, 30)
37 C.F.R. § 42.54

ORDER
Granting Petitioner’s Motion to Seal (Paper 46)
37 C.F.R. § 42.54

We have jurisdiction to conduct this *inter partes* review under 35 U.S.C. § 6. This Final Written Decision is issued pursuant to 35 U.S.C. § 318(a) (2018) and 37 C.F.R. § 42.73 (2020). For the reasons discussed below, we determine Tekni-Plex, Inc. (“Petitioner”)¹ has shown by a preponderance of the evidence that claims 1–5, 7–12, and 15–24 (“the Challenged Claims”) of U.S. Patent No. 10,562,680 B2 (Ex. 1001, “the ’680 patent”) are unpatentable.

I. INTRODUCTION

A. Summary of Procedural History

Petitioner filed a Petition pursuant to 35 U.S.C. §§ 311–319 requesting an *inter partes* review of the Challenged Claims. Paper 1 (“Pet.”). We instituted an *inter partes* review of the Challenged Claims on all grounds of unpatentability asserted in the Petition. Paper 7. Converter Manufacturing, LLC (“Patent Owner”)² filed a Corrected Patent Owner Response. Paper 25 (“Resp.”). Petitioner filed under seal a Reply to the Patent Owner Response. Paper 47 (“Reply”); *see also* Paper 45 (publicly

¹ Petitioner identifies itself and Dolco LLC as real parties in interest. Pet. 142.

² Patent Owner identifies no additional real parties in interest. Paper 5, 1.

accessible, redacted version of the Reply). Patent Owner filed a Sur-reply in support of the Patent Owner Response. Paper 61 (“Sur-reply”).

Petitioner filed a Motion to Exclude Exhibit 2064. Paper 58; *see also* Paper 65 (Patent Owner’s Opposition to Petitioner’s Motion to Exclude); Paper 67 (Petitioner’s Reply in Support of Its Motion to Exclude). Subsequently, Petitioner withdrew its Motion to Exclude, explaining that it was moot because Petitioner understood Patent Owner has “withdrawn the exhibit.” Paper 76, 31:21–32:7. Accordingly, we consider Petitioner’s Motion to Exclude as withdrawn.

Patent Owner filed a Motion to Exclude Exhibits 1037–1040, 1051, 1053, 1057, 1058, and portions of Exhibits 1044 and 1045. Paper 66 (“MTE”), 1; *see also* Paper 64 (Petitioner’s Opposition to Patent Owner’s MTE (“MTE Opp.”)); Paper 68 (Patent Owner’s Reply in Support of Its MTE (“MTE Reply”). As explained below, we deny Patent Owner’s Motion to Exclude. *See infra* Section III. We also grant Patent Owner’s Motions to Seal (Papers 18, 30) and Deny Without Prejudice Petitioner’s Motion to Seal (Paper 46). *See infra* Section IV.

Following oral argument, we entered a transcript of the hearing in the record. Paper 76. Petitioner bears the burden of proving unpatentability of each claim it has challenged by a preponderance of the evidence, and the burden of persuasion never shifts to Patent Owner. *See* 35 U.S.C. § 316(e) (2018); 37 C.F.R. § 42.1(d); *Dynamic Drinkware, LLC v. Nat’l Graphics, Inc.*, 800 F.3d 1375, 1378 (Fed. Cir. 2015).

B. Related Matters

The parties identify the ’680 patent as a subject of *Clearly Clean Prods., LLC, et al. v. Tekni-Plex, Inc., et al.*, No. 2:20-cv-04723-AB (E.D. Pa.); *Clearly Clean Prods. LLC, et al. v. Eco Food Pak USA Inc., et al.*,

No. 5:20-cv-01054 (C.D. Cal.); and *In re Certain Rolled-Edge Rigid Plastic Food Trays*, No. 337-TA-1203 (ITC). Pet. 142–43; Paper 5, 1–2. Petitioner also states that it concurrently filed petitions for *inter partes* review of U.S. Patent Nos. 9,908,281 (IPR2021-00916) and 10,189,624 (IPR2021-00918), which share a priority chain with the '680 patent. Pet. 142.

C. The '680 Patent

The '680 patent issued February 18, 2020, from an application filed on December 7, 2018, and is directed to articles processed according to “methods of displacing a sharp edge away from the periphery of an article made from a thermoplastic material, where the sharp edge might otherwise damage surfaces that contact the periphery of the article.” Ex. 1001, 4:66–5:5, codes (21), (22), (45). According to the '680 patent, “[f]ormation of shaped article from thermoplastic materials is well known,” and “[o]ne common use for shaped thermoplastics is to form containers that can be sealed with thin plastic films.” *Id.* at 1:23–24, 1:44–47. However, if the trimmed edge of the article is sharp, “it can cut or break the film.” *Id.* at 1:50–56. Thus, the '680 patent recognizes that “[i]t would be beneficial if the sharp edges of shaped thermoplastic articles could be displaced in such a way that the risk of injury or damage to sealing films could be reduced,” and “[i]t would be further beneficial if such individual shaped articles could be used with multiple known sealing technologies.” *Id.* at 3:48–54. The '680 patent includes over 70 figures, many with multiple drawings further labeled alphabetically. We address Figures 1, 24A, 24B, and 24C below.

Figure 1 of the '680 patent is reproduced below.

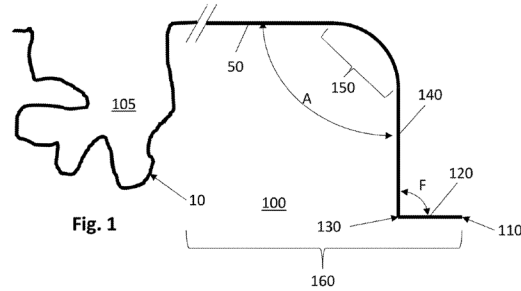
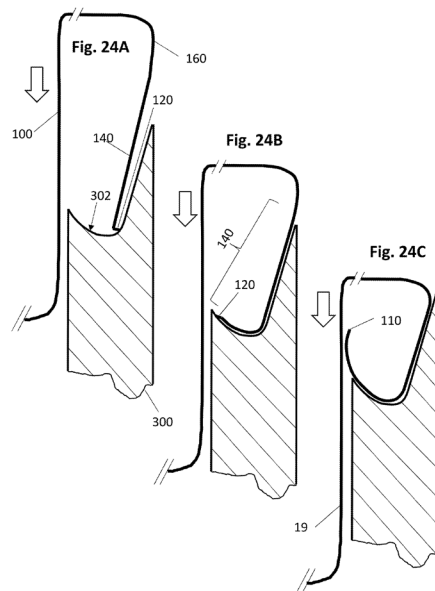


Figure 1 illustrates “a sectional view of a thermoplastic article 100 having a deflectable flange 160 formed at an edge thereof.” *Id.* at 6:37–39.

Deflectable flange 160 includes bend region 150, peripheral edge 110, and, optionally, spacer 140. *Id.* at 19:46–48. The angle “A” formed by the bend region, between extension 50 and spacer 140, is preferably about ninety degrees. *Id.* at 13:40–44, 13:57–63, 19:52–58.

Petitioner draws attention in the Petition to Figure 25C of the '680 patent. Pet 3. Reproduced below are Figures 24A, 24B, and 24C of the '680 patent.



Figures 24A, 24B, and 24C sequentially “illustrate deflection and rolling over of the deflectable flange 160, including the sharp peripheral edge 110,”

using ram 300. *Id.* at 9:21–23, 32:53–56. The ’680 patent explains that “the same deflection and rolling over of the edge can be performed on multiple edges (e.g., all edges) of the article simply by using multiple rams or a ram that contacts all edges to be so treated.” *Id.* at 9:23–28. To roll and shape the edge of article 100, deflectable flange 160 is urged (in the direction indicated by the open arrows) against upper heated surface 302 of heated ram 300. *Id.* at 30:24–35. Deflectable flange 160 includes peripheral flange 120 at the peripheral end of spacer 140. *Id.* at 32:53–58. “[T]he peripheral flange 120 deflects . . . during bending of the deflectable flange 160 to the extent that it becomes completely bent over the spacer 140, forming a ‘hook’-like structure.” *Id.* at 32:59–63.

The ’680 patent, in some embodiments, describes the degree of displacement of the peripheral edge in the context of its “offset angle” (“OA”). *Id.* at 26:48–59. The ’680 patent explains that the offset angle may be assessed “using a plane that extends through the peripheral edge 110 and the portion of the deflectable flange immediately adjacent to it or by measuring the offset angle OA using a plane that extends through the elbow 130 and the portion of the deflectable flange 160 immediately proximal to it, relative to the body.” *Id.*

D. Illustrative Claim of the ’680 Patent

Petitioner challenges claims 1–5, 7–12, and 15–24 of the ’680 patent. Pet. 1. Claim 1, the only independent claim of the ’680 patent, is illustrative of the claimed subject matter and is reproduced below.

1. An article having a smooth, non-circular periphery, the article comprising a shaped thermoplastic substrate sheet, the shape of the substrate sheet including
a body including a bottom surrounded by sidewalls and

- a deflectable flange joined at a junction to the sidewalls at at least a portion of the periphery, the deflectable flange including
 - a peripheral edge of the substrate sheet at a position distal from the junction;
 - a smoothly-curved bend region interposed between the junction and the peripheral edge wherein a proximal portion of the bend region is offset from a distal portion thereof by an angle A of from 85 to 135 degrees;
 - a substantially planar extension interposed between the junction and the proximal portion of the bend region, the plane of the extension being substantially parallel to the bottom, and the distal portion of the bend region and the body extending away from the same face of the extension;
 - a peripheral flange bearing the peripheral edge and being connected to the rest of the deflectable flange by way of an elbow; and
 - a curved bent portion interposed between the elbow and the bend region,
- wherein the curvatures of the bend region and the bent portion position the peripheral edge away from the periphery.

Ex. 1001, 72:57–73:17.

E. References and Testimony

Below we provide an abbreviated summary of the qualifications of Glenn May, who provided testimony in support of Petitioner, and James W. Clements, who provided testimony in support of Patent Owner. We also provide a table identifying the primary references relied upon by Petitioner, as well as the exhibits corresponding to the declarations and deposition testimony in the record for Mr. May and Mr. Clements. Additional testimony was provided by Mr. James Naughton, Executive Vice President at Thermoforming Systems LLC (Ex. 1045, ¶ 3), Mr. Jeff Maguire, Managing Partner of Patent Owner and of Clearly Clean Products, LLC

(Ex. 2031 ¶ 2); and Mr. Millard Wallace, Partner of Patent Owner and of Clearly Clean Products, LLC (Ex. 2063 ¶ 2).

Mr. May indicates he received a Bachelor of Science in Packaging Science from Michigan State University in 1992 and a Food Processing Certification from the University of California, Davis, in “Container Closure and Thermal Processing” in 1995. Ex. 1003 ¶ 6. He states he has “over 29 years of experience in packaging design, development, testing, sourcing and troubleshooting for large and small consumer packaged goods (“CPG) users and suppliers” in a range of products. *Id.* ¶ 8. In addition to working for various companies as a packaging engineer over his career, Mr. May is “currently owner of ProPac Consulting, which provides solutions for all types of packaging and product challenges.” *Id.* ¶¶ 9–14. In addition to being an inventor on three patents, “including two for packaging,” Mr. May states that he has “worked with thermoforming design, development, materials testing, supplier selection and qualification, and tooling for over three decades.” *Id.* ¶¶ 7, 17.

Mr. Clements qualifications are provided on a *curriculum vitae* which indicates he received an “Associates Degree in Product Design and Development” from St. Louis Tech in 1979 and has taken “[t]raining courses from PTC Corporation in PRO/Engineer CAD software” and “[v]arious internal and external vendor courses at the Lawrence Livermore National Laboratory and Amcor Packaging.” Ex. 2008, 2; *see also* Ex. 2007 ¶ 4 (Mr. Clements stating that “[d]etails of [his] professional qualifications and publications are listed in [his] current *curriculum vitae* in Exhibit 2008”). Mr. Clements indicates he was a Senior Development Engineer at Amcor Packaging from 1999 to 2021 and “[w]orked with cross-functional teams . . . to take thermoformed rigid food packaging products from

conceptual ideas through to high-volume commercial production.”

Ex. 2008, 1.

References and Witness Testimony³	Date	Ex. No.
WO 96/01179 (“Portelli”)	Jan. 18, 1996	1003
WO 2012/064203 A1 (“Long”)	May 18, 2012	1004
U.S. Patent No. 4,228,121 (“Meadors”)	Oct. 14, 1980	1005
U.S. Patent No. 6,960,316 B2 (“Brown”)	Nov. 1, 2005	1006
Declaration of Glenn May	May 9, 2021	1002
Declaration of Glenn May	June 7, 2022	1044
Deposition Transcript of Glenn May	Jan. 20, 2022	2009
Deposition Transcript of Glenn May	June 30, 2022	2070
Deposition Transcript of Glenn May	July 12, 2022	2075
Declaration of James Naughton	June 7, 2022	1045
Deposition Transcript of James Naughton	July 6, 2022	2069
Expert Declaration of Mr. James W. Clements	Feb. 21, 2022	2007
Declaration of Mr. James W. Clements in Response to Evidentiary Objections	Mar. 14, 2022	2040
Declaration of Jeff Maguire	Feb. 21, 2022	2031 ⁴
Declaration of Millard Wallace in Response to Evidentiary Objections to Patent Owner Exhibits 2060, 2061, and 2062	June 28, 2022	2036
Deposition Transcript of Millard F. Wallace, III	July 12, 2022	2074

³ The table identifies only a select number of documents particularly pertinent to this Decision. *See, e.g.*, Paper 70 (Patent Owner’s Third Amended List of Exhibits); Paper 47, v–x (Petitioner’s Table of Exhibits). A complete identification of the papers and exhibits that form the record of this case is available in the docket of this proceeding.

⁴ Patent Owner filed a redacted version of Mr. Maguire’s declaration as Exhibit 2030. Patent Owner also filed a second exhibit pertaining to an email exchange dated July 13, 2018, as Exhibit 2031 (the same exhibit number as Mr. Maguire’s unredacted declaration).

F. Asserted Grounds of Unpatentability

Petitioner asserts that the Challenged Claims are unpatentable based on the following grounds (Pet. 26):

Ground⁵	Claim(s) Challenged	35 U.S.C. §	Reference(s)/Basis
1	1–3, 5, 7, 8, 10, 11, 15–23	102	Portelli
2	1–5, 7–12, 20–23	102	Meadors
3	1–5, 7–12, 15–24	103	Portelli, Long
4	1–5, 7–12, 15–24	103	Long, Meadors
5	4, 9, 24	103	Portelli
6	9	103	Portelli, Brown

II. ANALYSIS

A. Legal Standards of Anticipation and Obviousness

Petitioner contends under two grounds that the Challenged Claims are anticipated. Pet. 26. A claim is anticipated if a single prior art reference either expressly or inherently discloses every limitation of the claim. *Orion IP, LLC v. Hyundai Motor Am.*, 605 F.3d 967, 975 (Fed. Cir. 2010). “A single prior art reference may anticipate without disclosing a feature of the claimed invention if such feature is necessarily present, or inherent, in that reference.” *Allergan, Inc. v. Apotex Inc.*, 754 F.3d 952, 958 (Fed. Cir. 2014) (citing *Schering Corp. v. Geneva Pharm.*, 339 F.3d 1373, 1377 (Fed. Cir. 2003)).

⁵ Petitioner identifies its grounds of unpatentability in the numbered order provided in the table, which is the order in which we address the grounds below. See Pet. iii–vii. In its Response, Patent Owner also refers to the grounds using the numbering provided by Petitioner. See Resp. iii–v.

Petitioner contends under four grounds that the Challenged Claims are unpatentable based on obviousness.⁶ Pet. 26. 35 U.S.C. § 103(a) sets forth as follows:

[a] patent may not be obtained . . . 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 at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains.

The question of obviousness is resolved on the basis of underlying factual determinations including (1) the scope and content of the prior art; (2) any differences between the claimed subject matter and the prior art; (3) the level of ordinary skill in the art; and (4) when in evidence, objective evidence of nonobviousness. *Graham v. John Deere Co.*, 383 U.S. 1, 17–18 (1966).

An obviousness analysis “need not seek out precise teachings directed to the specific subject matter of the challenged claim, for a court can take account of the inferences and creative steps that a person of ordinary skill in the art would employ.” *KSR Int’l Co. v. Teleflex Inc.*, 550 U.S. 398, 418 (2007). However, Petitioner cannot satisfy its burden of proving obviousness by employing “mere conclusory statements.” *In re Magnum Oil Tools Int’l, Ltd.*, 829 F.3d 1364, 1380 (Fed. Cir. 2016). Instead, Petitioner must articulate a reason why a person of ordinary skill in the art would have combined the prior art references. *In re NuVasive*, 842 F.3d

⁶ The Leahy-Smith America Invents Act (“AIA”), Pub. L. No. 112-29, 125 Stat. 284, 287–88 (2011), amended 35 U.S.C. § 103, effective March 16, 2013. Because the application from which the ’680 patent issued has an effective filing date prior to March 16, 2013, the pre-AIA version of § 103 applies. No issue turns on the applicable version of the statute, however, and the outcome of this Decision would be the same regardless of which version of the statute applies.

1376, 1382 (Fed. Cir. 2016); *see also Pers. Web Tech., LLC, v. Apple, Inc.*, 848 F.3d 987, 993–94 (Fed. Cir. 2017) (“[O]bviousness concerns whether a skilled artisan not only *could have made* but *would have been motivated to make* the combinations or modifications of prior art to arrive at the claimed invention”) (quoting *Belden Inc. v. Berk-Tek LLC*, 805 F.3d 1064, 1073 (Fed. Cir. 2015)).

B. Level of Ordinary Skill in the Art

The level of skill in the art is a factual determination that provides a primary guarantee of objectivity in an obviousness analysis. *Al-Site Corp. v. VSI Int’l Inc.*, 174 F.3d 1308, 1324 (Fed. Cir. 1999) (citing *Graham*, 383 U.S. at 17–18; *Ryko Mfg. Co. v. Nu-Star, Inc.*, 950 F.2d 714, 718 (Fed. Cir. 1991)). In determining the level of ordinary skill in the art, various factors may be considered, including the “type of problems encountered in the art; prior art solutions to those problems; rapidity with which innovations are made; sophistication of the technology; and educational level of active workers in the field.” *In re GPAC Inc.*, 57 F.3d 1573, 1579 (Fed. Cir. 1995) (citation omitted).

Petitioner contends that a person of ordinary skill in the art at the time of the invention would have had “either (1) a Bachelor of Science degree in packaging science, mechanical engineering, material science, or chemistry and two years of experience designing and manufacturing thermoformed plastic items, or (2) three years of experience designing and manufacturing thermoformed plastic items.” Pet. 6–7 (citing Ex. 1002 ¶ 35); Reply 53–54 (citing Ex. 1044 ¶¶ 28–29).

Patent Owner states that Petitioner’s proposed level of skill “is acceptable” with a series of “clarifications,” which do not address the relevant level of skill, but instead purport to list activities a person of

ordinary skill in the art can, or cannot, do “without considerable experimentation.” Resp. 6 (citing, e.g., Ex. 2007 ¶ 31); Sur-reply 30. Patent Owner directs us to no authority, and we are aware of none, that informs that the level of ordinary skill in the art is determined based on a list of activities that allegedly require, or do not require, “considerable experimentation,” as Patent Owner suggests. Patent Owner appears to confuse consideration of the level of ordinary skill in the art with whether a patent is enabled. *See In re Wands*, 858 F.2d 731, 737 (Fed. Cir. 1988) (explaining that the touchstone of enablement is whether undue experimentation would have been required to practice the claimed invention). Accordingly, we find Patent Owner’s purported “clarifications” of Petitioner’s proposed level of ordinary skill inapplicable.

Patent Owner also argues as follows:

In any situation, a [person of ordinary skill in the art] in thermoforming would view publications from the standpoint of whether they taught mass-producible designs and techniques that would enable large-scale production of the articles, e.g., thousands to millions of articles, with substantially no defects (e.g., sharp edges, thin sections, weakness in corners), and not just prototype endeavors.

Resp. 7 (citing Ex. 2007 ¶ 32). We understand Patent Owner to intend to cite paragraph 33 of Mr. Clements’s declaration, which appears to be identical to the quote above and cites various portions of Mr. May’s deposition. Ex. 2002 ¶ 33 (citing Ex. 2009 24:7–26:3; 44:12–16; 49:23–50:4). The portions of Mr. May’s deposition cited by Mr. Clements do not address the level of ordinary skill in the art and do not support the proposition Patent Owner and Mr. Clements assert in regard to “large-scale” production. For example, Mr. May stated that “[t]he prototype was to better predict the operations for mass production,” and that mass production “can

widely vary” and “may be anywhere from hundreds of units to hundreds of thousands of units to millions of units.” Ex. 2009, 25:21—26:4. Indeed, there is no support from any source that a person of ordinary skill in the art would have been limited to a person who “would only view publications from the standpoint of whether they taught mass-producible designs,” as Patent Owner and Mr. Clements suggest. To the contrary, the ’680 patent broadly “relates to the field of forming shaped thermoplastic articles,” includes claims directed to “an article . . . comprising a shaped thermoplastic sheet,” and provides no discussion of, or requirement for, the “large scale production of articles.” Ex. 1001, 1:21–22; 72:57–73:17. That isn’t to say that considerations related to the production of an article are necessarily irrelevant to our obviousness analysis, but rather, that a person of ordinary skill in the art is not limited to a person who would have only viewed “publications from the standpoint of whether they taught mass-producible designs.” *See* Resp. 7.

We find that the ’680 patent and the cited prior art references reflect the appropriate level of skill at the time of the claimed invention and that the level of appropriate skill reflected in these references and in the ’680 patent is consistent with the definition of a person of ordinary skill in the art proposed by Petitioner. *See Okajima v. Bourdeau*, 261 F.3d 1350, 1355 (Fed. Cir. 2001).

C. Claim Construction

We apply the same claim construction standard that would be used to construe the claim in a civil action under 35 U.S.C. § 282(b). 37 C.F.R. § 42.100(b). Under that standard, claim terms “are generally given their ordinary and customary meaning” as understood by a person of ordinary skill in the art at the time of the invention. *Phillips v. AWH Corp.*, 415 F.3d

1303, 1312–13 (Fed. Cir. 2005) (en banc). “In determining the meaning of the disputed claim limitation, we look principally to the intrinsic evidence of record, examining the claim language itself, the written description, and the prosecution history, if in evidence.” *DePuy Spine, Inc. v. Medtronic Sofamor Danek, Inc.*, 469 F.3d 1005, 1014 (Fed. Cir. 2006) (citing *Phillips*, 415 F.3d at 1312–17). Extrinsic evidence is “less significant than the intrinsic record in determining ‘the legally operative meaning of claim language.’” *Phillips*, 415 F.3d at 1317.

Petitioner suggests in the Petition that no claim term requires an express construction. Pet. 9. Patent Owner discusses “thermoplastic substrate sheet” and “[a]n article having a smooth, non-circular periphery,” both of which we address below.

1. “*thermoplastic substrate sheet*”

Claim 1 recites, in the preamble, “[a]n article . . . comprising a shaped thermoplastic sheet.” Ex. 1001, 72:57–73:17. The Specification does not otherwise describe a “thermoplastic substrate sheet.”

According to Patent Owner, “‘thermoplastic substrate sheet’ excludes sheets made of paperboard or sheets made by injection molding,” because, during prosecution of a related application, “the Applicant argued that ‘thermoplastic sheet’ excluded paperboard and injection molded material.” Resp. 8 (citing Ex. 2012, 8). We disagree with Patent Owner’s characterization of the relevant prosecution history, as explained below.

A parent application to the ’680 patent recited “[a] method of making a container . . ., the method comprising thermoforming a thermoplastic sheet to yield a precursor article.” Ex. 1046, 68. In regard to that claim, the Applicant argued that it recited “a method in which a thermoplastic sheet

(i.e., not paperboard . . .) is thermoformed (i.e., not injection molded . . .) into a precursor article having a rim.” Ex. 2012, 8.

Petitioner agrees that paperboard is not a “thermoplastic substrate sheet,” but contends that the term does not exclude injection molded materials. Reply 1–2. We agree. The prosecution history relied upon by Patent Owner provides that a “precursor article” is made by “thermoforming a thermoplastic sheet,” but does not address, much less limit, how the “thermoplastic sheet,” itself, is formed. Thus, the prosecution history relied on by Patent Owner does not support Patent Owner’s argument that “‘thermoplastic substrate sheet’ excludes . . . sheets made by injection molding.”

We further credit the testimony of Mr. May in this regard, who explains that “whether a material is thermoformed or injection molded does not dictate whether it is thermoformable, since many thermoplastics are both thermoformable and injection moldable.” Ex. 1044 ¶ 327 (citing Ex. 1032a, 300, 315, 332–35, 613). Likewise, the Specification of the ’680 patent states that “[a] wide variety of methods (e .g., thermo-forming, casting, molding, and spinning) can be used to confer shape to a molten thermoplastic or to a preformed thermoplastic sheet that has been softened or melted.” Ex. 1001, 1:24–27. In its Sur-reply, Patent Owner argues that “[t]he intrinsic evidence provides that ‘thermoformed’ means something other than ‘injection molded.’” Sur-reply 2–3. Patent Owner’s argument does not inform the meaning of the claim phrase at issue, which is “thermoplastic substrate sheet.”

In sum, the Specification and the extrinsic evidence does not suggest that an injection molded sheet is precluded from being a “thermoplastic substrate sheet” and the prosecution history does not show that a

“thermoplastic substrate sheet” made by injection molding was disclaimed during prosecution. Accordingly, we find that ‘thermoplastic substrate sheet’ excludes sheets made of paperboard, but does not exclude sheets made by injection molding. Moreover, had we adopted Patent Owner’s proposed construction, the outcome of this Decision would be the same.

2. “[a]n article having a smooth, non-circular periphery”

Claim 1 recites, in the preamble, “[a]n article having a smooth, non-circular periphery.” Patent Owner argues that “the preamble of claim 1 is a limitation as it was used to overcome a rejection to the pending claim during prosecution.” Resp. 9 (citing Ex. 1008, 46–47). Petitioner does not dispute that the preamble of claim 1 is limiting. *See, e.g.*, Pet. 13, 96 (arguing that “[r]egardless of whether the preamble of [c]laim 1 is limiting,” it is taught by the asserted prior art). We likewise treat the preamble as a limitation.

3. *Additional Claim Terms*

We find that no other claim term requires an express construction for purposes of rendering this Decision. *See Wellman, Inc. v. Eastman Chem. Co.*, 642 F.3d 1355, 1361 (Fed. Cir. 2011) (“[C]laim terms need only be construed ‘to the extent necessary to resolve the controversy.’”) (quoting *Vivid Techs., Inc. v. Am. Sci. & Eng’g, Inc.*, 200 F.3d 795, 803 (Fed. Cir. 1999))

D. Scope and Content of the Asserted Prior Art

Petitioner relies on Portelli, Long, Meadors, and Brown to show that the Challenged Claims are unpatentable. Pet. 9–12. Each of these references is summarized in relevant part below. We also find that Patent

Owner fails to overcome the presumption that Portelli, Long, and Meadors are enabled for the reasons that follow.⁷

1. Summary of Portelli

a. Disclosures of Portelli

Portelli generally relates to “trays for packaging which are wrapped in plastic film or plastic wrap,” as well as to methods and apparatus for producing such trays. Ex. 1003, 1:2–5. Portelli states that such plastic trays are formed by a thermoforming operation, but “have a sharp terminal edge forming the periphery thereof with an unfortunate tendency to tear or cut through plastic film within which the trays are wrapped.” *Id.* at 1:29–2:2. Portelli suggests it would be advantageous to disclose “trays with a peripheral edge region which reduced the tendency of the wrap to tear.” *Id.* at 2:16–18.

Figure 13 of Portelli is reproduced below.

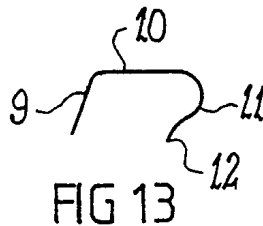


Figure 13 illustrates a schematic sectional view of the edge of a tray “after it has been deformed out of the wrap path.” *Id.* at 8:11–13; *see also* Pet. 9–10 (discussing Figure 13 of Portelli). The tray in Figure 13 includes sidewall 9, rim 10, peripheral edge region 11, and terminal edge 12, providing “the finished tray product a more rounded peripheral edge region.” *Id.* at 8:28–

⁷ Patent Owner does not argue that Brown is not enabled. *See generally* Resp.

9:1, 14:10–17. Portelli discloses that the trays can have a rounded rectangular shape with a concave compartment formed therein. *See, e.g., id.* at Figs. 14–16.

b. Whether Portelli is Enabled

Patent Owner argues that “Portelli’s First Embodiment (Figures 1–2 and 9–11) and Fourth Embodiment (Figures 7–8) cannot function as prior art because each is inoperative and cannot be made without unreasonable amounts of experimentation.” Resp. 9–10 (citing Ex. 2007 ¶¶ 35, 36, 39, 49, 52, 53, 55, 110, 111); Sur-reply 1–11. Petitioner argues that Portelli is “operable and enabled.” Reply 2–23.

Portelli “is presumptively enabling barring any showing to the contrary by a . . . patentee.” *See In re Antor Media Corp.*, 689 F.3d 1282, 1287–88 (Fed. Cir. 2012); *Impax Labs., Inc. v. Aventis Pharms., Inc.*, 545 F.3d 1312, 1316 (Fed. Cir. 2008). To rebut this presumption, Patent Owner⁸ “must generally do more than state an unsupported belief that a reference is not enabling.” *In re Morsa*, 713 F.3d 104, 110 (Fed. Cir. 2013). With regard to allegations of anticipation, “a prior art reference need not enable its full disclosure; it only needs to enable the portions of its disclosure alleged to anticipate the claimed invention.” *Antor Media*, 689 F.3d at 1290. With regard to allegations of obviousness, “[e]ven if a reference discloses an inoperative device, it is prior art for all that it teaches.” *Beckman Instruments, Inc. v. LKB Produkter AB*, 892 F.2d 1547, 1551 (Fed. Cir. 1989); *see also Raytheon Technologies Corp. v. General Electric Co.*,

⁸ Although the ultimate burden of persuasion remains with Petitioner, *Dynamic Drinkware, LLC v. Nat’l Graphics, Inc.*, 800 F.3d 1375, 1379–81 (Fed. Cir. 2015), *Antor Media* and *Morsa* make clear that Patent Owner bears a burden of production on the issue of the enablement of the prior art.

993 F.3d 1374, 1381 (Fed. Cir. 2021) (stating that “[i]n the absence of such other supporting evidence to enable a skilled artisan to make the claimed invention, a standalone § 103 reference must enable the portions of its disclosure being relied upon”).

The touchstone of enablement is whether undue experimentation would have been required to practice the claimed invention. *Wands*, 858 F.2d at 737. A reference is enabled “even if a ‘reasonable’ amount of routine experimentation is required in order to practice a claimed invention.” *Enzo Biochem, Inc. v. Calgene, Inc.*, 188 F.3d 1362, 1371 (Fed. Cir. 1999). Factors relevant to a determination of undue experimentation include: (1) the quantity of experimentation necessary, (2) the amount of direction or guidance presented, (3) the presence or absence of working examples, (4) the nature of the invention, (5) the state of the prior art, (6) the relative skill of those in the art, (7) the predictability or unpredictability of the art, and (8) the breadth of the claims. *Wands*, 858 F.2d at 737.

Patent Owner’s arguments are primarily directed to *Wands* factors grouped in the following manner: factors 3, 5, and 6; factors 4 and 7; factor 2, and factor 1. Resp. 9–29. We follow this same arrangement and order in our consideration of the *Wands* factors below, however, we begin with factor 8, which Patent Owner does not address. *See id.*

i. The Breadth of the Claims (Factor 8)

All of the Challenged Claims are directed to an “article having a smooth, non-circular periphery, the article comprising a shaped thermoplastic sheet” with certain features, including a body with a bottom and sidewalls, and a deflectable flange. Ex. 1001 72:56–73:27, 73:31–73:45, 74:7–74:43 (claim 1 of the ’680 patent and claims 2–5, 7–12, and 15–24, which depend from claim 1). The Challenged Claims do not recite a

process for making the claimed article and do not require that the claimed article be mass produced.

ii. *Working Examples, State of the Prior Art, and Relative Skill of Those in the Art (Factors 3, 5, and 6)*

Patent Owner argues that processes such as Portelli's thermal deformation process were known to be inoperative for rolling the flange of a thermoformed tray. Resp. 11. Specifically, Patent Owner cites statements made during the prosecution of the New Zealand counterpart to Long explaining that "puckering and distortion of the lip . . . often occurs with known thermal deformation processes." *Id.* at 11–12 (citing Ex. 2010, 1). Patent Owner also refers to statements from Long that use of its method, in contrast to a thermoformed preform, "means none of the puckering or distortions often encountered with rolling a flange is encountered." *Id.* at 14 (citing Ex. 1004, 6:29–33). Patent Owner contends that these statements would have suggested to a person of ordinary skill in the art that Portelli's process "resulted in failure and only created defective trays with puckering and distortion," and, therefore, Portelli's methods of rolling a flange to make a smooth periphery in a non-circular article was not enabled. *Id.* at 12–13 (citing Ex. 2007 ¶ 43–44).

Petitioner contends that Patent Owner misinterprets Long's statements about Portelli. Reply 20. Specifically, "Long does not suggest that 'puckering and distortions' *always* occur with edge-rolling . . . only that they 'often' occur." *Id.* Petitioner argues that the record, including Mr. May's testimony, "shows that companies use the same methods to produce trays without puckering or distortion." *Id.* Petitioner explains that thermoforming is an "extremely mature" art spanning 70 years. *Id.* at 2. Petitioner points to known thermoformed rolled rim techniques by two companies, DexterMT

and OMV, that employ methods similar to that of Portelli to make rounded rectangular articles. *Id.* at 3; *see also id.* at 6–19 (describing DexterMT’s and OMV’s thermoformed products). Petitioner also draws our attention to an “authoritative book by James L. Throne in 1996” that “describes the ‘rolled rim’ technique as ‘[t]he classic example of rim treatment of thin-gage parts’ and ‘a standard method of reinforcing the rim region’ which is used for a variety of shapes.” *Id.* at 3–4 (citing Ex. 1049, 569–571; Ex. 1047, 74:17–75:8). Petitioner explains that Throne, like Portelli, uses heat and a forming tool to roll the flange of a thermoformed article by displacing the peripheral edge inwardly. *Id.* at 4 (citing Ex. 1003, Fig. 8; Ex. 1044 ¶¶ 48, 53; Ex. 1049, 571).

The statements Patent Owner identifies in Long and its New Zealand counterpart do not persuade us that a person of ordinary skill in the art would have understood Portelli’s thermoforming method to be inoperative or a failure. As Petitioner aptly notes, neither Long nor its New Zealand counterpart states that puckering *always* occurs. Reply 20. Rather, Long and its New Zealand counterpart contrast a problem that *often* occurs when describing the benefits of Long’s claimed trimming process. We do not view statements distinguishing the purported advantages of one invention against another as rising to the level of establishing that thermal deformation processes, like that of Portelli, are known to be “inoperative [or] cannot be made or used without unreasonable amounts of experimentation,” as asserted by Patent Owner. Resp. 11–13.

Next, Patent Owner argues that Mr. May’s reproductions of the figures of Portelli illustrate puckers formed at the tray’s periphery. *Id.* at 13–16. Patent Owner reproduces Mr. May’s annotated Figure 8, including its own annotations, and argues that Mr. May’s illustrations

confirm puckering occurs in Portelli. *Id.* at 15–16 (reproducing a variation of Figures 8 and noting that puckering purportedly occurs at “S”). Patent Owner dismisses the notion that the highly zoomed in figures it relies upon merely show “pixilation” or an “anomaly” in the quality of the line drawing, because that would purportedly “contradict the record evidence, including the failures” Patent Owner identified. *Id.* at 16. Petitioner argues that a person of ordinary skill in the art would have recognized the purported defects in Figure 8 of Portelli as “merely imperfections in a manually drawn figure in which the draft person overshot the lengths of certain lines.” *Id.* at 21 (citing Ex. 1044 ¶ 59).

We do not interpret Portelli’s figures as showing “sharp pointed puckers” on the tray periphery at “s” on Patent Owner’s annotated figures. *See id.* at 13–15 (Portelli Figure 8 (modified) and annotated by Patent Owner). Patent Owner directs us to nothing in Portelli to suggest that the distortions seen in the enlarged figures are intentional, as opposed to a product of the enlargement of manually-drawn images. Portelli’s figures are not photographs of an actual tray and Portelli does not discuss or identify these imperfections as puckering or any other aspect of its thermoformed tray. *See generally* Ex. 1003.

Patent Owner further argues that Mr. May admitted Portelli’s fourth embodiment is not operative. Patent Owner first directs us to Portelli, which states in regard to the process shown in Figures 7 and 8 that “an ejector 27 for detaching the trays 5 with deformed edges from the die 25 is located within the interior of the die 25.” *Id.* at 16; Ex. 1003, 13:15–16. Portelli further states as follows:

In use, carrying out the method of the invention, an inverted tray is provided or mounted on the support 24. At this

point the terminal edge 12 forms the peripheral edge of the tray 5. The support 24 is then moved upwardly towards the die 25 by actuating the piston and cylinder assembly. As a result, the peripheral edge region 11 of the tray 5 is brought into contact with the die 25. This heats the peripheral edge region 11 of the tray making it malleable and then deforms or rolls the peripheral edge region 11 of the tray 5 such that the edge 12 is displaced out of the wrap path. This position is illustrated in Fig. 8.

The support 24 is then retracted downwardly away from the die 25. Generally the tray 5 would remain in contact with the die 25 after the support 24 was lowered or retracted. This is because the malleable plastic of the peripheral edge region 11 tends to adhere to the hot die 25. The ejector 27 which is sandwiched between the base 8 of the tray 5 and the die 25 is then urged downwardly away from the die 25 to detach the tray 5 from the die 25 causing it to drop onto the support 24. Any suitable means can be used for urging the ejector 27 downwardly. As such mechanisms are well known in the art they are not discussed further in the specification. Separation of the tray 5 from the die 25 facilitates cooling of the peripheral edge region 11 of the tray 5 allowing it to harden in a deformed condition.

Ex. 1003, 13:18–14:6.

According to Patent Owner, Mr. May “admitted” this portion of Portelli was inoperable because Mr. May stated during his deposition as follows:

Q . . . in Portelli10 page 13, lines 28 to 29, did you consider in any of your opinions related to Portelli's Figures 7 and 8 that the plastic of the peripheral edge Region 11 would adhere to the hot die 25?

A I think that that's understood to be a concern or an issue, and a POSITA reading Portelli would be alerted by this teaching of Portelli that that's something to beware of.

Q In your experience, what issues could result when the plastic adheres to a hot die in a thermoforming operation?

A If that were to occur, the part could stick to the mold, causing a jam, the part may not be ejected properly.

Subsequent parts, after that part was removed, if the residue or the plastic was not removed sufficiently, could be compromised in terms of proper formation.

Q Could sharp edges result when the plastic adheres to the die?

A If an edge adheres to a die, it's very likely that article would be defective and would be discarded or recycled. So I think Portelli is explaining this such that a POSITA reading it would understand in the progressive deformation of the peripheral edge to beware of the edge becoming stuck to a mold or a die.

Q And when a plastic product is stuck to the die, when you push it off of that die, have you -- do you remember the types of results that would transpire/what type of surfaces were formed by having been removed from adhering to the die?

A The continuous heat of a die of this nature could deform the article, very likely causing a type of defect that would require disposal of the item.

Ex. 2009, 276:7–277:18). At no point in the testimony cited by Patent Owner, reproduced above, does Mr. May “admit” that any aspect of Portelli would have been inoperable. In this regard, we agree with Petitioner that Patent Owner mischaracterized Mr. May’s testimony and that, instead, Mr. May “merely stated the unremarkable fact that if an edge of an article stuck to a die, it might be defective.” Reply 19 (citing Ex. 2009, 276:7–277:18). Indeed, Patent Owner’s expert, Mr. Clements, testifies that a person of ordinary skill in the art would have understood how to overcome this issue of sticking as “there are a ‘wide variety’ of techniques to prevent parts from sticking to a hot die, including treating the surface with a non-stick coating, controlling process time and temperature, and the ‘list goes on from there.’” Reply 19 (citing Ex. 1047, 40:19–43:14); *see also* Ex. 1044 ¶¶ 67–68 (citing Ex 1056, 305–306; Ex. 1050, 168).

Patent Owner then turns to recent thermodynamic simulations performed by Mr. Clements, from which, according to Patent Owner, a person of ordinary skill in the art would have understood to show that “uncontrolled expansion and rippling or deformation (buckling or melting) [would occur] in response to either (i) being pressed into die 25 and/or (ii) succumbing to the force of gravity.” Resp. 17–19 (citing Ex. 2007 ¶¶ 60, 102–105). Patent Owner argues that this is consistent with Portelli, which states that the “heat treatment step may also effect some beading of the plastic by melting.” *Id.* (citing Ex. 1003, 17:5–6).

Petitioner argues that the thermodynamic simulations by Mr. Clements were flawed and only theoretical, as “no physical tests [were performed] to verify his theories.” *Id.* at 21–22 (citing Ex. 1047, 73:11–74:2, 144:18–23; 147:15–148:19). Specifically, Petitioner explains that Mr. Clements simulations were “fundamentally flawed” for the following reasons:

[Mr. Clements] ignored all the heat flowing into the support 24 illustrated in Portelli Fig. 8, unrealistically assuming that all of the heat enters the peripheral edge region 11 from the die and propagates through the thin plastic to the base 8;

[o]mitt[ed] the cooling effect of the support 24 artificially elevated the flange temperatures in Mr. Clements’s model, making the flange look hotter and weaker than it would actually be, causing Mr. Clements to conclude erroneously that the flange would buckle and deflect in the wrong direction when engaged by the die 25; [and]

ignore[d] heat-shielding and water-cooling [in Portelli’s heated-air embodiments].

Id. at 22–23 (citing Ex. 1003, 4:3–6, 4:10–12, 7:1–6, 11:20–21, 19:20–21, 22:26–28; Ex. 1044 ¶¶ 36, 71, 94–97, 122; Ex. 1047, 153:4–14, 155:11–156:15; Ex. 2007 ¶¶ 40–45, 60, 83–84). We find that the thermodynamic

simulations Mr. Clements provided indicate deformation may occur under some circumstances, but agree with Petitioner that Mr. Clements failed to account for numerous teachings in Portelli such as the heat flow and cooling effects identified by Petitioner. *See id.*

Lastly, Patent Owner states that “[n]either Patent Owner, its expert, nor Petitioner’s expert are aware of any working examples of Portelli or anything similar to it.” Resp. 21 (citing Ex. 2007 ¶ 35–36; Ex. 2009, 310:25–311:4). Once again, Patent Owner misrepresents the testimony of Mr. May. Mr. May was asked whether he “personally ever tried to do what Portelli has shown in Exhibit 1003.” Ex. 2009, 309:2–3. Mr. May explained at length that he “created articles with rolled edges,” that he “may have used processes that were similar to Portelli,” and that “Portelli certainly offers a method of producing [articles with rolled edges].” *Id.* at 309:2–311:4. At no point, in the portions of Mr. May’s deposition cited by Patent Owner, did Mr. May indicate that he was not aware of any working examples of Portelli or “anything similar,” as Patent Owner asserts. Resp. 21. Moreover, though Patent Owner argues that Portelli discloses no working examples, working examples are not required to show enablement. *See Beckman Instruments*, 892 F.2d at 1551 (actual implementation is not required to enable a prior art reference); *Schering Corp. v. Geneva Pharms., Inc.*, 339 F.3d 1373, 1380 (Fed. Cir. 2003) (explaining that anticipation does not require the actual creation or reduction to practice of the prior art subject matter).

*iii. Nature of the Invention and Predictability of the Art
(Factors 4 and 7)*

Patent Owner argues that “[t]he critical dependence on polymer chemistry and how plastic reacts to different degrees of heating and cooling

qualifies thermoforming as a highly unpredictable art field.” Resp. 22 (citing Ex. 2007 ¶ 21). According to Patent Owner, the “highly unpredictable aspects” of Portelli’s first embodiment include its use of hot air convection vectors and “the extent and direction of the plastic’s thermal expansion along the terminal edge region.” *Id.* As a result, Patent Owner explains that rippling, folding, and puckering occur which is detrimental to the smoothness of the periphery of the edge and even more so when that edge is folded over. *Id.* at 22–24. Patent Owner reasons that Portelli is not enabled because Portelli does not teach the following:

how to (i) control the hot air from ducts 2 to consistently heat the precursor region 11 and edges 12; (ii) control the unpredictable thermal expansion of either edge 12, region 11, or tapers 42 while simultaneously avoiding the distortions and puckering that would result from using the unheated formers 34–41; or (iii) achieve a mass-producible rectangular article having a smooth periphery on “high volume assembly line scale.”

Id. at 25–26 (citing Ex. 2007 ¶¶ 39–44).

Patent Owner’s assertion that Portelli does not describe how to prepare mass-produced, high-volume articles is misplaced. The Challenged Claims are merely directed to an article and do not provide any limitations directed to whether that article is “mass-producible” or is commercially manufactured on a “high volume assembly line scale.” *See* Ex. 1001 72:56–73:27, 73:31–73:45, 74:7–74:43.

We find Patent Owner’s argument that Portelli describes a process that uses of “hot air convection” and “thermal expansion” that is unpredictable, because Portelli does not detail how to control the process, not persuasive and contrary to the evidence of record. *See* Resp. 22–26. Petitioner shows that thermoforming is a mature art that has been successfully practiced for many years. Reply 2–6. Further we note the

numerous prior art references and commercial articles of record, predating and existing near or at the time of the '680 patent, describe using heat to thermoform and shape articles, including rectangular articles, as indicators of a well-developed state of the art. *See e.g.*, Ex. 1049, 124–128; Ex. 1044 ¶¶ 42–49, 52; Ex. 1051; Ex. 1053; Ex. 1058; Ex. 1003; Ex. 1004; Ex. 1005; Ex. 1047, 23:1–23 (describing thermoforming as a “mature art”).

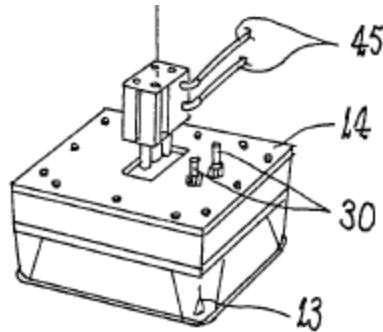
Further, Portelli explains that its method heats the peripheral edge of the tray such that the peripheral edge becomes malleable and can be shaped. Ex. 1003, 2:28–30. Portelli describes one embodiment that “comprises blowing hot air over the peripheral edge region of the tray” so that it is heated and is shaped around a former and complementary deforming formation. *Id.* at 6:22–29. Portelli also explains that “the apparatus includes shield means for shield[ing] that portion of the tray laterally inwardly of the peripheral edge region, from the hot air blast” and may also include a “cooling means for actively cooling the peripheral edge region of the tray.” *Id.* at 7:1–6; *see also id.* at 4:3–12; 9:27–29 (interrupting the hot air blast and the edge region is cooled); 11:15–26. Portelli explains that the cycle time for its method is “dependent on the aggressiveness of the heating of the edge region 11 . . . and the rate at which the edge region 11 is cooled.” *Id.* at 10:6–14. According to Portelli the preferred method for cooling the tray is to use “cooling water [that] is circulated through pipes 30 mounted on former 3 thereby acting to cool the former 3 which in turn cools the region 11.” *Id.* at 10:21–24. Mr. May further testified regarding numerous methods, known to persons of ordinary skill in the art, to control and minimize the problems identified by Patent Owner. Ex. 1044 ¶¶ 72–82 (citing Ex. 1035, 61–65, 185, 194–195; Ex. 1050, 183–187). Patent Owner does not adequately address or explain what is lacking in Portelli’s

disclosure or why Portelli's shielding and cooling means are not sufficient to control the heating of the peripheral edge. *See generally* Resp. 22–26; Sur-Reply.

iv. Amount of Direction or Guidance (Factor 2)

Patent Owner argues that Portelli's first embodiment (Figures 1–2 and 9–11) use nonstandard thermoforming equipment which weighs against enablement. Resp. 26. Specifically, Patent Owner contends that “a [person of ordinary skill in the art] would not know what a ‘clacker box’ is nor would . . . be able to obtain the specifications needed to make one.” *Id.* Patent Owner states that Mr. May testifies that he “couldn't say [if] he had ever seen Portelli's nonstandard equipment in Figures 9–11 prior to the earliest effective filing date.” *Id.* at 27 (citing Ex. 2009, 324:5–20, 338:19–340:17). In this regard, Mr. May testified that he had seen “something similar” to the thermoforming equipment of Portelli “within [his] 30 years of experience,” but did not recall whether it was before or after August of 2015. Ex. 2009, 324:5–20. Patent Owner reasons that this testimony is “further proof that a [person of ordinary skill in the art] would not have had the requisite equipment to even attempt Portelli's First Embodiment methods,” and that “it was incumbent on the Portelli reference to sufficiently describe this non-standard machinery.” *Id.*

The crux of the issue is whether the ordinarily skilled artisan would understand from the description of Portelli's “clacker box” what it is and how to use it. A portion of Figure 11 of Portelli illustrating its “clacker box” is reproduced below.



The excerpt of Figure 11 above shows clacker box 14, including clamping feet 13, water cooling pipes 30, and compressed air conduits 45 for moving feet 13 of clacker box 14 in and out from under rim 10 of a tray being formed. Ex. 1003, 11:27–29. Portelli also explains that clacker box 14 acts to shield the upper portion of the rim from the hot air blast. *Id.* at 11:20–21.

Petitioner shows that using heated air for thermoforming articles was standard practice and widely-known to persons of ordinary skill in the art. Reply 23 (citing Ex. 1049, 124–128). Petitioner argues that “[t]he use of hot-air manifolds such as illustrated in Figs. 9–11 of Portelli was so well-established that a [person of ordinary skill in the art] could buy manifolds as standard, of-the-shelf components.” *Id.* (citing Ex. 1044 ¶ 88). Petitioner explains that “Portelli’s manifold is not an exotic part just because it has an unusual name—‘clacker box.’” Reply 23. In this regard, Mr. May testifies that Portelli’s clacker box “is a typical hot-air manifold whose behavior and performance would have been well-understood by a [person of ordinary skill in the art.]” Ex. 1044 ¶ 87.

Patent Owner does not discuss or dispute—separate from criticism of the term “clacker box”—whether Portelli describes a component sufficiently for a person of ordinary skill in the art to make and use the component identified as a clacker box. We do not find compelling Patent

Owner's assertion that a person of ordinary skill in the art would not have known from Portelli what a "clacker box" is or how to obtain one.

v. *Quantity of Experimentation Necessary (Factor 1)*

Patent Owner argues that a "combination of certainties and uncertainties make" experimentation with Portelli's first and fourth embodiments unreasonable. Resp. 27. With respect to the first embodiment, Patent Owner identifies the following issues: "(1) excess plastic tapers 42 on the periphery will always result and will leave puckers or other distortions on the periphery;" "(2) the convection vectors of the hot air from ducts 2 is unpredictable and there is no teaching on how to control it;" and "(3) every plastic that Portelli [uses] has a natural unpredictability in terms of its reaction to heat and its thermal expansion which necessarily prevents a [person of ordinary skill in the art] from knowing what it will do in response to unequal heating by hot air from ducts 2 and repeated impact by formers 3." *Id.* at 27–28 (citing Ex. 2007 ¶¶ 38–45, 52). Patent Owner also identifies the following "combination of certainties and uncertainties" with respect to Portelli's fourth embodiment: "(1) in moving the sharp terminal edge 12 away from the periphery, a new sharp corner . . . is formed;" "(2) an uncontrolled amount of radiant heat will cause unpredictable weakening, expansion, and rippling in the plastic;" "(3) the adhesion between peripheral edge region 11 and hot die 25 would result in defective articles upon ejecting the same from the mold;" "(4) the adhesion between peripheral edge region 11 and hot die 25 would "un-roll" the deformed region 11 as the article is ejected from die 25;" and "(5) the combination of heating and gravity will cause the terminal edge 12 to wilt or buckle in response to being pressed into die 25 and the rim 10, zone "X",

and portions of sidewall 9 will become softened, weakened, and deformed.” *Id.* at 28 (citing Ex. 2007 ¶¶ 55–57, 60, 80, 81, 103–109).

We find Patent Owner’s argument that the amount of experimentation to make and use Portelli would have been unreasonable not persuasive. *See* Resp. 27–29. The test for enablement is “not merely quantitative.” *PPG Indus., Inc. v. Guardian Indus. Corp.*, 75 F.3d 1558, 1564 (Fed. Cir. 1996). On the contrary, “a considerable amount of experimentation is permissible, if it is merely routine.” *Id.*; *In re Vaeck*, 947 F.2d 488, 495 (Fed. Cir. 1991) (“That *some* experimentation may be required is not fatal; the issue is whether the amount of experimentation required is ‘undue.’”). Patent Owner fails to identify what about the quality or quantity of experimentation is “undue” with respect to enabling a person of ordinary skill in the art to practice the process taught by Portelli to produce an article with the features of the Challenged Claims. As explained above, we disagree with Patent Owner that the evidence of record shows that the peripheral edge always puckers, that Portelli results in uncontrolled heating, that adhesion necessarily occurs, or that the skilled artisan would not know how to overcome adhesion to the die. *See* Resp. 27–28. In this regard, Mr. Clements acknowledges experimentation is routine in the art of thermoforming plastics. Ex. 2007 ¶ 21.

vi. Conclusion as to Enablement of Portelli

Based on our analysis above, we find in consideration of all of the evidence and argument advanced by the parties that, on balance, each of the *Wands* factors discussed above weighs in favor of showing that Portelli is enabled for purposes of both anticipation and obviousness.

2. Summary of Long

a. Disclosures of Long

Long “relates to an open mouthed container (eg. tray, cup or the like) having a profiled periphery outwardly of the mouth, there being a return of the edge in the under part of the profiled periphery.” Ex. 1004, 1:4–6. Long discloses the use of a trimming procedure applied to “a thermoformed precursor or preform” to provide a container with “a ‘concealed-from-above’ in-turned edge.” *Id.* at 1:19–25.

Figures 4, 5A, 5B, and 5C of Long are reproduced below.

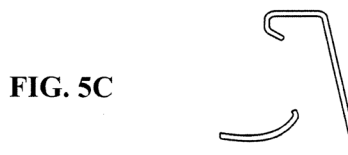
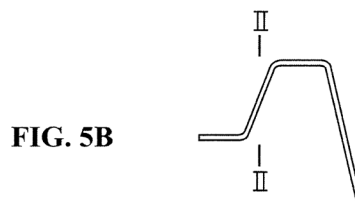
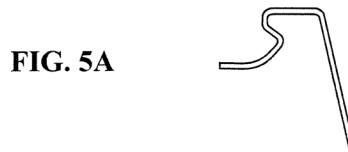
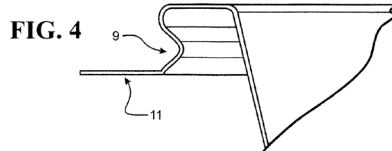


Figure 4 illustrates the edge region of a preform or precursor container prior to trimming. *Id.* at 6:4–6. Long further explains as follows in regard to Figures 5A, 5B, and 5C:

Figures 5A, 5B and 5C show, as three stages, the features of Figure 4, the distortion, deforming, stretching, blowing or the like of the form of Figure 5A sufficiently to provide a cut line shown by the broken lines II-II in Figure 5B which is outwardly of the final profile periphery and Figure 5C shows how the resilience allows the under turn of the preform or precursor of Figure 5A to be reassumed after the cut has been made on the broken line as shown in Figure 5B.

Id. at 6:7–12.

b. Whether Long is Enabled

Patent Owner argues that “Long’s prophetic disclosures taken ‘as a whole’ do not enable a [person of ordinary skill in the art] to make and use any of what is mentioned, experimentation or not.” Resp. 50–51.

According to Patent Owner, “Long as a reference teaches very little except incomplete and erroneous proposals for the [person of ordinary skill in the art] to figure out on its own.” *Id.* at 34 (citing Ex. 2007 ¶¶ 122–124).

Critically, according to Patent Owner, “Long provides no evidence that its theoretical proposals, to the extent they can be practiced or understood, can be successfully used to make a rectangular thermoformed tray having a smooth-edged periphery -*via any process amenable to mass manufacturing.*”

Id. (citing Ex. 2007 ¶¶ 122-124, 212) (emphasis added). Patent Owner’s enablement argument is fundamentally flawed because the Challenged Claims do not recite an article manufactured by a “process amenable to mass manufacturing.” Petitioner may rely on Long for all that it teaches to show

obviousness even if Long does not teach a “process amenable to mass manufacturing.”

Specifically, Patent Owner argues that “Long mentions a ‘first tooling assembly’ but in no way describes what it is,” that “Long’s precursor requires a mold whose rim has a significant negative draft,” and that according to modeling done by Mr. Clements “using Mr. May’s dimensions of Long’s periphery, . . . shrinkage of the periphery of the thermoformed thermoplastic of the article enters into the undercuts of the mold to become ‘trapped.’” *Id.* at 35–37 (citing, e.g., Ex. 2007 ¶¶ 122–140, 154; Ex. 2010, 13). From this, Patent Owner argues that “in the process of attempting to recreate Long’s proposals using a mold with undercuts, the [person of ordinary skill in the art] would realize that the proposed methods yield a trapped part that is unusable for any further processing.” *Id.* at 37 (citing Ex. 2007 ¶¶ 136, 152). Patent Owner contends that “a cooled precursor could not be released from the mold without breaking it while a heat-softened precursor could not be released without also permanently deforming the periphery into a contour different from the one required by Long Figure 5A,” and that the “impossible removal problem is further complicated if a male mold is used or if a [person of ordinary skill in the art] were to attempt mass-production of such a precursor.” *Id.* at 39 (citing Ex. 2007 ¶¶ 144–146). Next Patent Owner argues that a person of ordinary skill in the art would understand that the precursor with Long’s Figure 5A periphery “as dimensioned according to Mr. May’s measurements . . . has an overhang-to-sheet thickness ratio that exceeds ratios known to permanently crimp or lock thermoplastic sheets made of PET, CPET, PP and polystyrene thermoplastics . . . to adjacent object surface.” Resp. 39 (citing Ex. 2007 ¶¶ 143–152).

We find Mr. Clements attempt to model how a person of ordinary skill in the art might theoretically attempt to produce the article shown in Long’s Figure 5A ambitious, but flawed, and not persuasive to show that producing the article taught by Long was “impossible.” *See* Ex. 2007 ¶¶ 123–143. Mr. Clements modeling is based as much on the assumptions he adopts as it is on what Long, itself, taught. Those assumptions include using the dimensions of Figure 5A to match “those measured by Mr. May,” using an “industry standard radius at each corner,” and then speculating from the model he created that a person of ordinary skill in the art “would find that removal of an article with Long’s Figure 5A periphery would not be possible without resort to permanent deformation or destruction of the article.” *Id.*

The conclusions Mr. Clements reaches identify no persuasive support and, therefore, appear speculative and conclusory. *See, e.g.,* Ex. 2007 ¶¶ 141–143; *see also id.* ¶ 143 (noting that “a male mold could also be utilized,” which was apparently not modeled by Mr. Clements, but he concludes would have the “previous problems” and “will also have the potential for ripping the plastic”). We further find persuasive in this regard Petitioner’s showing that articles made using Long’s process were, in fact, produced on a commercial scale “since at least as early as 2012.” Reply 27–38 (citing, *e.g.*, Ex. 1044 ¶¶ 126, 137, 143; Ex. 1045 ¶ 4–5; Ex. 1057). In short, the evidence provided by Patent Owner fails to show that the features of the article Long teaches that correspond to the claimed elements of the ’680 patent would have been impossible to produce in accordance with Long, as Patent Owner asserts.

Next, Patent Owner argues that Long refers to a “second tooling assembly” that performs “generic actions,” but does not provide “details

about the intricacies of the ‘second tooling assembly.’” Resp. 41–42 (citing Ex. 2007 ¶¶ 156–161). According to Patent Owner, Mr. May acknowledged that Long’s second tooling assembly would need to be custom made, and from this Patent Owner asserts a person of ordinary skill in the art “would have to engage in considerable and undue experimentations to make and use such non-standard equipment.” *Id.* at 42–45 (citing, e.g., Ex. 2007 ¶¶ 161–163; Ex. 2009, 367:2–368:8). We are not persuaded that merely because Long may require “custom made” tooling for “generic actions” to produce an article it teaches, that shows that undue experimentation would have been required.

Patent Owner’s additional arguments are misplaced in the context of whether Long was enabled. Resp. 45–57. We have considered all of Patent Owner’s additional arguments, including that variations in the trimming tolerances result in sharp points that tear the overwrap film, that the demoldable periphery of Long necessarily creates the sharp edge it seeks to avoid, and that the nature of thermoplastics is unpredictable and known to generate microscopic hairs on the thermoformed surface. *Id.* While Patent Owner identifies issues that may need to be refined in the production process, or may even require experimentation to perfect, lacking is any persuasive evidence that the required experimentation would be undue. *Id.*

As noted above, Petitioner shows that actual trays embodying Long have been made since before the priority date. Reply 27–38 (citing Ex. 1045 ¶¶ 4–5; Ex. 1044 ¶¶ 126–127, 143, 150; Ex. 1057). Petitioner further shows that “Mr. Clements’s analysis is purely theoretical” and “[h]e did not test any trays or precursors to determine whether they could be removed from a mold.” *Id.* at 39. According to Petitioner, Mr. Clements also “contradicts himself by admitting a thinner tray . . . might be easier to remove from the

mold” and “admits that [Long’s] peripheral edges avoid the wrap path.” *Id.* (citing Ex. 1047:87:9–14; Ex. 1048, 123:11–124:13). Even with regard to potential problems raised by Patent Owner with the Long process, Petitioner shows that solutions were well-known, for example, to address the generation of microscopic hairs on the thermoformed surface. *Id.* at 41 (citing Ex. 1035, 171, Ex. 1044 ¶ 213).

Based on our analysis above, we find in consideration of all of the evidence and argument advanced by the parties that, on balance, a preponderance of the evidence pertaining to the *Wands* factors discussed above weighs in favor of showing that Long is enabled for purposes of obviousness.

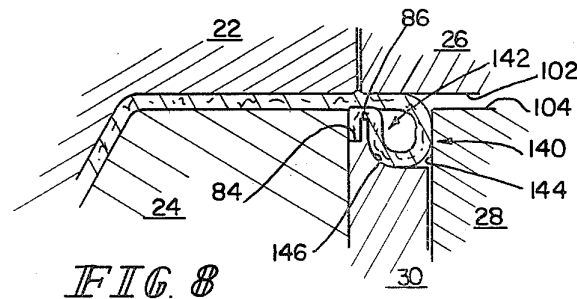
Even if Long were not self-enabled, its teachings nonetheless “qualify as prior art for the purpose of determining obviousness under § 103.” *Symbol Techs., Inc. v. Opticon, Inc.*, 935 F.2d 1569, 1578 (Fed. Cir. 1991). “[A prior art reference asserted under § 103 does not necessarily have to enable its own disclosure, i.e., be ‘self-enabling,’ to be relevant to the obviousness inquiry.” *Raytheon Technologies*, 993 F.3d at 1380.

3. *Summary of Meadors*

a. *Disclosures of Meadors*

Meadors generally relates to methods and apparatus for forming “a multiple-thickness bead in a sheet or blank of a flexible material, such as thermoplastic material,” in the process of making a container or lid. Ex. 1005, 1:5–9.

Figure 8 of Meadors is reproduced below.



In Figure 8, an apparatus with elements including vertically upper die member 22, vertically lower die member 24, vertically upper draw pad 26, vertically lower draw pad 28, and ring 30 work in conjunction to form a blank of flexible material into a desired configuration. *Id.* at 2:59–3:2, 3:57–58, 4:67–5:3. Petitioner describes the article formed in Figure 8 of Meadors as a tray with “an extension which is bent down, then in, and then up such that the edge is displaced from the periphery of the tray, giving the tray a smooth periphery.” Pet. 11–12 (citing Ex. 1002 ¶ 46).

b. Whether Meadors is Enabled

Patent Owner argues that “[t]here is no guidance in Meadors on how to use its dies and heating coils to adequately thermoform a thermoplastic sheet to obtain the bead formations illustrated in Meadors’ Figures 6–10 without tearing the sheet,” and that Meadors is not enabled based on the following:

- (i) a POSITA must re-invent Meadors’ process using a thermoplastic substrate to investigate how, if at all, the same beads could be achieved using that thermoplastic substrate as are shown in Figures 6–10 (in which the substrate was paper stock);
- (ii) there is no guidance on how to adjust the dies to properly operate on a thermoplastic; (iii) there are no working examples of a thermoplastic with the beads of Figures 6–10 formed by Meadors’ dies, and (iv) because ABS, a thermoplastic, and paper stock have different material properties, Ex. 2009, 194:6–9, a

[person of ordinary skill in the art] cannot predict the effects of Meadors' device on ABS. Ex. 2007, ¶¶206-208

Resp. 64–65 (discussing *Wands* factors 1, 2, 3, and 7).

Meadors expressly discloses “[a] method and apparatus for forming a double-thickness bead in a flexible sheet stock article,” and states as follows:

According to the method, a blank 100 of flexible material is provided. Blank 100 typically is in the form of a disc-like round, rectangular, elliptical, etc., flat sheet. The material may be of any known type, including, but not limited to, paper (e.g., milk carton stock), thermoplastic material (e.g., acrylonitrile butadiene styrene), or other suitable material.

Ex. 1005, 3:40–46. In light of this express disclosure, we do not find persuasive the opinion of Mr. Clements that, based on his “experience in the molding of paper products . . . Meadors’ Figures 6–10 are exclusively limited to rolled peripheries in paper or fiber sheets” in light of “the material cross-section Meadors chose to use in its figures.” Ex. 2007 ¶ 195; *see also id.* ¶¶ 201–202 (suggesting that Meadors “cannot possibly show its dies operating on a plastic substrate” because another reference includes illustrations that show that plastic substrate “thins in the corners of the die as it is flexed”). Mr. Clements’s opinions on what cross-hatching symbols correlate to paper versus plastic or how another reference depicts the thickness of plastic in a die simply do not supersede the express disclosure of Meadors, which makes clear that the blank is a “flexible material” and may be “paper” or “thermoplastic.” *See* Ex. 1005, 3:40–46; *see also* Reply 25 (noting that “[w]hatever material is denoted by the texture lines in the drawings [of Meadors], it is only an example”).

Mr. Clements also states that “the Meadors process would never work on a plastic sheet of material,” because, in his view, if it were plastic it would “rip or rupture” in response to the stretching forces applied to it.”

Ex. 2007 ¶ 205. Mr. Clements identifies no persuasive support for his opinion, which we accordingly find conclusory and insufficient to supplant the express disclosures of Meadors. We have also considered Mr. Clements opinion that, even though Meadors expressly discloses heating coils 90 and 92 to “heat-set the material,” in his view this does not constitute thermoforming, which requires “heat to be constantly controlled.” *Id.* ¶ 208. Mr. Clements does not direct us to any disclosure in Meadors that suggests the heat is not controlled, and neglects to address Meadors express disclosure that “[h]eating coils 90, 92, respectively are provided in the upper and lower dies 22, 24 as desired, depending, for example, upon the type of material to be formed in the die mechanism 20.” Ex. 1005, 3:36–39; *see also* Ex. 1044 ¶ 267 (Mr. May testifying that a person of ordinary skill in the art would have known “that the reason to use heated dies to shape a thermoplastic sheet is to thermoform it”).

Based on our analysis above, we find in consideration of all of the evidence and argument advanced by the parties that, on balance, a preponderance of the evidence pertaining to the *Wands* factors discussed above weighs in favor of showing that Meadors is enabled for purposes of anticipation and obviousness.

4. Summary of Brown

Brown generally pertains to improvements in an extended rim of an injection-molded container. Ex. 1006, 1:8–13. Figure 6 of Brown is reproduced below.

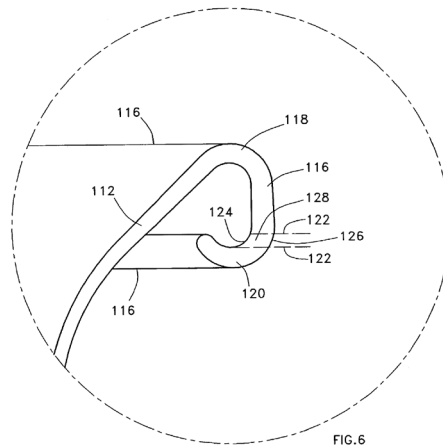


Figure 6 illustrates the rim portion of a container with rim wall 116 having an upper portion 118, lower portion 120, and inner surface 124, and an outer surface 126. *Id.* at 2:55–57, 5:7–21. Upper portion 118 extends outward and downward, and lower portion 120 extends downward and inward, then “further extends with both an inward directional component and an upward directional component.” *Id.*

E. Alleged Anticipation by Portelli

Petitioner contends that claims 1–3, 5, 7, 8, 10, 11, and 15–23 of the '680 patent are anticipated by Portelli. Pet. 13–55. Claim 1 requires, in part, an article having a non-circular periphery and a shape that includes a deflectable flange with certain features. Ex. 1001, 72:57–73:17. For purposes of showing anticipation, Petitioner relies on Figure 13 of Portelli as disclosing the recited deflectable flange and on Figures 14 and 15 of Portelli as disclosing an article with a non-circular periphery. Pet. 13–16. More specifically, Petitioner asserts that “rim 58 [shown in Figure 14] is illustrated as item 10 in Portelli [Figure] 13.” *Id.* at 19.

In response, Patent Owner shows in this case that rim 58 of Figure 14 of Portelli is shown in Figure 16 of Portelli and that rim 58 does not have the features that Petitioner relies on from Figure 13 of Portelli as corresponding

to the recited deflectable flange. Resp. 30. In the Reply, Petitioner argues as follows:

A [person of ordinary skill in the art] viewing Portelli in its entirety would immediately understand that the flanges in Figs. 8 and 13–16 are just examples of flange shapes intended to be used on the trays in Figs 14–16, since (1) each flange accomplishes Portelli’s purpose of displacing the terminal edge away from the wrap path, and (2) Portelli describes and illustrates the same rounded rectangular article in multiple drawings. Ex. 1003, Abstract, 1:30–2:2, 2:22–25, Figs. 10, 11, 14, 15. Furthermore, the flange shapes illustrated in Figs. 8 and 13–16 are very simple, each consisting of a small number of straight segments and arcs. Thus a [person of ordinary skill in the art] would ‘at once envisage’ including the flange in Fig. 13 in the trays in Figs. 14–16. Ex. 1044, ¶ 120.

Reply 24–25; *see also id.* at 24 (arguing that “a reference containing all of the elements of a claim “can anticipate [the] claim even if it ‘d[oes] not expressly spell out’ all the limitations arranged or combined as in the claim, if a person of skill in the art, reading the reference, would ‘at once envisage’ the claimed arrangement or combination” (quoting *Kennametal, Inc. v. Ingersoll Cutting Tool Co.*, 780 F.3d 1376, 1381 (Fed. Cir. 2015)).

In the Sur-reply, Patent Owner argues that Petitioner improperly raises a new theory of anticipation in its reply based on *Kennametal* that was not relied upon in the Petition. Sur-reply 12. We agree. Patent Owner demonstrated in its Response that Petitioner wrongly asserted in the Petition that “rim 58 [shown in Figure 14] is illustrated as item 10 in Portelli [Figure] 13.” Pet. 19; Resp. 30. Petitioner abandons that argument in its Reply, and instead turns to new testimony from Mr. May to support a new basis for anticipation, namely that a person of ordinary skill in the art would have known that teachings of different embodiments in Portelli may

be combined because they are, for example, “very similar.” *See* Ex. 1044 ¶ 120. Because this is argument and evidence that was not sufficiently advanced by Petitioner as a basis for anticipation in the Petition, under the circumstances presented in this case, it constitutes a new ground of anticipation improperly raised by Petitioner for the first time in its Reply.⁹ *See Intelligent Bio-Systems, Inc. v. Illumina Cambridge Ltd.*, 821 F.3d 1359, 1369 (Fed. Cir. 2016) (“It is of the utmost importance that petitioners in the IPR proceedings adhere to the requirement that the initial petition identify ‘with particularity’ the ‘evidence that supports the grounds for the challenge to each claim’” (citing 35 U.S.C. § 312(a)(3))).

For the reasons above, Petitioner fails to show in the Petition that Portelli anticipates claim 1 of the ’680 patent. For the same reasons, Petitioner fails to show that claims 2, 3, 5, 7, 8, 10, 11, and 15–23 of the ’680 patent, which depend from claim 1, are anticipated by Portelli.

F. Alleged Anticipation by Meadors

Petitioner contends that claims 1–5, 7–12, and 20–23 of the ’680 patent are anticipated by Meadors. Pet. 56–90. Petitioner provides a detailed explanation of its contentions in the Petition, including a clause-by-clause analysis specifying how Meadors discloses each limitation, frequently accompanied by annotated figures from Meadors, and those contentions are supported by the testimony of Mr. May. *Id.*; Ex. 1002 ¶¶ 104–148. In addition to arguing that Meadors is not enabled, which we found not persuasive for the reasons provided above, Patent Owner also

⁹ Petitioner also cited in the Petition to rectangular tray 5 shown in Portelli Figure 11, but did not otherwise explain in either the Petition or the Reply how this disclosure related to what Petitioner relied on in Figures 13, 14, and 15 of Portelli. *See* Pet. 15 (citing Ex. 1003, 10:17–18).

argues that Meadors “only teaches formed sheets of paper stock,” “does not inherently disclose an article with a non-circular periphery or one formed in the shape of a rectangular tray having rounded corners and edges,” and “does not teach a material that is necessarily substantially optically clear.” Resp. 59–67. Based on our review of the foregoing arguments and evidence, we find that Petitioner establishes sufficiently that Meadors discloses each of the limitations of claims 1–5, 7–12, and 20–23 of the ’680 patent and adopt Petitioner’s analysis as our own findings and conclusions as to these claims. Pet. 56–90. We focus our discussion below on the reasons why we find Patent Owner’s arguments in opposition not persuasive. *See In re NuVasive, Inc.*, 841 F.3d 966, 974 (Fed. Cir. 2016) (noting that “[t]he Board, having found the only disputed limitations together in one reference, was not required to address undisputed matters”); Paper 8, 8 (emphasizing that “any arguments for patentability not raised in the response may be deemed waived”).

Claim 1 is directed to “[a]n article . . . comprising a shaped thermoplastic substrate sheet.” Ex. 1001, 72:57–73:17. Petitioner shows that Meadors expressly discloses this limitation. Pet. 56–57 (citing Ex. 1005, 1:5–9, 3:36–46, 4:23–25). Specifically, Meadors states that its “invention relates to methods of, and apparatus for, forming a multiple-thickness bead in a sheet or blank of a flexible material, *such as thermoplastic material* or paper stock, as the sheet or blank is being formed into an article such as a container or lid for a container,” and that the material used in a blank to form a container “may be of any known type, including, but not limited to, paper (e.g., milk carton stock), *thermoplastic material* (e.g., acrylonitrile butadiene styrene), or other suitable material.” Ex. 1005, 1:5–9, 3:36–46 (emphasis added). Patent Owner’s argument that

Meadors “only teaches formed sheets of paper stock” based on the cross hatching used in certain figures, and on how another reference illustrates deformed thermoplastics, has no merit in light of the express disclosures of Meadors that a flexible material is used and such flexible material may be a “thermoplastic material.” *See* Resp. 59–64.

Claim 1 also provides that the recited article has a “non-circular periphery” and claims 10 and 21 further recite that the body of the article “has the shape of a rectangular tray having rounded corners and edges.” Ex. 1001, 72:57–73:17; 73:40–41; 74:21–23. Petitioner shows that Meadors expressly discloses that “[b]lank 100 typically is in the form of a disc-like round, rectangular, elliptical, etc., flat sheet.” Pet. 57; Ex. 1005, 3:41–43. Petitioner contends that “a non-circular periphery is inherent in Meadors,” because, as Mr. May explains, “thermoform preforms typically have the general outer shape of the finished article” and “Meadors’ rectangular blank means that a generally rectangular tray would be the result of subsequent processing.” Pet. 57; Ex. 1002 ¶ 106. As to claims 10 and 21, Petitioner further contends that “a rounded rectangular shape is inherent in Meadors,” because “manufacturability and robustness considerations in thermoforming require compartments and rolled flanges to have rounded corners and edges.” Pet. 87, 89 (citing Ex. 1002 ¶ 141). Patent Owner argues that Meadors does not inherently disclose a noncircular periphery or rectangular tray because Mr. May testified that the periphery of the blank “generally . . . will be similar to the periphery of the finished article,” and that he used the term “[g]enerally” because it’s possible to . . . trim away a portion of the blank such that you would alter the overall shape.” Resp. 66; Ex. 2009, 202:9–16. We find no contradiction in Mr. May’s testimony, as Patent Owner asserts. *See* Resp. 66. Mr. May explained that Meadors

discloses the use of a rectangular blank and that a rectangular blank necessarily produces a rectangular article. That is not contradicted by Mr. May's additional explanation that if one cuts the blank the overall shape of the article may be altered. Meadors, itself, does not disclose or suggest cutting the blank. We are persuaded that a preponderance of the evidence shows that Meadors discloses an article with a "non-circular periphery" with "the shape of a rectangular tray having rounded corners and edges." *See* Ex. 1001, 72:57–73:17; 73:40–41; 74:21–23.

Claim 12 depends from claim 1 and further recites "wherein substantially every part of the article is substantially optically clear." Ex. 1001, 73:44–45. The Specification of the '680 patent states that "[m]any known thermoformable plastic sheets are substantially optically clear, meaning that a substantial amount of light incident upon one face of the sheet will pass therethrough and be visible to an observer looking at the opposite face." *Id.* at 52:58–62. According to the '680 patent, "[i]t is well known that many optically clear plastic materials become opaque . . . when they are bent." *Id.* at 53:1–4. The '680 patent states that the methods described therein "permit bending of optically clear thermoplastic materials to form containers without significantly reducing the optical clarity of the materials," and that "it is believed that the ability to bend these materials without opacification is attributable to raising the temperature of the materials above their glass transition temperature (but below their melting temperature) prior to bending them." *Id.* at 53:8–10, 53:13–18. The '680 patent further states as follows:

To the extent an objective measure of optical clarity is considered necessary, a material can be considered "substantially optically clear" if at least 50% of visible white light (measured as luminous flux) that is incident upon one face of the material from

directly above it is transmitted out the opposite face of the material (without regard to diffraction- or scattering-related redirection of the light).

Id. at 53:19–26.

Petitioner shows that the plastic used in the tray of Meadors is ABS, that ABS is optically clear, and, thus, that the entire tray of Meadors is substantially optically clear, as required by claim 12. Pet. 88 (citing Ex. 1005, 3:45–46; Ex. 1002 ¶ 143). Patent Owner argues that “the fact that Meadors is silent as to whether its par[t]icular ABS has a pigment, colorant, or opacifier means that Meadors cannot disclose an ABS that is necessarily substantially optically clear.” Resp. 67. We disagree. There is no dispute that Meadors discloses the use of optically clear ABS and that Meadors does not disclose the use of “pigment, colorant, or opacifier.” The only conclusion the evidence supports is that Meadors discloses the use of ABS, which necessarily produces a substantially optically clear article, as required by claim 12.

G. Alleged Obviousness Over Portelli and Long

Petitioner contends that claims 1–5, 7–12, and 15–24 of the ’680 patent would have been obvious over the combination of Portelli and Long. Pet. 96–132. Petitioner’s contentions are supported by Mr. May. Ex. 1002 ¶¶ 149–230. In addition to Patent Owner’s enablement arguments, which we found not persuasive for the reasons addressed above, Patent Owner further disputes only whether Petitioner has shown a sufficient reason to combine Portelli and Long and, with regard only to claim 12, whether the asserted combination teaches a “substantially optically clear” article. Resp. 32–34; 57–60.

1. Differences Between the Subject Matter of Claims 1–5, 7, 10, 11, and 15–24 and the Combination of Portelli and Long

Petitioner shows that the combination of Portelli and Long teaches each of the limitations of claims 1–5, 7, 10, 11, and 15–24. Pet. 96–132. As to claim 1, Petitioner relies on Long as teaching a tray with a smooth periphery and rounded, rectangular, non-circular shape. *Id.* at 96–98 (citing, e.g., Ex. 1004, 7:14 Figs. 1, 5C). Petitioner shows that Long’s tray is comprised of a substrate sheet of thermoplastic and is thermoformed into a tray with a bottom, sidewalls, and deflectable flange. *Id.* at 98–104 (citing, e.g., Ex. 1004, 2:16–19, 2:25–32, 3:16–17, 3:25–26, 3:33–34, 4:4–11, 6:3–4, 6:22–33, 7:5–21, 8:3–9, 8:17–26, 8:32–9:8, Figs. 1, 2, 3, 5C ; *see also* Ex. 1002 ¶¶ 172–179 (Mr. May’s testimony supporting Petitioner’s contentions). Petitioner includes an annotated version of Figure 5 C of Long identifying how Long teaches a tray with a bend region interposed between the junction and the peripheral edge where the angle between the proximal and distal portions of the bend region is 90°. *Id.* at 104–105; Ex. 1002 ¶ 182; *see also id.* at 106–112 (detailing, with annotated figures, how Long teaches additional features of the deflectable flange of claim 1). As to the “peripheral flange bearing the peripheral edge and being connected to the rest of the deflectable flange by way of an elbow,” Petitioner relies on Portelli. *Id.* at 32, 109. Petitioner shows that the peripheral flange shown in Figure 13 of Portelli includes an elbow corresponding to the “elbow” recited in claim 1. *Id.* (citing Ex. 1002 ¶ 70; Ex. 1003 Fig. 13).

Patent Owner does not dispute Petitioner’s showing that the combination of Portelli and Long teaches each of the limitations of claim 1, as well as each of the limitations of claims 2–5, 7, 10, 11, and 15–24. *See generally* Resp. We have reviewed Petitioner’s contentions in this regard

and determine that the Petition provides a sufficient showing that the combination of Portelli and Long teaches each limitation of claims 1–5, 7, 10, 11, and 15–24. We adopt Petitioner’s arguments and evidence as to these claims and limitations as our own. *See* Pet. 96–132; *see also* Paper 8, 8 (cautioning Patent Owner “that any arguments not raised in the response may be deemed waived).

2. Differences Between the Subject Matter of Claims 8 and 9 and the Combination of Portelli and Long

Petitioner includes claim 8 in its heading of claims that would have been obvious over Portelli and Long, however, Petitioner provides no analysis in the Petition to support that contention. *See* Pet. v; 96–132. With respect to claim 9, which depends from claim 8, Petitioner asserts under the ground of obviousness over Portelli and Long that claim 8 “is anticipated by Portelli.” *Id.* at 117. For the reasons provided above, Petitioner fails to show that claim 8 is anticipated by Portelli. *See supra* Section II.E. While we recognize that claim 9 appears to recite a narrower limitation (an offset angle (OA) of at least 230 degrees) than claim 8 (reciting an offset angle (OA) of at least 105 degrees), which arguably may suggest that if claim 9 were shown to be obvious over the asserted art, then claim 8 necessarily would have been obvious, we decline to speculate by importing allegations into the Petition directed to claim 8 not expressly asserted by Petitioner. Thus, Petitioner fails to address in the Petition the differences between claim 8 and the asserted combination of Portelli and Long, and the Petition is likewise deficient under this ground with regard to claim 9 because it depends from claim 8.

3. *Differences Between the Subject Matter of Claim 12 and the Combination of Portelli and Long*

Claim 12 depends from claim 1 and further recites “wherein substantially every part of the article is substantially optically clear.” Ex. 1001 , 73:44–45. Petitioner contends that Long identifies plastics, including PET, PLA, CPET, PP, and HIPS, that are “optically clear,” such that “Long’s entire tray is optically clear.” Pet. 120 (citing Ex. 1002 ¶ 209). In support, Mr. May states that in his experience “when a thermoformed article is specified to be made from an otherwise clear plastic and there is an absence of a specification or request to add a colorant or pigment, the intention and expectation is for a clear thermoform article.” Ex. 1002 ¶ 209.

Patent Owner does not dispute that Long teaches the use of optically clear plastics, but instead argues that Figure 1 of Long “shows it to be an opaque tray.” Resp. 57. We agree with Petitioner, as supported by Mr. May, that a person of ordinary skill in the art would have understood Figure 1 of Long “to be for the purpose of illustrating the shape of the tray, not its clarity or opacity, regardless of whether structures in the back are illustrated as visible through structures in the front.” Reply 41 (citing Ex. 1044 ¶ 255). Patent Owner further argues that using PET in the Long process requires stretching that “would induce crystallinity (and therefore opacity) in the parts elongated, which would include the side wall and the bent portion.” Resp. 58 (citing Ex. 2007 ¶ 66 (discussing Portelli), which we understand to have been intended to be ¶ 166 (discussing Long)). Mr. Clements did not address inducing “crystallinity” in Paragraphs 66 or 166 of his declaration, but instead stated that it was his “opinion that a [person of ordinary skill in the art] would expect the combination of demolding and stretching of the article according to Long’s methods to

induce the development of opacity in the material (assuming the material started out as being optically or visually clear, which Long neither shows nor describes, but instead illustrates only an opaque tray in its Figure 1).”

Ex. 2007 ¶ 166. Mr. Clements does not address how a process that may induce “the development of opacity” informs a determination of whether “substantially every part of the article” made by that process “is substantially optically clear,” as that term is defined in the ’680 patent. *See* Ex. 1001, 53:19–26

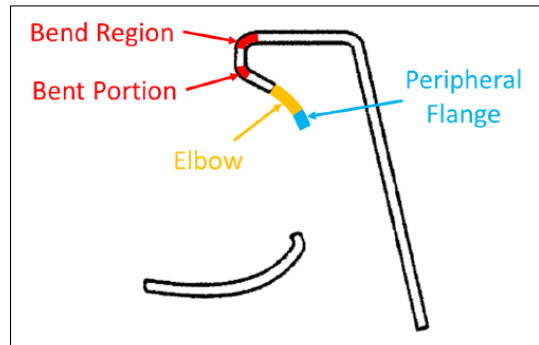
In its Reply, Petitioner provides a series of images showing that “clear trays made by Alto according to Long’s process are entirely clear” to support his opinion that “Long’s process does not introduce any crystallinity which would cause Long’s trays to be anything but entirely clear.”

Reply 42–45 (citing Ex. 1044 ¶ 256, Ex. 1045); Ex. 1044 ¶ 257. Patent Owner does not dispute the evidence provided by Petitioner and Mr. May in this regard. *See generally* Sur-reply.

We find a preponderance of the evidence shows that Long teaches an article “wherein substantially every part of the article is substantially optically clear,” as additionally required by claim 12. We credit the testimony of Mr. May in this regard, who explains that Long teaches the use of materials that are optically clear and shows that articles produced using Long’s process are entirely clear, which is more persuasive and supported than Mr. Clements opinion as explained above.

4. Reasons Supporting Obviousness Over Portelli and Long

Petitioner argues that it would have been obvious to add the elbow and peripheral flange of Portelli’s tray to Long’s tray such that “the curved bent portion is interposed between the elbow and the bend region, as shown in the annotated figure below.



Pet. 111. The figure above shows an annotated and modified version of Figure 5C of Long with the Bend Region and Bent Portion shown in red, the Elbow shown in yellow and the Peripheral Flange shown in blue, where Petitioner notes that the elbow and peripheral flange are from Portelli. *Id.*

Both Portelli and Long teach rolling over the peripheral edge of thermoformed articles in order to prevent the terminal edge of the article from tearing a plastic overwrap. Ex. 1003, 1:29–2:8; Ex. 1004, 1:9–13, 7:9–13. Portelli and Long describe several rolled-over configurations to accomplish the expressed solution. *See* Ex. 1003, Figs. 8 and 13; Ex. 1004, Figs. 5C and 8B. Petitioner contends that “a [person of ordinary skill in the art] would have looked at multiple rounded rectangular plastic food trays and would have considered it obvious to combine the concepts from those similar trays.” Pet. 95 (citing Ex. 1002 ¶¶ 160–164); *see also* *Wm. Wrigley Jr. Co. v. Cadbury Adams USA LLC*, 683 F.3d 1356, 1364 (Fed. Cir. 2012) (noting that the substitution of “one well-known cooling agent for another” presents “a strong case of obviousness”).

Further, according to Petitioner, “a [person of ordinary skill in the art] would have been motivated to combine any or all of Portelli (including Figs. 8 and 13) [and] Long . . . because the problems addressed by the ’680 Patent—(1) overwrap film or flesh being cut by the tray’s sharp edges, and (2) easily deformable edges—were recognized by these references and

thus ‘known in the field of endeavor at the time of invention and addressed by the patent.’” *Id.* at 92 (quoting *KSR*, 550 U.S. at 420). Petitioner argues that “the number of solutions for the problem of cutting the overwrap or the customer’s skin was so limited that the inventors of Portelli [and] Long . . . and the ’680 Patent all came up with the same solution: rolling the sharp edge away from the article’s periphery.” *Id.* at 92–93 (citing Ex. 1001, Claims 1, 11; Ex. 1002 ¶¶ 152–154; Ex. 1003, Abstract, 3:1–3, 5:1–2, 5:12, 5:25–6:3, 15:20–23, 18:3–5, 20:11–16, 20:24–27, 21:17–23; Ex. 1004, 1:9–13; 3:22–24; 4:1–3; 6:18–20; 7:9–19; 8:22–24; 8:33–9:1). Petitioner also argues the asserted combination would have been motivated by “the numerous similarities and common features” of the Portelli and Long trays. *Id.* at 93–95. In sum, Petitioner reasons that the combination of elements from Portelli and Long to arrive at the features of the Challenged Claims “is nothing more than ‘the predictable use of prior art elements according to their established functions,’ since the same problems addressed by the ’680 Patent were recognized and addressed in the same way by Portelli [and] Long, . . . and due to market forces driving similar trays and manufacturing equipment.” We find Petitioner’s reasoning above sufficiently supports the asserted combination of features from Portelli and Long. We further considered Patent Owner’s arguments in opposition and find them not persuasive for the reasons provided below. *See* Resp. 32–34.

According to Patent Owner, Long reports “puckering and distortion effects will result” from using “thermal deformation to roll a flanged edge,” as taught by Portelli. *Id.* at 32–33 (citing Ex. 1004, 6:29–33). Patent Owner also argues that “Long further distinguished Portelli’s double-stage thermoforming process from its proposed trimming procedure by calling it ‘slow’ and telling the reader that Portelli’s process should be ‘avoided.’” *Id.*

at 33. As an initial matter, Patent Owner misrepresents what Long states. Long states that “the slowness of a double stage thermoforming process” is “avoided” by using the process taught by Long, not that “Portelli’s process should be avoided,” as Patent Owner asserts. *See* Ex. 1004, 6:29–33.

Patent Owner argues that “Long’s criticisms, discrediting, and discouragement of Portelli’s proposed thermoformed precursor edge-rolling methods would motivate a [person of ordinary skill in the art] to avoid combining or modifying the incompatible proposals of Long and Portelli in the manner advocated by Petitioner.” *Id.* at 33. Patent Owner also asserts that the combination would defeat each reference’s principle of operation because “the combination advocated by the Petition would require either (i) removal from Portelli of the critical secondary thermoforming step to roll the flange, or (ii) that Long to use thermoforming instead of a secondary trimming operation (which Long expressly says not to do).”¹⁰ *Id.* at 33–34 (citing Ex. 2007 ¶ 216); *see also* Sur-reply 18–19. We do not agree with Patent Owner’s arguments that Long teaches away from a combination with Portelli. *See* Resp. 32–33.

¹⁰ Patent Owner argues for the first time in its Sur-reply that a person of ordinary skill in the art “would have no expectation of success in enabling even obvious teachings or suggestions of Portelli, whether cited individually or in combination with Brown or Long.” Sur-reply 27. In its Response, Patent Owner argued that Petitioner failed to show a reasonable expectation of success with regard to Petitioner’s contention that claims 4, 9, and 24 would have been obvious over Portelli, alone. Resp. 72–75. Patent Owner did not argue that Petitioner failed to show a reasonable expectation of success with regard to Petitioner’s contentions based on obviousness over Portelli and Long. *See generally id.* Accordingly, we find Patent Owner’s arguments improper as new arguments in its Sur-reply that were not raised in the Response, and, therefore, are deemed waived. *See* Paper 8, 8 (“any arguments not raised in the response may be deemed waived”).

To teach away, a reference must discourage one of ordinary skill in the art from following the path set out in the reference, or lead that person in a direction divergent from the path taken by the applicant. *In re Gurley*, 27 F.3d 551, 553 (Fed. Cir. 1994) (“[A] reference will teach away if it suggests that the line of development flowing from the reference’s disclosure is unlikely to be productive of the result sought by the applicant.”). “A reference does not teach away . . . if it merely expresses a general preference for an alternative invention but does not ‘criticize, discredit, or otherwise discourage’ investigation into the invention claimed.” *DePuy Spine, Inc. v. Medtronic Sofamor Danek, Inc.*, 567 F.3d 1314, 1327 (Fed. Cir. 2009) (quoting *In re Fulton*, 391 F.3d 1195, 1201 (Fed. Cir. 2004)). Long’s statements contrasting double stage thermoforming methods against Long’s process merely expresses a preference for its own trimming process. Ex. 1004, 6:29–34. Patent Owner does not identify any teaching in Long that criticizes, discredits, or otherwise discourages the skilled artisan from following the path outlined by the ’680 patent, and, our independent review of Long does not reveal any such teaching.

We are also not persuaded that the combination of Portelli and Long would be contrary to the principle of operation described in either of Portelli and Long. In considering whether a proposed modification would be obvious, we also consider whether combining references would violate the principle of operation of the modified reference. *See In re Mouttet*, 686 F.3d 1322, 1332 (Fed. Cir. 2012). A principle of operation of a prior art reference is concerned with whether the apparatus or process described therein, once modified, will operate on the same principles as before, or said another way, whether it operates in or is capable of working in the same manner. *See id.* (affirming a Board decision that using electrical versus optical components

“does not affect the operability of Mouttet’s broadly claimed device—a programmable arithmetic processor.”); *see also Univ. of Maryland Biology Inst. v. Presens Precision Sensing GmbH*, 711 F. App’x. 1007, 1011 (Fed. Cir. 2017) (unpublished) (finding that the proposed combination would not “require a substantial reconstruction and redesign of the elements shown . . . or change in its basic principles”); *Smartdoor Holdings, Inc. v. Edmit Indus., Inc.*, 707 F. App’x. 705, 709 (Fed. Cir. 2017) (unpublished) (affirming the PTAB where the asserted combination would operate in the same manner), *In re Holness*, 612, F. App’x. 999, 1007 (Fed. Cir. 2015) (unpublished) (affirming the PTAB where no evidence exists that “the bar code reader in Capuano is incapable of working for a rotational motion.”). What a reference teaches and how a proposed modification of a reference would change its principle of operation are underlying factual inquiries in an obviousness analysis. *See, e.g., Icon Health & Fitness, Inc. v. Strava, Inc.*, 849 F.3d 1034, 1046 (Fed. Cir. 2017) (addressing the Board’s factual findings with respect to a reference’s principle of operation). There is no sufficient evidence to support that merely applying Portelli’s teaching of an elbow and peripheral flange to Long’s tray does not alter the operation of either reference.

Additionally, Patent Owner raises a series of arguments denoted “Deficiencies in Petitioner’s Obviousness Challenges (Grounds 4–7).” Resp. 67–72. These arguments are not expressly directed to Petitioner’s allegations of obviousness over Portelli and Long, which Petitioner identifies as “Ground 3.” Pet. 96. Nevertheless, to the extent Patent Owner applies these additional arguments to allegations of obviousness over Portelli and Long, we find the arguments not persuasive, as explained below.

First, Patent Owner argues that “Petitioner cannot credibly argue that the shape of the claimed article peripheries is so simple as to be predictable to a [person of ordinary skill in the art],” because, if it were so simple, then “Petitioner would be able to confirm the exact same claim element in every reference.” Resp. 67–68. Patent Owner’s argument is not persuasive because the issue of obviousness in this case does not turn on whether the shape of the claimed article is simple. Moreover, Petitioner’s assertion that “the respective elements [of the Challenged Claims] are simple, geometric shapes” and that “[t]here is nothing unpredictable about their functionality in a plastic food tray” is supported by Mr. May. Pet. 91 (citing Ex. 1002 ¶ 149). Patent Owner directs us to no evidence to the contrary.

Second, Patent Owner argues that “Portelli was a failure and Long cannot be practiced by anyone,” such that there was “no path towards a solution prior to the earliest effective filing date of the ’680 Patent.” Resp. 68–69. According to Patent Owner, “the path taken by Patent Owner cannot prove obviousness – that is hindsight.” *Id.* at 68. Patent Owner also argues that “the flange of a non-circular article is the article’s ‘most frustratingly-inconsistent feature,’” which, Patent Owner argues shows the “unpredictability of *any* thermoformed flange.” *Id.* at 69–70 (citing Ex. 2024. The evidence Patent Owner cites, an article titled “How to Robotically Handle Trays for Parts Packaging,” merely states that the flange is a “most frustratingly-inconsistent feature” and “was not intended as a parameter for automated systems to locate the tray.” Ex. 2024, 3. The portions of the article relied on by Patent Owner do not address the “unpredictability” of any particular flange shape, as claimed, but instead implies potential issues in manufacturing and quality control. *See id.* (stating “[i]t is a major pitfall to instruct robotic grippers (or other end

effectors) to locate trays based on the flange because the flange dimension must be constant and consistent. Yet this is extremely challenging, due to variances in the die cutting tolerances that are inherent in the thermoforming process”).

Third, Patent Owner argues that “Petitioner fails to explain how any of these similarities [between the ’680 patent and the asserted references] or the market forces behind them render obvious claim limitations directed to post-forming processes on a non-circular thermoformed precursor flange.” Resp. 70–71. The Challenged Claims, however, are directed to an article, not to “post-forming processes.” *See, e.g.*, Ex. 1001, 72:57–73:17. Patent Owner also argues that “the material properties of a thermoplastic can be affected by so many different factors that even where there are similarities, the end results achievable with each one can vary tremendously.” Resp 71 (citing Ex. 1032, 265–266). Patent Owner does not direct us to any evidence that the asserted references require the use of different thermoplastic materials or that the teachings of one reference are inapplicable to another based on material properties.

Fourth, Patent Owner argues that “Petitioner identifies no credible motivation for combining or modifying references,” because Mr. May testified that Portelli and Long offered solutions to the same problem and stated he did not know “that a modification of them is necessarily compulsory.” Resp. 72 (citing Ex. 2009, 400:18–401:4). According to Patent Owner, “Mr. May admits that a [person of ordinary skill in the art] could have been motivated to modify Portelli, Long, or Meadors but it was not necessary.” *Id.* Contrary to Patent Owner’s argument, Mr. May’s testimony merely provides that Long and Portelli taught solutions for packaging such that their modification was not “necessarily compulsory,”

not that a person of ordinary skill in the art would have had no reason to modify them as Petitioner proposed.

5. *Objective Evidence of Nonobviousness*

The fourth *Graham* factor instructs that we must consider—apart from what the prior art itself would have suggested— whether objective evidence of nonobviousness (i.e., secondary considerations) may lead to a conclusion that the challenged claims would not have been obvious. *See, e.g., Stratoflex, Inc. v. Aeroquip Corp.*, 713 F.2d 1530, 1538–39 (Fed. Cir. 1983) (instructing that evidence of secondary considerations, when present, must always be considered in determining obviousness). Objective evidence of nonobviousness may include evidence of commercial success, licensing, copying, praise by others, long felt but unresolved need, and failure or skepticism of others. *Graham*, 383 U.S. at 17–18. But, secondary considerations are only a part of the “totality of the evidence;” its mere existence does not control the conclusion of obviousness. *See Richardson-Vicks Inc. v. Upjohn Co.*, 122 F.3d 1476, 1483 (Fed. Cir. 1997). Objective evidence of nonobviousness “may often be the most probative and cogent evidence in the record” and “may often establish that an invention appearing to have been obvious in light of the prior art was not.” *Transocean Offshore Deepwater Drilling, Inc. v. Maersk Drilling USA, Inc.*, 699 F.3d 1340, 1349 (Fed. Cir. 2012).

Patent Owner argues that evidence of nonobviousness exists in the form of commercial success, industry praise, long-felt need, skepticism, and copying. Resp. 80–84. Patent Owner also contends that there is a

presumption of nexus between these secondary considerations and the claimed invention.¹¹ *Id.* at 78–79.

a. Nexus

Objective evidence of nonobviousness “is only relevant to the obviousness inquiry ‘if there is a nexus between the claimed invention and the [objective indicia of nonobviousness].’” *In re Affinity Labs of Tex., LLC*, 856 F.3d 883, 901 (Fed. Cir. 2017) (quoting *Ormco Corp. v. Align Tech., Inc.*, 463 F.3d 1299, 1312 (2006)). A “nexus” is a legally and factually sufficient connection between the objective evidence and the claimed invention such that the objective evidence should be considered in the determination of obviousness. *Henny Penny Corp. v. Frymaster LLC*, 938 F.3d 1324, 1332 (Fed. Cir. 2019); *In re Paulsen*, 30 F.3d 1475, 1482 (Fed. Cir. 1994). A presumption of nexus arises where “the patentee shows that the asserted objective evidence is tied to a specific product and that product ‘embodies the claimed features, and is coextensive with them.’” *Fox Factory, Inc. v. SRAM, LLC*, 944 F.3d 1366, 1373 (Fed. Cir. 2019) (quoting *Polaris Indus., Inc. v. Arctic Cat, Inc.*, 882 F.3d 1056, 1072 (Fed. Cir. 2018) (quoting *Brown & Williamson Tobacco Corp. v. Philip Morris Inc.*, 229 F.3d 1120, 1130 (Fed. Cir. 2000))); *see also* *Teva Pharms. USA, Inc. v. Sandoz, Inc.*, 723 F.3d 1363, 1372 (Fed. Cir. 2013) (explaining

¹¹ In its Sur-reply, Patent Owner argues that Mr. May’s testimony should be accorded no weight because he “never considered [Patent Owner’s] objective indicia of non-obviousness in rendering his reply obviousness opinions.” Sur-reply 26–27 (citing Ex. 1002 ¶ 25; Ex. 1044 ¶¶ 295–366; Ex. 2070, 409:14–410:5. Mr. May was not offered as an expert as to the issues raised by Patent Owner’s objective evidence of nonobviousness and we accord his testimony the appropriate weight based on the topics he addressed. *See* Ex. 1044.

that a “presumption of a nexus” exists where a product is “coextensive” with a patent claim). Patent Owner bears the burden of establishing that a nexus exists between the evidence of secondary considerations and the patented invention. *Fox Factory*, 944 F.3d at 1373.

Patent Owner purports to show nexus by providing a table prepared by Mr. Clements that lists in one column a Roll Over-Wrap Tray Product and in a second column the claims of the ’680 patent corresponding to that product. Resp. 78–79 (citing Ex. 2007 ¶¶ 228–232, A-1–A-75). Mr. Clements provides claim charts showing how various products embody various claims of the ’680 patent. Ex. 2007, A-1–A-75. Petitioner does not dispute that Patent Owner has shown that a presumption of nexus applies. *See* Reply 53. Accordingly, we apply a presumption of nexus for purposes of our consideration of Patent Owner’s objective evidence of nonobviousness.

b. Commercial Success

Patent Owner asserts that since the first sales of the Roll Over-Wrap trays in 2016 there has been “exponential growth in the sales numbers” and that “[t]he customers . . . have also exponentially grown since 2016.” Resp. 80 (citing Ex. 2030 ¶¶ 9–10). According to Patent Owner, Mr. Clements “believes that the exponential growth in sales and customers is a strong indicator of market acceptance and demand for the innovations captured by the Roll Over-Wrap Trays.” *Id.* (citing Ex. 2007 ¶¶ 228–237). There are several significant deficiencies in Patent Owner’s argument. First, Mr. Clements never suggested Patent Owner demonstrated “exponential growth in sales and customers.” *See* Ex. 2007 ¶¶ 228–337. Mr. Clements did state that, in his opinion, the “unit sales and sales dollars achieved by Patent Owner . . . were extraordinary.” *Id.* ¶ 231. Mr. Clements did not explain

what “extraordinary” meant to him in this context and provided no comparison to sales or customer data for any industry as whole. *Id.* Second, Patent Owner purports to rely on the Declaration of Mr. Maguire as support for the asserted “exponential growth,” however, Mr. Maguire stated only that “[e]very model of Roll Over-Wrap tray has had continuous, *and in some cases*, exponential, increase in sales growth over the time span in which it was sold.” Ex. 2030 ¶ 10. Likewise, Mr. Maguire states that “[s]ince 2016, our number of customers for the Roll Over-Wrap trays have also grown at an *almost* exponential rate.” *Id.* ¶ 11. Thus, Patent Owner fails to show or explain any basis for its asserted “exponential growth” in sales numbers or customers, and, based upon our review of the sales and personnel information provided by Mr. Maguire we fail to find any support for the assertion. *See* Ex. 2031 ¶¶ 8–11. Third, Patent Owner identifies no relevant market and provides no data regarding market share for its products for us to consider.

Petitioner argues, and we agree, that Patent Owner exaggerates its commercial success. Reply 53. Having considered the record evidence, we accord moderate weight to Patent Owner’s evidence of commercial success, which suggests increasing sales values and numbers of customers from 2016 to 2021, but provides no context with regard to the relevant market, such as market size or market share.

c. Industry Praise

Patent Owner argues that the Roll Over-Wrap[®] tray has received industry praise. Resp. 80–81. Specifically, Patent Owner states that the Roll Over-Wrap tray was awarded the 2019 Ameristar Award by the Institute of Packaging Professionals, and that industry professionals have praised the “patented features and benefits derived from those features.” *Id.* (citing

Ex. 2032; Ex. 2030 ¶¶ 14–15; Ex. 2007 ¶¶ 236–237). Mr. Maguire explains that he “and others decided to enter the decided to enter the Roll Over-Wrap Tray for consideration by the Institute of Packaging Professionals (“IoPP”) for the prestigious Ameristar Award,” and “told the IoPP that no other company in the world has been able to produce a rolled edge on a non-circular plastic tray product” and that “we were the only ones that had a patent for rolled-edge rectangular plastic tray technology.” Ex. 2031 ¶ 14.

Patent Owner also directs us to three email communications. The first from March, 2020, appears to be an email from a potential customer, who, Patent Owner notes, said “[t]he edge is impressive, and is definitely what we would need in order to not have to go up in film gauge.” *Id.* at 81 (quoting Ex. 2034, 2). The second is an email from November, 2019, stating that “the customer has found similar trays . . . [h]owever the [competing tray] edges do not have the same rolled edge as [Patent Owner’s tray]” and “[a]s a result, they may be able to use a thinner film with [Patent Owner’s] trays.” *Id.* (quoting Ex. 2033, 1). Third, an email from July, 2018, from a “packaging engineer” who said he was “impressed with the roll over edge design of the tray.” *Id.* at 81 (quoting Ex. 2031, 2).

Having considered the record evidence, we accord little weight to Patent Owner’s evidence of industry praise which consists of a single award obtained based on an application submitted by Patent Owner that claimed its product was produced by “no other company in the world” and three private emails involving what appears to be potential customers.¹² *See* Exs. 2031–2033.

¹² We observe that although Mr. Maguire testifies that he has “an entire server filled with e-mails” regarding sales, he selected only Exhibits 2032, 2033, and 2034 to produce as examples. Ex. 1052, 19:3–11.

d. Long felt Need

Patent Owner alleges that the problem of a “sharp peripheral edge in non-circular thermoformed articles existed for over half a century until it was finally solved on the earliest effective filing date of the ’680 patent.” Resp. 82 (citing Section II.B of the Patent Owner Response). According to Patent Owner, “attempts to move the sharp peripheral edge of a non-circular article out of the [over-wrap] path have all failed.” Section II.B of the Patent Owner Response, however, states that in 1994 “Portelli proposed rolling the flange of a tray using double stage thermoforming.” Resp. 4 (citing Ex. 1003, 2:3–8); Ex. 2009, 247:23–248:10. Patent Owner further suggests that “twenty years later” the “industry was told . . . rolling a flanged edge using thermoforming should be ‘avoided.’” *Id.* (citing Ex. 2007 ¶ 26; Ex. 1004, 6:29–33; Ex. 2010). Patent Owner’s evidence shows that a rolled edge was known in the art through the teachings of Portelli and Long, among others. That Long prefers an alternate solution does not establish a long-felt and unresolved need in the art.

In order to show a long-felt but unmet need *for the claimed invention*, the objective evidence must show that the need was a persistent one that was recognized by those of ordinary skill in the art. *In re Gershon*, 372 F.2d 535, 538 (CCPA 1967). “Evidence of long felt but unresolved need tends to show non-obviousness because it is reasonable to infer that the need would not have persisted had the solution been obvious.” *WBIP, LLC v. Kohler Co.*, 829 F.3d 1317, 1332 (Fed. Cir. 2016). Here, Patent Owner at best suggests problems may have existed with the mass manufacture of non-circular trays with a rolled edge, however, the ’680 patent does not claim a method of manufacture that resolves any such related long felt need in manufacturing, but is instead directed to the article itself. Additionally,

Patent Owner acknowledges various alternative means of packaging satisfied the need, including, for example, “utilize[ing] more expensive, heavier gauge [over wrap].” Resp. 5 (citing Ex. 2007 ¶ 28).

Moreover, Patent Owner directs us to no specific evidence in this case in support of its argument of long felt need, and instead ambiguously refers to “[a]s discussed above” and “[s]ee *supra*.” We decline in this case to speculate as to what in the preceding eighty pages of Patent Owner’s brief Patent Owner intends to rely on. Here, the record evidence shows minimal, if any, evidence of long felt need. As a result, we accord little weight to Patent Owner’s evidence of long felt need as need tied to the claimed features has not been shown.

e. Skepticism

Patent Owner argues that skepticism of known thermal deformation processes was reported in Long (by the applicant, Alto Packaging Limited (“Alto”)) because Long purports to describe a process through which “none of the puckering or distortions often encountered with rolling a flanged edge is encountered.” Resp. 82–84 (citing Ex. 1004, 6:29–33; Ex. 2010, 1 (a Request for Examination with Claim Amendments submitted by Alto to Intellectual Property Office of New Zealand stating, in part, that the procedure described “aims to provide faster online handling and to avoid puckering and distortion of the lip that often occurs with known thermal deformation processes”)). According to Patent Owner, “[i]n spite of that skepticism of others, [it] proceeded contrary to the accepted wisdom in the art and not only used thermal deformation to achieve the rolled edge, but did so without any *unwanted* puckers or distortions.” *Id.* at 83 (emphasis added). We note, Patent Owner does not clarify what distinguishes “unwanted puckers or distortions” from acceptable “puckers or distortion.”

“If industry participants or skilled artisans are skeptical about whether or how a problem could be solved or the workability of the claimed solution, it favors nonobviousness.” *WBIP, LLC*, 829 F.3d at 1335. Long’s statements comparing its trimmed solution to a molded thermoformed edge in the prior art and suggesting that the “puckering or distortions *often encountered*” may be avoided, is one of preference not skepticism. *See* Ex. 1004, 6:29–33. As a result, we accord little weight to Patent Owner’s evidence of skepticism from what amounts to a single statement from a source in a competitive industry seeking a patent on its own purported improvement in the art.

f. Copying

Patent Owner asserts that “[u]pon gaining access to thousands of Patent Owner’s patented Roll Over-Wrap trays and discussing their manufacture and features with the Patent Owner, Petitioner was able to create at least two different knockoffs with the patented features.” Resp. 84 (citing; Ex. 2004; Ex. 2007, B1–B13; Ex. 2030 ¶¶ 20–21). Patent Owner directs us to the testimony of Mr. Maguire, who states he approved a purchase order from Petitioner for trays sold by Patent Owner. *See* Ex. 2030 ¶ 21 (citing Ex. 2004). Contrary to Patent Owner’s argument, Mr. Maguire does not identify any discussions with Petitioner about the manufacture and features of Patent Owner’s products. *See id.* According to Patent Owner, Petitioner’s access to its patented products combined with Petitioner’s manufacture and sale of “substantially similar infringing trays is legally sufficient evidence of copying.” *Id.*

“Copying requires duplication of features of the patentee’s work based on access to that work, lest all infringement be mistakenly treated as copying.” *Institut Pasteur & Universite Pierre Et Marie Curie v. Focarino*,

738 F.3d 1337, 1347–48 (Fed. Cir. 2013). Evidence of copying may take the form of “internal documents, direct evidence such as photos or patented features, or disassembly of products, or access and similarity to a patented product.” *Liqwd, Inc. v. L’Oreal USA, Inc.*, 941 F.3d 1133, 1137 (Fed. Cir. 2019). But, it is well established that not every competing product that arguably falls within the scope of a patent is evidence of copying; otherwise, “every infringement suit would automatically confirm the nonobviousness of the patent.” *Iron Grip Barbell Co. v. USA Sports, Inc.*, 392 F.3d 1317, 1325 (Fed. Cir. 2004).

Here, Patent Owner relies on Petitioner’s access and subsequent manufacture of “knockoff” products purportedly having the patented features. As a result, Patent Owner has shown some evidence of copying. However, while the evidence of record suggests Petitioner had access to Patent Owner’s work, there is no evidence to suggest that copying, in fact, occurred. As a result, we accord little weight to Patent Owner’s evidence of copying from what amounts to a single purchase order of products from Patent Owner.

6. Collective Considerations of the Graham Factors

Based upon consideration of the entire record, and for the reasons discussed above, we determine Petitioner has shown by a preponderance of the evidence that the combination of Portelli and Long teaches each limitation of claims 1–5, 7, 10–12, and 15–24 and has shown that an ordinarily skilled artisan would have had a reason to combine features of both Portelli and Long as asserted to arrive at the claimed invention with a reasonable expectation of success when doing so, and that Petitioner’s evidence of unpatentability significantly outweighs the marginal evidence of commercial success, industry praise, long felt need, and copying provided by

Patent Owner. On the whole, we find that the information provided in consideration of the *Graham* factors collectively demonstrates that Petitioner has shown by a preponderance of the evidence that claims 1–5, 7, 10–12, and 15–24 of the '680 patent are unpatentable under 35 U.S.C. § 103(a) as obvious over Portelli and Long. Petitioner has not shown that claims 8 and 9 would have been obvious over Portelli and Long because Petitioner fails to adequately address in the Petition how Petitioner contends the asserted references teach the features of these two claims.

H. Alleged Obviousness over Long and Meadors

Petitioner contends that the subject matter of claims 1–5, 7–12, and 15–24 would have been obvious over Long and Meadors. Pet. 132–134. Petitioner generally argues that Long teaches certain limitations of claims 2, 3, 5, 7, 10–12, and 15–23 for the same reasons provided by Petitioner in its analysis of the obviousness of claims over Portelli and Long; that “every element” of claims 1–5, 7–12, and 20–23 is taught by Meadors for the same reasons provided by Petitioner in its analysis of the anticipation of claims by Meadors; and that a person of ordinary skill in the art would have had reason to combine Long and Meadors for substantially the same reasons supporting the combination Portelli and Long. *Id.* at 132. As to claim 24, Petitioner provides additional analysis, asserting claim 24 depends from claim 23, and that claim 23 “is anticipated by Long.” *Id.* at 133 (citing “Ground 3, Claim 23, above”). Petitioner identifies “Ground 3” as obviousness over Portelli in view of Long, not anticipation by Long. Pet. 96.

Patent Owner argues, and we agree, that “Petitioner does not even say what aspect of Long would be used by a [person of ordinary skill in the art] to modify Meadors and vice-versa.” Resp. 75. Accordingly, we find

Petitioner fails to carry its burden of showing how any of claims 2, 3, 5, 7, 10–12, and 15–24 would have been obvious over Long and Meadors.

*I. Alleged Obviousness Over Portelli, Alone or
in Combination with Brown*

Petitioner contends that claims 4, 9, and 24 of the '680 patent would have been obvious over Portelli. Pet. 134–137. Petitioner also argues that claim 9 would have been obvious over the combination of Portelli and Brown. *Id.* at 138–140. Claim 4 depends from claim 1, claim 9 depends from claims 1, 7, and 8; and claim 24 depends from claims 1, 20, and 23. Ex. 1001, 73:23–25, 73:31–39; 74:18–19, 74:25–39.

Petitioner contends only that the additional limitations of dependent claims 4 and 24 would have been obvious over and that the additional limitations of claim 9 would have been obvious over Portelli, alone or in combination with Brown. Pet. 134–140. As to the features of the claims from which claims 4, 9, and 24 depend, Petitioner relies only on its anticipation allegations based on Portelli. *See, e.g., id.* at 135 (stating that “[c]laim 9 depends from [c]laim 8, which is anticipated by Portelli”); 139. Because Petitioner fails to show, for the reasons discussed above, that claim 1 is anticipated by Portelli, and otherwise fails to argue that claim 1 would have been obvious over Portelli, alone or in combination with Brown, Petitioner fails to show that claims 4 and 24 would have been obvious over Portelli or that claim 9 would have been obvious over Portelli, alone or in combination with Brown.

III. PATENT OWNER’S MOTION TO EXCLUDE

Patent Owner seeks to exclude Exhibits 1037–1040, 1051, 1053, 1057, and 1058, as well as portions of Exhibits 1044 and 1045. MTE 1–14;

MTE Reply 1–5. Petitioner opposes the motion. MTE Opp. 1–15. For the following reasons we deny Patent Owner’s Motion to Exclude.

A. Exhibits 1037–1040

Exhibits 1037–1039 have not been filed in this case and were not considered in rendering this Decision. Exhibit 1040 was filed as an exhibit in this case, however, we do not rely on Exhibit 1040 in rendering this Decision. Accordingly, we deny Patent Owner’s motion to exclude Exhibits 1037–1040 as moot.

B. Exhibit 1044

Patent Owner seeks to exclude paragraphs 39–40, 42, 44, 46, 51–53, 116, 270–271, and 332–333 of Ex. 1044 (Mr. May’s Reply Declaration). MTE 5–6. According to Patent Owner, these paragraphs include images of articles “that were alleged by Petitioner to have been made by either DexterMT or OMV” and are unauthenticated and inadmissible hearsay. *Id.* at 6.

Petitioner argues that “even if the materials cited by Patent Owner are not authenticated—which they are, as discussed below—Mr. May would still be entitled to rely on them because it is undisputed that those materials contain the kinds of facts and data on which experts in his field would reasonably rely.” MTE Opp. 8. Further, Petitioner argues that the DexterMT and OMV materials were authenticated by Mr. Naughton’s testimony and Mr. May’s physical possession and testing. *Id.* at 10.

On this matter, Petitioner has the better argument. Here, there exists sufficient evidence to support a finding that the images and samples Mr. May relies upon are in fact what Mr. May purports them to be. Specifically, the images of DexterMT samples were photographs taken by Mr. May from samples he obtained himself from Mr. Willemse (from

DexterMT) or from Mr. Naughton, who secured the samples during visits to New Zealand and Washington. Ex. 2070, 136:20–137:8; Ex. 1045 ¶¶ 15–19. Mr. May further testifies that he confirmed the samples were made near the 2016 time frame through his discussions with Mr. Naughton, Mr. Willemse, and through an article appearing in *Thermoforming Quarterly*, third quarter 2016, discussing the K-Show in Germany where certain samples were displayed and distributed to customers. Ex. 2070, 125:24–134:5.

Furthermore, the OMV images Mr. May provides purport to originate from a presentation given at the SPE Conference in Indianapolis in 2004 and were provided to him by individuals who attended that presentation. *Id.* at 212:7–213:16; 214:13–16. Mr. May testifies that he confirmed the presentation was given at the conference by discussing the presentation with conference attendees, through internet research, and his own experience with OMV and conversations with OMV personnel. *Id.* at 213:8–214:16, 215:20–217:5.

We agree with Petitioner that experts like Mr. May would reasonable rely on materials, like those described in paragraphs 39–40, 42, 44, 46, 51–53, 116, 270–271, and 332–333 of Exhibit 1044, in forming the basis of their opinions. *See* Fed. R. Evid. 703. Therefore, Patent Owner’s motion to strike paragraphs 39–40, 42, 44, 46, 51–53, 116, 270–271, and 332–333 of Exhibit 1044 is denied.

C. Exhibit 1045

Patent Owner seeks to exclude paragraphs 4–6, 10, and 12–14 of Exhibit 1045 (Mr. Naughton’s declaration). MTE 7–12; MTE Reply 5. In particular, Patent Owner alleges that, with respect to paragraphs 4–6, that Mr. Naughton’s testimony is based on inadmissible hearsay. *Id.* at 7. Patent Owner also asserts that Mr. Naughton’s testimony in paragraphs 10 and 12 is based on inadmissible hearsay, that paragraphs 10 and 12–14 are

unauthenticated, that paragraphs 12–14 are not passed on personal knowledge, and that paragraph 14 is incomplete. *Id.* at 10–12. Petitioner asserts that the identified passages are not hearsay and even if some contain hearsay or unauthenticated information, the paragraphs are admissible as facts and data on which an expert, such as Mr. May, can rely upon under Rule 703. MTE Opp. 11.

We disagree with much of Patent Owner’s characterization of Mr. Naughton’s testimony as based solely on hearsay and not based on personal knowledge as Mr. Naughton’s testimony indicates he has been active in the thermoforming community since at least 1985. Ex. 1045 ¶ 3. Therefore, the majority of Mr. Naughton’s testimony is based on his nearly 40 years in the industry. *Id.* Though Patent Owner identifies some of Mr. Naughton’s testimony, including his statements regarding what Alto employees may have told him as well as the testimony regarding the Alto purchase order, we do not rely on these statements for the truth of the matter asserted, i.e., that Alto manufactured the identified trays in 2012. *See, e.g., id.* ¶ 5 (“I know from information provided to me from Alto employees that Alto began making plastic trays . . . at least as early as 2012), 10 (discussing Alto’s purchase order that was forwarded to Mr. Naughton outside the normal course of business). Instead, we consider Mr. Naughton’s testimony that Alto successfully used Long’s method as evidence that Long’s method is not “impossible,” as Patent Owner suggests. *See, e.g.,* Resp. 38. To the extent the evidence may have served a hearsay purpose, we assign it little, if any, weight. Further, experts like Mr. May are permitted to rely on hearsay if experts in the same field would reasonably rely on such materials in forming opinions and inferences based on the subject. *See* Fed. R. Evid. 703. To the extent that Mr. May relies on evidence that is not of the type

which “experts in the field would reasonably rely,” we have assigned very little weight to such evidence.¹³ Thus, we deny Patent Owner’s motion to exclude select paragraphs of Exhibit 1045.

D. Exhibits 1051, 1053

Exhibit 1051 is a two-page portion of the website of DexterMT and Exhibit 1053 are portions of the Wiley Encyclopedia of Packaging Technology. Patent Owner asserts that Exhibits 1051 and 1053 are multipage documents and “Petitioner has failed to produce the entirety of the contents” “[i]n spite of Patent Owner’s request for the complete copy” and therefore should be excluded under Federal Rule of Evidence 1002. MTE 12–13.

Petitioner asserts that “Patent Owner cites no authority for the extraordinary proposition that a webpage is inadmissible unless the proponent scours the entire website of the owner of the webpage and downloads every single webpage from that site.” MTE Opp. 13–14. Petitioner directs our attention to several prior cases denying motions to exclude on similar grounds.

We are not persuaded that Exhibits 1051 and 1053 should be excluded from the record. Patent Owner does not contend that the exhibits are misleading because they are excerpted. Nor does Patent Owner contend it could not access the completed exhibits or identify any omitted portion of the exhibits that should be considered for “completeness.” Indeed, it appears

¹³ Even if we accorded the identified paragraphs of Exhibit 1045 no weight, it would not alter our ultimate conclusion that the claims are anticipated or obvious, as Patent Owner’s arguments and evidence attempting to rebut the presumption of enablement of Long are inadequate. *See supra* Section II.D.2.b.

from the record that Exhibit 1051, while an excerpted portion of the entire DexterMT website, is a complete document within that website. Ex. 1051 The same is true with Exhibit 1053 which contains the entries for “Robots” and “Thermoforming” within the larger Wiley Encyclopedia of Packaging Technology. Ex. 1053. Accordingly, we deny Patent Owner’s motion to exclude Exhibits 1051 and 1053.

E. Exhibit 1057

Exhibit 1057 is a copy of the New Zealand counterpart of Long. Patent Owner asserts that Exhibit 1057 is irrelevant and should be excluded “as not being substantively relied upon in the Reply or [Mr.] May’s Declaration.” MTE 13. Petitioner argues that Exhibit 1057 is discussed in its Reply and used to establish that Alto marks its trays with the patent number in Exhibit 1057. MTE Opp. 15.

We are not persuaded by Patent Owner’s arguments that Exhibit 1057 is irrelevant and should be excluded. Petitioner relies on Exhibit 1057 to rebut Patent Owner’s contention that Long is inoperable and non-enabled. Reply 31. Patent Owner has not shown Exhibit 1057 lacks relevance and completeness of our trial record weighs in favor of inclusion. Accordingly, we deny Patent Owner’s motion to exclude Exhibit 1057.

F. Exhibit 1058

Exhibit 1058 includes a series of four images of rolled-rim articles from OMV. Ex. 1058. Patent Owner urges that we exclude Exhibit 1058 as unauthenticated. MTE 13; MTE Reply 5. According to Patent Owner, “[Mr.] May’s understanding of Exhibit 1058 comes from third parties who are not identified on the record or his declaration.” *Id.* at 14. Petitioner asserts that “Exhibit 1058 is not cited in isolation, but as the basis for some of Mr. May’s opinions.” MTE Opp. 15. Petitioner explains that “[a]s an

expert, he is entitled to rely on it” and “the probative value of Ex. 1058 . . . outweighs the non-existent risk of prejudice.” *Id.*

We are not persuaded that Exhibit 1058 should be excluded from the record. Exhibit 1058 is offered by Petitioner and Mr. May as an “example of the feasibility of rolling thermoform flanges in a manner consistent with the teachings of Portelli.” Ex. 1044 ¶¶ 52–53; Reply 19. And as Petitioner asserts, experts like Mr. May are permitted to rely on otherwise inadmissible materials if experts in the same field would reasonably rely on such materials in forming opinions and inferences based on the subject. *See* Fed. R. Evid. 703. To the extent that Mr. May relies on evidence that is not of the type which “experts in the field would reasonably rely,” we have assigned very little weight to such evidence.¹⁴ As a result, we deny Patent Owner’s motion to exclude Exhibit 1058.

IV. MOTIONS TO SEAL

Patent Owner filed two motions to seal.¹⁵ Papers 18, 30. Patent Owner also filed Paper 17, identified in the docket as a “Motion to File

¹⁴ Even if we accorded no weight to Exhibit 1058, Exhibit 1058 is but one example in the record of thermoformed articles having rolled over terminal edges. *See, e.g.*, Ex. 1003.

¹⁵ Patent Owner filed a third paper (Paper 63) that is identified in the docket as a “Motion to File Confidential Documents,” however, the corresponding paper filed as Paper 63 appears to be a duplicate copy of the Patent Owner Sur-reply filed as Paper 61 on the same date. Patent Owner also appears to have filed Exhibits 2061 and 2074 under seal, accompanied by redacted versions, but does not appear to have filed a motion to seal the non-public version of these exhibits in this case. If Patent Owner seeks to maintain Exhibits 2061 and 2074 under seal, Patent Owner may contact the Board within two weeks of this Decision to seek leave to file late a motion to seal. Additionally, in some instances Patent Owner used the same exhibit number for both the sealed version and the redacted version (e.g., Exhibit 2040), while in other instances Patent Owner used different exhibit numbers, often

Confidential Documents,” that is a motion captioned for related case “IPR2021-00916” between the same parties, not this case. Paper 17 refers to a modified version of the Board’s Default Protective Order as “attached hereto as Appendix A.” *Id.* at 1. No Appendix A was filed with Paper 17.

Patent Owner filed Paper 18 on the same date as Paper 17 and identified Paper 18 in the docket as “Appendix A to Patent Owner’s Motion to File Confidential Documents.” Paper 18, however, is not an “Appendix,” but instead is Patent Owner’s Motion to File Confidential Documents in this proceeding. Like Paper 17, Paper 18 also refers to a modified version of the Board’s Default Protective Order as “attached hereto as Appendix A.” *Id.* at 1. Like Paper 17, no Appendix A was filed with Paper 18 in this case, and we are unable to locate in the record of this proceeding any proposed modified version of the Board’s Default Protective Order. Rather than require Patent Owner to correct the multiple errors in filing noted above at this late stage of the proceeding, we understand the parties to seek entry in this case of the same modified protective order proposed by the parties and entered in the related case IPR2021-00916. *See* Paper 18, 1 (stating that “Patent Owner and Petitioner have met and conferred on the modified version of the Board’s Default Protective Order”). Accordingly, for purposes of this case we enter the Modified Protective Order filed in *Tekni-Plex, Inc. v. Converter Manufacturing, LLC*, IPR2021-00916, Paper 17 (“Protective Order”).

There is a strong public policy for making all information filed in an *inter partes* review open to the public, especially because the proceeding

overlapping with other exhibits (e.g., Exhibit 2031). The motions make sufficiently clear which documents are at issue. *See* Papers 18, 30.

determines the patentability of claims in an issued patent and, therefore, affects the rights of the public. Generally, all papers filed in an inter partes review shall be made available to the public. *See* 35 U.S.C. § 316(a)(1); 37 C.F.R. § 42.14. Our rules, however, “aim to strike a balance between the public’s interest in maintaining a complete and understandable file history and the parties’ interest in protecting truly sensitive information.”

Consolidated Patent Trial Practice Guide 19. Thus, a party may move to seal certain information (37 C.F.R. § 42.14); but only “confidential information” is protected from disclosure (35 U.S.C. § 326(a)(7)).

Confidential information means trade secret or other confidential research, development, or commercial information. 37 C.F.R. § 42.2. The standard for granting a motion to seal is “for good cause.” 37 C.F.R. § 42.54(a). The party moving to seal bears the burden of proof and must explain why the information sought to be sealed constitutes confidential information. 37 C.F.R. § 42.20(c). Confidential information that is subject to a protective order ordinarily becomes public 45 days after final judgment in a trial.

Consolidated Trial Practice Guide 21–22. There is an expectation that confidential information relied upon or identified in a final written decision will be made public. *Id.* A party seeking to maintain the confidentiality of the information may file a motion to expunge the information from the record prior to the information becoming public. 37 C.F.R. § 42.56.

Patent Owner’s first motion seeks to seal portions of Exhibits 2030, 2031, 2033, and 2034. Paper 18, 1. Patent Owner’s second motion seeks to seal portions of Exhibit 2040. Paper 30, 1. We find that good cause exists to seal each of the requested exhibits. Patent Owner’s motions to seal are unopposed and Patent Owner has provided public, redacted versions of each exhibit it seeks to protect with limited redactions, and, thus, has balanced the

strong public policy interest in making information available to the public with its own interests in maintaining certain information as business confidential. Accordingly, we grant Patent Owner's motions to seal Exhibits 2030, 2031, 2033, and 2034, and 2040. *See* Papers 18, 30.

Petitioner filed a motion to seal Petitioner's Reply to [Corrected] Patent Owner's Response (Paper 47) and Exhibit 1052. Paper 46, 1. Petitioner filed publicly accessible, redacted versions of its Reply (Paper 45) and Exhibit 1052. We find that good cause exists to seal both the requested paper and exhibit. Petitioner's motion to seal is unopposed and Petitioner has provided public, redacted versions of both the paper and exhibit it seeks to protect with limited redactions, and, thus, has balanced the strong public policy interest in making information available to the public with its own interests in maintaining certain information as business confidential. Accordingly, we grant Petitioner's motion to seal portions of Paper 47 and Exhibit 1052. *See* Paper 46.

The record will be maintained undisturbed, with Paper 47 and Exhibits 1052, 2030, 2031, 2033, 2034, and 2040 remaining sealed, pending the outcome of any appeal taken from this decision. At the conclusion of any appeal proceeding, or if no appeal is taken, the sealed documents will be made public. *See* Office Patent Trial Practice Guide, 77 Fed. Reg. 48,756, 48,760–61 (Aug. 14, 2012). Further, either party may file a motion to expunge the sealed documents from the record pursuant to 37 C.F.R. § 42.56. Any such motion will be decided after the conclusion of any appeal proceeding or the expiration of the time period for appealing, and it will be denied with respect to any sealed document relied upon for this Decision.

V. CONCLUSION

The outcome for the Challenged Claims in this proceeding is set forth in summary as follows:

Claim(s) Challenged	35 U.S.C. §	Reference(s)/ Basis	Claim(s) Shown Unpatentable	Claim(s) Not Shown Unpatentable
1–3, 5, 7, 8, 10, 11, 15–23	102	Portelli		1–3, 5, 7, 8, 10, 11, 15–23
1–5, 7–12, 20–23	102	Meadors	1–5, 7–12, 20–23	
1–5, 7–12, 15–24	103	Portelli, Long	1–5, 7, 10–12, 15–24	8, 9
1–5, 7–12, 15–24	103	Long, Meadors		1–5, 7–12, 15–24
4, 9, 24	103	Portelli		4, 9, 24
9	103	Portelli, Brown		9
Overall Outcome			1–5, 7–12, 15–24	

VI. ORDER¹⁶

Upon consideration of the record before us, it is:

¹⁶ Should Patent Owner wish to pursue amendment of a Challenged Claim in a reissue or reexamination proceeding subsequent to the issuance of this decision, we draw Patent Owner’s attention to the April 2019 *Notice Regarding Options for Amendments by Patent Owner Through Reissue or Reexamination During a Pending AIA Trial Proceeding*. See 84 Fed. Reg. 16,654 (Apr. 22, 2019). If Patent Owner chooses to file a reissue application or a request for reexamination of the challenged patent, we remind Patent Owner of its continuing obligation to notify the Board of any such related matters in updated mandatory notices. See 37 C.F.R. § 42.8(a)(3), (b)(2).

ORDERED that Patent Owner's Motion to Exclude (Paper 66) is denied;

FURTHER ORDERED that the Stipulated Protective Order in *Tekni-Plex, Inc. v. Converter Manufacturing, LLC*, IPR2021-00916, Paper 17, is hereby entered and shall govern the treatment of confidential and highly confidential information in this case;

FURTHER ORDERED that Patent Owner's Motions to Seal (Papers 18, 30) are granted;

FURTHER ORDERED that Petitioner's Motion to Seal (Paper 46) is granted;

FURTHER ORDERED that claims 1–5, 7–12, and 15–24 of U.S. Patent No. 10,562,680 B2 have been proven by a preponderance of the evidence to be unpatentable;

FURTHER ORDERED that, pursuant to 35 U.S.C. § 318(b), upon expiration of the time for appeal of this Decision, or the termination of any such appeal, a certificate shall issue canceling claims 1–5, 7–12, and 15–24 U.S. Patent No. 10,562,680 B2; and

FURTHER ORDERED that, as this is a Final Written Decision, a party seeking judicial review of the Decision must comply with the notice and service requirements of 37 C.F.R. § 90.2.

IPR2021-00919
Patent 10,562,680 B2

PETITIONER:

Michael A. Fisher
Kevin M. Flannery
DECHERT LLP
michael.fisher@dechert.com
kevin.flannery@dechert.com

PATENT OWNER:

Joseph A. Farco
Brian C. Anscomb
Benjamin Schwartz
NORRIS MCLAUGHLIN, P.A.
jfarco@norris-law.com
bcanscomb@norris-law.com
bschwartz@norris-law.com