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Paper 34
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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 IPR2017-01633
Patent 6,866,812 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 16, 24–27, 30–32, 38–41, 44, and 45 of U.S. Patent No. 6,866,812 B2 (Ex. 1001, "the '812 patent"). Plastic Omnium Advanced Innovation and Research ("Patent Owner") did not file a Preliminary Response. On January 18, 2018, we instituted trial on all claims and grounds in the Petition. Paper 7 ("Inst. Dec."). During the trial, Patent Owner filed a Response (Paper 11, "PO Resp."), Petitioner filed a Reply (Paper 22), and Patent Owner filed a Sur-Reply (Paper 28). We held a hearing, the transcript of which has been entered into the record. Paper 33 ("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 16, 24–27, 30–32, 38–41, 44, and 45 of the '812 patent is unpatentable.

B. Related Matters

The parties note that the '812 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 3, 1.

C. The Asserted Grounds of Unpatentability

Petitioner contends that claims 16, 24–27, 30–32, 38–41, 44, and 45 of the '812 patent are unpatentable based on the following grounds (Pet. 14–48):[1]

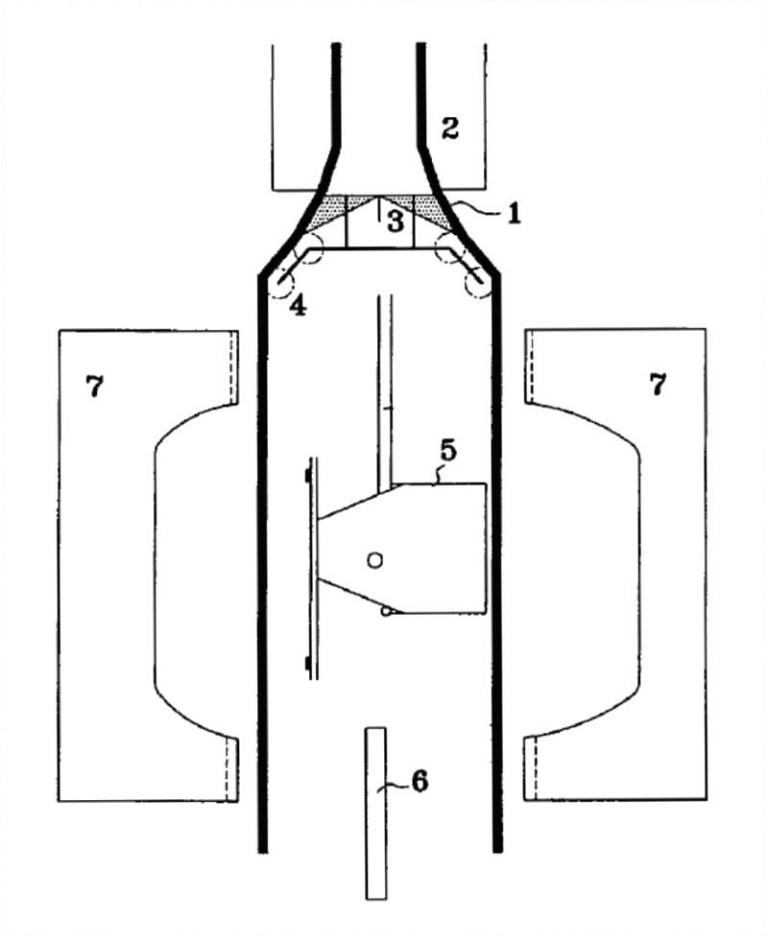
Statutory Ground	Basis	Challenged Claim(s)
§ 103	Kasugai[2] and Kagitani[3]	32, 38–41, 44, and 45
§ 103	Kasugai, Kagitani, and Hata[4]	16, 24–27, 30, and 31
§ 103	Hatakeyama[5] and Kagitani	32, 38–41, 44, and 45
§ 103	Hatakeyama, Kagitani, and Hata	16, 24–27, 30, and 31

D. The '812 Patent

The '812 patent, titled "Process for Manufacturing Hollow Plastic Bodies," issued on March 15, 2005. 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 1:6–8. To meet "sealing 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 within the hollow bodies." *Id.* at 1:8–20. These efforts have included "incorporat[ing]

[1] Petitioner also relies on a declaration from Dr. David O. Kazmer. Ex. 1010.
[2] Kasugai, U.S. Patent No. 4,952,347, issued Aug. 28, 1990 (Ex. 1003, "Kasugai").
[3] Kagitani et al., Japanese Patent Application Publication No. *Hei* 6-218792, published Aug. 9, 1994 (English translation and Japanese original both provided) (Ex. 1004, "Kagitani").
[4] Hata et al., European Patent Application Publication No. EP 0742096 A2, published Nov. 13, 1996 (Ex. 1006, "Hata").
[5] Hatakeyama et al., Japanese Patent Application Publication No. *Sho* 56-51333, published May 8, 1981 (English translation and Japanese original both provided) (Ex. 1005, "Hatakeyama").

certain accessories and ducts actually within the hollow bodies, thus eliminating any interface between them and the external atmosphere." *Id.* at 1:20–23. The '812 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 1:48–53. One embodiment of the invention is illustrated in the sole figure of the '812 patent, reproduced below:



The figure depicts "an extrusion blow-[molding] machine with continuous extrusion used for producing motor-vehicle fuel tanks." *Id.* at 2:41–45. The circular die of extrusion head 2 produces tubular

extrudate 1 "of circular cross section." *Id.* at 5:23–27. As the tubular material leaves the extrusion head, it "is separated into two sheets" by two blades 3. *Id.* at 5:27–30. 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 5:31–37. 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 5:37–41.

E. Illustrative Claims

Claims 16, 24–27, 30–32, 38–41, 44, and 45 of the '812 patent are challenged. Claims 16 and 32 are independent and illustrative; they recite:

> 16. A process of manufacturing a hollow body, comprising the steps of:
>
> extruding a multilayered parison comprising stacked layers fastened to each other;
>
> cutting through said multilayered parison so as to form two portions separated by a cut; and
>
> molding said two portions so as to form said hollow body,
>
> wherein said step of cutting said multilayered parison comprises making at least two cuts in said multilayered parison so as to form two separate sheets.

Ex. 1001, 6:27–37.

> 32. A process of manufacturing a fuel tank, comprising the steps of:
>
> extruding a parison;
>
> cutting through said parison so as to form two portions separated by a cut; and
>
> molding said two portions so as to form said fuel tank,

wherein said step of cutting said parison comprises making at least two cuts in said parison so as to form two separate sheets.

Ex. 1001, 7:14–23.

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);[6] *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 two terms: "hollow body" and "parison." Pet. 11–12. Patent Owner discusses these same two terms. PO Resp. 13–15.

1. "Hollow Body"

Petitioner argues that "hollow body" should be interpreted as "any article whose surface has at least one empty or concave part." Pet. 12 (citing

[6] The Final Rule changing the claim construction standard to the standard that is used to construe a claim in a civil action under 35 U.S.C. § 282(b) does not apply here because the Petition was filed before the effective date of the Final Rule, November 13, 2018. *See* Changes to the Claim Construction Standard for Interpreting Claims in Trial Proceedings Before the Patent Trial and Appeal Board, 83 Fed. Reg. 51,340, 51,344 (Oct. 11, 2018).

Ex. 1001, 1:58–62; Ex. 1010 ¶ 19). Patent Owner agrees. PO Resp. 13. The '812 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, 1:58–59. 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 '812 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 '812 patent, "any article whose surface has at least one empty or concave part."

2. "Parison"

The two challenged independent claims both recite a step involving "extruding" a "parison." Ex. 1001, 6:27–37, 7:14–23. Petitioner argues that "parison" in these claims should be interpreted as "the product obtained by passing, through a die, a composition of at least one thermoplastic melt homogenized in an extruder whose head is terminated by the die." Pet. 11–12 (citing Ex. 1001, 2:35–40; Ex. 1010 ¶ 18). Patent Owner does not propose a different construction but notes that Petitioner's proposed construction "is inconsistent with its litigation definition" and is different from the construction adopted by the District Court in the related infringement suit. PO Resp. 14–15. In addition, Patent Owner argues that the term "parison" need not be construed because each combination of prior art asserted by Petitioner "depicts a parison." *Id.* The '812 patent defines "extruded parison" in the same way that it defines "hollow body," using the

phrase "is understood to mean." *Compare* Ex. 1001, 2:35–38, *with* Ex. 1001, 1:58–59. Although we construe the term "parison" rather than the term "extruded parison," we note that the parison used in the methods of the challenged claims is something that is extruded. *Id.* at 6:27–37, 7:14–23. Accordingly, we give effect to the definition in the '812 patent, and we interpret "parison" as "the product obtained by passing, through a die, a composition of at least one thermoplastic melt homogenized in an extruder whose head is terminated by the die." Ex. 1001, 2:35–38.

B. Asserted Obviousness over Kasugai and Kagitani

Petitioner argues that the subject matter of claims 32, 38–41, 44, and 45 would have been obvious to a person of ordinary skill in the art given the teachings of Kasugai and Kagitani. Pet. 14–31.

1. Kasugai

Kasugai "relates to a method of manufacturing a fuel tank for automobiles," particularly from "synthetic resin formed by blow molding." Ex. 1003, 1:7–10. In the method of Kasugai, "component parts are previously fixed to a holding plate of synthetic resin being used . . . as an insert to a blow molding mold," allowing "the outside wall [to be] formed around the insert member by blow molding." *Id.* at 2:17–25. The outer wall of Kasugai's fuel tank "is formed by blow molding" a "cylindrical parison" that "is arranged around the insert member." *Id.* at 4:59–5:1. In addition to this "cylindrical parison" embodiment, Kasugai also teaches that "the parison . . . may be composed of two sheets." *Id.* at 5:42–45.

2. Kagitani

Kagitani "relates to a method and device for producing a plastic sheet." Ex. 1004 ¶ 1. In Kagitani's method, "a parison is lowered from an

accumulator head as its thickness is adjusted, and the lowered parison is severed in a vertical direction by a severing blade and expanded by an expansion member," which "turn[s] the parison into a sheet shape." *Id.* ¶ 4. The die slit from which the parison of Kagitani is extruded is "annular." *Id.* ¶ 6. In addition, Kagitani teaches using "severing blades in two locations" to make the parison "into two sheets" to be "used in a blow molding method." *Id.* ¶ 7.

3. Analysis

Petitioner argues that a person of ordinary skill in the art would have had reason to combine the teachings of Kasugai with the teachings of Kagitani and that those combined teachings teach or suggest every limitation of claims 32, 38–41, 44, and 45. Pet. 14–31. Patent Owner argues that a person of ordinary skill in the art would have had no reason to combine the teachings of Kasugai with those of Kagitani. PO Resp. 15–19. In addition, as discussed below, Patent Owner argues that the combination of Kasugai and Kagitani does not teach or suggest certain limitations of the dependent claims 38, 39, 41, 44, and 45. *Id.* at 19–24.

a. Claim 32

As Petitioner argues, Pet. 15–25, claim 32 recites a preamble and four limitations: "[a] process of manufacturing a fuel tank," "extruding a parison," "cutting through said parison so as to form two portions separated by a cut," and "molding said two portions so as to form said fuel tank," "wherein said step of cutting said parison comprises making at least two cuts in said parison so as to form two separate sheets." Ex. 1001, 7:14–23.

Petitioner argues that the combination of Kasugai and Kagitani teaches each of these limitations. Pet. 15–25. We agree.

Kasugai teaches "a method of manufacturing a fuel tank" from "synthetic resin formed by blow molding." Ex. 1003, 1:7–10. Specifically, Kasugai teaches that a "cylindrical parison" is "extruded from . . . the molding machine" and that it is used to blow mold a fuel tank. *Id.* at 4:59– 5:10. In addition to this use of a "cylindrical parison," Kasugai teaches using "two sheets" for blow molding a fuel tank. *Id.* at 5:42–45, Fig. 7. Although Kasugai does not explain how to make the two sheets that it teaches using to blow mold a fuel tank in its two-sheet embodiment, Kagitani teaches a method of making two sheets for use in blow molding. Ex. 1004 ¶ 7. Kagitani cuts an extruded cylindrical parison with "severing blades in two locations" and expands those severed portions "into a sheet shape." *Id.* ¶¶ 6–7.

Patent Owner does not dispute this evidence or argue that the combination of Kasugai and Kagitani fails to teach or suggest any limitation of claim 32.[7] PO Resp. 15–19. Accordingly, on the present record, we are persuaded that Petitioner has shown by a preponderance of the evidence that the combination of Kasugai and Kagitani teaches every limitation of claim 32, including the scope of the claim as a whole.

Petitioner argues that a person of ordinary skill in the art would have had a reason to combine the teachings of Kasugai and Kagitani. Pet. 20–23. Specifically, Petitioner argues that simultaneously producing the two sheets

[7] Patent Owner does argue that Kasugai fails to teach or suggest certain limitations and that Kagitani fails to teach or suggest other claim limitations. PO Resp. 15–19. But a claim is not nonobvious when there are deficiencies in individual prior-art references, only when there is a deficiency in the combination of those references. *In re Keller*, 642 F.2d 413, 425 (CCPA 1981) ("The test for obviousness is not . . . that the claimed invention must be expressly suggested in any one . . . reference[].").

necessary for Kasugai's two-sheet process from a single extruded parison, as taught by Kagitani, would create a manufacturing advantage, and producing the sheets this way would also allow for the production of sheets of varying thickness, which would not be possible using other prior-art sheet manufacturing methods. *Id.*

There is evidence to support Petitioner's view. Petitioner directs us to evidence of record supporting a finding that a person of ordinary skill in the art would have sought to gain a manufacturing advantage by using Kagitani's method to produce the two plastic sheets needed for Kasugai's blow molding method from a single extruded cylindrical parison. Ex. 1010 ¶¶ 52–53. Moreover, Kagitani teaches that its method of producing plastic sheets is beneficial because it allows the thickness of the produced plastic sheets to vary, allowing the production of fuel tanks with walls of varying thickness. Ex. 1004 ¶¶ 3–4; Ex. 1010 ¶ 56. Thus, the evidence of record supports the conclusion that a person of ordinary skill in the art, seeking to carry out the two-sheet fuel tank formation process taught by Kasugai, would have had a reason to use the two-sheet manufacturing process of Kagitani to make the two plastic sheets necessary to carry out Kasugai's process.

Against this evidence, Patent Owner argues that a person of ordinary skill in the art would not have thought "that it could be beneficial (or even possible) to start with Kasugai's [cylindrical] parison embodiment and then modify it to practice a two-sheet process" because the cylindrical parison embodiment "is the preferred way to practice Kasugai's invention." PO Resp. 16. We disagree. Petitioner does not argue that a person of ordinary skill in the art would "start with Kasugai's [cylindrical] parison embodiment

and then modify it to practice a two-sheet process," as Patent Owner argues. Instead, Petitioner relies on Kasugai's disclosure of a separate embodiment that molds two flat sheets into a hollow body. Pet. 16 ("Kasugai also discloses other embodiments where the tank is formed by blow molding two sheets of plastic."). Moreover, Kasugai depicts the cylindrical parison process and the two-sheet process as separate embodiments. Ex. 1003, 4:55–5:41 (describing the cylindrical parison embodiment), 5:42–45 (describing the two-sheet embodiment), Fig. 2 (depicting the cylindrical parison embodiment), Fig. 7 (depicting the two-sheet embodiment).

Patent Owner also argues that Kasugai fails to explain how to seal the seam between its two sheets "in a manner that would prevent evaporative losses and maintain the structural integrity of the tank." PO Resp. 16–17. According to Patent Owner, sealing this seam "would require undue experimentation." *Id.* at 17 (citing Ex. 2001 ¶ 57). Patent Owner cites expert testimony that states, without further support, that sealing the seam of Kasugai's two-sheet embodiment "would be highly problematic, if not technically/economically feasible." Ex. 2001 ¶ 57. This unsupported testimony is conclusory, so it is unpersuasive. *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); *Phillips v. AWH Corp.*, 415 F.3d 1303, 1318 (Fed. Cir. 2005) (en banc) (conclusory statements by expert in support of claim construction may not be relied upon). Further, Kasugai is a patent that not only teaches but also claims its two-sheet embodiment. Ex. 1003, 10:13–17, 12:9–13. As such, it "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).

Moreover, to the extent Kasugai lacks disclosure of how to seal the seam between its two sheets with an interposed plate, the '812 patent also lacks this disclosure. Ex. 1001, 1:4–5:42. The description of sealing the seam between the two sheets in the '812 patent merely states that "[t]he welding operation in the [mold] consists in pinching the periphery of the parison, at least partially, and in welding together, by hot fusion welding, the surfaces of the parison which have been pinched." *Id.* at 3:1–4. The '812 patent discusses "films, sheets or plates" that support the accessories placed inside its fuel tank and states that those "films, sheets or plates" may be "extended to the outside of the perimeter of the [parison] sheets," in which case they are "held between the pinching regions of the parison which are intended to be fastened together." *Id.* at 4:52–64. This is quite similar to Kasugai's disclosure of "holding plate 6" that "is grasped by the parison 28 and pressed [so that] the melting bonding strength becomes good." Ex. 1003, 4:66–5:1. Thus, the level of detail in the disclosure of Kasugai is similar to that of the specification of the '812 patent. That is, Patent Owner did not provide in its own specification "the type of detail [it] now argues is necessary in prior art references," which permits a "finding that one skilled in the art would have known how to implement the features of the references and would have concluded that the reference disclosures would have been enabling." *In re Epstein*, 32 F.3d 1559, 1568 (Fed. Cir. 1994). This is because, when a patent specification does not "specifically describe" any "equipment or techniques to be used," it may be deduced "that all of the equipment and technical knowledge required to perform the claimed

method" is known to one of ordinary skill in the art. *In re Fox*, 471 F.2d 1405, 1407 (CCPA 1973); *see also Southwire Co. v. Cerro Wire LLC*, 870 F.3d 1306, 1312 (Fed. Cir. 2017) (without proof to the contrary, when there is no focus on a disputed claim limitation in the specification, the limitation is merely "an observed result of an old process").

Patent Owner argues that this reliance on the disclosure of the '812 patent amounts to using the patent's own disclosure against it. Paper 28, 4–5 (citing *Para-Ordnance Mfg., Inc. v. SGS Importers Int'l, Inc.*, 73 F.3d 1085, 1087 (Fed. Cir. 1996) ("obviousness may not be established using hindsight, or in view of the teachings or suggestions of the inventor")). We are not persuaded by this argument. This is not a case of using the inventor's own disclosure of how to make or use an invention as a way to establish that a person of ordinary skill in the art somehow would have been aware of how to make or use the invention. Instead, we use the fact that the '812 patent fails to provide a description of how to seal the seam between two sheets with an interposed "film[], sheet[] or plate[]" as evidence that a person of ordinary skill in the art would have had the ability to determine, without undue experimentation, how to accomplish that task. *See Epstein*, 32 F.3d at 1568. Thus, that knowledge would have been available to a person of ordinary skill in the art attempting to carry out Kasugai's method of making a fuel tank in which a support plate was pinched by a parison composed of two plates being joined together in a mold.

For these reasons, we are satisfied that the combination of Kasugai and Kagitani, together with the background knowledge available to one of ordinary skill in the art, "as a whole . . . enable[s] one skilled in the art to make and use the" invention of the '812 patent. *Therasense, Inc. v. Becton,*

Dickinson & Co., 593 F.3d 1289, 1297 (Fed. Cir. 2010) (vacated on other grounds) (citing *Beckman Instruments, Inc. v. LKB Produkter AB*, 892 F.2d 1547, 1551 (Fed. Cir. 1989)).

Thus, the evidence of record provides a reason for a person of ordinary skill in the art to have combined the teachings of Kasugai with those of Kagitani. We are not persuaded by Patent Owner's arguments that a person of ordinary skill in the art would have avoided modifying Kasugai's cylindrical parison embodiment to use a two-sheet parison instead of a cylindrical parison or that the combination of Kasugai and Kagitani insufficiently explains how to join the two sheets together during the manufacture of a fuel tank. Accordingly, Petitioner has shown by a preponderance of the evidence that a person of ordinary skill in the art would have had reason to combine the teachings of Kasugai and Kagitani.

b. Claim 38

Claim 38 depends from claim 32 and adds a limitation requiring that the "step of molding comprise[] a step of holding apart said two portions of said parison and a subsequent step [of bringing] said two portions together." Ex. 1001, 8:7–9.

Petitioner argues that the additional limitation of claim 38 is taught or suggested by Kasugai. Pet. 25–26 (citing Ex. 1003, 4:59–66, 5:42–45, 8:23–26, 10:13–17, 12:9–13, Fig. 11). We agree. Before the closure of the mold around the two sheets, Kasugai depicts its two-sheet embodiment with the two plastic sheets separated by a space that contains the holding plate and the accessories attached thereto. Ex. 1003, Fig. 7, Fig. 17. Kasugai also discloses a "[m]ethod of manufacturing a fuel tank" in which "the parison used . . . includes two sheets with the holding plate arranged therebetween

and opposed in parallel to the base portion of the holding plate." *Id.* at 10:13–17, 12:9–13. In this method, Kasugai discloses "tightening the mold and thereby pressing the parison against the outer periphery of the holding plate." *Id.* at 9:37–38, 10:66–67. The step of arranging the two sheets with the holding plate between them teaches "holding apart [the] two portions of [the] parison," and the step of pressing the parison against the holding plate teaches bringing the "two portions [of the parison] together." Ex. 1001, 8:7–9.

Against this evidence, Patent Owner argues that Kasugai fails to explain "how its alleged two-sheet embodiment would work" and does not describe "holding apart the two portions of said parison as claimed." PO Resp. 19. As just discussed, however, Kasugai discloses both arranging its two sheets in a fashion where they are separated by enough distance to place the holding plate and its attached accessories between them and pressing its two sheets together. Ex. 1003, 9:37–38, 10:13–17, 10:66–67, 12:9–13, Fig. 7, Fig. 17. Patent Owner also argues that a person of ordinary skill in the art "would not attempt to practice Kasugai's process with two sheets." PO Resp. 19. As discussed above, however, Kasugai expressly discloses practicing its method of fuel tank manufacture with a parison made of two plastic sheets. Ex. 1003, 10:13–17, 12:9–13, 5:42–45, 8:23–26, Fig. 7, Fig. 17. Accordingly, we find that the combination of Kasugai and Kagitani teaches the subject matter of claim 38.

c. Claim 39

Claim 39 depends from claim 38 and adds a limitation requiring that the "process" of claim 32 include "a step of inserting an object in said

parison during said step of holding [apart] said two portions." Ex. 1001, 8:10–12.

Petitioner argues that the additional limitation of claim 39 is taught or suggested by Kasugai. Pet. 26–27 (citing Ex. 1003, 2:17–25, 4:59–5:1, Fig. 1). We agree. As discussed above, before the closure of the mold around the two sheets, Kasugai teaches separating its two plastic sheets by a space that contains holding plate 6 and the accessories attached thereto, and Kasugai teaches pressing the two sheets around and against the holding plate by closing the mold. Ex. 1003, 9:37–38, 10:13–17, 10:66–67, 12:9–13, Fig. 7, Fig. 17. Either the holding plate or any of the accessories attached thereto qualifies as "an object."

Patent Owner repeats its argument that Kasugai does not teach holding apart the two sheets of its two-sheet embodiment. PO Resp. 19–20. We find this argument unpersuasive for the same reasons discussed above with respect to claim 38. Accordingly, we find that the combination of Kasugai and Kagitani teaches the subject matter of claim 39.

d. Claim 40

Claim 40 depends from claim 39 and adds a limitation requiring that the object inserted in claim 39 be "a preassembled structure." Ex. 1001, 8:13–14. Petitioner argues that Kasugai teaches this limitation. Pet. 27–28 (citing Ex. 1003, 2:17–25, Fig. 3, Fig. 4). Patent Owner does not dispute Petitioner's argument or evidence with respect to claim 40. PO Resp. 15–24. We agree with Petitioner. As Figures 3 and 4 of Kasugai show, the various accessories that are attached to holding plate 6 are all attached before the plate is placed in the mold. Ex. 1003, Fig. 3, Fig. 4; *see also* Ex. 1003, 2:17–20 ("component parts are previously fixed to a holding plate

of synthetic resin being used as an insert member"). Accordingly, we find that the combination of Kasugai and Kagitani teaches the subject matter of claim 40.

e. Claim 41

Claim 41 depends from claim 40 and adds a limitation requiring that the preassembled structure of claim 40 be "configured to anchor to an internal wall of said fuel tank." Ex. 1001, 8:15–17. Petitioner argues that "Kasugai discloses that the components and holding plate of the insert member are pressed onto the internal tank wall and welded or fixed in place." Pet. 28–29 (citing Ex. 1003, 4:66–5:1, 5:16–22; Ex. 1010 ¶¶ 76–78).

Petitioner is correct that Kasugai teaches forming a pocket in its side walls, at the point where the two shells are pinched together to form a seam, and placing the edge of its holding plate within that pocket as a way of attaching the holding plate to the wall. Ex. 1003, 4:66–5:1 (describing the attachment as "melting bonding" whose "strength becomes good"), Fig. 1 (depicting the parison pressed against the edge of the holding plate), Fig. 5 (same), Fig. 7 (depicting two-sheet parison).

Patent Owner argues that Kasugai's teaching of attaching its holding plate to the "circumferential pinch or seam" instead of to a flat portion of the upper or lower wall of the tank does not satisfy the requirement of claim 41 that the preassembled structure be "configured to anchor to an internal wall." PO Resp. 20–23 (citing Ex. 1001, 4:1–3, Fig. 1; Ex. 2001 ¶ 60). Specifically, according to Patent Owner, a person of ordinary skill in the art would interpret claim 41 such that all preassembled structures that are "configured to anchor to an internal wall" are configured to attach to a flat wall, not pinched within a pocket formed within the wall. *Id.*

We are not persuaded that the scope of "an internal wall of the fuel tank" is as narrow as Patent Owner argues it is. Patent Owner's argument relies chiefly on structure not depicted in the only figure of the '812 patent. Specifically, the figure includes illustrative structure 5, which supports accessories that are not themselves depicted in the figure. According to Patent Owner, these accessories are supposedly attached to the flat inner surface of one of the sheets that will make a fuel tank, and, in fact, the figure depicts illustrative structure 5 being attached to a flat portion of an interior wall of the fuel tank. Ex. 1001, 5:31–42, Fig. 1; *see* PO Resp. 20–23. Because the attachment process in the prior art combination would occur on a curved side wall, but the only figure of the patent shows a flat side wall, Patent Owner contends the proposed combination is improper. PO Resp. 21. But the figure of the '812 patent "is given for the purpose of illustrating a specific embodiment of the inventions without in any way wishing to restrict the scope thereof." Ex. 1001, 2:41–43. Accordingly, the specification precludes limiting the claims to only the flat side wall embodiment depicted in the figure. Moreover, "the claims of a patent are not limited to the preferred embodiment, unless by their own language." *Karlin Tech., Inc. v. Surgical Dynamics, Inc.*, 177 F.3d 968, 973 (Fed. Cir. 1999). Here, the language of claim 41 does not state that the wall in question must be flat or that the method of attachment of the preassembled structure must be of some form other than insertion into a pocket in the wall. Ex. 1001, 8:15–17. There also is evidence that a person of ordinary skill in the art would not have limited a "wall" to a completely flat surface. Ex. 1003, 5:38 (referring to "outside wall 2"), Fig. 5 (depicting outside wall 2 as including all of flat top surface 3, flat bottom surface 5, four-sided side wall 4, and connections

between these parts). Accordingly, the evidence of record shows that a person of ordinary skill in the art would have understood "wall" to encompass non-flat structures, and neither the language of the '812 patent specification nor the language of claim 41 provides a reason to change this interpretation.

This leaves the testimony of Professor Tim Osswald, to which Patent Owner directs us, to support Patent Owner's argument that a person of ordinary skill in the art would not have carried out Kasugai's attachment process as alleged by Petitioner. PO Resp. 21 (citing Ex. 2001 ¶ 60). Professor Osswald testifies that "[o]ne of ordinary skill in the art would not attempt to anchor one of these components to the tank's curved side wall, nor the tank's pinch or seam, as this may compromise the tank's seal or lead to increased fuel vapor losses." Ex. 2001 ¶ 60. There is no explanation in this testimony or in the testimony immediately preceding or following this as to how or why the attachment of a plate to a wall by insertion into a pocket in the wall would "compromise the tank's seal or lead to increased fuel vapor losses." *Id.* Moreover, this testimony merely parrots the precise language of the Patent Owner Response. *Compare* Ex. 2001 ¶ 60, *with* PO Resp. 21. This testimony does not persuasively rely on foundational factual underpinnings; therefore, we find it of very little probative value.

In addition, to the extent that Kasugai's attachment method might "compromise the tank's seal or lead to increased fuel vapor losses," as Professor Osswald testifies, Kasugai teaches a process designed to remedy these problems. Specifically, Kasugai teaches applying "high-frequency heating" to "the outside wall" in order to "improv[e] the melting bonding strength between these parts"; Kasugai teaches that this "improve[s] the air

tightness in the side wall." Ex. 1003, 5:30–41. Accordingly, we find that the combination of Kasugai and Kagitani teaches the subject matter of claim 41.

f. Claim 44

Claim 44 depends from claim 32 and adds a limitation requiring that the "step of molding" includes "a step of blowing gas within said parison, and a step of welding said two portions together." Ex. 1001, 8:24–26. Petitioner argues that this limitation is taught or suggested by Kasugai. Pet. 29–31 (citing Ex. 1003, 2:48–64, 4:62–66, Fig. 1, Fig. 7; Ex. 1010 ¶ 80). Patent Owner disagrees, arguing that "[t]he combination of Kasugai and Kagitani fails to disclose 'welding said two portions together.'" PO Resp. 23. Patent Owner does not cite any evidence to support its argument that Kasugai and Kagitani fail to teach or suggest welding together the two sheets of Kasugai's parison. *Id.* Instead, Patent Owner relies on its argument with respect to claim 38 that Kasugai fails to teach or suggest holding the two sheets apart and bringing them together. *Id.* As described above, we are not persuaded that Kasugai fails to teach these limitations.

With respect to the limitation of claim 44 that requires welding the two sheets together, the evidence of record shows that a person of ordinary skill in the art would have understood Kasugai's method as involving welding its two sheets together. Ex. 1003, 4:59–66 (describing grasping the edge of the holding plate with the cylindrical parison), 5:42–45 (describing carrying out the same process with a two-sheet parison); Ex. 1010 ¶ 80 (when "two parison portions are hot, the compressive stress" caused by the portions being "compressed against each other when molten" would "cause[] the plastic materials to weld and seal the two halves together," and this is a

conventional feature of blow molding). As for the other additional limitation of claim 44, requiring blow molding, Kasugai teaches that its "outside wall 2 is formed by blow molding," using air blowing port 25, which is inserted into parison 28 so that "air is blown into the parison 28." Ex. 1003, 4:62–66, Fig. 1. Accordingly, we find that the combination of Kasugai and Kagitani suggests the subject matter of claim 44.

g. Claim 45

Claim 45 depends from claim 32 and adds a limitation requiring that the "step of molding comprises a step of bringing said two portions together and a step of welding said two portions together so as to form a leak-tight joint." Ex. 1001, 8:27–30. Petitioner argues that the purpose of Kasugai's method is to form a fuel tank, and no fuel tank can function unless it can carry fuel, which requires it to be leak-tight. Pet. 31 (citing Ex. 1010 ¶ 83). Patent Owner argues that, although Kasugai teaches forming a cylindrical parison around the edge of holding plate 6, it does not explain how to form a leak-tight joint when using its two-sheet embodiment. PO Resp. 23–24.

The preponderance of the evidence supports Petitioner's argument. Kasugai is concerned with improving "the air tightness in the side wall 4." Ex. 1003, 5:30–31. Kasugai teaches a method of achieving this degree of leak-tightness. Ex. 1003, 5:38–41 (describing the application of "high-frequency heating" and thereby "improving the melting bonding strength between," *inter alia*, the outside wall and the holding plate). In addition, we credit the testimony of Dr. Kazmer that "[t]he joint between the two portions that form the fuel tank must be leak-tight for the tank to carry fuel and function as a fuel tank." Ex. 1010 ¶ 83. This is important because Kasugai's purpose is to create a fuel tank. Ex. 1003, at [54], [57], 1:7–10,

1:44–45. Against this evidence is Patent Owner's argument that the combination of Kasugai and Kagitani is non-enabling. PO Resp. 23–24. As discussed above with respect to claim 32, however, we find that a person of ordinary skill in the art would have had the ability to determine, without undue experimentation, how to seal the seam between two sheets with an interposed "film[], sheet[] or plate[]." Accordingly, we find that the combination of Kasugai and Kagitani teaches the subject matter of claim 45.

h. Objective Indicia of Nonobviousness

Patent Owner argues that, even if "Petitioners have set forth a colorable showing of obviousness, the commercial success achieved by [Patent Owner's twin-sheet blow molding ("TSBM")] products rebuts all of Petitioners' hindsight-based obviousness conclusions." PO Resp. 33–35. We are not persuaded that the evidence of record establishes any commercial success that is relevant to the question of the obviousness of the challenged claims of the '812 patent.

First, Patent Owner argues that it created the market for fuel tanks made using the TSBM process. PO Resp. 34 (citing Ex. 2001 ¶¶ 83–84; Ex. 2005, 49:1–9, 49:16–25, 67:8–13). The first piece of supporting evidence is a statement by Professor Osswald that, "prior to the inventions of the '812 patent, there were no fuel tanks manufactured in this way." Ex. 2001 ¶ 84. But Professor Osswald offers no support for this conclusory statement. The remaining cited evidence includes a statement that Patent Owner received "an order in 2005 from BMW," without any explanation of what the order was for, what manufacturing process was necessary to fill the order, whether BMW was aware that TSBM was needed to fill the order, or whether any competing products were available. Ex. 2005, 49:1–9.

Other cited testimony indicates that Patent Owner executed non-disclosure agreements with its suppliers and that, in 2008, Patent Owner "had to prepare . . . the first industry machine," but there is no context suggesting precisely what "first industry machine" means, particularly given the unexplained three-year gap between the receipt of the order (presumably for TSBM tanks) and the preparation of the "first industry machine." *Id.* at 49:16–25.

The final cited piece of evidence is testimony that "twin-sheet is becoming . . . one of the standard technolog[ies] . . . of the market," with "more than around 5 million tanks a year that are . . . produced by one or the other form of twin-sheet." *Id.* at 67:8–13. These three pieces of evidence somewhat support a finding that there is some demand for fuel tanks made using the TSBM process or similar processes.

Second, Patent Owner argues that its market share increased from 12% to 20% thanks to its development of the TSBM process. PO Resp. 34 (citing Ex. 2001 ¶ 85; Ex. 2005, 32:4–34:10, 34:18–25, 165:21–167:16). The evidence, however, does not support a finding that this increase in market share was due only to the TSBM process. Professor Osswald's testimony relies on the testimony of Paul Wouters in Exhibit 2005. Ex. 2001 ¶ 85 (citing Ex. 2005, 32:4–34:10, 34:18–25, 165:21–167:16). Mr. Wouters, meanwhile, did not testify that the growth in market share was due to the development of the TSBM process. Instead, Mr. Wouters testified that "our company's strategy is to . . . have the . . . largest portfolio of solutions . . . to adapt and to be the closest to the needs of each customer," and that "it's thanks to that strategy that we gr[e]w from a market share which was about 12 percent at the time to more than 20 percent last year."

Ex. 2005, 32:17–25. Mr. Wouters went on to state that this growth was "because we have been adapting our technologies to the needs of each customer." *Id.* at 32:25–33:3. In response to a question regarding why Patent Owner does not always recommend TSBM to its customers, Mr. Wouters testified that "we have several patented technolog[ies]" and "we adapt to the customer['s] needs." *Id.* at 33:23–34:10. Thus, there is some evidence of customer demand for the tanks that Patent Owner makes using its TSBM process, as well as some evidence that Patent Owner's overall market share is increasing, but there is no evidence that the increase in market share is due to Patent Owner's adoption of TSBM technology.

This last point is important because it is not sufficient that a product or its use merely be within the scope of a claim in order for secondary evidence of non-obviousness tied to that product to be given substantial weight. There must also be a causal relationship, termed a "nexus," between the evidence and the claimed invention. *Merck & Co. v. Teva Pharms. USA, Inc.*, 395 F.3d 1364, 1376 (Fed. Cir. 2005). A nexus is required in order to establish that the evidence relied upon traces its basis to a novel element in the claim, rather than to something in the prior art. *Institut Pasteur & Universite Pierre et Marie Curie v. Focarino*, 738 F.3d 1337, 1347 (Fed. Cir. 2013). All types of objective evidence of non-obviousness must be shown to have such a nexus. *In re GPAC Inc.*, 57 F.3d 1573, 1580 (Fed. Cir. 1995) (nexus generally); *see also Rambus Inc. v. Rea*, 731 F.3d 1248, 1256 (Fed. Cir. 2013) (long-felt need); *Wm. Wrigley Jr. Co. v. Cadbury Adams USA LLC*, 683 F.3d 1356, 1364 (Fed. Cir. 2012) (copying); *In re Huang*, 100 F.3d 135, 140 (Fed. Cir. 1996) (commercial success). The stronger the showing of nexus, the greater the weight accorded the objective

evidence of non-obviousness. *See Ashland Oil, Inc. v. Delta Resins & Refractories, Inc.*, 776 F.2d 281, 306 (Fed. Cir. 1985).

There is some tension in applicable Federal Circuit precedent regarding the standard for establishing an appropriate nexus. On the one hand, "[w]here the offered secondary consideration actually results from something other than what is both claimed and *novel* in the claim, there is no nexus to the merits of the claimed invention," meaning that "there must be a nexus to some aspect of the claim not already in the prior art." *In re Kao*, 639 F.3d 1057, 1068–69 (Fed. Cir. 2011). On the other hand, there is no requirement that "objective evidence must be tied exclusively to claim elements that are not disclosed in a particular prior art reference in order for that evidence to carry substantial weight." *WBIP, LLC v. Kohler Co.*, 829 F.3d 1317, 1331 (Fed. Cir. 2016). A patent owner may show, for example, "that it is the claimed combination as a whole that serves as a nexus for the objective evidence; proof of nexus is not limited to only when objective evidence is tied to the supposedly 'new' features(s)." *Id.* Ultimately, the fact finder must weigh the secondary considerations evidence presented in the context of whether the claimed invention as a whole would have been obvious to a skilled artisan. *Id.* at 1331–32.

As discussed above, Patent Owner has identified testimony that its commercial success is due more to the variety of different solutions that it offers than to the abilities of one particular manufacturing process, which does not support the existence of a nexus between the alleged commercial success and the challenged claims. Patent Owner also argues that nexus is present because the TSBM manufacturing process permits the installation of "internally-mounted accessories or ducts," which "are a required feature of a

fuel tank." PO Resp. 35. But the ability to install accessories or ducts inside a fuel tank and to mount those accessories or ducts to the internal walls of the tank is not unique to TSBM, nor is it an ability that was developed for the first time with the TSBM process. Kasugai's process depicts accessories installed in a fuel tank. Ex. 1003, 3:56–4:7, Fig. 1, Fig. 5. So does Hatakeyama's process. Ex. 1005, 2, Fig. 5. Even the '812 patent acknowledges that, when "[h]ollow plastic bodies" acting "as gas and liquid tanks" are required "to meet sealing standards in relation to . . . environmental requirements," one method of doing so historically "has been to incorporate certain accessories and ducts actually within the hollow bodies." Ex. 1001, 1:6–23. Accordingly, the ability of the TSBM process to place accessories inside fuel tanks does not provide a nexus between the challenged claims and the commercial success of that process.

Finally, Patent Owner argues that the TSBM process practices all of the challenged claims. PO Resp. 34 (citing Ex. 2001 ¶¶ 85–86). If the TSBM process does indeed practice the challenged claims, then it may be "'the invention disclosed and claimed in the patent,'" in which case "there is a presumption of nexus for objective considerations." *WBIP*, 829 F.3d at 1329 (quoting *J.T. Eaton & Co. v. Atl. Paste & Glue Co.*, 106 F.3d 1563, 1571 (Fed. Cir. 1997)). It is not clear that the evidence here supports a finding that the TSBM process "is the invention disclosed and claimed in the patent." *Id.* Professor Osswald testifies as to the steps generally performed in Patent Owner's TSBM process. Ex. 2001 ¶ 86. There is certainly a resemblance between these general steps and the steps recited in the challenged claims, but there is no evidence or argument comparing the steps of the TSBM process to the limitations of each challenged claim, or even to

the limitations of any particular claim. *Id.*; PO Resp. 33–35. Moreover, Professor Osswald testifies that, in his opinion, Patent Owner's "TSBM manufacturing process . . . practices, ***at a minimum***, the claimed inventions of the '812 patent." Ex. 2001 ¶ 86 (emphasis added). The qualification "at a minimum" renders the testimony unclear and unpersuasive. Professor Osswald might mean by this that the TSBM process might do something more than practice a claimed invention, although, if so, he does not explain what is beyond or better than "practicing" the claimed invention or how the TSBM process does whatever that might be. Alternatively, Professor Osswald might mean that the TSBM process might practice a claimed invention but also practice additional steps, but, again, he does not explain what those additional steps might be. Moreover, of course, the phrase "at a minimum" suggests that the something extra, whatever it is, and whether it consists of additional unclaimed steps or doing something beyond or better than merely "practicing" the invention, may or may not be present, without stating that it definitively is present. All of these concerns make it difficult to conclude even that Professor Osswald himself is persuaded that the TSBM process "is the invention disclosed and claimed in the patent." *WBIP*, 829 F.3d at 1329 (quoting *J.T. Eaton*, 106 F.3d at 1571). If he is not persuaded, it is unclear why we should be. Accordingly, we do not conclude that Patent Owner is entitled to a presumption that there is a nexus between the challenged claims and the commercial success of the TSBM process.

Even if we were to find Patent Owner were entitled to a presumption of nexus, "[t]he presumption of nexus is rebuttable." *WBIP*, 829 F.3d at 1329. Here, the evidence as a whole rebuts any presumption of nexus. As discussed above, Patent Owner directs us to evidence that the cited

commercial success is due not to the fact that the TSBM process practices the challenged claims of the ’812 patent, but instead to Patent Owner’s wide variety of manufacturing processes, allowing a choice to be made to use the process that most closely matches the client’s needs. Ex. 2005, 32:4–34:10, 34:18–25, 165:21–167:16. Moreover, Patent Owner directs us to the testimony of Mr. Wouters, who, in discussing Patent Owner’s desire “to adapt and be the closest to the customer[’s] needs,” states that “it’s our choice.” PO Resp. 34; Ex. 2005, 34:18–25. This suggests that customers cannot be choosing the TSBM process over the other available processes thanks to the features that correspond to the challenged claims because it is not Patent Owner’s customers who choose the manufacturing process to be used. To the extent that Patent Owner relies on the commercial success of twin-sheet techniques generally, as opposed to its own TSBM process, we have been directed to no evidence of record that those other processes practice the challenged claims of the ’812 patent. To the extent that Patent Owner relies more broadly on the ability of the TSBM process to install accessories and ducts inside fuel tanks, this ability existed in prior-art processes, as acknowledged by the ’812 patent itself.

Thus, there is some evidence of customer demand for the tanks that Patent Owner makes using its TSBM process, as well as some evidence that Patent Owner’s overall market share is increasing, but, to the extent that this rises to the level of commercial success, there is insufficient evidence of a nexus between that commercial success and the challenged claims of the ’812 patent, rendering the evidence of commercial success less persuasive to the question of the obviousness of those claims.

i. Conclusion

As discussed above, we find that the combination of Kasugai and Kagitani teaches the subject matter of each of claims 32, 38–41, 44, and 45; that a person of ordinary skill in the art would have had a reason to combine the teachings of Kasugai with those of Kagitani; and that there is insufficient evidence of relevant commercial success. Accordingly, we conclude that Petitioner has shown by a preponderance of the evidence that each of claims 32, 38–41, 44, and 45 would have been obvious over the combination of Kasugai and Kagitani.

C. Asserted Obviousness over Kasugai, Kagitani, and Hata

Petitioner argues that the subject matter of claims 16, 24–27, 30, and 31 would have been obvious to a person of ordinary skill in the art given the teachings of Kasugai, Kagitani, and Hata. Pet. 31–34.

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. 1006, 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

Petitioner argues that a person of ordinary skill in the art would have had reason to combine the teachings of Kasugai and Kagitani with the

teachings of Hata and that those combined teachings teach or suggest every limitation of claims 16, 24–27, 30, and 31. Pet. 31–34.

a. Claim 16

Petitioner argues, *id.* at 31–32, that claim 16 is similar to claim 32, but claim 16 recites a "hollow body" in place of claim 32's "fuel tank," and claim 16 recites a "multilayered parison comprising stacked layers fastened to each other" in place of the "parison" of claim 32. *Compare* Ex. 1001, 6:27–37, *with* Ex. 1001, 7:14–23. Patent Owner agrees. PO Resp. 24. We agree with both parties' characterizations of claim 16.

As discussed above, we find that Petitioner has shown by a preponderance of the evidence that the combination of Kasugai and Kagitani teaches all the limitations of claim 32 and that a person of ordinary skill in the art would have had a reason to combine the teachings of Kasugai and Kagitani. In addition, we find that the "fuel tank" of claim 32 is merely a specific type of the "hollow body" of claim 16 because, according to the '812 patent, a "hollow body" is "any article whose surface has at least one empty or concave part," and one example of a "hollow body" is a "tank[]." Ex. 1001, 1:58–62. Thus, the combination of Kasugai and Kagitani teaches the "hollow body" of claim 16.

As for the "multilayered parison comprising stacked layers fastened to each other" recited by claim 16, Petitioner argues that Hata teaches this limitation, and Patent Owner does not dispute Petitioner's evidence or argument, with the exception of arguing that Hata fails to remedy the deficiencies of the Kasugai-Kagitani combination. Pet. 32–33; PO Resp. 24. As discussed above, we find no deficiencies in the Kasugai-Kagitani combination that need be remedied by Hata. In addition, Hata teaches

producing a multilayered fuel tank by "blow molding." Ex. 1006, 5:18–21. The multilayered fuel tank "comprises (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 3:21–23. Accordingly, we find that Petitioner has shown by a preponderance of the evidence that the combination of Kasugai, Kagitani, and Hata teaches or suggests the subject matter of claim 16.

In addition, Petitioner argues that a person of ordinary skill in the art would have used Hata's multilayered material to manufacture a fuel tank according to the method taught by the combination of Kasugai and Kagitani. Pet. 33. Patent Owner does not dispute this evidence or argument. PO Resp. 24. Hata teaches that making a multilayered fuel tank using its material provides beneficial gasoline barrier properties and impact resistance. Ex. 1006, 2:27–29. Accordingly, we find that Petitioner has shown by a preponderance of the evidence that a person of ordinary skill in the art would have had reason to combine the teachings of Kasugai, Kagitani, and Hata.

b. Claims 24–27, 30, and 31

But for their dependence from claim 16 instead of claim 32, claims 24–27, 30, and 31 are identical to claims 38–41, 44, and 45 of the '812 patent. *Compare* Ex. 1001, 6:56–7:13, *with* Ex. 1001, 7:14–8:30. Accordingly, Petitioner repeats its arguments with respect to the obviousness of claims 38–41, 44, and 45. Pet. 34. Patent Owner does not dispute Petitioner's evidence or argument, except to argue that Hata fails to remedy the deficiencies of the Kasugai-Kagitani combination. PO Resp. 24. As discussed above, we do not find any deficiencies in the Kasugai-Kagitani

combination that need be remedied by Hata. Accordingly, we find that Petitioner has shown by a preponderance of the evidence that the combination of Kasugai, Kagitani, and Hata teaches the subject matter of claims 24–27, 30, and 31.

c. Objective Indicia of Nonobviousness

Patent Owner again argues that, even if "Petitioners have set forth a colorable showing of obviousness, the commercial success achieved by [Patent Owner's] TSBM products rebuts all of Petitioners' hindsight-based obviousness conclusions." PO Resp. 33–35. For the reasons discussed above with respect to the Kasugai-Kagitani ground of obviousness, we are not persuaded that the evidence of record establishes any commercial success that is persuasive on the question of the obviousness of the challenged claims of the '812 patent.

d. Conclusion

As discussed above, we find that the combination of Kasugai, Kagitani, and Hata teaches the subject matter of each of claims 16, 24–27, 30, and 31; that a person of ordinary skill in the art would have had a reason to combine the teachings of Kasugai with those of Kagitani and Hata; and that there is insufficient evidence of relevant commercial success. Accordingly, we conclude that Petitioner has shown by a preponderance of the evidence that each of claims 16, 24–27, 30, and 31 would have been obvious over the combination of Kasugai, Kagitani, and Hata.

D. Asserted Obviousness over Hatakeyama and Kagitani

Petitioner argues that a person of ordinary skill in the art would have had reason to combine the teachings of Kasugai with the teachings of Kagitani and that those combined teachings teach or suggest every limitation

of claims 32, 38–41, 44, and 45. Pet. 34–45. Patent Owner argues that a person of ordinary skill in the art would have had no reason to combine the teachings of Hatakeyama with those of Kagitani. PO Resp. 15–19. In addition, as discussed below, Patent Owner argues that the combination of Hatakeyama and Kagitani does not teach or suggest certain limitations of the dependent claims 38, 39, 41, 44, and 45. *Id.* at 19–24.

1. Claim 32

As Petitioner argues, Pet. 35–41, claim 32 recites a preamble and four limitations: "[a] process of manufacturing a fuel tank," "extruding a parison," "cutting through said parison so as to form two portions separated by a cut," and "molding said two portions so as to form said fuel tank," "wherein said step of cutting said parison comprises making at least two cuts in said parison so as to form two separate sheets." Ex. 1001, 7:14–23.

Petitioner argues that the combination of Hatakeyama and Kagitani teaches each of these limitations. Pet. 35–41. We agree. Hatakeyama teaches "a method for producing a hollow molded product having an insert therewithin," such as "thermoplastic resin fuel tanks." Ex. 1005, 1. Hatakeyama also teaches that a "parison" is "extruded . . . from [a] die," then "lowered to a prescribed position while being cut open by [a] cutting device." *Id.* at 2. This permits an "insert component . . . [to be] inserted into the parison" before the fuel tank is created by blow molding. *Id.*

Kagitani teaches a method of making two sheets for use in blow molding. Ex. 1004 ¶ 7. In Kagitani's method, this is accomplished by using "severing blades in two locations" to sever a cylindrical parison in two places. *Id.* ¶¶ 6–7. Accordingly, on the present record, we are persuaded

that Petitioner has shown sufficiently that the combination of Hatakeyama and Kagitani teaches every limitation of claim 32.

Patent Owner does not dispute this evidence or argue that the combination of Hatakeyama and Kagitani fails to teach or suggest any limitation of claim 32. PO Resp. 25–29. Accordingly, we find that Petitioner has shown by a preponderance of the evidence that the combination of Hatakeyama and Kagitani teaches the subject matter of claim 32.

Petitioner argues that a person of ordinary skill in the art would have had a reason to combine the teachings of Hatakeyama and Kagitani. Pet. 37–39. Specifically, Petitioner argues that a person of ordinary skill in the art would have had a reason to use Kagitani's method to produce two plastic sheets for use in Hatakeyama's method of making a fuel tank because doing so would permit the insertion of numerous or bulky accessories into the fuel tank. *Id.* (citing Ex. 1010 ¶¶ 121, 125). There is evidence to support this view. Dr. Kazmer testifies that replacing the single-cut parison of Hatakeyama with the two-sheet parison manufactured using the process of Kagitani allows for the insertion of accessories that are larger than, or otherwise unconstrained by, the size of Hatakeyama's extrusion head. Ex. 1010 ¶¶ 121, 125.

Against this evidence, Patent Owner argues that a person of ordinary skill in the art "would understand the opening in Hatakeyama's parison to be sufficient[ly large] to install internal components and would have no desire to redesign the entire system to make the opening wider." PO Resp. 25–27 (citing Ex. 2001 ¶¶ 71–73). We disagree. The evidence Patent Owner cites states that Hatakeyama's process, before any modification using the

teachings of Kagitani, permits the insertion of "large components," such as "breakwater plates" or "baffles." Ex. 2001 ¶ 72. Because these "large and bulky components," *id.*, could already be installed using the unmodified process of Hatakeyama, Patent Owner argues that a person of ordinary skill in the art would not have had any reason to modify Hatakeyama's process further to permit the installation of even larger components. We are not persuaded by this argument. The fact that Hatakeyama's method allows for the insertion of some accessories, even large ones, does not mean that there was no reason to develop a process that allowed for the installation of even larger accessories. Importantly, missing from the evidence of record in this case is any evidence that "breakwater plates" or "baffles" are the largest accessories that might reasonably be installed in a fuel tank. And even if Hatakeyama's process were somehow better than the process of claim 32, this would not necessarily negate the suggestion to combine the teachings of Hatakeyama with those of Kagitani because "[a] finding that the prior art as a whole suggests the desirability of a particular combination need not be supported by a finding that the prior art suggests that the combination claimed . . . is the preferred, or most desirable, combination." *Bayer Healthcare Pharms., Inc. v. Watson Pharms., Inc.*, 713 F.3d 1369, 1376 (Fed. Cir. 2013) (quoting *In re Fulton*, 391 F.3d 1195, 1200 (Fed. Cir. 2004)).

Patent Owner also argues that "Hatakeyama uses the surface adjacent or across from the parison opening to attach or incorporate the insert component to the tank," relying on "a flat surface on the oppos[it]e side of the rod/cylinder to attach the component to the tank," and that this flat surface would be unavailable once Hatakeyama was modified to also split

the parison open on the side opposite the original opening. PO Resp. 27–29. We are not persuaded by this argument. "Combining the teachings of references does not involve an ability to combine their specific structures." *In re Nievelt*, 482 F.2d 965, 968 (CCPA 1973); *see also In re Keller*, 642 F.2d 413, 425 (CCPA 1981) ("The test for obviousness is not whether the features of a secondary reference may be bodily incorporated into the structure of the primary reference. . . . Rather, the test is what the combined teachings of those references would have suggested to those of ordinary skill in the art."). Patent Owner does not direct us to evidence of record that supports a finding that it would have been beyond the ability of a person of ordinary skill in the art to determine precisely how to attach an accessory to some portion of the inside wall of a tank performed using the process of Hatakeyama modified using the teachings of Kagitani, including wall portions that lack seams. And, even if the combination of Hatakeyama and Kagitani were limited to the bodily incorporation of Kagitani's twin-sheet production method into Hatakeyama's precise accessory-placement method, there is evidence supporting the view that a person of ordinary skill in the art would have attached a component on the seam that would be located opposite the original parison opening. Specifically, Professor Osswald testified that "an accessory could be attached to a tank seam." Ex. 1012, 157:22–158:4 (testifying that this would be "not ideal," but "could be" done). Accordingly, we find that Petitioner has shown by a preponderance of the evidence that a person of ordinary skill in the art would have had a reason to combine the teachings of Hatakeyama with those of Kagitani.

2. Claim 38

Claim 38 depends from claim 32 and adds a limitation requiring that the "step of molding comprise[] a step of holding apart said two portions of said parison and a subsequent step [of bringing] said two portions together." Ex. 1001, 8:7–9.

Petitioner argues that the additional limitation of claim 38 is taught by Kagitani. Pet. 41 (citing Ex. 1004 ¶ 7; Ex. 1010 ¶¶ 134–137). We agree. Kagitani discloses cutting a cylindrical parison along a single line and opening it to make a single flat sheet, with the sheet routed some considerable distance laterally from the extrusion head through guide rolls 42. Ex. 1004 ¶ 7, Fig. 2. Kagitani also teaches "providing severing blades in two locations" for producing two sheets, although it does not illustrate this embodiment. *Id.* ¶ 7. The purpose of guide rolls 42 is to guide the sheet or sheets produced by Kagitani's method "to a position between the molds." *Id.* Dr. Kazmer testifies that a person of ordinary skill in the art would have understood that, just as a single set of guide rolls are used in Kagitani's single-sheet embodiment, two sets of guide rolls should be used in Kagitani's two-sheet embodiment, with the rolls separated by enough distance to hold the two sheets apart. Ex. 1010 ¶ 135.

Patent Owner does not dispute this evidence but repeats its argument that "one of ordinary skill would not combine Hatakeyama and Kagitani in a way that would result in two portions or sheets separated by a cut." PO Resp. 30. As discussed above with respect to claim 32, we find that a person of ordinary skill in the art would have had a reason to combine the teachings of Hatakeyama and those of Kagitani.

Accordingly, we find that the combination of Hatakeyama and Kagitani teaches the subject matter of claim 38.

3. Claim 39

Claim 39 depends from claim 38 and adds a limitation requiring that the "process" of claim 32 include "a step of inserting an object in said parison during said step of holding [apart] said two portions." Ex. 1001, 8:10–12.

Petitioner argues that the additional limitation of claim 39 is taught or suggested by Hatakeyama. Pet. 42 (citing Ex. 1005, 1–2; Ex. 1010 ¶¶ 138–140). We agree. Hatakeyama teaches placing an "insert component" inside the parison through a cut in the parison before the mold is closed. Ex. 1005, 1–2. Dr. Kazmer testifies that, in the combined Hatakeyama-Kagitani process, a person of ordinary skill in the art would have understood that Hatakeyama's method of insertion would also work to place the insert component between the two sheets of the parison through one of the cuts separating the two sheets before the closure of the mold. Ex. 1010 ¶ 139.

Patent Owner does not dispute this evidence but repeats its argument that "one of ordinary skill would not combine Hatakeyama and Kagitani in a way that would result in two portions or sheets separated by a cut." PO Resp. 30. As discussed above with respect to claim 32, we find that a person of ordinary skill in the art would have had a reason to combine the teachings of Hatakeyama and those of Kagitani.

Accordingly, we find that the combination of Hatakeyama and Kagitani teaches the subject matter of claim 39.

4. Claim 40

Claim 40 depends from claim 39 and adds a limitation requiring that the object inserted in claim 39 be "a preassembled structure." Ex. 1001, 8:13–14. Petitioner argues that Hatakeyama suggests this limitation. Pet. 43 (citing Ex. 1010 ¶¶ 142–143).

Patent Owner argues that the insert components disclosed in Hatakeyama, such as "breakwater plate[s]" and "inner tank[s]" do not satisfy the construction of "preassembled structure" that Petitioner has offered in the related infringement suit in District Court. PO Resp. 31 (citing Ex. 2004, 11–12). We note that Patent Owner did not request a construction of "preassembled structure" in its Response. *Id.* at 13–15. Further, the construction standard in District Court is different from that in this proceeding. Here, for purposes of this proceeding, we do not apply the *Phillips* claim-construction standard that the District Court applies; instead, 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. Pragmatus AV, LLC*, 582 F. App'x 864, 869 (Fed. Cir. 2014) (non-precedential). Thus, we have been made aware of no reason to bind Petitioner here to the *Phillips* construction of "preassembled structure" it has offered in related litigation.

That said, even under Patent Owner's proposal to construe "preassembled structure" to mean "a set of multiple parts previously joined into a single arrangement that is capable of attachment to at least one accessory," PO Resp. 31, there is evidence here to support Petitioner's argument that Hatakeyama suggests inserting the preassembled structure of

claim 40. Hatakeyama teaches the use of a single actuator rod 6. Ex. 1005, 2, Fig. 2, Fig. 3, Fig. 4. Dr. Kazmer testifies that this "would suggest to a [person of ordinary skill in the art] that multiple components would be connected to form a single insert object and placed on the actuator rod 6 prior to closure of the mold." Ex. 1010 ¶ 143.

Patent Owner does not direct us to evidence contradicting this testimony. PO Resp. 31–32. Patent Owner does argue that Dr. Kazmer's testimony "is complete conjecture without any support other than Dr. Kazmer's say-so" and "should not be accorded any weight." *Id.* at 32. In reply, Petitioner argues that Dr. Kazmer's testimony merely summarizes a "well known" technique in the art of fuel tank manufacturing. Reply 20–21 (citing Ex. 1003, 4:45–54, Fig. 3).

We agree with Petitioner. To the extent that "preassembled structure" should be construed as limited to "a set of multiple parts previously joined into a single arrangement that is capable of attachment to at least one accessory," the preponderance of the evidence supports Petitioner's argument that a person of ordinary skill in the art would have been able and motivated to use Hatakeyama's single actuator rod to place multiple accessories into a fuel tank by joining those accessories into a single arrangement. This is evidenced by both Dr. Kazmer's testimony to this effect and the disclosure of joining multiple components in the prior art. Ex. 1003, 4:45–54, Fig. 3; Ex. 1010 ¶ 143.

Accordingly, we find that the combination of Hatakeyama and Kagitani teaches the subject matter of claim 40.

5. Claim 41

Claim 41 depends from claim 40 and adds a limitation requiring that the preassembled structure of claim 40 be "configured to anchor to an internal wall of said fuel tank." Ex. 1001, 8:15–17. Petitioner argues that Hatakeyama teaches this limitation. Pet. 43 (citing Ex. 1005, 2; Ex. 1010 ¶¶ 145–147). We agree. Hatakeyama teaches using its actuator rod "to press-fix" the insert component to the wall of the tank. Ex. 1005, 2.

Patent Owner does not dispute this evidence but repeats its argument that Hatakeyama does not disclose inserting a preassembled structure, only single, unassembled components. PO Resp. 31–32. As discussed above with respect to claim 40, we find that Hatakeyama suggests the insertion of a preassembled structure. Accordingly, we find that the combination of Hatakeyama and Kagitani teaches the subject matter of claim 41.

6. Claim 44

Claim 44 depends from claim 32 and adds a limitation requiring that the "step of molding" includes "a step of blowing gas within said parison, and a step of welding said two portions together." Ex. 1001, 8:24–26. Petitioner argues that this limitation is taught or suggested by Hatakeyama. Pet. 44 (citing Ex. 1005, 2; Ex. 1010 ¶ 149). Patent Owner disagrees, arguing that "[t]he combination of Hatakeyama and Kagitani fails to disclose 'welding said two portions together.'" PO Resp. 32–33. Patent Owner does not cite any evidence to support its argument that Hatakeyama and Kagitani fail to teach or suggest welding together the two sheets of Kagitani's parison. *Id.* Instead, Patent Owner relies on its argument with respect to claim 32 that "one of ordinary skill in the art would not have modified Hatakeyama's fuel-tank manufacturing process to add another seam to create

two portions separated by a cut." *Id.* at 32. As described above, however, we find that a person of ordinary skill in the art would have had a reason to combine the teachings of Hatakeyama with those of Kagitani.

With respect to the limitation of claim 44 that requires welding the two sheets together, Petitioner's evidence of record shows that a person of ordinary skill in the art would have understood Hatakeyama's method as involving closing and welding the previously open parts of its parison. Ex. 1005, 2 ("metal mold 9 is closed such that a pinch-off occurs"); Ex. 1010 ¶ 149 (when "two parison portions are still hot, the compressive stress" caused by the portions being "compressed against each other when molten" would "cause[] the plastic materials to weld and seal the two halves together," and this is a conventional feature of blow molding). As for the other additional limitation of claim 44, requiring blowing gas into the parison, Hatakeyama teaches that "air is blow in through an air blow-in hole." Ex. 1005, 2. Accordingly, we find that the combination of Hatakeyama and Kagitani teaches the subject matter of claim 44.

7. Claim 45

Claim 45 depends from claim 32 and adds a limitation requiring that the "step of molding comprises a step of bringing said two portions together and a step of welding said two portions together so as to form a leak-tight joint." Ex. 1001, 8:27–30. Petitioner argues that the purpose of Hatakeyama's method is to form a fuel tank, and no fuel tank can function unless it can carry fuel, which requires it to be leak-tight. Pet. 45 (citing Ex. 1010 ¶ 153). Patent Owner repeats its argument that the combination of Hatakeyama and Kagitani fails to teach or suggest welding, and Patent Owner also argues that "Hatakeyama's insert component . . . could . . .

prevent Hatakeyama's weld from being leak tight," because it "interrupt[s]" the joint between the two sheets that make up the parison. PO Resp. 32–33.

The preponderance of the evidence supports Petitioner's argument. We credit the testimony of Dr. Kazmer that "[t]he joint between the two portions that form the fuel tank must be leak-tight for the tank to carry fuel and function as a fuel tank." Ex. 1010 ¶ 153. This is important because Hatakeyama's purpose is to create a fuel tank. Ex. 1005, 1–2. Against this evidence are Patent Owner's arguments that a person of ordinary skill in the art would not have combined the teachings of Hatakeyama with those of Kagitani and that the presence of Hatakeyama's insert component precludes the formation of a leak-tight joint in any case. PO Resp. 32–33. As discussed above with respect to claim 32, however, we find that a person of ordinary skill in the art would have had a reason to combine the teachings of Hatakeyama with those of Kagitani, and we find that a person of ordinary skill in the art could have attached Hatakeyama's insert component to an inner wall of the fuel tank. Accordingly, we find that the combination of Hatakeyama and Kagitani teaches the subject matter of claim 45.

8. Objective Indicia of Nonobviousness

Patent Owner argues that, even if "Petitioners have set forth a colorable showing of obviousness, the commercial success achieved by [Patent Owner's] TSBM products rebuts all of Petitioners' hindsight-based obviousness conclusions." PO Resp. 33–35. For the reasons discussed above with respect to the Kasugai-Kagitani ground of obviousness, we are not persuaded that the evidence of record establishes any commercial success that is persuasive on the question of the obviousness of the challenged claims of the '812 patent.

9. Conclusion

As discussed above, we find that the combination of Hatakeyama and Kagitani teaches the subject matter of each of claims 32, 38–41, 44, and 45; that a person of ordinary skill in the art would have had a reason to combine the teachings of Hatakeyama with those of Kagitani; and that there is insufficient evidence of relevant commercial success. Accordingly, we conclude that Petitioner has shown by a preponderance of the evidence that each of claims 32, 38–41, 44, and 45 would have been obvious over the combination of Hatakeyama and Kagitani.

E. Asserted Obviousness over Hatakeyama, Kagitani, and Hata

Petitioner argues that a person of ordinary skill in the art would have had reason to combine the teachings of Hatakeyama and Kagitani with the teachings of Hata and that those combined teachings teach or suggest every limitation of claims 16, 24–27, 30, and 31. Pet. 45–48.

1. Claim 16

Petitioner argues, *id.* at 45–46, that claim 16 is similar to claim 32, but claim 16 recites a "hollow body" in place of claim 32's "fuel tank," and claim 16 recites a "multilayered parison comprising stacked layers fastened to each other" in place of the "parison" of claim 32. *Compare* Ex. 1001, 6:27–37, *with* Ex. 1001, 7:14–23. Patent Owner agrees. PO Resp. 24. We agree with both parties' characterizations of claim 16.

As discussed above, we find that Petitioner has shown by a preponderance of the evidence that the combination of Hatakeyama and Kagitani teaches all the limitations of claim 32 and that a person of ordinary skill in the art would have had a reason to combine the teachings of Hatakeyama and Kagitani. In addition, we find that the "fuel tank" of

claim 32 is merely a specific type of the "hollow body" of claim 16 because, according to the '812 patent, a "hollow body" is "any article whose surface has at least one empty or concave part," and one example of a "hollow body" is a "tank[]." Ex. 1001, 1:58–62. Thus, the combination of Hatakeyama and Kagitani teaches the "hollow body" of claim 16.

As for the "multilayered parison comprising stacked layers fastened to each other" recited by claim 16, Petitioner argues that Hata teaches this limitation, and Patent Owner does not dispute Petitioner's evidence or argument, with the exception of arguing that Hata fails to remedy the deficiencies of the Hatakeyama-Kagitani combination. Pet. 46–47; PO Resp. 33. As discussed above, we find no deficiencies in the Hatakeyama-Kagitani combination that need be remedied by Hata. In addition, Hata teaches producing a multilayered fuel tank by "blow molding." Ex. 1006, 5:18–21. The multilayered fuel tank "comprises (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 3:21–23. Accordingly, we find that Petitioner has shown by a preponderance of the evidence that the combination of Hatakeyama, Kagitani, and Hata teaches the subject matter of claim 16.

In addition, Petitioner argues that a person of ordinary skill in the art would have used Hata's multilayered material to manufacture a fuel tank according to the method taught by the combination of Hatakeyama and Kagitani. Pet. 47. Patent Owner does not dispute this evidence or argument. PO Resp. 33. Hata teaches that making a multilayered fuel tank using its material provides beneficial gasoline barrier properties and impact resistance. Ex. 1006, 2:27–29. Accordingly, we find that Petitioner has

shown by a preponderance of the evidence that a person of ordinary skill in the art would have had reason to combine the teachings of Hatakeyama, Kagitani, and Hata.

2. Claims 24–27, 30, and 31

But for their dependence from claim 16 instead of claim 32, claims 24–27, 30, and 31 are identical to claims 38–41, 44, and 45 of the '812 patent. *Compare* Ex. 1001, 6:56–7:13, *with* Ex. 1001, 7:14–8:30. Accordingly, Petitioner repeats its arguments with respect to the obviousness of claims 38–41, 44, and 45. Pet. 48. Patent Owner does not dispute Petitioner's evidence or argument, except to argue that Hata fails to remedy the deficiencies of the Hatakeyama-Kagitani combination. PO Resp. 24. As discussed above, we do not find any deficiencies in the Hatakeyama-Kagitani combination that need be remedied by Hata. Accordingly, we find that Petitioner has shown by a preponderance of the evidence that the combination of Hatakeyama, Kagitani, and Hata teaches the subject matter of claims 24–27, 30, and 31.

3. Objective Indicia of Nonobviousness

Patent Owner argues that, even if "Petitioners have set forth a colorable showing of obviousness, the commercial success achieved by [Patent Owner's] TSBM products rebuts all of Petitioners' hindsight-based obviousness conclusions." PO Resp. 33–35. For the reasons discussed above with respect to the Kasugai-Kagitani ground of obviousness, we are not persuaded that the evidence of record establishes any commercial success that is relevant to the question of the obviousness of the challenged claims of the '812 patent.

4. Conclusion

As discussed above, we find that the combination of Hatakeyama, Kagitani, and Hata teaches the subject matter of each of claims 16, 24–27, 30, and 31; that a person of ordinary skill in the art would have had a reason to combine the teachings of Hatakeyama with those of Kagitani and Hata; and that there is insufficient evidence of relevant commercial success. Accordingly, we conclude that Petitioner has shown by a preponderance of the evidence that each of claims 16, 24–27, 30, and 31 would have been obvious over the combination of Hatakeyama, Kagitani, and Hata.

F. Pending Motion to Seal

At the time Petitioner filed its Reply, it also filed a motion to seal both the Reply and accompanying Exhibit 1014. Paper 23. Exhibit 1014 is a transcript of a deposition of Jules Joseph Van Schaftingen, the first named inventor of the '812 patent, given in the related infringement suit in District Court. This transcript was marked highly confidential in that suit, and Petitioner requests that it be kept confidential here. Paper 23, 1–2. Because Petitioner's Reply quotes Exhibit 1014, Petitioner also requests that it be kept confidential. Patent Owner did not file an opposition to the motion to seal.

Because it appears that there is good reason to maintain the confidentiality of Exhibit 1014, and because the Reply quotes some material from Exhibit 1014, we grant the motion to seal. Both Petitioner's Reply and the accompanying Exhibit 1014 shall be maintained as confidential under the terms of the Board's default protective order. Because the present decision does not rely on Exhibit 1014 or on the language of Exhibit 1014 that is quoted in the Reply, this decision will not be confidential.

The public interest requires that the Board's proceedings be as non-confidential as possible. Accordingly, within ten days of the issuance of this Decision, Petitioner shall file a publicly available, redacted version of the Reply that does not expose any confidential information from Exhibit 1014. Further, 45 days after the expiration of the time for appeal of this decision, or 45 days after the termination of any such appeal, both the non-public version of the Reply and Exhibit 1014 will be made public. During that 45-day window, Petitioner is authorized to file a motion to expunge the confidential information from the record so that it does not become public. 37 C.F.R. § 42.56.

CONCLUSION

Upon consideration of the Petition, Response, Reply, Sur-Reply, and the evidence before us, we determine that Petitioner has proven by a preponderance of the evidence that claims 32, 38–41, 44, and 45 would have been obvious over the combination of Kasugai and Kagitani and over the combination of Hatakeyama and Kagitani. We also determine that Petitioner has proven by a preponderance of the evidence that claims 16, 24–27, 30, and 31 would have been obvious over the combination of Kasugai, Kagitani, and Hata, as well as over the combination of Hatakeyama, Kagitani, and Hata.

ORDER

It is hereby

ORDERED that Petitioner has proven by a preponderance of the evidence that claims 16, 24–27, 30–32, 38–41, 44, and 45 of U.S. Patent No. 6,866,812 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 16, 24–27, 30–32, 38–41, 44, and 45 of U.S. Patent No. 6,866,812 B2;

FURTHER ORDERED that, within ten days of the issuance of this decision, Petitioner shall file a public, redacted version of the Reply that does not expose any confidential information from Exhibit 1014;

FURTHER ORDERED that, during the 45-day period following the expiration of the time for appeal or the termination of any such appeal, Petitioner is authorized to file a motion to expunge any confidential information from the record;

FURTHER ORDERED that, 45 days after the expiration of the time for appeal or the termination of any such appeal, in the absence of any motion to expunge confidential information, the entire record of this proceeding shall be made publicly available; 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.

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