UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

DONGHEE AMERICA, INC. and DONGHEE ALABAMA, LLC,

Petitioners

v.

PLASTIC OMNIUM ADVANCED INNOVATION AND RESEARCH,

Patent Owner

U.S. Patent 6,866,812
Issue Date: March 15, 2005
Title: Process for Manufacturing Hollow Plastic Bodies

CASE: Unassigned

Petition for *Inter Partes* Review of U.S. Patent 6,866,812

EXHIBIT LIST

Ex. 1001	U.S. Patent No. 6,866,812 ("'812 Patent")
Ex. 1002	Patent File History for U.S. Patent No. 6,866,812 ("File History") (Excerpts)
Ex. 1003	U.S. Patent No. 4,952,347 ("Kasugai")
Ex. 1004	Japanese Laid-open Patent Publication No. Hei 6-218792 and a certified translation thereof ("Kagitani")
Ex. 1005	Japanese Laid-open Patent Publication No. Sho 56-51333 and a certified translation thereof ("Hatakeyama")
Ex. 1006	European Patent Publication No. EP 0 742 096 A2 ("Hata")
Ex. 1007	French Patent Publication No. 2 420 415 and a certified translation thereof ("Frame")
Ex. 1008	Japanese Laid-open Patent Publication No. Sho 55-101415 and a certified translation thereof ("Asano")
Ex. 1009	U.S. Patent No. 5,129,544 ("Jacobson")
Ex. 1010	Declaration of Expert David Kazmer Ph.D. ("Kazmer")

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I. INTRODUCTION

Petitioners Donghee America, Inc. and Donghee Alabama LLC (collectively, "Petitioners") respectfully request *inter partes* review of claims 16, 24-27, 30-32, 38-41, 44, and 45 of U.S. Patent No. 6,866,812 ("'812 Patent", attached as Ex. 1001). For the reasons set forth below, there is a reasonable likelihood that the challenged claims are unpatentable.

The '812 Patent is directed to a process for making a plastic hollow body by molding two plastic sheets, wherein a parison is cut to make the two sheets. However, it was well known by the time of the invention of the '812 Patent that two sheets of plastic could be molded to form a hollow body. It was also well known that a parison could be cut to provide two moldable plastic sheets. As demonstrated herein, the '812 Patent claims nothing more than the obvious combination of using the prior art cutting process to obtain the plastic sheets needed for the prior art sheet molding process.

II. MANDATORY NOTICES UNDER 37 C.F.R. § 42.8(B)

A. REAL PARTY IN INTEREST

Petitioners, together with Kautex Textron GmbH & Co. KG, Donghee Industrial Co., Ltd., and DH Holdings Co., Ltd., are the real parties in interest.

B. RELATED MATTERS

The ’812 Patent is asserted against Petitioners in a lawsuit brought by Patent Owner, *Plastic Omnium Advanced Innovation and Research v. Donghee America, Inc. et al.*, C.A. No. 16-cv-00187-LPS-CJB (D. Del.). The Complaint was served on June 21, 2016. Other patents asserted in the litigation are U.S. Patent Nos. 6,814,921; 7,166,253; 8,122,604; 8,163,228; 9,079,490; 9,399,326; and 9,399,327.

C. NOTICE OF COUNSEL AND SERVICE INFORMATION

Petitioners consent to e-mail service at the address below.

Lead Counsel	Backup Counsel
Alyssa Caridis a8cptabdocket@orrick.com Registration No. 57,545	Bas de Blank M2BPTABDocket@orrick.com Registration No. 74,930
ORRICK, HERRINGTON, & SUTCLIFFE LLP 777 South Figueroa Street, Suite 3200 Los Angeles, CA 90017 Tel: 213-629-2020/Fax: 213-612-2499 Customer No. 34313	

III. REQUIREMENTS FOR INTER PARTES REVIEW

As set forth below, this Petition meets and complies with all requirements under 37 C.F.R. § 42.104 for *inter partes* review.

A. GROUND FOR STANDING

Pursuant to 37 C.F.R. § 42.104(a), Petitioners certify that the ’812 Patent is available for *inter partes* review and Petitioners are not barred or estopped from

requesting *inter partes* review challenging the claims of the '812 Patent on the grounds identified herein.

B. IDENTIFICATION OF CHALLENGE

Pursuant to 37 C.F.R. § 42.104(b), Petitioners request that the PTAB invalidate the challenged claims of the '812 Patent.

1. Challenged Claims

Claims 16, 24-27, 30-32, 38-41, 44, and 45 of the '812 Patent are challenged in this Petition.

2. The Prior Art And Statutory Grounds.

The prior art references relied upon herein are: U.S. Patent No. 4,952,347 ("Kasugai", Ex. 1003); Japanese Laid-open Patent Publication No. Hei 6-218792 ("Kagitani", Ex. 1004); Japanese Laid-open Patent Publication No. Sho 56-51333 ("Hatakeyama", Ex. 1005); and European Patent Publication No. EP 0 742 096 A2 ("Hata", Ex. 1006).

Below are the specific statutory grounds under 35 U.S.C. § 103 (pre-AIA) on which the claims are challenged:

Ground 1: Claims 32, 38, 39, 40, 41, 44, and 45 are rendered obvious under § 103 by Kasugai in view of Kagitani.

Ground 2: Claims 16, 24, 25, 26, 27, 30, and 31 are rendered obvious under § 103 by Kasugai in view of Kagitani and in further view of Hata.

Ground 3: Claims 32, 38, 39, 40, 41, 44, and 45 are rendered obvious under § 103 by Hatakeyama in view of Kagitani.

Ground 4: Claims 16, 24, 25, 26, 27, 30, and 31 are rendered obvious under § 103 by Hatakeyama in view of Kagitani and in further view of Hata.

While directed to the same set of claims, Grounds 1 and 2 are not redundant of Grounds 3 and 4, respectively. For example, unlike Hatakeyama, Kasugai does not expressly disclose cutting open a parison (though this step is disclosed by Kagitani). Unlike Kasugai, Hatakeyama does not disclose molding two plastic sheets (though this step is disclosed by Kagitani).

Petitioners are not aware of any secondary considerations that would impact the obviousness of the claims.

3. Claim Construction

A claim subject to *inter partes* review shall be given by the Patent Office "its broadest reasonable construction in light of the specification of the patent in which it appears" to one of ordinary skill in the art. 37 C.F.R. §§ 42.100(b) and 42.104(b)(3). Petitioners' proposed constructions of certain terms in the challenged claims pursuant to this standard are provided in Section VI below.

4. Identification Of Elements In The Prior Art

An explanation of how claims 16, 24-27, 30-32, 38-41, 44, and 45 of the '812 Patent are unpatentable, including an identification of where each element of the claims is found in the prior art is provided in Section VIII below.

5. Supporting Evidence

Supporting evidence relied upon includes excerpts of the File History of the '812 Patent ("File History", Ex. 1002) and the Declaration of David Kazmer Ph.D. ("Kazmer", Ex. 1010).

IV. OVERVIEW OF THE '812 PATENT

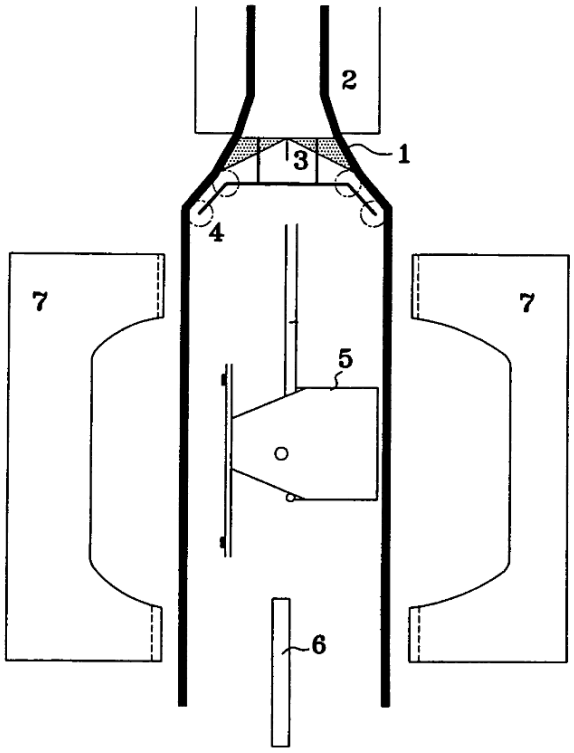
The '812 Patent is titled "Process for Manufacturing Hollow Plastic Bodies." The application that matured into the '812 Patent was filed on December 22, 2000, and the patent issued on March 15, 2005. The '812 Patent purports to claim priority to a foreign application (Belgium) filed on December 22, 1999. The face of the patent lists Jules-Joseph Van Schaftingen, Yannick Gerard, Stéphane Leonard, Serge Dupont, and Jöel Op De Beeck as inventors, and states that the patent was assigned to Solvay (Societe Anonyme). According to the assignment record filed with the PTO, Solvay (Societe Anonyme) assigned its interest in the patent to Inergy Automotive Systems Research (Societe Anonyme), which has since changed its name to Plastic Omnium Advanced Innovation and Research.

A. SUMMARY OF THE '812 PATENT

The '812 Patent is directed to a process for making plastic hollow bodies, particularly fuel tanks. The specification explains that stricter environmental regulations had forced fuel tank manufactures to incorporate fuel system accessories within the tanks themselves to limit emissions. Ex. 1001, '812 Patent at 1:8-23. Thus, by the time of '812 Patent, "[t]he insertion of accessories into a parison intended subsequently to be blown in order to produce a hollow body is itself well known and found in many industrial applications in the manufacture of hollow bodies, particularly in that of liquid and gas tanks." *Id.* at 1:24-28. However, according to the patent, "inserting accessories into a closed cylindrical parison proves to be tricky when they are bulky: this is because it is important for the parison to cover the accessories without interfering with them before the blowing operation is carried out." *Id.* at 1:29-33. The '812 Patent purports to overcome this drawback with "a process for manufacturing hollow plastic bodies from an extruded parison of closed cross section, in which at least one cut is made in the parison which is then formed by moulding." *Id.* at 1:54-57.

In the illustrated embodiment, reproduced below, "[t]he tubular multilayer extrudate [*i.e.*, parison] (1) of circular cross section… is separated into two sheets (1), using two steel blades (3) placed at 180° to each other, at the exit of the circular die mounted on the extrusion head (2)." *Id.* at 5:23-31. "The two sheets (1)

are guided and kept apart using wheels (not shown) and rollers (4),” and accessories are inserted between the sheets. *Id.* at 5:32-36. Finally, the mold halves are closed, which “caus[es] the two sheets to be welded together,” and air is injected to form the tank. *Id.* at 5:37-42.



The specification of the ’812 Patent describes a prior art method for making a blow molded fuel tank from two sheets at 1:34-47. Specifically, the ’812 Patent purports to describe the Kasugai prior art (relied on by Petitioners) as requiring “two extrusion heads and/or extruders capable of simultaneously producing two flat sheets….” *Id.* at 1:42-47. However, that is an inaccurate description of Kasugai, because Kasugai does not set forth any particular method or structure for producing two flat sheets. As will be explained in further detail in Ground 1

(claim 32-b), a POSITA would have been motivated to combine Kasugai with prior art machines that form two sheets by making two cuts in a parison to make the two sheets required in Kasugai's process. Such art was not considered by the Examiner.

B. SUMMARY OF THE FILE HISTORY

The application which lead to the '812 Patent was filed on December 22, 2000 as Appl. No. 09/741,811. In the first Office Action, dated October 16, 2003, the Examiner i) rejected claims 1-4, 12-15, and 20 of the application as anticipated by Tsuchida (JP S59109328A), ii) rejected claims 1, 3, 4, 6, and 14 as anticipated by Hiekazu (JP S61032735A), and iii) rejected claim 11 as obvious in view of Tsuchida and Kasugai. Ex. 1002, File History at 20. According to the Examiner, the Tsuchida and Hiekazu references both teach extruding a parison, making a single longitudinal cut in the parison, inserting an object into the cut parison, and blow molding the parison to make a headrest, with the object incorporated into the headrest. *Id.* at 20-21. The Examiner further stated that Kasugai teaches a method of blow molding a parison with an insert and it would have been obvious "to use the method taught by Tsuchida to form the article taught by Kasugai in order to quickly and easily form a fuel tank with an insert integrally bonded thereto." *Id.* at 20. The Examiner objected to claims 5-9 and 16-19 "as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims." *Id.*

at 21. Claims 5 and 16, for example, recited "the parison is cut twice over its entire length, along two separate lines, so as to produce two separate sheets." *Id.* at 12, 16.

On February 17, 2004, the Applicant cancelled all of the claims and added new claims 21-69. *Id.* at 29. The Applicant argued that the claims were patentable because they are "directed to a process of manufacturing a hollow body *for receiving a liquid*," require "extruding, cutting and molding *a multilayered* parison comprising *stacked layers* fastened to each other," or are directed to "a process for manufacturing a *fuel tank*." *Id.* at 30 (emphasis in original). In contrast, the Tsuchida and Hiekazu references, "disclose methods of molding an insert to a *headrest*. They do not appear to disclose hollow bodies for receiving liquids, multilayered parisons, nor fuel tanks." *Id.* (emphasis in original).

The Applicant further argued that Kasugai "does not teach or suggest a step of cutting through an extruded parison so as to form two portions separated by a cut," and "there is insufficient evidence for any motivation to modify the Kasugai method by incorporating the Tsuchida and Hidekazu teachings…." *Id.* at 31. Specifically, the Applicant argued that Kasugai "does not suggest a step of cutting through an extruded parison would be desired," and a POSITA in the art of fuel tank manufacturing would not look to prior art concerning headrests. *Id.* at 32.

In a Final Office Action dated August 17, 2004, the Examiner again applied Tsuchida in view of Kasugai to reject claims 21-23, 25-33, 35, 37-40, 42-50, 52-55, 57-66, 68, and 69. The Examiner dismissed the Applicant's argument that Tsuchida and Kasugai are not combinable, stating that the references "are combinable because they solve the same problem, that of molding articles with inserts therein." *Id.* at 39-40. The Examiner objected to claims 24, 34, 41, 51, 56, and 67 "as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims." *Id.* at 40. Claims 24, 41, and 56 recited "wherein said step of cutting said parison comprises making at least two cuts in said parison so as to form two separate sheets" or a similar limitation. *Id.* at 23, 25, 26.

In response, on November 17, 2004, the Applicant amended the independent claims to include the "at least two cuts" limitation of claims 24, 41, and 56. *Id.* at 43-48. On December 3, 2004, the Examiner issued the Notice of Allowance. *Id.* at 54.

V. LEVEL OF ORDINARY SKILL IN THE ART

A person of ordinary skill in the art ("POSITA") at the time of the alleged invention of the '812 Patent would be a degreed Mechanical or Plastics engineer with three years of experience directly related to plastics product design and molding. Alternatively, a non-degreed practitioner with ten years of experience

directly related to plastics product design and molding could also be considered one of ordinary skill in the art. Ex. 1010, Kazmer ¶ 12.

Petitioners' expert, Dr. David Kazmer, would have been a POSITA as of the '812 Patent's priority date. *Id.* ¶ 13. Today, he is a professor and Chair of the Department of Plastics Engineering at the University of Massachusetts Lowell. *Id.* ¶ 3.

VI. PROPOSED CLAIM CONSTRUCTION

Petitioner proposes construction of certain claim terms below pursuant to the broadest reasonable interpretation standard. The proposed claim constructions are offered to comply with 37 C.F.R. §§ 42.100(b) and 42.104(b)(3) and for the sole purpose of this Petition, and thus do not necessarily reflect appropriate claim constructions to be used in litigation where a different claim construction standard applies.

1. "Parison"

Claims 16 and 32 recite "extruding a multilayered parison" and "extruding a parison," respectively. The '812 Patent states: "The term 'extruded parison' is understood to mean 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. According to the invention, the parison has a closed cross section. Preferably, this cross section is circular or elliptical." Ex. 1001, '812

Patent at 2:35-40. "[T]he PTO must give claims their broadest reasonable construction consistent with the specification." *In re ICON Health & Fitness, Inc.*, 496 F.3d 1374, 1379 (Fed. Cir. 2007). Therefore, the PTO must "look to the specification to see if it provides a definition for claim terms, but otherwise apply a broad interpretation." *Id.* Accordingly, as the '812 patent provides a definition of "parison," the broadest reasonable interpretation of "parison" is "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." *See* Ex. 1010, Kazmer ¶ 18.

2. "Hollow Body"

Claim 16 recites a "process for manufacturing a hollow body…." The '812 Patent states that: "The term 'hollow body' is understood to mean any article whose surface has at least one empty or concave part. In particular, the process according to the invention is well suited to the manufacture of hollow articles which are in the form of closed bodies, such as tanks." Ex. 1001, '812 Patent at 1:58-62. Accordingly, the broadest reasonable interpretation of "hollow body" is "any article whose surface has at least one empty or concave part." *See* Ex. 1010, Kazmer ¶ 19.

VII. IDENTIFICATION OF THE REFERENCES AS PRIOR ART

With the exception of Kasugai, none of the prior art references relied on by Petitioners were before the Examiner during the prosecution of the ’812 Patent. And the mere fact Kasugai was before the Examiner should not prevent a finding of a reasonable likelihood of success based on Kasugai as the combination of Kasugai with Kagitani or Hata was not before the Examiner.

Each of the prior art references relied upon by Petitioners qualifies as prior art under 35 US.C. § 102(b) (pre-AIA):

- Kasugai (Ex. 1003) issued on August 28, 1990, more than one year prior to the earliest priority date of the ’812 Patent, and is thus prior art under § 102(b).
- Kagitani (Ex. 1004) was laid-open on August 9, 1994, more than one year prior to the earliest priority date of the ’812 Patent, and is thus prior art under § 102(b).
- Hatakeyama (Ex. 1005) was laid-open on May 8, 1981, more than one year prior to the earliest priority date of the ’812 Patent, and is thus prior art under § 102(b).
- Hata (Ex. 1006) was published on November 13, 1996, more than one year prior to the earliest priority date of the ’812 Patent, and is thus prior art under § 102(b).

VIII. DETAILED EXPLANATION OF UNPATENTABILITY OF CLAIMS 16, 24-27, 30-32, 38-41, 44, AND 45 OF THE '812 PATENT

A. GROUND 1: OBVIOUSNESS BY KASUGAI IN VIEW OF KAGITANI

Kasugai in view of Kagitani render obvious claims 32, 38, 39, 40, 41, 44, and 45 under 35 U.S.C. § 103.

Kasugai is titled "Method of Manufacturing a Fuel Tank from Synthetic Resin." Like the '812 Patent, Kasugai is directed to incorporating accessories into plastic fuel tanks during the manufacturing process. *See, e.g.*, Ex. 1003, Kasugai at 2:17-25 ("In the method of manufacturing a fuel tank of synthetic resin according to the present invention, component parts are previously fixed to a holding plate of synthetic resin being used as an insert member to be set as an insert to a blow molding mold to mold an outside wall and in this state the outside wall is formed around the insert member by blow molding and the holding plate is fixed to the inner circumferential surface of the outside wall."). Kasugai teaches that, in a preferred embodiment, the tank may be made by blow molding two plastic sheets. *See, e.g.*, *id.* at 5:42-45 ("although the cylindrical parison 28 for extrusion from the head 29 is exemplified, the parison 28 may be composed of two sheets of parisons 38").

1. Claim 32

[32-preamble] A process of manufacturing a fuel tank, comprising the steps of:

Kasugai discloses a process for manufacturing a fuel tank. Ex. 1003, Kasugai at 1:7-10 ("The present invention relates to a method of manufacturing a fuel tank for automobiles, and more particularly to a method of manufacturing a fuel tank of synthetic resin formed by blow molding.").

Thus, to the extent the preamble is determined to be limiting, Kasugai discloses this element. *See* Ex. 1010, Kazmer ¶ 43.

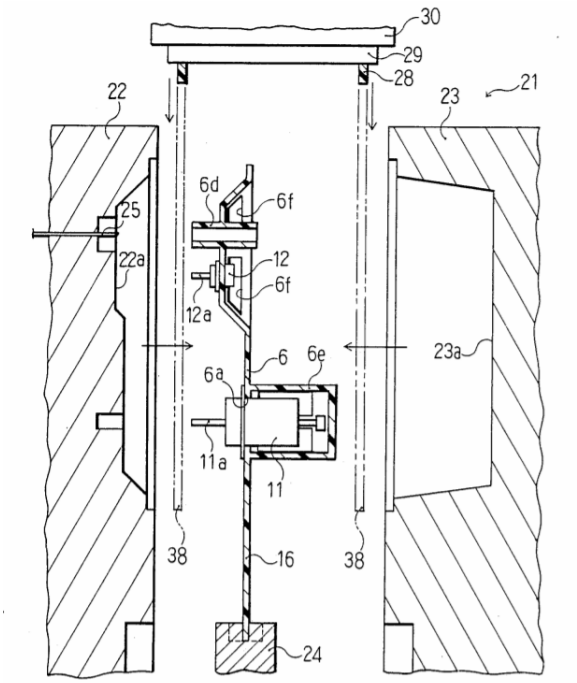
[32-a] extruding a parison;

Kasugai discloses extruding a "cylindrical parison" and blow molding it to form a fuel tank. Ex 1003, Kasugai at 4:59-65 ("The cylindrical parison 28 extruded from the head 29 of the molding machine 30 is arranged around the insert member 7 along the base portion 6A. The mold tightening is performed, and the air blowing port 25 is inserted from position of the pipe portion 6d into the parison 28 and air is blown into the parison 28.").

Accordingly, Kasugai discloses limitation 32-a. *See* Ex. 1010, Kazmer ¶¶ 44-45.

[32-b] cutting through said parison so as to form two portions separated by a cut; and

In addition to blow molding a cylindrical parison, Kasugai also discloses other embodiments where the tank is formed by blow molding two sheets of plastic. Specifically, Kasugai states that "although the cylindrical parison 28 for extrusion from the head 29 is exemplified, the parison 28 may be composed of two sheets of parisons 38 as shown in FIG. 7," which is reproduced below. Ex 1003, Kasugai at 5:42-45; *see also id.* at 8:23-26, claims 6 and 14.



Kasugai does not disclose how the two sheets are formed. There is no disclosure explaining the process or structure for forming the two plastic sheets. A

POSITA would have been aware of prior art processes and structures for creating plastic sheets suitable for blow molding. Ex. 1010, Kazmer ¶ 47. A POSITA would have known of many different options at the time for creating two plastic sheets. *Id.* ¶ 47. One such option is disclosed by Kagitani, which is titled "Method and device for producing a plastic sheet."

Kagitani expressly discloses a sheet forming method that involves extruding a parison, cutting the parison to form two portions, and flattening the two parison portions into two sheets suitable for blow molding. Ex. 1004, Kagitani ¶ 4 ("in the plastic sheet production method of the present invention, 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 the diameter of which increases progressively in the downward direction, turning the parison into a sheet shape" (emphasis added)), ¶ 7 ("providing severing ***blades in two locations allows the parison 35 to be made into two sheets and used in a blow molding method***" (emphasis added)).

Specifically, Kagitani's method starts by extruding parison 35 from "annular die slit 34 (parison output opening)." Ex. 1004, Kagitani ¶ 6; *see also id.* ¶ 7 ("extruding the molten resin… from the die slit 34 to the outside in a tubular shape"). Within the die, central core 24 is moveable in the axial direction for adjusting the width of die slit 34, thereby providing the ability to alter the thickness

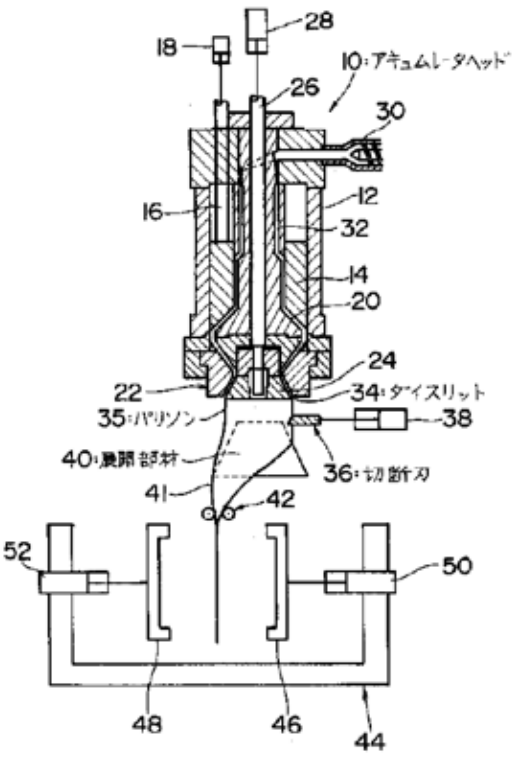
of the parison as it is extruded. *Id.* ¶ 6 (when "core 24 [moves] in the axial direction, the width dimension of the die slit 34 (i.e. the dimension in the radial direction) changes."), *id.* ¶ 7 ("thickness-adjusting hydraulic cylinder 28 is operated to move the core 24 in the upward direction… reducing the width dimension of the die slit 34 and making the parison 35… thinner, or conversely, the core 24 is moved in the downward direction… increasing the width dimension of the die slit 34 and making the parison 35… thicker, thus enabling consecutive adjustment of the thickness of the parison 35).

As the parison is extruded and moves downward, it reaches severing blade 36 below the die, and severing blade 36 cuts the parison along its length. Ex. 1004, Kagitani ¶ 6 ("a severing blade 36 that can sever the parison 35… is provided below the die 22"), *id.* ¶ 7 ("[t]he parison 35 that has been extruded from the die slit 34 is severed at a prescribed position in the vertical direction by the severing blade 36"). Kagitani expressly discloses that a second severing blade can be added for making two cuts in the parison to form two sheets for blow molding. *Id.* ¶ 7 ("It should be noted that the severing blade 36 is provided in one location in the abovementioned embodiment but is not limited to such a configuration, and providing severing blades in two locations allows the parison 35 to be made into two sheets and used in a blow molding method.").

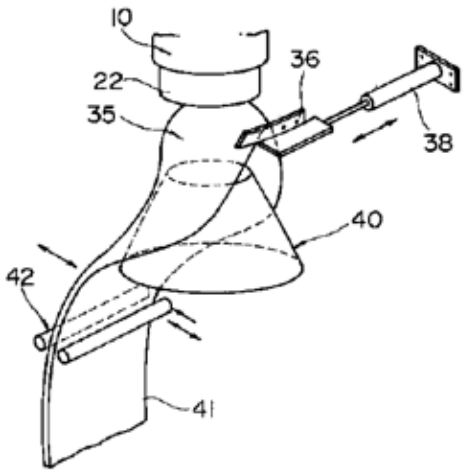
After the parison has been cut into two semi-circular pieces, expansion member 40 expands or flattens the pieces into sheets, which are guided to between the mold halves by rollers 42. *Id.* ¶ 7 ("the severed parison 35 is expanded into a sheet shape by the expansion member 40 and then pinched… by the guide rolls 42 and guided to a position between the molds").

Figures 1 and 2 of Kagitani, reproduced below, illustrate the structure of Kagitani's one blade embodiment.

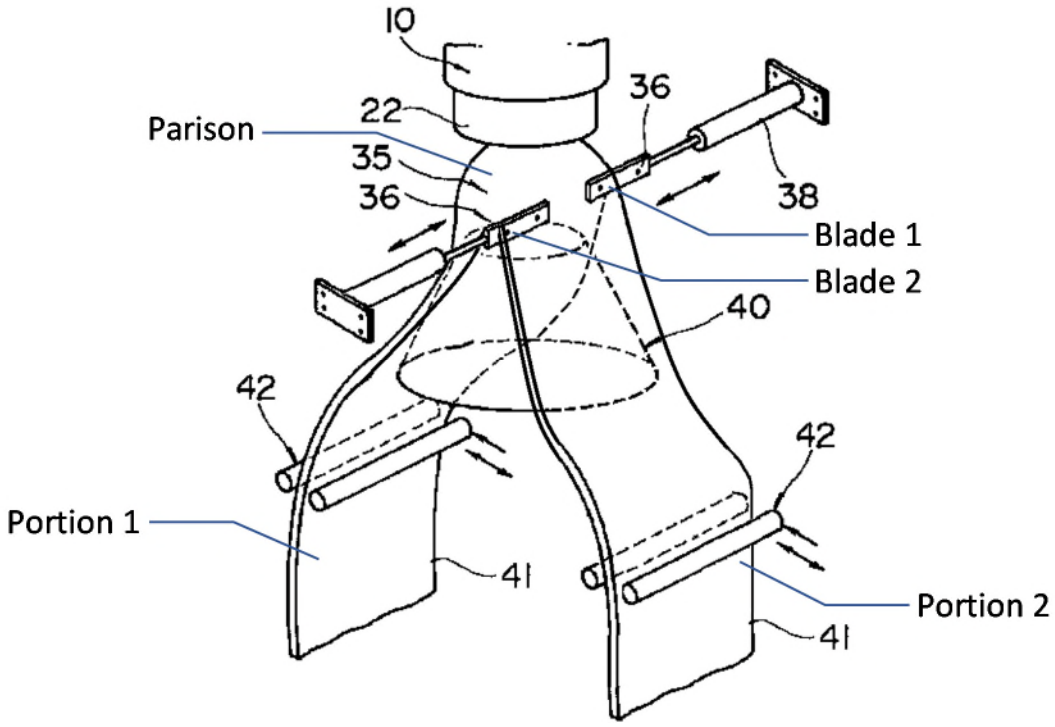
【図1】



【図2】



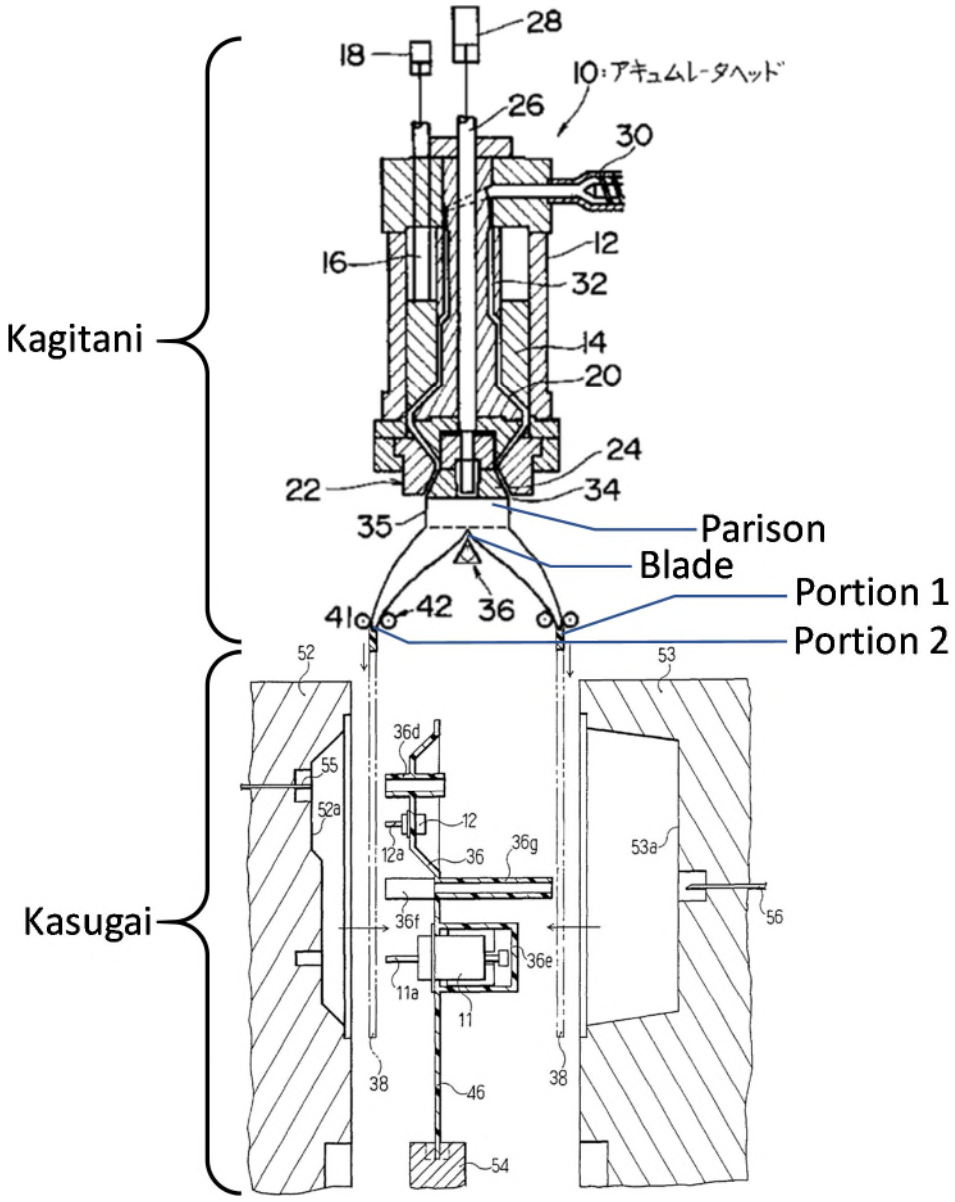
Though Kagitani does not provide an illustration of its expressly disclosed two blade embodiment, a demonstrative showing what a two blade system would potentially look like is shown below.



Kazmer-1: Demonstrative of Kagitani FIG. 2 showing Kagitani's method of providing of two sheet portions by cutting parison 35 with blade 36

Because Kagitani discloses that its two blade cutting method "allows the parison [ ] to be made into two sheets and used in a blow molding method" (Ex. 1004, Kagitani ¶ 7), a POSITA would have been motivated to combine Kagitani with Kasugai by a desire to gain a manufacturing advantage by making the two plastic sheets needed for Kasugai's blow molded fuel tank from a single extruded cylindrical parison. Ex. 1010, Kazmer ¶ 53. Indeed, Kagitani does not restrict the use of the plastic sheets made using its method to blow molding only certain types of articles. A POSITA would understand that the two sheets output by Kagitani could be directly used as the two input sheets of Kasugai. *Id.* ¶ 52. A

demonstrative depicting how this obvious combination of Kasugai with Kagitani might look is shown below.



Kazmer-2: Demonstrative of Kasugai FIG. 7 showing the incorporation of Kagitani's two output sheets 41 as input sheets 38 to Kasugai.

Further, a POSITA would have been motivated to specifically select Kagitani over other prior art methods of forming plastic sheets in order to achieve

Kagitani's disclosed benefits over other such methods. Ex. 1010, Kazmer ¶ 54. In particular, Kagitani states that in other methods for making two sheets, the "bifurcation members" that divide a circular-shaped plastic melt flow into two semi-circular flows (and subsequently expanded into sheets) were located in the extrusion head. Ex. 1004, Kagitani ¶ 2. Because of the position of the bifurcation members in the extrusion head, it was not possible to change the width of the slit through which the plastic is extruded, and thus it was not possible to continuously change the thickness of the sheets along their length. *Id.* ¶ 3 ("Accordingly, when the sheet thickness is to be changed, because it is necessary to fit a core having a different dimension in the radial direction into the die, this gives rise to the problem that it is not possible to form a sheet while changing its vertical direction thickness in a consecutive manner."). Thus these other methods had the disadvantage that "the thickness of the parison must be made to match the thickness of the thickest part of the molded product, giving rise to the problem that the number of unnecessarily thick portions increases and the weight of the molded product also increases." *Id.* And attempts to overcome this limitation had resulted only in larger and more expensive systems, which was not desirable. *Id.*

Kagitani overcomes these limitations of the other sheet forming systems by moving the "bifurcation members" from a location within the extrusion head to a location below the exit of the die (Kagitani's severing blades), which enables the

use of a head with an adjustable "parison output opening" (annular die slit 34) that can modify the thickness of the parison as it is extruded. Ex. 1004, Kagitani ¶¶ 3, 4; *see also* Ex. 1010, Kazmer ¶ 56. A POSITA would have been motivated to specifically choose Kagitani's method and system to form the sheets of Kasugai's fuel tank to gain the manufacturing advantage of making tanks with walls of variable thickness, such that the tank walls could be made thin in certain areas (*e.g.,* places where no accessories are attached and the structural load is otherwise not high), and thick in other areas, resulting in cost and weight savings. Ex. 1010, Kazmer ¶ 56.

Yet another motivation to combine Kagitani and Kasugai is described in the specification of '812 Patent. The '812 Patent states that prior art methods (incorrectly characterizing Kasugai as one of these methods) have "the drawback of having to position two extrusion heads and/or extruders capable of simultaneously producing two flat sheets, the thickness uniformity and the production uniformity of which are constant from one sheet to another and at any point on each of the sheets." Ex. 1001, '812 Patent at 1:42-47. Thus, a POSITA would have selected Kagitani over methods that require two extrusion heads or extruders by a desire to gain the manufacturing benefit of using a single extrusion head. Ex. 1010, Kazmer ¶ 57.

Accordingly, Kagitani discloses limitation 32-b and it would have been obvious to combine Kagitani and Kasugai. *See* Ex. 1010, Kazmer ¶¶ 46-60.

[32-c] molding said two portions so as to form said fuel tank,

Kasugai discloses blow molding two plastic sheets to form a fuel tank. *See, e.g.*, Ex. 1003, Kasugai at 4:62-66 ("The mold tightening is performed, and the air blowing port 25 is inserted from position of the pipe portion 6d into the parison 28 and air is blown into the parison 28."), 5:42-45 ("although the cylindrical parison 28 for extrusion from the head 29 is exemplified, the parison 28 may be composed of two sheets of parisons 38 as shown in FIG. 7"), claim 6.

Accordingly, the combination of Kasugai and Kagitani discloses limitation 32-c. *See* Ex. 1010, Kazmer ¶¶ 61-62.

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

As discussed above with respect to limitation 32-b, Kagitani discloses two severing blades for making two cuts in the parison to form two separate sheets for blow molding. Ex. 1004, Kagitani ¶ 7 ("It should be noted that the severing blade 36 is provided in one location in the abovementioned embodiment but is not limited to such a configuration, and providing severing blades in two locations allows the parison 35 to be made into two sheets and used in a blow molding method.").

Indeed, Kagitani was not the first to disclose this limitation (the purportedly key feature of the '812 patent). Methods for making two cuts in a parison so as to form two separate sheets were well known in the art by at least the early 1980s. *See* Ex. 1010, Kazmer ¶ 63; Ex. 1007, Frame at 2 (1979 publication stating "a cutting component is arranged… to diametrically separate the parison [ ] into two sheets"); Ex. 1008, Asano at 2 (1980 publication "to form the parison [ ] into a plurality of plate-like bodies, the plurality of cutting blades… are disposed on the inside or outside of the outlet" of the extruder).

Accordingly, the combination of Kasugai and Kagitani discloses limitation 32-d. *See* Ex. 1010, Kazmer ¶¶ 63-64. Claim 32 of the '812 Patent is therefore rendered obvious by Kasugai in view of Kagitani. *Id.* ¶¶ 63-65.

2. Claim 38

The process of claim 32, wherein said step of molding comprises a step of holding apart said two portions of said parison and a subsequent step said two portions together.

Kasugai discloses that the two plastic sheets are initially held apart, and are brought together by the closing of the mold halves to form the fuel tank. *See, e.g.,* Ex. 1003, Kasugai at Figure 11, 4:59-66, 5:42-45, 8:23-26, claims 6 and 14.

Further, Kagitani discloses that guide rolls 42 are used to guide the sheets "to a position between the molds," thereby holding the sheets apart before they

would be brought together by the closing of the blow mold halves. Ex. 1004, Kagitani ¶ 7.

Accordingly, Kasugai in view of Kagitani render obvious claim 38 of the '812 Patent. *See* Ex. 1010, Kazmer ¶¶ 66-69.

3. Claim 39

The process of claim 38, further comprising a step of inserting an object in said parison during said step of holding a part said two portions.

Kasugai discloses an "insert member" made of a holding plate and a number of fuel system components "previously fixed" to the holding plate. Ex. 1003, Kasugai at 2:17-25 ("In the method of manufacturing a fuel tank of synthetic resin according to the present invention, component parts are previously fixed to a holding plate of synthetic resin being used as an insert member to be set as an insert to a blow molding mold to mold an outside wall and in this state the outside wall is formed around the insert member by blow molding and the holding plate is fixed to the inner circumferential surface of the outside wall.").

The "insert member" is inserted between the mold halves and into the open parison for attachment to the internal wall of the tank. *Id.*; *see also id.* at 4:59-5:1 ("The cylindrical parison 28 extruded from the head 29 of the molding machine 30 is arranged around the insert member 7 along the base portion 6A. The mold tightening is performed, and the air blowing port 25 is inserted from position of the

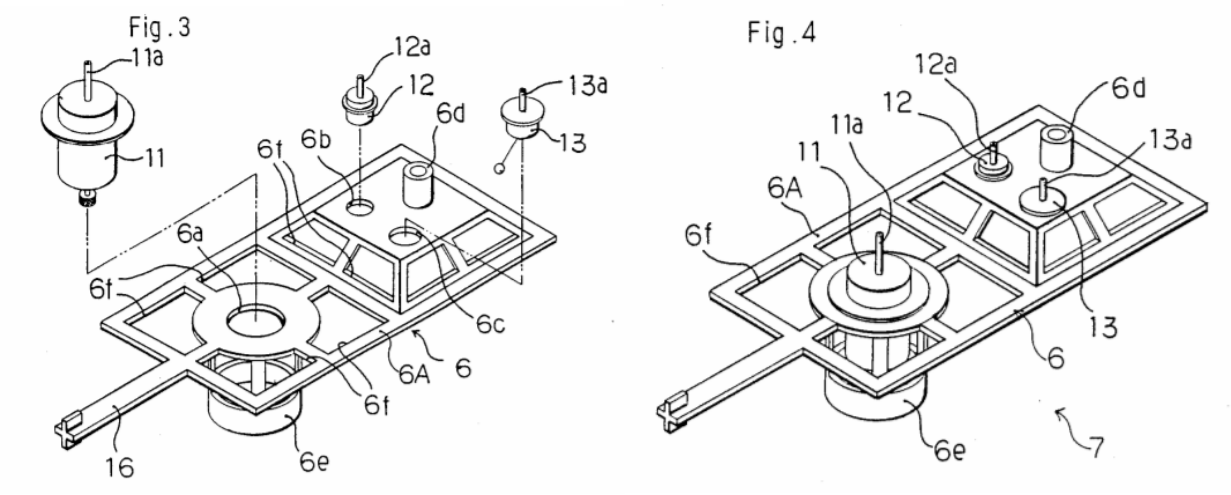
pipe portion 6d into the parison 28 and air is blown into the parison 28. The outside wall 2 is formed by blow molding (refer to FIG. 1). Since the outer periphery of the base portion 6A of the holding plate 6 is grasped by the parison 28 and pressed then, the melting bonding strength becomes good."). In the combination of Kasugai with Kagitani, the insertion of the objects would also be done while the mold halves are open and the two plastic sheets are apart. Ex. 1010, Kazmer ¶¶ 70-72. This is shown in the Kazmer-2 demonstrative above depicting the combination of Kagitani's structure for forming two plastic sheets with Kasugai's structure for blow molding a tank from two sheets.

Accordingly, Kasugai in view of Kagitani render obvious claim 39 of the '812 Patent. *See* Ex. 1010, Kazmer ¶¶ 70-73.

4. Claim 40

The process of claim 39, wherein said object is a preassembled structure.

As discussed above with respect to claim 39, the "component parts are ***previously*** fixed to a holding plate of synthetic resin being used as an insert member." Ex. 1003, Kasugai at 2:17-25 (emphasis added). Accordingly, the insert member is a preassembled structure. Below, Figure 3 of Kasugai depicts the holding plate and components before they are put together, while Figure 4 shows them in their preassembled state.



Accordingly, Kasugai in view of Kagitani render obvious claim 40 of the '812 Patent. *See* Ex. 1010, Kazmer ¶¶ 74-75.

5. Claim 41

The process of claim 40, wherein said preassembled structure is configured to anchor to an internal wall of said fuel tank.

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. *See, e.g.*, Ex. 1003, Kasugai at 4:66-5:1 ("Since the outer periphery of the base portion 6A of the holding plate 6 is grasped by the parison 28 and pressed then, the melting bonding strength becomes good."), 5:16-22 ("[P]ortions [ ] of the upper wall 3… are pressed to the nipple portions [ ] of the component parts and… holding plate 6. The airtightness of the outside wall 2 to the atmosphere can be secured without assembling a rubber part for a seal.").

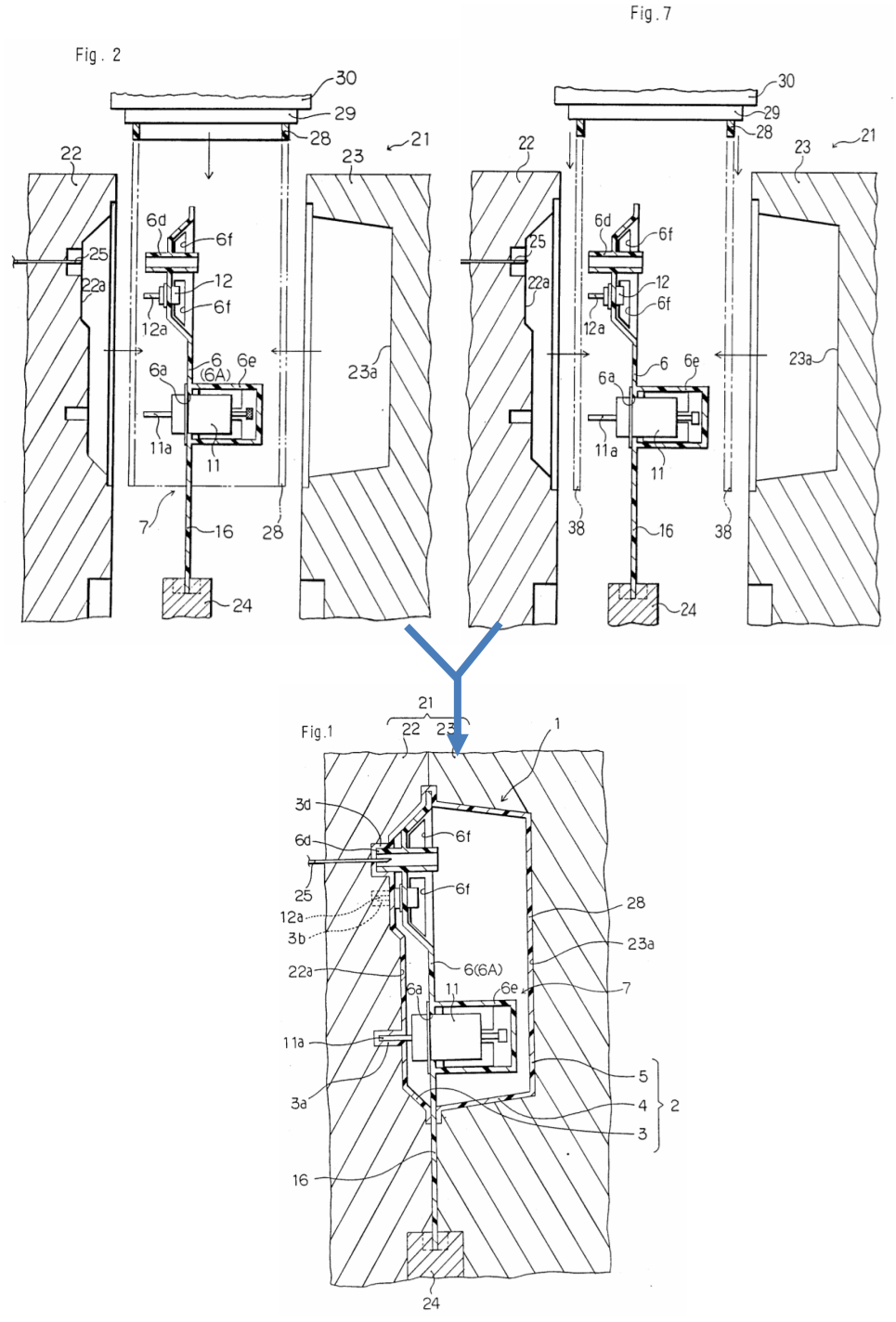
Accordingly, Kasugai in view of Kagitani render obvious claim 41 of the '812 Patent. *See* Ex. 1010, Kazmer ¶¶ 76-78.

6. Claim 44

The process of claim 32, wherein said step of molding comprises a step of blowing gas within said parison, and a step of welding said two portions together.

Kasugai discloses that the mold haves are closed to seal and blow mold the parison to form a fuel tank. *See, e.g.*, Ex. 1003, Kasugai at 4:62-66 ("The mold tightening is performed, and the air blowing port 25 is inserted from position of the pipe portion 6d into the parison 28 and air is blown into the parison 28. The outside wall 2 is formed by blow molding (refer to FIG. 1)."). As typical in blow molding operations, the closing of the mold welds together the open ends of the parison to form a closed hollow body. *See* Ex. 1010, Kazmer ¶ 80. In Kasugai's two sheet embodiment, the welding would take place around the perimeter of the mold cavities where the two plastic sheets are compressed against one another to seal the two halves together into a tank. *Id.* Indeed, the mold closing and welding of the plastic parison or plastic sheets would look like Figure 1 of Kasugai, regardless whether one started with the "cylindrical parison" embodiment (Figure 2) or the two sheet embodiment (Figure 7). *See, e.g.*, Ex. 1003, Kasugai at 2:48-64 ("FIG. 1 is a sectional view of a mold during blow molding as a first embodiment

of the invention…. FIG. 7 is a sectional view illustrating a modification of a parison to be used in the first embodiment").



Accordingly, Kasugai in view of Kagitani render obvious claim 44 of the '812 Patent. *See* Ex. 1010, Kazmer ¶¶ 79-82.

7. Claim 45

The process of claim 32, wherein said 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.

The purpose of Kasugai, including the two sheet embodiment, is to form a fuel tank. The joint between the two halves of the fuel tank must be leak-tight for the tank to carry fuel and function as a fuel tank. *See* Ex. 1010, Kazmer ¶ 83. Moreover, Kasugai expressly discloses that "airtightness" is a desirable quality for fuel tanks. *See* Ex. 1003, Kasugai at 5:20-22, 2:31-36.

Accordingly, Kasugai in view of Kagitani render obvious claim 45 of the '812 Patent. *See* Ex. 1010, Kazmer ¶¶ 83-85.

B. GROUND 2: OBVIOUSNESS BY KASUGAI IN VIEW OF KAGITANI AND IN FURTHER VIEW OF HATA

Kasugai in view of Kagitani and in further view of Hata render obvious claims 16, 24, 25, 26, 27, 30, and 31 under 35 U.S.C. § 103.

1. Claim 16

Independent claim 16 is similar to independent claim 32, addressed above in Ground 1. The only differences between the two are that i) claim 16 recites a process for manufacturing a "hollow body" (whereas claim 32 recites a specific type of hollow body – a "fuel tank"), and ii) claim 16 requires the parison to be "a

multilayered parison comprising stacked layers fastened to each other" (whereas claim 32 required "a parison"). Accordingly, Petitioners incorporate by reference the discussion of claim 32 in Ground 1, and address the "multilayer" limitation below.

Kasugai and Kagitani do not disclose "a multilayered parison comprising stacked layers fastened to each other." However, multilayered parisons made of stacked layers were well known in the art before the invention of the '812 Patent. Ex. 1010, Kazmer ¶ 89. Many different options for multilayered parisons were available to a POSITA, and a POSITA would have selected from among those options in view of a variety of concerns including structural, environmental, safety, weight, and costs. *Id.* One such option is disclosed by Hata.

Hata, like Kasugai relates to plastic fuel tanks made by molding, and in particular blow molding. Ex. 1006, Hata at 5:18-21 ("The multi-layered fuel tank of the present invention may be produced in any manner which is not specifically restricted. Typical molding methods include extrusion molding, blow molding, and injection molding, which are commonly used in the field of polyolefins. Of these molding methods, coextrusion molding and coinjection molding are desirable, particularly coextrusion blow molding is desirable."). Hata specifically discloses a blow molded fuel tank made from a multilayered parison of stacked layers. *Id.* at 3:21-26 ("According to the present invention, the fuel tank of multi-layer

construction 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…. [T]he fuel tank is usually formed by extrusion blow molding which involves the step of pinching-off the parison. So as to form a strong bottom, the parison should be closed with good adhesion.").

Hata explains that it was well known that vapor emission levels and impact resistance were important considerations in fuel tank design, *id.* at 2:20-22, and that its stacked multilayer fuel tank provides important benefits in these areas, *id.* at 2:27-29 ("It is an object of the present invention to provide a multi-layered fuel tank composed of high-density polyethylene and EVOH layers, which is superior in gasoline barrier properties (especially for oxygen-containing gasoline) and impact resistance.").

Neither Kasugai nor Kagitani require the parison to be of any particular composition, and a POSITA would understand that one option would be to use Hata's multilayered coextruded parison. Ex. 1010, Kazmer ¶ 93. A POSITA would have been motivated to use Hata's multilayered parison to form the fuel tank of the combination of Kasugai and Kagitani at least to achieve the advantages disclosed in Hata of superior impact resistance and/or gas barrier properties. *Id.*

Accordingly, Kasugai in view of Kagitani and in further view of Hata renders obvious claim 16. *See* Ex. 1010, Kazmer ¶¶ 86-101.

2. Claims 24, 25, 26, 27, 30, and 31

Claims 24, 25, 26, 27, 30, and 31 depend from claim 16. These claims are otherwise identical to claims 38, 39, 40, 41, 44, and 45, respectively, addressed above in Ground 1 (*i.e.*, claim 24 corresponds to claim 38, claim 25 corresponds to claim 39, and so on). Accordingly, Petitioners respectfully refer the Board to the discussion in Ground 1 of claims 38, 39, 40, 41, 44, and 45. For the reasons discussed therein, and the reasons discussed for claim 16, each of claims 24, 25, 26, 27, 30, and 31 is rendered obvious by Kasugai in view of Kagitani in further view of Hata. *See* Ex. 1010, Kazmer ¶¶ 102-113.

C. GROUND 3: OBVIOUSNESS BY HATAKEYAMA IN VIEW OF KAGITANI

Hatakeyama in view of Kagitani render obvious claims 32, 38, 39, 40, 41, 44, and 45 under 35 U.S.C. § 103.

Hatakeyama is titled "Method for producing a hollow molded product with insert." Like the '812 Patent, Hatakeyama is directed to incorporating accessories into plastic fuel tanks during the manufacturing process. *See, e.g.*, Ex. 1005, Hatakeyama at 2 ("The present invention… is a method for producing a hollow molded product with insert, wherein a side wall of a thermoplastic resin molten parison is cut open, an insert component held by a rod is inserted into the parison through the gap produced by cutting open the side wall, a metal mold is closed, and before or after air is blown in the parison and the insert component are press-

fixed."). To install the internal accessories, Hatakeyama teaches cutting the parison to form a gap through which the accessories can be inserted. *See id.*

1. Claim 32

[32-preamble] A process of manufacturing a fuel tank, comprising the steps of:

Hatakeyama discloses a process for manufacturing a hollow body using a mold and a specific embodiment for making plastic fuel tanks. Ex. 1005, Hatakeyama at 1 ("This invention relates to a method for producing a hollow molded product having an insert therewithin."; "for example, of thermoplastic resin fuel tanks").

Thus, to the extent the preamble is determined to be limiting, Hatakeyama discloses this element. *See* Ex. 1010, Kazmer ¶¶ 114-115.

[32-a] extruding a parison;

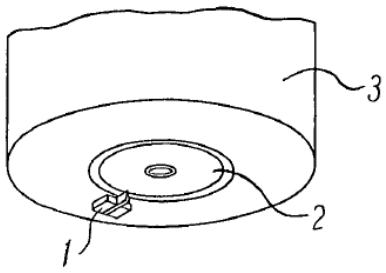
Hatakeyama discloses extruding a parison. Ex. 1005, Hatakeyama at 2 ("Fig. 2 is a perspective diagram showing some of the steps of the present invention, in which the parison 4, after being extruded or injected from the die 3, is lowered to a prescribed position while being cut open by the cutting device 1.").

Accordingly, Hatakeyama discloses limitation 32-a. *See* Ex. 1010, Kazmer ¶¶ 116-118.

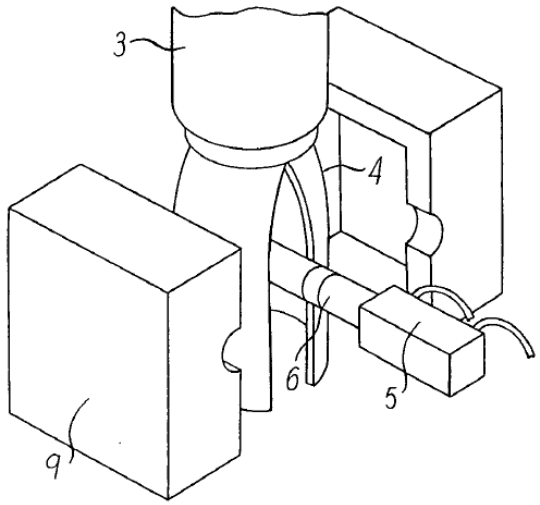
[32-b] cutting through said parison so as to form two portions separated by a cut; and

Hatakeyama discloses that, as the parison is being extruded, it is "cut open by the cutting device 1" placed below the die. Ex. 1005, Hatakeyama at 2 ("Fig. 1 is a perspective diagram showing the positional relationship of a parison side wall cutting device 1, a mandrel 2, and a die 3. Fig. 2 is a perspective diagram showing some of the steps of the present invention, in which the parison 4, after being extruded or injected from the die 3, is lowered to a prescribed position while being ***cut open by the cutting device 1***."). Below, Figures 1 and 2 of Hatakeyama show cutting device 1 and how it cuts open the parison.

第１図



第２図



Hatakeyama then inserts through the cut in the parison an accessory to be attached to the internal wall. *Id.* ("Through the gap that has been cut open, an

insert component 7 that is held by a rod 6 linked with an air cylinder or hydraulic cylinder 5 is inserted into the parison 4.").

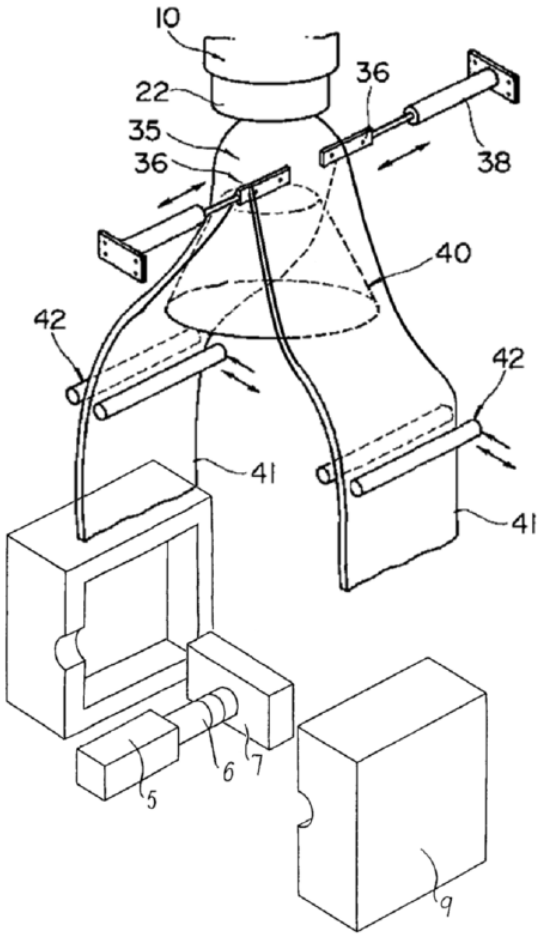
Although the parison in Hatakeyama is cut, it is not cut so as to form two portions. The width of the opening formed in Hatakeyama's parison is constrained by the diameter of the parison, thereby limiting a POSITA's ability to insert and position accessories within the parison, including limiting the size of the accessories that could be inserted. *See* Ex. 1010, Kazmer ¶ 120.

At the time of the invention of the '812 Patent, it was well known that by making plastic fuel tanks from two separate portions, numerous internal accessories can easily be incorporated into the tank prior to sealing the two portions of the tank together. For example, Jacobson, issued July 14, 1992, discloses forming two laminate sheets into half shells, and inserting reservoirs, baffles, support brackets, valves, filler tube extensions, and the like before the half shells are sealed together. Ex. 1009, Jacobson at 2:53-63 ("After the sheets for the laminate structure are bonded together, the first and second housing parts are stamped or otherwise formed from the laminate sheets using conventional stamping methods… [D]uring final assembly, additional internal structures, such as reservoirs, baffles, emissions valving, filler neck extensions, and the like may be positioned within the chamber formed between the housing parts prior to sealing the housing part flanges together."), 3:46-56 ("[P]rior to joining the housing

flanges 16 and 20 together, one or more additional structures 26 can be positioned within the housing chamber... These additional structures can include, for example, reservoirs, baffles to control fuel slosh, support brackets for pressure or vacuum stability, filler tube extensions in order to direct fuel into a reservoir, valving for emission or vapor control, filler neck support brackets, portions of quick connect couplings, valving for liquid loss control, or the like."). And, as previously discussed, Kasugai further discloses that fuel tanks with internal accessories may be made from two plastic sheets which are blow molded, instead of stamping as in Jacobson.

To overcome Hatakeyama's limitations on the insertion of bulky or numerous accessories, a POSITA would have therefore been motivated to modify the structure of Hatakeyama to provide a parison that is cut to make two separate portions to provide better access to the inside, as was well known in the art. Ex. 1010, Kazmer ¶ 121. As previously discussed in Ground 1 (claim 32-b), Kagitani discloses a structure for providing a parison cut into two separate portions. Indeed, the modification to Hatakeyama would have been straightforward as it would essentially have consisted of adding from Kagitani a second cutting device (*e.g.*, blade) below the die and guiding devices (*e.g.*, rollers) for guiding the two portions of the cut parison apart. *Id.* ¶ 125.

Or viewed another way, a POSITA could have simply used Kagitani's two blade embodiment to make a fuel tank, as Kagitani does not restrict the use of the plastic sheets made using its method to blow molding only certain types of articles. All that would be needed in this case would be the addition of a mechanism to insert accessories into the parison, which Hatakeyama discloses. Ex. 1005, Hatakeyama at 2 ("insert component 7 that is held by a rod 6 linked with an air cylinder or hydraulic cylinder 5 is inserted into the parison 4"); Ex. 1010, Kazmer ¶ 125. A demonstrative depicting how an obvious combination of Hatakeyama and Kagitani might look is shown below.



Kazmer-4: Demonstrative depicting combination of Kagitani's structure for forming two plastic sheets with Hatakeyama's structure for inserting a component into a blow molded tank

Accordingly, Kagitani discloses limitation 32-b and it would have been obvious to combine Kagitani with Hatakeyama. *See* Ex. 1010, Kazmer ¶¶ 119-126.

[32-c] molding said two portions so as to form said fuel tank,

Hatakeyama discloses blow molding a cut parison to form a fuel tank. Ex. 1005, Hatakeyama at 2 ("a metal mold 9 is closed such that a pinch-off 8 occurs, the rod 6 linked with the air cylinder or hydraulic cylinder 5 is moved forward to press-fix the parison 4 and insert component 7, and air is blown in through an air blow-in hole"). In the combination of Hatakeyama with Kagitani, the parison would be cut into two portions and molded to form the tank.

Accordingly, the combination of Hatakeyama and Kagitani discloses limitation 32-c. *See* Ex. 1010, Kazmer ¶¶ 127-130.

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

Kagitani discloses two severing blades for making two cuts in the parison to form two separate sheets for blow molding. Ex. 1004, Kagitani ¶ 7 ("It should be noted that the severing blade 36 is provided in one location in the abovementioned embodiment but is not limited to such a configuration, and providing severing blades in two locations allows the parison 35 to be made into two sheets and used in a blow molding method.").

Indeed, as previously discussed, the ability to make two cuts in a parison so as to form two separate sheets (the purportedly key feature of the '812 patent) was well known in the art even before the publication of Kagitani – at least since the early 1980s. *See* Ex. 1010, Kazmer ¶ 53; Ex. 1007, Frame at 2 (1979 publication stating "a cutting component is arranged… to diametrically separate the parison [ ] into two sheets"); Ex. 1008, Asano at 2 (1980 publication "to form the parison [ ] into a plurality of plate-shaped bodies, the plurality of cutting blades… are disposed on the inside or outside of the outlet" of the extruder).

Accordingly, the combination of Hatakeyama and Kagitani discloses limitation 32-d. *See* Ex. 1010, Kazmer ¶¶ 131-133. Claim 32 of the '812 Patent is therefore rendered obvious by Hatakeyama in view of Kagitani. *Id.*

2. Claim 38

The process of claim 32, wherein said step of molding comprises a step of holding apart said two portions of said parison and a subsequent step said two portions together.

Kagitani discloses that guide rolls 42 are used to guide the sheets "to a position between the molds," thereby holding the sheets apart before they would be brought together by the closing of the blow mold halves. Ex. 1004, Kagitani ¶ 7.

Accordingly, Hatakeyama in view of Kagitani render obvious claim 38 of the '812 Patent. *See* Ex. 1010, Kazmer ¶¶ 134-137.

3. Claim 39

The process of claim 38, further comprising a step of inserting an object in said parison during said step of holding a part said two portions.

Hatakeyama discloses inserting an "insert component" through an opening in the cut open parison while the mold is open. Ex. 1005, Hatakeyama at 1-2 ("The present invention… is a method for producing a hollow molded product with insert, wherein a side wall of a thermoplastic resin molten parison is cut open, an insert component held by a rod is inserted into the parison through the gap produced by cutting open the side wall, a metal mold is closed, and before or after air is blown in the parison and the insert component are press-fixed."), *id.* at 2 ("Through the gap that has been cut open, an insert component 7 that is held by a rod 6 linked with an air cylinder or hydraulic cylinder 5 is inserted into the parison 4."). Hatakeyama describes fuel tank baffles and reservoirs as specific examples of insert components. *Id.* at 2 ("hollow molded products that are provided with breakwater plates to eliminate the problem of noise resulting from agitation of the internal fluid or with inner tanks in which internal fluid is always present or that are otherwise provided with further added value").

Similarly, in the combination of Hatakeyama with Kagitani, the insertion of the objects would also be done while the mold halves are open and the two plastic sheets are apart. Ex. 1010, Kazmer ¶¶ 138-140.

Accordingly, Hatakeyama in view of Kagitani render obvious claim 39 of the '812 Patent. *See* Ex. 1010, Kazmer ¶¶ 138-141.

4. Claim 40

The process of claim 39, wherein said object is a preassembled structure.

The baffle and reservoir described in Hatakeyama, as well as any other "insert component," would be preassembled prior to their insertion into the parison. Ex. 1010, Kazmer ¶¶ 142-143.

Accordingly, Hatakeyama in view of Kagitani render obvious claim 40 of the '812 Patent. *See* Ex. 1010, Kazmer ¶¶ 142-144.

5. Claim 41

The process of claim 40, wherein said preassembled structure is configured to anchor to an internal wall of said fuel tank.

Hatakeyama discloses that the preassembled insert components are "press fix[ed]" against the internal wall of the tank, and thus the insert components comprise a device configured to anchor them to the internal wall of the tank. Ex. 1005, Hatakeyama at 2 ("the rod 6 linked with the air cylinder or hydraulic cylinder 5 is moved forward to press-fix the parison 4 and insert component 7").

Accordingly, Hatakeyama in view of Kagitani render obvious claim 40 of the '812 Patent. *See* Ex. 1010, Kazmer ¶¶ 145-147.

6. Claim 44

The process of claim 32, wherein said step of molding comprises a step of blowing gas within said parison, and a step of welding said two portions together.

Hatakeyama discloses that the mold haves are closed to seal and blow mold the parison to form a fuel tank. *See* Ex. 1005, Hatakeyama at 2 ("a metal mold 9 is closed such that a pinch-off 8 occurs, the rod 6 linked with the air cylinder or hydraulic cylinder 5 is moved forward to press-fix the parison 4 and insert component 7, and air is blown in through an air blow-in hole"). As typical in blow molding operations, the closing of the mold welds together the open ends of the parison to form a closed hollow body. *See* Ex. 1010, Kazmer ¶ 149. In the combination of Hatakeyama and Kagitani, the welding would take place around the perimeter of the mold cavities where the two plastic sheets are compressed against one another to seal the two halves together into a tank. *Id.*

Accordingly, Hatakeyama in view of Kagitani render obvious claim 44 of the '812 Patent. *See* Ex. 1010, Kazmer ¶¶ 148-152.

7. Claim 45

The process of claim 32, wherein said 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.

The purpose of Hatakeyama (and the combination of Hatakeyama and Kagitani) is to form a fuel tank. The joint between the two halves of the fuel tank must be leak-tight for the tank to carry fuel and function as a fuel tank. *See* Ex. 1010, Kazmer ¶ 153.

Accordingly, Hatakeyama in view of Kagitani render obvious claim 45 of the '812 Patent. *See* Ex. 1010, Kazmer ¶¶ 153-156.

D. GROUND 4: OBVIOUSNESS BY HATAKEYAMA IN VIEW OF KAGITANI AND IN FURTHER VIEW OF HATA

Hatakeyama in view of Kagitani and in further view of Hata render obvious claims 16, 24, 25, 26, 27, 30, and 31 under 35 U.S.C. § 103.

1. Claim 16

Independent claim 16 is similar to independent claim 32, addressed above in Ground 3. The only differences between the two are that i) claim 16 recites a process for manufacturing a "hollow body" (whereas claim 32 recites a specific type of hollow body – a "fuel tank"), and ii) claim 16 requires the parison to be "a multilayered parison comprising stacked layers fastened to each other" (whereas claim 32 required "a parison"). Accordingly, Petitioners incorporate by reference

the discussion of claim 32 in Ground 3, and address the "multilayer" limitation below.

Hatakeyama and Kagitani do not disclose "a multilayered parison comprising stacked layers fastened to each other." However, multilayered parisons made of stacked layers were well known in the art before the invention of the '812 Patent. Ex. 1010, Kazmer ¶ 160. Many different options for multilayered parisons were available to a POSITA, and a POSITA would have selected from among those options in view of a variety of concerns including structural, environmental, safety, weight, and costs. *Id.* One such option is disclosed by Hata.

Hata, like Hatakeyama relates to plastic fuel tanks made by molding, and in particular blow molding. Ex. 1006, Hata at 5:18-21 ("The multi-layered fuel tank of the present invention may be produced in any manner which is not specifically restricted. Typical molding methods include extrusion molding, blow molding, and injection molding, which are commonly used in the field of polyolefins. Of these molding methods, coextrusion molding and coinjection molding are desirable, particularly coextrusion blow molding is desirable."). Hata specifically discloses a blow molded plastic fuel tank made from a multilayered parison of stacked layers. *Id.* at 3:21-26 ("According to the present invention, the fuel tank of multi-layer construction 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… [T]he fuel tank is usually formed by extrusion blow molding which involves the step of pinching-off the parison. So as to form a strong bottom, the parison should be closed with good adhesion.").

Hata explains that it was well known that vapor emission levels and impact resistance were important considerations in fuel tank design, *id.* at 2:20-22, and that its stacked multilayer fuel tank provides important benefits in these areas, *id.* at 2:27-29 ("It is an object of the present invention to provide a multi-layered fuel tank composed of high-density polyethylene and EVOH layers, which is superior in gasoline barrier properties (especially for oxygen-containing gasoline) and impact resistance.").

Neither Hatakeyama nor Kagitani require the parison to be of any particular composition, and a POSITA would understand that one option would be to use Hata's multilayered coextruded parison. Ex. 1010, Kazmer ¶ 164. A POSITA would have been motivated to use Hata's multilayered parison to form the fuel tank of the combination of Hatakeyama and Kagitani at least to achieve the advantages disclosed in Hata of superior impact resistance and/or gas barrier properties. *Id.*

Accordingly, Hatakeyama in view of Kagitani and in further view of Hata renders obvious claim 16. *See* Ex. 1010, Kazmer ¶¶ 157-172.

2. Claims 24, 25, 26, 27, 30, and 31

Claims 24, 25, 26, 27, 30, and 31 depend from claim 16. These claims are otherwise identical to claims 38, 39, 40, 41, 44, and 45, respectively, addressed above in Ground 3 (*i.e.*, claim 24 corresponds to claim 38, claim 25 corresponds to claim 39, and so on). Accordingly, Petitioners respectfully refer the Board to the discussion in Ground 3 of claims 38, 39, 40, 41, 44, and 45. For the reasons discussed therein, and the reasons discussed for claim 16, each of claims 24, 25, 26, 27, 30, and 31 is rendered obvious by Hatakeyama in view of Kagitani in further view of Hata. *See also* Ex. 1010, Kazmer ¶¶ 173-184.

IX. CONCLUSION

Petitioners respectfully request that the Board institute *inter partes* review of claims 16, 24-27, 30-32, 38-41, 44, and 45 of the '812 Patent for at least the foregoing reasons.

Dated: June 16, 2017

Respectfully submitted,

By: */Alyssa Caridis/*

Alyssa Caridis
acaridis@orrick.com

Registration No. 57,545
CA Bar No. 260,103

ORRICK, HERRINGTON, & SUTCLIFFE LLP
777 South Figueroa Street, Suite 3200
Los Angeles, CA 90017
Tel: 213-629-2020
Fax: 213-612-2499

Attorneys for Petitioners
Donghee America, Inc. and
Donghee Alabama, LLC.

CERTIFICATE OF COMPLIANCE

Pursuant to 37 C.F.R. § 42.24(d), the undersigned certifies that the foregoing Petition for *Inter Partes* Review of U.S. Patent No. 6,866,812 contains, as measured by the word-processing system used to prepare this paper, 9,623 words. This word count does not include the items excluded by 37 C.F.R. § 42.24(a).

Dated: June 16, 2017 By: */Anita Chou/*
Anita Chou

CERTIFICATE OF SERVICE

The undersigned certifies service pursuant to 37 C.F.R. §§ 42.6(e) and 42.105(a & b) on the Patent Owner via FedEx of a copy of this Petition for *Inter Partes* Review and supporting materials at the correspondence address of record for the ’812 Patent:

Robert Mattson, Esquire
OBLON, McCLELLAND,
MAIER & NEUSTADT, L.L.P.
1940 Duke Street
Alexandria, VA 22314
Telephone: (703) 413-3000
Facsimile: (703) 413-2220
E-mail: rmattson@oblon.com

Attorneys for Plastic Omnium Advanced Innovation and Research

Dated: June 16, 2017

By: */Anita Chou/*
Anita Chou