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Paper 48
Entered: January 6, 2016

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

HYUNDAI MOBIS CO., LTD. and MOBIS ALABAMA, L.L.C.,
Petitioners,

v.

AUTOLIV ASP, INC.,
Patent Owner.

Case IPR2014-01006
Patent 7,614,653 B2

Before JONI Y. CHANG, WILLIAM V. SAINDON, and TRENTON A. WARD, *Administrative Patent Judges*.

CHANG, *Administrative Patent Judge.*

FINAL WRITTEN DECISION
35 U.S.C. § 318(a) and 37 C.F.R. § 42.73

I. INTRODUCTION

Hyundai Mobis Co., Ltd. and Mobis Alabama, L.L.C. (collectively, "Petitioner") filed a corrected Petition requesting *inter partes* review of claims 1–3, 5–9, 11–13, 15–22, 24–30, 32–37, 39, and 40 of U.S. Patent No. 7,614,653 B2 ("the '653 patent"). Paper 6 ("Pet."). Autoliv ASP, Inc. ("Patent Owner") filed a Preliminary Response. Paper 8 ("Prelim. Resp."). We determined that there was a reasonable likelihood that Petitioner would prevail with respect to claims 1–3, 6, 20–22, 25–30, 33–37, and 40, but not with respect to claims 5, 7–9, 11–13, 15–19, 24, 32, and 39. Pursuant to 35 U.S.C. § 314, we authorized an *inter partes* review to be instituted, on January 13, 2015, as to claims 1–3, 6, 20–22, 25–30, 33–37, and 40 of the '653 patent. Paper 12 ("Dec.").

Subsequent to institution, Patent Owner filed a Patent Owner Response (Paper 25, "PO Resp."). Petitioner filed a Reply to the Patent Owner Response (Paper 31, "Reply"). An oral hearing was held on August 12, 2015.[1] A transcript of the hearing has been entered into the record of this proceeding as Paper 46 ("Tr.").

We have jurisdiction under 35 U.S.C. § 6(c), and this Final Written Decision is entered pursuant to 35 U.S.C. § 318(a). For the reasons set forth below, we conclude that Petitioner has demonstrated by a preponderance of the evidence that claims 1–3, 6, 20–22, 25–30, 33–37, and 40 of the '653 patent are unpatentable.

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[1] The oral arguments for the instant proceeding and Case IPR2014-01005 were consolidated.

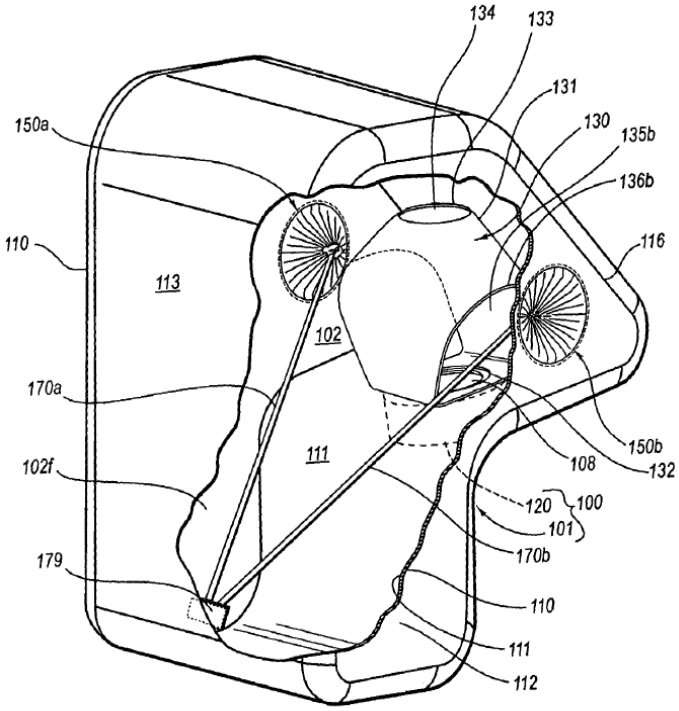
A. Related Matters

The ’653 patent was asserted in *Autoliv ASP, Inc. v. Hyundai Mobis Co., LTD*, No. 2:13-cv-141-MHT (D. Ala.). Pet. 55.

B. The ’653 Patent

The ’653 patent describes an airbag protective system with closeable vents and fixed vents. Ex. 1001, Abs., 1:44–54. The airbag system is said to prevent injuries by providing a softer airbag deployment. *Id*. at 2:66–3:7. According to the ’653 patent, the airbag responds to the vehicle occupant’s position during deployment, and releases the inflating gas from the airbag accordingly, to avoid excessive impact force from the airbag on the occupant. *Id*.

Figure 1 of the ’653 patent is reproduced below.



As shown in Figure 1 of the ’653 patent above, airbag cushion 101 includes closeable vents 150a-b and cords 170a-b. The airbag system has diffuser 130, configured to create a pressure pocket and redirect the gas to closeable vents 150a-b. *Id*. at 3:55–60.

Figures 2A–2C, reproduced below, illustrate an airbag deploying where there is no obstruction from an out-of-position occupant.

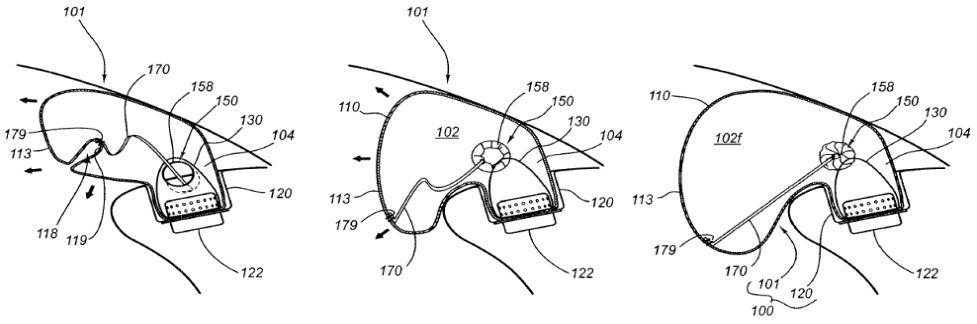


Fig. 2A ***Fig. 2B*** ***Fig. 2C***

As depicted in Figure 2A of the ’653 patent above, cord 170 is attached to the inside of airbag 101 at base 119 of fold 118. *Id*. at 8:5–26. Closeable vent 150 remains open at the early stage of deployment, as cord 170 is slack. *Id*. at 5:44–46. Figure 2B shows that, as airbag 101 continues to deploy without obstruction, airbag 101 unfolds and cord 170 moves to a tensioned condition, constricting the opening of closeable vent 150. *Id*. at 8:5–26. When airbag 101 becomes fully inflated, as shown in Figure 2C, cord 170 is fully tensioned, closing closeable vent 150. *Id*.

Figure 4B of the ’653 patent, reproduced below, illustrates an airbag deploying where there is an obstruction from an out-of-position occupant.

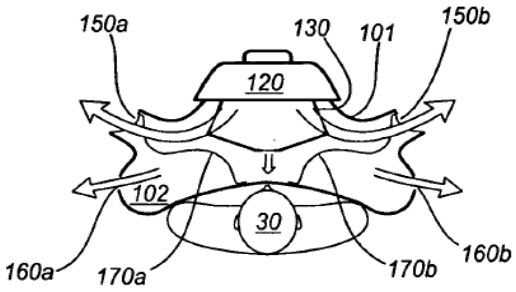


Fig. 4B

As depicted in Figure 4B of the ’653 patent above, if airbag 101 encounters out-of-position occupant 30 during deployment, the obstruction causes cords 170a-b to remain slack so that closeable vents 150a-b continue to be open throughout deployment, permitting the inflating gas to vent rapidly through closeable vents 150a-b. *Id*. at 6:34–44. In this situation, the airbag inflation is dampened and occupant 30 receives a softer deployment impact. *Id*.

C. Illustrative Claim

As discussed above, we instituted the instant trial as to claims 1–3, 6, 20–22, 25–30, 33–37, and 40 of the ’653 patent. Of those, claims 1, 7, 11, 20, 28, and 35 are independent. Claim 1, reproduced below, is illustrative:

> 1. An airbag module, comprising:
>
> an inflatable airbag cushion having a cushion membrane;
>
> a first closeable vent having a first vent aperture in the cushion membrane of the inflatable airbag cushion;
>
> a second closeable vent having a second vent aperture in the cushion membrane of the inflatable airbag cushion; and

> at least one cord anchored to the cushion membrane of the inflatable airbag cushion and having a first vent portion and a second vent portion,
>
> wherein the first closeable portion and the second closeable portion respectively engage the first closeable vent and the second closeable vent in a configuration such that, upon deployment of the inflatable airbag cushion with obstruction, the cord does not fully extend and the first closeable vent and the second closeable vent remain open, and upon deployment of the inflatable airbag cushion without obstruction, the cord extends and at least partially closes the first closeable vent and the second closeable vent;
>
> wherein the cord is anchored to the cushion membrane at a region of the cushion membrane which is folded to have at least one fold, and
>
> wherein the fold is held in place by *a releasable temporary holding feature*.

Ex. 1001, 10:2–26 (emphasis added).

D. Prior Art Relied Upon

Petitioner relies upon the following prior art references:

Pinsenschaum	US 2004/0012179 A1	Jan. 22, 2004	(Ex. 1009)
Wolanin	US 5,280,953	Jan. 25, 1994	(Ex. 1010)
Prescaro	US 5,242,192	Sept. 7, 1993	(Ex. 1011)
Seymour	US 5,772,239	June 30, 1998	(Ex. 1012)
Kriska	US 5,494,314	Feb. 27, 1996	(Ex. 1016)
Inoue[2]	JP H05-85295	Apr. 6, 1993	(Ex. 1008)
Tajima	JP 2003-137060 A	May 14, 2003	(Ex. 1013)

[2] Citations to Inoue and Tajima are to the certified English-language translations submitted by Petitioner in Exhibits 1008 and 1013, respectively.

E. Instituted Grounds of Unpatentability

We instituted the instant trial based on the following grounds of unpatentability (Dec. 42):

Claims	Basis	References
1–3, 6, 20–22, 25, and 28–30	§ 103(a)	Inoue, Pinsenschaum, and Wolanin
26, 27, 33–37, and 40	§ 103(a)	Inoue, Pinsenschaum, Wolanin, and Tajima

II. ANALYSIS

A. Claim Construction

In an *inter partes* review, claim terms in an unexpired patent are given their broadest reasonable construction in light of the specification of the patent in which they appear. 37 C.F.R. § 42.100(b); *see also In re Cuozzo Speed Techs., LLC.*, 793 F.3d 1268, 1277–1279 (Fed. Cir. 2015) ("Congress implicitly approved the broadest reasonable interpretation standard in enacting the AIA,"[3] and "the standard was properly adopted by PTO regulation."). Under this 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). An inventor may rebut that presumption by providing a definition of the term in the specification with

[3] Leahy-Smith America Invents Act, Pub. L. No. 112-29, 125 Stat. 284 (2011) ("AIA").

reasonable clarity, deliberateness, and precision. *In re Paulsen*, 30 F.3d 1475, 1480 (Fed. Cir. 1994). In the absence of such a definition, limitations are not to be read from the specification into the claims. *In re Van Geuns*, 988 F.2d 1181, 1184 (Fed. Cir. 1993).

"a releasable temporary holding feature"

Claim 1 recites "wherein the cord is anchored to the cushion membrane at a region of the cushion membrane which is folded to have at least one fold," and "wherein the fold is held in place by a *releasable temporary holding feature*." Ex. 1001, 10:22–26 (emphasis added). Claim 6, which depends directly from claim 1, further recites "wherein the releasable temporary holding feature is *stitching*." *Id*. at 10:36–37 (emphasis added).

Although the parties agree that the claim element "a releasable temporary holding feature" does not include the word "means," the parties dispute whether this claim element is a means-plus-function limitation and falls within the purview of 35 U.S.C. § 112, ¶ 6.[4] Pet. 5–6; PO Resp. 8–9. Petitioner argues that the word "feature" does not impart any specific structure, and none of the words modifying "feature" connotes any structure. Pet. 5–6. Patent Owner disagrees, arguing that there is a presumption that a claim element does not invoke § 112, ¶ 6, if the claim element, as here, does

[4] Section 4(c) of the AIA re-designated 35 U.S.C. § 112, ¶ 6, as 35 U.S.C. § 112(f). Pub. L. No. 112-29, 125 Stat. 284, 296 (2011). Because the '653 patent has a filing date before September 16, 2012 (effective date), we will refer to the pre-AIA version of § 112.

not use the word "means." PO Resp. 8–9. Patent Owner asserts that the disputed claim element should be accorded its plain and ordinary meaning, in light of the Specification. *Id*.

In the Decision on Institution, we determined that the claim element imparts sufficient structure so that the presumption against applying § 112, ¶ 6, was not overcome. Dec. 8–11. After we entered that Decision, the United States Court of Appeals for the Federal Circuit issued *Williamson v. Citrix Online, LLC*, 792 F.3d 1339 (Fed. Cir. 2015) (en banc), overruling cases[5] that previously stated that the absence of the word "means" in a claim element established a "strong" presumption that § 112, ¶ 6, does not apply. *Id*. at 1348–49. In short, *Williamson* overruled the heightened presumption standard. *Id.* at 1349 ("Henceforth, we will apply the presumption as we have done prior to *Lighting World*, without requiring any heightened evidentiary showing and expressly overrule the characterization of the presumption as 'strong.'"). Therefore, we conduct our claim construction analysis here for this Final Written Decision in light of *Williamson*, without applying the prior heightened presumption standard.

As stated by the Federal Circuit in *Williamson*, "[t]he standard is whether the words of the claim are understood by persons of ordinary skill in the art to have a sufficiently definite meaning as the name for structure." *Id.* In that regard, the knowledge of an ordinarily skilled artisan is reflected by

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[5] *See, e.g.*, *Flo Healthcare Solutions, LLC v. Kappos*, 697 F.3d 1367, 1373 (Fed. Cir. 2012); *Lighting World, Inc. v. Birchwood Lighting, Inc.*, 382 F.3d 1354, 1358 (Fed. Cir. 2004) (stating that "the presumption flowing from the absence of the term 'means' is a strong one that is not readily overcome").

the prior art of record. *See Okajima v. Bourdeau*, 261 F.3d 1350, 1355 (Fed. Cir. 2001); *In re Oelrich*, 579 F.2d 86, 91 (CCPA 1978).

Here, in light of the prior art before us, we observe that one with ordinary skill in the art at the time of the invention would have appreciated that "a releasable temporary holding feature" is a device with sufficient structure for holding a fold of the airbag cushion in place during shipping, handling, and storing, until the airbag is deployed and inflated. *See, e.g.*, Ex. 1009 ¶ 56, Figs 4A, 4B. For example, Pinsenschaum discloses that a pleat structure in the airbag vent cover is held in folded relation by *break-away seams*, which may include *stitching, adhesive bonding, or welding*. *Id*. According to Pinsenschaum, the strength of the break-away seams is selected such that they will rupture upon the application of a sufficient force when the airbag is deploying. *Id*. ¶¶ 56–58. As another example, Seymour discloses a fabric airbag cover having *tear tabs* or a *tear seam* to hold the folds of the airbag in place prior to deployment. Ex. 1012, 3:59–4:16, Figs. 5–6. The tear tabs and tear seam, which comprises *a weak stitch pattern of thin thread*, are designed to be strong enough to retain the folded airbag, but will pull apart and release the airbag when the airbag is deploying. *Id*. Therefore, an ordinarily skilled artisan would have recognized that "a releasable temporary holding feature" is a name that indicates a class of structures—e.g., break-away seams, stitching, tear tabs, and a tear seam.

We are not persuaded by Petitioner's argument that none of the words modifying "feature" connotes any structure (Pet. 5–6). We are cognizant that the word "feature" is similar to the word "mechanism," which standing

alone may connote no more structure than the term "means." *See Mass. Inst. Of Tech. v. Abacus Software*, 462 F.3d 1344, 1354 (Fed. Cir. 2006) (holding that the generic term "mechanism" typically did not connote sufficient structure). Nonetheless, the surrounding claim language may further define the word "feature" to add sufficient structure to avoid a claim construction under § 112, ¶ 6. *See Greenberg v. Ethicon Endo-Surgery, Inc.*, 91 F.3d 1580, 1583 (Fed. Cir. 1996) (holding that § 112, ¶ 6, did not apply to the claim limitation "detent mechanism" because "the noun 'detent' denotes a type of device with a generally understood meaning in the mechanical arts."). A particular device defined in functional terms is not sufficient to convert the claim element into a means-plus-function limitation because many devices take their names from the functions they perform, such as "filter," "brake," "clamp," "screwdriver," or "lock." *Id*. Here, we find that the term "holder"—which is equivalent to "holding feature"—is such a term. *See holder*, THE AMERICAN HERITAGE DICTIONARY OF THE ENGLISH LANGUAGE (4th ed. 2000) (available at http://www.thefreedictionary.com) ("2. A device for holding: [for example,] a towel holder").

In determining whether a claim element without using "means" invokes § 112, ¶ 6, we also must "ask if the claim language, read in light of the specification, recites sufficiently definite structure to avoid § 112, ¶ 6." *Media Rights Techs., Inc. v. Capital One Fin. Corp.*, 800 F.3d 1366 (Fed. Cir. 2015) (citing *Robert Bosch, LLC v. Snap-On Inc.*, 769 F.3d 1094, 1099 (Fed. Cir. 2014). Here, the Specification of the '653 patent also uses the language "a releasable temporary holding feature" to designate a class of structures for holding a fold of an airbag cushion in place. *See, e.g.*,

Ex. 1001, 8:42–45. For instance, the Specification indicates a fold of the airbag cushion is held initially by a *tack stitch* to prevent undesired closure of the closeable vents during shipping or handling and to ensure that the cords remain slack during initial deployment of the airbag. *Id*. at 8:5–10. According to the Specification, other structures—fasteners, adhesives, clips, knots, hook and loop fasteners, etc.—also may be used as a releasable temporary holding feature for holding the folds of the airbag cushion in place. *Id*. at 8:36–45. Thus, the Specification confirms that "a releasable temporary holding feature" indicates a class of structures, and is not simply a nonce word or a verbal construct that is used as a substitute for the term "means for."

The presumption against the application of § 112, ¶ 6, to a claim term lacking the word "means" can be overcome "if the challenger demonstrates that the claim term fails to 'recite sufficiently definite structure' or else recites 'function without reciting sufficient structure for performing that function." *Williamson*, 792 F.3d at 1349 (citing *Watts v. XL Sys., Inc.*, 232 F.3d 877, 880 (Fed. Cir. 2000)). For all the reasons stated above, we determine that Petitioner has not made such a showing here with respect to the claim term "a releasable temporary holding feature." Rather, we determine that this claim term, as used in the '653 patent, reasonably imparts sufficient structure so that the presumption against applying § 112, ¶ 6, is not overcome. Consequently, we decline to adopt Petitioner's claim construction under § 112, ¶ 6, and we accord the term's ordinary and customary meaning as would be understood by one with ordinary skill in the art in light of the Specification.

B. Principles of Law

A patent claim is unpatentable under 35 U.S.C. § 103(a) if the differences between the claimed subject matter and the prior art are such that the subject matter, as a whole, would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. *KSR Int'l Co. v. Teleflex Inc*., 550 U.S. 398, 406 (2007). The question of obviousness is resolved on the basis of underlying factual determinations including: (1) the scope and content of the prior art; (2) any differences between the claimed subject matter and the prior art; (3) the level of ordinary skill in the art; and (4) objective evidence of nonobviousness. *Graham v. John Deere Co.*, 383 U.S. 1, 17–18 (1966).

C. Level of Ordinary Skill in the Art

In determining the level of ordinary skill in the art at the time of the invention, we note that various factors may be considered, including "type of problems encountered in the art; prior art solutions to those problems; rapidity with which innovations are made; sophistication of the technology; and educational level of active workers in the field." *In re GPAC, Inc.*, 57 F.3d 1573, 1579 (Fed. Cir. 1995) (citing *Custom Accessories, Inc. v. Jeffrey-Allan Indus., Inc.*, 807 F.2d 955, 962 (Fed. Cir. 1986)). We also are mindful that the level of ordinary skill in the art is reflected by the prior art of record. *See Okajima*, 261 F.3d at 1355.

Although the parties agree that the educational level of active workers in the relevant field is relatively high (e.g., at least a Bachelor of Science degree in Mechanical Engineering or a related field), the parties dispute

whether the relevant field is limited to *frontal* airbag design and development. *See, e.g.*, PO Resp. 2; Reply 6–7; Ex. 1017 ¶ 15; Ex. 2015 ¶ 22. For instance, Petitioner's expert, Ms. Karen Balavich, submits that "a person having ordinary skill in the art relevant to the '653 patent would likely have had at least a Bachelor of Science degree in Mechanical Engineering or a related field, and at least three (3) years of professional or practical experience in the field of *automotive safety technologies*, including inflatable airbags." Ex. 1017 ¶ 15 (emphasis added). In contrast, Patent Owner's expert, Mr. Henk Helleman, testifies that "a person of ordinary skill in the art of *frontal* airbag design and development at the time of the alleged invention would have had at least a bachelor's degree in a relevant technical field such as mechanical or aerospace engineering, and at least six years of experience in the design, development, and testing of *frontal* airbags." Ex. 2015 ¶ 22 (emphases added).

As Petitioner notes, the claims of the '653 patent are not limited to *frontal* airbags. Reply 7; Ex. 1001, 10:2–14:6. The '653 patent also is said to be related generally to the field of *automotive protective systems*, specifically inflatable airbags for automobiles. Ex. 1001, 1:7–9. The Specification of the '653 patent further states:

> As those of skill in the art will appreciate, the principles of the invention may be applied to and used with *a variety of airbag deployment systems including frontal driver and passenger airbags, knee airbags, overhead airbags, curtain airbags, and the like*. Thus, the present invention is applicable to airbag cushions of various shapes and sizes.

Id. at 2:54–60 (emphasis added).

Based on the written description of the '653 patent, we determine that the relevant field is not limited to *frontal* airbag design and development, and that persons with ordinary skill in the art would not be only those who had "at least six years of experience in the design, development, and testing of *frontal* airbags," as alleged by Patent Owner (PO Resp. 9–10; Ex. 2015 ¶ 22).

D. Ms. Balavich's Declaration

Patent Owner argues that Ms. Balavich's Declaration (Ex. 1017) should be accorded no weight because Ms. Balavich allegedly lacks a sufficient understanding of the relevant physical properties of a deploying *frontal* airbag, and her conclusions of obviousness are based on improper hindsight reasoning. PO Resp. 9–23. Petitioner counters that Patent Owner misapprehends the relationships among the prior art, the claims of the '653 patent, and expert testimony. Reply 6–10. In particular, Petitioner notes that a primary purpose of the expert's testimony is to "help the trier of fact to understand the evidence or to determine a fact in issue," and the claimed subject matter at issue here is not limited to *frontal* airbags. *Id*. (citing Fed. R. Evid. 702(a)).

We determined that Patent Owner has not articulated a persuasive reason for giving Ms. Balavich's Declaration (Ex. 1017), as a whole, little or no weight. We have reviewed Ms. Balavich's testimony and cross-examination testimony. Exs. 1017, 1034, 2008, 2016. Ms. Balavich's qualification and experience are sufficient to qualify her as an expert in the pertinent field under Federal Rule of Evidence 702. *See, e.g.*, Ex. 1017

¶¶ 4–12 ("I received a Bachelor of Science degree in Mechanical Engineering . . . . I am a named inventor on seven (7) United States patents for automotive airbag technology . . . . I have authored or co-authored five (5) publications, including technical papers, articles, and conference papers on automotive safety technologies."). As we discuss above, the relevant field is not limited to *frontal* airbags, as alleged by Patent Owner, but rather is related generally to the field of *automotive protective systems*, specifically inflatable airbags for automobiles, as described by the Specification of the '653 patent. Ex. 1001, 1:7–9. Therefore, the relevant field as well as the description in the '653 patent are broad enough to encompass Ms. Balavich's qualifications. In addition, there is no requirement of a perfect match between the expert's experience and the relevant field. *SEB S.A. v. Montgomery Ward & Co.*, 594 F.3d 1360, 1373 (Fed. Cir. 2010).

As to whether Ms. Balavich's conclusions of obviousness are based on improper hindsight reasoning, we review her testimony with respect to each disputed material fact individually in light of prior art and other evidence in this entire record. We exercise our discretion to determine the appropriate weight to be accorded to the evidence presented, including expert opinion, based on the disclosure of the underlying facts or data upon which that opinion is based.

For the reasons stated above, we decline to accord Ms. Balavich's Declaration, as a whole, little or no weight, as urged by Patent Owner.

E. Claims 1–3, 6, 20–22, 25, and 28–30—Obviousness Over Inoue, Pinsenschaum, and Wolanin

Petitioner asserts that claims 1–3, 6, 20–22, 25, and 28–30 are unpatentable under 35 U.S.C. § 103(a) as obvious over Inoue in view of Pinsenschaum and Wolanin. Pet. 11–48. Petitioner also proffers a Declaration of Ms. Balavich to support its contentions. Ex. 1017.

Inoue (Ex. 1008)

Inoue discloses an airbag apparatus designed to protect an out-of-position occupant from injuries caused by the deploying airbag and to ensure the protective performance for normal situations. Ex. 1008, Abs., ¶¶ 1, 7. Inoue's airbag includes an outlet hole for venting the inflating gas from the airbag during deployment. *Id*. ¶ 10. When an out-of-position occupant collides with the airbag at an early stage of deployment, the outlet hole remains open, venting out the inflating gas to reduce the impact force on the occupant. *Id*. ¶¶ 12, 29.

Figures 1 and 2 of Inoue, reproduced below, illustrate a deployed airbag, and a detailed view of the outlet hole, respectively.

Figure 1

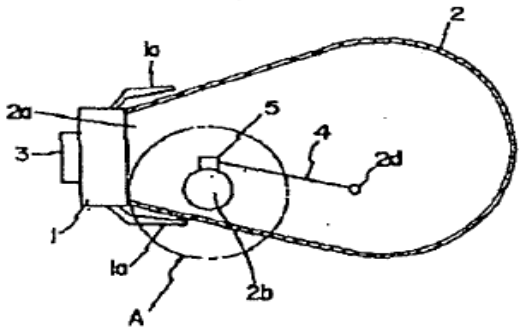
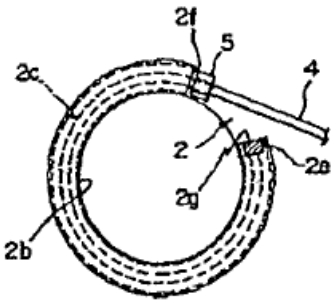


Figure 2

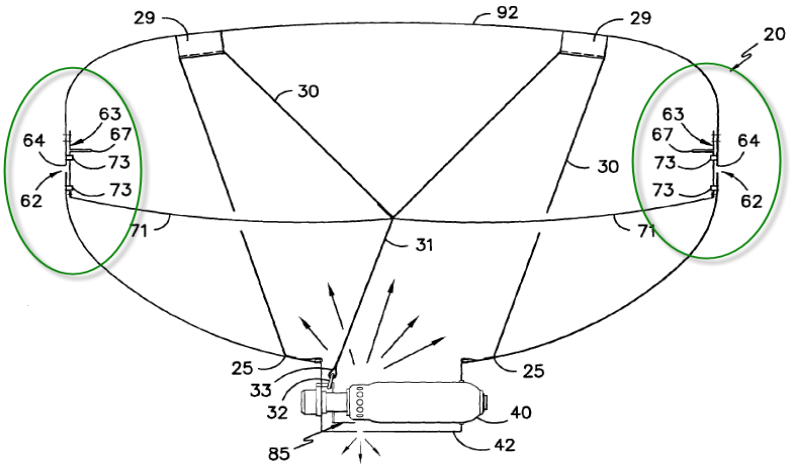


As shown in Figures 1 and 2 of Inoue above, outlet hole 2b having a wide opening is formed as part of airbag 2. Ring-shaped drawstring through-hole 2c is formed on the circumference of outlet hole 2b and on the inner surface of airbag 2. *Id*. ¶ 19. Drawstring through-hole 2c can be formed by either turning back the material forming airbag 2, or sewing on a separate, long, bag-shaped item. *Id*.

Drawstring 4 is inserted inside drawstring through-hole 2c from one end 2f. *Id*. ¶ 20. Drawstring 4 is anchored to airbag 2 at end 2g of drawstring through-hole 2c. *Id*. End 2d of drawstring 4 is anchored at a position towards the deployment direction side from outlet hole 2b inside airbag 2. *Id*. The length of drawstring 4 is established so that drawstring 4 becomes taut when airbag 2 is deployed completely, constricting the opening of outlet hole 2b. *Id*.

Pinsenschaum (Ex. 1009)

Pinsenschaum describes an airbag having a plurality of closeable or actuated vents and tethering elements to control the airbag deployment based upon size and position of the vehicle occupant. Ex. 1009 ¶ 1, Fig. 3A. The vents are actuated selectively in conjunction with control of the inflated profile of the airbag such that venting of the inflating gas from the airbag is matched appropriately to the inflated profile characteristics of the airbag. *Id*. Figure 3A of Pinsenschaum is reproduced below (green markings added).



As shown in annotated Figure 3A above, airbag 20 has two closeable vents 62, straps 71, and tethering elements 30, which are anchored to the interior of airbag 20 and connected to straps 71. *Id.* ¶¶ 31, 54–55.

Wolanin (Ex. 1010)

Wolanin discloses an airbag having a plurality of closeable vents and tether wires to control the flow of inflating gas in response to displacement of the airbag. Ex. 1010, Abs. Figures 4A and 4C of Wolanin, reproduced below (with blue annotations added), illustrate a deploying airbag.

Out-of-position occupant

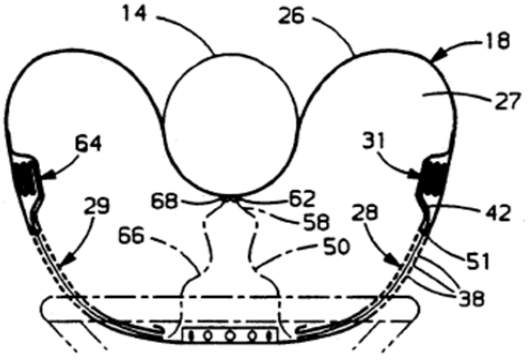


FIG. 4A

Occupant in normal position

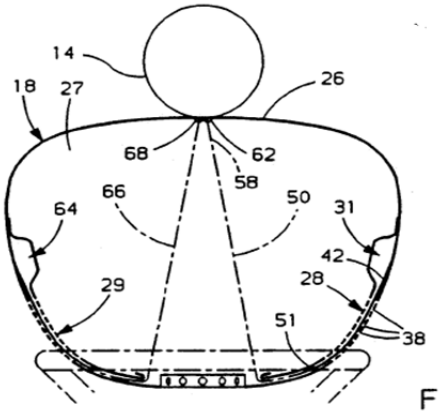


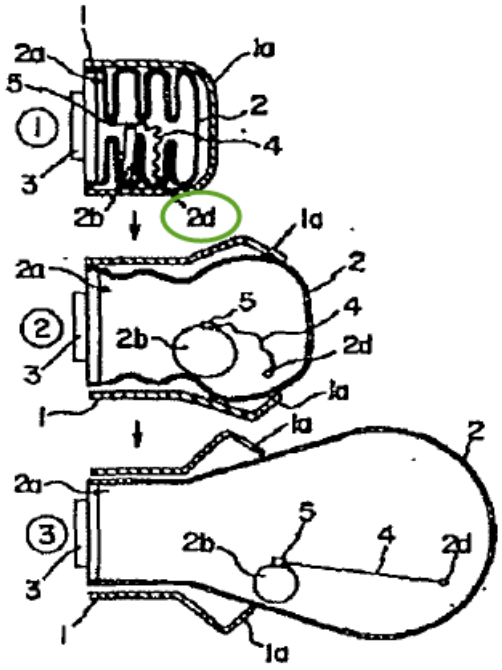
FIG. 4C

As illustrated in annotated Figure 4A above, when out-of-position occupant 14 contacts airbag 18 before it fully deploys, tether wires 50 and 66 remain slack, permitting closeable vents 28 and 29 to remain open, venting the inflating gas from airbag 18. *Id*. at 3:51–56. Annotated Figure 4C above shows that, when occupant 14 is in a normal position and does not contact airbag 18 until it fully inflated, tether wires 50 and 66 become tensioned and close off the vent openings completely. *Id*. at 3:65–68.

Discussion

Independent claims 1, 20, and 28 recite "wherein the cord is anchored to the cushion membrane at a region of the cushion membrane which is folded to have at least one fold," and "wherein the fold is held in place by a *releasable temporary holding feature*." *See, e.g.*, Ex. 1001, 10:22–26 (emphasis added). Claims 6 and 20 further recites "wherein the releasable temporary holding feature is *stitching*." *Id*. at 10:36–37, 11:57–58 (emphasis added). Claims 25 and 28 recite "wherein the *releasable temporary holding feature* prevents closure of the closeable vent during shipping or handling and ensure that the cord remains slack during initial deployment of the airbag module." *Id*. at 12:1–4, 28–31 (emphasis added).

Petitioner asserts that the combination of Inoue, Pinsenschaum, and Wolanin would render the aforementioned limitations obvious. Pet. 12, 25–26, 37–38. Petitioner first points out that Figure 3(1) of Inoue illustrates that an airbag folded along its sides. *Id*. at 25. Figures 3(1)–3(3) of Inoue are reproduced below with a green circle added for emphasis.



Petitioner notes that Figure 3(1) of Inoue above shows drawstring 4 is anchored to airbag 2 at region 2d that is folded. *Id*.; Ex. 1008 ¶ 20. Indeed, as shown Figure 3(1), prior to deployment, airbag 2 is folded and held in place by airbag case 1, which has covering body 1a. Ex. 1008 ¶ 17, Fig. 3(1). Further, as shown by Figures 3(1)–3(3), airbag case 1 prevents closure of outlet hole 2b and ensures that drawstring 4 remains slack during initial deployment of airbag 2. *Id*. at ¶¶ 17–20, Figs. 3(1)–3(3). According to Inoue, at the time of a vehicle collision, inflator 3 introduces a gas into airbag 2, and covering body 1a will open when airbag 2 deploys. *Id*.

There is no dispute that the combination of Inoue, Pinsenschaum, and Wolanin discloses the claim limitation—"wherein the cord is anchored to the cushion membrane at a region of the cushion membrane which is folded to have at least one fold"— as recited in claims 1, 20, and 28. The parties' dispute mainly centers on whether the combination of prior art renders

obvious the "releasable temporary holding feature" limitations, as recited in claims 1, 6, 20, 25, and 28. In that regard, Petitioner asserts that using a break-away seam or tack stitch in an airbag apparatus—to hold a fold in place prior to deployment—was well known in the art, as evidenced by Pinsenschaum and Wolanin. Pet. at 25–26, 29–30; Ex. 1009 ¶ 56; Ex. 1010, 3:15–21. According to Petitioner, one with ordinary skill in the art would have applied the break-away seam or tack stitch, in light of Pinsenschaum and Wolanin, to the folds in Inoue's airbag, for holding the folds in place prior to deployment. *Id*. (citing Ex. 1017 ¶ 55).

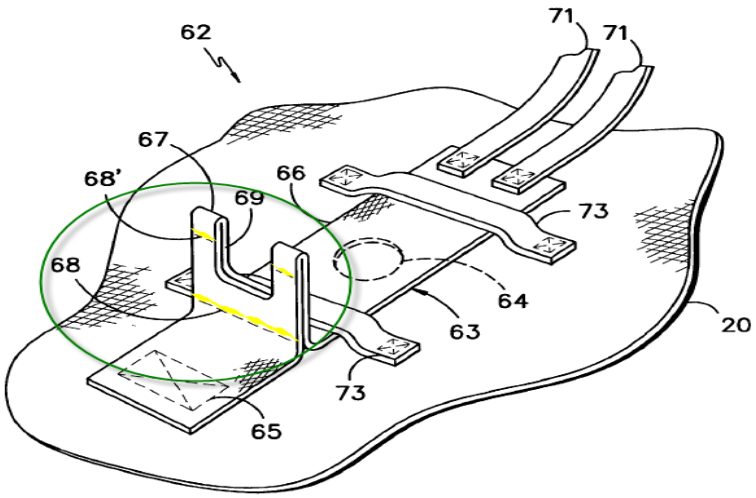
Patent Owner counters that Petitioner provides no practical reason why one of ordinary skill in the art would have been motivated "to add a fold held by tack stitching or any other releasable temporary holding feature to an airbag" where the cord is anchored, as required by the claims. PO Resp. 27–29 (citing Ex. 2015 ¶¶ 71–78). Patent Owner also alleges that Petitioner submits "no reason how or why the addition of these temporary releasable holding features will improve the performance of the airbag." *Id*.

"A reference must be considered for everything it *teaches* by way of technology and is not limited to the particular *invention* it is describing and attempting to protect." *EWP Corp. v. Reliance Universal Inc.*, 755 F.2d 898, 907 (Fed. Cir. 1985) (emphases in original). In an obviousness analysis, we must consider the combination of references, as a whole, in light of the general knowledge of an ordinarily skilled artisan. *In re Merck & Co.*, 800 F.2d 1091, 1097 (Fed. Cir. 1986).

Here, Petitioner relies upon the combination of Inoue, Pinsenschaum, and Wolanin to render obvious the aforementioned "releasable temporary

holding" claim limitations. Pet. 25–26, 37–40. Petitioner articulates that it would have been obvious to apply the releasable stitching of Pinsenschaum or Wolanin to the fold in Inoue's airbag cushion, holding the fold in place prior to deployment. *Id*.

As discussed above, Pinsenschaum discloses an airbag having a plurality of closeable vents. Ex. 1009 ¶ 1. Pinsenschaum uses *releasable break-away seams* to hold a fold in the vent cover, ensuring that the vents remain open prior to full deployment. *Id*. ¶¶ 55–59. Figure 4A of Pinsenschaum is reproduced below (highlights and marking added).



As shown in annotated Figure 4A of Pinsenschaum above, cover element 63 is folded in pleat structure 67, which is held in place by break-away seams 68, 68'. *Id*. ¶ 56. Pinsenschaum also describes that the *break-away seams* 68, 68' may be any suitable construction including *stitching, adhesive bonding, welding or the like*. *Id*. The strength of the break-away seams 68, 68' is selected such that they will rupture upon the application of a sufficient tensioning force pulling in the direction away

from the attachment location. *Id*. Although only a single fold is illustrated, multiple fold pleat structures may be utilized. *Id*.

Wolanin also discloses an airbag having closeable vents and tether wires, controlling the rate of the gas being released from the airbag, to provide a soft deployment. Ex. 1010, Abstract. The vents are open initially when the tether wires are slack and valve flap is folded in a stack of accordion pleats. *Id*. at 3:6–21. Wolanin uses *a tack stitch to hold the folds in place so that the vents remain open*. *Id*.

Upon review of Inoue, Pinsenschaum, and Wolanin, we are persuaded that Petitioner has proffered sufficient evidence to support its contention that the combination of these references renders obvious the aforementioned "releasable temporary holding feature" limitations, as recited in claims 1, 6, 20, 25, and 28. We also have considered Patent Owner's arguments and supporting evidence, but find them to be unpersuasive.

In support of its arguments, Patent Owner directs attention to Seymour (a prior art cited by Petitioner, Pet. 49–51) and a Declaration of Mr. Helleman. PO Resp. 27–29 (citing Ex. 1012, 1:36–49; Ex. 2015 ¶¶ 71–78). Neither Seymour nor Mr. Helleman's testimony, however, supports Patent Owner's contentions that intend to undermine Petitioner's evidence of obviousness. In fact, Seymour confirms that an ordinarily skilled artisan would have found it obvious to use a releasable temporary holding feature to hold the folds of an airbag in place before deployment.

For instance, Seymour discloses holding the folded airbag in place with a fabric envelope that has tear tabs or a tear seam (both a releasable

temporary holding feature). Ex. 1012, 3:59–4:16. Figures 5 and 6 of Seymour are reproduced below with green markings added.

FIG. 5

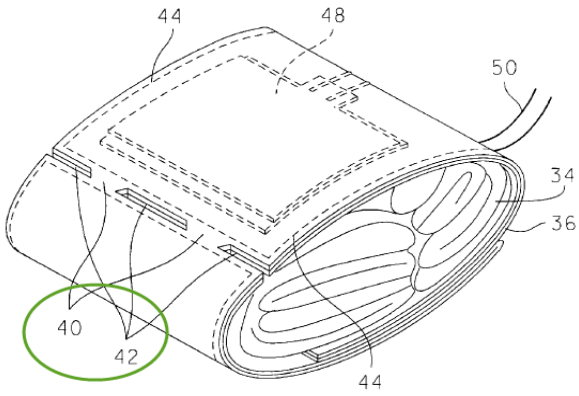
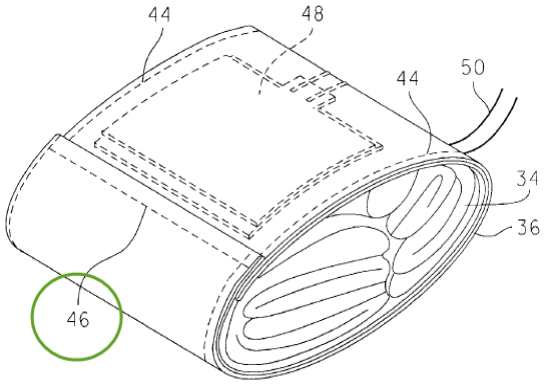


FIG. 6



As shown in Figures 5 and 6 of Seymour, folded airbag 34 is held in place by fabric envelope 36. *Id*. In Figure 5, *tear tabs* 40 are included in slot 42 on fabric envelope 36, whereas fabric envelope 36, in Figure 6, includes *tear seam* 46, which comprises a weak stitch pattern of thin thread. *Id*. Tear tabs 40 and tear seam 46 are designed to retain the folds of airbag 34 in place, and pull apart and release the folds as airbag 34 is inflated. *Id*.

Contrary to Patent Owner's argument and Mr. Helleman's testimony (PO Resp. 28; Ex. 2015 ¶ 77), Seymour would not discourage one with ordinary skill in the art from using a releasable temporary holding feature. Ex. 1012, 2:9–15, 42–48. The portion of Seymour (*id*. at 1:36–49) relied upon by Patent Owner and Mr. Helleman's testimony (PO Resp. 28; Ex. 2015 ¶ 77) indicates the problems to be solved by the releasable temporary holding features disclosed in Seymour. More importantly, Seymour describes using these releasable temporary holding features to reduce number components and to optimize the airbag module. Ex. 1012,

2:9–48. According to Seymour, by replacing a traditional airbag housing with a fabric envelope that has tear tabs or a tear seam, the airbag module would be smaller, lighter, and has fewer parts, allowing the airbag module to be assembled easier and faster, and to be produced more cost effectively. *Id*.

Given these advantages disclosed in Seymour, we find that Seymour's teachings would have encouraged an ordinarily skilled artisan to make such a simple substitution, expressly providing reasons to use a releasable temporary holding feature in an airbag. Significantly, Seymour also shows that implementing a releasable temporary holding feature—namely, tear tabs or a tear seam in an airbag module to hold the folds of an airbag in place (*see* Ex. 1012, 2:9–48)—would not have been "uniquely challenging" or otherwise beyond the level of an ordinary skilled artisan. *See Leapfrog Enters., Inc. v. Fisher-Price, Inc.*, 485 F.3d 1157, 1162 (Fed. Cir. 2007) (citing *KSR*, 550 U.S. at 418) (finding that Leapfrog failed to present evidence that the inclusion a "reader" into the device as issue was "uniquely challenging"). Therefore, Seymour does not undermine Petitioner's showing of obviousness, as alleged by Patent Owner. Rather, Seymour supports Petitioner's articulated reasoning as to why one with ordinary skill in the art would have combine the prior art teachings.

Patent Owner's arguments and Mr. Helleman's testimony (PO Resp. 27–29; Ex. 2015 ¶¶ 75–80) also are not commensurate with the claim scope, by importing improperly a limitation from a preferred embodiment (Ex. 1001, 8:5–10) into the claims. *See In re Self*, 671 F.2d 1344, 1348 (CCPA 1982) (It is well established that limitations not appearing in the claims cannot be relied upon for patentability.). Nothing in the claims

requires the releasable temporary holding feature to be *directly on* the particular fold where the cord is anchored. The claims merely require "the fold is *held in place* by" a stitching or any other releasable temporary holding feature. We decline to import improperly a limitation from a preferred embodiment into the claims. *See Thorner v. Sony Computer Entm't Am. L.L.C.*, 669 F.3d 1362, 1365 (Fed. Cir. 2012) (holding that it is not enough that the only embodiment, or all of the embodiments, contain a particular limitation to limit a claim to that particular limitation.).

For the foregoing reasons, we determine that Petitioner has established sufficiently that the combination of Inoue, Pinsenschaum, and Wolanin renders obvious the "releasable temporary holding feature" limitations, as recited by claims 1, 6, 20, 25, and 28.

Conclusion for Claims 1–3, 6, 20–22, 25, and 28–30

In consideration of the foregoing, we determine that Petitioner has demonstrated by a preponderance of the evidence that claims 1–3, 6, 20–22, 25, and 28–30 are unpatentable under § 103(a) as obvious over the combination of Inoue, Pinsenschaum, and Wolanin.

F. Claims 26, 27, 33–37, and 40—Obviousness over Inoue, Pinsenschaum, Wolanin, and Tajima

Petitioner asserts that claims 26, 27, 33–37, and 40 are unpatentable under § 103(a) as obvious over the combination of Inoue, Pinsenschaum, Wolanin, and Tajima. Pet. at 51–54. Claims 26 and 27 depend directly from claim 20; and claims 33 and 34 depend directly from claim 28. Claims 36, 37, and 40 depend directly from independent claim 35, which

recites similar limitations as those of claim 20, and further recites a "diffuser." As discussed above, we determine that Petitioner has demonstrated by a preponderance of the evidence that the claimed subject matter, as a whole, recited in independent claims 20 and 28 would have been obvious over the combination of Inoue, Pinsenschaum, and Wolanin. Therefore, our discussion here focuses on the additional limitations recited in claims 26, 27, 33–37, and 40.

Fixed Vent

The parties dispute whether the combination of prior art renders obvious an airbag having both a closeable vent and a *fixed vent* that is "adapted to vent gas during airbag deployment with and without obstruction," as recited in claims 27, 34, and 40. Pet. 51–53; PO Resp. 50–59. In that regard, Petitioner alleges that an airbag with a fixed vent is well known in the art at the time of the invention, as evidenced by each of Inoue, Pinsenschaum, Wolanin, and Tajima. Pet. 51–53 (citing Ex. 1009 ¶ 3, Ex. 1010, 1:16–19, Ex. 1013 ¶¶ 7, 71, 95–102, Figs. 3, 4, 21–24). Petitioner notes that Pinsenschaum states that "to facilitate the discharge of inflator gas from the airbag, it is common to incorporate *vents in the form of normally open fixed diameter apertures* across the walls of the airbag." Pet. 51–53; Ex. 1009 ¶ 3 (emphasis added). Petitioner also notes that Tajima discloses such fixed vents on an airbag. Pet. 51–53; Ex. 1013 ¶ 71, Figs. 3, 4, 21. Petitioner further asserts that, in light of the prior art teachings, an ordinarily skilled artisan would have been found it obvious to utilize both a closeable vent and a fixed vent on an airbag. *Id*. at 53 (citing Ex. 1017 ¶¶ 68–70).

Patent Owner advances a number of arguments that the combination of prior art does not render obvious an airbag having a closeable vent and a fixed vent, as required by the claims at issue. PO Resp. 51–57. For support, Patent Owner directs our attention to the Declaration of Mr. Helleman, who essentially repeats Patent Owner's arguments. Ex. 2015 ¶¶ 141–168.

First, Patent Owner contends that Petitioner fails to articulate a sufficient rationale to combine the prior art references. PO Resp. 54–57. According to Patent Owner, "[t]here is no need *to add fixed vents* to Petitioner's hypothetical airbag to account for accidental closure" because an airbag "designer of ordinary skill would [have been] fully aware of the airbag's behavior in both theoretical and real-world environments and would optimize that design for predictable, reliable, and consistent operation." *Id*.; Ex. 2015 ¶¶ 154–59 (emphasis added). Patent Owner also argues that adding a fixed vent would compromise the performance of the airbag system by venting too much gas in the situation where there is no obstruction, and that Tajima's fixed vent is ineffective. *Id*. at 52–53, 56; Ex. 2015 ¶ 154.

Upon consideration of the evidence in this entire record, we are not persuaded by Patent Owner's arguments and expert testimony because they improperly characterize the advantage, disclosed in Tajima, for having both a closeable vent and a fixed vent disposed on an airbag as teaching away from *adding* a fixed vent to an airbag—requiring the prior art to disclose expressly a motivation for *adding* a fixed vent to an airbag that already has a closeable vent.

Tajima discloses several embodiments, each of which illustrates an airbag having a closeable vent and two fixed vents, as well as a diffuser,

which we will discuss in the next section below. Ex. 1013 ¶¶ 71, 95, Figs. 3–6, 21–24. For instance, Figures 21 and 22 of Tajima are reproduced below (with blue annotations and green markings added), showing one of the embodiments.

Fig. 21

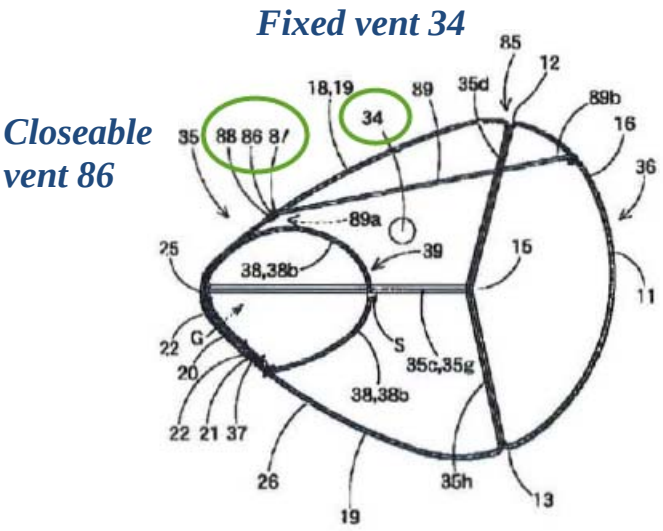
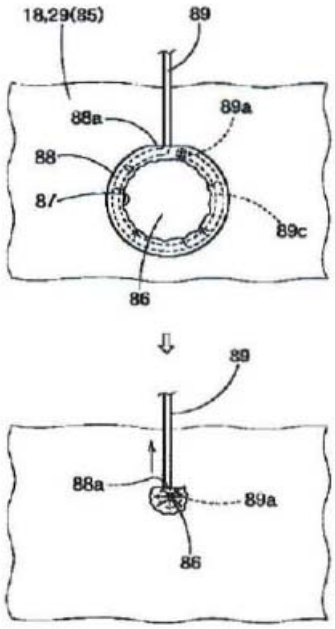


Fig. 22



As shown in annotated Figures 21 and 22 of Tajima above, airbag 85 includes diffuser 39, closeable vent 86, and *fixed vents* 34—one fixed vent on each side of the airbag. Fixed vents 34 have fixed openings and are adapted to vent gas during deployment with and without obstruction, as they are not equipped with a closeable mechanism. *Id*. ¶¶ 70, 71, 95. According to Tajima, having a closeable vent and fixed vents disposed on the same airbag will provide smooth deployment when there is an obstruction. *Id*. ¶ 71. Therefore, Tajima explicitly discloses a reason why one with ordinary skill in the art would have found it obvious to implement a closeable vent and fixed vents in the same airbag. More importantly, Tajima illustrates that implementing such an airbag would not have been "uniquely challenging" or

otherwise beyond the level of an ordinary skilled artisan at the time of the invention. *See Leapfrog*, 485 F.3d at 1162.

Patent Owner's argument that having fixed vents would compromise the performance by venting too much gas is misplaced. PO Resp. 56; Ex. 2015 ¶ 154. Tajima explicitly indicates that "gross opening" of the fixed vents is not possible. Ex. 1013 ¶ 71.

Also, Patent Owner's argument that "fixed vents may not vent when an obstruction is encountered" contradicts the teachings of Tajima, and improperly attempts to construe the claims to require every fixed vent on the airbag to vent all the time continuously during the deployment. PO Resp. 52; Ex. 2015 ¶ 146. The claims merely recite "a fixed vent disposed on the airbag and *adapted to vent gas* during airbag deployment with and without obstruction." Notably, according to Tajima, because the inflating gas is exhausted from the fixed vents during deployment when there is an obstruction, "the increased pressure forces on the interfering object HP can be prevented in a remarkably smooth manner." Ex. 1013 ¶ 70.

Furthermore, we are not persuaded by Patent Owner's argument that Tajima's fixed vents are ineffective. PO Resp. 52–53; Ex. 2015 ¶¶ 147–48. The portion of Tajima relied upon by Patent Owner's argument discusses the disadvantage of an airbag having *only fixed vents*, without a closeable vent. Ex. 1013 ¶ 71. Patent Owner's argument again is not commensurate with the claim scope. The claims at issue do not require *a single fixed vent*, by itself, to be operated effectively but allow for both fixed vents and closeable vents. In fact, Tajima discloses that having a closeable vent and fixed vents

on an airbag will provide a smooth deployment when there is an obstruction. *Id*.

Patent Owner's expert, Mr. Helleman, testifies that a person with ordinary skill in the art would have been "fully aware of the airbag's behavior in both theoretical and real-world environments and would optimize that design for predictable, reliable, and consistent operation." Ex. 2015 ¶¶ 157–58. Therefore, such an artisan would have been capable of predictably implementing an airbag that has a closeable vent and fixed vents in order to provide smooth deployment, as taught by Tajima. Doing so would have been within the level of ordinary skill in the art and would have amounted to combining known elements according to their established functions, yielding predictable results. *KSR*, 550 U.S. at 416–18. In light of the evidence before us, we determine that Petitioner's explanation for combining the teachings of Inoue, Pinsenschaum, Wolanin, and Tajima suffices as an articulated reasoning with rational underpinning to justify the legal conclusion of obviousness.

For the foregoing reasons, we conclude that Petitioner has demonstrated by a preponderance of the evidence that the combination of Inoue, Pinsenschaum, Wolanin, and Tajima, renders obvious the "fixed vent" claim limitation, as required by claims 27, 34, and 40.

Diffuser

Claims 26, 33, 35–37, and 40 each require "a diffuser configured to [redirect] inflation gas to the closeable vent from an inflator such that the gas rapidly exits the inflatable airbag cushion via the closeable vent when

deployment of the airbag is obstructed." Ex. 1001, 12:5–9, 12:41–45, 12:49–13:5, 14:4–6.

Petitioner asserts that "Tajima discloses that [a] rectifying fabric or diffuser changes the flow of the incoming deployment gas to direct it in both left and right side directions." Pet. 53 (citing Ex. 1013 ¶ 34). Petitioner submits that the disputed claim limitation requires redirecting the gas to a *closeable* vent such that the gas rapidly exits the airbag via the *closeable* vent, whereas Tajima's diffuser redirects the gas to exit the *side* vents, which are *fixed* vents in Tajima's airbag. *Id*. at 54 (citing Ex. 1013 ¶¶ 39, 70; Ex. 1017 ¶¶ 68, 71). Nevertheless, Petitioner maintains that an ordinarily skilled artisan would have found it obvious to use Tajima's diffuser to redirect the gas toward closeable vents which are on the sides of Inoue's airbag, as modified in view of Pinsenschaum and Wolanin, to more readily exhaust excess gas from the airbag during deployment, as discussed by Tajima. *Id*.

Patent Owner advances a number of arguments that the combination of prior art does not render obvious an airbag having a "diffuser" as required by claims 26, 33, 35–37, and 40. PO Resp. 29–50. Patent Owner relies upon the Declaration of Mr. Helleman, who essentially repeats the Patent Owner's arguments. Ex. 2015 ¶¶ 83–138. We have considered Patent Owner's arguments and supporting expert testimony, and determine that they are unpersuasive.

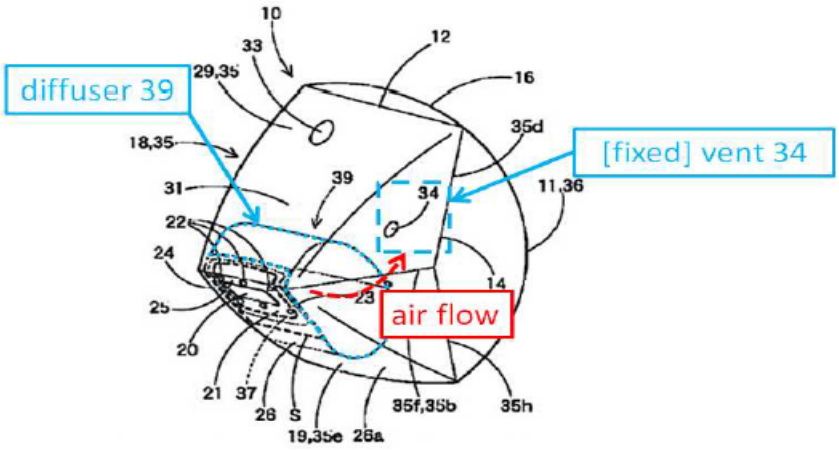
First, Patent Owner argues that Petitioner fails to consider the effect of Bernoulli's principle—pressure is lower in a moving fluid than in a stationary fluid (Ex. 1001, 6:64–7:10)—which allegedly requires the gas to

flow *directly in a straight path* from the diffuser to the closeable vents. PO Resp. 32–34; Ex. 2015 ¶¶ 85–95. Patent Owner maintains that Tajima does not disclose the claimed "diffuser," because Tajima's diffuser does not direct the flow of gas towards the closeable vent, but towards a solid portion of the airbag sidewall, which would again redirect the flow of air towards the forward portion of the airbag. *Id*. at 38–41; Ex. 2015 ¶¶ 82, 107–114.

At the outset, Patent Owner, once again, attempts to substantiate its position by importing improperly a limitation from a preferred embodiment into the claims. *See Enzo Biochem, Inc. v. Applera Corp.*, 599 F.3d 1325, 1342 (Fed. Cir. 2010) ("[I]t is improper to read limitations from a preferred embodiment described in the specification—even if it is the only embodiment—into the claims absent a clear indication in the intrinsic record that the patentee intended the claims to be so limited."). Nothing in the claims requires the gas flows *directly in a straight path* from the diffuser to the closeable vents, much less requires a particular location of the closeable vents that accounts for the effect of Bernoulli's principle.

Further, Patent Owner's attack of the references individually does not undermine Petitioner's showing of obviousness, because nonobviousness cannot be established by attacking references individually where the ground of unpatentability is based upon the teachings of a combination of references. *See In re Keller*, 642 F.2d 413, 426 (Fed. Cir. 1981). Here, we are persuaded that the prior art teachings, as a whole, would have rendered obvious a diffuser that redirects the inflating gas to a closeable vent such that the gas rapidly exits the airbag via the vent when deployment is obstructed by an out-of-position occupant. For instance, Figure 3 of Tajima is

reproduced below with annotations added by Patent Owner (Prelim. Resp. 33):



As shown in annotated Figure 3 of Tajima above, diffuser 39 is located inside of airbag 10, redirecting the gas flow to the left and right sides of the airbag. Ex. 1013 ¶ 35. As the parties point out, Tajima's diffuser redirects the gas to exit the side vents. Pet. 54; Prelim. Resp. 32. The side vents of Inoue, Pinsenschaum, and Wolanin are *closeable* vents. Ex. 1008, Fig. 1; Ex. 1009, Figs. 3A–3B; Ex. 1010, Figs. 4A–4C. As such, incorporating Tajima's diffuser into such an airbag would redirect the gas to the *closeable* vents, such that the gas rapidly exits the airbag via the *closeable* vents.

Interestingly, Patent Owner does not explain why an ordinarily skilled artisan—who would have had at least a Bachelor of Science degree in Engineering and three to six years of working experience in design, development, and testing airbags (Ex. 1017 ¶ 15; Ex. 2015 ¶ 22)—would not have considered it obvious to optimize the location of the vents on an airbag, especially in view of its own expert's testimony that an ordinarily skilled

artisan would have been "fully aware of the airbag's behavior in both theoretical and real-world environments and would optimize that design for predictable, reliable, and consistent operation." Ex. 2015 ¶¶ 157–58. Moreover, such an artisan would not compel to follow blindly the teaching of one prior art reference over the other without the exercise of independent judgment. *Lear Siegler, Inc. v. Aeroquip Corp.*, 733 F.2d 881, 889 (Fed. Cir. 1984); *see also KSR*, 550 U.S. at 420–21 (stating that a person with ordinary skill in the art is "a person of ordinary creativity, not an automaton," and "in many cases . . . will be able to fit the teachings of multiple patents together like pieces of a puzzle").

Second, Patent Owner alleges that one with ordinary skill in the art would not have been motivated to combine Tajima's diffuser and the airbag of Inoue, as modified in view of Pinsenschaum and Wolanin. PO Resp. 34–38; Ex. 2015 ¶¶ 97–99. In particular, Patent Owner asserts that Tajima's diffuser, redirecting the gas to the sides, would compromise the performance of the airbag because, without sufficient forward movement of the gas, the airbag would fail to expand as desired for full deployment or fail to operate as designed. PO Resp. 36–37; Ex. 2015 ¶¶ 99–104. Patent Owner also contends that Tajima's diffuser would prevent the cord from extending and the closeable vents from closing, as required by the claims at issue. PO Resp. 41–46; Ex. 2015 ¶¶ 115–22.

Patent Owner's arguments squarely contradict the teachings of Tajima. *See* Ex. 1013 ¶¶ 34, 95–102, Figs. 3–4, 21–24. Notably, Tajima discloses an airbag that has a diffuser, a closeable vent, and fixed vents for providing smooth deployment to protect an occupant in situations where:

(1) the occupant does not obstruct the deployment; and (2) the occupant is out-of-position and is obstructing the deployment. *Id*.

Figures 23 and 24 are reproduced below with blue annotations and green markings added.

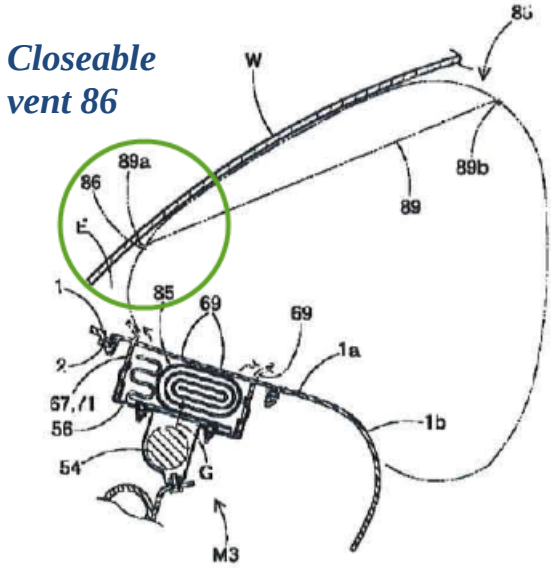


Fig. 23 – Full Deployment without obstruction

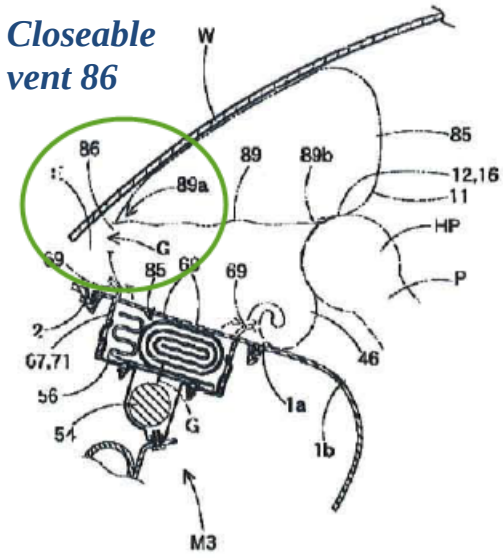


Fig. 24 – Deployment with obstruction from out-of-position occupant HP

Annotated Figures 23 and 24 of Tajima illustrate the deployment of airbag 85—the same embodiment as shown in Figures 21 and 22 reproduced in our Fixed Vents discussion above—which has a diffuser, a closeable vent, and fixed vents. *Id*. ¶¶ 95–103. As annotated Figure 23 shows, where there is no obstruction from an occupant, cord 89 extends completely and closes closeable vent 86, and, more significantly, airbag 85 operates as designed, deploying fully to protect the occupant. *Id*. Also, annotated Figure 24 shows that, where deployment of airbag 85 is obstructed by out-of-position occupant HP, cord 89 does not extend fully and closeable vent 86 remains

open so that gas G rapidly exits airbag 85 via closeable vent 86, providing a smooth deployment protecting out-of-position occupant HP. *Id*.

Tajima illustrates that implementing a diffuser, a closeable vent and side vents in the same airbag would not have compromised the performance of the airbag, as alleged by Patent Owner. *Id*. ¶¶ 95–103, Figs. 21–24. Importantly, Tajima demonstrates that such an implementation would not have been "uniquely challenging" or otherwise beyond the level of an ordinary skilled artisan. *See Leapfrog*, 485 F.3d at 1162.

Third, Patent Owner argues that the addition of extra components to an airbag such as Tajima's diffuser generally is disfavored because any additional material cost, weight, or extra component impacts the desirability and performance of an airbag design. PO Resp. 37–38; Ex. 2015 ¶¶ 105–06. Patent Owner's general allegation regarding additional cost and weight is not persuasive. For instance, Patent Owner does not submit sufficient or credible evidence that the alleged increase of cost or weight would have a substantial or meaningful impact such that it would dissuade one with ordinary skill in the art from utilizing a diffuser in an airbag. Moreover, the alleged increase of cost or weight, if any, does not substantiate Patent Owner's position of nonobviousness in view the advantage of providing smooth deployment to protect an occupant, as taught by Tajima. *See Medichem, S.A. v. Rolabo, S.L.*, 437 F.3d 1157, 1165 (Fed. Cir. 2006) ("given course of action often has simultaneous advantages and disadvantages, and this does not necessarily obviate motivation to combine"); *In re Farrenkopf*, 713 F.2d 714, 717–18 (Fed. Cir. 1983) (where a prior art reference taught the addition of inhibitors as the most convenient,

but costliest, solution to a particular problem, the court held that the additional expense would not have discouraged one of ordinary skill in the art from seeking the convenience expected therefrom). As discussed above, Tajima's diffuser redistributes the inflating gas uniformly to provide a smooth deployment, protecting an occupant even in the situation where the occupant is out-of-position obstructing the deployment. Ex. 1013 ¶¶ 34, 95–102, Figs. 3–4, 21–24. "[I]f a technique has been used to improve one device, and a person of ordinary skill in the art would recognize that it would improve similar devices in the same way, using the technique is obvious unless its actual application is beyond his or her skill." *KSR*, 550 U.S. at 417.

Finally, Patent Owner argues that the combination of Pinsenschaum and Tajima fails to render the "diffuser" limitation obvious. PO Resp. 44–46. In particular, Patent Owner alleges that during early deployment and deployment with obstruction, Pinsenschaum's closeable vents as shown in Figure 3A of Pinsenschaum are closed and not venting any gas. *Id*. As discussed above, however, each of Inoue's outlet hole, Wolanin's closeable vents, and Tajima's closeable vents remains open during early deployment and during deployment with obstruction. Ex. 1008, Abs., ¶¶ 1, 7, 10, 12, 29, Figs. 1–4; Ex. 1010, Abs., 3:51–68, Figs. 4A, 4C; Ex. 1013 ¶¶ 95–103, Figs. 21–24. Patent Owner's arguments narrowly focus on only one of the embodiments of Pinsenschaum, and fail to consider the combination of Inoue, Pinsenschaum, Wolanin, and Tajima, as a whole. *See Merck*, 800 F.2d at 1097.

In light of the prior art teachings before us, we are persuaded that Petitioner has provided articulated reasoning with rational underpinning why one with ordinary skill in the art would have combined Tajima's diffuser with the airbag of Inoue, as modified in view of Pinsenschaum and Wolanin. For the reasons stated above, we also are persuaded that Petitioner has demonstrated by a preponderance of evidence the combination of Inoue, Pinsenschaum, Wolanin, and Tajima renders obvious the "diffuser" limitations, as recited in claims 26, 33, 35–37, and 40.

Conclusion for Claims 26, 27, 33–37, and 40

In consideration of the foregoing, we are persuaded that Petitioner has demonstrated by a preponderance of the evidence that claims 26, 27, 33–37, and 40 are unpatentable over the combination of Inoue, Pinsenschaum, Wolanin, and Tajima.

III. CONCLUSION

For the foregoing reasons, we determine that Petitioner has demonstrated by a preponderance of the evidence that claims 1–3, 6, 20–22, 25–30, 33–37, and 40 of the '653 patent are unpatentable based on the following grounds:

Claims	Basis	References
1–3, 6, 20–22, 25, and 28–30	§ 103(a)	Inoue, Pinsenschaum, and Wolanin
26, 27, 33–37, and 40	§ 103(a)	Inoue, Pinsenschaum, Wolanin, and Tajima

IV. ORDER

In consideration of the foregoing, it is:

ORDERED that claims 1–3, 6, 20–22, 25–30, 33–37, and 40 of the ’653 patent are held unpatentable; 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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