

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

DONGHEE AMERICA, INC. and DONGHEE ALABAMA, LLC,
Petitioner,

v.

PLASTIC OMNIUM ADVANCED INNOVATION AND RESEARCH,
Patent Owner.

Case IPR2017-01605
Patent 7,166,253 B2

Before MITCHELL G. WEATHERLY, CHRISTOPHER M. KAISER, and
ROBERT L. KINDER, *Administrative Patent Judges*.

KAISER, *Administrative Patent Judge*.

FINAL WRITTEN DECISION
35 U.S.C. § 318; 37 C.F.R. § 42.73

INTRODUCTION

A. Background

Donghee America, Inc. and Donghee Alabama, LLC (collectively, “Petitioner”) filed a Petition (Paper 1, “Pet.”) requesting an *inter partes* review of claims 1–3, 7, 11, 12, and 14 of U.S. Patent No. 7,166,253 B2 (Ex. 1001, “the ’253 patent”). Plastic Omnium Advanced Innovation and Research (“Patent Owner”) did not file a Preliminary Response. On December 14, 2017, we instituted trial on all claims and grounds in the Petition. Paper 7 (“Inst. Dec.”).

During the trial, Patent Owner filed a Response (Paper 12, “PO Resp.”), Petitioner filed a Reply (Paper 23), Patent Owner filed Observations on Cross-Examination (Paper 36), and Petitioner filed Responses to those Observations (Paper 39). In addition, Patent Owner filed a Contingent Motion to Amend proposing three new claims as replacements for claims 1–3 if those claims were proven unpatentable. Paper 14 (“Mot. Amend”). Petitioner opposed the Motion to Amend (Paper 22, “Opp. Mot. Amend”), Patent Owner filed a Reply (Paper 29, “Reply Mot. Amend”), and Petitioner filed a Sur-Reply (Paper 34). Finally, Patent Owner filed a motion to strike Exhibit 1014, which Petitioner opposed. Paper 38; Paper 41. We held a hearing, the transcript of which has been entered into the record. Paper 42 (“Tr.”).

We have jurisdiction under 35 U.S.C. § 6, and we issue this Final Written Decision pursuant to 35 U.S.C. § 318(a) and 37 C.F.R. § 42.73. We conclude that Petitioner has established by a preponderance of the evidence that each of claims 1–3, 7, 11, 12, and 14 of the ’253 patent is unpatentable. We also conclude that Patent Owner did not satisfy the statutory

requirements for its Motion to Amend, so we deny the motion. Finally, we dismiss Patent Owner’s Motion to Strike as moot.

B. Related Matters

The parties note that the ’253 patent is asserted in *Plastic Omnium Advanced Innovation and Research v. Donghee America, Inc. et al.*, C.A. No. 16-cv-00187-LPS-CJB (D. Del.). Pet. 2; Paper 4, 1.

C. The Asserted Grounds of Unpatentability

Petitioner contends that claims 1–3, 7, 11, 12, and 14 of the ’253 patent are unpatentable based on the following grounds (Pet. 13–38):¹

Statutory Ground	Basis	Challenged Claim(s)
§ 102	Linden ²	1–3, 12, and 14
§ 103	Linden	14
§ 103	Linden and Hata ³	7 and 11
§ 102	Keller ⁴	1–3, 12, and 14
§ 103	Keller and Hata	7 and 11

D. The ’253 Patent

The ’253 patent, titled “Process for Manufacturing Hollow Plastic Bodies,” issued on January 23, 2007. Ex. 1001, at [45], [54]. “Hollow plastic bodies are used in a number of diverse and varied industries for many uses, especially as gas and liquid tanks.” *Id.* at 1:13–15. To meet “sealing

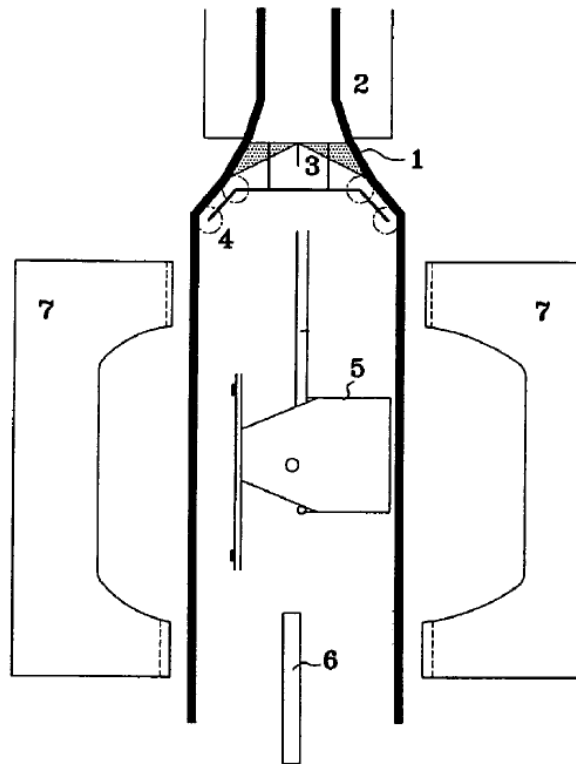
¹ Petitioner also relies on a declaration from Dr. David O. Kazmer. Ex. 1007.

² Linden et al., U.S. Patent No. 5,326,514, issued July 5, 1994 (Ex. 1003, “Linden”).

³ Hata et al., European Patent Application Publication No. EP 0742096 A2, published Nov. 13, 1996 (Ex. 1004, “Hata”).

⁴ Keller, U.S. Patent No. 6,138,857, issued Oct. 31, 2000 (Ex. 1005, “Keller”).

standards in relation to the environmental requirements with which [the tanks] must comply,” “[endeavors] have . . . been made to reduce as far as possible the losses arising from the various ducts and accessories associated with the hollow bodies.” *Id.* at 1:15–28. These efforts have included “incorporat[ing] certain accessories and ducts actually within the hollow bodies, thus eliminating any interface between them and the external atmosphere.” *Id.* at 1:28–31. The ’253 patent is intended “to provide a process which . . . allows bulky accessories to be easily and rapidly inserted into and positioned in a hollow body without any risk of producing undesirable irregularities in the walls of the hollow body obtained.” *Id.* at 1:56–61. One embodiment of the invention is illustrated in the only figure of the ’253 patent, reproduced below:



The figure depicts “an extrusion blow-[molding] machine with continuous extrusion used for producing motor-vehicle fuel tanks.” *Id.* at 2:50–54. The circular die of extrusion head 2 produces tubular extrudate 1 “of circular cross section.” *Id.* at 5:37–42. As the tubular material leaves the extrusion head, it “is separated into two sheets” by two blades 3. *Id.* at 5:42–45. Blowing nozzle 6 and structure 5 “supporting the accessories to be incorporated into the tank” are positioned between the two sheets, and the sheets are positioned between two halves 7 “of an open [mold].” *Id.* at 5:46–53. The halves are “then closed around the combination of sheets and accessories, causing the two sheets to be welded together, while blowing air is injected under pressure,” causing the tank to be formed. *Id.* at 5:53–57.

E. Illustrative Claim

Claims 1–3, 7, 11, 12, and 14 of the ’253 patent are challenged. Claim 1 is independent and illustrative; it recites:

1. A process for manufacturing a hollow body using a [mold], comprising the steps of:
incorporating at least one of an accessory or a duct within the hollow body;
after said step of incorporating, closing said [mold] in a way which eliminates any interface between said at least one of said accessory or said duct and an external atmosphere outside of the hollow body;
wherein said at least one of said accessory or said duct is supported by a preassembled structure which comprises at least one device configured to anchor said preassembled structure to an internal wall of the hollow body.

Id. at 6:2–14.

ANALYSIS

A. Claim Construction

In an *inter partes* review, we construe claim terms in an unexpired patent according to their broadest reasonable construction in light of the specification of the patent in which they appear. 37 C.F.R. § 42.100(b) (2016); *see Cuozzo Speed Techs. LLC v. Lee*, 136 S. Ct. 2131, 2144 (2016) (upholding the use of the broadest reasonable interpretation standard). Claim terms generally are given their ordinary and customary meaning, as would be understood by one of ordinary skill in the art in the context of the entire disclosure. *In re Translogic Tech., Inc.*, 504 F.3d 1249, 1257 (Fed. Cir. 2007).

Petitioner proposes construing three terms: “hollow body,” “accessory,” and “duct.” Pet. 10–12.

1. “Hollow Body”

Petitioner argues that “hollow body” should be interpreted as “any article whose surface has at least one empty or concave part.” *Id.* at 11 (citing Ex. 1001, 1:66–67; Ex. 1007 ¶ 15). Patent Owner agrees. PO Resp. 15. The ’253 patent states that “[t]he term ‘hollow body’ is understood to mean any article whose surface has at least one empty or concave part.” Ex. 1001, 1:66–67. Where an inventor defines specific terms used to describe an invention, we will give effect to those definitions, as long as they are set out “with reasonable clarity, deliberateness, and precision,” “so as to give one of ordinary skill in the art notice of the change” in meaning. *In re Paulsen*, 30 F.3d 1475, 1480 (Fed. Cir. 1994). Here, the phrase “is understood to mean,” as used in the ’253 patent, signals that the inventor presents a clear, deliberate, and precise definition.

Accordingly, we interpret “hollow body” as having the definition given it in the ’253 patent, “any article whose surface has at least one empty or concave part.”

2. *“Accessory”*

Petitioner argues that “accessory” should be interpreted as “any object or device which is generally associated with the hollow body in its usual method of use or operation and which interacts with it in order to fulfil certain useful functions.” Pet. 11–12 (citing Ex. 1001, 4:5–8; Ex. 1007 ¶ 16). Patent Owner agrees. PO Resp. 15. As with “hollow body,” “accessory” also is defined in the ’253 patent, which states that “[t]he term ‘accessory’ is understood to mean any object or device which is generally associated with the hollow body in its usual method of use or operation and which interacts with it in order to fulfil certain useful functions.” Ex. 1001, 4:5–8. Accordingly, we interpret “accessory” as “any object or device which is generally associated with the hollow body in its usual method of use or operation and which interacts with it in order to fulfil certain useful functions.”

3. *“Incorporating”*

The parties disagree about the proper construction of “incorporating.” Patent Owner argues that “incorporating” means “attaching,” and Petitioner argues that “incorporating” means “inserting.” PO Resp. 15–20; Reply 2–9. In contrast to the claim terms discussed above, the parties do not direct us to any express definition of “incorporating” in the specification of the ’253 patent. PO Resp. 15–20; Reply 2–9.

Patent Owner directs us to several pieces of evidence that allegedly support construing “incorporating” to mean “attaching.” First, Patent Owner

argues that its proposed construction “is consistent with the dictionary definition of ‘incorporate,’ which means ‘[u]nited into one body; combined in one mass or substance.’” PO Resp. 17 (quoting Ex. 2002, 3 (alteration in original)). The dictionary definition to which Patent Owner refers us is the definition of the participial adjective “incorporate,” not the verb used in the challenged claims. Ex. 2002, 3 (“**incorporate** . . . *ppl. a.*”). This definition also is indicated as “[n]ow *rare.*” *Id.* Accordingly, it is unhelpful in determining the proper construction of the term “incorporating” in the challenged claims. The dictionary page Patent Owner filed as Exhibit 2002 also defines the transitive verb “incorporate,” as “[t]o combine or unite into one body” and “[t]o put into or include in the body or substance of something else.” *Id.* Because one of these definitions is consistent with Patent Owner’s proposed construction and the other is consistent with Petitioner’s proposed construction, these definitions do not resolve the dispute on the correct meaning of the term.

Patent Owner also argues that the use of the words “insert” and “incorporate” in the written description of the ’253 patent demonstrates that “incorporate” cannot be construed to mean “insert.” PO Resp. 17–18. Specifically, according to Patent Owner, because the ’253 patent in several places states that “the two parts of the cut parison are held apart at a sufficient distance from each other so that it is possible to insert between them, before moulding, an object intended to be incorporated inside the hollow body,” the words “insert” and “incorporate” must have different meanings. *Id.* at 17 (emphasis omitted) (quoting Ex. 1001, 3:39–48). We disagree. The cited language in the ’253 patent distinguishes inserting an object between the “parts of the cut parison” from incorporating that object

“inside the hollow body,” not merely “insert[ing]” from “incorporat[ing].” Ex. 1001, 3:39–43; see Ex. 1001, 3:65–67 (“it is desired to insert into the cut parison at least one accessory intended to be incorporated into the hollow body”), 4:1–4 (“it is desired to insert between the sheets at least one accessory intended to be incorporated into the hollow body”). To the extent these phrases must mean different things, that difference may be due to the fact that the insertion is into one thing (“the two parts of the cut parison,” “the cut parison,” or “between the sheets”) and the incorporation is into another (“the hollow body”). Thus, the language of the written description of the ’253 patent does not require that “insert” and “incorporate” have different meanings.

Finally, Patent Owner directs us to the testimony of Professor Tim Osswald as support for its view that “incorporate” should mean “attach.” PO Resp. 16 (citing Ex. 2001 ¶¶ 40–42). In relevant part, this testimony states that, “[a]fter reading the specification of the ’253 patent, one of ordinary skill in the art would understand and interpret the word ‘incorporating’ to mean ‘fastening’ or ‘attaching’ so that the accessory or duct becomes part of the hollow body.” Ex. 2001 ¶ 42. Professor Osswald does not cite any evidence in support of his testimony. “[C]onclusory, unsupported assertions by experts as to the definition of a claim term are not useful.” *Phillips v. AWH Corp.*, 415 F.3d 1303, 1318 (Fed. Cir. 2005) (en banc). Accordingly, we give little weight to Professor Osswald’s statement regarding the proper construction of “incorporate.” See *In re Am. Acad. of Sci. Tech. Ctr.*, 367 F.3d 1359, 1368 (Fed. Cir. 2004) (“[T]he [PTAB] is entitled to weigh the declarations and conclude that the lack of factual

corroboration warrants discounting the opinions expressed in the declarations” (citations omitted)).

In contrast to Patent Owner, Petitioner directs us to evidence supporting its proposed construction of “incorporate” as “insert.” First, Petitioner argues that the language of the ’253 patent requires a construction of “incorporating” as encompassing “inserting” rather than as limited to “attaching.” Reply 2–4. Both parties argue that the “incorporating” recited in the challenged claims must occur before the mold closes to form the hollow body. PO Resp. 16; Reply 2–3. We agree. Ex. 1001, 6:2–14 (“ . . . after said step of incorporating, closing said mould . . .”). Thus, it is important to note the processes that the ’253 patent describes as occurring before, during, and after mold closure. Because “incorporating” must occur before mold closure, the process of “incorporating” may not be limited to any process that the patent describes as occurring during or after mold closure. Petitioner is correct that the ’253 patent describes a process in which a preassembled structure for supporting an accessory “may . . . be fastened by welding to the wall of the hollow body, upon closing the mould,” *i.e.*, during, not before, mold closure. Ex. 1001, 4:23–30. Thus, the language of the ’253 patent does not support construing the term “incorporating” as limited to “attaching.”

Petitioner also argues that both parties agreed in the related infringement suit in District Court that the proper construction of “incorporating” under the *Phillips* standard, used in that forum, was “inserting.” Reply 7–8 (citing Ex. 1010, at Ex. A, 4). Specifically, in that litigation, Patent Owner agreed that the correct construction of “incorporating at least one of an accessory or a duct within the hollow body”

was “inserting an accessory or duct into the hollow body.” Ex. 1010, at Ex. A, 4. Here, we apply the broadest-reasonable-interpretation standard. 37 C.F.R. § 42.100(b) (2016). “The broadest reasonable interpretation of a claim term may be the same as or broader than the construction of a term under the *Phillips* standard. But it cannot be narrower.” *Facebook, Inc. v. Pragmaus AV, LLC*, 582 F. App’x 864, 869 (Fed. Cir. 2014) (non-precedential). Here, for the term “incorporating,” Patent Owner’s proposed broadest reasonable interpretation (“attaching”) is narrower than the *Phillips* construction Patent Owner has advanced (“inserting”). Thus, “attaching” cannot be the broadest reasonable interpretation of “incorporating.”

Other than Patent Owner’s proposed “attaching” construction, the only construction the parties have proposed either in this case or in the related District Court case is Petitioner’s proposed “inserting” construction. PO Resp. 15–20 (discussing only “inserting” and “attaching” constructions); Reply 2–9 (Petitioner arguing in favor of “inserting”); Ex. 1010, at Ex. A, 4 (both parties proposing “inserting”). The ’253 patent supports such a construction, because it describes at least some of its embodiments as involving only insertion of an object between the sheets that will form the hollow body before mold closure. Ex. 1001, 4:23–30.

Accordingly, for the foregoing reasons, we adopt Petitioner’s proposed construction of “incorporating” as “inserting.”

4. “Duct”

Petitioner argues that “duct” should be interpreted as a “pipe, tube, or channel that conveys a substance.” Pet. 12; Reply 9–11. Unlike “hollow body” and “accessory,” the term “duct” is not defined expressly in the ’253 patent. Petitioner’s proposed construction is the ordinary meaning of

“duct.” Pet. 12 (citing Ex. 1006, 357 (dictionary definition of “duct” as “a pipe, tube, or channel that conveys a substance”))).

Patent Owner argues that we should depart from the ordinary meaning of “duct” to interpret it as “a pipe or tube external to a fuel-tank accessory.” PO Resp. 20–22. Specifically, Patent Owner argues that the recitation in the challenged claims of “an accessory or a duct” “makes clear that an accessory is a separate component from a duct.” *Id.* at 20–21. This argument does not persuade us that a “duct” must always be external to an “accessory.” As Patent Owner notes, the ’253 patent gives “[n]on-limiting examples” of accessories, including “liquid pumps, pipettes, reservoirs or baffles internal to the hollow body, and ventilation devices [*i.e.* valves].” *Id.* (quoting Ex. 1001, 4:5–11) (alteration in original). We agree that “the claimed ‘duct’ is something distinct from the above-noted accessories,” *id.* at 21, in that the function of a duct is to convey a substance from one place to another, which differs from the functions of the listed accessories. But the listing of exemplary accessories and the use of the alternative “or” in the challenged claims do not require that a duct be located outside any accessory that happens to be present.

Patent Owner also argues that, “[i]n the context of fuel tanks, ducts are used to connect fuel-tank accessories to each other” and that another patent related to fuel tanks “defines the word ‘pipe’ in the context of fuel tanks” as “an elongated channel open at its end and of basically tubular section” that “is preferably used to convey something.” *Id.* at 21 (quoting Ex. 2003, 2:65–3:5; citing Ex. 2001 ¶¶ 49–50). We note that, except for claim 12, the challenged claims are not limited to fuel tanks, which makes this evidence of limited value. Ex. 1001, 6:2–55 (claiming a “process for

manufacturing a hollow body”). Further, the definition of “pipe” in Exhibit 2003 does not appear in the ’253 patent and is a definition of “pipe,” not a definition of “duct.” Ex. 2003, 2:65–3:5. Moreover, even if this evidence were considered to provide a definition for “duct” in the ’253 patent, the definition in question would be consistent with Petitioner’s—not Patent Owner’s—proposed construction. *Compare* Ex. 2003, 2:65–3:5 (defining “pipe” as “an elongated channel open at its end and of basically tubular section” that “is preferably used to convey something”), *with* Pet. 12 (proposing to construe “duct” as a “pipe, tube, or channel that conveys a substance”), *and* PO Resp. 20 (proposing to construe “duct” as “a pipe or tube external to a fuel-tank accessory”). Thus, this evidence does not support adopting Patent Owner’s proposed construction of “duct.”

Finally, Patent Owner directs us to the testimony of Professor Osswald as support for the position that “one of ordinary skill in the art would not consider an internal, sub-part of a functional accessory, such as a fuel line within a surge pot, to be the claimed ‘duct’” and that “[d]ucts and accessories are separate components.” PO Resp. 22 (citing Ex. 2001 ¶¶ 51–52). But Professor Osswald’s testimony merely states without support, and in precisely the same language as Patent Owner’s brief, that “one of ordinary skill in the art would not consider an internal, sub-part of a functional accessory, such as a fuel line within a surge pot, to be the claimed ‘duct.’” Ex. 2001 ¶ 52. As discussed above, “conclusory, unsupported assertions by experts as to the definition of a claim term are not useful.” *Phillips*, 415 F.3d at 1318. Accordingly, we give little weight to Professor Osswald’s statement regarding the proper construction of “duct.” *See Am. Acad. of Sci.*, 367 F.3d at 1368 (“[T]he [PTAB] is entitled to weigh the

declarations and conclude that the lack of factual corroboration warrants discounting the opinions expressed in the declarations” (citations omitted)).

Thus, Patent Owner has not directed us to evidence of record sufficient to support the adoption of Patent Owner’s narrow construction of “duct” as limited to pipes or tubes “external to a fuel-tank accessory.” Because Petitioner’s proposed construction is consistent with the ordinary meaning of “duct,” we adopt it and construe “duct” as a “pipe, tube, or channel that conveys a substance.”

5. *“Preassembled Structure”*

The challenged claims each recite “wherein said at least one of said accessory or said duct is supported by a preassembled structure.” Ex. 1001, 6:2–14. Patent Owner argues that we should construe “preassembled structure” as limited to “a set of multiple parts previously joined into a single arrangement that is capable of attachment to at least one accessory.” PO Resp. 22–23 (quoting Ex. 2004, 11–12). Petitioner disagrees, arguing that “preassembled structure” should be construed more broadly to cover any “premade structure,” even if it is not made up of multiple parts. Reply 11–13.

In support of its proposed construction, Patent Owner directs us to evidence that Petitioner supported Patent Owner’s proposed construction in the related District Court proceeding and that the District Court adopted this construction. PO Resp. 22 (quoting Ex. 2004, 11–12).

In support of its proposed construction, Petitioner directs us to evidence that Patent Owner supported Petitioner’s proposed construction in

the related District Court proceeding. Reply 13 (quoting Ex. 1012, 14; citing Ex. 1011, 15–16).

We are not persuaded that either party necessarily should be bound to the claim construction it proposed in District Court in this case. We interpret claim terms as having their broadest reasonable interpretation, a different standard from that applied in District Court proceedings. 37 C.F.R. § 42.100(b) (2016). Moreover, a rule binding one party to its statements in District Court necessarily would bind the other party to its own contradictory statements, bringing us no closer to resolving the disputed meaning of this term.

It is worth noting that the District Court construed the term “preassembled structure” consistently with the construction proposed here by Patent Owner. Ex. 2004, 11–12. “There is no dispute that the [Patent Trial and Appeal Board] is not generally bound by a prior judicial construction of a claim term.” *Power Integrations, Inc. v. Lee*, 797 F.3d 1318, 1326 (Fed. Cir. 2015) (citing *In re Trans Tex. Holdings Corp.*, 498 F.3d 1290, 1298 (Fed. Cir. 2007)). This “does not mean, however, that [the Board] has no obligation to acknowledge that interpretation or to assess whether it is consistent with the broadest reasonable construction of the term.” *Id.* On the issue of requiring multiple parts, the District Court reasoned that “the Court does not understand [preassembled] to merely mean ‘premade.’” Ex. 2004, 11–12.

We are not persuaded by the District Court’s reasoning, because the court may not have been presented with, and did not discuss, all of the claim construction arguments the parties have made here. Moreover, the limitation of “preassembled structure[s]” to those having multiple parts is inconsistent

with the description in the '253 patent of an exemplary “preassembled structure” as “an arm provided with a tab for fastening to the wall of the hollow body.” Ex. 1001, 4:26–28. A single arm does not have multiple parts, and, although the arm and the tab might be separate pieces, there is no description that requires this to be the case, as opposed to an arm/tab combination that is forged, machined, or molded in a single operation. *Id.* Accordingly, we are unpersuaded that the record contains evidence sufficient to limit “preassembled structure[s]” to those made up of multiple parts. Moreover, to the extent that both a construction limiting a “preassembled structure” to something made of multiple pieces and a construction also allowing for a one-piece “preassembled structure” are reasonable, we are compelled to choose the broader of the two constructions. 37 C.F.R. § 42.100(b) (2016). Here, the broader construction is the one that allows the “preassembled structure” to have either a single piece or multiple pieces.

For the foregoing reasons, we adopt Petitioner’s proposed construction and interpret “preassembled structure” as “premade structure.”

B. Asserted Anticipation by Linden

Petitioner argues that Linden anticipates claims 1–3, 12, and 14. Pet. 13–23.

1. Linden

Linden relates to “a process for the production of hollow bodies from thermoplastic material by blow molding” in which “an additional body is disposed inside the hollow body by being carried on a holding means which is joined to the inside surface of the wall of the hollow body.” Ex. 1003, at [57]. The process of Linden is illustrated in Figure 1, reproduced below:

holding means to the wall. *Id.* at 8:11–29. Linden teaches that this process can be used to produce “motor vehicle [fuel] tanks” containing “a surge cup or pot” as an “additional body.” *Id.* at 1:14–21.

2. *Analysis*

Petitioner argues that all limitations of claims 1–3, 12, and 14 are disclosed by Linden. Pet. 13–23. Patent Owner argues that, under its proposed construction of “incorporating,” Linden does not disclose “incorporating at least one of an accessory or a duct within the hollow body” before closing the mold, as required by each of the challenged claims. PO Resp. 23–24. Patent Owner also argues that, under its proposed construction of “duct,” Linden does not disclose “incorporating [a] duct within [the] hollow body,” as required by claim 14. *Id.* at 24–25. We are persuaded that Petitioner has shown by a preponderance of the evidence that Linden discloses all the limitations of claims 1–3, 12, and 14.

a. Claim 1

As Petitioner argues, claim 1 recites a preamble and three limitations: “[a] process for manufacturing a hollow body using a [mold],” “incorporating at least one of an accessory or a duct within the hollow body,” “after said step of incorporating, closing said [mold] in a way which eliminates any interface between said at least one of said accessory or said duct and an external atmosphere outside of the hollow body,” and “said at least one of said accessory or said duct is supported by a preassembled structure which comprises at least one device configured to anchor said preassembled structure to an internal wall of the hollow body.” Pet. 14–19 (emphases omitted); *see* Ex. 1001, 6:2–14.

With respect to the preamble, Linden discloses “a process for the production of a hollow body of thermoplastic material by blow molding.” Ex. 1003, 3:33–35. Specifically, the “hollow body” of Linden may be a “motor vehicle tank[.]” *Id.* at 1:14–20. Accordingly, Linden discloses a “process for manufacturing a hollow body using a [mold],” as required by claim 1.

The next issue is whether Linden discloses “incorporating at least one of an accessory or a duct within the hollow body.” Linden teaches “introduc[ing]” “an additional body . . . into the preform” for incorporation into the finished hollow body. *Id.* at 3:68–4:1. This “additional body” may be “a surge cup or pot” that contains “the intake opening for the fuel line leading to the fuel pump.” *Id.* at 1:60–2:5. The surge cup of Linden is an “object or device which is generally associated with the [fuel tank of Linden] in its usual method of use or operation and which interacts with it in order to fulfil certain useful functions,” such as supplying fuel to a fuel pump. *Id.* (“a surge cup or pot provided in the interior of a . . . fuel tank and intended to ensure that fuel is retained in the region of the intake opening leading to the fuel pump, thereby to ensure that fuel is always available to the pump”). Accordingly, Linden’s surge cup falls within our construction of “accessory.”

Moreover, Linden teaches “introduc[ing]” the surge cup “into the preform which has at least one opening for that purpose, to be applied to the inside surface of the wall of the expanded hollow body.” *Id.* at 3:62–4:3. Patent Owner argues that this teaching is insufficient to disclose attaching the surge cup to the wall of the hollow body before the mold closes. PO Resp. 23–24. We agree that Linden does not teach attaching its accessory to

the inside wall of the fuel tank before the mold closes around the preform. Instead, in Linden, the mold halves are closed around the preform and the mandrel, and “a suitable blowing agent . . . is introduced under pressure” through the mandrel, causing the preform to expand to press “against the inside wall defining the mold cavity,” and only then is the holding means for the accessory displaced to be brought into contact with the inner wall of the expanded preform, welding the holding means to the wall. Ex. 1003, 7:27–55, 8:11–29, Figs. 1–3. But, as discussed above, we disagree with Patent Owner about the proper construction of “incorporating” in the challenged claims. Claim 1 requires only that an accessory or a duct be “incorporat[ed] . . . within the hollow body” before mold closure occurs, and we construe “incorporating” to mean “inserting,” without requiring “attaching.” Thus, it is unimportant that Linden fails to teach attaching the surge cup to the wall before mold closure. All that is required is that Linden disclose inserting the surge cup into the preform before mold closure, and Linden does disclose this. *Id.* at 3:62–4:3, 7:27–49, Figs. 1–3.

The next question is whether Linden discloses “after said step of incorporating, closing [the mold] in a way which eliminates any interface between said at least one of said accessory or said duct and an external atmosphere outside of the hollow body.” As discussed above, Linden discloses closing the mold halves after placing the additional body within the preform. But Linden discloses that “[a]t its lower end the preform 28 is pressed around the mandrel 14 by virtue of closure of the mold halves 10a and 10b.” *Id.* at 7:40–42, Fig. 2. Because mandrel 14 is hollow, *id.* at 6:35–39; 6:46–54, it is not completely clear that closure of Linden’s hollow body around mandrel 14 necessarily eliminates any interface

between the additional body inside Linden's hollow body and the atmosphere outside the hollow body. On the other hand, the closure of the mold described in the '253 patent occurs with blowing nozzle 6 "positioned between the two parts of the [mold]," and "blowing air is injected under pressure via the nozzle," which is quite similar to the use of hollow mandrel 14 in Linden. Ex. 1001, 5:50–57. Given the similarity between Linden's method and the method described in the '253 patent, we determine that Petitioner has shown by a preponderance of the evidence that Linden discloses the limitation of claim 1 requiring the step of, "after said step of incorporating, closing [the mold] in a way which eliminates any interface between said at least one of said accessory or said duct and an external atmosphere outside of the hollow body."

The final question with respect to claim 1 is whether Linden discloses that the additional body incorporated within the hollow body "is supported by a preassembled structure which comprises at least one device configured to anchor said preassembled structure to an internal wall of the hollow body." Petitioner argues that Linden's "[h]olding means 24 is a preassembled structure" in which "leg members 44, 45" have "enlarged foot portion[s] 36." Pet. 18 (citing Ex. 1003, 9:23–34). We agree. "[H]olding means 24 . . . substantially comprises first and second support or leg members 44, 45," and "support or leg members 44, 45 are each provided with an enlarged foot portion 36 of substantially plate-like configuration." Ex. 1003, 9:23–34. Even if Linden's holding means 24 were not in the aggregate the recited "preassembled structure," each leg member 44, 45, taken together with its respective foot portion 36 is. Ex. 1001, 4:26–28 (describing a "preassembled structure" as "for example, an arm provided

with a tab for fastening to the wall of the hollow body”). Linden’s “foot portions 36 are pressed against the inside surface, which is still hot and thus plastic, . . . of the hollow body . . . thereby to produce a welded joint between the foot portions 36 and the inside surface.” *Id.* at 9:34–42.

Petitioner has shown by a preponderance of the evidence that Linden discloses the limitation of claim 1 requiring that the accessory or duct be “supported by a preassembled structure which comprises at least one device configured to anchor said preassembled structure to an internal wall of the hollow body.”

Accordingly, Petitioner has shown by a preponderance of the evidence that Linden discloses all the limitations of claim 1, arranged as in claim 1.

b. Claim 2

Claim 2 depends from claim 1 and adds a limitation reciting that the “device configured to anchor [the] preassembled structure to an internal wall of the hollow body” of claim 1 “includes tabs.” Ex. 1001, 6:2–18. Claim 2 also adds a limitation reciting that the process of claim 1 “further comprises a step of welding said tabs to said internal wall.” *Id.*

Petitioner argues that Linden discloses these limitations. Pet. 19–20 (citing Ex. 1003, 9:24–42, Figure 5; Ex. 1007 ¶¶ 51–52). Patent Owner does not dispute Petitioner’s evidence or argument. PO Resp. 23–24. We agree with Petitioner. The ’253 patent does not discuss the meaning of “tabs,” stating only that they “may, for example, be fastened by welding to the wall of the hollow body, upon closing the mould.” Ex. 1001, 4:28–30. Similarly, Linden discloses “leg members 44, 45” that “are each provided with an enlarged foot portion 36,” such that the foot portions “are pressed against the inside surface, which is still hot and thus plastic, of the wall region 32 of the

hollow body 30,” which “produce[s] a welded joint between the foot portions 36 and the inside surface of the wall region 32.” Ex. 1003, 9:34–42, Fig. 4. Accordingly, we find that Linden discloses the limitations of claim 2, arranged as in claim 2.

c. Claim 3

Claim 3 depends from claim 2 and adds a limitation requiring that the “tabs” of claim 2 “are supported by an arm.” Ex. 1001, 6:19–20. As discussed above, Linden discloses “leg members 44, 45” that “are each provided with an enlarged foot portion 36,” such that the foot portions “are pressed against the inside surface, which is still hot and thus plastic, of the wall region 32 of the hollow body 30,” which “produce[s] a welded joint between the foot portions 36 and the inside surface of the wall region 32.” Ex. 1003, 9:34–42, Fig. 4. The “foot portion[s]” of Linden are the “tabs” of claim 3 of the ’253 patent, and each “foot portion” is supported by a “leg member.” Petitioner argues that “[e]ach leg member is an arm.” Pet. 21. Patent Owner does not dispute Petitioner’s evidence or argument. PO Resp. 23–24. We agree that the “leg members” of Linden could be described as “arms” that support the “foot portions” that attach the “leg members” to the inside wall of Linden’s “hollow body.” Ex. 1003, 9:23–34, Fig. 4. Accordingly, we find that Linden discloses the limitations of claim 3, arranged as in claim 3.

d. Claim 12

Claim 12 depends from claim 1 and adds a limitation requiring that the “hollow body” of claim 1 be “a fuel tank.” Ex. 1001, 6:46–47. Petitioner argues that “Linden specifically discloses that its manufacturing process can be used to manufacture a motor vehicle fuel tank.” Pet. 22

(citing Ex. 1003, 1:17–18, 1:60–65). Patent Owner does not dispute Petitioner’s evidence or argument. PO Resp. 23–24. We agree with Petitioner that Linden discloses using the manufacturing process it teaches to make a fuel tank. Ex. 1003, 1:60–65 (“a typical additional body which is to be fitted into a hollow body is a surge cup or pot provided in the interior of a motor vehicle fuel tank”). Accordingly, we find that Linden discloses the limitations of claim 12, arranged as in claim 12.

e. Claim 14

Claim 14 depends from claim 1 and adds a limitation requiring that the process of claim 1 comprise “a step of incorporating said duct within said hollow body, and wherein said duct is supported by said preassembled structure.” Ex. 1001, 6:52–55. Thus, claim 14 limits the phrases “an accessory or a duct” and “said accessory or said duct” in claim 1 to merely “a duct” and “said duct.”

Petitioner argues that Linden discloses incorporating a duct into its hollow body and supporting it with a preassembled structure in the fashion required by claims 1 and 14. Pet. 22–23. Specifically, Petitioner argues that Linden discloses incorporating a surge pot that contains within it an “intake opening for the fuel line” that falls within the proper construction of “duct.” *Id.* Patent Owner argues, first, that Linden’s surge pot itself is not a “duct,” and, second, that the internal passage Petitioner identifies within Linden’s surge pot is not a “duct” under Patent Owner’s proposed construction of “duct.” PO Resp. 24–25. In addition, Patent Owner argues that, under Patent Owner’s proposed construction of “preassembled structure,” Linden’s

holding means 24 does not satisfy claim 14's requirement for a "preassembled structure."⁵ *Id.* at 25.

As discussed above, we do not adopt Patent Owner's proposed construction of either "duct" or "preassembled structure." We agree with Patent Owner that Linden's surge pot itself is not a duct, although we note that Petitioner does not argue that it is. Instead, Petitioner argues that the portion of Linden's surge pot identified as the "intake opening for the fuel line" is a "duct." Pet. 22–23. We agree. We construe "duct" as a "pipe, tube, or channel that conveys a substance." The "intake opening for the fuel line" disclosed in Linden conveys fuel to the fuel pump. Ex. 1003, 1:63–65 ("fuel is retained in the region of the intake opening leading to the fuel pump, thereby to ensure that fuel is always available to the pump"). In cross-section, Linden's "intake opening for the fuel line" is generally rectangular, with the cross-sectional area shrinking as the opening passes counterclockwise around the outer portion of the surge pot. *Id.* at Figs. 5, 6. Although this may or may not be a "pipe" or a "tube," it certainly is a channel, with at least a portion of the channel being closed on all sides. *Id.* Accordingly, under the broadest reasonable interpretation of "duct," Linden's "intake opening for the fuel line" is a "duct." We are not persuaded otherwise by Patent Owner's argument to the contrary. With respect to the issue of whether the intake opening of Linden is a "duct," Patent Owner's argument depends on our adopting Patent Owner's proposed construction of "duct" as "a pipe or tube external to a fuel-tank accessory."

⁵ Although claim 1 recites the same limitation as claim 14, Patent Owner did not challenge this language in its analysis of claim 1. PO Resp. 23–24.

PO Resp. 24–25. As discussed above, we do not construe “duct” in this fashion.

As for Patent Owner’s argument that Linden’s holding means 24 is not a “preassembled structure,” we explained above that each of Linden’s “leg members 44, 45,” together with its “foot portion 36,” is a “preassembled structure” within the meaning of that term in the ’253 patent. As explained above, we are not persuaded by Patent Owner’s argument that a “preassembled structure” must be limited only to structures made up of multiple parts, so the leg members of Linden are preassembled structures. Petitioner argues that “holding means 24,” rather than either of the leg members, is the “preassembled structure,” Pet. 23, but Linden’s holding means 24 “substantially comprises first and second support or leg members 44, 45,” each of which has an associated foot portion 36. Ex. 1003, 9:23–34. Linden does not identify any other parts of the holding means. *Id.* Because the leg members are the primary components of the holding means, and because Linden is silent regarding the existence or identity of any additional parts of the holding means, Petitioner’s identification of the holding means operates as an identification of the leg members. Thus, we find that Linden discloses the “preassembled structure” of claim 14.

To the extent that Patent Owner’s argument is that Linden’s holding means (or the leg members of which it is composed) does not directly hold the “intake opening for the fuel line,” but instead holds only the surge pot of which that intake opening is a part,⁶ we are not persuaded by this argument.

⁶ Patent Owner does not clearly articulate this argument, arguing only that Linden’s holding means 24 fails to satisfy Patent Owner’s proposed

Claim 14 requires only that the “duct [be] supported by [the] preassembled structure,” and the parties have directed us to no evidence of record that requires that the duct be supported directly, rather than indirectly through some other structure. Ex. 1001, 6:52–55. Accordingly, we find that Linden discloses the limitations of claim 14, arranged as in claim 14.

f. Conclusion

We find that Petitioner has shown by a preponderance of the evidence that Linden anticipates claims 1–3, 12, and 14 of the ’253 patent.

C. Asserted Obviousness over Linden

As discussed above, Petitioner argues that Linden anticipates claim 14, and we find that Petitioner has proven this anticipation by a preponderance of the evidence. Pet. 22–23. Petitioner’s anticipation argument relies on Petitioner’s proposed construction of “duct,” which we adopt. *Id.* Petitioner also argues that, if we do not adopt Petitioner’s construction of “duct,” the subject matter of claim 14 would have been obvious to a person of ordinary skill in the art given the teachings of Linden. *Id.* at 23–24. Because we find claim 14 unpatentable as anticipated by Linden under Petitioner’s proposed construction of “duct,” and because Petitioner proposes reaching the obviousness of claim 14 over Linden only if we disagree with its arguments on those points, we conclude that Petitioner’s obviousness argument is moot, and we do not reach it. *See SAS Inst., Inc. v. Iancu*, 138 S. Ct. 1348, 1357 (2018) (“the petitioner’s contentions . . . define the scope of the litigation all the way from institution through to conclusion”).

construction of “preassembled structure” because it need not be made of multiple parts. PO Resp. 25.

D. Asserted Obviousness over Linden and Hata

Petitioner argues that the subject matter of claims 7 and 11 would have been obvious to a person of ordinary skill in the art given the teachings of Linden and Hata. Pet. 25–28.

1. Hata

Hata relates to “a fuel tank of multi-layer construction having good impact resistance as well as good barrier properties for gasoline.” Ex. 1004, at [57]. The fuel tank of Hata is “composed of high-density polyethylene and EVOH layers.” *Id.* at 2:27–29. Specifically, Hata discloses a tank that “is constructed of (a) inner and outer layers of high-density polyethylene, (b) intermediate layers of adhesive resin, and (c) a core layer of ethylene-vinyl alcohol copolymer.” *Id.* at 2:52–53. The tank can be produced by “extrusion molding, blow molding, and injection molding,” and Hata teaches that “particularly coextrusion blow molding is desirable.” *Id.* at 5:18–21.

2. Analysis

Claim 7 depends from claim 1 and adds a limitation requiring that “the hollow body [be] a multilayered structure made of stacked layers.” Ex. 1001, 6:31–33. Claim 11 depends from claim 7 and adds a limitation requiring that the “multilayered structure [be] obtained by coextrusion.” *Id.* at 6:43–45. Petitioner argues that Hata teaches or suggests these limitations and that a person of ordinary skill in the art would have had a reason to combine the teachings of Hata with the teachings of Linden, rendering claims 7 and 11 obvious over the combined teachings. Pet. 25–28 (citing Ex. 1003, 5:25–34, 6:28–32; Ex. 1004, 2:20–22, 2:27–29, 2:52–53, 5:18–21, 5:52–54; Ex. 1007 ¶¶ 63–68). Patent Owner does not dispute Petitioner’s evidence or argument. PO Resp. 23–27.

We note first that claims 7 and 11 both depend from claim 1. Ex. 1001, 6:31–33, 6:43–45. Accordingly, claims 7 and 11 “include all the limitations of” claim 1. 37 C.F.R. § 1.75(c). Petitioner does not explain why claim 1 would have been obvious over the teachings of Linden and Hata, relying instead on its argument that Linden anticipates claim 1. Pet. 25–28. We are mindful, however, that, although “novelty under 35 U.S.C. § 102 and nonobviousness under 35 U.S.C. § 103 are separate conditions of patentability,” “anticipation is the ‘epitome of obviousness.’” *Cohesive Techs., Inc. v. Waters Corp.*, 543 F.3d 1351, 1363 (Fed. Cir. 2008) (quoting *In re Kalm*, 378 F.2d 959, 962 (CCPA 1967)). Accordingly, we consider Petitioner’s challenge to claim 1 on grounds of anticipation to constitute an argument that Linden itself also teaches or suggests every limitation of claim 1 for purposes of arguing that claims 7 and 11 would have been obvious over the combination of Linden and Hata.

In our Decision on Institution, we added claim 1 to the asserted ground of obviousness over the combination of Linden and Hata. Inst. Dec. 16. No party objected to that addition during the course of the trial, and, as noted above, we construe Petitioner’s challenge to claim 1 on grounds of anticipation by Linden as additionally arguing that claim 1 would have been obvious over the combination of Linden and Hata. This is sufficient, in our opinion, to show by a preponderance of the evidence that the prior art would have taught or suggested the portion of the subject matter of claims 7 and 11 that is recited in claim 1. We are not persuaded, however, that we may reach the issue of the obviousness of claim 1 itself over the combination of Linden and Hata, because the Petition does not present that issue directly. *SAS Inst.*, 138 S. Ct. at 1357 (“the petitioner’s

contentions . . . define the scope of the litigation all the way from institution through to conclusion”). Accordingly, we do not conclude that claim 1 is obvious over the combination of Linden and Hata. Instead, we merely consider the issue of whether claims 7 and 11 are obvious over that combination of prior art references.

As explained above, Linden discloses the limitations of claim 1, from which claims 7 and 11 depend.⁷ Hata teaches making a fuel tank that “is constructed of (a) inner and outer layers of high-density polyethylene, (b) intermediate layers of adhesive resin, and (c) a core layer of ethylene-vinyl alcohol copolymer.” Ex. 1004, 2:52–53. The tank can be produced by “extrusion molding, blow molding, and injection molding,” and Hata teaches that “particularly coextrusion blow molding is desirable.” *Id.* at 5:18–21. Accordingly, we determine that Petitioner has shown by a preponderance of the evidence that the combination of Linden and Hata teaches or suggests the limitations of claims 7 and 11. In addition, Hata teaches that its multilayered construction method results in a fuel tank that “is superior in gasoline barrier properties (especially for oxygen-containing gasoline) and impact resistance.” *Id.* at 2:27–29; *see also id.* at [57] (“a fuel tank of multi-layer construction having good impact resistance as well as good barrier properties for gasoline, especially one containing methanol and MTBE”). Accordingly, we determine that Petitioner has shown by a preponderance of the evidence that a person of ordinary skill in the art would have had reason to make Linden’s fuel tank from Hata’s materials, which provide desirable properties for fuel tanks. *See* Ex. 1003, 5:30–33 (disclosing that Linden’s

⁷ Patent Owner does not argue that the combination of Linden and Hata affects the analysis of claim 1, as examined above.

method may be used to produce “a fuel tank of plastic material”). Thus, Petitioner has proven by a preponderance of the evidence that claims 7 and 11 would have been obvious to a person of ordinary skill in the art in view of the combination of Linden and Hata.

E. Asserted Anticipation by Keller

Petitioner argues that Keller anticipates claims 1–3, 12, and 14. Pet. 28–36.

1. Keller

Keller “relates . . . to two methods for the mounting of lines in a fuel tank, one of the fuel tanks being manufactured by the blowing method and the other fuel tank by assembling two moldings.” Ex. 1005, 1:6–12. Specifically, Keller discloses lines that “are prestressed against the inside of the wall of the fuel tank by means of at least one spring element.” *Id.* at 1:50–53. In addition to lines, “other components connected to the lines, such as, for example, suction jet pumps and valves, can be arranged within the fuel tank.” *Id.* at 2:63–66. In one embodiment of Keller, lines, a jet pump, and a baffle are connected to spring elements and inserted into a tubular molding blank. *Id.* at 3:66–4:13, Fig. 1a. This blank is then introduced into a mold, heated, and blown to take the shape of the mold cavity. *Id.* at 4:14–22, Fig. 1b. The lines and connected components are “prestressed permanently against the inside of the wall of the fuel tank.” *Id.* at 4:18–20. In a separate embodiment of Keller, instead of blow molding a tubular blank, the fuel tank is constructed from two separate, pre-molded, flanged pieces that are welded together after the lines and components are placed between them. *Id.* at 4:23–37, Figs. 2a, 2b. In this second embodiment, Keller discloses stressing the lines and attached components

against the walls of the fuel tank using spring elements similar to those used in the first embodiment. *Id.*

2. *Analysis*

Petitioner argues that all limitations of claims 1–3, 12, and 14 are disclosed by Keller. Pet. 28–36. Patent Owner argues that Keller is not enabled. PO Resp. 28–30. Patent Owner also argues that Keller fails to teach attaching its accessories to the inside wall of the hollow body. *Id.* at 30–31. Finally, Patent Owner argues that, even if Keller were construed as disclosing attaching the accessories to the walls of the hollow body, this attachment does not occur before mold closure, as allegedly claimed. *Id.* at 31–32.

a. Enablement of Keller

Patent Owner argues that Keller is not enabled. *Id.* at 28–30. Specifically, Patent Owner argues that a person of ordinary skill in the art would need to engage in undue experimentation to determine how to carry out the process disclosed as the first embodiment of Keller. *Id.* at 28–29. Patent Owner also argues that Keller’s second embodiment is not enabled because it fails to explain how the springs that are compressed are left in what Keller refers to as a “tensioned state.” *Id.* at 30–31 (quoting Ex. 1005, 4:33–35).

Keller “is presumptively enabling barring any showing to the contrary by a . . . patentee.” *In re Antor Media Corp.*, 689 F.3d 1282, 1288 (Fed. Cir. 2012). To rebut this presumption, Patent Owner⁸ “must generally do more

⁸ Although the ultimate burden of persuasion remains with Petitioner, *Dynamic Drinkware, LLC v. Nat’l Graphics, Inc.*, 800 F.3d 1375, 1379–81

than state an unsupported belief that a reference is not enabling.” *In re Morsa*, 713 F.3d 104, 110 (Fed. Cir. 2013). “To be enabling, the specification of a patent must teach those skilled in the art how to make and use the full scope of the claimed invention without ‘undue experimentation.’” *Genentech, Inc. v. Novo Nordisk, A/S*, 108 F.3d 1361, 1365 (Fed. Cir. 1997) (quoting *In re Wright*, 999 F.2d 1557, 1561 (Fed. Cir. 1993)). “[A] patent specification complies with the statute 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 whether undue experimentation would be necessary 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. *In re Wands*, 858 F.2d 731, 737 (Fed. Cir. 1988).

(1) Keller’s First Embodiment

Here, the evidence on the first *Wands* factor is equivocal. Patent Owner directs us to the testimony of Dr. Osswald that significant experimentation would be necessary to carry out Keller’s first embodiment. PO Resp. 29 (citing Ex. 2001 ¶¶ 61–63). Dr. Osswald testifies that, in carrying out Keller’s first embodiment, the mold cannot be closed until after the plastic blank is “molten,” because closing the mold would require pinching the ends of the blank closed, which cannot be done with a non-

(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.

molten blank. Ex. 2001 ¶ 63. The problem with melting the blank before closing the mold is that Keller's springs would then be able "to expand and stretch the blank" before the mold was closed around the blank, which "would lead to numerous problems, such as wrinkling of the molten sheet, overstretching of some regions which will lead to excessive thinning, as well as oddly shaped open ends that would be difficult to pinch shut between the mold halves." *Id.*

Against this evidence, Petitioner directs us to the testimony of Dr. Kazmer. Pet. 22 (citing Ex. 1008 ¶ 36). Dr. Kazmer testifies that a person of ordinary skill in the art "would understand how to design a mold and process in which the mold is closed, then heated," as well as how to close the ends of the blank in "a secondary operation." Ex. 1008 ¶ 36. The testimony of both Dr. Osswald and Dr. Kazmer is conclusory and unsupported by citations to other evidence. Ex. 1008 ¶ 36; Ex. 2001 ¶¶ 61–63. In particular, Dr. Osswald cites no supporting evidence that a person of ordinary skill in the art would know that Keller's springs pushing against a molten blank before mold closure would cause "wrinkling of the molten sheet, overstretching of some regions which will lead to excessive thinning, as well as oddly shaped open ends that would be difficult to pinch shut between the mold halves." Ex. 2001 ¶ 63. Dr. Kazmer cites no evidence supporting his testimony at all. Ex. 1008 ¶ 36. We do not find conclusory expert testimony to be persuasive. *Exmark Mfg. Co. v. Briggs & Stratton Power Prods. Grp., LLC*, 879 F.3d 1332, 1350 (Fed. Cir. 2018) (conclusory statements by expert in support of damages analysis cannot support a verdict); *Arendi S.A.R.L. v. Apple Inc.*, 832 F.3d 1355, 1366 (Fed. Cir. 2016) (conclusory statements by expert in support of obviousness

analysis may not be relied upon); *Phillips*, 415 F.3d at 1318 (conclusory statements by expert in support of claim construction may not be relied upon). Accordingly, it is not permissible for us to rely on either party's evidence on this factor. With no reliable evidence, we find that the first *Wands* factor weighs in favor of neither party.

We agree with Patent Owner that the second and third *Wands* factors weigh in favor of concluding that Keller's first embodiment is non-enabled. PO Resp. 29. Keller provides very little guidance on how to heat its blank and close a mold around it. Instead, it merely states that "blank 1 is subsequently introduced into a mold, not illustrated, heated and at the same time swollen." Ex. 1005, 4:14–15. Keller provides no working examples. *Id.* at 1:1–4:56.

The fourth *Wands* factor is the nature of the invention. Keller does not disclose a particularly complex invention as its first embodiment. Instead, the invention of Keller "relates . . . to two methods for the mounting of lines in a fuel tank" to overcome the disadvantages of mounting lines partially on the outside of the fuel tank. *Id.* at 1:9–12. These disadvantages include making the tank "complicated to mount because of the multiplicity of parts" and causing the tank to have "a large number of sealing points" through which "[f]uel vapors may escape." *Id.* at 1:29–32. The simple nature of Keller's invention weighs in favor of finding Keller enabling.

The fifth *Wands* factor, the state of the prior art, weighs in favor of finding Keller's first embodiment enabled. This factor considers whether the prior art demonstrates that the knowledge of a person of ordinary skill in the art would fill in any gaps in Keller's disclosure. We find that it does. Linden is prior art to Keller, *compare* Ex. 1003, at [22], [30], [45], *with* Ex. 1005, at

[22], [30], [45], and it discloses a method of expanding a plastic blank, before mold closure, into which an accessory has been inserted. Ex. 1003, 14:52–64, Fig. 12. This suggests that a person of ordinary skill in the art would have understood how to heat a blank and close a mold in a workable fashion.

The sixth *Wands* factor is the relative skill of those in the art. Patent Owner argues that the level of skill “is relatively low—requiring only two years designing automotive fuel tanks.” PO Resp. 29 (citing Ex. 2001 ¶ 25). Petitioner does not argue that the person of ordinary skill in the art has any experience designing fuel tanks but does have “experience directly related to plastics product design and molding.” Pet. 10. The ’253 patent relates to a “[p]rocess for manufacturing hollow plastic bodies” generally; although it emphasizes the manufacture of “motor-vehicle fuel tanks,” it is not limited to that specific application. Ex. 1001, at [57]; *see also* Ex. 1001, at [54] (title of challenged patent, “Process for Manufacturing Hollow Plastic Bodies”), 1:11–12 (“The present invention relates to a process for the manufacture of hollow plastic bodies.”), 1:66–2:3 (defining “hollow body” as “any article whose surface has at least one empty or concave part” and providing as an example “tanks,” without limiting this to “fuel tanks”), 6:2–55 (only one out of fourteen claims limited to a fuel tank). Accordingly, the evidence does not support Patent Owner’s attempt to limit the person of ordinary skill in the art to a fuel tank designer. Instead, the evidence supports Petitioner’s view that the person of ordinary skill in the art of the ’253 patent would have had “experience directly related to plastics product design and molding.”

As for the amount of relevant experience, Petitioner argues that the person of ordinary skill in the art would have been “a degreed Mechanical or

Plastics engineer with three years of experience” or, alternatively, “a non-degreed practitioner with ten years of experience.” Pet. 10 (citing Ex. 1007 ¶ 24). When addressing the level of ordinary skill outside the context of its *Wands* analysis of Keller, Patent Owner agrees that the person of ordinary skill in the art would have had a degree. PO Resp. 14 (citing Ex. 2001 ¶¶ 25–26) (arguing that a person of ordinary skill in the art would have had a degree “in mechanical engineering, or . . . in chemical engineering”); *but see* PO Resp. 29 (arguing, in the context of the enablement of Keller, that the person of ordinary skill in the art would have had “only two years designing automotive fuel tanks,” with no degree). With respect to the level of skill in the art as it affects the enablement analysis, Patent Owner describes a person having a “relatively low” level of skill, with no degree and only two years in fuel tank design, a field different from that of the ’253 patent. PO Resp. 29. A person with a degree in any of the subjects mentioned by either Petitioner or Patent Owner (mechanical engineering, chemical engineering, or plastics engineering) would have a higher level of skill, and they would have even more skill with two years of experience in the relevant field (plastics product design and molding) argued by Petitioner. Accordingly, there is insufficient evidence to support Patent Owner’s argument that this *Wands* factor supports a conclusion that Keller is non-enabled. Were we to find that a person of ordinary skill in the art had three years’ experience, as Petitioner argues, or additionally took classes in plastics processing, as Patent Owner argues, the level of skill would be even higher. Thus, the sixth *Wands* factor weighs in favor of concluding that Keller’s first embodiment is enabled.

The seventh *Wands* factor is the predictability of the art. Keller notes that “[o]ther embodiments of [its] invention will be apparent to those skilled

in the art from consideration of the specification and practice of the invention disclosed herein.” Ex. 1005, 4:50–52. Moreover, Keller discloses a mechanical invention, which is “an art where the results are predictable.” *Spectra-Physics, Inc. v. Coherent, Inc.*, 827 F.2d 1524, 1533 (Fed. Cir. 1987). Accordingly, this factor weighs in favor of concluding that Keller’s first embodiment is enabled.

Finally, the eighth *Wands* factor is the breadth of the claims. The broadest claim related to Keller’s first embodiment is claim 10, which is limited to “[a] method for the mounting of lines in a fuel tank,” as opposed to in hollow bodies generally. Ex. 1005, 5:15. The fuel tank also must be “produced by the heating together with subsequent swelling of a tubular blank within a mold,” which does not even cover all possible types of blow molding, much less all methods of manufacturing fuel tanks or hollow bodies generally. *Id.* at 5:15–17. The lines must be “fastened to at least one spring element” that “is subsequently compressed and introduced together with the lines into the blank,” which does not cover all methods of fastening the lines to the tank. *Id.* at 5:17–20. The narrowness of Keller’s broadest claim means that Keller’s claims are narrow, and narrow claims are more easily enabled than broad claims. Accordingly, the eighth *Wands* factor weighs in favor of concluding that Keller’s first embodiment is enabled.

Thus, two of the *Wands* factors, the amount of direction or guidance presented and the presence or absence of working examples, weigh in favor of a conclusion of lack of enablement. One factor, the quantity of experimentation necessary, is neutral. The remaining five factors weigh in favor of finding that Keller’s first embodiment is enabled. Upon a balancing

of these factors, we conclude that Keller's first embodiment may support a finding of anticipation.

(2) Keller's Second Embodiment

With respect to Keller's second embodiment, Patent Owner argues that the statement in Keller that "spring elements 17, 18 are in a tensioned state," Ex. 1005, 4:33–35, is in conflict with the remaining disclosure of Keller, and a person of ordinary skill in the art would not be able to understand how to practice Keller. PO Resp. 30. According to Dr. Osswald, the "two pre-fabricated moldings" of Keller's second embodiment are brought together at either end of the spring elements in question, then welded, causing the spring elements to be in "a compressive state," rather than the "tensioned state" disclosed by Keller. Ex. 2001 ¶¶ 64–65. Thus, Patent Owner argues, if the spring elements somehow must be put into a tensioned state, Keller fails to explain how this is accomplished. PO Resp. 30.

Petitioner argues that Keller's statement that the spring elements are in a "tensioned state" is erroneous, possibly the result of a typographical error, and that a person of ordinary skill in the art, reading the entire disclosure of Keller, would be able to determine that, despite this statement, the molded halves of the fuel tank being pressed together would cause the spring elements to be compressed inside the finished tank. Reply 24–25; Ex. 1008 ¶ 40.

We agree with Petitioner. The word "tension" has at least two meanings in English, one with the sense of "being stretched" or the opposite of "compression," and the other with the sense of "unrest, or imbalance," or

the opposite of “in a relaxed state.” Ex. 3001,⁹ 1. Thus, the use of the word “tensioned” in Keller might refer to either the opposite of compressed or the opposite of relaxed. The latter interpretation is supported by the description of the spring elements as being “in the relaxed state” before the molded fuel tank halves are brought together and welded. Ex. 1005, 4:29–30, Fig. 2a. It is also supported by the fact that the specification of Keller was not originally written in English, suggesting some possible difficulty in translation. *Id.* at [30]. Moreover, even if Keller’s intent had been to communicate the meaning of “opposite of compressed,” as Patent Owner assumes, the rest of the specification of Keller makes clear that this was an error. *Id.* at 3:7–14 (after one end of the spring elements is fastened to one tank half, the other tank half is “subsequently assembled counter to the force of the spring element”), 4:35–37 (after the tank halves are welded, “lines 19 and the components 20, 21 in the fuel tank 15 are prestressed against the lower molding 14”), Figs. 2a, 2b. On this evidence, we find that the mere use of the phrase “tensioned state” in Keller would not cause a person of ordinary skill in the art to be unable to practice the method disclosed in Keller’s second embodiment. Thus, we conclude that Keller’s second embodiment may support a finding of anticipation.

b. Claim 1

As Petitioner argues, claim 1 recites a preamble and three limitations: “[a] process for manufacturing a hollow body using a [mold],” “incorporating at least one of an accessory or a duct within the hollow body,” “after said step of incorporating, closing said [mold] in a way which

⁹ Merriam-Webster, *Tension*, <http://www.merriam-webster.com/dictionary/tension>.

eliminates any interface between said at least one of said accessory or said duct and an external atmosphere outside of the hollow body,” and “said at least one of said accessory or said duct is supported by a preassembled structure which comprises at least one device configured to anchor said preassembled structure to an internal wall of the hollow body.” *Id.* at 29–33 (emphases omitted); see Ex. 1001, 6:2–14.

With respect to the preamble, Keller discloses “two methods for the mounting of lines in a fuel tank, one of the fuel tanks being manufactured by the blowing method and the other fuel tank by assembling two moldings.” Ex. 1005, 1:6–12.

The next issue is whether Keller discloses “incorporating at least one of an accessory or a duct within the hollow body.” Keller discloses incorporating “virtually any desired number of lines and other components connected to the lines, such as, for example, suction jet pumps and valves . . . within the fuel tank.” *Id.* at 2:63–3:14. The “suction jet pumps and valves” of Keller are “object[s] or device[s] which [are] generally associated with the [fuel tank of Keller] in its usual method of use or operation and which interact[] with it in order to fulfil certain useful functions,” such as controlling the flow of fuel from the tank. Accordingly, they fall within our construction of “accessory.”

Moreover, Keller teaches “introduc[ing]” the lines and their connected components “into the blank” before heating and swelling the blank in a mold. *Id.* at 2:57–66. Patent Owner argues that this teaching is insufficient to disclose attaching the surge cup to the wall of the hollow body before the mold closes. PO Resp. 31–32. We agree that Keller does not teach attaching its accessory to the inside wall of the fuel tank before the mold

closes around the preform. Instead, in Keller, the spring elements do not “prestress[]” the lines and their attached accessories “against the inside of the wall of the fuel tank” until after the blank is “introduced into a mold.” *Id.* at 4:14–22. But, as discussed above, we disagree with Patent Owner about the proper construction of “incorporating” in the challenged claims. Claim 1 requires only that an accessory or a duct be “incorporat[ed] . . . within the hollow body” before mold closure occurs, and we construe “incorporating” to mean “inserting,” not “attaching.” Thus, it is unimportant that Keller fails to teach attaching the lines and attached accessories to the wall before mold closure. All that is required is that Keller disclose inserting the lines and attached accessories into the preform before mold closure, and Keller does disclose this.

The next question is whether Keller discloses “after said step of incorporating, closing [the mold] in a way which eliminates any interface between said at least one of said accessory or said duct and an external atmosphere outside of the hollow body.” Keller discloses introducing a tubular blank containing feed lines, a suction jet pump, and a baffle “into a mold,” then heating and swelling the blank to take the form of the mold. *Id.* at 4:14–22, Figs. 1a, 1b. Keller also teaches that this method of making a fuel tank results in the “escape of fuel vapors from the fuel tank [being] reliably avoided.” *Id.* at 1:64–67. Accordingly, we find that Petitioner has proven by a preponderance of the evidence that Keller discloses the limitation of claim 1 requiring the step of, “after said step of incorporating, closing [the mold] in a way which eliminates any interface between said at least one of said accessory or said duct and an external atmosphere outside of the hollow body.”

The final question with respect to claim 1 is whether Keller discloses that the additional body incorporated within the hollow body “is supported by a preassembled structure which comprises at least one device configured to anchor said preassembled structure to an internal wall of the hollow body.” Petitioner argues that Keller’s spring elements “provide[] a force that ensures that they (along with the accessories and ducts to which [they] are attached) will be anchored in place against the internal wall of the tank.” Pet. 33 (citing Ex. 1005, 2:26–33). In addition, Petitioner argues that Keller discloses welding or adhesively bonding the spring elements to the inside of the fuel tank. *Id.* (citing Ex. 1005, 3:23–28). Patent Owner argues that “one of ordinary skill in the art would not consider a prestressed spring force to be an ‘attachment’ to the fuel tank’s wall” and would instead require “a mechanical or chemical connection” to the wall. PO Resp. 30–31 (citing Ex. 2001 ¶¶ 76–77).

We find Petitioner’s argument more persuasive than Patent Owner’s. First, claim 1 does not require “attachment” to the wall of the hollow body at all. As discussed above, we construe “incorporate” to require only “insertion,” not “attachment,” and the claim requires the preassembled structure only to include a “device configured to anchor” the structure to the wall. Ex. 1001, 6:10–14. And Patent Owner does not argue that “anchor” means “attach.” PO Resp. 30–31. Thus, it is sufficient that Keller discloses that, when the fuel tank is swollen, “the lines and the components are then held in their intended positions.” Ex. 1005, 2:66–3:4. Moreover, if a “mechanical or chemical connection” to the wall were required, as Patent Owner argues it is, Keller certainly discloses such a connection. “[T]he lines are fastened to the inside of the wall particularly reliably if . . . the

spring element[s] are welded or adhesively bonded to the inside of the wall of the fuel tank after the assembly of the moldings or the swelling of the fuel tank.” Ex. 1005, 3:23–28. Petitioner has proven by a preponderance of the evidence that Keller discloses the limitation of claim 1 requiring that the accessory or duct be “supported by a preassembled structure which comprises at least one device configured to anchor said preassembled structure to an internal wall of the hollow body.”

Accordingly, Petitioner has proven by a preponderance of the evidence that Keller’s first embodiment discloses all the limitations of claim 1, arranged as in claim 1.

Petitioner also argues that Keller’s second embodiment discloses all the limitations of claim 1. Pet. 29–33. We disagree. As discussed above, claim 1 requires closing the mold after inserting the accessory or duct into the hollow body. Ex. 1001, 6:2–14. Petitioner argues that Keller’s second embodiment discloses this limitation because, “once the ducts and accessories are positioned, the . . . two half shells . . . are closed.” Pet. 32 (citing Ex. 1005, 4:32–37). In contrast to Keller’s first embodiment, which relies on a plastic blank being “introduced into a mold,” Ex. 1005, 4:14, it is not clear that Keller’s second embodiment involves closing a mold to bring the two tank halves together. Instead, Keller discloses only that “[t]he upper molding 13 has a flange 22 intended to be welded to the lower molding 14” and that the two moldings are “welded together.” *Id.* at 4:32–37. Thus, Petitioner has not shown by a preponderance of the evidence that Keller’s second embodiment discloses closing the mold after inserting the accessory between the tank halves.

c. Claim 2

Claim 2 depends from claim 1 and adds a limitation reciting that the “device configured to anchor [the] preassembled structure to an internal wall of the hollow body” of claim 1 “includes tabs.” Ex. 1001, 6:2–18. Claim 2 also adds a limitation reciting that the process of claim 1 “further comprises a step of welding said tabs to said internal wall.” *Id.*

Petitioner argues that Keller discloses these limitations. Pet. 33–34 (citing Ex. 1005, 3:23–28, 4:23–30, Fig. 2a; Ex. 1007 ¶¶ 85–87). Patent Owner does not dispute Petitioner’s evidence. PO Resp. 27–32. Nevertheless,¹⁰ we find that Petitioner has not shown by a preponderance of the evidence that Keller anticipates claim 2 of the ’253 patent. In showing that Keller discloses the “tabs” of claim 2, Petitioner relies on Keller’s second embodiment. Pet. 33–34 (citing Ex. 1005, 4:23–30, Fig. 2a). But the limitations of claim 1 are incorporated into claim 2, 37 C.F.R. § 1.75(c), and, as discussed above, Keller’s second embodiment does not disclose all the limitations of claim 1. When a prior-art reference discloses every limitation of the challenged claim only through a combination of multiple embodiments within that reference, it does not anticipate the challenged claim. *Net MoneyIN, Inc. v. Verisign, Inc.*, 545 F.3d 1359, 1370–71 (Fed. Cir. 2008). Because Petitioner’s argument for the anticipation of claim 2 relies on a combination of portions of Keller’s first embodiment and portions of Keller’s second embodiment, Petitioner has not shown that Keller anticipates claim 2.

¹⁰ Because Petitioner bears the burden of proving unpatentability by a preponderance of the evidence, 35 U.S.C. § 316(e), our consideration of the asserted grounds of unpatentability is not limited to reviewing the arguments advanced by Patent Owner.

d. Claim 3

Claim 3 depends from claim 2 and adds a limitation requiring that the “tabs” of claim 2 “are supported by an arm.” Ex. 1001, 6:19–20. Petitioner argues that Keller discloses this limitation. Pet. 34–35 (citing Ex. 1007 ¶¶ 88–90). Patent Owner does not dispute Petitioner’s evidence or argument. PO Resp. 27–32. Nevertheless, we find that Petitioner has not shown by a preponderance of the evidence that Keller anticipates claim 3 of the ’253 patent, because claim 3 incorporates the limitations of claim 2, which Petitioner has not shown is anticipated by Keller.

e. Claim 12

Claim 12 depends from claim 1 and adds a limitation requiring that the “hollow body” of claim 1 be “a fuel tank.” Ex. 1001, 6:46–47. Petitioner argues that “[t]he preferred embodiment of Keller’s manufacturing process is for a fuel tank.” Pet. 35 (citing Ex. 1005, 1:6–12). Patent Owner does not dispute Petitioner’s evidence or argument. PO Resp. 27–32. We agree with Petitioner that Keller discloses using the manufacturing process it teaches to make a fuel tank. Ex. 1005, 1:9–12 (“[t]he invention relates . . . to two methods for the mounting of lines in a fuel tank”). Accordingly, we find that Keller discloses the limitations of claim 12, arranged as in claim 12.

f. Claim 14

Claim 14 depends from claim 1 and adds a limitation requiring that the process of claim 1 comprise “a step of incorporating said duct within said hollow body, and wherein said duct is supported by said preassembled structure.” Ex. 1001, 6:52–55. Thus, claim 14 limits the phrases “an

accessory or a duct” and “said accessory or said duct” in claim 1 to merely “a duct” and “said duct.”

Petitioner argues that Keller discloses incorporating a duct into its hollow body and supporting it with a preassembled structure in the fashion required by claims 1 and 14. Pet. 35–36. Specifically, Petitioner argues that Keller discloses arranging “virtually any desired number of lines and other components connected to the lines . . . within the fuel tank.” *Id.* at 35 (quoting Ex. 1005, 2:63–3:6). Patent Owner does not dispute Petitioner’s evidence or argument. PO Resp. 27–32. We agree with Petitioner that Keller discloses incorporating “lines” into its fuel tank and that those “lines” are “pipe[s], tube[s], or channel[s] that convey[] a substance,” our construction of “ducts.” Ex. 1005, 1:14–22 (describing the lines as serving the purposes of “ventilating [the tanks] during refueling or during operation” and “feeding fuel by means of suction jet pumps between the various chambers”), 2:63–66 (“virtually any desired number of lines and other components connected to the lines . . . can be arranged within the fuel tank”). Accordingly, we find that Keller discloses the limitations of claim 14, arranged as in claim 14.

g. Conclusion

We find that Petitioner has shown by a preponderance of the evidence that Keller anticipates claims 1, 12, and 14 of the ’253 patent. Petitioner has not shown by a preponderance of the evidence that Keller anticipates claims 2 and 3 of the ’253 patent.

F. Asserted Obviousness over Keller and Hata

Petitioner argues that the subject matter of claims 7 and 11 would have been obvious to a person of ordinary skill in the art given the teachings of Keller and Hata. Pet. 36–38.

Claim 7 depends from claim 1 and adds a limitation requiring that “the hollow body [be] a multilayered structure made of stacked layers.” Ex. 1001, 6:31–33. Claim 11 depends from claim 7 and adds a limitation requiring that the “multilayered structure [be] obtained by coextrusion.” *Id.* at 6:43–45. Petitioner argues that Hata teaches or suggests these limitations and that a person of ordinary skill in the art would have had a reason to combine the teachings of Hata with the teachings of Linden, rendering claims 7 and 11 obvious over the combined teachings. Pet. 36–38.

We note first that claims 7 and 11 both depend from claim 1. Ex. 1001, 6:31–33, 6:43–45. Accordingly, claims 7 and 11 “include all the limitations of” claim 1. 37 C.F.R. § 1.75(c). Petitioner does not explain why claim 1 would have been obvious over the teachings of Keller and Hata, relying instead on its argument that Keller anticipates claim 1. Pet. 36–38. We are mindful, however, that, although “novelty under 35 U.S.C. § 102 and nonobviousness under 35 U.S.C. § 103 are separate conditions of patentability,” “anticipation is the ‘epitome of obviousness.’” *Cohesive Techs.*, 543 F.3d at 1363 (quoting *Kalm*, 378 F.2d at 962). Accordingly, we consider Petitioner’s challenge to claim 1 on grounds of anticipation to constitute an argument that Keller itself also teaches or suggests every limitation of claim 1 for purposes of arguing that claims 7 and 11 would have been obvious over the combination of Keller and Hata.

In our Decision on Institution, we added claim 1 to the asserted ground of obviousness over the combination of Keller and Hata. *Inst. Dec. 22*. No party objected to that addition during the course of the trial, and, as noted above, we construe Petitioner’s challenge to claim 1 on grounds of anticipation by Keller as additionally arguing that claim 1 would have been obvious over the combination of Keller and Hata. This is sufficient, in our opinion, to show by a preponderance of the evidence that the prior art would have taught or suggested the portion of the subject matter of claims 7 and 11 that comes from claim 1. We are not persuaded, however, that we may reach the issue of the obviousness of claim 1 itself over the combination of Keller and Hata, because the Petition does not present that issue. *SAS Inst.*, 138 S. Ct. at 1357 (“the petitioner’s contentions . . . define the scope of the litigation all the way from institution through to conclusion”). Accordingly, we do not conclude that claim 1 is obvious over the combination of Keller and Hata. Instead, we merely consider the issue of whether claims 7 and 11 are obvious over that combination of prior-art references.

As explained above, Keller discloses the limitations of claim 1, from which claims 7 and 11 depend. Hata teaches making a fuel tank that “is constructed of (a) inner and outer layers of high-density polyethylene, (b) intermediate layers of adhesive resin, and (c) a core layer of ethylene-vinyl alcohol copolymer.” *Ex. 1004*, 2:52–53. The tank can be produced by “extrusion molding, blow molding, and injection molding,” and Hata teaches that “particularly coextrusion blow molding is desirable.” *Id.* at 5:18–21. Accordingly, we determine that Petitioner has shown by a preponderance of the evidence that the combination of Keller and Hata teaches or suggests the

limitations of claims 7 and 11. In addition, Hata teaches that its multilayered construction method results in a fuel tank that “is superior in gasoline barrier properties (especially for oxygen-containing gasoline) and impact resistance.” *Id.* at 2:27–29; *see also id.* at [57] (“a fuel tank of multi-layer construction having good impact resistance as well as good barrier properties for gasoline, especially one containing methanol and MTBE”). Accordingly, we determine that Petitioner has shown by a preponderance of the evidence that a person of ordinary skill in the art would have had reason to make Keller’s fuel tank from Hata’s materials, which provide desirable properties for fuel tanks. *See* Ex. 1005, 1:9–15 (“[t]he invention relates . . . a fuel tank” that is “usually” made of “plastic”). Thus, Petitioner has proven by a preponderance of the evidence that claims 7 and 11 would have been obvious to a person of ordinary skill in the art given the combination of Keller and Hata.

G. Motion to Amend

Patent Owner filed a contingent motion to amend its claims. Specifically, Patent Owner asks us to address whether proposed claims 15, 16, and 17 are patentable if we conclude that any of claims 1, 2, or 3 is unpatentable. Mot. Amend 1. As discussed above, we conclude that each of claims 1, 2, and 3 is unpatentable as anticipated by Linden, and we conclude that claim 1 also is unpatentable as anticipated by Keller. Accordingly, we consider whether claims 15, 16, and 17 are patentable.

Our approach to the motion to amend is directed by the guidance memorandum issued by the Board in November 2017. *See* Memorandum, “Guidance on Motions to Amend in view of *Aqua Products*” (Nov. 21, 2017), <https://www.uspto.gov/sites/default/files/documents/>

guidance_on_motions_to_amend_11_2017.pdf (“Guidance”). Under that Guidance, we first ask whether the motion to amend meets the statutory requirements of 35 U.S.C. § 316(d) and the regulatory requirements of 37 C.F.R. § 42.121. If those requirements are met, we “proceed to determine whether the substitute claims are unpatentable by a preponderance of the evidence based on the entirety of the record, including any opposition made by the petitioner.” Guidance 2.

In accordance with *Aqua Products, Inc. v. Matal*, 872 F.3d 1290 (Fed. Cir. 2017), and the Guidance, when we proceed to consider the patentability of proposed substitute claims, the burden of persuasion is not placed on a patent owner. Rather, the burden of persuasion ordinarily lies with the petitioner to show any proposed substitute claims are unpatentable by a preponderance of the evidence. The Board itself may also justify any finding of unpatentability by reference to evidence in the record, as it may do when a petitioner ceases to participate in a proceeding. *See Bosch Automotive Service Solutions, LLC v. Matal*, 878 F.3d 1027, 1040 (Fed. Cir. 2017) (citing *Aqua Products, Inc. v. Matal*, 872 F.3d 1290, 1311 (Fed. Cir. 2017) (O’Malley, J.)).

1. *Reasonable Number of Substitute Claims*

Under 35 U.S.C. § 316(d), “[f]or each challenged claim,” a motion to amend may propose at most “a reasonable number of substitute claims,” the proposed amended claims “may not enlarge the scope of the [challenged] claims,” and the proposed amended claims “may not . . . introduce new matter.”

On the issue of “a reasonable number of substitute claims,” we note that Patent Owner proposes the issuance of three substitute claims even if we

conclude that only a single challenged claim is unpatentable. Mot. Amend 2 (“To the extent the Board finds *any one* of original claims 1, 2, or 3 unpatentable, [Patent Owner] respectfully requests that the Board *grant this motion to amend*.”). There is a rebuttable presumption “that only one substitute claim [is] needed to replace each challenged claim.” 37 C.F.R. § 42.121(a)(3). It is unclear that Patent Owner has shown the requisite need for three claims to replace a single claim. But, in light of our conclusion that claims 1–3 are unpatentable, we determine that the three proposed substitute claims are replacing three original claims rather than a single original claim. Accordingly, Patent Owner has proposed a reasonable number of substitute claims.

2. *No Enlargement of Scope of Original Claims*

We also agree that the proposed claims do not enlarge the scope of the challenged original claims. Proposed claims 16 and 17 merely change the dependency of claims 2 and 3 from claim 1 to claim 15. *Compare* Mot. Amend, Claims App’x, with Ex. 1001, 6:15–20. Proposed claim 15 itself preserves all the limitations of original claim 1 and adds at least five additional limitations. *Id.* Given the limitations added to claim 15, and given that Petitioner does not argue that claim 15 enlarges the scope of claim 1, Opp. Mot. Amend 1–25, we proceed on the basis of the proposed substitute claims satisfying the requirement not to enlarge the scope of the original claims.

3. *New Matter*

The remaining statutory requirement is that the proposed substitute claims not “introduce new matter.” 35 U.S.C. § 316(d)(3). Patent Owner argues that proposed claim 15 does not introduce any new matter. Mot.

Amend 3–8; Reply Mot. Amend 4–10. Petitioner argues that there is no written-description support either in the specification of the '253 patent as issued or in the original disclosure at the time of the application for the '253 patent for the new language requiring “incorporating” to “include[] attaching the at least one accessory or duct to the hollow body” before “closing [the] mold.” Opp. Mot. Amend 2–5.

To avoid a problem with new matter, Patent Owner must demonstrate that the new language in claim 15 finds support in the original disclosure supporting the application that led to the '253 patent. With respect to this limitation, Patent Owner directs us to four portions of the original disclosure. Mot. Amend 6 (citing Ex. 2017, 5:21–27, 6:12–19, 9:28–30); Reply Mot. Amend 6–7 (citing Ex. 2017, 8:1–37). Petitioner argues that none of these portions of the original disclosure supports the limitation requiring attachment of the accessory or duct to the hollow body before mold closure. Opp. Mot. Amend 2–5; Sur-Reply 13–17. We agree with Petitioner.

The first portion of the disclosure cited states:

Another preferred technique is that in which the two parts of the cut parison are held apart at a sufficient distance from each other so that it is possible to insert between them, before moulding, an object intended to be incorporated inside the hollow body. Thus, it is possible in particular to insert a bulky object.

Ex. 2017, 5:21–27. As explained above with respect to claim construction, this passage does not describe attachment of the “bulky object” to the wall of the hollow body. Instead, this merely describes inserting a bulky object between “the two parts of the cut parison” with the intent to leave the object inside the finished hollow body. This quoted language does not describe attaching anything to the hollow body, either before or after mold closure.

The same is true of the other two passages cited in Patent Owner's motion to amend. *Id.* at 6:12–19 (describing the “process according to the invention” as “beneficial when it is desired to insert into the cut parison at least one accessory intended to be incorporated into the hollow body” and as “particularly advantageous when it is desired to insert between the sheets at least one accessory intended to be incorporated into the hollow body”), 9:28–30 (“A robot (not shown) then positions the structure (5) supporting the accessories to be incorporated into the tank.”). Accordingly, none of these three portions of the original disclosure provides written-description support for a requirement that an accessory or duct be attached to the hollow body (as opposed to merely inserted into the hollow body) before mold closure.

The remaining support to which Patent Owner directs us describes “the use of means for positioning bulky objects and preassembled structures which can be mounted very precisely in the hollow body.” *Id.* at 8:1–4. Specifically, it describes “the use of supports in the form of films, sheets or plates . . . which are attached to the object or the structure at points such that it is possible to support and move the object or the structure while holding it, by pulling, between grippers.” *Id.* at 8:5–10. This language does not describe attaching anything to the hollow body, only to the “object or [preassembled] structure” being inserted into the hollow body. In fact, this language makes clear that the “object or structure” can be moved, meaning that it cannot be attached to the hollow body. *Id.* This conclusion is strengthened by additional language in the same paragraph: “the films, sheets or plates are extended to the outside of the perimeter of the sheets and thus make it possible to hold and continuously position the object or the

structure while the mould is closing.” *Id.* at 8:12–16. If the object or structure can be “continuously position[ed] . . . while the mould is closing,” it cannot have been attached to the hollow body before mold closure occurred. *Id.* The same paragraph describes holding the “films, sheets or plates . . . between the pinching regions of the parison which are intended to be fastened together,” then “welding” them in place. *Id.* at 8:16–22. Similarly, the following paragraph makes clear that using “films, sheets or plates” of “small thickness” ensures that the “films, sheets or plates” do not interfere with the joining together of the sheets making up the hollow body, emphasizing that the “films, sheets or plates” supporting the accessory or structure are joined to the hollow body in the region where the hollow body’s sheets are pinched together. *Id.* at 8:23–30. But the original disclosure does not describe closing the parison by pinching any portions of it together except by closing a mold around it. *Id.* at 9:32–36 (the mold “is then closed around the combination of sheets and accessories, causing the two sheets to be welded together”). Accordingly, there is no description of welding the “films, sheets or plates” to the pinching regions of the parison except during or after mold closure.

Finally, this portion of the disclosure describes “[a]n additional way of precisely positioning the bulky objects or the preassembled structures inside the hollow body,” which is “to provide the films, sheets or plates serving as support with plastic cones intended to be inserted precisely in the corresponding relief parts located on the edges of the mould, in the parison welding regions.” *Id.* at 8:31–37. According to Patent Owner, “once the plastic cones are aligned with and pressed into the edges of the mold, this will also cause the accessory to press against the mold for attachment,” and

“the internally-mounted accessories are attached/welded to the tank wall at the same time the film is pressed against the mold’s edges, all of which occurs prior to mold closure.” Reply Mot. Amend 7. But the language of the original disclosure itself does not describe any attachment occurring before mold closure, only “precise[] positioning.” Ex. 2017, 8:31. Even if the type of positioning described results in the accessory being “press[ed] against the mold for attachment,” as Patent Owner argues, Reply Mot. Amend 7, there is no description of any welding occurring either between the accessory and the wall of the hollow body or between the “plastic cones” and the “parison welding regions.” Ex. 2017, 8:31–37.

For evidence that a person of ordinary skill in the art would understand the original disclosure to describe such welding, Patent Owner directs us to the testimony of Dr. Osswald. Reply Mot. Amend 7 (citing Ex. 2020 ¶¶ 33–36). In his declaration, Dr. Osswald testifies that,

once the plastic cones are aligned with and pressed into the edges of the mold (resulting in the plastic sheet pressing against the mold’s pinching region), this will also cause the accessory to press against the mold for attachment. The remainder of the sheet can then be formed to the mold with vacuum pressure. Hence, once the plastic cones of the attachment plate are positioned and pressed into the plastic sheet on the edges of the mold, one of ordinary skill in the art would understand that the accessories are also attached/welded to the tank wall at the same time, all of which occurs prior to mold closure.

Ex. 2020 ¶¶ 34–35. This testimony is purely conclusory; Dr. Osswald cites no support for the statement that the person of ordinary skill in the art would understand the “precise[] positioning” of the original disclosure to mean “attachment.” As we noted above, we do not find conclusory expert testimony to be persuasive. *Exmark*, 879 F.3d at 1350 (conclusory

statements by expert in support of damages analysis cannot support a verdict); *Arendi*, 832 F.3d at 1366 (conclusory statements by expert in support of obviousness analysis may not be relied upon); *Phillips*, 415 F.3d at 1318 (conclusory statements by expert in support of claim construction may not be relied upon). Accordingly, we do not rely on this testimony to convert the original disclosure of “precise[] positioning” into “attachment.”

Dr. Osswald also cites the deposition testimony of Dr. Kazmer as support for the idea that it is possible to attach something to the tank wall before the mold closes. Ex. 2020 ¶ 36 (citing Ex. 2019, 22:13–24:4). That testimony, however, states that “the act of the mold closing pushes the feet [of the accessory support] against the plastic [of the tank wall].” Ex. 2019, 23:21–24:4. Dr. Kazmer does testify that the mold need not be completely closed for this to work, *id.*, but he never says that the mere act of touching the feet to the wall, without the pressure of the mold closing against the wall, is sufficient to attach the feet to the wall. Accordingly, it is not clear that there is any record evidence to support Dr. Osswald’s opinion that a person of ordinary skill in the art would understand that attachment of an accessory to the wall of the hollow body before mold closure was possible, much less Dr. Osswald’s opinion that a person of ordinary skill in the art would understand the original disclosure’s description of “precise[] positioning” as a description of “attachment” to the tank wall before mold closure.

Having considered the evidence of record and the arguments of both parties, we find that the original disclosure in the application leading to the ’253 patent does not support the new limitation of claim 15 requiring “attaching the at least one accessory or duct to the hollow body” before “closing [the] mold.” Mot. Amend, Claims App’x. Moreover, claims 16

and 17 both depend, directly or indirectly, from claim 15. *Id.* Accordingly, those claims both incorporate all the limitations of claim 15. 37 C.F.R.

§ 1.75(c). Because the original disclosure does not support all the limitations of claim 15, it also fails to support all the limitations of claims 16 and 17. Because Patent Owner has not demonstrated that the proposed substitute claims satisfy the statutory requirement that they not introduce new matter, we deny Patent Owner's motion to amend.

H. Motion to Strike

Following our authorization, Patent Owner filed a Motion to Strike the declaration of Dr. David O. Kazmer (Exhibit 1014), which was filed along with Petitioner's Sur-Reply Opposing the Motion to Amend. Paper 38. Petitioner filed an opposition. Paper 41.

Patent Owner makes several arguments in support of its request that we strike Exhibit 1014. These arguments include that the Administrative Procedure Act does not permit the filing of any evidence unless "the opposing party is given notice of the evidence and an opportunity to respond to it." Paper 38, 2 (quoting *Genzyme Therapeutic Prods. Ltd. P'ship v. Biomarin Pharm. Inc.*, 825 F.3d 1360, 1366 (Fed. Cir. 2016)). Patent Owner also argues that our trial procedures do not permit the filing of any evidence with a sur-reply "other than deposition transcripts of the cross-examination of any reply witness," and Exhibit 1014 is not such a deposition transcript. *Id.* (quoting Trial Practice Guide Update (August 2018), https://www.uspto.gov/sites/default/files/documents/2018_Revised_Trial_Practice_Guide.pdf) (emphasis removed). In addition, Patent Owner argues that Exhibit 1014 provides new evidence beyond the scope of any reasonable

rebuttal to any evidence discussed in Patent Owner's Reply in support of its motion to amend. *Id.* at 3–5.

We are sensitive to Patent Owner's concerns with the late submission of evidence in *inter partes* review proceedings. As Patent Owner notes, this should become less of a problem with the publication of the August 2018 update to the Board's Trial Practice Guide, which places clear limits on what evidence may accompany a sur-reply. Paper 38, 2. As Patent Owner also notes, however, Petitioner's Sur-Reply and Exhibit 1014 were filed before the effective date of the August 2018 update to the Trial Practice Guide. *Id.* at 2–3.

Ultimately, there is no need for us to strike Exhibit 1014 from the record of this proceeding, because we have not relied on Exhibit 1014 in reaching our decision on the patentability of either the challenged claims or the claims presented in the motion to amend. Because we have not considered Exhibit 1014, its presence or absence in the record would not affect the outcome of this proceeding, rendering moot the question of whether it should be stricken from the record. Accordingly, we dismiss Patent Owner's Motion to Strike Exhibit 1014 as moot.

CONCLUSION

Upon consideration of the Petition, Response, Reply, Motion to Amend, Opposition to the Motion to Amend, Reply in Support of the Motion to Amend, Sur-Reply Opposing the Motion to Amend, the Observations on Cross-Examination and Responses thereto, Patent Owner's Motion to Strike and Petitioner's Opposition, and the evidence before us, we determine that Petitioner has proven by a preponderance of the evidence that claims 1–3, 12, and 14 are anticipated by Linden; that claims 7 and 11 would

have been obvious over the combination of Linden and Hata; that claims 1, 12, and 14 are anticipated by Keller; and that claims 7 and 11 would have been obvious over the combination of Keller and Hata. We determine that Petitioner has failed to prove by a preponderance of the evidence that claims 2 and 3 are anticipated by Keller. The Petition makes its challenge to claim 14 as obvious over Linden alone contingent on our construing “duct” in a way that we do not construe it, so the Petition does not allow us to reach the question of whether claim 14 would have been obvious over Linden alone. The Petition does not present the question of whether claim 1 would have been obvious over either the combination of Linden and Hata or the combination of Keller and Hata, so we do not reach those issues. We determine that Patent Owner has failed to satisfy the statutory condition of 35 U.S.C. § 316(d)(3) that its proposed substitute claims not introduce new matter, so we deny the motion to amend. Finally, we dismiss Patent Owner’s motion to strike as moot, because, in reaching our decision in this proceeding, we do not rely on the evidence Patent Owner seeks to strike.

ORDER

It is hereby

ORDERED that Petitioner has proven by a preponderance of the evidence that claims 1–3, 7, 11, 12, and 14 of U.S. Patent No. 7,166,253 B2 are 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 1–3, 7, 11, 12, and 14 of U.S. Patent No. 7,166,253 B2;

FURTHER ORDERED that Patent Owner’s Motion to Amend proposing substitute claims 15–17 is denied;

FURTHER ORDERED that Patent Owner’s Motion to Strike is dismissed as moot; and

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

IPR2017-01605
Patent 7,166,253 B2

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