

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 IPR2017-01647
Patent 6,814,921 B1

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 1–5, 8, and 9 of U.S. Patent No. 6,814,921 B1 (Ex. 1001, “the ’921 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 21), and Patent Owner filed a Sur-Reply (Paper 26). We held a hearing, the transcript of which has been entered into the record. Paper 31 (“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 not established by a preponderance of the evidence that any of claims 1–5, 8, and 9 of the ’921 patent is unpatentable.

B. Related Matters

The parties note that the ’921 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 1–5, 8, and 9 of the ’921 patent are unpatentable based on the following grounds (Pet. 12–49):¹

Statutory Ground	Basis	Challenged Claim(s)
§ 103	Kasugai ² and Kagitani ³	1–5, 8, and 9
§ 103	PFC ⁴ and Kagitani	1–5, 8, and 9

A. The ’921 Patent

The ’921 patent, titled “Method for Making a Fuel Tank in Plastic Material,” issued on November 9, 2004. Ex. 1001, at [45], [54]. “Plastic fuel tanks on board vehicles of various kinds must generally meet sealing and permeability standards.” *Id.* at 1:6–7. “One means sometimes used has been to incorporate certain accessories and pipes inside the tanks, thus eliminating their interface with the external environment.” *Id.* at 1:17–20. A stated purpose of the ’921 patent is “to provide a process for producing a plastic fuel tank with excellent control of the reproducibility and accuracy of the dimensions, which . . . is well suited to the incorporation of accessories before the molding phase.” *Id.* at 1:47–52.

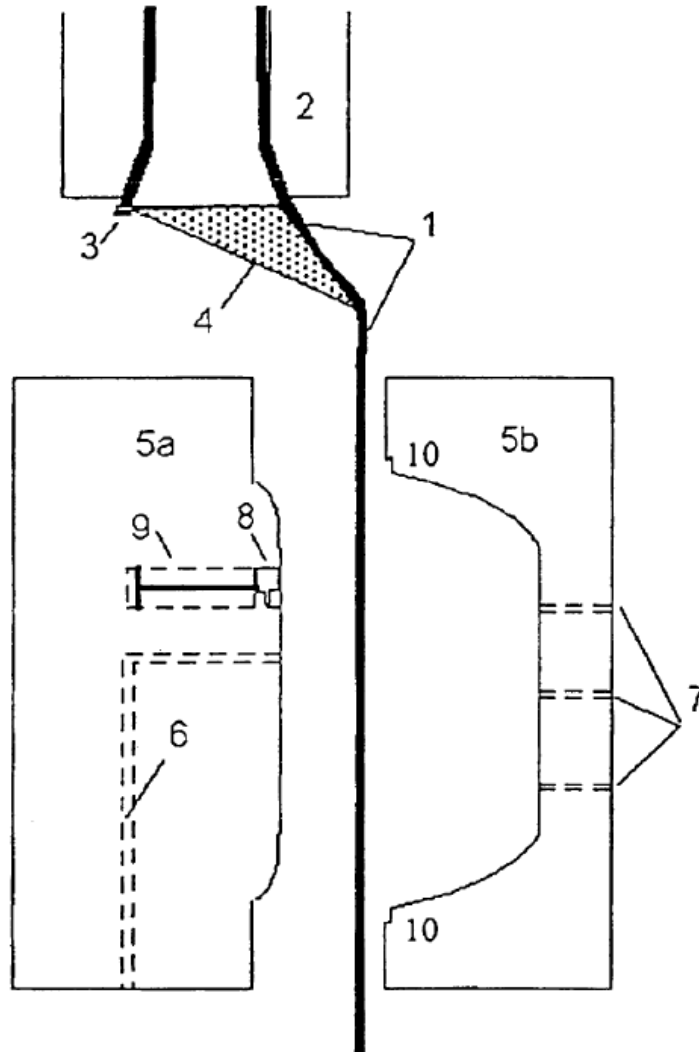
¹ Petitioner also relies on a declaration from Dr. David O. Kazmer. Ex. 1009.

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 A, published Aug. 9, 1994 (English translation and Japanese original both provided) (Ex. 1004, “Kagitani”).

⁴ Plastic Forming Company, U.K. Patent Publication No. 1,410,215, published Oct. 15, 1975 (Ex. 1005, “PFC”).

One embodiment of the invention is illustrated in the sole figure of the '921 patent, reproduced below:



The figure depicts “an extrusion-blow-molding installation with continuous extrusion used to produce automobile gas tanks.” *Id.* at 5:17–21. The circular die of extrusion head 2 produces tubular extrudate 1 of circular cross section. *Id.* at 5:21–27. As the tubular material leaves the extrusion head, it “is cut along a generatrix using . . . steel blade” 3. *Id.* at 5:24–27. The cut extrudate “is bent back to form a sheet” that is guided into mold 5. *Id.* at 5:28–30. Mold 5 is closed around the sheet, causing the sheet “to be

compression-molded” in region 10 of mold 5. *Id.* at 5:30–34. Pressurized air is supplied through line 6 to one side of the sheet, and air is evacuated from the other side of the sheet via lines 7. *Id.* at 5:34–38.

B. Illustrative Claim

Claims 1–5, 8, and 9 of the ’921 patent are challenged. Claim 1 is illustrative; it recites:

1. A process for manufacturing plastic hollow bodies from two shells formed by molding, which are joined together,
at least one shell being produced by compression-molding a portion of a plastic sheet between a mold and a punch and by the remaining portion of the sheet being blow-molded in the region not compression-molded,
characterized in that it is applied to the manufacture of a fuel tank
and in the sheet is obtained in the same manufacturing line as the shell which will be produced from this sheet, by the cutting and opening an extruded parison of closed cross section.

Ex. 1001, 5:44–6:5 (paragraphing added for clarity).

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);⁵ *see Cuozzo Speed Techs. LLC v. Lee*, 136 S. Ct. 2131, 2144 (2016)

⁵ A recent amendment to this rule does not apply here because the Petition was filed before November 13, 2018. *See* “Changes to the Claim Construction Standard for Interpreting Claims in Trial Proceedings Before

(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 five terms: “shell,” “punch,” “parison,” “stacked double molds (sandwich molds or stack molds),” and “accessory.” Pet. 8–11. Patent Owner discusses these terms as well. PO Resp. 13–19. We conclude that we need only construe “punch” in order to resolve this case. *Vivid Techs., Inc. v. Am. Sci. & Eng’g, Inc.*, 200 F.3d 795, 803 (Fed. Cir. 1999) (“only those terms need be construed that are in controversy, and only to the extent necessary to resolve the controversy”).

Petitioner proposes construing “punch” as “a device that compresses material against a portion of the mold to shape the material.” Pet. 9–10; Reply 2–4. Patent Owner argues that “punch” should be construed as “another mold portion that cooperates with the mold to clamp the sheet.” PO Resp. 14–17; Sur-Reply 3–5. We are not persuaded that either party proposes the correct broadest reasonable interpretation of the term “punch.”

Two of the challenged claims recite the term “punch.” In claim 1, “at least one shell” is “produced by compression-molding a portion of a plastic sheet between a mold and a punch,” with the remainder of the sheet being blow molded. Ex. 1001, 5:44–6:1. This claim language requires that the punch be separate from at least one portion of the mold, with the plastic sheet that is being formed located between the punch and that mold portion.

the Patent Trial and Appeal Board,” 83 Fed. Reg. 51,340 (Oct. 11, 2018) (to be codified at 37 C.F.R. pt. 42).

In claim 8, “at least one device” is “placed on the punch side or on the die side of the mold.” *Id.* at 6:30–32. This language makes clear that the punch must be associated somehow with one portion of the mold, making it possible to distinguish that mold portion (the punch side of the mold) from the opposing mold portion (the die side of the mold). *See* Tr. 36:10–19, 53:1–12, 89:23–90:7.

Thus, the claims of the ’921 patent place some requirements on a “punch.” The punch must be separated from one portion of the mold, with the plastic sheet that is being formed located between the punch and that mold portion, and the punch must be associated with the other portion of the mold, making it possible to distinguish a “punch side” and a “die side” of the mold. Thus, the proper construction of “punch” cannot be as broad as Petitioner suggests, encompassing any “device that compresses material against a portion of the mold to shape the material.”

The written description of the ’921 patent makes clear that the punch may be “fastened to [a] mold portion.” Ex. 1001, 2:48–51. Thus, the term “punch” must encompass at least some bodies that are separate from the mold itself, and it cannot be limited to covering only portions of the mold itself, as Patent Owner suggests. Of course, the punch may be part of the punch side of the mold. *Id.* at 5:31–33, Fig. 1 (depicting punch 5a as part of one portion of mold 5). The written description also makes clear that the sheet of material being formed is compression molded “in a region located between the punch . . . and the die.” *Id.*

Based on the foregoing, we determine that the construction that is consistent with both the language of the claims and the written description and sole figure of the ’921 patent is that a “punch” is “a device that is part

of, fastened to, or otherwise associated with one portion of the mold—the punch side of the mold—and, upon mold closure, acts to compress material against another portion of the mold—the die side of the mold—to shape the material.”

B. Asserted Obviousness over Kasugai and Kagitani

Petitioner argues that the subject matter of claims 1–5, 8, and 9 would have been obvious to a person of ordinary skill in the art given the teachings of Kasugai and Kagitani. Pet. 12–34.

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 1–5, 8, and 9. Pet. 12–34.

Patent Owner argues, *inter alia*, that the combination of Kasugai and Kagitani fails to teach either a “punch” or “compression-molding a portion of a plastic sheet between a mold and a punch.” PO Resp. 19–24.

a. Claim 1

As Petitioner argues, Pet. 13–27, claim 1 recites a preamble and four limitations: “[a] process for manufacturing plastic hollow bodies from two shells formed by molding, which are joined together,” “at least one shell being produced by compression-molding a portion of a plastic sheet between a mold and a punch and by the remaining portion of the sheet being blow-molded in the region not compression-molded,” “characterized in that it is applied to the manufacture of a fuel tank,” and characterized “in [that] the sheet is obtained in the same manufacturing line as the shell which will be produced from this sheet, by the cutting and opening an extruded parison of closed cross section.” Ex. 1001, 5:44–6:5.

With respect to the limitation requiring that the “at least one shell” be “produced by compression-molding a portion of a plastic sheet between a mold and a punch,” Petitioner argues that Kasugai’s “insert member,” which is made of a holding plate and attached accessories, acts as the required

“punch,” as well as that the pressing of plastic material against the insert member by the mold in Kasugai is the required compression molding between a mold and a punch. Pet. 15–19. Patent Owner opposes this argument, arguing that a person of ordinary skill in the art would not consider Kasugai’s “insert member” to be a “punch.” PO Resp. 19–24.

As discussed above, we construe “punch” as “a device that is part of, fastened to, or otherwise associated with one portion of the mold—the punch side of the mold—and, upon mold closure, acts to compress material against another portion of the mold—the die side of the mold—to shape the material.” Under this construction, it must be possible to identify one side of the mold as the “punch side” of the mold, because that side of the mold has a punch as part of its structure, or fastened to its structure, or in some other way associated with its structure. It is not possible to make such an identification in Kasugai. Kasugai’s mold has two mold halves, identified in Kasugai’s figures as items 22 and 23. Ex. 1003, 4:23–30, Fig. 1, Fig. 2. Kasugai does not refer to its insert member 7, or to any other item it discloses, as a “punch.” *Id.* at 1:1–12:36. And the insert member is not part of or fastened to either half of Kasugai’s mold. *Id.* at Fig. 1, Fig. 2. Both halves of Kasugai’s mold contain recessed portions into which the plastic material being formed is pressed by insert member 7. *Id.* Because Kasugai’s insert member 7 is not part of, attached to, or otherwise associated with either mold half to a greater extent than to the other half, it is not possible to identify either mold half 22 or mold half 23 as the “punch side” of the mold in Kasugai. Accordingly, we find that Kasugai does not teach or suggest the “punch” recited in claim 1 of the ’921 patent.

Because Petitioner relies on Kasugai to teach or suggest the recited “punch,” Pet. 19, and because Kasugai does not teach or suggest a “punch,” we determine that Petitioner has not shown by a preponderance of the evidence that the combination of Kasugai and Kagitani teaches or suggests all the limitations of claim 1.

b. Claims 2–5, 8, and 9

Claims 2–5, 8, and 9 each depend, directly or indirectly, from claim 1. Ex. 1001, 6:6–40. Accordingly, each of these claims includes all the limitations of claim 1. 37 C.F.R. § 1.75(c). As discussed above, Petitioner has not shown by a preponderance of the evidence that the combination of Kasugai and Kagitani teaches or suggests all the limitations of claim 1. Thus, Petitioner also has not shown by a preponderance of the evidence that the combination of Kasugai and Kagitani teaches or suggests all the limitations of claims 2–5, 8, and 9.

C. Asserted Obviousness over PFC and Kagitani

Petitioner argues that the subject matter of claims 1–5, 8, and 9 would have been obvious to a person of ordinary skill in the art given the teachings of PFC and Kagitani. Pet. 34–49.

1. *PFC*

PFC relates to “a new and useful method of and apparatus for molding hollow articles of thermoplastic material.” Ex. 1005, 1:12–16. In PFC, two molded plastic shells are joined to form a hollow body. *Id.* at 3:69–84, Figs. 3, 4. The shells are created by placing an intermediate plate between the two halves of a mold, with a plastic sheet between each of the mold halves and the intermediate plate, then closing the mold. *Id.* at 2:46–56, 2:119–125, 3:36–49, Figs. 1, 2. Once the mold is closed, the two sheets are

caused to conform to the surfaces of the mold halves by blow molding. *Id.* at 1:73–2:11, 3:57–63.

2. *Analysis*

Petitioner argues that a person of ordinary skill in the art would have had reason to combine the teachings of PFC with the teachings of Kagitani and that those combined teachings teach or suggest every limitation of claims 1–5, 8, and 9. Pet. 34–49.

Patent Owner argues, *inter alia*, that the combination of PFC and Kagitani fails to teach either a “punch” or “compression-molding a portion of a plastic sheet between a mold and a punch.” PO Resp. 33–37.

a. Claim 1

As Petitioner argues, Pet. 35–43, claim 1 recites a preamble and four limitations: “[a] process for manufacturing plastic hollow bodies from two shells formed by molding, which are joined together,” “at least one shell being produced by compression-molding a portion of a plastic sheet between a mold and a punch and by the remaining portion of the sheet being blow-molded in the region not compression-molded,” “characterized in that it is applied to the manufacture of a fuel tank,” and characterized “in [that] the sheet is obtained in the same manufacturing line as the shell which will be produced from this sheet, by the cutting and opening an extruded parison of closed cross section.” Ex. 1001, 5:44–6:5.

With respect to the limitation requiring that the “at least one shell” be “produced by compression-molding a portion of a plastic sheet between a mold and a punch,” Petitioner argues that PFC’s intermediate mold plate, which is placed between the mold halves during some forming operations, acts as the required “punch,” as well as that the pressing of plastic material

against the intermediate mold plate by the mold in PFC is the required compression molding between a mold and a punch. Pet. 37–38. Patent Owner opposes this argument, arguing that a person of ordinary skill in the art would not consider PFC’s intermediate mold plate to be a “punch.” PO Resp. 33–37.

As discussed above, we construe “punch” as “a device that is part of, fastened to, or otherwise associated with one portion of the mold—the punch side of the mold—and, upon mold closure, acts to compress material against another portion of the mold—the die side of the mold—to shape the material.” Under this construction, it must be possible to identify one side of the mold as the “punch side” of the mold, because that side of the mold has a punch as part of its structure, or fastened to its structure, or in some other way associated with its structure. It is not possible to make such an identification in PFC. PFC’s mold has two mold halves, identified in PFC’s figures as items 3 and 4. Ex. 1005, 2:107–116, Fig. 1, Fig. 2. PFC does not refer to its intermediate mold plate 5, or to any other item it discloses, as a “punch.” *Id.* at 1:1–7:117. And the intermediate mold plate is not part of or fastened to either half of PFC’s mold. *Id.* at Fig. 1, Fig. 2. Both halves of PFC’s mold contain recessed portions into which the plastic material being formed is pressed by intermediate mold plate 5. *Id.* Because PFC’s intermediate mold plate 5 is not part of, attached to, or otherwise associated with either mold half to a greater extent than to the other, it is not possible to identify either mold half 3 or mold half 4 as the “punch side” of the mold in PFC. Accordingly, we find that PFC does not teach or suggest the “punch” recited in claim 1 of the ’921 patent.

Because Petitioner relies on PFC to teach or suggest the recited “punch,” Pet. 39, and because PFC does not teach or suggest a “punch,” we determine that Petitioner has not shown by a preponderance of the evidence that the combination of PFC and Kagitani teaches or suggests all the limitations of claim 1.

b. Claims 2–5, 8, and 9

Claims 2–5, 8, and 9 each depend, directly or indirectly, from claim 1. Ex. 1001, 6:6–40. Accordingly, each of these claims includes all the limitations of claim 1. 37 C.F.R. § 1.75(c). As discussed above, Petitioner has not shown by a preponderance of the evidence that the combination of PFC and Kagitani teaches or suggests all the limitations of claim 1. Thus, Petitioner also has not shown by a preponderance of the evidence that the combination of PFC and Kagitani teaches or suggests all the limitations of claims 2–5, 8, and 9.

CONCLUSION

Upon consideration of the Petition, Response, Reply, Sur-Reply, and the evidence before us, we determine that Petitioner has not proven by a preponderance of the evidence that any of claims 1–5, 8, and 9 would have been obvious over either the combination of Kasugai and Kagitani or the combination of PFC and Kagitani.

ORDER

It is hereby

ORDERED that Petitioner has not proven by a preponderance of the evidence that claims 1–5, 8, and 9 of U.S. Patent No. 6,814,921 B1 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 confirming the patentability of claims 1–5, 8, and 9 of U.S. Patent No. 6,814,921 B1; 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.

IPR2017-01647
Patent 6,814,921 B1

PETITIONER:

Alyssa Caridis
Bas de Blank
Don Daybell
Vickie L. Freema
ORRICK, HERRINGTON, & SUTCLIFFE LLP
a8cptabdocket@orrick.com
M2BPTABDocket@orrick.com
D2DPTABDocket@orrick.com
PTABDocketVF4@orrick.com

PATENT OWNER:

Robert C. Mattson
Vincent Shier
Christopher Ricciuti
OBLON, MCCLELLAND, MAIER & NEUSTADT, LLP
CPDocketMattson@oblon.com
CPDocketShier@oblon.com
CPDocketRicciuti@oblon.com