IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

INTEX RECREATION CORP. AND BESTWAY (USA), INC.
Petitioners

v.

TEAM WORLDWIDE CORPORATION
Patent Owner

Case IPR2018-00872
Patent No. 7,246,394 B2

Before BEVERLY M. BUNTING, JAMES J. MAYBERRY, and
ERIC C. JESCHKE, *Administrative Patent Judges.*

PETITIONER'S NOTICE OF APPEAL

Pursuant to 35 U.S.C. §§ 141, 142, and 319, and in accordance with 37 C.F.R. §§ 90.2 and 90.3, Petitioner Intex Recreation Corp. ("Petitioner") hereby appeals to the United States Court of Appeals for the Federal Circuit from the Final Written Decision of the Patent Trial and Appeal Board entered on September 11, 2019 (Paper 133) in case number IPR2018-00872 (the "Final Written Decision"), and from all underlying findings, determinations, rulings, opinions, orders, and decisions that are adverse to Petitioner. A copy of the Final Written Decision is attached as Exhibit A.

In accordance with 37 C.F.R. § 90.2(a)(3)(ii), Petitioner states that the issues on appeal include, but are not limited to: the Board's determination that claims 1-12 and 16-23 of U.S. Patent No. 7,246,394 are not unpatentable under 35 U.S.C. § 103; the Board's consideration of (or failure to consider) the expert testimony, prior art, and other arguments and/or evidence of record; any finding or determination supporting or related to the foregoing issues and all other issues decided adversely to Petitioner; and the validity and/or enforceability of the Final Written Decision in view of *Arthrex, Inc. v. Smith & Nephew, Inc.*, No. 2018-2140, 2019 WL 5616010 (Fed. Cir. Oct. 31, 2019).

A copy of this Notice of Appeal is being timely filed with the Clerk's Office for the United States Court of Appeals for the Federal Circuit along with payment

of the required docketing fee. In addition, a copy of this Notice of Appeal is being filed simultaneously with the Patent Trial and Appeal Board and with the Director of the United States Patent and Trademark Office.

FAEGRE BAKER DANIELS LLP

Dated: November 12, 2019

By: /R. Trevor Carter/
R. Trevor Carter
Reg No. 40,549

Lead Counsel for Petitioner,
Intex Recreation Corp.

CERTIFICATE OF FILING AND SERVICE

I certify that on November 12, 2019, Petitioner's Notice of Appeal was filed electronically through the Patent Trial and Appeal Board's E2E system, and has been filed with the Director of the United States Patent and Trademark Office by Priority Mail Express at the following address:

Director, United States Patent and Trademark Office
c/o Office of the General Counsel
United States Patent and Trademark Office
P.O. Box 1450
Alexandria, VA 22313-1450

I further certify that on November 12, 2019, Petitioner's Notice of Appeal was filed with the Clerk's Office for the United States Court of Appeals for the

Federal Circuit and the required docket fee was paid electronically through the Court's CM/ECF system.

I further certify that, pursuant to 37 C.F.R. § 42.6(e) and Patent Owner's agreement to accept electronic service, I caused a true and correct copy of Petitioner's Notice of Appeal to be served via email on November 12, 2019, to the following:

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EXHIBIT A

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Paper No. 133
Entered: September 11, 2019

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

INTEX RECREATION CORPORATION and BESTWAY (USA) INC.,
Petitioners,

v.

TEAM WORLDWIDE CORPORATION,
Patent Owner.

Case IPR2018-00872
Patent 7,246,394 B2

Before BEVERLY M. BUNTING, JAMES J. MAYBERRY, and ERIC C. JESCHKE, *Administrative Patent Judges*.

MAYBERRY, *Administrative Patent Judge*.

JUDGMENT
Final Written Decision
Determining No Challenged Claims Unpatentable
35 U.S.C. § 318(a)

ORDER
Denying Petitioners' Motion to Exclude
Denying Patent Owner's Motion to Exclude
37 C.F.R. § 42.64

I. INTRODUCTION

Intex Recreation Corp., Bestway (USA) Inc., Walmart Inc., Wal-Mart Stores Texas, LLC, Wal-Mart.com USA LLC, and Sam's West, Inc. d/b/a Sam's Club (collectively, "Petitioners"), filed a Petition ("Pet.") requesting *inter partes* review of claims 1–12 and 16–23 (the "Challenged Claims") of U.S. Patent No. 7,246,394 B2 (Ex. 1201, the "'394 patent"). Paper 1.[1] Patent Owner, Team Worldwide Corp., filed a Preliminary Response ("Prelim. Resp.") to the Petition. Paper 8. We instituted trial on all claims and grounds. Paper 14 ("Dec. on Inst.").

After we instituted trial, Patent Owner filed a Patent Owner Response. Paper 50 ("PO Resp.").[2] Petitioners filed a Reply to the Patent Owner Response. Paper 77 ("Reply").[3] Patent Owner filed a Sur-Reply to the Reply. Paper 89 ("Sur-Reply").[4]

Both Petitioners and Patent Owner filed motions to exclude evidence. Papers 94, 96. Both parties filed oppositions and replies to the respective motions. Papers 99, 100, 102, 103.

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[1] The Petition indicates that, along with Petitioners, the following entities are real parties-in-interest: Intex Development Company Ltd., Intex Industries (Xiamen) Co., Ltd., Intex Marketing Ltd., Intex Trading Ltd., Bestway Global Holdings, Inc., Bestway (Hong Kong) International, Ltd., Bestway Inflatables & Materials Corp., Bestway (Hong Kong) Enterprise Co. Ltd., Bestway (Nantong) Recreation Corp., The Coleman Company, Inc., and Newell Brands Inc. Pet. 1.

[2] A public version of the Patent Owner Response was filed as Paper 51.

[3] A public version of the Reply was filed as Paper 78.

[4] A public version of the Sur-Reply was filed as Paper 90.

A consolidated oral hearing for *inter partes* review proceedings IPR2018-00870, IPR2018-00871, and IPR2018-00872 was conducted on June 7, 2019, and the record includes a transcript of the hearing. Paper 123 ("Tr.").[5] An oral hearing for IPR2018-00875, which concerns a related patent, was also conducted on June 7, 2019, and the record contains a transcript of that hearing. Paper 126.[6]

On June 18, 2019, we granted a joint motion to terminate the proceeding as to the Walmart entities (Walmart Inc., Wal-Mart Stores Texas, LLC, Wal-Mart.com USA LLC, and Sam's West, Inc. d/b/a Sam's Club). Paper 120. Accordingly, Intex Recreation Corp. and Bestway (USA) Inc. are the sole remaining "Petitioners."

Petitioners rely on the declaration testimony of Dr. Joseph Beaman (Exs. 1202, 1625), Mr. W. Todd Schoettelkotte (Ex. 1649), and Mr. Ryan Slate (Ex. 1650). Patent Owner relies on the declaration testimony of Dr. Glen Stevick (Ex. 2229) and Dr. Stephen Becker (Ex. 2638).

The Board has jurisdiction under 35 U.S.C. § 6. This Final Written Decision is issued pursuant to 35 U.S.C. § 318(a) and 37 C.F.R. § 42.73. For the reasons that follow, we conclude that that the Petitioners have not proven by a preponderance of the evidence that the Challenged Claims are unpatentable.

[5] A public version of the transcript was filed as Paper 122.
[6] A public version of the transcript was filed as Paper 125.

A. Related Matters

The parties indicated that the '394 patent was the subject of an infringement suit in the U.S. District Court for the Eastern District of Texas, in a case styled *Team Worldwide Corp. v. Walmart, Inc. et al.*, No. 2-17-cv-00235-JRG (the "Litigation"). *See* Pet. 1–2; Paper 6, 1. The Litigation was dismissed because of settlement. *See* Paper 109, 1.

Petitioners also identify filed petitions for *inter partes* review of U.S. Patent Nos. 9,211,018 (the "'018 patent") and 7,346,950 (the "'950 patent"), which are asserted in the Litigation, and additional petitions directed to the '394 patent. *See* Pet. 2; Paper 6, 1 (identifying IPR2018-00870, IPR2018-00871, IPR2018-00873, and IPR2018-00874 as challenging the '394 patent; IPR2018-00875 as challenging the '950 patent; and IPR2018-00859 as challenging the '018 patent).

Patent Owner indicates that additional lawsuits involving the '394, '950, and '018 patents, have been filed: *Team Worldwide Corp. v. Macy's, Inc. & Macys.com, LLC*, No. 2:19-cv-00099-JRG (E.D. Tex.); *Team Worldwide Corp. v. Target Corporation & Target Brands, Inc.*, No. 2:19-cv-00100-JRG (E.D. Tex.); *Team Worldwide Corp. v. The Home Depot, Inc.*, No. 2:19-cv00098-JRG (E.D. Tex.); *Team Worldwide Corp. v. Dick's Sporting Goods, Inc.*, No. 2:10-cv-00097-JRG (E.D. Tex.); *Team Worldwide Corp. v. Costco Wholesale Corp.*, No. 2:19-cv-00096-JRG (E.D. Tex.); *Team Worldwide Corp. v. Bed Bath & Beyond Inc.*, No. 2:19- cv-00095-JRG (E.D. Tex.); *Team Worldwide Corp. v. Amazon.com, Inc. and Amazon.com LLC*, No. 2:19-cv-00094-JRG (E.D. Tex.); *Team Worldwide Corp. v. Ace Hardware Corp.*, No. 2:19-cv-00093-JRG (E.D. Tex.); and *Team Worldwide*

Corp. v. Academy, Ltd. d/b/a Academy Sports + Outdoors, No. 2:19-cv-00092-JRG (E.D. Tex.). Paper 109, 2–3; *see also* Paper 116, 3–4 (providing Petitioners' updated mandatory notices with respect to the newly-filed lawsuits). Patent Owner indicates that these lawsuits have been stayed pending the results of this and related *inter partes* review proceedings. Paper 109, 3.

B. The '394 Patent

The '394 patent "relates in general to an inflatable product provided with an electric air pump." Ex. 1201, 1:14–15. According to the '394 patent, prior air mattresses included inflatable chambers that "are inflated by an electric air pump . . . , which is separately provided, requiring users to carry two items, the air mattress itself, and an electric air pump" such that "[i]nconvenience results, especially for outdoor use." *Id.* at 1:17–24. The '394 patent, in contrast, "provides a modified air mattress, which has a built-in electric air pump eliminating the need for an external pump." *Id.* at 1:25–27. Figure 1A is reproduced below:

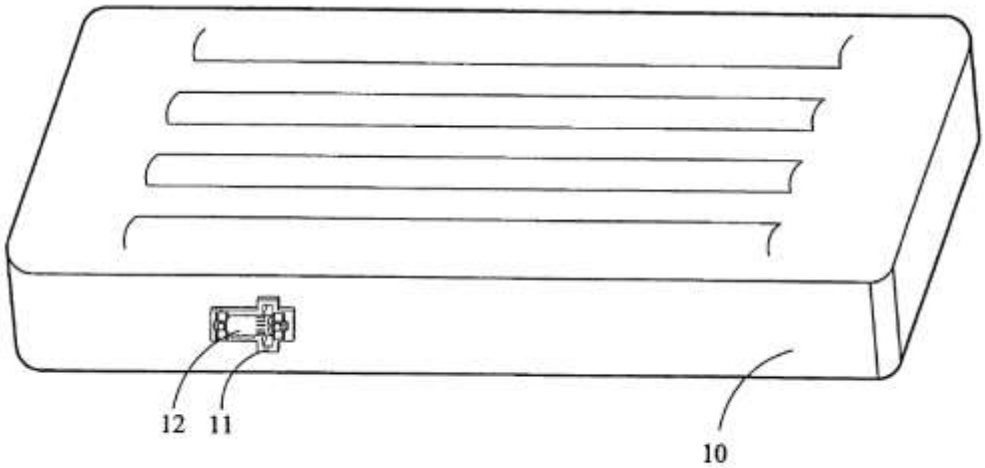


FIG. 1A

Id., Fig. 1A. Figure 1A depicts "a perspective diagram of an inflatable product," which includes inflatable chamber 10, pump seat 11, and air pump 12. *Id.* at 1:50–51, 3:15–21. Figures 3A and 3B are reproduced below:

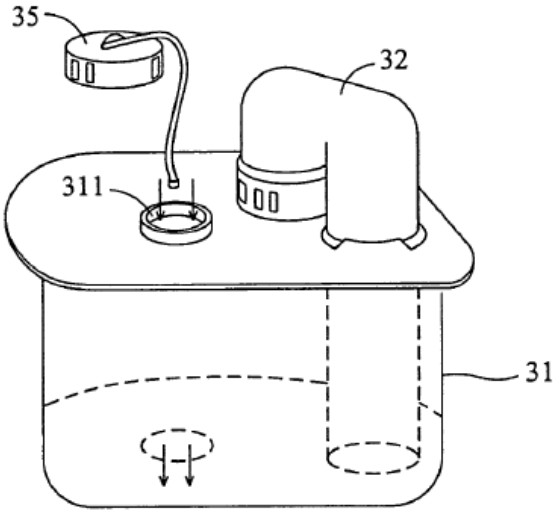


FIG. 3A

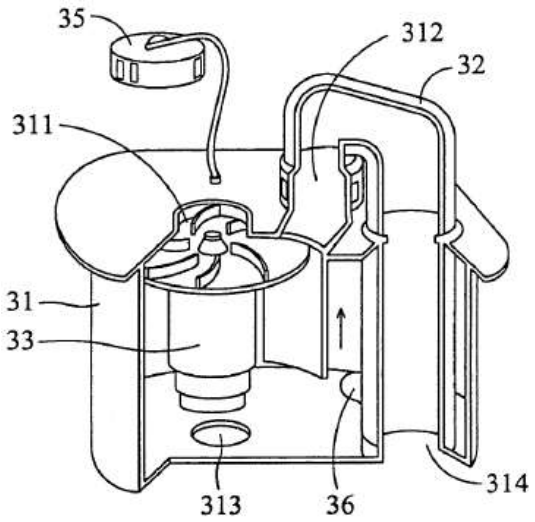


FIG. 3B

Id., Figs. 3A, 3B. Figure 3A depicts an air pump of an embodiment of an inflatable product (as shown, for example, in Figure 1A) during inflation. *See id.* at 1:66–67. Figure 3B depicts the air pump of Figure 3A with portions of certain structures removed. *See id.* at 2:1–2. Figures 3A and 3B show, among other aspects, housing 31, fan and motor 33, switching pipe 32, flap 36, and cover 35. *Id.* at 4:13–16. For inflation, "the switching pipe 32 is connected to the air outlet 312 on the top surface of the housing 31" and "cover 35 is removed from the air intake 311." *Id.* at 4:22–25. In this configuration, "[t]he inflatable product (not shown) is inflated by the fan and motor 33" as "[a]ir flows through the air intake 311 and the air outlet 313, and into the inflatable product." *Id.* at 4:25–28.

Figures 3C and 3D are reproduced below:

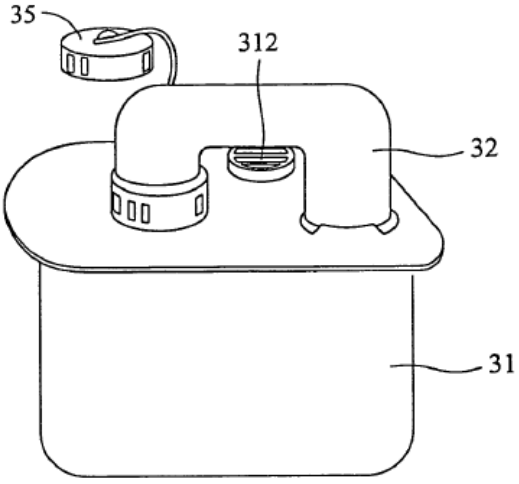


FIG. 3C

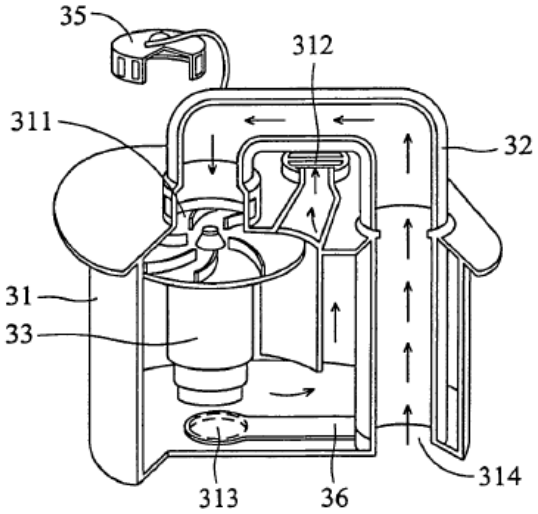


FIG. 3D

Id., Figs. 3C, 3D. Figure 3C depicts an air pump of an embodiment of an inflatable product during deflation. *See id.* at 2:3–4. Figure 3D depicts the air pump of Figure 3C with portions of certain structures removed. *See id.* at 2:5–6. For deflation, "the switching pipe 32 is switched from the air outlet 312 to the air intake 311 on the top surface of the housing 31" and "the flap 36 follows the switching pipe 32 to rotate to close the air outlet 313 on the bottom surface of the housing 31." *Id.* at 4:29–33. In this configuration, "air in the inflatable product is evacuated by the fan and motor 33" along the path indicated by arrows such that "[a]ir flows through the air intake 314, the switching pipe 32 and the air intake 311, and into the housing 31" and "out from the air outlet 312." *Id.* at 4:33–38.

C. Challenged Claims

Of the Challenged Claims, claims 1 and 16 are independent claims. Ex. 1201, 8:24–38, 9:38–10:19. Claim 1 is representative and reproduced below.

> 1. An inflatable product including:
> an inflatable body;
> a fan and motor assembly for pumping air;
> a housing built into the inflatable body, the housing having an interior region; and
> an air conduit disposed at least in part in the housing, the air conduit being movable between a first position and a second position while remaining disposed at least in part in the housing, the fan and motor inflating the inflatable body when the air conduit is in the first position, and deflating the inflatable body when the air conduit is in the second position;
> wherein air flows between the interior region of the housing and the inflatable body during inflation and deflation.

Ex. 1201, 8:24–38.

D. The Applied References

We instituted trial on grounds that rely on the following references:

Miller	US 5,529,377	June 25, 1996	Ex. 1213
Scott	US 4,938,528	July 3, 1990	Ex. 1212
Wu	US 6,698,046 B1	Mar. 2, 2004	Ex. 1205
Pisante	FR 2 583 825 A1	Dec. 26, 1986	Ex. 1263[7]

[7] Exhibit 1263 includes both the original French publication and a certified translation in English. *See, e.g.*, Ex. 1263, 39–40 (providing the translator's declaration). When citing to Pisante, we cite to the page number of Exhibit 1263 provided by Petitioners.

E. Asserted Grounds of Unpatentability

We instituted trial on the following grounds: (1) all Challenged Claims are unpatentable under 35 U.S.C. § 103 over Miller, Scott, and Wu; and (2) all Challenged Claims are unpatentable under 35 U.S.C. § 103 over Miller, Scott, and Pisante. *See* Dec. on Inst. 42, 46, 47, 51; Pet. 23.

F. Overview of the Applied References

We discuss each of the prior art references relied on in the Petition—Miller, Scott, Wu, and Pisante—in turn, below.

1. Miller

Miller, titled "Air Cell Module for Automobile Seat," issued June 25, 1996, from an application filed June 25, 1993. Ex. 1213, (54), (45), (22). Miller is generally directed "to automotive seats that include air cells to adjust the comfort of the seat." *Id.* at 1:7–9. We reproduce Miller's Figures 2 and 3, below.

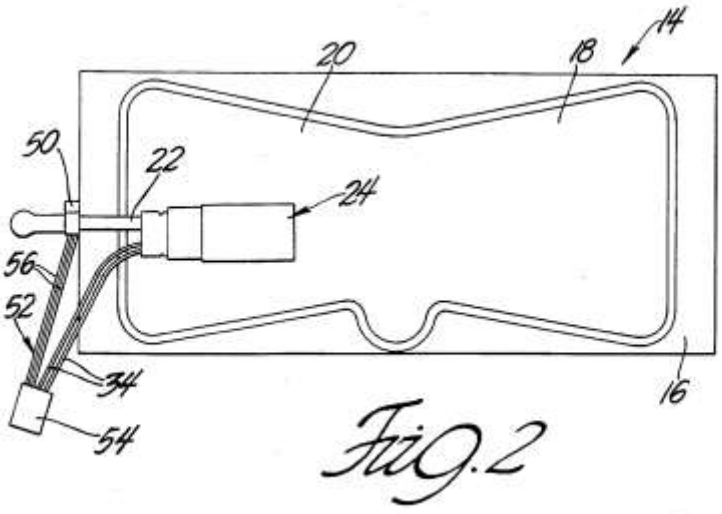


Fig. 2

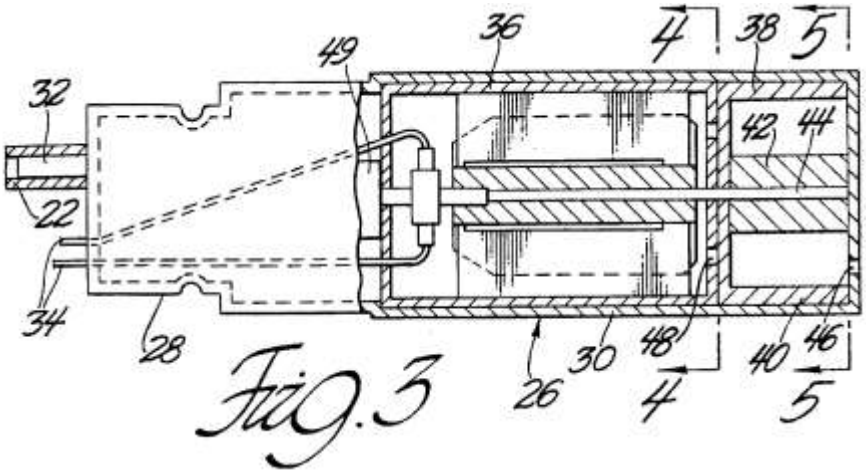


Fig. 3

Figure 2 depicts "a front view of the air cell module" of the embodiment of Miller's Figure 1 and Figure 3 depicts "an enlarged, partially sectioned side view of the air cell module shown in [Figure] 2." Ex. 1213, 2:64–67. Air cell module 14 is formed by flexible plastic backing member 16 and bow-tie shaped plastic membrane 18 secured to backing member 16 at its periphery. *Id.* at 3:20–24. Air cell module 14 is mounted on a backplate or other suitable support of the automobile seat back. *Id.* at 4:35–36.

Air cell 20 includes plastic air tube 22 that extends through the seam between the backing member 16 and the plastic membrane 18 and welded to backing member 16 and plastic membrane 18 to keep air cell 20 air tight. Ex. 1213, 3:24–30. Air cell module 14 also includes solenoid valve 50, disposed outside of air cell 20 and connected to the exterior end of air tube 22 to control the flow of air to and from air cell 20. *Id.* at 4:13–17.

Air cell module 14 also includes an electric motor driven air pump subassembly 24, which is disposed inside air cell 20, and which is operatively connected to the air tube 22. Ex. 1213, 3:31–38. "[A]ir pump

subassembly 24 is preferably welded to the backing member 16 but it can be welded to the plastic membrane 18 instead so long as it is held in a relatively fixed location." *Id.* at 3:34–36.

Subassembly 24 includes wankel-type air pump 38 attached to electric motor 36, which reside, as a unit, within housing piece 30. Ex. 1213, 3:51–55. Control switch 60 is located on the side of the seat to adjust the pressure of the air cell 20. *Id.* at 4:25–27. "The air cell is preferably inflated and deflated by a pump system that uses a reversible electric motor and air pump and a single solenoid valve that are controlled by a two-position switch." *Id.* at 4:27–30. Miller states that "[t]he advantage of such a system is that the deflation rate is quick and matches the inflation rate. Also the air cell can be fully evacuated and the seat occupant senses power operation on inflation and deflation." *Id.* at 4:30–34.

Miller discloses a second embodiment that includes electric motor driven air pump subassembly 124 to inflate and deflate air cell 114. Ex. 1213, 4:43–54. Subassembly 124 includes a reversible electric motor 136 connected to reversible air pump 138, such as a conventional vane pump. *Id.* at 4:59–61; *see also* Fig. 6 (depicting subassembly 124 outside of air cell 114).

2. Scott

Scott, titled "Seat Assembly with Inflatable Bladder Having a Single Non-Reversible Pump for Inflating and Deflating the Bladder," issued July 3, 1990, from an application filed April 27, 1989. Ex. 1212, (54), (45), (22). Scott is generally directed "to a vehicle seat assembly having an inflatable bladder in the seat to provide adjustable support for the seat

occupant and in particular to an improved air delivery system for inflating and deflating the seat bladder having a single, non-reversible pump for both inflating and deflating the bladder." *Id.* at 1:10–15.

Scott discloses, as part of the background to its invention, that it was known that inflatable bladders for vehicle seats may be deflated by the seat occupant applying pressure to the bladder or by using a pump—either a second pump separate from the pump used to inflate the bladder or a single, reversible pump to inflate and deflate the bladder. *See* Ex. 1212, 1:16–40. Scott discloses that "[t]he two pump system has the added expense of the second pump [and] [a] reversible pump is more expensive than a one-directional pump and is less efficient." *Id.* at 1:40–43. Scott continues that, because a reversible pump is less efficient than a one-directional pump, "a larger motor is required to produce the same amount of air pressure and volume flow as a one-directional pump." *Id.* at 1:43–45.

Scott discloses an exemplary one-directional pump for inflating and deflating a bladder in its Figure 12, which we reproduce below.

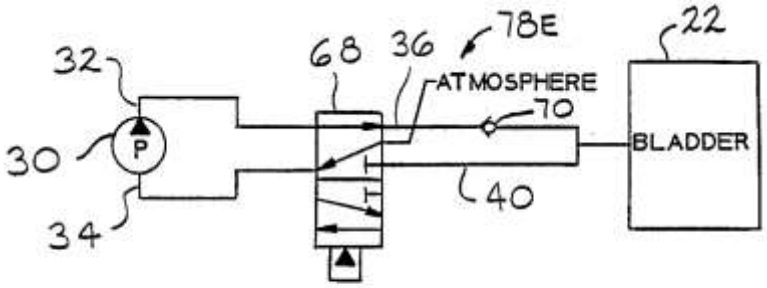


FIG. 12

Figure 12 depicts "a pneumatic schematic of a modified form of the air delivery system of" Scott's invention. Ex. 1212, 2:49–50. Air delivery

system 28E[8] includes valve 68, which enables pump 30 to both inflate and deflate bladder 22. *See id.* at 5:57–66. As depicted in Figure 12, pump inlet 34 is in communication with the atmosphere through valve 68, and outlet conduit 36 is open through valve 68 to check valve 70 and bladder 22. In this configuration of valve 68, pump 30 would inflate bladder 22. *Id.*, Fig. 12. Check valve 70 prevents air from leaking from the bladder 22 through valve 68 and pump 30 to atmosphere. *Id.* at 5:53–56. In operation, pump 30 pumps air through conduit 36 and the air pressure from the pump opens check valve 70 to allow air to flow into bladder 22. *Id.* at 5:57–60. Air does not leave bladder 22 as conduit 40 is blocked at valve 68, as seen in Figure 12. *Id.* at 5:60–61.

To deflate bladder 22, valve 68 moves to a second position that brings pump inlet 34 into communication with conduit 40 and pump outlet 32 in communication with the atmosphere. Ex. 1212, 5:62–66. In Figure 12, this configuration corresponds to the rectangular representation of valve 68 moving upwards, so that the bottom half of the depicted valve structure aligns with conduit 40 and the line to atmosphere. *See* Ex. 1271 (providing an animation showing how the system of Scott's Figure 12 operates).

3. Wu

Wu, titled "Air Mattress Control Unit," issued March 2, 2004, from an application filed March 26, 2002 and claiming priority to two provisional applications filed March 26, 2001 and May 17, 2001. Ex. 1205, (54), (45),

[8] Scott's Figure 12 mistakenly identifies the air delivery system as "78E." *Compare* Ex. 1212, Fig. 12, *with id.* at 5:45–6:2.

(22), (60). Wu is generally directed to a system for controlling air flow into chambers of an air mattress. *Id.* at 1:12–14. We reproduce Wu's Figures 1 and 2, below.

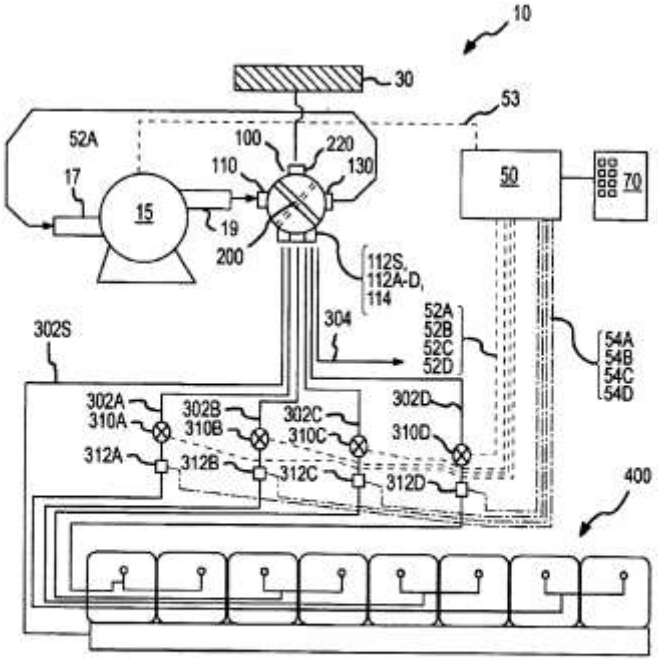


FIG.1

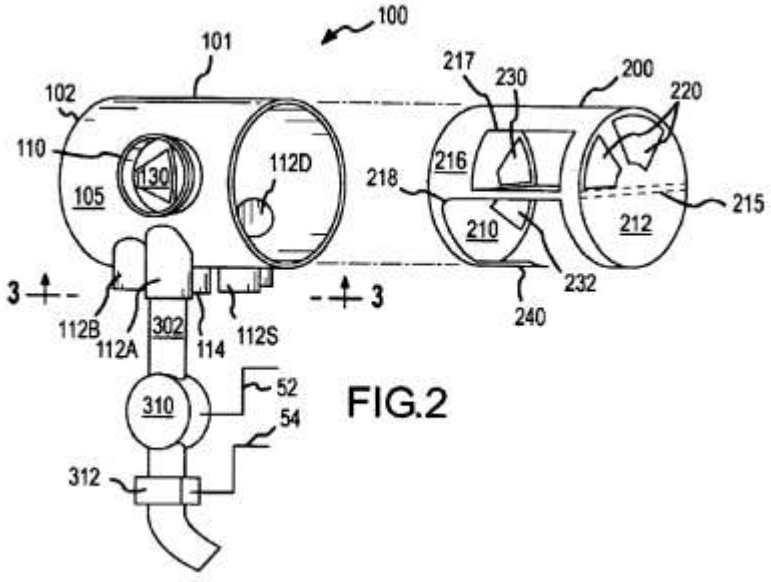


FIG.2

Figure 1 depicts Wu's system and Figure 2 depicts "a perspective view of the rotary valve of" Wu's system. Ex. 1205, 2:34–37. Relevant to Petitioners' position, Wu discloses two-position rotary valve 100, which allows a one-directional pump (centrifugal fan-type blower 15) to both inflate and deflate air mattress 400. *See id.* at 2:63–3:29, 4:48–59.

As illustrated in Figure 2, rotary valve 100 includes cylindrically shaped valve housing 101 with outer wall 105 that includes inlet port 110 that connects with exhaust port 19 of blower 15. Ex. 1205, 4:61–66. Outer wall 105 also includes exhaust ports that supply air to air mattress 400's air supply ports. *Id.* at 4:66–5:2.

Gate member 200 fits within valve housing 101 and includes two end walls that close gate member 200 within valve housing 101. Ex. 1205, 5:9–19. Horizontal wall 215 divides gate member 200 into two sections. *Id.* at 5:19–22. The port arrangement in gate member 200 and valve housing 101 allows the valve to operate in a first position that allows air to be delivered to air mattress 400, and a second position that allows for air mattress 400 to be deflated. *Id.* at 5:44–48.

4. Pisante

Pisante, titled "Hand-Operated Device for the Localized Production of a Fluid Stream," published December 26, 1986. Ex. 1263, 20. Pisante is generally directed to a small device in which a one-direction pump can be used, alternatingly, for blowing air or suction. *Id.* at 21, 5–7. Pisante's Figures 1, 3, and 4 are reproduced below.

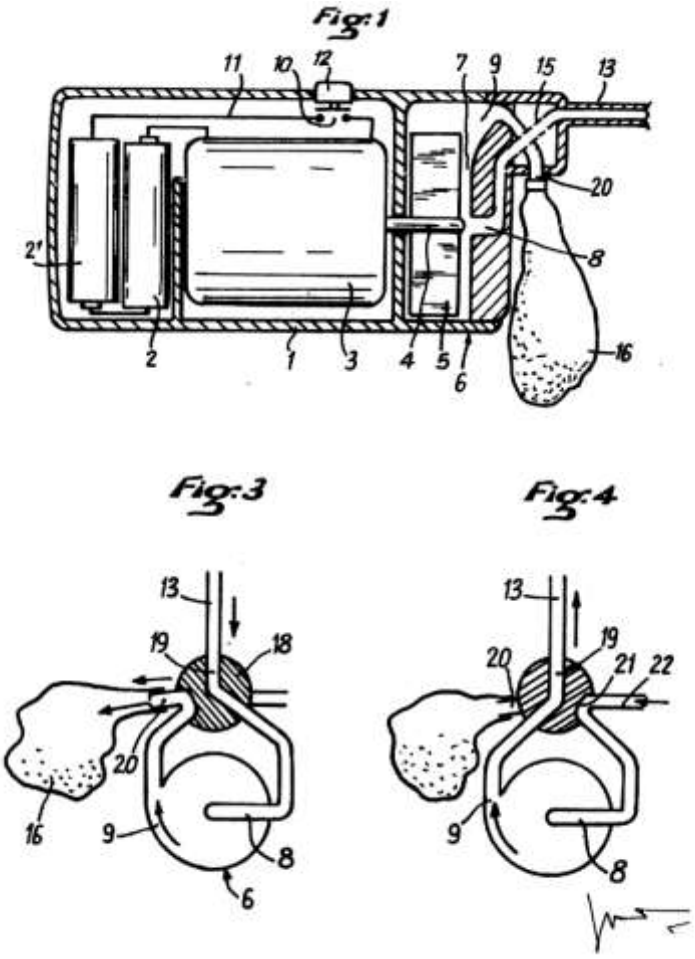


Figure 1 depicts "a cross-sectional view of the device according to" Pisante's invention. Ex. 1263, 26, 28–29. Figure 3 and Figure 4 provide "views of the operation of the three-way ball valve type rotating switching device." *Id.* at 27, 5–6. Pisante's device includes shell 1 and electric motor 3, with output shaft 4 to drive rotor 5 of blower 6. *Id.* at 27, 14–17. The device also includes a switching device, which reverses the flow of air through the device. *Id.* at 27, 6–7.

Rotating valve 15, which is manually rotated using chuck 17, includes barrel 18 with inner channel 19. Ex. 1263, 29, 5–12. As seen in Figure 3,

rotating valve 15 can position inner channel 19 such that air is drawn into blower or turbine 6 through tube 13 and out into envelope 16. *Id.* at 29, 12–18. Alternatively, as seen in Figure 4, barrel 18 can position inner channel 19 to conduct air drawn in through inlet 22, through blower 6, and out tube 13. *Id.* at 29, 20–29.

II. ANALYSIS

A. Level of Ordinary Skill in the Art

The level of skill in the art is "a prism or lens" through which we view the prior art and the claimed invention. *Okajima v. Bourdeau*, 261 F.3d 1350, 1355 (Fed. Cir. 2001). Petitioners contend that a person having ordinary skill in the art would have had "a bachelor's degree in mechanical engineering, or an equivalent field" or, alternatively, "an associate's degree in mechanical engineering, or an equivalent field, and two years of practical experience in product design and manufacturing." Pet. 7 (citing Ex. 1202 ¶¶ 26–27).

Patent Owner contends that a person having ordinary skill in the art would have had "a bachelor's degree in mechanical engineering or an equivalent field" or, alternatively, "a designer with at least two years of experience in mechanical and electrical design aspects of inflatable products having electric air pumps." PO Resp. 29 (citing Ex. 2229 ¶¶ 21–27). That is, Patent Owner contends that, equivalent to having a bachelor's degree in mechanical (or similar) engineering, is having specific experience in the mechanical and electrical aspects of inflatable products with electric pumps.

We find both parties assert very similar definitions of the level of ordinary skill in the art. Both definitions include, as one alternative, a

degreed mechanical engineer or the like. We agree with Patent Owner that an individual[9] without a bachelor's degree in mechanical engineering would be a person of ordinary skill in the art so long as she had experience with inflatable products with electric motors, and we adopt Patent Owner's formulation of the level of ordinary skill in the art.

We base our determination on a review of the prior art of record concerning inflatable products, small pumps for inflating or deflating products, and valves for small pumps. *See, e.g.*, Exs. 1217–1254 (providing certain prior art); *see also* Ex. 1202 ¶¶ 51–106 (discussing the state of the art for inflatable products and pumps). We determine, based on the review of this evidence, that Patent Owner's proposed definition is consistent with the level of ordinary skill reflected in this evidence. As such, based on the complete record, we find that a person of ordinary skill in the art would have had "a bachelor's degree in mechanical engineering or an equivalent field" or, alternatively, "a designer with at least two years of experience in mechanical and electrical design aspects of inflatable products having electric air pumps."

Further, we note that our patentability and claim construction analyses presented below would reach the same findings and determinations under either party's definition of the level of ordinary skill in the art. *Cf.* Ex. 2229

[9] Patent Owner uses the term "designer" in defining the level of skill in the art for an individual without a bachelor's degree in mechanical engineering. We do not discern any special meaning for that term based on Patent Owner's assertions, other than a person with the indicated experience. *See* PO Resp. 29; Ex. 2229 ¶¶ 21–27.

¶ 26 ("My opinions expressed in this declaration remain the same under either definition of a [person having ordinary skill in the art]."); Ex. 1625 ¶ 11 ("Despite my initial opinion, I agree with the Board's . . . definition of a [person having ordinary skill in the art].").

B. 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) (2017). Under the broadest reasonable construction standard, claim terms 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). Also, we are careful not to read a particular embodiment appearing in the written description into the claim if the claim language is broader than the embodiment. *See In re Van Geuns*, 988 F.2d 1181, 1184 (Fed. Cir. 1993) ("[L]imitations are not to be read into the claims from the specification.").

The claim construction standard to be employed in an *inter partes* review recently changed to the standard set forth in *Phillips v. AWH Corp.,* 415 F.3d 1303, 1316 (Fed. Cir. 2005). *See* Changes to the Claim Construction Standard for Interpreting Claims in Trial Proceedings Before the Patent Trial and Appeal Board, 83 Fed. Reg. 51,340 (Oct. 11, 2018) (now codified at 37 C.F.R. § 42). That new standard, however, applies only to proceedings in which the petition was filed on or after November 13, 2018. The Petition in this proceeding was filed on March 30, 2018, and we apply the broadest reasonable interpretation claim construction standard that

was in effect at that time.[10] We invited the parties to address the impact, if any, of the proposed change to the claim construction standard upon the present proceeding. *See* Dec. on Inst. 26 n.8. Neither Patent Owner nor Petitioners indicate that any claim term would have a different construction under the *Phillips* standard as compared to the broadest reasonable construction standard.

We note that, in two situations, the proper interpretation of a claim term departs from the ordinary and customary meaning, as would be understood by one of ordinary skill in the art in the context of the entire disclosure—when the patentee acted as its own lexicographer or disavowed certain claim scope. *See Luminara Worldwide, LLC v. Liown Elecs. Co.*, 814 F.3d 1343, 1353 (Fed. Cir. 2016). "The standards for finding lexicography and disavowal are '*exacting*.'" *Id.* (emphasis added). "To act as a lexicographer, a patentee must 'clearly set forth a definition of the disputed claim term' and 'clearly express an intent to redefine the term.'" *Id.* Disavowal (or disclaimer) requires that the patentee make it clear, either in the Specification or in the prosecution history, "that the invention does not

[10] Patent Owner recognizes that the change in claim construction standard does not apply to this proceeding, but "submits that *Phillips* has been recognized as the correct standard and should be applied in this case." PO Resp. 15 n.3. Patent Owner does not identify any authority, either in the case law or Board decisions, that would allow us to apply the *Phillips* standard to this case, nor does Patent Owner explain why the standard in *Phillips* is "the correct standard," and, by implication, that the broadest reasonable interpretation is the incorrect standard. *See id.* In accordance with our rules, we apply the appropriate claim construction standard dictated for the current proceeding, the broadest reasonable interpretation.

include a particular feature." *Id.* "While such disavowal can occur either explicitly or implicitly, *it must be clear and unmistakable*." *Id.* (emphasis added).

Petitioners provide express constructions for three terms: "inflatable body," "pipe," and "fan." Pet. 23–29. Patent Owner provides an express construction for an additional term: "built into." PO Resp. 16–29. We need address the constructions of only "built into" and "fan" to resolve the parties' disputes. *See Nidec Motor Corp. v. Zhongshan Broad Ocean Motor Co. Ltd.*, 868 F.3d 1013, 1017 (Fed. Cir. 2017), *cert. denied*, 138 S. Ct. 1695 (Apr. 30, 2018) (citing *Vivid Techs., Inc. v. Am. Sci. & Eng'g, Inc.*, 200 F.3d 795, 803 (Fed. Cir. 1999)) (indicating that "we need only [expressly] construe terms 'that are in controversy, and only to the extent necessary to resolve the controversy'").

1. "built into"

In our Decision on Institution, we construed the term "built into" to mean "integrated into and not detachable from." Dec. on Inst. 22–26. Patent Owner remarks that our construction matches its proposed construction. PO Resp. 16–17. Petitioners do not offer a different construction in their Reply. *See* Reply; *see also id.* at 1–2 (addressing whether Miller's pump is built into the wall of cell module 14, but not addressing the construction of "built into").

The parties do dispute how our construction is applied to the prior art in these proceedings and we address this dispute in our analysis of Ground 1, below.

Thus, based on the complete record, we adopt the reasons set forth in the Decision on Institution for purposes of this Final Written Decision in construing "built in" to mean "integrated into and not detachable (or readily removed) from." Dec. on Inst. 22–26.

2. "fan"

In the Decision on Institution, we preliminarily determined that the term "fan" is entitled to its plain and ordinary meaning, "a device that alters air pressure through rotation, where the rotational action acts on the air to create a flow of air." Dec. on Inst. 27. Petitioners agree with our construction. Reply 11 ("Petitioners agree with this construction."); *see also* Ex. 1625 ¶ 55 ("I agree with this construction."). Patent Owner contends that the construction from the Decision on Institution is overly broad, as it captures certain air pumps, such as compressors, that a person having ordinary skill in the art would not have considered as being a fan. PO Resp. 23–24.

Patent Owner contends that the proper construction of the term "fan" is "a device that moves air by continually adding energy to increase the air velocity to values greater than those occurring at the discharge of the fan and does not apply force to movable boundaries of enclosed discrete volumes to move the air." PO Resp. 22. Essentially, Patent Owner argues that, when properly construed, the scope of the term "fan" excludes positive displacement pumps. *See id.* at 25. Patent Owner argues that a person having ordinary skill in the art would have understood that there is a continuum of air-moving devices, which includes fans, blowers, and positive displacement compressors, and fans and positive displacement compressors

are on the opposite ends of the continuum. *Id.* at 25–26 (referencing Ex. 2229 ¶ 149).

Patent Owner explains that pumps can be divided between two types—dynamic pumps and displacement pumps. PO Resp. 26. Patent Owner continues that, with dynamic pumps, "energy is continuously added to increase the fluid velocities within the machine to values greater than those occurring at the discharge such that subsequent velocity reduction within or beyond the pump produces a pressure increase." *Id.* (referencing Ex. 2247, 8–9). According to Patent Owner, with displacement pumps, "energy is periodically added by application of force to one or more movable boundaries of any desired number of enclosed, fluid-containing volumes, resulting in a direct increase in pressure up to the value required to move the fluid through valves or ports into the discharge line." *Id.* (referencing Ex. 2247, 8–9). Patent Owner adds that centrifugal pumps are dynamic pumps and that all of the fans in the '394 patent are centrifugal pumps. *Id.* (referencing Ex. 2247, 12; Ex. 2229 ¶ 46).

Petitioners argue that our preliminary construction of fan in the Decision on Institution is "fully supported" by the '394 patent. Reply 12 (referencing Ex. 1201, 4:25–28, 4:63–5:5, 8:2–13; Ex. 1625 ¶ 60). Petitioners argue that fan 155 disclosed in the '394 patent at Figures 10A and 10B is a positive displacement pump. *Id.* (referencing Ex. 1201, Figs. 10A–B, 7:66–8:6; Ex. 1625 ¶¶ 62–70). Specifically, Petitioners argue that a person having ordinary skill in the art would have understood that fan 155 is a rotary vane pump and this broad use of the term "fan" demonstrates that the patentee intended to instill breadth to the term. *Id.* at 12–13.

To support their contention that fan 155 is a rotary vane pump, Petitioners first argue that fan 155 is an alternative embodiment that replaces a bellows pump, which is a positive displacement pump and that a person having ordinary skill in the art would have understood that you would replace one positive displacement pump for another. Reply 13 (referencing Ex. 1625 ¶¶ 63–64).

Second, Petitioners argue that the eccentric location of fan 155 "is a distinct characteristic of a positive-displacement rotary vane pump." *Id.* at 14 (referencing Ex. 1213, 4:59–64, Fig. 8; Ex. 1625 ¶ 66). Petitioners explain that the eccentricity permits the pump to compress air to move the air through the pump. *Id.* (referencing Ex. 1213, 4:59–64; Ex. 1625 ¶ 66). Third, according to Petitioners, the position of air inlet 152 and air outlet 153 on the circumference of reservoir 151 also supports their position that fan 155 is a rotary vane pump. *Id.* (referencing Ex. 1625 ¶ 67).

Petitioners recognize that Figures 10A and 10B do not depict fan 155 with vanes. Reply 15. Petitioners argue that a person having ordinary skill in the art would have understood that the vanes are an inherent feature of fan 155. *Id.* (referencing Ex. 1625 ¶ 67). Petitioners add that, if fan 155 was not a positive displacement pump, then it is unclear how the fan would actually work. *Id.* at 16 (referencing Ex. 1625 ¶¶ 68–69). Petitioners remark that Patent Owner does not provide any "meaningful analysis of the fan 155 of Fig. 10B or how it would operate if it were not a positive displacement pump." *Id.*

Patent Owner counters that Petitioners' reliance on the parenthetical phrase "air pressure rotator" in describing fan 155 does not amount to a

lexicographic definition of the term "fan." PO Resp. 23. Patent Owner also argues that Dr. Beaman agrees that, without blades or vanes, fan 155 would not be a positive displacement pump. *Id.* at 24. Patent Owner also argues that "a construction of 'fan' that includes a subset of positive displacement pumps is not supported by the '394" patent. Sur-Reply 10.

With this backdrop, we look anew at the construction of the term "fan." We begin with the language of the claim itself. *See, e.g.*, *Phillips v. AWH Corp.*, 415 F.3d 1303, 1314 (Fed. Cir. 2005) (en banc) ("[T]he context in which a term is used in the [claim at issue] can be highly instructive."). Claim 1 recites "a fan and motor assembly for pumping air" and further recites "the fan and motor inflating the inflatable body when the air conduit is in the first position, and deflating the inflatable body when the air conduit is in the second position." Ex. 1201, 8:26, 8:32–35. The language of the claim informs us that the fan, when coupled with a motor, pumps air to inflate and deflate the inflatable body. The language in independent claims 13 and 16 recite similar subject matter. *See id.* at 9:10–31, 9:38–10:19. We discern nothing in dependent claims that would provide additional insight of the meaning of "fan."

In construing terms, "the person of ordinary skill in the art is deemed to read the claim term not only in the context of the particular claim in which the disputed term appears, but in the context of the entire patent, including the specification." *Phillips*, 415 F.3d at 1313. Indeed, the specification is "the single best guide to the meaning of a disputed term" and "[u]sually, it is dispositive." *Id.* Claims must be construed "in view of the specification, of which they are a part." *Id.* at 1315; *see also In re Suitco Surface, Inc.*, 603

F.3d 1255, 1260 (Fed. Cir. 2010) ("[C]laims should always be read in light of the specification and teachings in the underlying patent."). Our reviewing court has "held that '[e]ven when guidance is not provided in explicit definitional format, the specification may define claim terms by implication such that the meaning may be found in or ascertained by a reading of the patent documents.'" *In re Abbott Diabetes Care Inc.*, 696 F.3d 1142, 1150 (Fed. Cir. 2012) (quoting *Irdeto Access, Inc. v. Echostar Satellite Corp.*, 383 F.3d 1295, 1300 (Fed. Cir. 2004)).

The Specification uses the term "fan" consistently; that is, the fan, in conjunction with a motor, is used to inflate or deflate the inflatable product. *See, e.g.*, Ex. 1201, 3:52–54, 3:64–65 ("[A]ir pump 22[, which includes fan and motor 223,] pumps air into the inflatable product."), 4:25–35 ("The inflatable product (not shown) is inflated by the fan and motor 33. Air flows through the air intake 311 and the air outlet 313, and into the inflatable product. . . . The air in the inflatable product is evacuated by the fan and motor 33."), 4:63–5:5 ("To inflate the back support 42, the user . . . activate[s] the fan and motor 435 . . . [, t]hen, outside air is pumped into the back support 42 through the air intake 4301 and air outlet 4302 of the air pump assembly 43."), 6:2–4 ("The air pump assembly 63 has a fan and motor 633, a valve switch 631 and a cantilever arm 632 connected to the valve switch 631."), 6:49–67 ("The air pump assembly includes . . . a fan and motor 82 received in the pack 81. . . . When the slider 87 is moved to the right, . . . the fan and motor 82 is activated to rotate in a normal direction. When the slider 87 is moved to the left, . . . the fan and motor 82 is activated to rotate in a reverse direction."), 8:2–13 ("The air pump 150 includes . . . a

motor 154 provided . . . to rotate the fan 155. . . . During operation, air is pumped into the reservoir 151 through the air intake 152 and then pumped out through the air outlet 153 . . . to inflate the umbrella."). Also, when depicted, the fan is attached to the motor in an axial arrangement, indicating to one of skill in the art that the motor includes a shaft that rotates the fan component. *See id.*, Figs. 2B, 3B, 3D, 4C, 4F, 8C, 10A, 10B. For example, Figure 4C depicts a short segment of a shaft between what is the fan and motor. *Id.*, Fig. 4C.

As we explain in greater detail below, we also find that the pump configuration depicted in 10B is a positive displacement pump. We reproduce Figure 10B, below.

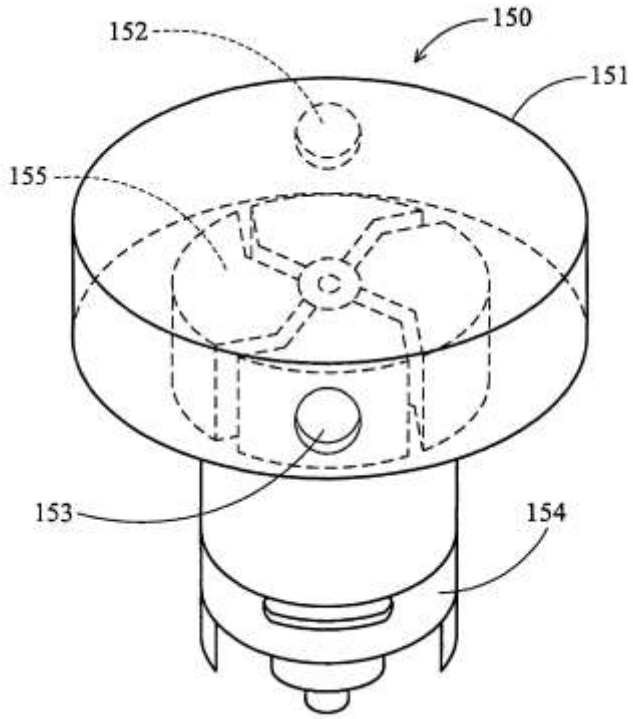


Figure 10B depicts "a perspective diagram of a fan assembly of F[igure] 10A." Ex. 1201, 3:7–8. The Specification expressly states that fan 155 is

eccentrically received in reservoir 151, which is a characteristic of a positive displacement pump. *See id.* at 8:2–6; Ex. 1625 ¶ 65. Also, the Specification expressly identifies fan 155 as an "air pressure rotator," a label that supports a finding that fan 155 is part of a positive displacement pump, which moves air by increasing its pressure through rotation. *See* Ex. 1201, 8:3–4; Ex. 2247, 9. Also, inlet 152 and outlet 153 are spaced apart and positioned on the circumference of reservoir 151, also a characteristic of a positive displacement pump. *See* Ex. 1625 ¶ 67.

We recognize that a positive displacement pump would require some structure, such as vanes, to capture a volume of air and compress that volume of air and that this structure is not shown in Figure 10B. *See* PO Resp. 24; Ex. 1625 ¶ 67; Ex. 2229 ¶ 48. However, we do not consider this omission in the drawing dispositive when considering the totality of the evidence.[11] *See, e.g.*, *Bos. Sci. Corp. v. Johnson & Johnson*, 647 F.3d 1353, 1366 (Fed. Cir. 2011) ("Because the specification is viewed from the perspective of one of skill, in some circumstances, a patentee may rely on information that is 'well-known in the art' for purposes of" having an adequate disclosure).

In reaching our understanding of the disclosure of the '394 patent with respect to Figure 10B, we credit Dr. Beaman's testimony, in part, because we find the testimony consistent with other information of record on positive displacement pumps. *See* Ex. 1625 ¶¶ 59–66; Ex. 2229 ¶ 48; Ex. 2247, 9.

[11] Indeed, many of the fans depicted in the '394 patent do not show vanes or impellers. *See, e.g.*, Ex. 1201, Figs. 2B, 4C, 4F.

We do not credit Patent Owner's assertion that "[a]ll of the fans of the '394 patent . . . are centrifugal pumps" as this assertion is not adequately supported. *See* PO Resp. 26 (referencing Ex. 2229 ¶ 46).[12] Dr. Stevick does not adequately explain how fan 155 would operate as a centrifugal pump given the locations of the air inlet and air outlet. *See* Ex. 1625 ¶ 69 ("It is also unclear how fan 155 would operate if it were not a positive displacement pump.").

Given that the patent drafter decided to use the term "fan" in the Specification to broadly encompass a rotating positive displacement pump, we determine that Patent Owner's proposed construction is not consistent with how the term "fan" is used in the Specification. To be clear, we do not determine that the patentee acted as its own lexicographer and *expressly* defined the term "fan" in the Specification. Instead, "the '[v]aried use of a disputed term in the written description demonstrates the breadth of the term rather than providing a limited definition.'" *Marine Polymer Techs., Inc. v. HemCon, Inc.*, 672 F.3d 1350, 1370 (Fed. Cir. 2012) (quoting *Johnson Worldwide Assocs., Inc. v. Zebco Corp.*, 175 F.3d 985, 991 (Fed. Cir. 1999)).

The prosecution history does not provide much additional information on the term "fan." During prosecution, the examiner rejected independent claim 1 as anticipated by U.S. Patent No. 6,332,760 (the "'760 patent"). Ex. 1203, 63. The examiner identified the '760 patent's electric pump 30 as corresponding to the recited fan and motor. *See id.*; Ex. 3004 (providing the

[12] Patent Owner likely means ¶ 49.

'760 patent). The patentee overcame the rejection by arguing that the '760 patent was not prior art. *See* Ex. 1203, 27–28. Still, the examiner's reliance on electric pump 30 (which is not described as having a fan) as corresponding to the recited fan and motor does support an inference that the examiner construed the term "fan" broadly and in a manner included within our construction above.

We have reviewed Patent Owner's extrinsic evidence and do not find it sufficient to change our understanding of the Specification's broad use of the term "fan." *See* Ex. 2229 ¶¶ 42–51; Ex. 2247; Ex. 2040, 450:9–13, 455:1–8, 455:16–460:1, 462:3–6.

Accordingly, given the breadth of the use of the term "fan" in the Specification, we maintain our construction of the term from the Decision on Institution and find that "fan" means "a device that alters air pressure through rotation, where the rotational action acts on the air to create a flow of air," as this construction represents the broadest reasonable construction in light of the Specification.

C. Asserted Grounds of Unpatentability

In *inter partes* reviews, a petitioner bears the burden of proving unpatentability of the challenged claims, and the burden of persuasion never shifts to the patent owner. *Dynamic Drinkware, LLC v. Nat'l Graphics, Inc.*, 800 F.3d 1375, 1378 (Fed. Cir. 2015). To prevail in this proceeding, Petitioners must support their challenge by a preponderance of the evidence. 35 U.S.C. § 316(e); 37 C.F.R. § 42.1(d). Accordingly, all of our findings and conclusions are based on a preponderance of the evidence.

Petitioners' two grounds of unpatentability are based on obviousness. *See* Pet. 23.

> Section 103(a) [of 35 U.S.C.] forbids issuance of a patent when "the differences between the subject matter sought to be patented 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) when available, secondary considerations, such as commercial success, long felt but unsolved needs, and failure of others. *Graham v. John Deere Co.*, 383 U.S. 1, 17–18 (1966). We address these underlying factual issues below.[13]

1. Ground 1 – the Challenged Claims are allegedly unpatentable over Miller, Scott, and Wu

Petitioners contend that "Miller in combination with Scott in further combination with Wu renders the Challenged Claims obvious." Pet. 31. We address the Challenged Claims under this ground below.

a. Independent claim 1

i. Limitation-by-limitation analysis of the scope of the prior art and any differences between the claimed subject matter and the prior art

The preamble of independent claim 1 recites "[a]n inflatable product." Ex. 1201, 8:24. Neither party asserts that the preamble is limiting. *See*

[13] We address the level of ordinary skill in the art in Section II.A., *supra*.

Pet. 33 n.4 ("The preamble is not a limitation."); PO Resp. 33–49 (addressing claim 1 under the first ground, but not the preamble). Petitioners further assert that Miller does disclose an inflatable product—an automotive seat assembly. Pet. 33 n.4.

Patent Owner states that "Miller is nothing like the '394 patent." PO Resp. 32. Patent Owner continues that Miller "deals with a completely enclosed air cell permanently embedded in the interior of a seatback to provide lumbar support" and, in contrast, the '394 patent "addresses much larger inflatables that are portable and intended to completely deflate and store between uses." *Id.* at 32–33 (referencing Ex. 2229 ¶ 63). Patent Owner does not direct us to any arguments or evidence that convinces us to narrow the scope of the Challenged Claims to "larger inflatables that are portable and intended to completely deflate and store between uses." With respect to each of the Challenged Claims, the patentee elected to broadly claim the subject matter as an inflatable product.

Independent claim 1 recites "an inflatable body." Ex. 1201, 8:25. Petitioners contend that Miller discloses an inflatable body, air cell 20. Pet. 33; *see* Ex. 1213, 3:20–30, 4:44–51, Figs. 1, 2, 6; *see also* Ex. 1202 ¶ 180 (describing Miller's air cell 20). Petitioners further contend that Miller's air cell 20 is substantially airtight, "as the purpose of the bladder is to maintain a sense of firmness for relatively extended periods of time." Pet. 34.[14]

[14] We do not need to decide whether the proper construction of the term "inflatable body" requires that body to be substantially airtight. *See* Pet. 27–28; PO Resp. 18–21.

We find, based on the complete record, that the information in the Petition demonstrates, by a preponderance of the evidence, that Miller discloses an inflatable body. *See* Pet. 33–34; Ex. 1213, 3:20–30, 4:44–51, Figs. 1, 2, 6. Patent Owner does not challenge Petitioners' contentions with respect to this element.

Independent claim 1 also recites "a fan and motor assembly for pumping air." Ex. 1201, 8:26. Petitioners contend that Miller discloses air pump assembly 24, which includes Wankel pump 38 and electric motor 36, for pumping air into air cell 20. Pet. 34–35; *see* Ex. 1213, 3:31–33, 3:39–45, 3:51–55; *see also* Ex. 1202 ¶ 183. Petitioners contend that rotor 42 alters air pressure through rotation, making it a fan. Pet. 35 (referencing Ex. 1202 ¶ 183). As Miller describes, crank 44 is driven by electric motor 36 and moves rotor 42 in an orbital manner in housing 40; that is, rotor 42 rotates as it moves along the edges of the two lobes of housing 40. Ex. 1213, 3:62–67, Figs. 3, 5; *see also id.* at 3:55–58 ("The air pump 38 comprises a cup or housing 40 that has a bi-lobular chamber, a triangular rotor 42 disposed in the chamber, and a crank 44 for driving the rotor 42."); Ex. 1202 ¶ 183 (describing the operation of pump 38).

Patent Owner argues that, even under our construction of "fan," Miller's Wankel pump 38 is not a fan because it does not create a flow of air. PO Resp. 34. Patent Owner explains that "[t]here is no 'flow' of air from the input port of the pump to the output port because the Wankel pump divides the input and output steps by compressing air in a closed volume as an intermediate step." *Id.* Patent Owner adds that Dr. Beaman concedes

that he has never heard of a Wankel pump being referred to as a fan. *Id.* (referencing Ex. 2040, 449:18–450:12).

Petitioners reply that Miller expressly discloses that its pump creates a flow of air to and from the air cell. Reply 11 (referencing Ex. 1213, 5:36–37, 6:24–25). Petitioners also argue that Dr. Stevick acknowledges that the Board's construction would encompass compressors. *Id.* (referencing Ex. 2229 ¶¶ 49, 50); *see also* Ex. 2229 ¶ 50 ("[T]he Board's preliminary interpretation of 'fan' . . . would encompass compressors.").

Patent Owner replies that Miller's Wankel pump, as with any positive displacement pump, captures a volume of air, compresses that volume, and then expels that volume. Sur-Reply 9. Patent Owner argues that the Wankel pump "is a device that reduces chamber volume through rotation, where the reduction in chamber volume acts on the air." *Id.*

We do not find that Patent Owner's arguments and evidence undermine the Petition's showing that pump 38 creates a flow of air. As is clear from Miller, pump 38 operates to move air in and out of air cell module 14 to inflate and deflate the cell. *See* Ex. 1213, 4:27–30. The inflation and deflation is caused by rotor 42 acting on the air to create a flow of air into and out of the cell. *See id.* at 3:62–4:6. Patent Owner fails to explain adequately why the flow of air must be continuous between all affected regions. Also, regardless of whether Wankel pumps are referred to as fans, the pump falls within the construction of the term "fan" as the patentee uses the term in the '394 patent Specification. Finally, although we agree with Patent Owner that, like all positive displacement pumps, a Wankel pump is a device that reduces chamber volume through rotation,

where the reduction in chamber volume acts on the air, that reduction in chamber volume results in an increase in the gas pressure. *See, e.g.*, Ex. 2247, 9 ("Displacement pumps are essentially divided into reciprocating and rotary types, depending on the nature of movement of the *pressure-producing members*.") (emphasis added).

For the reasons above, we find that the information in the Petition demonstrates, by a preponderance of the evidence, that Miller discloses a fan and motor assembly for pumping air.

Alternatively, Petitioners contend that Miller discloses a rotary vane pump. *See* Pet. 35 (identifying vane pump 138). Petitioners contend that a person having ordinary skill in the art would have had reason to substitute vane pump 138 for Wankel pump 38. *Id.* at 36. Specifically, Petitioners contend that a person having ordinary skill in the art (1) "would have generally recognized rotary vane pumps like rotary vane pump 138 as being relatively 'smaller and lighter,' which 'permits the overall [pump] to be of smaller size and weight for ease of transportability and installation'" (referencing Ex. 1232, 1:61–65); and (2) "would have understood the replacement to be nothing more than a simple substitution of one known element (a [Wankel] pump 38) for another known element (a rotary vane pump 138) to obtain a predictable result (a pump assembly for pumping air)" as these pumps are "readily interchangeable" (referencing Ex. 1202 ¶ 187). Pet. 36.

Patent Owner argues that a person having ordinary skill in the art would not have substituted Miller's rotary vane pump for Miller's Wankel pump. PO Resp. 47. Patent Owner argues that Miller's Figure 6 shows

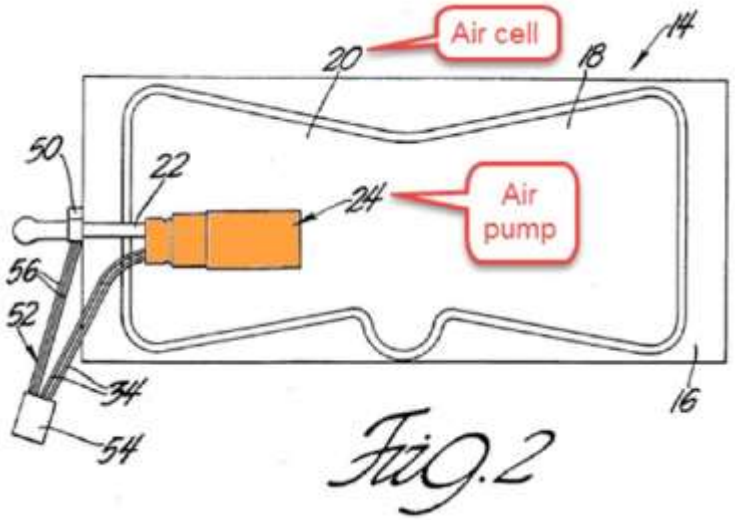
rotary vane pump 138 outside air cell 114. *Id.* at 48. Patent Owner continues that a person having ordinary skill in the art would have understood that the Wankel pump of the first embodiment (pump 38) has a flatter shape than a round, rotary vane pump. *Id.* at 48–49. Patent Owner argues that this shape difference is why Miller locates the rotary vane pump outside of the air cell, so as to avoid discomfort when sitting in Miller's seat. *Id.* at 49.

Petitioners respond that Miller discloses that its rotary vane pump 138 would be contained in a cutout in seat back 12, which could be deepened to accommodate the larger profile of the rotary pump. Reply 17. Patent Owner's reply reiterates the differences between the flat-sided pump 38 and round pump 138. Sur-Reply 10–11.

We determine that Petitioners have not demonstrated, by a preponderance of the evidence, why a person having ordinary skill in the art would have had reason to substitute rotary vane pump 138 for Wankel pump 38 *and locate rotary vane pump 138 inside of air cell 14*. *See, e.g.*, *Belden Inc. v. Berk-Tek LLC*, 805 F.3d 1064, 1073 (Fed. Cir. 2015) ("[O]bviousness concerns whether a skilled artisan not only *could have made* but *would have been motivated to make* the combinations or modifications of prior art to arrive at the claimed invention."). We agree with Petitioners that Miller suggests substituting rotary vane pump 138 for Wankel pump 38, but Miller expressly discloses that, with this substitution, rotary vane pump 138 would be located *outside* of the air cell. *See* Ex. 1213, Fig. 6. In weighing the complete record, we determine that Petitioners have not provided sufficient evidence and arguments to outweigh the express teaching of Miller to have

rotary vane pump 138 outside of the air cell, especially in light of the additional fact that Miller clearly discloses a preference for pump 38 to be located *inside* the air cell. Accordingly, we do not further analyze Petitioners' obviousness positions directed to substituting rotary vane pump 138 for Wankel pump 38.

Independent claim 1 further recites "a housing built into the inflatable body, the housing having an interior region." Ex. 1201, 8:27–28. Petitioners contend that Miller's air pump assembly 24 (including Wankel pump 38) is contained in housing 26. Pet. 37 (referencing Ex. 1202 ¶¶ 190–194). Petitioners add that housing 26 includes an interior region. *Id.* at 38. Petitioners further contend that Miller discloses that air pump assembly 24, including housing 26, is built into air cell 20. *Id.* at 38. Petitioners explain that air pump assembly 24 is disposed inside of air cell 20 and welded into place. *Id.* at 38–39. We reproduce Petitioners' annotated version of Miller's Figure 2, below.



This annotated version of Miller's Figure 2 identifies air cell 20 and air pump assembly 24 (in orange), with air pump assembly 24 located inside air cell 20. *See* Pet. 39; *see also* Ex. 1213, 3:31–33 ("The air cell module 14 further comprises an electric motor driven air pump subassembly 24 that is disposed inside the air cell 20 and welded in place.").

Patent Owner responds that pump 38 "is separate from the walls of the air cell" because it is "entirely internal . . . and never built into the inflatable body structure as required by all '394 patent claims." PO Resp. 44. Petitioners reply that air pump 24 is welded in place inside the air cell, either to backing member 16 or plastic member 18. Reply 2. Petitioners add that Patent Owner has no evidence to support this contention. *Id.* Patent Owner replies that, the fact that Miller's pump must be welded in place illustrates that the pump is not integrated into the inflatable body. Sur-Reply 1.

We determine, based on the complete record, that the information in the Petition demonstrates, by a preponderance of the evidence, that Miller discloses a housing built into the inflatable body, the housing having an interior region. *See* Pet. 37–39. We find that pump 38 includes a housing with an interior region. *See* Ex. 1213, Fig. 3 (depicting pump 38 and motor 36 enclosed in housing 26, with an interior region adjacent to rotor 42), 3:31–61 (describing the configuration of air pump subassembly 24, including housing 26 made of cup-shaped pieces 28 and 30, with air pump 38 (with a bi-lobular chamber) and electric motor 30 slid into housing piece 30); *see also* Pet. 38 (describing an annotated version of Figure 3).

Also, we find that air pump subassembly 24 is built into Miller's inflatable body; that is, the air pump subassembly is integrated into and not

detachable from air cell 20. As the Petition describes, Miller discloses that air pump subassembly 24 is welded to the interior wall of air cell 20, thus it is not detachable from the wall. Pet. 38–39; *see* Ex. 1213, 3:31–43; *see also* Ex. 1202 ¶¶ 192, 193; Ex. 1625 ¶¶ 16–20. Also, we find that, because air pump subassembly 24 is disposed *entirely within* air cell 20, the housing is *integrated into* the inflatable body. By being fixed *inside* air cell 20, air pump subassembly 24 is part of the air cell, i.e., integrated into the air cell.

Patent Owner's argument does not undermine the Petition's showing. Patent Owner seems to argue, in its Patent Owner Response, that this limitation requires the housing to be built into *the wall* of the inflatable body. The claim, however, does not require the housing to be built into *the wall* of the inflatable body; it, instead, requires the housing to be built into the inflatable body itself. *See* Ex. 1201, 8:27. Patent Owner also seems to argue that the air pump cannot be integrated into the air cell if it must be welded into the air cell. Again, this argument does not undermine Petitioners' position. We find that being entirely within air cell 20 makes air pump assembly 24 integrated *into* the inflatable body.

Independent claim 1 also recites:

> an air conduit disposed at least in part in the housing, the air conduit being movable between a first position and a second position while remaining disposed at least in part in the housing, the fan and motor inflating the inflatable body when the air conduit is in the first position, and deflating the inflatable body when the air conduit is in the second position.

Ex. 1201, 8:29–35 (the "air conduit" limitation). Petitioners recognize that Miller, which discloses that pump 38 is a reversible pump, does not disclose the recited air conduit. Pet. 39–40. Petitioners contend that Scott discloses a

uni-directional pump with the recited air conduit configured as recited in the "air conduit" limitation. *Id.* at 40 (identifying the conduit in Scott's valve 68).

Petitioners explain that Scott's Figure 12 presents uni-directional pump 30 with valve 68 used to inflate and deflate bladder 22. Pet. 40–41. Petitioners explain that valve 68 includes four ports: (1) atmosphere, (2) pump inlet 34, (3) pump outlet 32, and (4) bladder 22 (through air conduit 36 or 40). *Id.* at 41–42. We reproduce Petitioners' annotated version of Scott's Figure 12, below.

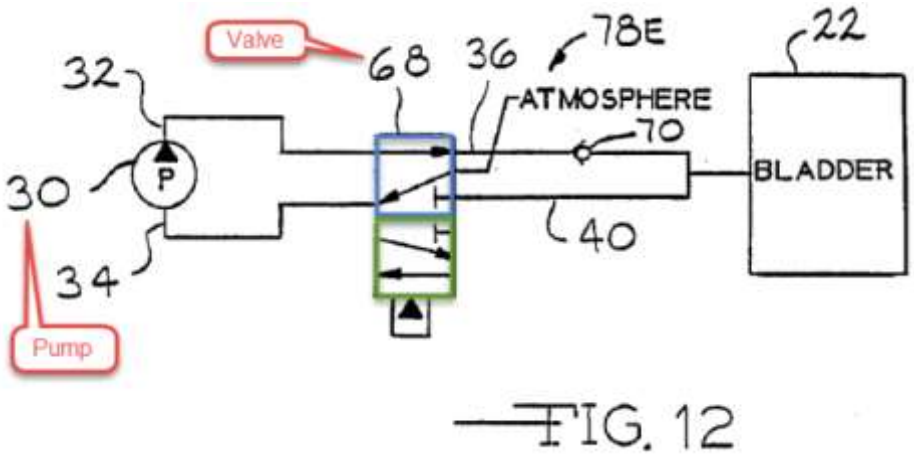


FIG. 12

This annotated figure identifies pump 30 and valve 68 and highlights the two positions for valve 68, one in blue and one in green. Pet. 41. Petitioners contend that "[i]n the first position (outlined in blue, above), valve 68 connects **port 1** (atmosphere) with **port 2** (pump inlet 34), and **port 3** (pump outlet 32) with **port 4** (bladder 22). *Id.* at 42 (referencing Ex. 1213, 5:50–53). "In its second position (outlined in green), valve 68 connects **port 4** (bladder 22) with **port 2** (pump inlet 34), and **port 3** (pump outlet 32) with **port 1** (atmosphere). *Id.* (referencing Ex. 1212, 5:62–66;

Ex. 1202 ¶ 115); *see also* Ex. 1271 (providing an animation showing how valve 68 allows pimp 30 to inflate and deflate bladder 22); Pet. 44–49 (explaining how Miller's pump, in combination with Scott's teaching of a uni-directional pump including a valve such as valve 68 performs as recited in the "air conduit" limitation).

Petitioners contend that, in converting Miller from a reversible pump to a uni-directional pump with valve 68, a person having ordinary skill in the art would have maintained Miller's pump housing, "such that the movable air conduit (i.e., such as Scott's valve 68) was disposed inside Miller's housing 26." Pet. 44–45 (referencing Ex. 1202 ¶¶197, 205–207). We address Petitioners' reasoning for positioning valve 68 within the housing and their other reasons in support of this modification, below.

Patent Owner responds that "[n]either Miller nor Scott nor the combination of Miller with Scott teaches an air conduit disposed at least in part in the housing" as required by claim 1. PO Resp. 35. Patent Owner explains that, in Miller's first embodiment, solenoid valve 50, which controls the flow of air to and from air cell 20, is disposed outside of housing 26. *Id.* at 35–36; *see also* Ex. 1213, 4:13–20 (describing how solenoid valve 50 operates). Patent Owner continues that "Scott does not teach anything about the arrangement of the 'valve 68,' which Petitioners allege is the claimed air conduit, relative to a housing." PO Resp. 36. Patent Owner argues that, because Miller positions the pump components within a housing, but positions the air valve outside of that housing, a person having ordinary skill in the art, if motivated to make Petitioners' modification, would have positioned Smith's valve 68 outside of housing 26. *Id.* Patent

Owner concludes that, with valve 68 outside of housing 26, Petitioners' modified arrangement does not result in "an air conduit disposed at least in part in the housing." *Id.* That is, Patent Owner argues that the combined teachings of Miller and Scott do not result in the air conduit positioned at least in part in the housing because neither reference discloses that location for a valve.

Petitioners reply that Patent Owner's position ignores the four alternative reasons why a person having ordinary skill in the art would have retained Miller's housing design. Reply 9. Petitioners also argue that, even if Miller was read to prefer positioning the air valve outside of the housing, this preference would not teach away from the proposed modification. *Id.* at 10. Petitioners continue that Miller teaches that its housing 26 has sufficient space to accommodate additional components such as valve 68 and, with a smaller, uni-directional pump, the housing would have even more space. *Id.* Patent Owner replies that it addresses Petitioners' reasoning in its Patent Owner Response. Sur-Reply 2. Patent Owner stresses that its position is that neither Miller nor Scott, alone or in combination, teaches an air conduit position at least in part in the housing. *Id.* at 5.

For the reasons above, we determine that Petitioners' *proposed modification* of Miller with Scott's uni-directional pump includes placing Scott's valve 68 within Miller's housing such that the proposed modified version of Miller's system includes an air conduit positioned at least in part in the housing, where the air conduit operates as claimed in the "air conduit" limitation. *See* Pet. 44–45 (A person having ordinary skill in the art "would

have maintained Miller's housing-contained design . . . such that . . . Scott's valve 68[] was disposed inside Miller's housing 26."). That is, Petitioners argue that it would have been obvious, in view of its proposed modification, to locate a directional valve, such as valve 68, in the housing for the pump. We address Petitioners' reasoning for this modification in the subsection below.

Independent claim 1 finally recites "wherein air flows between the interior region of the housing and the inflatable body during inflation and deflation." Ex. 1201, 8:36–38. Petitioners contend that, based on their proposed modification of Miller to include Scott's valve 68 within Miller's housing 26, air would flow between the interior region of the housing and the inflatable body during inflation and deflation as required by this claim element. Pet. 49 (referencing Ex. 1212, Fig. 12; Ex. 1202 ¶¶ 220–224).

We determine, based on the complete record, that the information in the Petition demonstrates, by a preponderance of the evidence, that Miller's housing, as modified by Scott's valve as proposed by Petitioners, discloses the subject matter of this claim limitation. *See* Pet. 49; Ex. 1212, Fig. 12; Ex. 1202 ¶¶ 220–224. Patent Owner does not dispute Petitioners' contentions with respect to this limitation, other than as discussed above with respect to the air conduit limitation.

ii. Reasons to combine Miller and Scott

Petitioners contend that a person having ordinary skill in the art would have had reason to modify Miller with Scott's teaching of a uni-directional pump employing a valve, such as valve 68. Pet. 42.

First, Petitioners contend that its proposed modification would increase the spatial efficiency of air pump 24. Pet. 42. Petitioners rely, in part, on Scott's express disclosure that reversible pumps are less efficient and, as such, a larger motor is needed to create the same air pressure as a uni-directional pump. *Id.* (citing Ex. 1212, 1:42–45). Petitioners explain that their proposed modification would allow Miller's motor 36 to be smaller and that a person having ordinary skill in the art would have appreciated that this benefit is significant to Miller, given the small size of air cell 20. *Id.* at 42–43 (referencing Ex. 1202 ¶ 199).

Second, Petitioners reason that their proposed modification would have resulted in energy efficiencies and that a person having ordinary skill in the art would have desired a more efficient pump. *Id.* at 43 (referencing Ex. 1206, 4:29–32; Ex. 1202 ¶ 200). Again relying on Scott's disclosure, Petitioners contend that "the pump efficiency of a one-directional pump is greater than the efficiency of a reversible pump." *Id.* (quoting Ex. 1212, 1:54–56).

Third, Petitioners reason that their proposed modification would have decreased cost, as Scott expressly teaches that reversible pumps are more expensive than uni-directional pumps. Pet. 43 (referencing Ex. 1212, 1:40–43, 1:49–54; Ex. 1202 ¶ 201).

Fourth, Petitioners reason that a more efficient pump would have decreased the weight of pump 24, as it would require a smaller motor, again relying on Scott's express teachings. *Id.* at 43–44 (referencing Ex. 1212, 1:42–45; Ex. 1202 ¶ 202).

Fifth and finally, Petitioners reason that its proposed modification of Miller with Scott's teaching represents a simple substitution of known elements to achieve a predictable result. Pet. 44 (referencing Ex. 1202 ¶ 203). Petitioners continue that a person having ordinary skill in the art would have "appreciated the interchangeability of these two systems." *Id.* (referencing Ex. 1242, 11:59–63; Ex. 1202 ¶ 203).

Next, Petitioners explain why a person having ordinary skill in the art would have maintained Miller's pump housing. Pet. 44–45. Petitioners' reasons include compactness (referencing Ex. 1202 ¶ 209; Ex. 1232, Abstract); durability (referencing Ex. 1202 ¶ 209; Ex. 1206, 4:20); and decreased manufacturing costs (referencing Ex. 1202 ¶ 211). *Id.* at 45. Petitioners continue that maintaining a housing would have been well known to a person having ordinary skill in the art and maintaining the design would have yielded predictable results, even with a uni-directional pump. *Id.* (referencing Ex. 1202 ¶ 212; Exs. 1210, 1230, 1231, 1237, 1245). To illustrate their proposed modification, Petitioners annotate Scott's Figure 12, which we reproduce below.

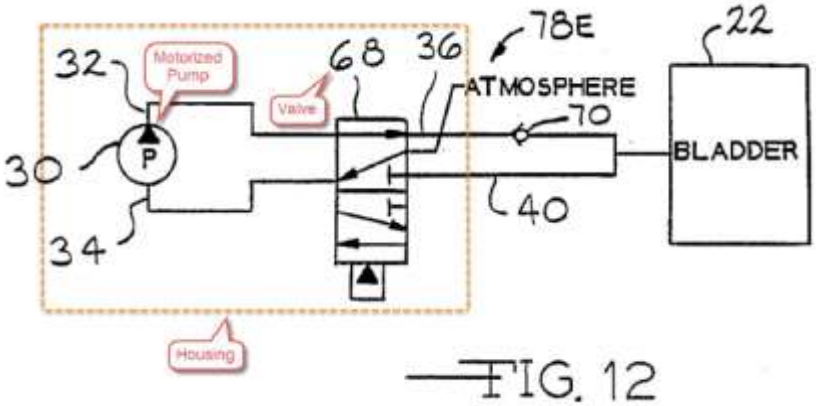


FIG. 12

Pet. 45. This annotated figure depicts uni-directional pump 30 and valve 68 within a housing, as Petitioners propose.

Patent Owner responds that the teachings in Scott directed to how a uni-directional pump is more efficient than a reversible pump ("Scott's efficiency statement," Ex. 1212, 1:41–45) does not apply to Miller's Wankel pump 38. PO Resp. 36–37. Patent Owner argues that "Petitioners have not explained how Scott would apply to reversible displacement pumps that are equally efficient in both directions, such as Miller's Wankel pump." *Id.* at 37. Patent Owner explains that Miller's Wankel pump, by its nature, is equally efficient in either operating direction because the operation of a positive displacement pump is "inherently symmetric." *Id.* at 38. Patent Owner adds that a person having ordinary skill in the art would have understood that Scott's efficiency statement did not apply to Miller's pump. *Id.* at 39 (referencing Ex. 2229 ¶¶ 99–120).

Petitioners reply that Patent Owner's argument misunderstands Petitioners' position. Reply 3. Petitioners explain that a person having ordinary skill in the art would have understood, consistent with Scott's teachings, that, to increase the efficiency of Miller's pump, the pump would have been modified for a single direction of rotation. *Id.* (referencing Ex. 1625 ¶ 25). Petitioners continue that their position is consistent with Patent Owner's expert testimony that Scott's efficiency statement applies to pumps of the same type. *Id.* (referencing Ex. 1646 ¶ 98; Ex. 1644 ¶¶ 92, 105; Ex. 1625 ¶ 25). Petitioners add that Dr. Stevick's testimony supports their contentions. *Id.* at 4 (referencing Ex. 2229 ¶ 108; *id.* ¶ 104; Ex. 1625 ¶ 26; Ex. 1601, 63:5–21, 64:13–65:2; Ex. 1646 ¶ 156; Ex. 1645, 61–62).

Patent Owner replies that Dr. Beaman's testimony does not include the requisite facts and data to support Petitioners' position. Sur-Reply 2–3. Patent Owner argues that if we discount Dr. Beaman's testimony, the Petitioners have no evidence to support its assertions with respect to Scott's efficiency statement. *Id.* at 3.

Patent Owner also responds that Scott's statements with respect to efficiency and cost are directed to comparing one pump against another pump, not comparing pump assemblies. PO Resp. 39–40. Patent Owner argues that Petitioners do not offer sufficient evidence and arguments that a uni-directional pump, in conjunction with valve 68, would have the size, cost, energy efficiency, and weight advantages argued by Petitioners. *Id.* at 40. Patent Owner adds Petitioners provide no evidence that adding a non-manual method for operating valve 68 would not adversely affect the argued advantages. *Id.* at 41. For example, Patent Owner argues that Petitioners fail to show that, once you incorporate a non-manual means to operate valve 68, the system would still be more energy efficient than Miller's system. *Id.* Patent Owner at least suggests that any efficiencies in employing a uni-directional pump and valve 68 may be lost due to resistance at valve 68. *Id.* (referencing Ex. 2229 ¶¶ 91–98).

Similarly, Patent Owner argues that there would be no net size reduction based on Petitioners' proposed modification because the modification results in adding components to the housing. PO Resp. 43–44.

Petitioners reply that Scott's efficiency statement is directed to its "invention," which includes valve 68. Reply 5 (referencing Ex. 1625 ¶¶ 28–29). That is, the efficiency statements take into consideration a uni-

directional pump assembly and compare that assembly with a reversible pump. *Id.* (referencing Ex. 1625 ¶ 30). Petitioners add that Patent Owner's declarant agrees with Petitioners' position. *Id.* (referencing Ex. 1635, 521:9–14, 521:20–522:3, 522:9–15; Ex. 1601, 63:5–21, 64:13–65:2). Petitioners argue that Scott's efficiency statement would "make[] little sense" if it ignored the structure that allowed the uni-directional pump to both inflate and deflate. *Id.* at 6. Petitioners add that, even if Patent Owner's argument was correct, the pump motor is a significant component of the assembly and savings associated with the motor "would result in significant savings for the entire pump design." *Id.* at 6–7. Finally, Petitioners reply that Miller discloses that its housing would have plenty of room for additional components, such as a non-manual method for operating valve 68. *Id.* at 7.

Patent Owner replies that Scott's efficiency statement is expressly directed to pump efficiency, not pump assembly efficiency. Sur-Reply 4–5. Patent Owner also argues that Petitioners did not quantify the additional costs associated with the additional components needed to implement Scott's uni-directional pump. *Id.* at 5.

Patent Owner also responds that Miller's configuration does not benefit from any energy or size savings. PO Resp. 45. Patent Owner argues that because "a car's alternator provides effectively unlimited electricity," Miller would not benefit from a system that requires less electricity. *Id.* Also, given the fixed size of Miller's seat, Miller would not benefit from a size reduction. *Id.* Finally, Patent Owner argues that the additional

components, such as a non-manual control system for valve 68, would offset any cost advantages. *Id.* at 45–46.

Petitioners reply that Scott is directed to an automotive application, so a person having ordinary skill in the art would have understood that Miller would benefit from the efficiencies disclosed in Scott. Reply 9 (referencing Ex. 1625 ¶ 42). Petitioners add that Miller references the advantages of a compact, space-efficient design. *Id.* (referencing Ex. 1625 ¶¶ 43–44, which relies on, for example, Ex. 1213, 2:14, 2:44–45, 2:50–52). Petitioners conclude that Patent Owner's declarant also recognizes that an objective of Miller is to provide a compact design. *Id.* (referencing Ex. 2229 ¶ 116). In its Sur-Reply, Patent Owner reiterates its positions. Sur-Reply 6–7.

Patent Owner also responds that Petitioners do not explain how its system would work without check valve 70, which was not identified by Petitioners in the Petition. PO Resp. 41–42, 46. Patent Owner argues that because the proposed modified system would leak air, the modification does not represent a simple substitution that would yield predictable results. *Id.* at 47.

Petitioners reply that a person having ordinary skill in the art would have known how to prevent the system from leaking. Reply 8 (referencing Ex. 1625 ¶ 40).

Finally, as we discussed above, in connection with our analysis of the air conduit limitation of claim 1, Patent Owner argues, essentially, that the information in the Petition fails to provide a reason why a person having ordinary skill in the art would have located valve 68 in housing 24, as neither reference discloses this arrangement. *See* PO Resp. 35–36.

We find, based on the complete record, that the Petition sufficiently articulates a reason, with rational underpinnings, for substituting Miller's reversible pump with Scott's uni-directional pump and valve 68. *See KSR Int'l Co.*, 550 U.S. at 418 ("[O]bviousness grounds cannot be sustained by mere conclusory statements; instead, there must be some articulated reasoning with some rational underpinning to support the legal conclusion of obviousness." (citing *In re Kahn*, 441 F.3d 977, 988 (Fed. Cir. 2006))).

With respect to Petitioners' reasoning that their proposed modification constitutes a simple substitution of known elements to achieve a predictable result, we give little or no weight to this reasoning. Petitioners fail to explain adequately why this substitution is "simple." *See* Pet. 44 (referencing Ex. 1242, 11:59–63; Ex. 1202 ¶ 203); Reply 7 (referencing Ex. 1625 ¶ 34; Ex. 1242, 11:59–63). Dr. Beaman's testimony is entitled to little or no weight, as it relies on Guthrie (Ex. 1242) without further explanation, other than Guthrie demonstrating the "interchangeability" of reversible and uni-directional pumps. *See* Ex. 1202 ¶ 203; Ex. 1625 ¶ 34. The cited section of Guthrie (11:59–63) merely states that a reversible blower may be used in place of Guthrie's cardiopulmonary resuscitation (CPR) valve. *See* Ex. 1242, 11:59–63. Without further explanation or evidence, we find that this single reference does not support the "interchangeability" of reversible and uni-directional pumps such that the interchange would constitute a simple substitution. *See, e.g.*, PO Resp. 40, 41, 46 (discussing some of the additional considerations associated with substituting Scott's uni-directional pump for Miller's reversible pump, such that the substitution is not "simple").

With respect to Petitioners' reasoning that the proposed modification would result in spatial efficiency, we give this reasoning little or no weight. In rebutting certain of Patent Owner's arguments, Petitioners contend that Miller's housing 26 has "plenty of room" to contain additional components, such as valve 68 and a non-manual method for operating valve 68. *See* Reply 6–7, 9–10. Petitioners fail to explain adequately how maintaining housing 26, with its "plenty of room," would result in spatial efficiency. That is, housing 26 would occupy the same space before and after the proposed modification if that housing is maintained.

We do give some weight to Petitioners' reasoning as to energy efficiency, cost, and weight. We agree with Petitioners that Scott expressly teaches that its system, including its valve structure, would be cheaper and more efficient. *See* Pet. 43–44, Reply 5–6. Scott expressly states that "[i]t is an advantage of the present invention that *the air delivery system* cost is reduced by use of a single, one directional pump versus two pumps or a reversible pump" and also states "that the pump efficiency of a one-directional pump is greater than the efficiency of a reversible pump." Ex. 1212, 1:50–56 (emphasis added). We find that these statements, in light of the fact that Scott and Miller are directed to very similar technologies, would have motivated a person having ordinary skill in the art to modify Miller with Scott's pump assembly. *See, e.g.*, Ex. 1212, 10–15 (indicating that the invention relates to a vehicle seat with an inflatable bladder that provides support for an occupant); Ex. 1213, 1:7–9 (indicating that the invention relates to adjustable air cells for seat comfort).

We do not credit Dr. Beaman's testimony, however, as we find that it does not support Petitioners' positions beyond what is disclosed in Scott. Dr. Beaman's reliance on other references either misinterprets or misapplies the references. *See* Ex. 1202 ¶ 189 (relying on Exs. 1210, 1205, 1212, 1263, and 1272 for the proposition that "a Uni-directional Pump Assembly could produce the same amount of volume flow with a smaller, single direction motor by optimizing the vanes of Miller's rotary vane pump 138, for example, for the single direction of rotation," where the references merely use a uni-directional pump for applications different than Miller and with no teaching of optimizing a positive displacement pump), ¶ 199 n.38 (citing to Exs. 1231, 1232, 1206, 1212, 1213, 1240,[15] and 1229 without further explanation), ¶ 200 (relying on Ex. 1206 for the proposition that a person having ordinary skill in the art would have desired a more efficient pump, where the reference was discussing its pump used for its specific application, including being battery operated), ¶ 203 (relying on Guthrie without further explanation).

With respect to Patent Owner's argument that Petitioners have no evidence to support its assertions with respect to Scott's efficiency statement without Dr. Beaman's testimony, we do not agree. *See* Sur-Reply 3. Scott

[15] Dr. Beaman testifies, with respect to Ex. 1240, that it "not[es] that 'the interior of the pump can be maintained as simply as possible' because 'reversal of the direction of rotation of the electric motor driving the pump is also not necessary.'" Ex. 1202 ¶ 89. The reference actually discloses that "the interior of the pump can be maintained as simply as possible" because the reversing mechanism is located *outside* of the housing, not because of employing a uni-directional pump. Ex. 1240, 15.

itself constitutes evidence in the record, and at least suggests to one of ordinary skill in the art (especially in the narrower field of automotive seat inflatable products) that substituting a uni-directional pump for a reversible pump would realize cost and efficiency advantages. *See Ortho-McNeil Pharm., Inc. v. Mylan Labs., Inc.*, 520 F.3d 1358, 1365 (Fed. Cir. 2008) ("The [teaching-suggestion-motivation] test, *flexibly applied*, . . . assures that the obviousness test proceeds on the basis of evidence—teachings, *suggestions* (a tellingly broad term), or motivations (an equally broad term)—that arise before the time of invention as the statute requires." (emphasis added)).

In summary, we find that Petitioners provide reasons, with rational underpinnings, for substituting Miller's bi-directional pump with a uni-directional pump and its associated valve and control system. This finding does not address all of the disputes between the parties, however. We turn next to Petitioners' reasoning for placing a directional valve, as taught by Scott's valve 68, into Miller's housing.

We find that Petitioners do not provide persuasive reasons, with rational underpinnings, for locating Scott's valve 68 in Miller's housing 26. *See* Pet. 44–46. As background, Miller defines a system with an air valve located outside of air cell 20. *See* Ex. 1213, Fig. 2 (showing solenoid valve 50). As Miller explains, "solenoid valve 50 is disposed outside the air cell 20 and connected to the exterior end of the air tube 22 to control the flow of air to and from the air cell 20." *Id.* at 4:14–17. Miller also discloses that electrical connections to solenoid valve 50 and the pump allow for remote

operation of the valve and pump. *Id.* at 4:17–24. We reproduce Miller's Figure 2, below.

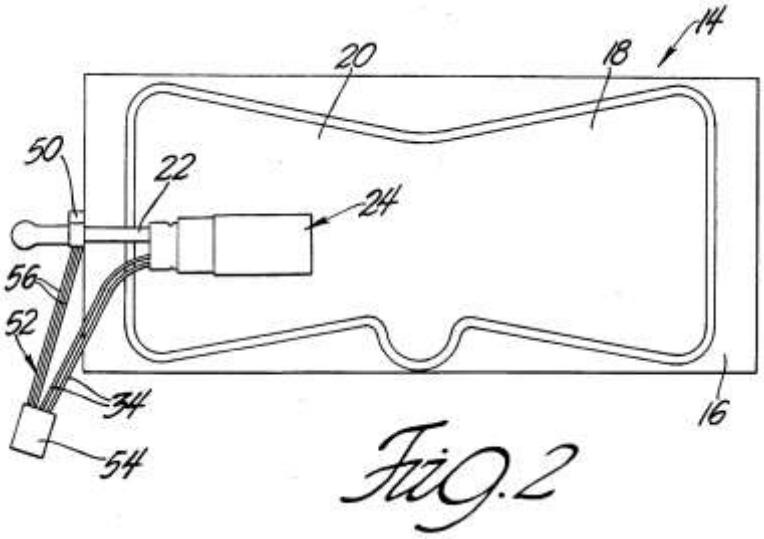


Fig. 2

Miller's Figure 2 depicts "a front view of" air cell module 14. *Id.* at 2:64. This depiction shows solenoid air valve 50 outside of air cell 20 and connected to electrical connector 54 through pigtail 52 with electrical leads 56. *See id.* at 4:13–20.

The Petition states that "in converting Miller's Reversible Pump Assembly in view of Scott, a [person having ordinary skill in the art] would have maintained Miller's housing-contained design . . ., *such that* the movable air conduit (i.e., such as *Scott's valve 68*) *was disposed inside Miller's housing 26*." Pet. 44–45 (emphasis added). The Petition continues that a person having ordinary skill in the art would have had "several reasons" to maintain the housing—compactness, durability, and decreased manufacturing costs. *Id.* at 45 (referencing Ex. 1202 ¶¶ 209–211; Ex. 1206, 4:20; Ex. 1232, Abstract). The Petition adds that maintaining the housing "would have been a well-known option . . . that would have yielded

predictable results." *Id.* (referencing Ex. 1202 ¶ 212, which cites to Exs. 1210, 1230, 1231, 1237, 1245).

Dr. Beaman testifies that "dispos[ing] the valve, like Scott's valve 68, inside of Miller's housing 26 . . . would have promoted the ***spatial efficiency*** of Miller's converted Uni-directional Pump Assembly." Ex. 1202 ¶ 209. Dr. Beaman explains that "disposing the valve inside of Miller's housing 26 would have provided for a more compact, unitized design, as compared to, for example, a Miller Uni-directional Pump Assembly with a directional control valve located outside of the housing." *Id.*

Dr. Beaman also testifies that "dispos[ing] the valve, like Scott's valve 68, inside of Miller's housing 26 . . . would have promoted the ***durability*** of Miller's converted Uni-directional Pump Assembly." Ex. 1202 ¶ 210. Dr. Beaman explains that a person having ordinary skill in the art "would have appreciated that a housing served 'to ***protect*** the inner workings of the pump' . . . [t]hus disposed inside of Miller's housing 26, the directional control valve would have been better protected from damage or other harm." *Id.* (quoting Ex. 1206, 4:20).

Dr. Beaman also testifies that a person having ordinary skill in the art "would have recognized that containing the valve, like Scott's valve 68, in Miller's housing 26 would have decreased manufacturing ***costs***." Ex. 1202 ¶ 211. Dr. Beaman explains that "the air pump assembly components of Miller's converted Unidirectional Pump Assembly (such as, Scott's valve 68) would be unitized in Miller's housing 26," which "would have simplified handling of Miller's converted Uni-directional Pump Assembly air pump 24 during manufacturing and further simplified interfacing the air

pump 24 with the air cell 20 during manufacturing, both of which would have resulted in reduced manufacturing and logistics costs." *Id.*

Patent Owner responds that Petitioners have not presented evidence that the combination of a uni-directional pump, a directional valve, such as valve 68, and any components necessary to control the valve would result in a size, cost, or weight reduction. PO Resp. 40–41, 43–44.

Petitioners reply that because the valve would be located inside the air cell, certain structures shown in Scott would not be needed. Reply 7. Petitioners also argue Miller discloses that its housing has "plenty of room." *Id.* (referencing Ex. 1213, 4:9–12); *see also* Reply 18 (indicating that "no 'additional space' would be necessary" to house the components necessary to operate valve 68). Petitioners also argue that Patent Owner fails to consider the cost and space savings that would result from the combination of Miller and Scott, which would be significantly more than any additional costs for controlling the valve. *Id.* at 18–19.

Patent Owner replies that Miller's disclosure about having "plenty of room" in housing 28 is directed to electrical leads and other electrical components, such as capacitors. Sur-Reply 13. Patent Owner argues that the valve required to support the unidirectional pump is larger than a capacitor.[16] *Id.*

[16] In support of this contention, Patent Owner cites to "Beaman Depo., 231:12–232:6" without citing to an exhibit number. *See* Sur-Reply 13. This reference is apparently to Exhibit 2753, one of three Beaman depositions in this record.

As to spatial efficiency, we find that this reasoning is not supported by a rational underpinning. First, we agree with Patent Owner that Miller's disclosure of "plenty of room" is in the context of small electrical components. *See* Ex. 1213, 4:9–12 ("The housing piece 28 also has plenty of room for the electric leads 34 as well as other electrical components such as capacitors that may be needed or desired."). Petitioners have not provided persuasive evidence that, even with a smaller motor, Petitioners' proposed modification that includes a directional valve and its control components, would allow for any space savings.

Second, although eliminating valve 50 and including a directional valve in housing 28 may reduce the space taken by valve 50 in the entire system, Petitioners do not provide persuasive evidence of the advantage of this change. Valve 50 is located outside of air cell module 14 and in the same plane as cell module 14 (which includes housing 26) over an area of the back of an automobile seat. *See id.*, Figs 1, 2. Miller is concerned with spatial efficiency as it relates to the *depth* of its structures, such as pump 24 in housing 26. *See id.* at 3:42–45 ("[H]ousing 26 is preferably of oval cross section as shown in F[igures] 4 and 5 to reduce the width of the housing 26 and provide flat sides to avoid discomfort to a seat occupant as explained below."); *id.*, Fig. 1 (showing the flat side of pump 24 parallel to the seatback). Petitioners do not adequately explain any benefit of moving a structure that is on the same plane as housing 26, given the size of the overall area of the seatback and the lack of evidence that the areal arrangement of components is at a premium. *Cf.* PO Resp. 45 ("[T]he car

seat itself is not getting any smaller, so Miller does not need the space advantages of Scott's unidirectional pump.").

With respect to manufacturing cost savings, we give Dr. Beaman's supporting testimony some, but not considerable, weight, as Dr. Beaman does not provide any underlying data or analysis in support of his opinion. Dr. Beaman does provide the basis underlying his opinion—that unitizing Miller's housing would simplify manufacturing (making it cheaper) as the single structure would simplify interfacing with air cell 20. Ex. 1202 ¶ 211. Dr. Beaman, however, does not provide any evidence to support his basis, instead relying on the inference that this simplification would provide an overall manufacturing cost savings. *Cf.* PO Resp. 40–41 (identifying factors that could adversely impact cost).

As to durability, we credit this reasoning to a small extent. Given that one function of a component housing is to protect the component (*see* Ex. 1206, 4:20), we credit Dr. Beaman's testimony with respect to added durability. *See* Ex. 1202 ¶ 210. This reasoning, however, is directed more to components in housings in the abstract, rather than directed specifically to Miller's system. For example, Petitioners do not direct us to persuasive evidence that, if located where valve 50 is located, a directional valve, such as Scott's valve 68, would be less durable than if positioned in a housing. Valve 50 is located inside a seatback, which would provide its own protection of the components. *See* Ex. 1213, Figs. 1, 2. That is, we do not discern any persuasive evidence that the durability of an air valve inside housing 26 would be significantly increased over one located outside the air cell but still within the seatback.

"[O]bviousness must be determined in light of *all the facts*, and . . . a given course of action often has simultaneous advantages and disadvantages, and this does not necessarily obviate motivation to combine." *Medichem, S.A. v. Rolabo, S.L.*, 437 F.3d 1157, 1165 (Fed. Cir. 2006) (emphasis added); *see also PAR Pharm., Inc. v. TWI Pharms., Inc.*, 773 F.3d 1186, 1196 (Fed. Cir. 2014) ("The presence or absence of a motivation to combine references in an obviousness determination is a pure question of fact."). We recognize that, "[e]ven under [the] 'expansive and flexible' obviousness analysis [of *KSR*], we must guard against 'hindsight bias' and *'ex post* reasoning.'" *St. Jude Med., Inc. v. Access Closure, Inc.*, 729 F.3d 1369, 1381 (Fed. Cir. 2013) (citation omitted).

In considering both parties' arguments and weighing the supporting evidence, we find that Petitioners have not demonstrated, by a preponderance of the evidence, that a person having ordinary skill in the art would have positioned a directional valve, such as Scott's valve 68, inside Miller's housing in view of Miller positioning its valve outside of its air cell. In making this finding, we do not find that Miller, by disclosing its valve 50 outside of air cell 20, teaches away from other valve locations, including in the housing. Instead, in making our finding, we give weight to Miller locating valve 50 outside of air cell 20 as a preferred location. *Cf. Polaris Indus., Inc. v. Arctic Cat, Inc.*, 882 F.3d 1056, 1069 (Fed. Cir. 2018) ("But even if a reference is not found to teach away, its statements regarding preferences are relevant to a finding regarding whether a skilled artisan would be motivated to combine that reference with another reference."). Petitioners do not provide persuasive arguments or evidence to overcome the

direct evidence in Miller describing positioning a directional valve where valve 50 is located. Said another way, the information in the Petition does not demonstrate, by a preponderance of the evidence, that it would have been obvious to locate a directional valve, such as valve 68 of Scott, inside housing 26, in light of Miller's express teaching of its air valve outside of cell 20. Instead, the proposed modification appears to be more the product of hindsight than an obvious modification. *See St. Jude Med.*, 729 F.3d at 1381.

iii. Secondary considerations

Secondary considerations, when present, must always be considered as part of an obviousness inquiry. *Transocean Offshore Deepwater Drilling, Inc. v. Maersk Drilling USA, Inc.*, 699 F.3d 1340, 1349 (Fed. Cir. 2012); *see* PO Resp. 62–70 (discussing secondary considerations); Reply 22–27 (same); Sur-Reply 18–26 (same). Because we find that the information in the Petition does not demonstrate, by a preponderance of the evidence, that a person having ordinary skill in the art would have made all of Petitioners' proposed modifications to arrive at the invention of claim 1, we need not address secondary considerations here.

iv. Conclusion as to claim 1

We determine, based on the complete record, that the information in the Petition fails to demonstrate, by a preponderance of the evidence, that claim 1 is unpatentable under 35 U.S.C. § 103 over Miller, Scott, and Wu.[17]

[17] We understand that Petitioners' first ground of unpatentability relies on Miller, Scott, and Wu. *See* Pet. 23. Petitioners rely on Wu for claims 4–6

Our determination is based on weighing the underlying factual findings in the obviousness analysis, as we have presented them above.

b. Dependent claims 2–12.

Claims 2–12 depend, directly or indirectly, from claim 1. In asserting that these claims are unpatentable, Petitioners rely on their position that the combination of Miller and Scott renders claim 1 obvious. *See* Pet. 50–70. Because we find that the information in the Petition does not demonstrate, by a preponderance of the evidence, that a person having ordinary skill in the art would have made all of Petitioners' proposed modifications to arrive at claim 1, we determine, based on the complete record, that the information in the Petition fails to demonstrate, by a preponderance of the evidence, that claims 2–12 are unpatentable under 35 U.S.C. § 103 over Miller, Scott, and Wu.

c. Claim 16–23.

For independent claim 16 and claims 17–23, which depend, directly or indirectly, from claim 16, Petitioners reference their positions with respect to claims 1–12. *See* Pet. 70–71. For the reasons discussed above in connection with our analysis of claims 1–12, we determine, based on the complete record, that the information in the Petition fails to demonstrate, by a preponderance of the evidence, that claims 17–23 are unpatentable under 35 U.S.C. § 103 over Miller, Scott, and Wu.

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and 8–11, which depend, directly or indirectly, from claim 1. *See* Pet. 50–70. Petitioners do not direct us to any teaching in Wu that would inform our analysis of claim 1.

2. Ground 2 – the Challenged Claims are allegedly unpatentable over Miller, Scott, and Pisante

In an alternative ground, Petitioners contend that the Challenged Claims are unpatentable as obvious over Miller, Scott, and Pisante. Pet. 71. The Petition relies on the identical analysis for claim 1 under this ground as it did for Ground 1. *See id.* ("The unpatentability analysis of claims 1–3, 7, and 12 for Ground 1, above, is identical to the analysis of claims 1–3, 7, and 12 for Ground 2."). Ground 2 differs only in that it applies the teachings of Pisante instead of Wu in the proposed combination for subject matter claimed in some dependent claims. *See id.* at 71–84 (addressing claims 2–12). For claims 16–23, the Petition relies on its analysis of claims 1–12 under this ground. *See* Pet. 86.

For the reasons stated above in connection with our analysis of claim 1 under Ground 1, we determine, based on the complete record, that the information in the Petition fails to demonstrate, by a preponderance of the evidence, that claim 1 is unpatentable under 35 U.S.C. § 103 over Miller, Scott, and Pisante. Also, for these same reasons, we determine that the information in the Petition fails to demonstrate, by a preponderance of the evidence, that claims 2–12 and 16–23 are unpatentable under 35 U.S.C. § 103 over Miller, Scott, and Pisante.

D. Motions to Exclude

1. Petitioners' motion to exclude evidence

Petitioners filed a motion to exclude certain exhibits that Petitioners contend are not cited in the Patent Owner Response, Sur-Reply, or any expert declaration. Paper 94, 1. Petitioners seek to exclude this evidence

(the "Uncited Exhibits") as irrelevant under Federal Rules of Evidence Rules 401 and 402. *Id.* Petitioners also argue that certain paragraphs in Ex. 2229 (Dr. Stevick's Declaration) and Ex. 2638 (Dr. Becker's Declaration) (the "Declaration Portions") should be excluded. *Id.* at 2–6.

a. Uncited Exhibits

With respect to the Uncited Exhibits (Exs. 2030–2035, 2241, 2242, 2243, 2748, 2751, and 2752), Petitioners argue that prior Board decisions provide that exhibits not cited in a patent owner's papers should be excluded. Paper 94, 1–2.

In opposition, Patent Owner argues that certain of the Uncited Exhibits are exhibits to depositions. Paper 99, 1. Specifically, Patent Owner argues that Exhibits 2030, 2031, 2032, 2033, 2751, and 2752 are exhibits to Dr. Beaman's deposition testimony (Exhibits 2040 and 2753). *Id.* Patent Owner adds that Petitioners did not properly object to the evidence, as they did not object to the evidence during the depositions. *Id.* at 2.[18]

Petitioners reply that, as to the Uncited Exhibits, Patent Owner addresses only a subset of the exhibits covered in Petitioners' motion. Paper 102, 1 (identifying Exs. 2234, 2235, 2241, 2242, 2243, and 2748 as uncontested by Patent Owner). As to the contested exhibits, Petitioners argue that Patent Owner does not identify where in its papers it relies on Dr. Beaman's testimony directed to any of the exhibits challenged by the

[18] Patent Owner does indicate that Exhibit 2030 was objected to at the deposition, but on the basis that it was derived from a different proceeding. Paper 99, 2.

motion. *Id.* at 2. Petitioners argue that, without reliance on these sections, the exhibits should be excluded. *Id.* at 2–3.

Petitioners also argue that Patent Owner's argument that Petitioners failed to object at the deposition is nonsensical. Paper 102, 3. Petitioners argue that they could not have known at the time of the deposition that Patent Owner would not rely on those exhibits in its later-filed papers. *Id.* at 3–4.

As to Exhibits 2234, 2235, 2241, 2242, 2243, and 2748, which are not contested by Patent Owner, we deny Petitioners' motion as moot, as we do not rely on them in this Decision. *See* Patent Trial and Appeal Board, Trial Practice Guide Update, 17 (August 2018) ("Trial Practice Guide August Update"), available at https://go.usa.gov/xU7GP ("In the Board's experience, consideration of the objected-to evidence is often unnecessary to resolve the patentability of the challenged claims, and the motion to exclude is moot."); *see also* Office Patent Trial Practice Guide, August 2018 Update, 83 Fed. Reg. 39,989 (Aug. 13, 2018) (notice).

We also deny Petitioners' motion as to the other Uncited Exhibits (Exhibits 2030, 2031, 2032, 2033, 2751, and 2752). As Patent Owner explains, these exhibits were used in conducting Dr. Beaman's depositions (Ex. 2040 and Ex. 2753) and the complete deposition transcripts are in the record. Although we do not rely on these exhibits in our Decision, we do rely on Dr. Beaman's depositions. We determine that it is proper to maintain Exhibits 2030, 2031, 2032, 2033, 2751, and 2752 in the record, as they are relevant to testimony in the depositions, even if that testimony is not ultimately relied upon by Patent Owner or Petitioners in this proceeding. If

we followed Petitioners' reasoning, in cases where a deposition or declaration covers multiple, related proceedings, portions of those exhibits would need to be removed to the extent they do not apply to any one proceeding. Similarly, to the extent that a line of questioning in a deposition or testimony in a declaration eventually is not used to support a party's position, that evidence would need to be excluded from the record. Such an approach would make dealing with evidence, particularly evidence entered in multiple proceedings as we have here, cumbersome to the parties to manage. Accordingly, we determine that we will maintain in the record of this proceeding the complete record of Dr. Beaman's depositions, including the associated exhibits.

b. Declaration Portions

With respect to the Declaration Portions, Petitioners argue that this evidence represents arguments that are improperly incorporated by reference by Patent Owner. Paper 94, 2–6.

Patent Owner argues that a motion to exclude evidence is not the proper vehicle to address incorporation by reference. Paper 99, 3. Patent Owner explains that we ruled on a motion to strike directed to the Declaration Portions. *Id.*; *see* Paper 76 (providing an Order denying Petitioners' motion to strike). Patent Owner also argues that Petitioners' motion improperly incorporates arguments from its motion to strike. Paper 99, 4–5. Finally, Patent Owner argues that it did not improperly incorporate arguments from its experts' declarations. *Id.* at 5–9. Petitioners' reply reiterates that the Declaration Portions were improperly incorporated by reference into the Patent Owner Response. Paper 102, 4–5.

We deny Petitioners' motion to exclude the Declaration Portions. Motions to exclude evidence are used to exclude evidence that is not admissible. *See* Trial Practice Guide August Update 16–17. Petitioners do not argue that the Declaration Portions represent *inadmissible* evidence. *Id.* Instead, Petitioners argue that the Declaration Portions represent improper *argument*, rather than evidence. *See* Paper 94, 2–6. Petitioners fail to provide any basis under the Federal Rules of Evidence as to why the Declaration Portions are inadmissible. *See id.*; Trial Practice Guide August Update 16 ("A motion to exclude must explain why the evidence is not admissible (e.g., relevance or hearsay)"). Although Petitioners did object to Exhibits 2229 and 2638, these objections were directed to bases under the Federal Rules of Evidence not argued in their motion. *See* Paper 55, 2, 19. As such, Petitioners have not adequately explained why the Declaration Portions are inadmissible.

Petitioners appear to use the motion to exclude to reargue their motion to strike, this time trying to exclude the underlying declaration paragraphs, rather than the sections of the Patent Owner Response that allegedly incorporate by reference these paragraphs. *See id.*; *see also* Paper 76 (providing our decision on Petitioners' motion to strike portions of the Patent Owner Response). We already addressed their motion to strike and how we would address any arguments improperly incorporated by reference. Paper 76. As an alternative basis for denying the motion, in this Decision, we do not consider any of the alleged arguments in the Declaration Portions, as they are directed to secondary considerations, which we did not reach here.

2. Patent Owner's motion to exclude evidence

We now turn to Patent Owner's motion to exclude evidence. In this motion, Patent Owner first "objects to Exhibits 1665–1669 on the ground that they contain improper attorney argument in violation of the page/word count limits for replies." Paper 96, 1. Second, Patent Owner contends that Exhibit 1625, Dr. Beaman's declaration supporting the Reply, mischaracterizes certain earlier testimony of Patent Owner's expert and exceeds the proper scope of a reply. *Id.* at 3. Third, Patent Owner objects, provisionally, to Exhibit 1650, a declaration by Ryan Slate, because Patent Owner was not afforded an opportunity to depose the declarant. *Id.* at 4–5.[19] Fourth, Patent Owner contends that Exhibits 1651–1654 and 1679 include hearsay, are irrelevant, are unfairly prejudicial, and lack foundation. *Id.* at 5. Fifth and finally, Patent Owner contends that Exhibits 1268, 1269, and 1270, and references to these exhibits in Ex. 1202, should be excluded under Federal Rules of Evidence 402, 403, and 1002. We address each of these categories in turn, below.

In opposition to this motion, Petitioners argue that Patent Owner's motion to exclude fails to follow our rules and procedures for a motion to exclude and that we should deny the motion, in its entirety, on that basis. Paper 100, 1–2 (quoting the Office Patent Trial Practice Guide, 77 Fed. Reg. at 48,767). We decline to deny Patent Owner's motion on this basis. We note that Petitioners' motion, which we addressed above, also fails to follow

[19] Patent Owner does not address this evidence in reply to Petitioners' contention that this objection should be withdrawn. *See* Paper 100, 6; Paper 103. We do not address this exhibit further.

the procedure outlined in the Office Patent Trial Practice Guide. *See* Paper 94.

a. Exhibits 1665–1669

Patent Owner argues that Exhibits 1665 through 1669 improperly incorporate attorney argument into Petitioners' Reply. Paper 96, 1–3. These exhibits are directed to Petitioners' allegations that Patent Owner improperly incorporates arguments from declarations into its Patent Owner Response. *See id.*

In opposition, Petitioners argue that Patent Owner does not cite any evidentiary basis for excluding these exhibits and that a motion to exclude is not the proper procedure to challenge these exhibits. Paper 100, 12 (referencing Trial Practice Guide Update, August 2018). Patent Owner replies that, by filing Exhibits 1665–1669, Petitioners exceeded the word count for a Reply. Paper 103, 2.

We do not exclude Exhibits 1665–1669. Patent Owner provides no evidentiary basis why these exhibits constitute inadmissible evidence. To the extent that these exhibits do contain attorney argument, the proper remedy in such a situation is for us, when considering Petitioners' Reply arguments and evidence as a whole, to not consider any "arguments" found only in these exhibits and not adequately explained in the Reply. *See* Trial Practice Guide August Update 17–18; *cf.* Paper 76, 5 (addressing Petitioners' motion to strike).

b. Exhibit 1625

Patent Owner argues that Dr. Beaman's reply declaration mischaracterizes testimony from Patent Owner's declarant in support of its

preliminary response (Dr. Durfee), based on characterizations of the testimony from Petitioners' counsel. Paper 96, 3–4. Patent Owner also argues that addressing Dr. Durfee's testimony, which was not relied on in the Patent Owner Response, is outside the scope of a proper reply. *Id.* at 3.

Petitioners argue that Patent Owner does not provide a basis under the Federal Rules of Evidence to exclude Dr. Beaman's testimony. Paper 100, 5. Petitioners add that a motion to exclude should not be directed to arguments or evidence that a party believes exceeds the proper scope of a reply. *Id.* Finally, Petitioners argue that the testimony sought to be excluded identifies inconsistencies between Patent Owner's declarants' testimony. *Id.* at 6.

In reply, Patent Owner argues that Dr. Beaman's testimony lacks foundation. Paper 103, 3.

We do not exclude this evidence. Patent Owner did not rely on a lack of foundation in its objection to Dr. Beaman's testimony or in the original motion to exclude. *See* Paper 85, 5 ("Team Worldwide objects to the Reply Declaration of Joseph J. Beaman, Jr. (Exhibit 1625), which mischaracterizes Exhibit 2201 and/or exceeds the proper scope of reply."); Paper 96, 3–4 (contending that portions of Exhibit 1625 "mischaracterize[] Patent Owner's early expert testimonial evidence (Exhibit 2201) and/or exceeds the proper scope of reply"). Accordingly, Patent Owner does not identify an evidentiary basis to exclude the evidence. Also, neither the motion nor the objection identifies, with particularity, those portions of Dr. Beaman's declarations to be excluded, as Patent Owner's citations were presented as exemplary only. *See id.*

c. Exhibits 1651–1654 and 1679

Patent Owner argues that Exhibits 1651–1654 should be excluded as hearsay, are irrelevant, and lack proper foundation. Paper 96, 5. Patent Owner also argues that Exhibit 1679 does not lay the proper foundation for these exhibits. *Id.* at 8.

We deny Patent Owner's motion as to these exhibits as moot, as we do not rely on them in this Decision. *See* Trial Practice Guide August Update 17 ("In the Board's experience, consideration of the objected-to evidence is often unnecessary to resolve the patentability of the challenged claims, and the motion to exclude is moot.").

d. Exhibits 1268, 1269, and 1270, and references to these exhibits in Ex. 1202

Patent Owner argues that Exhibits 1268, 1269, and 1270, and references to these exhibits in Ex. 1202 should be excluded, as Exhibits 1268, 1269, and 1270 are animations that do not accurately or completely represent the evidence underlying the animations. Paper 96, 10–11. We deny Patent Owner's motion as to these exhibits as moot, as we do not rely on them in this Decision. *See* Trial Practice Guide August Update 17.

III. CONCLUSION

After considering the complete record, we determine that the information in the Petition fails to demonstrate, by a preponderance of the

evidence, that any of the Challenged Claims are unpatentable.[20] Also, we deny Petitioners' and Patent Owner's motions to exclude evidence.

IV. ORDER

After due consideration of the record before us, it is:

ORDERED that no Challenged Claim has been shown to be unpatentable;

FURTHER ORDERED that Petitioners' and Patent Owner's motions to exclude (Papers 94, 96) are denied; 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.

[20] Should Patent Owner wish to pursue amendment of the challenged claims in a reissue or reexamination proceeding subsequent to the issuance of this decision, we draw Patent Owner's attention to the April 2019 *Notice Regarding Options for Amendments by Patent Owner Through Reissue or Reexamination During a Pending AIA Trial Proceeding*. *See* 84 Fed. Reg. 16654 (Apr. 22, 2019). If Patent Owner chooses to file a reissue application or a request for reexamination of the challenged patent, we remind Patent Owner of its continuing obligation to notify the Board of any such related matters in updated mandatory notices. *See* 37 C.F.R. § 42.8(a)(3), (b)(2).

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