

**From:** [Szypa, Alex](#)  
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**Cc:** [Koziarz, Matt L.](#); [VanWyke, Laina](#); [Fulghum, Roger](#); [Henkelman, Brad](#); [Chuning, Matthew](#); [Ton, Thao](#); [Stringfield, Holly C.](#)  
**Subject:** RE: IPR Nos. IPR2023-01236, -01237 and -01238 | Deposition Notice  
**Date:** Friday, May 3, 2024 11:35:46 AM  
**Attachments:** [image001.png](#)  
[image002.png](#)  
[2019 Pat. App. LEXIS 13979.PDF](#)

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[EXTERNAL EMAIL]

Liz,

I tried calling you but I understand you have conferences today.

We have one deposition date and time scheduled for the three IPR proceedings as it stands right now. Our intention was to conduct one deposition with one transcript that would be used in all three proceedings. We believe this would be the most efficient way to handle, and imagine you would likely want to do the same should you wish to depose our expert. There is a good amount of overlap in the three declarations, and at least some of the prior art is the same throughout. We do not believe there is anything inherently wrong with conducting the deposition in this way (see attached).

If you have any objections, we would like to address and sort those out now. Feel free to call me to discuss.

Thank you,



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**2019 Pat. App. LEXIS 13979**

Patent Trial and Appeal Board Representative Orders, Decisions and Notices

October 25, 2019, Decided

IPR2018-00874, Paper 149, Paper 129 ; Patent 7,246,394 B2

**Reporter**

2019 Pat. App. LEXIS 13979 \*

**INTEX RECREATION CORPORATION and BESTWAY (USA) INC.,  
Petitioner,  
v.  
TEAM WORLDWIDE CORPORATION,  
Patent Owner**

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**Notice:**

[\*1] ROUTINE OPINION. Pursuant to the Patent Trial and Appeal Board Standard Operating Procedure 2, the opinion below has been designated a routine opinion.

**Core Terms**

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patent, pump, air, inflatable, modify, assembly, valve, conduit, reply, ordinary skill, bladder, complete record, fan, airbeds, deflate, flange, invent, blower, preponderance of evidence, box, teach, depict, objective evidence, pipe, mattress, nonobviousness, embodiment, gate, fluid, nexus

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

**Opinion By:** ERIC C. JESCHKE

## Opinion

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JESCHKE, *Administrative Patent Judge.*

### JUDGMENT

Final Written Decision

Determining All Challenged Claims Unpatentable

[35 U.S.C. § 318\(a\)](#)

### ORDER

Denying Petitioner's Motion to Exclude

Denying Patent Owner's Motion to Exclude

[37 C.F.R. § 42.64](#)

Intex Recreation Corporation and Bestway (USA) Inc. (collectively, [\*2] "Petitioner")<sup>1</sup> challenges the patentability of claims 1-12 and 16-23 ("the Challenged Claims") of U.S. Patent No. 7,246,394 B2 (Ex. 1401, "the '394 patent"), which is assigned to Team Worldwide Corporation ("Patent Owner"). We have jurisdiction under [35 U.S.C. § 6](#), and we issue this Final Written Decision under [35 U.S.C. § 318\(a\)](#) and [37 C.F.R. § 42.73](#). For the reasons below, we conclude that Petitioner has proven by a preponderance of the evidence that claims 1-12 and 16-23 of the '394 patent are unpatentable.

### I. BACKGROUND

#### *A. Procedural History*

Petitioner filed a Petition seeking *inter partes* review of the Challenged Claims. Paper 1 ("Pet."). Patent Owner filed a Preliminary Response. Paper 8. We instituted a trial as to all the Challenged Claims. Paper 14 ("Decision on Institution" or "Dec. Inst.").

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<sup>1</sup> Walmart Inc., Wal-Mart Stores Texas, LLC, Wal-Mart.com USA LLC, and Sam's West, Inc. d/b/a Sam's Club ("the Walmart Entities") were originally named as petitioners (Paper 1, 1); however, this proceeding was terminated with respect to the Walmart Entities during trial (Paper 96).

During the trial, Patent Owner filed a Response (Paper 46, "PO Resp."), Petitioner filed a Reply (Paper 73, "Pet. Reply"), and Patent Owner filed a Sur-reply (Paper 80, "PO Sur-reply").<sup>2</sup> Petitioner and Patent Owner also filed Motions to exclude evidence (Papers 98 and 99, respectively), Oppositions to the Motions (Papers 100 and 101, respectively), and Replies to the Oppositions (Papers 105 and 104, respectively).

Petitioner relies on the declaration testimony of Dr. Joseph [\*3] J. Beaman, Jr. (Exs. 1402 and 1625) and Mr. W. Todd Schoettelkotte (Ex. 1649). Patent Owner relies on the declaration testimony of Dr. Glen Stevick (Ex. 2429) and Dr. Stephen L. Becker (Ex. 2638). Oral argument was held on July 29, 2019, and a copy of the transcript of that argument was entered into the record. Paper 117 (public); Paper 118 (confidential) ("Tr.").

### *B. Related Proceedings*

The parties identify a prior proceeding in the U.S. District Court for the Eastern District of Texas ("the Texas District Court") involving the '394 patent : *Team Worldwide Corp. v. Walmart Inc. et al.*, No. 2:17-cv-00235-JRG (E.D. Tex.), filed March 29, 2017 ("the Texas Litigation"). Pet. 1-2; PO Resp. 1; Paper 90, 1; Paper 120, 2. The Texas District Court issued a claim construction order on March 15, 2018. Ex. 1475. On November 20, 2018, the Texas District Court dismissed the Texas Litigation with prejudice. Ex. 1680.

The Texas Litigation also involved U.S. Patent No. 9,211,018 B2 ("the '018 patent ") and U.S. Patent No. 7,346,950 B2 ("the '950 patent "). Pet. 2; PO Resp. 1. Petitioner filed four additional petitions for *inter partes* review of claims 1-12 and 16-23 of the '394 patent in IPR2018-00870, IPR2018-00871, IPR2018-00872, and IPR2018-00873. Petitioner also filed petitions for *inter partes* review of (1) claims 1, 5, 7, and 11-14 of [\*4] the '018 patent , in IPR2018-00859, and (2) claims 1, 7, and 11-14 of the '950 patent , in IPR2018-00875.

The parties also identify the following proceedings in the Texas District Court involving the '394 patent , the '018 patent , and the '950 patent :

- (1) *Team Worldwide Corp. v. Macy's, Inc. and Macys.com, LLC*, No. 2:19-cv-00099-JRG (E.D. Tex.);
- (2) *Team Worldwide Corp. v. Target Corp. and Target Brands, Inc.*, No. 2:19-cv-00100-JRG (E.D. Tex.);
- (3) *Team Worldwide Corp. v. The Home Depot, Inc.*, No. 2:19-cv-00098-JRG (E.D. Tex.);
- (4) *Team Worldwide Corp. v. Dick's Sporting Goods, Inc.*, No. 2:19-cv-00097-JRG (E.D. Tex.);
- (5) *Team Worldwide Corp. v. Costco Wholesale Corp.*, No. 2:19-cv-00096-JRG (E.D. Tex.);
- (6) *Team Worldwide Corp. v. Bed Bath & Beyond, Inc.*, No. 2:19-cv-00095-JRG (E.D. Tex.);
- (7) *Team Worldwide Corp. v. Amazon.com, Inc. and Amazon.com LLC*, No. 2:19-cv-00094-JRG (E.D. Tex.);

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<sup>2</sup>Paper 47 is a public version of the Patent Owner Response. Paper 74 is a public version of the Petitioner's Reply. Paper 81 is a public version of the Patent Owner Sur-reply.

- (8) *Team Worldwide Corp. v. Ace Hardware Corp.*, No. 2:19-cv-00093-JRG (E.D. Tex.); and
- (9) *Team Worldwide Corp. v. Academy, Ltd. d/b/a Academy Sports + Outdoors*, No. 2:19-cv-00092-JRG (E.D. Tex.).

Paper 90, 2-3; Paper 120, 4-5. According to Patent Owner, these nine proceedings are stayed pending the outcomes of IPR2018-00859 and IPR2018-00870 through -00875. Paper 90, 3.

Patent Owner also states it "filed a claim in *In re Sears Holding Corporation, et al.* chapter 11 bankruptcy cases pending before the United States Bankruptcy Court for the Southern District of New York, Case No. 18-23538 (RDD) (Jointly Administered) in which Patent Owner asserts infringement" of the '394 patent, the '018 patent, and the '950 patent. Paper 90, 3.

### C. The '394 Patent

The '394 patent, titled "Inflatable Product with Built-in Housing [\*5] and Switching Pipe," issued on July 24, 2007. Ex. 1401, codes (54), (45). It "relates in general to an inflatable product provided with an electric air pump." *Id.* at 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:

Figure 1A depicts "a perspective diagram of an inflatable product," which includes inflatable chamber 10, pump seat 11, and air pump 12. Ex. 1401, 1:50-51, 3:15-21.

Figures 3A and 3B are reproduced below:

Figure 3A depicts an air pump of an embodiment of an inflatable product (as shown, for example, in Figure 1A) during inflation. Ex. 1401, 1:66-67. Figure 3B depicts the air pump of Figure 3A with portions of certain structures removed. *Id.* at 2:1-2. Figures 3A [\*6] 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. <sup>3</sup> 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:

<sup>3</sup> Throughout this Decision, we omit any bolding of reference numerals in quotations from the '394 patent and from prior art references.

Figure 3C depicts an air pump of an embodiment of an inflatable product during deflation. Ex. 1401, 2:3-4. Figure 3D depicts the air pump of Figure 3C with portions of certain structures removed. *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 [\*7] 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.

#### *D. Illustrative Claims*

Of the Challenged Claims, claims 1 and 16 are independent. Claims 2-12 depend from claim 1, and claims 17-23 depend from claim 16.

Claim 1 is 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. 1401, 8:24-38.

Claim 16 is reproduced below:

16. An inflatable product including:
  - an inflatable body;
  - a fan and motor assembly for pumping [\*8] air;
  - a housing built into the inflatable body, the housing having an interior region; and
  - an air conduit having a first end and a second end, the air conduit disposed at least in part in the housing and arranged to convey air pumped by the fan and motor assembly, the air conduit being movable between a first position and a second position, 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, and

wherein the fan and motor assembly causes air to be conveyed from the first end of the air conduit to the second end of the air conduit when the air conduit is in the first position, and the fan and motor assembly causes air to be conveyed in sequence from the inflatable body, through the second end of the air conduit, to the first end of the air conduit, to ambient when the air conduit is in the second position.

Ex. 1401, 9:38-10:19.

### *E. Instituted Grounds of Unpatentability*

We instituted *inter partes* review of the Challenged Claims based on the following grounds of [\*9] unpatentability asserted by Petitioner:

Claims Challenged	35 U.S.C. §	References
1-12, 16-23	103	Chaffee <sup>4</sup> and Wu <sup>5</sup>
1-12, 16-23	103	Chaffee, Scott <sup>6</sup> , and Pisante <sup>7</sup>

## II. DISCUSSION

### *A. The Level of Ordinary Skill in the Art*

The level of ordinary 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 \(Fed. Cir. 2001\)](#). In the Decision on Institution, we adopted Patent Owner's formulation of the level of ordinary skill in the art: one of ordinary skill in the art would have had either (1) a bachelor's degree in mechanical engineering or an equivalent field or (2) at least two years of experience in mechanical and electrical design aspects of inflatable products having electric air pumps. Dec. Inst. 15-16.

Following institution, neither Petitioner nor Patent Owner objected to this determination. *See* PO Resp. 20 (repeating the same formulation as stated prior to institution); *see also* Dec. Inst. 16 n.6 (discussing why we did not discern any special meaning for the term "designer" in Patent Owner's formulation of the level of skill in the art for an individual without a bachelor's degree in mechanical engineering). For the same reasons provided in the Decision on Institution (Dec. Inst. 15-16), we maintain this determination of the level of ordinary skill in the art for purposes of this Final Written Decision. [\*10] Further, the patentability and claim construction analyses below would reach the same findings and determinations under either party's definition of the level of ordinary skill in the art.

### *B. Claim Construction*

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<sup>4</sup> US 7,039,972 B2, issued May 9, 2006 (Ex. 1406, "Chaffee").

<sup>5</sup> US 6,698,046 B1, issued Mar. 2, 2004 (Ex. 1405, "Wu").

<sup>6</sup> US 4,938,528, issued July 3, 1990 (Ex. 1412, "Scott").

<sup>7</sup> FR 2583825 (and certified translation), published Dec. 26, 1986 (Ex. 1472, "Pisante").



In an *inter partes* review based on a petition filed prior to November 13, 2018, claim terms in an unexpired patent, such as the '394 patent, are given their broadest reasonable construction in light of the specification.<sup>8</sup> See [37 C.F.R. § 42.100\(b\) \(2017\)](#); [Cuozzo Speed Techs., LLC v. Lee, 136 S. Ct. 2131, 2144-46 \(2016\)](#) (upholding the use of the broadest reasonable interpretation standard as the claim construction standard to be applied in an *inter partes* review); see also [Changes to the Claim Construction Standard for Interpreting Claims in Trial Proceedings Before the Patent Trial and Appeal Board, 83 Fed. Reg. 51,340 \(Oct. 11, 2018\)](#) (amending [37 C.F.R. § 42.100\(b\)](#) effective November 13, 2018). Under the broadest reasonable construction standard, claim terms are generally given their ordinary and customary meaning, as would be understood by one of ordinary skill in the art at the time of the invention in the context of the entire disclosure. [In re Translogic Tech., Inc., 504 F.3d 1249, 1257 \(Fed. Cir. 2007\)](#).

Petitioner proposes constructions for the terms "fan" (Pet. 23-24), "inflatable body" ( *id.* at 24-26), and "pipe" ( *id.* at 26-27). Patent Owner proposes constructions for the terms "built into" (PO Resp. 12-14), "inflatable body" ( *id.* at 14-18), "pipe" ( *id.* at 18-19), and "fan" ( *id.* at 19-20). We determined in our Decision on Institution that express construction of only the term "built into" was necessary. Dec. Inst. 16-20.

Based on the full record developed at trial, we maintain that view for purposes of this Final Written Decision, as the determination as to the alleged obviousness of the Challenged Claims does not turn on the express interpretation of any of the remaining [\*11] claim terms. See [Nidec Motor Corp. v. Zhongshan Broad Ocean Motor Co., 868 F.3d 1013, 1017 \(Fed. Cir. 2017\)](#) (stating that "we need only construe terms 'that are in controversy, and only to the extent necessary to resolve the controversy'") (quoting [Vivid Techs., Inc. v. Am. Sci. & Eng'g, Inc., 200 F.3d 795, 803 \(Fed. Cir. 1999\)](#)). We discuss the term "built into" below.

Independent claims 1 and 16 each recite "a housing *built into* the inflatable body." Ex. 1401, 8:27, 9:41 (emphasis added). In the Decision on Institution, we preliminarily construed "built into" in accordance with its plain and ordinary meaning in light of the Specification--"integrated into and not detachable from." Dec. Inst. 20.

Patent Owner agrees with this construction. See PO Resp. 14 (stating that "'built into' should be construed as 'integrated into and not detachable from'"), 12 (stating that the preliminary construction "matches Patent Owner's proposed definition"). Petitioner did not address this claim term in the claim construction section of the Petition or in the Reply. See Pet. 23-27; see generally Pet. Reply. Here, the parties agree on the construction of "built into," but do not agree on the application of that construction to the asserted prior art. See Tr. 9:17-19 (counsel for Petitioner stating that "there's no dispute about [the construction of 'built into'] between the parties"), [\*12] 56:19-21 (counsel for Patent Owner stating that "everybody seems to agree" on the construction of "built into"). We address the disagreements as to the *application* of this construction to the prior art in the discussion of the asserted grounds below.

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<sup>8</sup> Patent Owner's contentions regarding the applicability of the district-court-type claim construction standard are inapposite because the present Petition was filed prior to the rule change effective November 13, 2018. See PO Resp. 11-12, 11 n.2. Although the applicable version of Rule 42.100(b) permitted a party to request that the Board apply the district-court-type claim construction standard, Patent Owner did not provide either the required certification or the required request. See [37 C.F.R. § 42.100\(b\)](#).

Based on the complete record, for the reasons provided in the Decision on Institution, we maintain our construction of "built into" in accordance with its plain and ordinary meaning in light of the Specification-"integrated into and not detachable from." *See* Dec. Inst. 17-20.

*C. Asserted Obviousness of Claims 1-12 and 16-23 Based on Chaffee and Wu*

Petitioner asserts that claims 1-12 and 16-23 of the '394 patent are unpatentable under [35 U.S.C. § 103\(a\)](#) based on Chaffee and Wu. Pet. 23, 31-66; Pet. Reply 6-23. Patent Owner provides arguments specifically addressing this asserted ground of unpatentability. PO Resp. 21-58; PO Sur-reply 2-19. We begin our analysis with an overview of the asserted prior art and then address the parties' specific contentions.

*1. Chaffee*

Chaffee relates to "inflatable devices, and, more specifically, to an inflatable device with a recessed fluid controller." Ex. 1406, 1:13-15.

Figure 2 of Chaffee is reproduced below:

Figure 2 depicts inflatable device 10, which includes, [\*13] among other aspects, "substantially fluid impermeable bladder 20 and a fluid controller 80 comprising an electrically powered pump at least partly positioned within bladder 20." Ex. 1406, 3:3-7. Chaffee discloses that fluid controller 80 "control[s] the flow of fluid into and/or out of bladder 20." *Id.* at 3:59-61.

Figures 3 and 5 are reproduced below:

Figures 3 and 5 depict a perspective view and cross-sectional view, respectively, of one embodiment of fluid controller 80. Ex. 1406, 2:34-35, 2:38-39. These figures depict, among other aspects, pump 81, flange 82, wall 83, and housing 90. *See id.* at 4:11-17, 5:4-13.

*2. Wu*

Wu is generally directed to a system for controlling air flow into chambers of an air mattress. Ex. 1405, 1:12-14.

Figure 1 of Wu is reproduced below:

Figure 1 depicts a schematic representation of the overall disclosed system 10, which includes, among other aspects, electric motor powered blower 15, two-position rotary valve 100, and air mattress supply lines 302A-D and 302S for supplying air to air mattress 400. Ex. 1405, 2:43-48. Included in rotary valve 100 is gate member 200, which is shown in Figure [\*14] 1 "in a first position for directing air flow in a pressurizing mode." *Id.* at 3:3-8. Wu discloses that "[w]hen gate member 200 is in the first position, air can flow through inlet port 110 of housing 101, into the second portion of gate member 200 and then out

through air mattress supply ports 112S, 112A, 112B, 112C and 112D and exhaust port 114." *Id.* at 5:56-60.

The system can be deflated by turning gate member 200 "to a second position shown in phantom" in Figure 1. Ex. 1405, 4:48-53. According to Wu, "[w]hen in the second position, gate member 200 directs air from air mattress 400 into intake 17 of blower 15 while air leaving blower 15 is directed through filter 30 to the outside environment." *Id.* at 4:54-57.

Figure 2 is reproduced below:

Figure 2 depicts a perspective view of rotary valve 100. Ex. 1405, 2:36-37, 4:60-61. As shown, rotary valve 100 includes cylindrically shaped valve housing 101 with outer wall 105, which includes inlet port 110 that connects with exhaust port 19 of blower 15. *Id.* at 4:61-66. Outer wall 105 also includes exhaust ports that supply air to air mattress 400's air supply ports. *Id.* at 4:66-5:1.

Gate member 200 fits within valve [\*15] housing 101 and includes two end walls that close gate member 200 within valve housing 101. Ex. 1405, 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 air mattress 400 to be deflated. *Id.* at 5:44-48.

### 3. Analysis

#### a. Independent Claim 1

Petitioner contends that the proposed combination of Chaffee and Wu satisfies each of the limitations of claim 1. Pet. 32-58. To support its arguments, Petitioner identifies certain passages in the cited references and explains the significance of each passage with respect to the corresponding claim limitation. *Id.* Petitioner also identifies reasons why one of ordinary skill in the art at the time of the invention would have been motivated to modify Chaffee based on Wu. *Id.* at 38, 43-56. We address in turn below the subject matter of each limitation in claim 1, then Petitioner's identified reasons to modify Chaffee based on Wu, and then objective evidence of nonobviousness.

#### (1) The "Inflatable Body" Limitation

Claim 1 recites "an inflatable body." <sup>9</sup> Ex. 1401, 8:25 ("the 'inflatable body' limitation"). Referencing Figure 2 of Chaffee, Petitioner states that Chaffee discloses "an inflatable device 10 including 'a substantially fluid impermeable bladder [\*16] 20' . . . that can be 'inflate[d] and/or deflate[d]' by a fluid controller 80 with a pump 81." Pet. 32 (citing Ex. 1406, 3:5, 3:8-10, 3:32-42, 3:64; 4:23-26; Ex. 1402 P 180). According to Petitioner, "[u]nder any reasonable construction of the term, Chaffee's bladder 20 is an 'inflatable body.'" *Id.* (citing Ex. 1402 P 181).

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<sup>9</sup> Petitioner takes the position that the "preamble [in claim 1] is not a limitation." Pet. 32 n.4. We agree; here, the body of the claim "sets out the complete invention" such that "the language of the preamble is superfluous." [Schumer v. Lab. Comput. Sys., Inc., 308 F.3d 1304, 1310 \(Fed. Cir. 2002\)](#). Patent Owner does not dispute Petitioner's position on this issue.

The record evidence, summarized above, supports Petitioner's position as to this limitation, which we adopt as our own. We find, based on the complete record, that Petitioner has demonstrated by a preponderance of the evidence that Chaffee discloses the "inflatable body" limitation. Patent Owner does not present arguments for this limitation.

*(2) The "Fan and Motor" Limitation*

Claim 1 recites "a fan and motor assembly for pumping air." Ex. 1401, 8:26 ("the 'fan and motor' limitation"). Petitioner relies on Chaffee as modified by Wu to address this limitation. *See* Pet. 33-38. Petitioner provides the annotated version of Figure 5 of Chaffee below and states that Chaffee discloses "a Reversible Pump Assembly including motor 84 and impeller 86." Pet. 33 (citing Ex. 1402 P 114).

Pet. 34. Figure 5 depicts a cross-sectional view of one embodiment of fluid controller 80. *See* Ex. 1406, 2:38-39. In the annotated version of Figure 5, Petitioner added (1) a text box identifying element 84 as a "Motor," (2) a text box identifying element 86 as an "Impeller," (3) a text box identifying element 81 as a "Pump," (4) a text box identifying element 20 as a "Bladder," (5) an orange overlay to motor 84, and (6) a blue overlay to impeller 86. Pet. 34. Referring to the annotated version of Figure 5 above, Petitioner states that "Chaffee disclose[s] that pump 81 'may be a conventional fluid pump including a motor 84 [orange] that drives an impeller 86 [blue] moving air into, or out of, bladder 20' and that a switch can 'reverse the direction of the pump to deflate bladder 20.'" Pet. 33 (quoting Ex. 1406, 3:62-67, 6:19-20) (citing Ex. 1402 PP 114, 182-183).

Petitioner also provides the annotated [\*17] version of Figure 1 of Wu below, and states that Wu discloses "a Uni-directional Pump Assembly, including blower 15 and rotary valve 100, 'for supplying air and controlling the flow of air into and out of the chambers of a patient supporting air mattress [400].'" Pet. 37 (quoting Ex. 1405, Abstract, 2:44-47) (citing Ex. 1402 P 12; Ex. 1466, 4:4-6, 15:5-6).

Pet. 37. Figure 1 depicts a schematic representation of the overall disclosed system 10, which includes, among other aspects, electric motor powered blower 15, two-position rotary valve 100, and air mattress supply lines 302A-D and 302S for supplying air to air mattress 400. Ex. 1405, 2:43-48. In the annotated version of Figure 1 of Wu, Petitioner added an orange overlay to electric motor powered blower 15. Pet. 37.

Petitioner states that "Wu's blower 15 is a fan and motor assembly for pumping air" and that "Wu describe[s] blower 15 as 'an electric motor powered variable speed blower,' and 'a centrifugal fan type blower.'" Pet. 38 (quoting Ex. 1405, Abstract, 2:56-57). According to Petitioner, in Figure 1, blower 15 "is schematically shown as part of system 10, although the electric motor is not shown." *Id.* (citing Ex. [\*18] 1405, 2:53-55; Ex. 1402 P 184). According to Petitioner, "in view of Wu's teaching of a Unidirectional Pump Assembly, including motorized blower 15 (a fan and motor) for pumping air, [one of ordinary skill in the art] would have been motivated to use Wu's teachings of a unidirectional blower 15 in converting Chaffee's pump 81 into a Uni-directional Pump Assembly," for reasons we discuss below ( *see infra* § II.C.3.a.7). Pet. 38 (citing Ex. 1402 PP 183-185).

The record evidence, summarized above, supports Petitioner's position as to this limitation, which we adopt as our own. We find, based on the complete record, that Petitioner has demonstrated by a preponderance of the evidence that Chaffee as modified by Wu discloses the subject matter of the "fan and motor" limitation. Patent Owner does not dispute that Chaffee as modified by Wu discloses the subject matter of this limitation.<sup>10</sup>

*(3) The "Interior Region" Limitation*

Claim 1 recites "the housing having an interior region." Ex. 1401, 8:27-28 ("the 'interior region' limitation"). Petitioner argues that Chaffee discloses this limitation. Pet. 38-40. Petitioner identifies flange 82, flange wall 83, and housing 90 in Chaffee, collectively, as a "housing." *Id.* at 39-40 (citing Ex. 1406, 4:15-17, 4:19-22; Ex. 1402 PP 187, 192) ("[T]o be clear, flange 82 and flange wall 83 are part of the housing 90 and, collectively, constitute the claimed 'housing.' Flange 82, flange wall 83, and housing 90 will be referred to herein, collectively, as 'Chaffee's Housing.'" (citation omitted)). Petitioner provides the following annotated version of Figure 5 of Chaffee, with (1) the three identified structural elements making up "Chaffee's Housing" overlaid in orange and identified with text boxes, (2) pump 81 identified with a text box, and (3) an "Interior region" identified:

Pet. 39. Figure 5 of Chaffee depicts "a top, cross-sectional [\*19] view of one embodiment." Ex. 1406, 2:38-39. Referring to the annotated version of Figure 5 above, Petitioner states that "Chaffee's Housing includes an interior region" (Pet. 40 (citing Ex. 1402 P 188; Ex. 1406, 4:15-17, 4:19-22)) and states that "pump 81 includes a 'housing 90 [orange] that surrounds the inner workings of the pump'" (Pet. 38 (quoting Ex. 1406, 4:18-19) (citing Ex. 1406, 2:55-26; Ex. 1402 P 187)).

The record evidence, summarized above, supports Petitioner's position as to this limitation, which we adopt as our own. We find, based on the complete record, that Petitioner has demonstrated by a preponderance of the evidence that Chaffee discloses the "interior region" limitation. Patent Owner does not present arguments for this limitation.

*(4) The "Built Into" Limitation*

Claim 1 recites "a housing built into the inflatable body." Ex. 1401, 8:27 ("the 'built into' limitation"). Petitioner state that Chaffee discloses this limitation. *See* Pet. 38 (citing Ex. 1402 P 186), 40-43. As discussed in the prior section (addressing the "interior region" limitation), Petitioner identifies flange 82, flange wall 83, and housing 90 in Chaffee, collectively, as the "housing." Pet. 39-40 ("[T]o be clear, flange 82 and flange wall 83 are part of the housing 90 and, collectively, constitute the claimed 'housing.'" (citing Ex. 1406, 4:15-17, 4:19-22; Ex. 1402 PP 187, 192)), 40 ("Flange 82, flange wall 83, and housing 90 will be referred to herein, collectively, as 'Chaffee's Housing.'"). Petitioner identifies bladder 20 in Chaffee as the "inflatable body." Pet. 40 ("Chaffee's Housing is built into bladder 20."), 41 and 43 (citing Ex. 1402 PP 190, 192, respectively) (both referencing "bladder 20 (the inflatable body)").

Petitioner provides this annotated version of Figure 5 of Chaffee:

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<sup>10</sup>We address below Patent Owner's arguments that one of ordinary skill in the art would not have modified Chaffee based on Wu as proposed. *See infra* § II.C.3.a.7.

Pet. 42. Figure 5 depicts a cross-sectional view of one embodiment of fluid controller 80. *See* Ex. 1406, 2:38-39. In the annotated version of Figure 5 above, Petitioner added [\*20] (1) a text box identifying element 82 as a "Flange," (2) a text box identifying element 83 as a "Flange wall," (3) a text box identifying element 90 as a "Housing," (4) a text box identifying element 81 as a "Pump," (5) a text box identifying element 20 as a "Bladder," (6) an orange overlay to portions of elements 82, 83, and 90, and (7) blue circles at the "connection point[s]" between flange 82 and bladder 20. Pet. 42.

Referring to Figures 2 and 5 of Chaffee, Petitioner states that Chaffee discloses that "fluid controller 80, through its Housing [(i.e., elements 82/83/90)], is built into and recessed in inflatable bladder 20." Pet. 40 (citing Ex. 1402 P 189); *see also id.* at 41 (providing annotated versions of Figures 2 and 5 of Chaffee). Petitioner states that the "connection point between the Housing (orange) (through flange 82) and bladder 20" is described in Chaffee as "being accomplished, for example, by 'adhesive or heat seal' ([Ex. 1406], 4:67-5:2, 5:26), thus creating a built in connection between Housing and bladder 20 (the inflatable body)." Pet. 41 (citing Ex. 1402 P 190; Ex. 1475, 23-24).

Patent Owner argues that Chaffee does not disclose the "built into" limitation and thus, even if combined, Chaffee and [\*21] Wu do not satisfy this limitation. PO Resp. 21-32, 54-58; PO Sur-reply 2-8. We first address arguments related to the disclosures in Chaffee and then turn to arguments related to its prosecution history.

Patent Owner asserts that at least portions of the identified "housing" (i.e., elements 82/83/90) in Chaffee are removable from bladder 20, and thus, the "housing" fails to satisfy the "not detachable from" requirement of the "built into" limitation.<sup>11</sup> PO Resp. 54-58. Specifically, Patent Owner argues that, in Chaffee, "the thing that is arguably 'built into' the wall of the bladder [20] is flange 82," but, according to Patent Owner, "flange 82 is separate from the housing 90." *Id.* at 55-56. In support, Patent Owner provides the following annotated version of Figure 3 of Chaffee, with flange 82 shown in green and housing 90 shown in orange:

PO Resp. 56; *see id.* at 31-32 (arguing that Figures 3-5 "all reflect a removable pump housing (orange) separate from the flange (green)"). Figure 3 depicts "a perspective, plan view of a fluid controller according to one embodiment." Ex. 1406, 2:34-35. According to Patent Owner, Chaffee explains that the reason why the housing 90 and flange 82 are [\*22] separate pieces and should be reversibly connected is to allow "the removal of portions of fluid controller 80 for repair or replacement, preventing the entire inflatable device from having to be disposed of in the event of a failure of one component." PO Resp. 57 (quoting Ex. 1406, 5:44-48) (emphasis by Patent Owner omitted); *see id.* (discussing Ex. 1406, 5:22-26, 5:33-35). Patent Owner contends that "[t]he only thing that may be 'built into' the bladder 20 is the flange 82, in which case flange 82 is separate from the housing 90 to allow for easy removal of the housing 90 to facilitate repair or replacement of defective pump components." *Id.* at 58.

In its Reply, Petitioner contends that Patent Owner's argument addresses "Chaffee's description of an **alternative** embodiment in which flange 82 and housing 90 are separate but connected" structures.

<sup>11</sup> As discussed above, we construe "built into" in accordance with its plain and ordinary meaning in light of the Specification--"integrated into and not detachable from." *See supra* § II.B.

Pet. Reply 7. Petitioner argues that statements such as at column 5, lines 33-35<sup>12</sup> "demonstrate that Chaffee contemplated another design in which flange 82 and housing 90 were not separate, connectable structures but, rather, different portions of the same structure." *Id.* (citing Ex. 1625 P 19). According to Petitioner, "Chaffee confirms this by stating '[f]lange 82 may, for [\*23] example, extend from housing 90 *or* may be a separate component connected to housing 90.'" *Id.* at 7-8 (quoting Ex. 1625 P 17 (quoting, with emphasis added, Ex. 1406, 5:7-9)) (citing Ex. 1625 PP 16, 20).

Dr. Stevick testifies that "or" in the sentence at column 5, lines 7-9 of Chaffee means "said another way." Ex. 1602, 611:15; *see also id.* at 610:21-611:5 (stating that with "or," Chaffee is "repeating what he means"), 608:25-609:2 (stating that Chaffee uses "or" "to say it another way to be more clear"); Ex. 2429 PP 55, 87, 136-143 (testifying that flange 82 must be separate from housing 90). In contrast, Petitioner's expert, Dr. Beaman, testifies that "or" indicates two "alternative designs." Ex. 1625 P 17, *cited at* Pet. Reply 7-8. Although the word "or" can, in some instances, have the meaning identified by Dr. Stevick, the word "or" in the sentence at issue is used in the disjunctive sense, i.e., to indicate that what precedes it is different from, or an alternative to, what follows. *See, e.g., SkinMedica, Inc. v. Histogen Inc., 727 F.3d 1187, 1199-1200 (Fed. Cir. 2013)* (discussing how the use of a disjunctive "or" in a specification indicates alternatives). Based on this interpretation, we understand Chaffee to disclose at least two *different* embodiments: (1) an embodiment in which flange 82 and housing 90 (as well as wall 83) are different portions of the *same* structural component and (2) an embodiment in which flange 82 and housing 90 are separate, but connected, components. *See* Ex. 1406, 5:7-11; Ex. 1625 P 17. Considering the record as a whole, we credit the testimony of Dr. Beaman over that of Dr. Stevick on this issue because Dr. Beaman's view is consistent with our understanding of Chaffee as disclosing two different embodiments.

We turn now to the meaning of "extends from" in column 5, line 7-9 of Chaffee. We agree with Patent Owner that merely stating that flange 82 "extend[s] from" housing 90 does not, *by itself*, indicate whether the flange and housing are part of the same structural component or whether they are separate, but connected. *See* PO Resp. 22 n.5 (citing Ex. 2040, 268:12-272:3); PO Sur-reply 6-7 (stating that "Dr. Stevick and Dr. Beaman both agree that the 'extends' language does not clearly disclose a one-piece embodiment"). Patent Owner's view, however, analyzes "extends from" in a vacuum rather than in the context of Chaffee overall. *See* Ex. 1625 P 20 ("As I testified, the 'extend[s] from' language in Chaffee must be read in context, as any [person of ordinary skill in the art] would do." (citing Ex. 2040, 268:22-269:2, 269:6-8, 270:5-9)), *cited at* Pet. Reply 7-8. In context and for the reasons discussed above, we understand the presence of a disjunctive "or" in the same sentence to indicate that [\*24] the disclosure that flange 82 may "extend from" housing 90--which precedes the "or"--would be understood as *different* from (i.e., an alternative to) the disclosure that flange 82 "may be a separate component connected to housing 90"--which follows the "or." *See* Ex. 1406, 5:7-9.

As argued by Petitioner (Pet. Reply 7-8), Patent Owner focuses on disclosures related to embodiments in which flange 82 and housing 90 are *separate but connected*. *See* PO Resp. 57 (discussing Ex. 1406, 5:22-26 (disclosing that "flange 82 may be constructed of a material that is more flexible than housing 90"), 5:33-35 ("Where flange 82 connects to housing 90 or another portion of fluid controller 80, it is preferred that such *connection* be reversible." (emphasis added)), 5:44-48 (discussing how "the reversible connection [discussed in the prior quotation] allows the removal of portions of fluid controller

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<sup>12</sup> "Where flange 82 connects to housing 90 or another portion of fluid controller 80, it is preferred that such connection be reversible." Pet. Reply 7 (quoting Ex. 1406, 5:33-35, with emphasis added by Petitioner) (citing Ex. 1625 P 19).



80 for repair or replacement" (emphasis added))). For example, we view the terms "connects to" and "connection" in two of the disclosures relied on by Patent Owner ( *see* Ex. 1406, 5:33-35, 5:44-48, *quoted at* PO Resp. 57) as referring back to the initial disclosure of an embodiment in which flange 82 "may be a separate component *connected to* housing 90" (Ex. 1406, 5:7-9 (emphasis added)). *See* Pet. Reply 7 (citing Ex. 1625 P 19) ("Such statements [\*25] demonstrate that Chaffee contemplated another design in which flange 82 and housing 90 were not separate, connectable structures but, rather, different portions of the same structure.").

In addition, we view the phrase "[i]n either case" (Ex. 1406, 5:44) as referring to two possible "reversible connection[s]" ( *id.* at 5:43-44), both of which *fall within the scope* of the initial disclosure of an embodiment in which flange 82 "may be a separate component connected to housing 90" ( *id.* at 5:7-9): one version in which housing 90 can disconnect from flange 82 ( *id.* at 5:33-35) and another version in which the *entire* fluid controller 80 (which includes flange 82 and housing 90) can disconnect from bladder 20 ( *id.* at 5:41-44). Based on the understanding discussed above of Chaffee's disclosure that flange 82 may, for example, "extend from" housing 90, we do not agree with Patent Owner's position that Chaffee *only* discloses embodiments in which at least one portion of the identified "housing" is removable from bladder 20. *See* PO Resp. 57-58.

We do, however, agree with Patent Owner's argument that Figure 5 of Chaffee does not necessarily depict an embodiment in which flange 82 and housing 90 (as well as wall 83) are different [\*26] portions of the *same* structural component. *See* PO Resp. 30-31 (citing Ex. 2029 PP 84-85). That said, the *disclosures* of Chaffee are not limited to only the *depictions* in the figures. And here, Petitioner has clearly relied on the statement at column 5, lines 7-9 of Chaffee to support its position as to the "built into" limitation. *See* Pet. 39-40 (identifying a "housing"); Pet. Reply 7-8.

We turn now to arguments based on Chaffee's prosecution history. Patent Owner argues that, in light of the prosecution history, one of skill in the art would not have understood Chaffee to disclose the embodiment relied on by Petitioner (as discussed above). PO Resp. 21-30, 32; PO Sur-reply 2-4, 7-8. Patent Owner also argues that certain amendments to the original figures (discussed below) remove Chaffee as prior art in this proceeding. *Id.* We discuss each position in turn, after a background of the relevant events from the prosecution history of Chaffee, which are not in dispute.

Chaffee issued on May 9, 2006, from U.S. Patent Application No. 09/859,706 (the "'706 application"), filed on May 17, 2001. *See* Ex. 1406, codes (45), (21), (22). Original Figures 3 and 4 filed with the '706 application had an additional reference numeral "90" not present in the issued version of Chaffee. Below, original Figure 3 (left) and issued Figure 3 (right) are reproduced with a red box added to identify the additional reference numeral "90" in original Figure 3:

Ex. 2441 (file history of the '706 application), 19; Ex. 1406, Fig. 3. [\*27] Figure 3 depicts a perspective view of one embodiment of fluid controller 80. *See* Ex. 1406, 2:34-35.

Below, original Figure 4 (left) and issued Figure 4 (right) are reproduced with a red box added to identify the additional reference numeral "90" in original Figure 4:



Ex. 2441, 20; Ex. 1406, Fig. 4. Figure 4 depicts a perspective view of one embodiment of fluid controller 80. *See* Ex. 1406, 2:36-37.

Below, original Figure 5 (left) and issued Figure 5 (right) are reproduced:

Ex. 2441, 21; Ex. 1406, Fig. 5. Figure 5 depicts a cross-sectional view of one embodiment of fluid controller 80. *See* Ex. 1406, 2:38-39. Mr. Chaffee filed formal drawings in December 2002, which included the additional reference numerals "90" from the original drawings. *See* Ex. 2441, 116-21.

In an Office Action dated September 7, 2005, the examiner objected to the drawings:

The drawings are objected to as failing to comply with [37 CFR 1.84\(p\)\(4\)](#) because reference character "90" has been used to designate both the housing (90) connected to the flange (82) as shown in Fig. 3 and the housing or covering around the motor (84), impeller (86), conduit (88), solenoid (104 [\*28] ), etc. as shown in Fig. 5. There appear[] to be two different structures which Applicant is referring to as a "housing" and these two different structures are being confused with each other. Each of the two different structural elements should be given a separate reference numeral.

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The drawings are objected to as failing to comply with [37 CFR 1.84\(p\)\(4\)](#) because reference numerals "83" and "90" have both been used to designate "fluid impermeable wall" (see Fig. 5) and "housing" (see Fig. 3).

Ex. 2441, 448-49. In response, Mr. Chaffee modified the then-pending Figures 3 and 4 by deleting the additional reference numerals "90." *See id.* at 498-99 (showing revisions to Figures 3 and 4 in an Amendment, dated December 7, 2005), 542-43 (showing revisions to Figures 3 and 4 in a Supplemental Amendment, dated December 8, 2005). In discussing these Amendments, Mr. Chaffee stated: "Applicant has deleted reference character 90 from FIGS. 3 and 4 of the enclosed annotated drawings so as to eliminate any confusion." *Id.* at 491 (Amendment), 533 (Supplemental Amendment).

With that background, we turn to Patent Owner's arguments. Patent Owner contends that original Figures 3 and 4 "explain how the 'extend from housing 90' phrase [(Ex. 1406, 5:8)] was not a teaching of a one-piece 'Chaffee Housing' as Petitioner[] allege[s], but rather a literal description of F[igures] 3-4 as they were originally filed." PO Resp. 22-23 (citing Ex. 2429 PP 70-71). According to Patent Owner,

Chaffee's original disclosure is evidence that the "extend from" phrase of Chaffee 5:7-9 is a direct reference to the green "housing" "90" structure of F[igure] 3 as filed, which is fluid impermeable wall 83 in [Chaffee as issued]. ***It is not a teaching that a flange extends from the orange pump housing as Petitioner[] contend[s]*** .

PO Resp. 29. In support, Patent Owner provides the following annotated version of original Figure 3 of Chaffee:

PO Resp. 28-29. The annotated version of original Figure 3 of Chaffee above shows (1) an outer structure overlaid in green, (2) an inner structure overlaid in orange, (3) a red box [\*29] around additional reference numeral "90" with a text box stating "Housing 90" pointing to the same, and (4) a text box stating "Flange 82 extends from Housing 90" pointing to reference numeral 82. *Id.* at 29.

We are not persuaded by Patent Owner's argument that the prosecution history of Chaffee undermines the understanding of "extend from" (Ex. 1406, 5:7-9) discussed above. As an initial matter, to the extent Patent Owner relies on the subjective intent of Mr. Chaffee during drafting, the proper analysis looks at how one of ordinary skill in the art at the time of the invention would have understood the relied-upon disclosures in the Chaffee patent. *See* PO Resp. 29 ("Had Chaffee's attorney *intended* the orange pump housing to be one piece with flange 82, he could have argued that the orange and green housings were one and the same and would not have deleted character '90.' He did not argue that they were the same." (emphasis added)); *cf.* [\*Realtime Data, LLC v. Iancu\*, 912 F.3d 1368, 1372-73 \(Fed. Cir. 2019\)](#) (affirming an obviousness determination in an *inter partes* review in which a first prior art reference disclosed all of the claim limitations and a second prior art reference was used to "demonstrate that a person of ordinary skill in the art would have understood" that [\*30] a teaching in the first reference satisfied a claim limitation); *see also* [\*KSR Int'l Co. v. Teleflex Inc.\*, 550 U.S. 398, 406 \(2007\)](#) (stating that the obviousness "analysis is objective").

In addition, the complete record developed at trial does not support Patent Owner's position as to the meaning of "[f]lange 82 may, for example, extend from housing 90." Ex. 1406, 5:7-9. First, as noted by Petitioner (Pet. Reply 8), the text in Chaffee (i.e., the written description) has consistently used reference numeral "90" to refer to a "housing[] that surrounds the inner workings of the pump" and can "provide a connection between fluid controller 80 and bladder 20" by, e.g., flange 82 extending therefrom. *Compare* Ex. 2441, 8:5-8, 9:9-12,<sup>13</sup> *with* Ex. 1406, 4:17-22, 5:4-9; Ex. 1406, 5:7-8. Mr. Chaffee's statements filed with the drawing Amendments at issue further support this understanding:

It is clear from the specification that the reference character 90 refers to the housing 90 that surrounds the inner workings of the pump 81, such as the motor (84), impeller (86), conduit (88), solenoid (104), etc., and can also serve as a connection between the fluid controller 80 and the bladder 20.

Ex. 2441, 491 (Amendment), 533 (Supplemental Amendment) (same), [\*31] *quoted at* Pet. Reply 9.

Second, as also noted by Petitioner (Pet. Reply 9), the labelling in original Figure 5 in Chaffee--and issued Figure 5--remained unchanged as to housing 90, and consistently supported the understanding of housing 90 as a structure surrounding the inner workings of the pump (rather than identifying the structure referred to as wall 83 in Chaffee as issued).<sup>14</sup> *See* Ex. 2441, 21 (original Figure 5), 119 (formal version of original Figure 5), 500 (showing revisions in Amendment), 544 (same in Supplemental Amendment), 508 (showing issued version in Amendment), 552 (same in Supplemental Amendment); Ex. 1406, Fig. 5,

<sup>13</sup> These citations to Exhibit 2441 refer to the page numbers added for this proceeding, not the internal pagination.

<sup>14</sup> As discussed above, however, we agree with Patent Owner that Figure 5 does not necessarily depict an embodiment in which flange 82 and housing 90 (as well as wall 83) are different portions of the *same* structural component. *See supra* p. 29.

5:10-11 (discussing "fluid impermeable wall 83"). In light of the complete record, we find that one of ordinary skill in the art would have understood housing 90 as a structure that "surrounds the inner workings of the pump" and can "provide a connection between fluid controller 80 and bladder 20" by (in one embodiment) flange 82 extending from housing 90 as a different portion of the same structural component.

We turn now to Patent Owner's argument that the amendments discussed above remove Chaffee as prior art in this proceeding. PO Resp. 21-30, 32; PO Sur-reply [\*32] 2-4, 7-8. Relevant to this issue, Petitioner states: "Chaffee is prior art under [35 U.S.C. § 102\(e\)](#) as it stems from a nonprovisional application (Application No. 09/859,706) that was filed on May 17, 2001 ( *see generally* Ex. 1406), which precedes the June 22, 2001 Priority Date of the '394 Patent ." Pet. 28 n.2. As discussed above, the amendments were filed in December 2005. Patent Owner argues that, by deleting the reference numerals "90" from original Figures 3 and 4, Mr. Chaffee "attempted to redefine housing 90 as the housing that 'surrounds the inner workings of the pump 81 ['81' was simultaneously newly added to FIG. 5 to replace '80.'].'" PO Resp. 29 (citing Ex. 2441, at 491, 500) (bracketed text added by Patent Owner). Patent Owner notes that the amendments "were made starting in 2005, years after the 2001 effective filing date of the '394 Patent ." *Id.* Patent Owner then concludes that Chaffee "is not a proper printed publication for challenging the '394 Patent claims because its disclosure was modified years after the effective filing date of the '394 Patent ." *Id.* at 32 (citing Ex. 2429 PP 88-89).

As an initial matter, we are not persuaded by Patent Owner's argument that, with the amendments, Mr. Chaffee "attempted to redefine" housing 90. PO Resp. 29. Instead, for the [\*33] reasons discussed above ( *see supra* pp. 33-36), the record supports Petitioner's argument that the amendments merely aligned Figures 3 and 4 with the rest of the specification as to housing 90. Pet. Reply 8-10.

Further, we understand Patent Owner to contend that the amendments constitute new matter and that, based on that alleged new matter, the effective filing date of Chaffee is now in December 2005, which would postdate the effective filing date of the '394 patent . *See, e.g., Nat. Alt. Int'l v. Iancu*, 904 F.3d 1375, 1383 (Fed. Cir. 2018) (discussing how new matter added during prosecution can change the effective filing date of a prior art reference); *see also* PO Sur-reply 7 (stating that "new matter is a basis for forfeiting an effective filing date"). Patent Owner argues that the amendments "are not immaterial" and that "[t]here is no support . . . for deleting reference numbers on figures without changing scope." PO Sur-reply 7.

Petitioner argues persuasively that Patent Owner does not adequately explain *why* the amendments amount to new matter. *See* Pet. Reply 10 (contending that this argument is "undeveloped" and "cursory" and that Patent Owner has not "articulated a cognizable new matter argument"). Patent Owner cites to the testimony of Dr. Stevick on this issue, but Dr. [\*34] Stevick essentially restates Patent Owner's argument. *Compare* Ex. 2429 PP 88-89, *with* PO Resp. 32; [37 C.F.R. § 42.65\(a\)](#). For the same reasons discussed above, Petitioner argues persuasively that the amendments merely removed clerical errors in the original drawings to align those drawings with the rest of the specification as to housing 90, and thus, did not constitute new matter. *See* Pet. Reply 8-10.<sup>15</sup> As noted by Petitioner, the examiner did not issue a new matter objection in the wake of the amendments. *See id.* at 10 (citing [Commonwealth Sci. v. Buffalo Tech.](#), 542 F.3d 1363, 1380 (Fed. Cir. 2008)).

<sup>15</sup> For similar reasons, we do not agree with Patent Owner that the amendments rendered Chaffee "ambiguous." PO Sur-reply 8.

For the reasons above, we find, based on the complete record, that Petitioner has demonstrated by a preponderance of the evidence that Chaffee discloses the "built into" limitation.

*(5) The "Air Conduit" Limitation*

Claim 1 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. 1401, 8:29-35 ("the 'air conduit' limitation"). Petitioner states that Chaffee as modified by Wu satisfies this limitation. Pet. 43 (citing Ex. 1002 P 193); *see also* Pet. 43-56 (discussing this limitation). Petitioner states that "Chaffee d[oes] not disclose a movable air conduit, as its air pump is a Reversible Pump Assembly" and that, "instead of using a directional control valve, such as the claimed movable air conduit, to switch between inflate and deflate functionality, Chaffee disclose[s] reversing the direction of its motor." Pet. 43 (citing Ex. 1402 P 194). Petitioner [\*35] argues that Wu teaches a "Uni-directional Pump Assembly" and Petitioner provides reasons (which we discuss below ( *see infra* § II.C.3.a.7)) why one of ordinary skill in the art "would have been motivated to use a Uni-directional Pump Assembly in place of Chaffee's Reversible Pump Assembly." Pet. 43 (citing Ex. 1402 PP 195-196). According to Petitioner, blower 15 and rotary valve 100 in Wu are included in the Uni-directional Pump Assembly. Pet. 43-44. Petitioner states that "[u]sing a Uni-directional Pump Assembly as taught by Wu in place of Chaffee's Reversible Pump Assembly would have resulted in an apparatus that disclose[s] each feature of this limitation." Pet. 46 (citing Ex. 1402 P 203).

Petitioner provides the annotated version of Figure 1 of Wu below:

Pet. 47. Figure 1 depicts a schematic representation of the overall disclosed system 10, which includes, among other aspects, electric motor powered blower 15, two-position rotary valve 100, and air mattress supply lines 302A-D and 302S for supplying air to air mattress 400. Ex. 1405, 2:43-48. In the annotated version of Figure 1 of Wu above, Petitioner added (1) a text box identifying element 15 as a "Blower," (2) a text box identifying element 100 as a "Rotary valve," and (3) a gray dotted outline and text box identifying a "Housing." Pet. 47. Petitioner states that "[t]o take advantage of the[] benefits that accompany a Uni-directional Pump Assembly, [one of ordinary skill in the art] would have relied on Wu's blower 15 . . . and rotary valve 100 teachings in accomplishing this conversion of Chaffee's pump 81." Pet. 46 (citing Ex. 1402 PP 195, 121). Referring to the annotated version of Figure 1 of Wu above, Petitioner states that in the proposed modified device "Chaffee's Housing (represented in gray, [above]) would simply surround Wu's blower 15 (the fan and motor) and rotary valve 100 and instead of Wu's air mattress 400 (as shown [above]), the system would route air to Chaffee's bladder 20." Pet. 46-47 (citing Ex. 1402 PP 195, 121).

Petitioner then provides the following annotated version of Figure 2 of Wu, which adds (1) text boxes identifying rotary valve 100 and gate member 200 and (2) orange overlay to gate member 200.

Pet. 48. Figure 2 depicts a perspective view of rotary valve 100. Ex. 1405, 2:36-37, 4:60-61. According to Petitioner, "in converting Chaffee's Reversible Pump Assembly in view of Wu, [one of ordinary skill in the art] would have maintained Chaffee's Housing-contained design . . . , such that the movable air conduit (e.g., Wu's rotary valve 100) and the fan and motor (e.g., Wu's blower 15) was disposed inside Chaffee's Housing." Pet. 48 (citing Ex. 1402 PP 205-208) (referencing Pet. 38-43). Petitioner then provides reasons (which we also discuss below ( *see infra* § II.C.3.a.7)) for maintaining "Chaffee's Housing-contained design" in the proposed modification of Chaffee based on Wu.<sup>16</sup> Pet. 48-49 (citing Ex. 1402 PP 206-209). According to Petitioner, "Chaffee pump 81[,] converted into a Uni-directional Pump Assembly in view of Wu's rotary valve 100 and blower 15 teachings[,] disclose[s] a movable air conduit (Wu's gate member 200) disposed in the housing (Chaffee's Housing)." Pet. 49 (citing Ex. 1402 P 210).

Petitioner argues that "Wu's gate member 200 (the air conduit) has a first position for inflation." Pet. 49 (citing Ex. 1405, 3:3-6; Ex. 1402 P 211). Petitioner provides the following annotated version of Figure 1 of Wu, which adds (1) blue arrows showing the direction of air flow in the inflation configuration, (2) orange overlay to portions of gate member 200, (3) a text box identifying element 15 as a "Blower," (4) a text box identifying element 200 as a "Gate member," and (5) a gray dotted outline and text box identifying a "Housing."

Pet. 50. Figure 1 depicts a schematic representation of the overall disclosed system 10. Ex. 1405, 2:43-48. Referring to the annotated version of Figure 1 above, Petitioner highlights Wu's disclosure that when "gate member 200 [orange] is in the first, pressurizing position, air [blue] from blower 15 is routed to air mattress 400 shown in FIG. 1, while outside air [blue] is drawn in through filter 30 shown in FIG. 1 and into the intake of blower 15." Pet. 49-50 (quoting, with bracketed text added by Petitioner, Ex. 1405, 5:67-6:4) (citing Ex. 1405, Fig. 2; Exs. 1468, 1470; Ex. 1402 PP 211-212).

Petitioner argues that "Wu's gate member 200 (the movable air conduit) has a second position for deflation." Pet. 53 (citing Ex. 1405, 5:44-48; Ex. 1402 P 218). Petitioner provides the following additional annotated version of Figure 1 of [\*36] Wu, which adds (1) blue arrows showing the direction of air flow in the deflation configuration, (2) orange overlay to portions of gate member 200, (3) a text box identifying element 15 as a "Blower," (4) a text box identifying element 200 as a "Gate member," and (5) a gray dotted outline and text box identifying a "Housing."

Pet. 54. Figure 1 depicts a schematic representation of the overall disclosed system 10. Ex. 1405, 2:43-48. Referring to the annotated version of Figure 1 above, Petitioner highlights Wu's disclosure that when "in the second position, gate member 200 directs air [blue arrows] from air mattress 400 into intake 17 of blower 15 while air leaving blower 15 is directed through filter 30 to the outside environment." Pet. 53 (quoting, with bracketed text added by Petitioner, Ex. 1405, 4:54-59) (citing Ex. 1405, Fig. 2; Exs. 1469, 1470; Ex. 1402 P 219). According to Petitioner, "[a]pplying this teaching to Chaffee, this movable air conduit[, when in the] second position[,] would route air from Chaffee's bladder 20, rather than air mattress 400 (shown [above]), to atmosphere and remain disposed in Chaffee's Housing (represented in gray, [above])." Pet. 53 (citing Ex. 1402 PP 218-219).

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<sup>16</sup>For consistency, below, we use the phrase "Chaffee's Housing-contained design" in the same manner as used by Petitioner.

The record evidence, summarized above, supports Petitioner's position as to this limitation, which we adopt as our own. We find, based on the complete record, that Petitioner has demonstrated by a preponderance of the evidence that Chaffee as modified by Wu discloses the subject matter of the "air conduit" limitation. [\*37] Patent Owner does not dispute that Chaffee as modified by Wu discloses the subject matter of this limitation.<sup>17</sup>

*(6) The "Wherein" Limitation*

In the final clause, claim 1 recites "wherein air flows between the interior region of the housing and the inflatable body during inflation and deflation." Ex. 1001, 8:36-38 ("the 'wherein' limitation"). Petitioner states that Chaffee as modified by Wu satisfies this limitation. Pet. 56 (citing Ex. 1402 P 225). According to Petitioner, "Chaffee disclose[s] that air flows between the interior region of the Housing and the inflatable body 20 during inflation and deflation, as fluid controller 80 'control[s] the flow of fluid *into* and/or *out* of bladder 20' and did so through outlet 120." Pet. 56-57 (citing Ex. 1406, 3:60-61 (emphasis added by Petitioner); Ex. 1402 P 226). Petitioner provides the following annotated version of Figure 5 of Chaffee, which adds (1) a text box identifying element 20 as a "Bladder," (2) a text box identifying element 81 as a "Pump," (3) text boxes identifying an "Outlet" and an "Interior Region," (4) orange overlay to motor 84, (5) blue overlay to impeller 86, and (6) a blue line from the "Outlet" through the "Interior Region" and through impeller 86.

[\*38]

Pet. 58. Figure 5 of Chaffee depicts "a top, cross-sectional view of one embodiment." Ex. 1406, 2:38-39. Referring to the annotated version of Figure 5 above, Petitioner states that "the motor and fan (which, as modified, is Wu's blower 15, rather than the motor 84 [orange] and impeller 86 [blue], shown [above]) inside of the Housing is what 'mov[es] air [blue arrow] into, or out of, bladder 20' through outlet 120." Pet. 57 (quoting Ex. 1406, 3:67 (bracketed text added by Petitioner)) (citing Ex. 1402 P 226). Petitioner states that "[t]his air flow path would not have changed in converting Chaffee into a Uni-directional Pump Assembly" as proposed. *Id.* (citing Ex. 1402 P 226).

The record evidence, summarized above, supports Petitioner's position as to this limitation, which we adopt as our own. We find, based on the complete record, that Petitioner has demonstrated by a preponderance of the evidence that Chaffee as modified by Wu discloses the subject matter of the "wherein" limitation. Patent Owner does not dispute that Chaffee as modified by Wu discloses the subject matter of this limitation.

*(7) The Asserted Reasons to Modify Chaffee with Wu*

As discussed above, Petitioner presents two different aspects of the proposed modification [\*39] of Chaffee based on Wu: (1) modifying Chaffee's reversible pump assembly to a unidirectional pump assembly based on Wu ( *see, e.g.*, Pet. 43-47, *discussed supra* §§ II.C.3.a.2, II.C.3.a.5) and (2) maintaining Chaffee's Housing-contained design in the proposed modified device ( *see, e.g.*, Pet. 48-49, *discussed supra* § II.C.3.a.5). We discuss these two aspects in turn below.

*Modifying Chaffee's Reversible Pump Assembly to a Uni-directional Pump Assembly Based on Wu*

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<sup>17</sup> We address below Patent Owner's arguments that one of ordinary skill in the art would not have modified Chaffee based on Wu as proposed. *See infra* § II.C.3.a.7.

According to Petitioner, one of ordinary skill in the art at the time of the invention "would have had several reasons to use a Uni-directional Pump Assembly in place of Chaffee's Reversible Pump Assembly" (Pet. 38 (citing Ex. 1402 P 185)), and as a result "would have been motivated to use Wu's teachings of a uni-directional blower 15 in converting Chaffee's pump 81 into a Uni-directional Pump Assembly" ( *id.* (citing Ex. 1402 PP 183-185)). Specifically, Petitioner argues: (1) "using Wu's Uni-directional Pump Assembly teachings would have promoted spatial efficiency compared to Chaffee's pump 81" (Pet. 44 (citing Ex. 1402 PP 197-198)); (2) "using Wu's Uni-directional Pump Assembly teachings would have increased the energy efficiency of Chaffee's pump 81" (Pet. 44-45 (citing Ex. 1402 P 199)); (3) "using Wu's Uni-directional Pump Assembly teachings would have decreased Chaffee's cost " (Pet. 45 (citing Ex. 1402 P 200)); (4) "using Wu's Uni-directional Pump Assembly teachings would have decreased the weight of Chaffee's pump 81" ( *id.* (citing Ex. 1402 P 201)); and (5) one of ordinary skill in the art "would have understood that applying Wu's Uni-directional Pump Assembly teachings to Chaffee was nothing more than a simple substitution of known elements (a Uni-directional Pump Assembly for a Reversible Pump Assembly) to achieve a predictable result (a pump capable of power inflate, power deflate)" (Pet. 46 (citing Ex. 1402 P 202)).

For the reasons discussed below, we determine that the record here supports Petitioner's assertion that one of ordinary skill in the art would have modified Chaffee's reversible pump assembly to a unidirectional pump assembly at least for improved energy efficiency. *See* Pet. 44-45 (citing Ex. 1402 P 199)). In support of the alleged improved energy efficiency of this aspect of the proposed modification, Petitioner states that one of ordinary skill in the art would [\*40] have "understood that 'the pump efficiency of a one-directional pump [like Wu's] is greater than the efficiency of a reversible pump [like Chaffee's]." Pet. 44-45 (quoting Ex. 1412, 1:54-56 (bracketed text added by Petitioner)).<sup>18</sup> Petitioner also states that one of ordinary skill in the art "would have desired a more efficient pump." Pet. 45 (citing Ex. 1406, 4:29-32 ("The pump also may be small and consume as little power as possible. Low power consumption is particularly desirable where the pump is to be powered by batteries, as it may extend battery life."); Ex. 1402 P 199).

Patent Owner presents certain arguments addressing this aspect of the proposed modification. First, Patent Owner argues that the only support for Petitioner's position as to the improved energy efficiency of the proposed modification "is a single sentence from the Scott patent (Ex. 1412, 1:54-56) - a reference not used" in this ground. PO Resp. 41. According to Patent Owner, "[t]here are no other facts or evidence supplied by Petitioner[] or Dr. Beaman to support" the proposition that "using Wu's Uni-directional Pump Assembly teachings would have increased the energy efficiency of Chaffee's pump 81." *Id.* According to Patent [\*41] Owner, Dr. Beaman's reliance on a statement in Chaffee on this issue ( *see* Ex. 1402 P 199 (citing Ex. 1406, 4:29-30)) is improper because "Dr. Beaman ignores the immediately succeeding passage from Chaffee that shows optimizations to the Chaffee reversible pump design can be made without converting to a uni-directional pump." *Id.* at 41-42 (citing Ex. 1406, 4:33-36; Ex. 2429 P 107).

Petitioner responds that "Chaffee confirms that [one of ordinary skill in the art] would seek a pump design with maximal efficiency, like a Unidirectional Pump Assembly." Pet. Reply 19 (citing Ex. 1625 P 63) (referencing Ex. 1406, 4:29-30).

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<sup>18</sup> The cited passage from Scott provides: "It is a further advantage of the present invention, that the pump efficiency of a one-directional pump is greater than the efficiency of a reversible pump." Ex. 1412, 1:54-56.



Patent Owner's arguments directed to Scott do not identify a deficiency in Petitioner's position. As an initial matter, that Scott is not one of the two prior art references forming the basis for this ground does not undermine Petitioner's reliance on a statement from Scott to support a motivation to modify Chaffee based on Wu. Cf. [\*KSR\*, 550 U.S. at 419](#) ("The obviousness analysis cannot be confined by a formalistic conception of the words teaching, suggestion, and motivation, or by overemphasis on the importance of published articles and the explicit content of issued patents.").

Moreover, Scott itself constitutes evidence in the record, [\*42] and, for reasons discussed below, Petitioner provides persuasive evidence that the passage it relies on (column 1, lines 54-56) *at least suggests* to one of ordinary skill in the art that a unidirectional pump assembly has pump efficiency advantages over a reversible pump assembly. See [\*In re Kotzab\*, 217 F.3d 1365, 1370 \(Fed. Cir. 2000\)](#) ("The motivation, suggestion or teaching may come explicitly from statements in the prior art, the knowledge of one of ordinary skill in the art, or, in some cases the nature of the problem to be solved. In addition, the teaching, motivation or suggestion *may be implicit from the prior art as a whole*, rather than expressly stated in the references." (emphasis added) (internal citation omitted)); see also Ex. 1412, 1:54-56 ("It is a further advantage of the present invention, that the pump efficiency of a one-directional pump is greater than the efficiency of a reversible pump.").

We are also not convinced by Patent Owner's contention that, based on the passage at column 4, lines 33-36 of Chaffee, one of ordinary skill in the art would have optimized Chaffee in a way *other than* modifying its reversible pump assembly to a unidirectional pump assembly as proposed. See PO Resp. 41-42; see also *id.* at 39 (arguing that one of ordinary skill in the art "would appreciate that Chaffee's reversible [\*43] pump could be optimized in a number of ways without changing to a one-directional pump as allegedly suggested by Scott"). The issue here is not whether one of ordinary skill in the art *could have* optimized Chaffee *without* performing the proposed modification, but rather whether one of ordinary skill in the art *would have* modified Chaffee, as proposed, for the reasons provided by Petitioner. See [\*KSR\*, 550 U.S. at 420](#) (stating that "any need or problem known in the field of endeavor at the time of the invention and addressed by the patent can provide a reason for combining the elements in the manner claimed"). Moreover, even assuming the "optimized" version of Chaffee discussed by Patent Owner (PO Resp. 39) is superior to the proposed modified device, that "better alternatives" may exist "does not mean that an inferior combination is inapt for obviousness purposes" ( [\*In re Mouttet\*, 686 F.3d 1322, 1334 \(Fed. Cir. 2012\)](#)).

As its second argument on this aspect of the proposed modification, Patent Owner contends that the proposed modification is not supported by a *different* statement from Scott, cited by Petitioner in several of the *other* reasoning statements summarized above and identified by Patent Owner as "Scott's Efficiency Statement" ( see PO Resp. 36 (discussing Ex. 1412, 1:40-45)). [\*44] PO Resp. 36-39. Patent Owner argues that one of ordinary skill in the art "would appreciate that Scott's Efficiency Statement is a generalization that compares one-directional and reversible pumps *of the same type*, and does not apply without qualification to reversible and one-directional pumps and motors." *Id.* at 36-37. According to Patent Owner, one of ordinary skill in the art "would appreciate that it is inappropriate to apply Scott's Efficiency Statement to compare the pumps of Chaffee and Wu because they are different types of fan pumps," with Chaffee disclosing an "axial fan pump" and Wu disclosing a "radial fan pump." *Id.* at 37 (citing Ex. 2429 P 99; Ex. 1405, 2:56-57).



Petitioner replies that "Scott's 'efficiency statements' apply to a comparison of Chaffee's axial fan 86 and Wu's centrifugal fan 15." Pet. Reply 11 (citing Ex. 1625 PP 39, 40).<sup>19</sup> According to Petitioner, "Dr. Stevick agrees that centrifugal fan pumps (like Wu's centrifugal fan 15) are 'typically' preferred over axial fan pumps (like Chaffee's axial fan 86) due to efficiency gains virtually identical to those described in Scott's 'efficiency statements.'" *Id.* at 11-12 (citing, *inter alia*, Ex. 1634, 153:19-153:25 (testifying that an axial fan pump is typically not as "efficient" as a centrifugal fan pump)).

On the complete record here, we are persuaded by Petitioner's argument that one of skill in the art would view the relied-upon passage in Scott--column 1, lines 54-56 ( *see* Pet. 44-45)--as at least suggesting to one of ordinary skill in the art that modifying Chaffee's reversible pump assembly to a unidirectional pump assembly would realize certain energy efficiency advantages. Pet. 44-45. As an initial matter, Patent Owner's argument, summarized above, does not actually address the passage from Scott relied on by Petitioner for the energy efficiency [\*45] rationale. Patent Owner incorrectly asserts that Petitioner relies on column 1, lines 40-45 of Scott to support the energy efficiency rationale (PO Resp. 37-38), but Petitioner actually relies on column 1, lines 54-56 of Scott for that rationale (Pet. 44-45). Because Patent Owner's argument focuses on a passage not relied on by Petitioner as to the energy efficiency rationale, we find it unpersuasive.

We turn now to the testimony of Patent Owner's declarant. In support of Patent Owner's argument, Dr. Stevick stated that "[i]t is a gross overgeneralization to apply Scott's Efficiency Statement to pumps of different types, because that would imply a one-directional pump of one type is always more efficient and compact than a reversible pump of a different type." Ex. 2429 P 99, *cited at* PO Resp. 37. Based on that, Dr. Stevick states that one of ordinary skill in the art "would appreciate that it is inappropriate to apply Scott's Efficiency Statement to compare the pumps of Chaffee and Wu because they are different types of fan pumps." Ex. 2429 P 99, *cited at* PO Resp. 37.

As noted by Petitioner, Dr. Stevick acknowledged during his deposition that "[t]ypically" a "centrifugal fan that can be optimized for its one-way [\*46] flow . . . is more efficient than the axial fan that has to have flow in two directions." Ex. 1634, 153:19-153:25, *discussed at* Pet. Reply 11-12. Patent Owner's argument that Dr. Stevick's "admission" does not support Petitioner's *alternative* rationales--e.g., that using a "uni-directional pump assembly is cheaper and/or smaller"--does not undermine the energy efficiency rationale. *See* PO Sur-reply 10. For these reasons, we are persuaded by Petitioner's argument that "Dr. Stevick's testimony directly undermines [Patent Owner's] argument that Scott's 'efficiency statements' would not apply 'to compare the pumps of Chaffee and Wu because they are different types of fan pumps.'" Pet. Reply 12 (quoting PO Resp. 36-37) (citing Ex. 1625 P 40).

Moreover, we are not persuaded by Patent Owner's argument that "Scott's Efficiency Statement applies to cases where the pumping air pressure and volume flow are designed to be the same in the forward and reverse directions." PO Resp. 38. According to Patent Owner, although "that may be beneficial for some applications, it is not necessary that the forward and reverse air pressure and volume flow are the same for reversible pumps connected to air mattresses." *Id.* Thus, Patent Owner [\*47] argues, "Scott provides no motivation to convert a reversible pump design to a one-directional pump design in applications where the inflation and deflation rates can be different, such as in Chaffee's inflatable air mattress." *Id.* at 38-39 (citing Ex. 2429 P 101).

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<sup>19</sup> Petitioner uses the term "Scott's 'efficiency statements'" to refer to a broader disclosure in Scott than Patent Owner, specifically column 1, lines 37-56. *See* Pet. Reply 11, n.3.

We are persuaded by Petitioner's argument that this argument by Patent Owner is unsupported. Pet. Reply 18. Here, Patent Owner does not provide adequate evidentiary basis for this understanding of Scott. Although Patent Owner cites to paragraph 101 of Dr. Stevick's declaration, Dr. Stevick merely repeats Patent Owner's argument (nearly word-for-word) with no additional analysis, facts, or data. *Compare* Ex. 2429 P 101, *with* PO Resp. 38-39; [37 C.F.R. § 42.65\(a\)](#). In addition, this argument again addresses a different passage in Scott than was relied on by Petitioner as to the energy efficiency rationale at issue.

*Maintaining "Chaffee's Housing-Contained Design"*

We turn now to the second aspect of Petitioner's proposed modification. According to Petitioner, "in converting Chaffee's Reversible Pump Assembly in view of Wu, [one of ordinary skill in the art] would have maintained Chaffee's Housing-contained design . . . , such that the movable air conduit (e.g., Wu's rotary valve 100) and the fan and motor (e.g., Wu's blower 15) was disposed inside Chaffee's Housing." Pet. 48 (citing Ex. 1402 PP 205-208). Petitioner provides several reasons to maintain Chaffee's Housing-contained design, including: (1) "compactness" (Pet. 49 (citing Ex. 1402 P 206; Ex. 1432, Abstract)); (2) "durability" ( *id.* (citing Ex. 1402 P 207; Ex. 1406, 4:20)); and (3) "decreased manufacturing costs" ( *id.* (citing Ex. 1402 P 208)). Petitioner also contends that "maintaining this Housing-contained design would have been a well-known option to [one of ordinary skill in the art] that yielded predictable results, as housing contained Uni-directional Pump Assemblies were well-known." *Id.* (citing Ex. 1402 P 209; Exs. 1410, 1430, 1431, 1437, 1445).

For the reasons discussed below, we determine that the record here supports Petitioner's assertion that one of ordinary skill in the art would have maintained Chaffee's Housing-contained design at least for durability. *See* Pet. 48-49 (citing Ex. 1402 P 207; Ex. 1406, 4:20). As noted by Petitioner, the cited passage in Chaffee teaches that a housing may serve "to protect the [\*48] inner workings of the pump." Ex. 1406, 4:20. This reasoning is supported by the testimony of Dr. Beaman, who discusses how "durability . . . is one of the five key design factors [one of ordinary skill in the art] would have considered." Ex. 1402 P 207 (emphasis omitted).

As to the durability rationale, Patent Owner first argues that "[b]uilt-in designs can . . . add heat to the material, resulting in faster aging and potential breakdown of the material." PO Resp. 49-50 (citing Ex. 2429 P 123). Patent Owner states that "Wu noted an overheating issue in existing systems and existing systems and one of the objects of Wu's invention is to provide a system that will not overheat." *Id.* at 48 (citing Ex. 1405, 1:35-39, 2:14-15, 3:8-11; Ex. 1466, 2:7-9, 3:11-12, 4:25-28).

Patent Owner has not adequately explained, or identified adequate evidentiary support for, why *maintaining* Chaffee's Housing-contained design would result in overheating. Specifically, we are not persuaded by Patent Owner's arguments that rely on Dr. Stevick's testimony that (1) one of ordinary skill in the art "would appreciate that if the blower was enclosed in a confined space, the resulting design *might need* an additional cooling apparatus" (Ex. 2429 P 121, *cited at* PO Resp. 48-49 [\*49] (emphasis added)) and that (2) "[b]uilt-in designs *can also* add heat to the material, resulting in faster aging and potential breakdown of the material" (Ex. 2429 P 123, *cited at* PO Resp. 49-50 (emphasis added)).

As an initial matter, the speculative nature of these statements is evident from the words shown in italics. Pet. Reply 21 (arguing the "speculative nature" of the statement in Ex. 2429 P 121). Moreover, for support on this issue, Dr. Stevick and Patent Owner cite the following statement from the Background of the Invention section of Wu: "Another object of the present invention is to provide an air mattress air supply

and control system having a fan and motor that will not over heat as is now the case with many existing systems." Ex. 1405, 1:35-38, *cited at* PO Resp. 48 & Ex. 2429 P 121. We are persuaded by Petitioner's argument that Patent Owner's "reliance on Wu's reference to overheating is misplaced." Pet. Reply 21 n.4 (citing Ex. 1625 PP 61-62). As noted by Petitioner and discussed by Dr. Beaman, this statement was not addressing a Housing-contained design (as in the modified device) at all, but rather addressing continuously operating pumps (which the proposed modified device is not). *See* Pet. Reply 18 (citing Ex. 1625 PP 61-62); Ex. 1625 P 61 ("Wu is describing an overheating issue with continuously operating air supply systems for low air loss inflatable mattresses. (Ex. 1405, 1:27-54.) Obviously, this is not how the modified Chaffee device would be used, as it need only operate for small periods of time, not continuously.").

Moreover, to the extent Patent Owner contends that *all* Housing-contained designs have overheating issues, that draws into question how the applicant in the '394 patent overcame such a common problem when this issue is not discussed in the '394 patent. *See* [\*Smith & Nephew, Inc. v. Rea\*, 721 F.3d 1371, 1381-82 \(Fed. Cir. 2013\)](#) (addressing a patent owner's argument as to an alleged technical issue in the proposed combination, stating that "[t]his naturally raises the question of how [patent owner] managed to make such a combination work"), [\*50] *cited at* Pet. Reply 21.

As to the second argument addressing this aspect of the proposed modification, Patent Owner contends that "[a] housing containing the components of Wu's blower, rotary valve and any control hardware would be relatively heavy and likely to damage the walls of an inflatable device." PO Resp. 49-50 (citing Ex. 2429 P 123).

Patent Owner has not identified evidentiary support for the contention that maintaining a Housing-contained design would damage the walls of the modified device. For example, the relied-upon testimony of Dr. Stevick essentially repeats Patent Owner's argument with no additional analysis, facts, or data. *Compare* Ex. 2429 P 123, *with* PO Resp. 49-50; [\*37 C.F.R. § 42.65\(a\)\*](#). Moreover, as argued by Petitioner (Pet. Reply 10-11), this argument seems to be based on an improper bodily incorporation theory involving the physical incorporation of Wu's structures into Chaffee. [\*Moultet\*, 686 F.3d at 1332](#) ("It is well-established that a determination of obviousness based on teachings from multiple references does not require an actual, physical substitution of elements.").

#### *Additional Asserted Reasons to Modify Wu with Chaffee*

We have reviewed Petitioner's additional asserted reasons for the two aspects of the proposed modification of Chaffee based on Wu (which are argued [\*51] in the alternative), and we determine that those reasons are not as strongly supported by the record as the reasons discussed above.

#### *Patent Owner's Additional Arguments*

In addition to the arguments discussed above, which specifically address one of Petitioner's rationales for each of the two aspects of the proposed modification, Patent Owner provides other arguments explaining why one of ordinary skill in the art would not have modified Chaffee based on Wu. We address each of those arguments in turn below.

First, Patent Owner argues that Petitioner ignores Wu's teachings of a closed loop air system. PO Resp. 32-35. Specifically, Patent Owner argues that one of ordinary skill in the art "would appreciate that Wu teaches a closed loop air flow control system and that the control components of Wu are an important part

of the operation of system 10 because they provide a control signal for blower 15 used for closed-loop control of air flow to an air mattress." *Id.* at 33-34 (citing Ex. 2429 P 92). According to Patent Owner, "when Petitioner[] refer[s] to the 'Uni-directional Pump Assembly' of Wu, [it] refer[s] only to blower 15 and rotary valve 100 of Wu's entire air control system and ignore[s] the controls on the system." [\*52] *Id.* at 34.

Patent Owner's arguments do not demonstrate a deficiency in the asserted rationale. Instead, we are persuaded by Petitioner's argument that Patent Owner's "position is inconsistent with Wu's teachings about the purpose of the control network." Pet. Reply 15 (citing Ex. 1625 PP 47-48). As argued by Petitioner, "Wu teaches that the purpose of its control network is to 'control the patient, mattress interface pressure to prevent the formation of bed sores' through the use of 'an algorithm.'" *Id.* (quoting Ex. 1405, 4:3-5, 4:15-23) (citing Ex. 1625 P 48). We are persuaded by Petitioner's argument that "[s]uch a control network is simply unnecessary in Chaffee's ordinary consumer inflatable mattress application." *Id.* (citing Ex. 1625 PP 48-49; Ex. 1635, 436:1-5 (Dr. Stevick testifying that one of ordinary skill in the art could use less than all of Wu's system); Ex. 1405, 3:18-22, 6:53-58).

In the Sur-reply, Patent Owner cites pages 47-49 of its Response for the proposition that "control elements are required to control Wu's blower." PO Sur-reply 13. Although page 49 of the Response references allegedly "necessary control network components" of Wu, Patent Owner does not, in the Response or Sur-reply, adequately explain *why* any part of Wu's control network would be *required* in the context of the proposed modified device.

Second, Patent Owner argues that one of ordinary skill in the art viewing Wu for what it teaches would not have modified Chaffee based on Wu. PO Resp. 51-55. Specifically, Patent Owner argues that one of ordinary skill in the art would have understood that "Wu uses a centrifugal fan type blower to provide ample pressure and air flow for an air mattress requiring constantly circulating air which may experience relatively high variations in air flow during use," whereas one of ordinary skill in the art "would appreciate that the air mattress of Chaffee requires substantially no air flow after the mattress is inflated, and so it does not require constantly circulating air and does not experience high variations in air flow or air pressure during use." [\*53] *Id.* at 52 (discussing Ex. 2429 PP 127-129). According to Patent Owner, one of ordinary skill in the art "would not look to Wu because it represents a much more complex flowing air system and would require at least a minimal control aspect to avoid overinflation and overheating if attempted to be substituted for Chaffee's reversible motor." *Id.* (citing Ex. 2429 P 130).

Patent Owner's arguments do not demonstrate a deficiency in Petitioner's proposed modification. As an initial matter, for reasons discussed above, Patent Owner has not established that any of the control network of Wu would be necessary in the context of the modified device. Moreover, Patent Owner has not adequately explained why the alleged *differences* between Chaffee and Wu identified by Patent Owner undermine the rationale provided by Petitioner. See [KSR, 550 U.S. at 420](#) ("[F]amiliar items may have obvious uses beyond their primary purposes, and in many cases a person of ordinary skill will be able to fit the teachings of multiple patents together like pieces of a puzzle."). Here, the cited testimony of Dr. Stevick does not support Patent Owner's position, as it essentially repeats Patent Owner's argument with no additional analysis, facts, or data. Compare Ex. 2429 PP 127-130, with PO Resp. 51-52; [37 C.F.R. § 42.65\(a\)](#).

Patent Owner also contends that one of ordinary skill in the art "would understand that to safely inflate a mattress the amount of power delivered to the blower 15 should be controlled using a control device, such

as control unit 50 and control line 53" in Wu, and that "[u]se of Wu's blower without the proper controls could result in a system that could produce [\*54] enough air pressure and air flow to overinflate the inflatable body or other air components, and the resulting system would therefore be unsafe." PO Resp. 53 (citing Ex. 1405, 2:54-55, 3:34-47, 4:56-67; Ex. 1466, 4:11-12, 5:13-21, 5:26-6:5) (referencing Ex. 2429 P 131). Patent Owner also asserts that one of ordinary skill in the art would "appreciate that Chaffee *teaches away* from air systems like Wu, because Chaffee specifies relatively low pressure operation in a limited range of pressures." *Id.* (citing Ex. 1406, 4:4-10). According to Patent Owner, one of ordinary skill in the art would understand (1) "that to use the variable speed blower of Wu, a control system would be required to control the blower power and the resulting air pressure applied to a mattress per Chaffee 4:5-10" and (2) "that the Wu blower without the Wu control system would not provide air pressure within a desired pressure range and might provide substantially more pressure than is needed or safe." *Id.* at 54 (citing Ex. 2429 PP 132, 133).

This argument does not demonstrate a deficiency in Petitioner's asserted rationale. The cited portions of Wu and the Wu provisional application (Ex. 1466) show that Wu (and its provisional) disclose the use of a control network, but do not [\*55] support Patent Owner's position that, if blower 15 and valve 100 are used *without* a control network, the system would necessarily overinflate an inflatable body or be rendered unsafe. Here, as noted by Petitioner, in contrast to the operation of the device in Wu, the modified device "need only operate for small periods of time, not continuously." Pet. Reply 18 (citing Ex. 1625 PP 61, 62, 64; Ex. 1635, 436:1-19); *see also* Tr. 92:6-9 (counsel for Patent Owner agreeing that Chaffee does not run continuously). Moreover the cited testimony of Dr. Stevick does not support Patent Owner's position, as it essentially repeats Patent Owner's argument with no additional analysis, facts, or data. *Compare* Ex. 2429 PP 131-133, *with* PO Resp. 53-54; [37 C.F.R. § 42.65\(a\)](#).

This argument also seems to be based on an improper bodily incorporation theory involving the physical incorporation of Wu's structures into Chaffee, as noted by Petitioner. Pet. Reply 10-11; *see also* [Mouttet, 686 F.3d at 1332](#) ("It is well-established that a determination of obviousness based on teachings from multiple references does not require an actual, physical substitution of elements.").

In addition, Patent Owner has not shown that the alleged differences between Chaffee and Wu--e.g., that Chaffee may "specif[y] relatively low pressure operation in a limited range of pressures" (PO Resp. 53)--amount to a teaching away. PO Resp. 53; *see In re Fulton, 391 F.3d 1195, 1201 (Fed. Cir. 2004)* ("The prior art's mere disclosure of more than one alternative does not constitute a teaching away from any of the[] [disclosed] alternatives because such disclosure does not criticize, discredit, or otherwise discourage the solution claimed . . .").

For the reasons above, we determine, in light of the complete record, that Petitioner has shown by a preponderance of the evidence that one of ordinary skill in the art at the time of the invention would have been motivated to modify Chaffee based [\*56] on Wu, as proposed.

#### (8) Objective Evidence of Nonobviousness

We turn next to Patent Owner's objective evidence of nonobviousness and Petitioner's rebuttal evidence. Objective evidence of nonobviousness, 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 \(Fed. Cir. 2012\)](#). Notwithstanding what the teachings of the prior art would have suggested to one of ordinary skill in the art at the time of the patent's invention, the totality of the evidence



submitted, including objective evidence of nonobviousness, may lead to a conclusion that one or more of the Challenged Claims would not have been obvious to one of ordinary skill in the art. In re Piasecki, 745 F.2d 1468, 1471-72 (Fed. Cir. 1984). Objective evidence may include long-felt but unsolved need, failure of others, unexpected results, commercial success, copying, licensing, and praise. See Graham v. John Deere Co., 383 U.S. 1, 17-18 (1966); Leapfrog Enters., Inc. v. Fisher-Price, Inc., 485 F.3d 1157, 1162 (Fed. Cir. 2007).

"For objective evidence to be accorded substantial weight, its proponent must establish a nexus between the evidence and the merits of the claimed invention." In re GPAC Inc., 57 F.3d 1573, 1580 (Fed. Cir. 1995). A nexus must be demonstrated for all types of objective evidence of nonobviousness. See *id.* (addressing nexus generally); Rambus Inc. v. Rea, 731 F.3d 1248, 1256 (Fed. Cir. 2013) (addressing long-felt need); Wm. Wrigley Jr. Co. v. Cadbury Adams USA LLC, 683 F.3d 1356, 1364 (Fed. Cir. 2012) (addressing copying); In re Kao, 639 F.3d 1057, 1069 (Fed. Cir. 2011) (addressing unexpected results); Muniauction, Inc. v. Thomson Corp., 532 F.3d 1318, 1328 (Fed. Cir. 2008) (addressing praise); In re Huang, 100 F.3d 135, 140 (Fed. Cir. 1996) (addressing [\*57] commercial success). The stronger the showing of nexus, the greater the weight accorded the objective evidence of nonobviousness. See GPAC Inc., 57 F.3d at 1580 ("To the extent that the patentee demonstrates the required nexus, his objective evidence of nonobviousness will be accorded more or less weight."); Ashland Oil, Inc. v. Delta Resins & Refractories, Inc., 776 F.2d 281, 306 (Fed. Cir. 1985). Conversely, the weaker the showing of nexus, the less weight accorded the objective evidence of nonobviousness.

"[T]here is a presumption of nexus for objective considerations when the patentee shows that the asserted objective evidence is tied to a specific product and that product 'is the invention disclosed and claimed in the patent.'" WBIP, LLC v. Kohler Co., 829 F.3d 1317, 1329 (Fed. Cir. 2016) (internal citation omitted); see also PPC Broadband, Inc. v. Corning Optical Commc'ns RF, LLC, 815 F.3d 734, 747 (Fed. Cir. 2016) ("Because the evidence shows that the SignalTight connectors are 'the invention disclosed and claimed in the patent,' we presume that any commercial success of these products is due to the patented invention . . . . This is true even when the product has additional, unclaimed features.") (internal citations omitted). Patent Owner produces evidence directed to alleged commercial success, copying, failure to use alternatives, broad acceptance, praise, licensing, long-felt need, and skepticism of others<sup>20</sup>. PO Resp. 67-75. We address [\*58] each of these indicia in turn, below, for all of the Challenged Claims. First, however, we address nexus generally.

### Nexus

As we explain in greater detail below, based on the complete record, we determine that Patent Owner is entitled to a presumption of nexus with respect to certain Challenged Claims because Patent Owner has "show[n] that the asserted objective evidence is tied to . . . specific product[s] and [those] products '[are] the invention disclosed and claimed in the patent.'" See WBIP, LLC, 829 F.3d at 1329. This presumption is based solely on the stipulations of infringement by certain competitors, as Patent Owner has failed to provide persuasive evidence that serves as a basis for a nexus for its products or any other competitor products not covered by the stipulation of infringement.

Relying on the testimony of Dr. Stevick, Patent Owner asserts that its products "and competitor products practice the inventive aspects of the '394 [p]atent [c]laims." PO Resp. 68 (citing Ex. 2429 PP 155-168,

<sup>20</sup> Patent Owner characterizes this indicium of nonobviousness as "against conventional wisdom." PO Resp. 74.

Appx.). First, Patent Owner points out that certain competitors involved in the Texas Litigation admitted that their products infringed some of the Challenged Claims. *Id.*; Ex. 2425, 2-4. Specifically, Patent Owner contends that "Intex and Bestway, the largest makers of airbeds sold in the U.S., admitted their products infringe the '394 [p]atent [c]laims." PO Resp. 68 (citing Ex. 2425).<sup>21</sup> Second, Patent Owner argues that "Dr. Stevick analyzed the industry and found that in the market electric 'built-in-pump' airbeds with power inflation and deflation generally refer to products that practice the '394 [p]atent [c]laims." [\*Id. at 68-69\*](#) (citing Ex. 2429 PP 175-230). Patent Owner adds that "Dr. Stevick showed that the design showing secondary considerations specifically aligns with the claims of the '394 patent." [\*Id. at 69\*](#) (citing Ex. 2429 PP 222, 241, 280). Third, Patent Owner relies on Dr. Stevick's testimony that its own products practice the Challenged Claims. *Id. at 68*; *see* Ex. 2429 PP 179-216, Appx. (containing analysis of Patent Owner's products against the Challenged Claims).

Petitioner counters that Patent Owner is not entitled to a presumption of nexus in this case. Pet. Reply 26. Petitioner argues that Patent Owner's declarant failed to fully analyze any of Patent Owner's products against the Challenged Claims. *Id.* Petitioner adds [\*59] that it disputed infringement as to several of the Challenged Claims. *Id.* Petitioner also argues that Patent Owner's nexus position relies on equating use of the phrase "built-in pump" in marketing material with falling within the scope of the Challenged Claims. *Id. at 26-27.*

As to the admission of infringement by certain competitors in the Texas Litigation, products from Airtek, Air Cloud, Air Comfort, AirBedz, Altimair, Pittman, and TexSport admittedly infringe claims 1-5, 7-12, 16-20, 22, and 23 (i.e., most, but not all, of the Challenged Claims) of the '394 patent. Ex. 2425, 2. Products from Intex, Bestway, and Boyd admittedly infringe claims 1-5, 7, 8, 10, and 12 of the '394 patent. *Id.* Because certain of Patent Owner's objective evidence of nonobviousness is directed to these products, Patent Owner's evidence in this regard demonstrates at least some showing of nexus.

We agree with Petitioner's position that Dr. Stevick's testimony fails to provide sufficient support that Patent Owner's products practice any of the Challenged Claims. Pet. Reply 26. Specifically, we are not persuaded by the testimony of Dr. Stevick that:

I have personally reviewed the pumps incorporated in [Patent Owner's] airbed models [\*60] including the following built-in pumps: EZ V AC Dual Pump and EZ V Auto Shut Off Pump (collectively, "TWW Pumps"). I have determined that each of the TWW Pumps practice at least claims 1, 2, 3, 7, 8, 9, 10, 11, 12, 16, 17, 18, 22 and 23 of the '394 [p]atent [c]laims and claims 4, 5, 6, 19, 20 and 21 to the extent that the PTAB adopts the claim construction of "pipe" asserted by Petitioner[.]

Ex. 2429 P 179. Petitioner argues convincingly that Dr. Stevick fails to provide any persuasive support for this opinion covering both of the "TWW Pumps." <sup>22</sup> Pet. Reply 26. Based on our review of the complete record, including Dr. Stevick's testimony, we find that Dr. Stevick did not provide support that even one of Patent Owner's products practices any of the Challenged Claims. Cf. Tr. 106:15-107:15

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<sup>21</sup> We understand Patent Owner to have intended to cite to Exhibit 2425, as no Exhibit "2025" has been filed in this proceeding.

<sup>22</sup> Our review of the complete record did not provide us with any additional evidence to support this testimony, such as evidence in the record that packaging is marked with the '394 patent number or appropriate virtual marking. *See* [35 U.S.C. § 287\(a\)](#).

(conceding that Dr. Stevick's analyses were not part of the record in this proceeding). Dr. Stevick's analysis purports to compare Patent Owner's Insta-bed product number 840018, which uses the EZ V AC Dual Pump, with the Challenged Claims. *See* Ex. 2429 P 180. Our review of this testimony indicates that Dr. Stevick compared different claim limitations of claim 1 against different pumps. *Compare* Ex. 2429 P 180 (including testimony about EZ [\*61] V AC Dual pump), *with* PP 181, 183 (including testimony about EZ V Auto-Shutoff pump), *and with* PP 182, 184-187 (providing testimony about "each" of the two pumps, relying on what was "shown above," which was an image of the EZ V Auto-Shutoff pump only). Dr. Stevick does not provide any testimony about the similarities and differences of these two pump models or why his analysis equally applies to both pumps and the Insta-bed product number 840018.

In the remainder of his testimony on how Patent Owner's products allegedly practice the Challenged Claims, Dr. Stevick addresses the limitations of a challenged dependent claim and declares that the TWW Pump models satisfy the limitation without providing any additional information demonstrating *why* either of the two pumps satisfy the limitation. *See* Ex. 2429 PP 188-215.

In summary, although Dr. Stevick did provide *an* analysis of each Challenged Claim with respect to certain TWW Pumps, we agree with Petitioner that he did not fully analyze *any* of Patent Owner's products. *See* Pet. Reply 26. Accordingly, Patent Owner has not demonstrated that it is entitled to a presumption of nexus based on its own products practicing the Challenged Claims.

We also agree with Petitioner [\*62] that Patent Owner is not entitled to a presumption of nexus based on alleged infringement that was disputed or based solely on a product having a "built-in pump." Pet. Reply 26-27; *see* PO Resp. 68-69. Dr. Stevick testifies that he "personally reviewed airbed models that account for at least the substantial majority of airbeds with electric built-in pumps ('BIP') in the marketplace, and they follow the design of [Patent Owner's] '394 [p]atent [c]laims." Ex. 2429 P 216.

Dr. Stevick's testimony about the airbeds he "personally reviewed" is entitled to little weight, as he does not provide any of the underlying analyses for his opinion (such as his analyses from the Texas Litigation), including which airbed models he reviewed or how the airbeds practiced any of the Challenged Claims of the '394 patent. *See* Ex. 2429 PP 216-218; Tr. 101:18-104:19; [37 C.F.R. § 42.65\(a\)](#).

Dr. Stevick testifies that "[m]anufacturers and retailers note the importance of a built-in electric pump that inflates and deflates in accordance with the '394 patent in their advertising." Ex. 2429 P 219. To support this opinion, Dr. Stevick references deposition testimony from corporate representatives from Bestway (USA) and Walmart. *Id.* Again, Dr. Stevick's testimony is not persuasive. We have reviewed the referenced deposition [\*63] testimony and find that it does not include any statements tying advertising to inflation and deflation as recited in the Challenged Claims. Similarly, as Petitioner argues, Patent Owner, does not provide persuasive evidence that supports his contention that any reference to an electric "built-in pump" that inflates and deflates indicates that the inflatable product practices one or more of the Challenged Claims. *See* Pet. Reply 26-27; Ex. 2429 PP 219-220.

In summary, based on the complete record, we determine that Patent Owner is entitled to a presumption of nexus with respect to certain Challenged Claims. This presumption is based solely on the stipulations of infringement by certain competitors in the Texas Litigation, as Patent Owner has failed to provide persuasive evidence that serves as a basis for a nexus for its products or any other competitor products not covered by the stipulation. *See* Ex. 2425, 2-4.



We address Patent Owner's arguments and evidence and Petitioner's rebuttal arguments and evidence as to each specific indicium of nonobviousness, below.<sup>23</sup>

### *Commercial Success*

Having determined that there is at least some nexus, we consider Patent Owner's arguments regarding the commercial success of the patented [\*64] products. Patent Owner contends that "[s]ales of hundreds of millions of dollars of patented products proves 'overwhelming' commercial success." PO Resp. 69 (citing an unpublished decision from the U.S. District Court for the Northern District of Texas). Patent Owner continues that "sales of the patented products by Walmart alone have exceeded [TEXT REDACTED BY THE COURT]." *Id.* (citing Ex. 2638 PP 15, 42; Ex. 2429 P 227) (emphasis omitted). Patent Owner contends that "[t]he market for infringing airbeds is a significant portion of the overall airbed market and constitutes most airbed sales by revenue" and that "[t]he industry continues to grow, showing commercial success." *Id.* (citing Ex. 2638 P 46). Patent Owner argues that "[t]hese airbeds are sold due to the '394 patented design." *Id.* (citing Ex. 2429 PP 222, 241, 280).

Patent Owner also contends that "Petitioner[s] and Real-Party-in-Interest Coleman's own internal research shows" that inflation and deflation times are important to consumers. PO Resp. 69-70 (citing Ex. 2638 PP 53-58, 61-85; Ex. 2429 PP 225-228, 239-244, 248, 275-277).<sup>24</sup> This research includes online interviews with individuals who have purchased airbeds within 12 months of the survey. *See, e.g.*, Ex. 2697, 2; Ex. 2698, 2, *cited in* Ex. 2638 PP 53-54.

Petitioner responds that unclaimed features, such as comfort and durability, contributed to any commercial success. Pet. Reply 27-28. Petitioner contends that these unclaimed features of airbeds are extensively advertised and are consistently rated as more important to customers than a pump. *Id.* (citing Ex. 1649 PP 9-11, 19-39, PP 21-22 n.24-27; Ex. 1625 PP 123-125; Ex. 1650 PP 8-19).

For example, Petitioner argues that comfort and durability are the most important features of an airbed to customers and that Patent Owner fails to address Petitioner's evidence that supports its position that unclaimed features are responsible for the commercial success. Pet. Reply 27-28. Petitioner argues that Patent Owner "equate[s] 'built-in pumps' with any 'premium' products that generate higher revenue and

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<sup>23</sup> Patent Owner argues that "[t]he party asserting invalidity must overcome the presumption [of nexus] by *clearly and convincingly* proving secondary considerations are unrelated to the patented technology." PO Resp. 68 (citing [WBIP, LLC, 829 F.3d at 1329](#)) (emphasis added). Patent Owner's reliance on *WBIP* for this proposition is misplaced as that case involved district court litigation, where invalidity must be proved by clear and convincing evidence. [WBIP, LLC, 829 F.3d at 1324](#); *see, e.g., Core Wireless Licensing S.A.R.L. v. LG Elecs., Inc.*, 880 F.3d 1356, 1364 (Fed. Cir. 2018) ("A patent is presumed valid, and the burden of establishing invalidity of a claim rests on the party asserting invalidity by clear and convincing evidence."). In an *inter partes* review proceeding, however, a petitioner must demonstrate, *by a preponderance of the evidence*, that a challenged claim is *unpatentable*. [35 U.S.C. § 316\(e\)](#). Patent Owner provides no argument to support its proposition that Petitioner must overcome a presumption of nexus by clear and convincing evidence given the lower burden of proof for unpatentability in an *inter partes* review proceeding as compared to invalidity in a district court.

<sup>24</sup> Patent Owner notes that a protective order in the Texas Litigation was modified to allow "use of protected documents in the 'pending IPRs--to the extent authorized by the Patent Trial and Appeal Board.'" PO Resp. 70 n.11; *see also* Ex. 2731 (providing the modified protective order). Patent Owner adds that because "the modified district court protective order allows the use of [Texas L]itigation discovery in Patent Owner's possession to the extent the Board allows, in addition to documents the Board has ordered produced in discovery, Patent Owner's expert declarations also address [e]xhibits . . . produced in the [Texas L]itigation for the Board's consideration." *Id.* Our analysis of Patent Owner's contentions as to commercial success, including any of the declarants' analyses that rely on the exhibits listed in footnote 11 of the Patent Owner Response, should in no way be construed as the Board authorizing Patent Owner to use these exhibits. The sole extent of any authorization from the Board to use confidential information from the Texas Litigation is presented in Paper 41.

profits, including raised height airbeds." *Id. at 28* (citing Ex. 1649 PP 40-44, 66-69, 72). Petitioner contends that, contrary to this position, "the evidence demonstrates that numerous product features create 'premium' airbed products." *Id. at 28-29* (citing Ex. 1649 PP 40-44, 66-69, 72; Ex. 1670, 90-91, 201-202).

Petitioner also argues that Patent Owner did not "address whether [\*65] market share was impacted when the claimed features were introduced to the market." Pet. Reply 29 (citing Ex. 1649 P 51). Petitioner argues that Intex's growth in sales on which Patent Owner relies "is tied directly to Intex's patented, comfort- and durability-focused Dura-Beam(R) product line--which is completely unrelated to the Challenged Claims." *Id.* (citing Ex. 1649 PP 55-57, Schedules 2-4; Ex. 1650 PP 8-22; Exs. 1651, 1652, 1654).

Finally, Petitioner argues that "the vast majority of airbeds purchased by consumers do not have a 'built-in pump' (referred to by [Patent Owner] as 'NBIP' sales), further demonstrating that a 'built-in pump' (whether covered by the Challenged Claims or not) is not important to the majority of consumers." Pet. Reply 29 (citing Ex. 1649 PP 45-54, 57).

In reply, Patent Owner argues that "Petitioner[] provide[s] no credible analysis regarding unclaimed features driving commercial success." PO Sur-reply 24. Patent Owner contends that "other features cannot explain away the success of the '394 patent " because Dr. "Becker analyzed the patented airbeds against unpatented airbeds and found the other Petitioner-identified features available in both types of airbeds" and thus, "a consumer could obtain them without paying extra for the patented models, but they did" pay extra. *Id.* (citing Ex. 1648, 243:19-245:12). Patent Owner also replies that Petitioner's arguments concerning market share and units sold are unavailing. *Id.* Patent Owner asserts that Walmart "has sold over [TEXT REDACTED BY THE COURT] worth of built-in pump airbeds that practice the Challenged [C]laims from April 2011 through August 2018" ( *id. at 21-22* (citing [\*66] Ex. 2638 P 15; Ex. 1648, 48:16-25; Ex. 2749, 373:19-374:6)) and that "[t]his is not a matter of dispute: it is based on Walmart and Petitioner's own filed admissions that their products infringe '394 patent claims" ( *id. at 22* (citing Ex. 2425, 2-3; Ex. 1648, 69:8-24, 143:4-13) (emphasis omitted)).

Patent Owner shows commercial success of certain airbeds that fall within the scope of some of the Challenged Claims based on the revenues generated by sales of these airbeds. As we explain in greater detail in our analysis below, we find that the nexus between these sales and the claimed product features, however, is weak. Accordingly, the overall weight we attribute to the objective evidence of commercial success is not considerable.

First, as we explained above, the presumed nexus is associated with only those products for which Petitioner (and other defendants in the Texas Litigation) admit infringement. Second, based on our review of the complete record, we find that unclaimed features of the sold airbeds contribute, at least in part, to the commercial success of these airbeds, which further weakens the nexus and discounts the overall weight given to this objective evidence. *See* Pet. Reply 27-29. As Petitioner [\*67] notes, customer survey data, which indicate why a customer purchases an airbed, counter Patent Owner's contentions. *See id.*; *see, e.g.*, Ex. 2694 (providing research on the purchasing process of airbed customers), *cited at* Pet. Reply 27. For example, customer research shows that [TEXT REDACTED BY THE COURT] Ex.

2694, 6; *see also id. at 7 [TEXT REDACTED BY THE COURT]*. This research shows that comfort and durability outranks a built-in pump<sup>25</sup> in a listing of most important features. *See id. at 10, 11*.

Other record evidence also supports this finding. For example, Coleman customer research shows that, in addition to built-in pumps, which were "highly valued" [TEXT REDACTED BY THE COURT] Ex. 2692, 20, 22, 25; *see also* Ex. 2644, 15 (indicating that the most important features are comfort, durability, and not leaking air); Ex. 2696, 8 (indicating that airbed efficacy, including durability and comfort, is more important in brand preference than advanced pump features, including the pump being built into the mattress); Ex. 2697, 20 (indicating that customers would be willing to pay more for durability).<sup>26</sup> Our review of the totality of the evidence shows that features related to comfort and durability, as well as the type of pump, are considerations that contribute more significantly [\*68] to the sales of airbeds at Walmart than a built-in pump.

We recognize that some of the evidence of record supports the position that customers are concerned with inflation or deflation times. *See, e.g.,* Ex. 2692, 25 [TEXT REDACTED BY THE COURT]. This evidence does not effectively strengthen the nexus between the Challenged Claims and commercial success. Patent Owner does not direct us to persuasive evidence that this customer concern directly translates into a preference for airbeds that are covered by the Challenged Claims. Although a capability to do power inflation and deflation would address this concern, Patent Owner does not direct us to persuasive evidence linking a limitation recited in the '394 patent to decreased inflation or deflation times as compared to the prior art.

As Petitioner argues, Dr. Becker's testimony also supports our finding. Pet. Reply 27-28. For example, Dr. Becker testifies, "I would agree that . . . comfort and durability are important characteristics in consumer demand." Ex. 1648, 34:19-21. Dr. Becker further testifies that "[e]very manufacturer that I've reviewed in describing their products describes a number of different differentiating features of those products, [\*69] not unlike what" Patent Owner did in terms of comfort and durability. *Id.* at 100:20-101:6. Dr. Stevick testifies consistent with this finding as well. *See* Ex. 1635, 372:3-14 [TEXT REDACTED BY THE COURT].

We are persuaded by Petitioner's argument that, between 2011 and 2018, Walmart sold more airbeds without built-in pumps as compared to airbeds with built-in pumps supports a finding that, when making an airbed purchase, customers consider factors *other than* whether the airbed has a built-in pump that will power inflate/deflate with a movable air conduit, as claimed in the Challenged Claims. Pet. Reply 29; Ex. 1649 P 52. In this time period, [TEXT REDACTED BY THE COURT] of airbed sales at Walmart were for airbeds without built-in pumps and sales for airbeds without built-in pumps had similar profit percentages as sales for airbeds with built-in pumps. *See* Ex. 1649 P 52. This [TEXT REDACTED BY THE COURT], on a per unit basis, supports an inference that customers' purchases are driven, at least in part, by factors other than whether an airbed has a built-in pump with a movable air conduit, as recited in the Challenged Claims.

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<sup>25</sup> We note that Coleman, the source of this information, disputes that any of its airbeds infringe the '394 patent and, as we indicate in our analysis of nexus, the evidence of record does not demonstrate that any Coleman airbed falls within the scope of any Challenged Claims. *See* Ex. 2425, 3. Coleman's use of the term "build in pump" in this survey analysis serves to illustrate that the term is not necessarily an analog for practicing the claims of the '394 patent.

<sup>26</sup> These exhibits were cited by declarants' analyses. *See* Ex. 1649 PP 21, 25, 27-29, 39, 62, 66; Ex. 2429 PP 272-274, 277, 278; Ex. 2638 PP 53, 55.

Finally, our finding of limited commercial success is consistent with the decision in binding [\*70] arbitration between Petitioner and Patent Owner involving the '394 patent (and other patents). In that proceeding, the arbitrator, [TEXT REDACTED BY THE COURT] Ex. 2765, 11.

At the same time, we are not persuaded by Petitioner's argument that the increase in sales of Intex airbeds that included built-in pumps was attributable to its introduction of the DURA-BEAM(R) product line. *See* Pet. Reply 29. Petitioner relies on declaration testimony from Mr. Schoettelkotte (its declarant with respect to economic analyses) and Mr. Slate (Intex's Director of Sales), both of whom reference data from Exhibits 1651 and 1652. *See* Ex. 1649 PP 55-57; Ex. 1650 P 22. We cannot discern, without additional analysis from Petitioner or its declarants, however, how these data support Petitioner's contention.<sup>27</sup>

Third, we discount slightly the weight of this objective evidence because Patent Owner's commercial success assertion includes a single retailer--Walmart--without any explanation as to the significance of the sales of this single retailer to the entire market. *See* PO Resp. 69-70. Although Patent Owner contends that infringing airbeds make up "a significant portion of the overall airbed market and constitutes most airbed sales by revenue," this contention is unsupported. *See id.* at 69 (citing Ex. 2638 P 46). Dr. Becker's declaration, at paragraph 46, likewise addresses Walmart sales only, not the "overall [\*71] airbed market." *See* Ex. 2638 P 46. As such, although we recognize that the amount of revenue from the Walmart sales is considerable and entitled to some weight, the lack of overall market share data cuts against the Walmart sales data. *See, e.g., Tec Air, Inc. v. Denso Mfg. Michigan Inc., 192 F.3d 1353, 1360-61 (Fed. Cir. 1999)* ("Based on Tec Air's sales evidence [of millions of products sold], the jury reasonably could have found that the invention enjoyed commercial success. Denso argues that this evidence is insufficient because Tec Air failed to provide market share data. Although sales figures coupled with market data provide stronger evidence of commercial success, sales figures alone are also evidence of commercial success."); *cf. In re Huang, 100 F.3d 135, 140 (Fed. Cir. 1996)* ("This court has noted in the past that evidence related solely to the number of units sold provides a very weak showing of commercial success, if any.")).

We are persuaded, based on the complete record, that there is not a strong nexus between the revenue values for infringing products sold at Walmart and the patented invention. We find that the strength of any nexus is offset by the evidence of record concerning the impact of non-patented features on customer demand. In conclusion, we find that Patent Owner is entitled to some, but not considerable, [\*72] weight with respect to the objective evidence of commercial success.

### *Copying*

We also consider the fact that a competitor who copies technology suggests it would not have been obvious. *See Windsurfing Int'l, Inc. v. AMF, Inc., 782 F.2d 995, 1000 (Fed. Cir. 1986)* ("[C]opying the claimed invention, rather than one within the public domain, is indicative of non-obviousness.").

Our [reviewing court's] case law holds that copying requires evidence of efforts to replicate a specific product, which may be demonstrated through internal company documents, direct evidence such as disassembling a patented prototype, photographing its features, and using the photograph as a

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<sup>27</sup> At oral hearing, Petitioner presented an analysis of its sales data to support its contention, which showed sales trends. *See* Tr. 155:20-156:7. That analysis, however, does not appear in Petitioner's Reply.

blueprint to build a replica, or access to the patented product combined with substantial similarity to the patented product.

Wyers v. Master Lock Co., 616 F.3d 1231, 1246 (Fed. Cir. 2010). Patent Owner contends that, "[a]s admitted by Petitioner[], Bestway, for example, copied the prevalent design for power inflate/deflate airbeds in the market starting in approximately 2010." PO Resp. 70-71 (citing Ex. 2429 PP 217, 219, 231, 261). Patent Owner adds that "[t]he products in the market look nothing like the prior art asserted in this IPR--they follow [Patent Owner's] '394 patented design." *Id.* at 71 (citing Ex. 2429 PP 243-245; Exs. 2682-2686).

We determine that Patent Owner's evidence of copying is entitled to no weight, as Patent Owner fails to offer any evidence of actual copying. First, Patent Owner does not direct us to any admission by a competitor that it copied one of Patent Owner's products embodying any of the Challenged Claims of the '394 patent. See Wyers, 616 F.3d at 1246 ("[C]opying requires evidence of efforts to replicate a specific product."). None of the paragraphs in Dr. Stevick's declaration highlighted [\*73] by Patent Owner discusses copying. Indeed, Dr. Stevick does not have a subsection of his declaration directed to copying. See Ex. 2429 PP 169-292 (providing testimony on secondary considerations, but not testifying as to copying). Moreover, Dr. Stevick's testimony at paragraphs 243-245, cited by Patent Owner, is not directed to whether a competitor's products look like the prior art, as Patent Owner indicates. See Ex. 2429 PP 243-245 (discussing alleged commercial success).

#### *Failure to Develop Alternatives*

Consideration of objective evidence of nonobviousness also includes "the failure of others to produce alternatives to the patented invention." GPAC Inc., 57 F.3d at 1580. As with other objective evidence, this evidence must demonstrate that any "inability or unwillingness of competitors" to develop alternative products "is rooted in the subject matter" of the Challenged Claims. See *id.* Patent Owner contends that Petitioner "attempted to design around the '394 [p]atent but failed--they knew consumers would not accept a design without a permanently built in pump that followed the '394 [p]atent [c]laims." PO Resp. 72-73 (citing Ex. 2429 PP 260-266, Appx.).

In support of this contention, Patent Owner relies on Dr. Stevick's testimony about Intex's 619B and 619C pumps, which Intex developed as alternatives to its admittedly infringing pump. PO Resp. 72-73; Ex. 2429 P 265. Dr. Stevick includes an analysis on how the 619C pump, as part of an airbed, would fall within the scope of claims 1-4, 6-12, 16-19, and 21-23 of the '394 patent. See Ex. 2429, Appx. Dr. Stevick further states that Petitioner did not develop any alternative similar to the products described in the prior art [\*74] and asserted in this proceeding. *Id.* P 265.<sup>28</sup>

Petitioner responds that it developed noninfringing alternatives to a built-in pump as claimed in the Challenged Claims, and customers immediately purchased the products. Pet. Reply 30. As noted above, however, Dr. Stevick testifies that those alternative designs infringe each of the Challenged Claims and, [TEXT REDACTED BY THE COURT] See Tr. 110:17-111:5; Ex. 2765, 14-16.

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<sup>28</sup>Dr. Stevick also testifies that "[e]ven 17 years after the patent was filed, in the face of litigation with the prospect of damages and possibly an injunction against their products, the market's biggest companies . . . were unable to avoid the patent claims despite three different attempts to develop alternatives." Ex. 2429 P 266. We do not consider this statement at all, as it constitutes argument that should have been included in the Patent Owner Response. See Paper 70, 5.



Patent Owner also states that "for many years" competitors offered airbeds that fell within the scope of the '394 patent claims, and would not use alternatives, relying on paragraphs 260-266 of Dr. Stevick's declaration. PO Resp. 71. Although some of these paragraphs are directed to the litigious nature of the field and an alternative design introduced by Petitioner after being sued for infringement, they do not show that the inability or unwillingness to develop alternatives was rooted in the subject matter of the Challenged Claims. *See* Ex. 2429 PP 260-266.

We determine that this objective evidence is entitled to some weight. The record indicates that Petitioner [TEXT REDACTED BY THE COURT]. *See* Ex. 2429 P 265, Appx.; Ex. 2765, 14-16. We note, however, contrary to Patent Owner's assertion, that Patent Owner does [\*75] not offer any direct evidence that Petitioner "knew consumers would not accept a design without a permanently built in pump." PO Resp. 72-73. Although Patent Owner's contention is not directly supported, we find, based on our review of the complete record, that Petitioner had an incentive to design around the '394 patent and attempted to do so by making a minimal change to its designs, which supports at least an inference that customers would not have accepted a drastically different design. *See* Ex. 2429 P 265; Ex. 2765, 14-16; *see also* Ex. 2634, Articles 5, 6 [TEXT REDACTED BY THE COURT]

The significance of this failure is tempered by the fact that the [TEXT REDACTED BY THE COURT] Accordingly, we find that there is limited nexus between this objective evidence and the limitations of the '394 patent .

#### *Broad Acceptance, Praise, and Licensing*

Industry acceptance of an invention may also provide an objective indicium of nonobviousness. *See Allen Archery, Inc. v. Browning Mfg. Co.*, 819 F.2d 1087, 1092 (Fed. Cir. 1987) (considering copying, praise, unexpected results, and industry acceptance as indicators of nonobviousness). Also, evidence that the industry praised a claimed invention or a product that embodies the patent claims weighs against an assertion that the same claim would have been obvious. *WBIP, LLC*, 829 F.3d at 1334. Praise from industry [\*76] participants, especially competitors, is probative as to nonobviousness because such participants "are not likely to praise an obvious advance over the known art. Thus, if there is evidence of industry praise of the claimed invention in the record, it weighs in favor of the nonobviousness of the claimed invention." *Apple Inc. v. Samsung Elecs. Co.*, 839 F.3d 1034, 1053 (Fed. Cir. 2016). Finally, "[l]icenses taken under the patent in suit may constitute evidence of nonobviousness; however, only little weight can be attributed to such evidence if the patentee does not demonstrate 'a nexus between the merits of the invention and the licenses of record.'" *GPAC Inc.*, 57 F.3d at 1580 (quoting *Stratoflex, Inc. v. Aeroquip Corp.*, 713 F.2d 1530, 1539 (Fed. Cir. 1983)).

Patent Owner contends that its "patented products launched an entire category of 'built-in pump' airbeds." PO Resp. 73 (citing Ex. 2638 PP 15, 16, 44-53).<sup>29</sup> Patent Owner also contends that "Petitioner['s] own witnesses testified about the value of the '394 patented invention, an admission of non-obviousness." *Id.* (citing Ex. 2638 P 46; Ex. 2429 PP 241, 248-254, 282, 283). Patent Owner adds that the sales figures show "broad consumer acceptance." *Id.* (citing Ex. 2638 PP 15, 42). Patent Owner continues that "[c]ompanies specifically tout the patented technology in their advertisements, including box art and photos highlighting the patented design." *Id.* (citing Ex. 2429 PP 219, 242-245; Exs. 2653, 2680-2687). Patent Owner also contends that its "patents in the pending [ *inter partes* reviews] including

<sup>29</sup> We understand Patent Owner to have intended to cite to Exhibit 2638, as no Exhibit "2639" has been filed in this proceeding.

the '394 patent also have obtained more than [TEXT REDACTED BY THE COURT] dollars in licensing." *Id.* at 73-74 (citing Ex. 2638 PP 49-52; Ex. 2429 P 284).

Petitioner responds that Patent Owner "points to no evidence that any licensing or alleged industry praise is the *direct* result of any claimed feature" (emphasis added) (citing Ex. 1649 PP 61, 73-78) and that "[t]he parties' settlement agreement should be given no weight" (citing [\*Bosch Auto. Serv. Sols., LLC v. Matal\*, 878 F.3d 1027, 1038 \(Fed. Cir. 2017\)](#)). Pet. Reply 30.

We find that this objective evidence is entitled to little weight. With respect to Patent Owner's contention that the invention of the '394 patent launched an entire category of airbeds, the evidence of record does not support the contention. Although Patent Owner directs us to paragraphs 15, 16, and 44-53 in Dr. Becker's declaration, we do not discern, and Patent Owner does not adequately explain, how this testimony supports the contention that the '394 patent launched an entire category [\*77] of airbeds. *See* PO Resp. 73; Ex. 2638 PP 15-16 (discussing Walmart products and sales), 44-53 (discussing Walmart sales and licensing).

As to Patent Owner's contention that Petitioner's witnesses testified about the value of the '394 patented invention (PO Resp. 73), we afford this assertion no weight, as it is not supported by record evidence or improperly incorporates by reference argument from a declarant. To support its contention, Patent Owner references a large number of paragraphs from its declarants' testimony--paragraph 46 of Dr. Becker's declaration and paragraphs 241, 248-254, 282, and 283 of Dr. Stevick's declaration--but provides no further explanation. *See* PO Resp. 73 (referencing Ex. 2638 P 46; Ex. 2429 PP 241, 248-254, 282, 283); Ex. 2638 P 46; Ex. 2429 PP 241, 248-254, 282, 283. Based on our review of the referenced evidence, we find that it does not support Patent Owner's contention.

Patent Owner also contends that "[c]ompanies specifically tout the patented technology in their advertisements, including box art and photos highlighting the patented design," to support its position that the large sales experienced by their product was due to the patented technology. *See* PO Resp. 73 (citing Ex. 2429 PP 219, 242-245; Exs. 2653, 2680-2687). The evidence relied on by Patent Owner is directed to the term "built-in pump" generally. Although inflation and deflation are mentioned in some of this evidence, Patent Owner fails to explain adequately how these references are tied to features recited in the Challenged Claims, such as the movable air conduit. Because Patent Owner's argument is unsupported by the evidence of record, it is not given any weight. PO Resp. 73 (citing Ex. 2429 PP 219, 242-245; Exs. 2653, 2680-2687).

Patent Owner's evidence of large sales merely attempts to repackage commercial success as a different indicium of nonobviousness--broad acceptance by consumers. We address commercial success in its own subsection, above.

Finally, we give little weight to the settlement agreement in the context of this indicium. Patent litigation [\*78] provides risk and uncertainty for a party and settlement represents a way to reduce that risk and uncertainty, independent of any value the parties place on the patented invention. *See* [\*Bosch Auto., 878 F.3d at 1038 \(Fed. Cir. 2017\)\*](#) ("[L]icensing, without more, is generally not a strong indication of nonobviousness if it cannot also be shown that the licensees did so out of respect for the patent rather than to avoid litigation expense."). Here, Patent Owner fails to explain adequately how respect for the Challenged Claims--rather than avoiding litigation's expense and risk--led to the settlement agreement.

In conclusion, we give the objective evidence associated with the indicia of nonobviousness for broad acceptance, industry praise, and licensing little weight.

### *Long-felt Need*

Evidence of a long-felt but unsolved need tends to show nonobviousness because it is reasonable to infer that the need would have not persisted had the solution been obvious; however, "[a]bsent a showing of long-felt need or the failure of others, the mere passage of time without the claimed invention is not evidence of nonobviousness." See [\*Iron Grip Barbell Co. v. USA Sports, Inc.\*, 392 F.3d 1317, 1325 \(Fed. Cir. 2004\)](#).

Patent Owner contends that "[f]or decades the airbed industry sought after goals finally solved by the '394 patent , [\*79] i.e., recessed pump, holding air, not overheating, efficiently enabling powered inflation and deflation in a short amount of time without undue size, noise, or expense," but that no one "created a working, commercially viable product before" the '394 patent . PO Resp. 74 (citing Ex. 2429 PP 256-259). Patent Owner adds, without further explanation, that "Petitioner['s] own asserted motivations to combine are further proof that there was a need, but it was not met until the '394 patent ." *Id.*

Petitioner responds that Patent Owner's declarant identifies the alleged long-felt need as "consumer convenience," which differs from the need identified in the Patent Owner Response and which was satisfied in the prior art. Pet. Reply 30-31 (citing Ex. 1625 PP 100-106).

We afford this objective evidence little weight. Patent Owner offers no persuasive evidence of a long-felt need for an inflatable product with a recessed pump that holds air and does not overheat, efficiently enabling powered inflation and deflation in a short amount of time, without undue size, noise, or expense. Our review of the cited paragraphs of Dr. Stevick's testimony reveals that it merely describes prior art systems that differ from the Challenged Claims. See, e.g., Ex. 2429 PP 256-259. Dr. Stevick's testimony does not direct us to any evidence of Patent Owner's stated long-felt need or that others attempted to satisfy that need and failed. Indeed, as Petitioner points out, Dr. Stevick's testimony seems to be directed to an alleged long-term need for "consumer convenience related to the pump." See Pet. Reply 30; Ex. 2429 P 256 ("[T]here was a long-felt need for consumer convenience related to the pump."). We are persuaded by Petitioner's argument that Dr. Stevick does not offer any evidence that even this alleged need existed. Pet. Reply 30-31.

For example, Dr. Stevick alleges that "[t]he problem persisted for over 100 years before" Mr. Wang (the named inventor of the '394 patent ) solved the problem, but Dr. Stevick's testimony provides no evidentiary support that any problem existed. See Ex. 2429 P 257. Although Dr. Stevick testifies that others failed, his testimony does not adequately explain why the previous designs did not provide customer convenience (the problem his testimony is directed to) or that the prior art solutions discussed [\*80] even attempted to solve the problem of customer convenience. See *id.* Instead, Dr. Stevick's testimony merely recounts the passage of time until the filing of the application that matured into the '394 patent . See *id.*

In conclusion, we give the objective evidence associated with long-felt need little weight.

### *Skepticism of Others*



"Evidence of industry skepticism weighs in favor of non-obviousness. If industry participants or skilled artisans are skeptical about whether or how a problem could be solved or the workability of the claimed solution, it favors non-obviousness." [\*WBIP, LLC, 829 F.3d at 1335\*](#). Patent Owner contends that "[c]onventional wisdom taught away from the '394 patented design." PO Resp. 74 (citing Ex. 2429 PP 285-290). Patent Owner argues that advantages of detachable pumps include that they work with multiple beds, result in smaller deflated beds, have lower costs, have higher efficiencies, and avoid overheating. *Id.* Patent Owner argues that these concerns weigh against a built-in pump design and, despite these concerns, Mr. Wang invented the claimed technology. *Id.*

We afford objective evidence of this indicium very little weight. First, even if we take the asserted disadvantages as true, such statements do not necessarily amount to credible evidence of industry skepticism or rise to the level of teaching away from the Challenged Claims. Moreover, Patent Owner does not direct us to any persuasive evidence that the inflatable product industry was skeptical that a built-in pump with a movable air conduit could effectively be used with an inflatable product, such as an airbed.

Second, we afford Dr. Stevick's testimony with respect to industry skepticism very little weight. Ex. 2429 PP 285-287. We find nothing in Dr. Stevick's testimony in the cited paragraphs that directly addresses industry skepticism or teaching away from the Challenged Claims. Instead, this testimony merely identifies differences between the claimed inflatable product of the '394 patent and prior art inflatable products. *See, e.g.,* Ex. 2429 PP 285-287. Novelty over certain prior art does not equate to industry skepticism or an industry teaching away from a certain solution.

Paragraphs 288 and 289 of Dr. Stevick's [\*81] testimony allegedly recount conversations between Mr. Wang and his son, a general manager for Patent Owner. As Petitioner persuasively points out, however, we have no documentation of these conversations or any other corroborating evidence and, to the extent that Dr. Stevick accurately characterizes the conversations, the interests of these parties in the outcome of this proceeding causes us to discount their unsworn statements. *See* Pet. Reply 31 (arguing that Patent Owner "relies on uncorroborated, biased conversations its experts had with the named inventor and no other relevant evidence"). In conclusion, we give the objective evidence associated with skepticism of others very little weight.

### *Summary*

Weighing all of the objective evidence, we determine, on the complete record, that Patent Owner is entitled to some, but not considerable, weight in favor of nonobviousness.

### *(9) Conclusion*

For the reasons discussed above (§§ II.C.3.a.1-7), the evidence presented by Petitioner strongly indicates that claim 1 would have been obvious over Chaffee and Wu. For the reasons also discussed above (§ II.C.3.a.8), Patent Owner's objective evidence weighs only slightly in favor of nonobviousness. [\*82] When considering all of the evidence of obviousness and nonobviousness together ( *see In re Cyclobenzaprine Hydrochloride Extended-Release Capsule Patent Litig., 676 F.3d 1063, 1079 (Fed. Cir. 2012)*), we find Petitioner's strong evidence of obviousness outweighs Patent Owner's objective evidence of nonobviousness. Thus, we conclude that Petitioner has demonstrated by a preponderance of the evidence that claim 1 would have been obvious over Chaffee and Wu.

*b. Dependent Claims 2 and 3*

Claim 2 depends from claim 1, and recites "wherein air flows from the interior region of the housing into the inflatable body when the air conduit is in the first position." Ex. 1401, 8:40-42. Claim 3 depends from claim 1, and recites "wherein air flows from the inflatable body into the interior region of the housing when the air conduit is moved to the second position." *Id.* at 8:43-46. Petitioner states that Chaffee as modified by Wu satisfies the additional limitations in these claims. Pet. 58 (citing Ex. 1402 PP 227-230).

Referring to a portion of the discussion in the Petition of the "air conduit" limitation, Petitioner states that "when Wu's gate member 200 (the air conduit) is in the first, inflating position, it directs air into Chaffee's bladder 20" by "draw[ing] air into the interior region of Chaffee's Housing (the housing) and then direct[ing] the air to bladder 20 (the inflatable body) through outlet 120." Pet. 58-59 (citing Ex. 1402 PP 227-228) (referencing Pet. 49-52). Referring to another portion of the discussion of the "air conduit" limitation, Petitioner states that "when Wu's gate member 200 is in the second position, it directs air out of Chaffee's bladder 20, by drawing air into the interior region of Chaffee's Housing through outlet 120 and then exhausts that air to the atmosphere." Pet. 59 (citing Ex. 1402 PP 229-230) (referencing Pet. 53-56).

The record evidence, summarized above, supports Petitioner's position as to the limitations in these claims, which we adopt as our own. We find, based on the complete record, that Petitioner has demonstrated by a preponderance of the evidence that Chaffee as modified by Wu satisfies the limitations in claims 2 and 3. Patent Owner does not present arguments addressing these claims. We determine, based on the complete record, that Petitioner has demonstrated [\*83] by a preponderance of the evidence that claims 2 and 3 would have been obvious based on Chaffee and Wu.

*c. Dependent Claims 4-6*

Claim 4 depends from claim 1, and recites "wherein the air conduit is a pipe." Ex. 1401, 8:47-48. Claim 5 depends from claim 4, and recites "wherein the pipe is rotatable." *Id.* at 8:49-50. Claim 6 depends from claim 4, and recites "wherein the pipe is a switching pipe." *Id.* at 8:51-52. Petitioner states that Chaffee as modified by Wu satisfies the additional limitations in these claims. Pet. 59 (citing Ex. 1402 PP 231-244).

As to claim 4, Petitioner refers to the discussion in the Petition of the "air conduit" limitation and states that "Wu's gate member 200 is a movable air conduit." Pet. 59 (citing Ex. 1402 PP 232) (referencing Pet. 43-56). Petitioner also provides the following annotated version of Figure 2 of Wu, with orange and blue overlay added to portions of gate member 200.

Pet. 60. Figure 2 depicts a perspective view of rotary valve 100. Ex. 1405, 2:36-37, 4:60-61. According to Petitioner, "[u]nder any reasonable construction of the term, Wu's gate member 200 is a pipe . . . as it is described as a tubular or cylindrical object, part, or passage, as shown in Figure 2, [above]." <sup>30</sup> Pet. 59 (citing Ex. 1405, 5:10-14 (referring to "circular" end walls 210 and 212 and "cylindrical" wall 216), 5:30, 5:35-36, Fig. 2; Ex. 1402 PP 233-237; Exs. 1468, 1469).

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<sup>30</sup> The Texas District Court construed "pipe" as "a tubular or cylindrical object, part, or passage." Ex. 1475, 14-16. In the Texas Litigation, Petitioner (and other parties) proposed to construe "pipe" as "a hollow body for conveying air or other gases." *Id.* at 14.

Although we need not determine the full scope of the term "pipe" in the context of this proceeding, we agree with Petitioner (and the Texas District Court) that the term "pipe" *at least includes* a tubular or cylindrical object, part, or passage. The record evidence, summarized above, supports Petitioner's position as to the limitation in this claim, which we adopt as our own. We find, based on the complete record, that Petitioner has demonstrated by a preponderance of the evidence that [\*84] gate member 200 in Wu falls within that understanding of the term "pipe."

As to claims 5 and 6, Petitioner states that "Wu's gate member 200 is also rotatable (Claim 5) and a switching pipe (Claim 6)." Pet. 60 (citing Ex. 1402 PP 238-244; Ex. 1405, 5:9-10 (describing gate member 200 as "rotat[ing] within valve housing 101"), 6:5 (describing gate member 200 as being "turned" to a specific position), 4:53; Exs. 1468, 1469). "That is," according to Petitioner, "Wu described gate member 200 (the pipe, Claim 4) as switching, by rotation, between two positions for an inflate mode and a deflate mode (Claims 5 and 6)." Pet. 60.

The record evidence, summarized above, supports Petitioner's position as to the limitations in these claims, which we adopt as our own. We find, based on the complete record, that Petitioner has demonstrated by a preponderance of the evidence that Chaffee as modified by Wu satisfies the limitations in claims 4-6. Patent Owner does not present arguments addressing these claims. We determine, based on the complete record, that Petitioner has demonstrated by a preponderance of the evidence that claims 4-6 would have been obvious based on Chaffee and Wu.

*d. Dependent Claim 7*

Claim 7 depends from claim 1, and recites "wherein the air conduit is arranged to convey air pumped by the fan and motor assembly." Ex. 1401, 8:53-55. Petitioner states that Chaffee as modified by Wu satisfies the additional limitation in this claim. Pet. 61 (citing Ex. 1402 P 245). Petitioner refers to the discussions in the Petition of the "air conduit" limitation and the "wherein" limitation, and state that "gate member 200 (the air conduit) conveys air pumped by Wu's blower 15 (the fan and motor) in both the inflate mode and deflate mode." *Id.* (citing Pet. [\*85] 43-58; Ex. 1402 P 245; Ex. 1405, 5:44-48, 5:56-6:4, 6:8-16).

The record evidence, summarized above, supports Petitioner's position as to the limitation in this claim, which we adopt as our own. We find, based on the complete record, that Petitioner has demonstrated by a preponderance of the evidence that Chaffee as modified by Wu satisfies the limitation in claim 7. Patent Owner does not present arguments addressing this claim. We determine, based on the complete record, that Petitioner has demonstrated by a preponderance of the evidence that claim 7 would have been obvious based on Chaffee and Wu.

*e. Dependent Claims 8 and 9*

Claim 8 depends from claim 7, and recites "wherein the air conduit has a first end and a second end, and wherein the fan and motor assembly causes air to be conveyed from the first end of the air conduit to the second end of the air conduit when the air conduit is in the first position." Ex. 1401, 8:56-60. Claim 9 depends from claim 8, and recites "wherein the fan and motor assembly causes air to be conveyed in sequence from ambient, through the first end of the air conduit, to the second end of the air conduit, and into the inflatable body when the air conduit is in the first position." [\*86] *Id.* at 8:61-65. Petitioner states that Chaffee as modified by Wu satisfies the additional limitations in these claims. Pet. 61 (citing Ex. 1402 PP 246-256).

Petitioner provides the following annotated version of Figure 2 of Wu, with blue overlay added to the identified "first end" and green overlay added to the identified "second end" of gate member 200.

Pet. 61-62 (citing Ex. 1405, 5:9-14, Fig. 2; Ex. 1402 PP 246-247). Figure 2 depicts a perspective view of rotary valve 100. Ex. 1405, 2:36-37, 4:60-61. Citing portions of the description of the inflating configuration in Wu as well as portions of the discussion of the "air conduit" limitation in the Petition, Petitioner explains how Chaffee as modified by Wu satisfies the airflow pathways recited in these claims. See Pet. 61-63 (citing Ex. 1405, 5:9-14, 5:60-6:4, Fig. 2; Ex. 1402 PP 246-256; Exs. 1468, 1470; Pet. 49-52).

The record evidence, summarized above, supports Petitioner's position as to the limitations in these claims, which we adopt as our own. We find, based on the complete record, that Petitioner has demonstrated by a preponderance of the evidence that Chaffee as modified by Wu satisfies the limitations in claims 8 and 9. Patent Owner does not present arguments addressing these claims. We determine, based on the complete record, that Petitioner has demonstrated by a preponderance of the evidence that claims 8 and 9 would have been obvious based on Chaffee and Wu.

*f. Dependent Claims 10 and 11*

Claim 10 depends from claim 8, and recites "wherein the fan and motor assembly causes air to be conveyed from the second end of the air conduit to the first end of the air conduit when the air conduit is in the second position." Ex. 1401, 8:66-9:2. Claim 11 depends from claim 10, and recites "wherein the fan and motor assembly causes air to be conveyed in sequence from the inflatable body, [\*87] through the second end of the air conduit, to the first end of the air conduit, to ambient when the air conduit is in the second position." *Id.* at 9:3-7. Petitioner states that Chaffee as modified by Wu satisfies the additional limitations in these claims. Pet. 63 (citing Ex. 1402 PP 257-266).

Petitioner provides the same annotated version of Figure 2 of Wu shown in the discussion of claims 8 and 9 above. Compare Pet. 65, with *id.* at 62. Citing portions of the description of the deflating configuration in Wu as well as portions of the discussion in the Petition of the "air conduit" limitation, Petitioner explains how Chaffee as modified by Wu satisfies the airflow pathways recited in these claims. See *id.* at 63-65 (citing Ex. 1405, 6:10-22, Fig. 2; Ex. 1402 PP 257-266; Exs. 1469, 1470; Pet. 53-56).

The record evidence, summarized above, supports Petitioner's position as to the limitations in these claims, which we adopt as our own. We find, based on the complete record, that Petitioner has demonstrated by a preponderance of the evidence that Chaffee as modified by Wu satisfies the limitations in claims 10 and 11. Patent Owner does not present arguments addressing these claims. We determine, based on the complete record, that Petitioner has demonstrated by a preponderance of the evidence that claims 10 and 11 would have been obvious based on Chaffee and Wu.

*g. Dependent Claim 12*

Claim 12 depends from claim 1, and recites "wherein the fan and motor are received in the housing." Ex. 1401, 9:8-9. Referring to the discussion in the Petition of the "air conduit" limitation, Petitioner states that, in the context of the proposed modification, "Wu's rotary valve 100 and blower 15 (the fan and motor) would be contained in Chaffee's Housing . . . particularly because Chaffee described the Housing as

'surround[ing] the inner workings of the pump.'" Pet. 65-66 (quoting Ex. 1406, 4:18-19) (citing Ex. 1406, Fig. 5; Ex. 1402 PP 267-268) (referencing Pet. 43-56).

The record evidence, summarized above, supports Petitioner's position [\*88] as to the limitation in this claim, which we adopt as our own. We find, based on the complete record, that Petitioner has demonstrated by a preponderance of the evidence that Chaffee as modified by Wu satisfies this limitation. Patent Owner does not present arguments addressing this claim. We determine, based on the complete record, that Petitioner has demonstrated by a preponderance of the evidence that claim 12 would have been obvious based on Chaffee and Wu.

#### *h. Claims 16-23*

For independent claim 16 and claims 17-23, which depend from claim 16, Petitioner references its positions with respect to claims 1-9, 11, and 12. *See* Pet. 66 (citing Ex. 1402 PP 269-284; Pet. 32-66). For the same reasons discussed above, we find that Chaffee as modified by Wu satisfies the limitations of these claims. Patent Owner does not present arguments addressing these claims aside from the arguments discussed above as to claim 1. We determine, based on the complete record, that Petitioner has demonstrated by a preponderance of the evidence that claims 16-23 would have been obvious based on Chaffee and Wu.

#### *D. Asserted Obviousness of Claims 1-12 and 16-23 Based on Chaffee, Scott, and Pisante*

Petitioner asserts that claims 1-12 and 16-23 of the '394 patent are unpatentable under [35 U.S.C. § 103\(a\)](#) based on Chaffee, Scott, and Pisante. Pet. 23, 67-92; Pet. Reply 23-25. Patent Owner provides arguments specifically addressing this asserted ground of unpatentability. PO Resp. 58-67; PO Sur-Reply 19-21. We begin our analysis with an overview of the asserted prior art and then address the parties' specific contentions. In this ground, Petitioner relies on Scott and Pisante, in addition to Chaffee (summarized above ( *see supra* § II.C.1)).<sup>31</sup>

##### *1. Scott*

Scott relates [\*89] "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." Ex. 1412, 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. 1412, 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.

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<sup>31</sup> We understand Petitioner to have intended to state "Chaffee + Scott + Pisante" rather than "Chaffee + Scott + Parienti" in the table summarizing the asserted grounds. Pet. 23. In the context of this ground, Petitioner relies on Pisante for claims 4-6 and 8-11, which depend, directly or indirectly, from claim 1. *See* Pet. 67-92.

Scott discloses an exemplary one-directional pump for inflating and deflating a bladder [\*90] in its Figure 12, which we reproduce below.

Figure 12 depicts "a pneumatic schematic of a modified form of the air delivery system of" Scott's invention. Ex. 1412, 2:49-50. Air delivery system 28E <sup>32</sup> 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 the valve 68 and pump 30 to atmosphere. *Id.* at 5:53-56. In operation, the 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. 1412, 5:62-66. In Figure 12, this configuration corresponds [\*91] 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. 1471 (providing an animation as to Scott's Figure 12).

## 2. Pisante

Pisante relates to a small device in which a one-direction pump can be used, alternatingly, for blowing air or suction. Ex. 1472, 21:5-7. <sup>33</sup>

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. 1472, 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. 1472, 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 [\*92] 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.

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<sup>32</sup> Scott's Figure 12 mistakenly identifies the air delivery system as "78E." *Compare* Ex. 1412, Fig. 12, *with id.* at 5:45-6:2; *see also* Pet. 69 n.9 (noting same mistake).

<sup>33</sup> Exhibit 1472 includes both the original French publication and a certified translation in English. *See, e.g.*, Ex. 1472, 39-40 (providing the translator's declaration). When citing to Pisante, we cite to the page number (and, in some instances, line numbers following a colon) of Exhibit 1472 provided by Petitioner.

### 3. Analysis

#### a. Independent Claim 1

Petitioner contend that the combination of Chaffee and Scott (but not Pisante) satisfies each of the limitations of claim 1. Pet. 67-75 (addressing claim 1 but not discussing Pisante). To support its arguments, Petitioner identifies certain passages in the cited references and explains the significance of each passage with respect to the corresponding claim limitation. *Id.* Petitioner also identifies reasons why one of ordinary skill in the art at the time of the invention would have been motivated to modify Chaffee based on Scott. *Id.* at 68-69, 72. We address in turn below the subject matter of each limitation in claim 1, then Petitioner's identified reasons to modify Chaffee based on Scott, and then objective evidence of nonobviousness.

##### (1) The "Inflatable Body" Limitation

To address the "inflatable body" limitation for this asserted ground, Petitioner again relies on Chaffee and refers to its analysis of this limitation in the prior ground. Pet. 67 (citing, *inter alia*, Pet. 32-33; Ex. 1402 P 292). For the same reasons as above ( *see supra* § II.C.3.a.1), we find, based on the complete record, that Petitioner has demonstrated by a preponderance of the evidence that Chaffee discloses the "inflatable [\*93] body" limitation. Patent Owner does not present arguments for this limitation.

##### (2) The "Fan and Motor" Limitation

Referring back to the annotated version of Figure 5 of Chaffee shown below and to the discussion in the Petition of the "fan and motor" limitation in the context of the prior asserted ground, Petitioner states (1) "Chaffee's pump 81 includes a motor 84 and impeller 86 (a fan and motor)" and (2) "Chaffee described this motor 84 and impeller 86 as being part of a Reversible Pump Assembly." Pet. 67-68 (citing Ex. 1402 PP 293, 294; Ex. 1406, 3:62-67, Fig. 5) (referencing Pet. 33-38).

Pet. 34. Figure 5 depicts a cross-sectional view of one embodiment of fluid controller 80. *See* Ex. 1406, 2:38-39. In the annotated version of Figure 5 above, Petitioner added (1) a text box identifying element 84 as a "Motor," (2) a text box identifying element 86 as an "Impeller," (3) a text box identifying element 81 as a "Pump," (4) a text box identifying element 20 as a "Bladder," (5) an orange overlay to motor 84, and (6) a blue overlay to impeller 86. Pet. 34.

Petitioner asserts that a person of ordinary skill in the art at the time of the invention "would have been motivated to convert Chaffee's Reversible Pump Assembly into a Uni-directional Pump Assembly." Pet. 68. According to Petitioner, one of ordinary skill in the art "would have known how, and would have been motivated, to adapt Chaffee's motor 84 and impeller 86 to take advantage of the favorable characteristics that accompany a Uni-directional Pump Assembly design" for reasons we will discuss below ( *see infra* § II.D.3.a.7). Pet. 68 (citing Ex. 1402 P 295) (referencing Pet. 43-56). Petitioner states that "Scott provided a teaching of a Uni-directional Pump Assembly" in that Scott discloses "an air delivery system 28E including a 'single, one-directional pump' 30 and 'two-position, four-way valve 68' (i.e., a Uni-directional Pump Assembly)." Pet. 69 (citing Ex. 1412, 1:58, 5:49-50; Ex. 1402 PP 129, 130, 297).

The record evidence, summarized above, supports Petitioner's position [\*94] as to this limitation, which we adopt as our own. We find, based on the complete record, that Petitioner has demonstrated by a



preponderance of the evidence that Chaffee as modified by Scott discloses the subject matter of the "fan and motor" limitation. Patent Owner does not dispute that Chaffee as modified by Scott discloses the subject matter of this limitation.<sup>34</sup>

### (3) *The "Interior Region" Limitation*

To address the "interior region" limitation for this asserted ground, Petitioner again relies on Chaffee and refers to its analysis of this limitation in the prior ground. Pet. 67 (citing, *inter alia*, Pet. 38-40; Ex. 1402 P 292). For the same reasons as above ( *see supra* § II.C.3.a.3), we find, based on the complete record, that Petitioner has demonstrated by a preponderance of the evidence that Chaffee discloses this limitation. Patent Owner does not present arguments for this limitation.

### (4) *The "Built Into" Limitation*

To address the "built into" limitation for this asserted ground, Petitioner again relies on Chaffee and refers to its analysis of this limitation in the prior ground. Pet. 67 (citing, *inter alia*, Pet. 40-43; Ex. 1402 P 292). Patent Owner relies on its arguments addressing this limitation in the prior ground. *See* PO Resp. 66 (arguing that "neither Scott nor Pisante makes up for the deficiencies of Chaffee with respect to" this limitation), 66-67 (citing Ex. 2429 PP 166-169) (arguing that, "even were it proper to combine the teachings of Chaffee and Scott/Pisante (it is not), that combination would still not result in a device having 'a housing built into the inflatable body' as all of the Challenged Claims require"). For the same reasons as above ( *see supra* § II.C.3.a.4), we find, based on the complete record, that Petitioner has demonstrated by a preponderance of the evidence that Chaffee discloses this limitation.

### (5) *The "Air Conduit" Limitation*

Petitioner relies on Chaffee as modified by Scott to satisfy this limitation. Pet. 69 (citing Ex. 1402 PP 296-299).<sup>35</sup> Petitioner refers back to the discussion of the "air conduit" limitation in the Petition for the prior asserted ground, and states that one of ordinary skill in the art "would have been motivated to convert Chaffee's Reversible Pump Assembly into a 'Unidirectional Pump Assembly'" for reasons we will discuss below ( *see infra* § II.D.3.a.7). Pet. 69 (citing Ex. 1402 P 297) (referencing Pet. 43-56). Petitioner states that "Scott provided a teaching of a Uni-directional Pump Assembly" in that Scott discloses "an air delivery system 28E including a 'single, one-directional pump' 30 and 'two-position, four-way valve 68' (i.e., a Uni-directional Pump Assembly)." Pet. 69 (citing Ex. 1412, 1:58, 5:49-50; Ex. 1402 PP 129, 130, 297).

Petitioner provides the annotated version of Figure 12 of Scott below, and states that, "[i]n valve 68's first position (outlined in blue), air delivery system 28E 'inflate[s] bladder 22,' and, in valve 68's second position (outlined in green), air delivery system 28E 'deflate[s] the bladder 22.'" Pet. 69-70 (quoting Ex. 1412, 5:57, 5:62) (citing Ex. 1402 PP 129-130).

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<sup>34</sup> We address below Patent Owner's arguments that one of ordinary skill in the art would not have modified Chaffee based on Scott as proposed. *See infra* § II.D.3.a.7.

<sup>35</sup> Although Petitioner states that "Chaffee, as modified by Wu, disclose[s] this limitation" (Pet. 69), based on the remainder of the discussion ( *id.* at 69-75), we understand Petitioner to rely on Chaffee as modified by Scott for this limitation.

Pet. [\*95] 70. Figure 12 depicts "a pneumatic schematic of a modified form of the air delivery system of" Scott's invention. Ex. 1412, 2:49-50. In the annotated version of Figure 12, Petitioner added text boxes identifying (1) element 68 as a "Valve" and (2) element 30 as a "Pump" and also added a blue outline and a green outline to the upper and lower portions, respectively, of valve 68. Pet. 70.

Petitioner also provides the following additional annotated version of Figure 12 of Scott:

Pet. 72. Figure 12 depicts "a pneumatic schematic of a modified form of the air delivery system of" Scott's invention. Ex. 1412, 2:49-50. In this annotated version of Figure 12, Petitioner added (1) a text box identifying element 68 as a "Valve" and (2) a gray dotted outline and text box identifying a "Housing." Pet. 72. According to Petitioner, "[i]n converting Chaffee's pump 81[]in view of Scott, [one of ordinary skill in the art] would have maintained Chaffee's Housing-contained design ( *see* [Pet. 38-43]), such that the movable air conduit (i.e., such as Scott's valve 68) was disposed inside Chaffee's Housing (represented in Scott's Figure 12, above, in gray)" (Pet. 72 (citing Ex. 1402 PP 302, 306)) for reasons we will discuss below ( *see infra* § II.D.3.a.7). Pet. 72 (citing Ex. 1402 PP 302, 306) (referencing Pet. 47-49).<sup>36</sup>

Petitioner also provides the following additional annotated version of Figure 12 of Scott:

Pet. 73. Figure 12 depicts "a pneumatic schematic of a modified form of the air delivery [\*96] system of" Scott's invention. Ex. 1412, 2:49-50. In this annotated version of Figure 12, Petitioner added (1) text boxes identifying element 68 as a "Valve" and element 30 as a "Pump," (2) a blue outline and a green outline to the upper and lower portions, respectively, of valve 68, (3) a gray dotted outline and text box identifying a "Housing," and (4) blue lines showing the direction of air flow. Pet. 73. Referring to this annotated version of Figure 12, Petitioner states "Scott's valve 68 is shown 'in its normal first position [outlined in blue] in which the pump inlet 34 is in communication through valve 68 with atmosphere, and the outlet conduit 36 is open through the valve 68.'" Pet. 73 (quoting Ex. 1412, 5:50-53). According to Petitioner, "[i]n this position, when Chaffee's fan and motor is actuated 'air [blue arrows] flow[s] into' Chaffee's bladder 20 to inflate it." Pet. 73 (quoting Ex. 1412, 5:59-60) (citing Ex. 1402 P 305).

Petitioner also provides the following additional annotated version of Figure 12 of Scott:

Pet. 75. Figure 12 depicts "a pneumatic schematic of a modified form of the air delivery system of" Scott's invention. Ex. 1412, 2:49-50. In this annotated [\*97] version of Figure 12, Petitioner added (1) text boxes identifying element 68 as a "Valve" and element 30 as a "Pump," (2) a blue outline and a green outline to the upper and lower portions, respectively, of valve 68, (3) a gray dotted outline and text box identifying a "Housing," and (4) blue lines showing the direction of air flow. Pet. 73. Importantly, Petitioner also altered the location of valve 68 with respect to the rest of the structures shown. *Compare* Pet. 75, *with* Ex. 1412, Fig. 12; *see* Pet. 74 n.11 (explaining this alteration).

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<sup>36</sup> With the reference to "Chaffee's Housing," we understand Petitioner to again refer to elements 82, 83, and 90, as discussed in the context of the asserted ground of Chaffee and Wu. *See* Pet. 38-40.

Referring to this annotated version of Figure 12, Petitioner states that "valve 68 can be 'actuated to its second position [outlined in green] to 'deflate' Chaffee's bladder 20." Pet. 74 (quoting Ex. 1412, 5:62-63). According to Petitioner, "[i]n this second position, 'pump inlet 34 is now in communication with the [bladder 20] through the now open pump inlet conduit 40' and 'pump outlet 32 is in communication through the valve 68 to atmosphere' to deflate Chaffee's bladder 20." Pet. 74 (quoting Ex. 1412, 5:62-66) (citing Ex. 1402 PP 309, 310). Petitioner states: "In short, Chaffee, as modified in view of Scott, disclose[s] this limitation, as a movable air conduit (Scott's valve 68) is disposed at least in part in Chaffee's Housing (the housing) when the conduit occupies a first position for inflation and a second position for deflation." Pet. 75 (citing Ex. 1402 PP 311, 312).

The record evidence, summarized above, supports Petitioner's position as to this limitation, which we adopt as our own. We find, based on the complete record, that Petitioner has demonstrated by a preponderance of the evidence that Chaffee as modified by Scott discloses the subject matter of the "air conduit" limitation. Patent Owner does not dispute that Chaffee as modified by Scott discloses the subject matter of this limitation.<sup>37</sup>

#### (6) *The "Wherein" Limitation*

To address the "wherein" limitation for this asserted ground, Petitioner refers to its analysis of this limitation in the prior ground. Pet. 67 (citing, *inter alia*, Pet. 56-58; Ex. 1402 P 292). For the same reasons as above ( [\*98] *see supra* § II.C.3.a.6), we find, based on the complete record, that Petitioner has demonstrated by a preponderance of the evidence that Chaffee as modified by Scott satisfies this limitation. Patent Owner does not present arguments for this limitation.

#### (7) *The Asserted Reasons to Modify Chaffee with Scott*

As discussed above, Petitioner presents two different aspects of the proposed modification of Chaffee based on Scott: (1) converting Chaffee's Reversible Pump Assembly with to a Uni-directional Pump Assembly based on Scott ( *see, e.g.*, Pet. 67-69, *discussed supra* §§ II.D.3.a.2, II.D.3.a.5) and (2) maintaining "Chaffee's Housing-contained design" in the proposed modified device ( *see, e.g.*, Pet. 72-73, *discussed supra* § II.D.3.a.5). We discuss these two aspects in turn below.

#### *Converting Chaffee's Reversible Pump Assembly to a Uni-directional Pump Assembly Based on Scott*

According to Petitioner, one of ordinary skill in the art at the time of the invention "would have been motivated to convert Chaffee's Reversible Pump Assembly into a Uni-directional Pump Assembly" and "would have known how, and would have been motivated, to adapt Chaffee's motor 84 and impeller 86 to take advantage of the favorable characteristics that accompany a Uni-directional Pump Assembly design" for the same reasons that one of ordinary skill in the art would have used [\*99] a unidirectional pump assembly in place of the reversible pump assembly in Chaffee discussed in the context of the prior asserted ground--"i.e., spatial efficiency, energy efficiency, cost, and weight." Pet. 68 (citing Pet. 43-56; Ex. 1402 P 295). Petitioner argues that one of ordinary skill in the art "would have known that a Uni-directional Pump Assembly could produce the same amount of volume flow with a smaller, single direction motor by optimizing the blades of the impeller for the single direction of rotation." *Id.* (citing

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<sup>37</sup> We address below Patent Owner's arguments that one of ordinary skill in the art would not have modified Chaffee based on Scott as proposed. *See infra* § II.D.3.a.7.

Ex. 1410, Figs. 23-30, 12:5-21; Ex. 1405, Fig. 1, 2:45-57; Ex. 1412, 1:46-2:2; Ex. 1472, Fig. 1, 7:14-17; Ex. 1474, 9-10; Ex. 1402 P 295). For the reasons discussed below, we determine that the record here supports Petitioner's assertion that one of ordinary skill in the art would have converted Chaffee's reversible pump assembly to a unidirectional pump assembly at least for increased energy efficiency. *See* Pet. 68-69 (citing Ex. 1402 PP 295, 297)).

As an initial matter, we provide our understanding of the proposed modification (as also provided in the Decision on Institution). *See* Dec. Inst. 55-56. We agree with Patent Owner that the modified device includes valve 68 of Scott, but we do not agree with Patent Owner that the proposed [\*100] conversion of "Chaffee's Reversible Pump Assembly into a Uni-directional Pump Assembly" (Pet. 68) *precedes* incorporating valve 68 from Scott. *Cf.* PO Resp. 59 ("Dr. Beaman's declaration clarifies that what Petitioner[ is] really advocating is that [one of ordinary skill in the art] would have been motivated to *convert* Chaffee's reversible pump into a uni-directional pump as allegedly suggested by Scott ( *see* Beaman Decl., Ex. 1402 at PP293-295, 297) and then *incorporate* Scott's control valve 68 into the converted pump assembly to meet the movable air conduit limitations of the Challenged Claims ( *see* Beaman Decl., Ex. 1402 at P298)." (underlining added)).

Instead, we understand the proposed conversion of "Chaffee's Reversible Pump Assembly into a Uni-directional Pump Assembly" (Pet. 68) to *include* incorporating valve 68 from Scott. This understanding is supported by the testimony of Dr. Beaman, who states that one of ordinary skill in the art "would have recognized that incorporating a directional control valve, like Scott's valve 68, into Chaffee's pump 81 would have allowed for this conversion" and that:

in the conversion, [one of ordinary skill in the art] would have known that Chaffee's modified motor [\*101] 84 and impeller 86 assembly would be functionally arranged as shown in the schematic of Scott's Figure 12, below, inside Chaffee's Housing (represented by gray dashed lines)--that is, Chaffee's modified motor 84 and impeller 86 would be located, schematically, where Scott's pump 30 is located schematically.

Ex. 1402 P 298.

We turn now to Patent Owner's arguments addressing this aspect of the proposed modification. First, Patent Owner argues that "[t]o summarily conclude without separate analysis that [one of ordinary skill in the art] would be motivated to combine Chaffee and Scott (or change the design of Chaffee based on suggestions in Scott) for the same reasons [one of ordinary skill in the art] would be motivated to combine Chaffee with Wu, is the epitome of hindsight reconstruction and improper." PO Resp. 59-60. Patent Owner states that "if those reasons are to be considered, then for the same reasons set forth [at pages 35-51 of the Patent Owner Response, regarding the asserted ground of] Chaffee and Wu, there would likewise be no motivation to combine Chaffee with Scott." PO Resp. 60.

Although the discussion of the reasons to modify Chaffee in view of Wu does, in some instances, [\*102] refer specifically to Wu ( *see* Pet. 43-46, 48-49), we view the reasons provided by Petitioner for both aspects of the proposed modification--e.g., increased energy efficiency and durability, respectively--as design considerations that adequately support the similar proposed modifications in the alternative ground here. In the discussion of this issue in the Decision on Institution, we stated: "To the extent Patent Owner views certain *specific* reasons provided by Petitioner[] in the context of the asserted ground based on

Chaffee and Wu as inapplicable in the context of the ground based on Chaffee and Scott, Patent Owner should specifically address those issues, as appropriate, during trial." Dec. Inst. 57. To the extent Patent Owner did so, we address those arguments below.

Second, Patent Owner repeats the argument made in the context of prior asserted ground that one of ordinary skill in the art "would appreciate that Scott's Efficiency Statement . . . is about producing the same amounts of air pressure and volume flow for both directions of a reversible pump, which is not a requirement for reversible pumps connected to air mattresses." PO Resp. 60 (citing Ex. 2429 P 153) (referencing PO Resp. 38-40 [\*103] ("Section V.A.3.b."); *compare* PO Resp. 60-61, with [id. at 38-39](#). For the same reasons discussed above ( *see supra* pp. 52-53), we are persuaded by Petitioner's position that this argument by Patent Owner is unsupported. Pet. Reply 18.

Third, Patent Owner contends as "misleading" Petitioner's statement that one of ordinary skill in the art "would have known that a Unidirectional Pump Assembly could produce the same amount of volume flow with a smaller, single direction motor by optimizing the blades of the impeller for the single direction of rotation." Pet. 68, *discussed at* PO Resp. 61. Patent Owner states that "it is true that by optimizing the impeller for one direction of rotation a smaller motor could be used to achieve a given air pressure and volume flow," but asserts that "it is also true that **both** a reversible pump (Chaffee) **and** a one-directional pump (Scott) could achieve the same air pressure and volume flow for inflation using smaller motors." PO Resp. 62. Patent Owner contends that one of ordinary skill in the art "would appreciate that if one were to choose to optimize inflation or deflation, the [person of ordinary skill] would choose to optimize inflation" and that "Chaffee teaches that its pump design can be optimized [\*104] in this very fashion, further undermining any motivation for [one of ordinary skill in the art] to instead combine it with Scott or Pisante." *Id.* (citing Ex. 1406, 4:29-36; Ex. 2429 P 157).

Petitioner responds that Patent Owner "does not appear to dispute the benefits that would result from this modification, as [Patent Owner] admits that 'it is true that by optimizing the impeller for one direction of rotation a smaller motor could be used to achieve a given air pressure and volume flow.'" Pet. Reply 23 (quoting PO Resp. 61-62) (citing Ex. 2429 P 156; Ex. 1625 P 79). Petitioner states: "As Scott teaches, the result is a smaller, more efficient, cheaper, and lighter pump assembly." *Id.* (citing Ex. 1412, 1:33-56; Ex. 1625 P 79).

We are persuaded by Petitioner's argument that Patent Owner acknowledges the benefit of converting Chaffee's reversible pump assembly to a unidirectional pump assembly. This understanding is supported by the testimony of both Dr. Stevick and Dr. Beaman. *See* Ex. 2429 P 156 (repeating Patent Owner's statement that "it is true that by optimizing the impeller for one direction of rotation a smaller motor could be used to achieve a given air pressure and volume flow"); Ex. 1625 P 79 ("It appears that Dr. Stevick (and Patent Owner) do not dispute [\*105] the benefits that would result from this modification, as Dr. Stevick (and Patent Owner) admits that 'it is true that by optimizing the impeller for one direction of rotation a smaller motor could be used to achieve a given air pressure and volume flow.'").

Patent Owner thus acknowledges the benefit of the proposed modification but argues that one of ordinary skill in the art would have *instead* optimized Chaffee *in another way*. *See* PO Resp. 61-62. The issue, however, is not whether one of ordinary skill in the art *could have* optimized Chaffee *without* performing the proposed modification, but rather whether one of ordinary skill in the art *would have* modified Chaffee, as proposed, for the reasons provided by Petitioner. *See KSR, 550 U.S. at 420* (stating that "any need or problem known in the field of endeavor at the time of the invention and addressed by the

patent can provide a reason for combining the elements in the manner claimed"). Moreover, even assuming the "optimized" version of Chaffee discussed by Patent Owner (PO Resp. 62) is superior to the proposed modified device, that "better alternatives" may exist "does not mean that an inferior combination is inapt for obviousness purposes" ( [\*Moultet, 686 F.3d at 1334\*](#)).

Fourth, Patent Owner argues that Scott's [\*106] Efficiency Statement does not compare reversible pumps to a "Uni-directional Pump Assembly." See PO Resp. 62-66. Patent Owner argues that "[c]ontrary to Petitioner[s] repeated assertions, Scott doesn't suggest substituting a reversible pump for a 'Uni-directional Pump Assembly.'" *Id.* at 62. According to Patent Owner, "Scott's Efficiency Statement *compares* a reversible pump to a one-directional pump" and "Scott's comparison is of a reversible pump to the 'one-directional air pump 30' of his disclosure -- not to Petitioner[s] 'Uni-directional Pump Assembly.'" *Id.* at 62-63 (citing Ex. 1412, 1:40-45). Patent Owner argues that "Petitioner[], on the other hand, advocate[s] converting Chaffee's pump 81 to a 'Uni-directional Pump Assembly' -- a phrase coined by Petitioner[] to reference the components in the gray box" in the annotated version of Figure 12 of Scott above ( see *supra* p. 106). PO Resp. 63 (citing Pet. 69-71). Patent Owner also argues that "Petitioner[s] proposed combination is really not in accordance with the teachings of Scott at all" and that "Petitioner[is] selectively picking the portions of the Scott embodiment they like, and discarding the rest." *Id.* at 64 (emphasis omitted). For example, Patent Owner argues that [\*107] "Petitioner[] *exclude* [ s ] the check valve 70 which, as Scott states, is a necessary component in the system of F[igure] 12," but Petitioner has "not demonstrated that [its] 'Unidirectional Pump Assembly' would work without check valve 70." *Id.* at 64, 65. According to Patent Owner,

Petitioner[s] dissection of Scott FIG. 12 and [its] use of coined phrases and self-generated "design" tables bearing no resemblance to the claims or specific prior art (i.e., Table 1 (Petition, p. 21) and Table 2 (Petition, pp. 22-23)) are just a pretense for Petitioner[s] combination of Chaffee and Scott to perform hindsight reconstruction of the '394 invention.

*Id.* at 64-65 (citing Ex. 2429 PP 160-162).

As an initial matter, for the reasons discussed above ( see *supra* pp. 51-53), Patent Owner's argument focuses on a passage not relied on by Petitioner as to the energy efficiency rationale, we find it unpersuasive. Assuming that Patent Owner addressed a relevant aspect of Scott, however, we address Patent Owner's argument as to what Scott is comparing in the relevant teachings. We agree with Patent Owner that column 1, lines 40-45 focuses on comparing aspects of a "reversible pump" to a "one-directional pump." Ex. 1412, 1:40-45. For the energy efficiency rationale, [\*108] however, Petitioner relies on a different passage in Scott--column 1, lines 54 to 56 (Pet. 44-45). That passage provides: "It is a further advantage of the present invention, that the pump efficiency of a one-directional pump is greater than the efficiency of a reversible pump." Ex. 1412, 1:54-56. We are persuaded by Petitioner's argument that the "present invention" referenced in this passage includes valve structures necessary to perform the disclosed inflation and deflation. See Pet. Reply 24, 19 (citing Ex. 1625 P 57 ("There can be no dispute that Scott's 'present invention' includes a movable air conduit, like valve 68, as this one-directional pump cannot accomplish inflation *and* deflation without this feature.")); Ex. 1635, 521:9-14 (Dr. Stevick agreeing that Scott's "air delivery system" includes "the one-directional pump and the valve means").



Moreover, at least as to energy efficiency, we are persuaded by Petitioner's argument that "[e]ven if Scott was only referring to motorized pump 30 (i.e., to the exclusion of valve 68)," pump 30 "predominates the . . . energy consumption . . . of a Uni-directional Pump Assembly." Pet. Reply 17 (citing Ex. 1625 P 60; Ex. 1634, 133:17-134:14). This is supported [\*109] by the testimony of Dr. Beaman, who states that one of ordinary skill in the art "would have understood the . . . energy consumption . . . of the movable air conduit 68 [in Scott] to be negligible in comparison to motorized pump 30." Ex. 1625 P 60. Patent Owner does not address these points by Petitioner. *See generally* PO Sur-reply.

We turn now to Patent Owner's arguments regarding check valve 70 in Scott. *See* PO Resp. 64-65; *see also* Ex. 1412, Fig. 12 (showing check valve 70). Petitioner responds that one of ordinary skill in the art "would understand what is needed to prevent the modified device from leaking, and Scott's teaching of check valve 70 directly supports this finding." Pet. Reply 25 (citing Ex. 1625 PP 82, 83).

Patent Owner's arguments as to check valve 70 in Scott do not demonstrate a deficiency in this asserted ground. Although Petitioner appears to acknowledge that check valve 70 (or a similar structure) may be necessary in the context of the modified device, as noted by Petitioner, claim 1 does not recite a check valve (or similar requirement). *See* Tr. 41:12-20. Thus, the fact that Petitioner did not discuss that structure in Scott in the Petition as part of the modified device does not, by itself, undermine the asserted ground of unpatentability based on Chaffee and Scott.

Patent Owner argues that, if check valve 70 is included in the modified device, "the combination of references does not enjoy the advantages of reduced cost and spatial efficiency argued by Petitioner[]." PO [\*110] Sur-reply 21. Patent Owner does not, however, assert that the inclusion of check valve 70 undermines the *energy efficiency* rationale at issue. Moreover, even assuming that Patent Owner is correct that adding check valve 70 "would make the system more complex and considerably more expensive" ( *id.*), a proposed modification with *some* disadvantages "does not necessarily obviate motivation to combine." [\*Medichem, S.A. v. Rolabo, S.L.\*, 437 F.3d 1157, 1165 \(Fed. Cir. 2006\)](#).

Finally, Patent Owner's assertion of "hindsight" does not demonstrate a deficiency in this ground. *See* PO Resp. 65. Rather, Patent Owner's assertion is essentially a rewording of the argument regarding the alleged lack of a reason to modify, which we addressed above. *See In re Cree, Inc.*, [818 F.3d 694, 702 n.3 \(Fed. Cir. 2016\)](#) (viewing an argument regarding "impermissible hindsight" as "essentially a repackaging of the argument that there was insufficient evidence of a motivation to combine the references").

#### *Maintaining "Chaffee's Housing-Contained Design"*

We turn now to the second aspect of Petitioner's proposed modification in the context of this asserted ground. According to Petitioner, "[i]n converting Chaffee's pump 81[]in view of Scott, [one of ordinary skill in the art] would have maintained Chaffee's Housing-contained design ( *see* [Pet. 38-43]), such that the movable air conduit (i.e., such as Scott's valve 68) was disposed inside Chaffee's Housing (represented in Scott's Figure 12, above, in gray)" (Pet. 72 (citing Ex. 1402 PP 302, 306)) for the same reasons that one of ordinary skill in the art would have maintained Chaffee's Housing-contained design in the context of the prior asserted ground (Pet. 72 (citing Ex. 1402 PP 302, 306) (referencing Pet. 47-49)).

As to this aspect of the proposed modification, Patent [\*111] Owner relies on the arguments discussed above in the context of the asserted ground of Chaffee and Wu. PO Resp. 65-66 (citing Ex. 2429 P 165) (stating that, "for the same reasons set forth [at pages 35 to 51 of the PO Response], regarding using



Chaffee's housing with Wu, there would likewise be no motivation to use Chaffee's housing with Scott"); *see supra* § II.C.3.a.7 ("Maintaining 'Chaffee's Housing-Contained Design'").

Although the discussion of the reasons why one of skill in the art would have maintained Chaffee's Housing-contained design when replacing Chaffee's reversible pump assembly with Wu's unidirectional pump assembly does, in some instances, refer specifically to Wu ( *see* Pet. 48-49), we view the reasons provided by Petitioner for both aspects of the proposed modification--e.g., increased energy efficiency and durability, respectively--as design considerations that adequately support the similar proposed modifications in the alternative ground here. In the discussion of this issue in the Decision on Institution, we stated: "To the extent Patent Owner views certain *specific* reasons provided by Petitioner[] in the context of the asserted ground based on Chaffee and Wu as inapplicable in the context [\*112] of the ground based on Chaffee and Scott, Patent Owner should specifically address those issues, as appropriate, during trial." Dec. Inst. 61. Patent Owner did not do so.

For the reasons above, we determine, in light of the complete record, that Petitioner has shown by a preponderance of the evidence that one of ordinary skill in the art at the time of the invention would have been motivated to modify Chaffee based on Scott, as proposed.

#### *(8) Objective Evidence of Nonobviousness*

The analysis of Patent Owner's objective evidence of nonobviousness is the same for this asserted ground as for the prior asserted ground. Thus, for the same reasons discussed above (§ II.C.3.a.8), we determine, on the complete record, that Patent Owner is entitled to some, but not considerable, weight in favor of nonobviousness.

#### *(9) Conclusion*

For the reasons discussed above (§§ II.D.3.a.1-7), the evidence presented by Petitioner strongly indicates that claim 1 would have been obvious over Chaffee and Scott. For the reasons also discussed above (§ II.D.3.a.8), Patent Owner's objective evidence weighs only slightly in favor of nonobviousness. When considering all of the evidence of obviousness and nonobviousness together ( [\*113] *see Cyclobenzaprine*, 676 F.3d at 1079), we find Petitioner's strong evidence of obviousness outweighs Patent Owner's objective evidence of nonobviousness. Thus, we conclude Petitioner has demonstrated by a preponderance of the evidence that claim 1 would have been obvious over Chaffee and Scott.

#### *b. Dependent Claims 2 and 3*

Petitioner states that Chaffee as modified by Scott satisfies the additional limitations in these claims. Pet. 75-76 (citing Ex. 1402 PP 313-314). Referring to a portion of the discussion in the Petition of the "air conduit" limitation in the context of this asserted ground, Petitioner states that, in the proposed modified device, "air flows from Scott's valve 68 to Chaffee's bladder 20 during inflation and from bladder 20 to valve 68 during deflation, and this occurs when that movable conduit is disposed within Chaffee's Housing." Pet. 75 (citing Ex. 1402 PP 313-314; Pet. 69-75). Thus, according to Petitioner, in the modified device, "air flows from the interior region of Chaffee's Housing into Chaffee's bladder 20 when Scott's valve 68 is in the first, inflating position, and from Chaffee's bladder 20 into the interior region of the housing when Scott's valve 68 is in the second, deflating position." Pet. 75-76 (citing Ex. 1402 PP 313-314; Pet. 69-75).

The record evidence, summarized above, supports Petitioner's position as to the limitations in these claims, which we adopt as our own. We find, based on the complete record, that Petitioner has demonstrated by a preponderance of the evidence that Chaffee as modified by Scott satisfies the limitations in claims 2 and 3. Patent Owner does not present arguments addressing these claims. We determine, based on the complete record, that Petitioner has demonstrated by a preponderance of the evidence that claims 2 and 3 would have been obvious based on Chaffee and Scott.

*c. Dependent Claims 4-6*

Petitioner states that "Chaffee in combination with Scott in further combination with Pisante" satisfies the additional limitations in these claims. Pet. 76 (citing Ex. 1402 P 315). Petitioner states that "Scott's movable air conduit (valve 68) is only disclosed in schematic form and, as a result, is not a pipe, as required" by these claims. *Id.* [\*114] (citing Ex. 1472, Fig. 12; Ex. 1402 P 315). As to claim 4, Petitioner provides the following annotated version of Figure 2 of Pisante.

Pet. 78. Figure 2 depicts "a perspective view of an embodiment in which the switching of the paths is undertaken by means of a rotating device." Ex. 1472, 27:1-2. In the annotated version of Figure 2 above, Petitioner added (1) a text box identifying element 15 as a "Pipe switching device" and (2) a text box identifying element 17 as a "Chuck." Pet. 78. Referring to the annotated version of Figure 2, Petitioner states that "Pisante is directed to a 'device that can alternately function as a blower or for suction'" (quoting Ex. 1472, 21:6-7), and that, "[t]o alternate between these two modes of operation, Pisante disclose[s] a directional control valve referred to as a 'pipe switching device' (the 'PSD') or 'rotating valve 15'" (citing Ex. 1472, 24:24-25, 29:11; Ex. 1402 PP137, 316). Pet. 78. Petitioner contends that "[b]ecause PSD 15 acts as either a blower or for suction, it conveys air." *Id.* (citing Ex. 1472, Abstract, 28:21-25, 29:10-29, Figs. 1, 3, 4; Ex. 1402 P 317). Petitioner also asserts that because pipe switching device 15 is "in the form of a tubular [\*115] or cylindrical object, part, or passage," "under any reasonable construction of 'pipe,' PSD 15 is a pipe." *Id.* (citing Ex. 1402 PP 318-319). Petitioner also provides reasons to further modify Chaffee and Scott based on Pisante. Pet. 79-83.

Although we need not determine the full scope of the term "pipe" in the context of this proceeding, we agree with Petitioner (and the Texas District Court) that the term "pipe" *at least includes* a tubular or cylindrical object, part, or passage. The record evidence, summarized above, supports Petitioner's position as to the limitation in this claim, which we adopt as our own. We find, based on the complete record, that Petitioner has demonstrated by a preponderance of the evidence that pipe switching device 15 in Pisante falls within that understanding of the term "pipe."

As to claims 5 and 6, Petitioner states that Pisante's pipe switching device 15 "is also rotatable (Claim 5) and a switching pipe (Claim 6)." Pet. 78-79 (citing Ex. 1402 PP 331-336; Ex. 1472, 28:28-29:2 (describing pipe switching device 15 "[a]s of a rotational type" and stating that it "can readily be manipulated by digital rotation"), Abstract, 24:24-28, 25:1-10, 27:5-7, 28:27-29). Petitioner states that "in addition to being referred to as a 'pipe switching' device, Pisante described PSD 15 as switching, by rotation, between two positions for a suction mode and a blower mode (Claims 5 and 6)." Pet. 79.

The record evidence, summarized above, supports Petitioner's position as to the limitations in these claims, which we adopt as our own. We find, based on the complete record, that Petitioner has demonstrated by a preponderance of the evidence that Chaffee as modified by Scott, and further modified

by Pisante, satisfies the limitations in claims 4-6. Patent Owner does not present arguments addressing these claims. We determine, based on the complete record, that Petitioner has demonstrated by a preponderance of the evidence [\*116] that claims 4-6 would have been obvious based on Chaffee, Scott, and Pisante.

*d. Dependent Claim 7*

Petitioner states that Chaffee as modified by Scott satisfies the additional limitation in this claim. Pet. 83 (citing Ex. 1402 P 337). Petitioner argues that Scott's "valve 68 (the air conduit) conveys air pumped by Chaffee's modified impeller 86 and motor 84 in both the inflate mode and deflate mode in Chaffee's converted Uni-directional Pump Assembly." *Id.* (citing Ex. 1402 P 337).

The record evidence, summarized above, supports Petitioner's position as to the limitation in this claim, which we adopt as our own. We find, based on the complete record, that Petitioner has demonstrated by a preponderance of the evidence that Chaffee as modified by Scott satisfies the limitation in claim 7. Patent Owner does not present arguments addressing this claim. We determine, based on the complete record, that Petitioner has demonstrated by a preponderance of the evidence that claim 7 would have been obvious based on Chaffee and Scott.

*e. Dependent Claims 8 and 9*

Petitioner states that "Chaffee combined with Scott, as modified by Pisante" satisfies the additional limitations in these claims. Pet. 83 (citing Ex. 1402 PP 338-347). Petitioner provides the following annotated version of Figure 2 of Pisante, which adds text boxes to identify a "Second end" and a "First end" of element 15.

Pet. 84. Figure 2 depicts "a perspective view of an embodiment in which the switching of the paths is undertaken by means of a rotating device." Ex. 1472, 27:1-2. [\*117] Citing portions of the Chaffee, Scott, and Pisante, Petitioner explains how Chaffee as modified by Scott, and further modified by Pisante, satisfies the airflow pathways recited in these claims. *See* Pet. 83-87 (citing Ex. 1402 PP 338-347; Ex. 1412, 5:50-60, Fig. 12; Ex. 1472, 28:28-29, 29:12-14, Figs. 1-3 and 12; Ex. 1471) (referencing Pet. 76-83).

The record evidence, summarized above, supports Petitioner's position as to the limitations in these claims, which we adopt as our own. We find, based on the complete record, that Petitioner has demonstrated by a preponderance of the evidence that Chaffee as modified by Scott, and further modified by Pisante, satisfies the limitations in claims 8 and 9. Patent Owner does not present arguments addressing these claims. We determine, based on the complete record, that Petitioner has demonstrated by a preponderance of the evidence that claims 8 and 9 would have been obvious based on Chaffee, Scott, and Pisante.

*f. Dependent Claims 10 and 11*

Petitioner states that "Chaffee combined with Scott, as modified by Pisante" satisfies the additional limitations in these claims. Pet. 87 (citing Ex. 1402 PP 348-354). Citing portions of the Chaffee, Scott, and Pisante, Petitioner explains how Chaffee as modified by Scott, and further modified by Pisante,

satisfies the airflow pathways recited in these claims. *See* Pet. 88-90 (citing Ex. 1402 PP 348-354; Ex. 1412, 5:62-66, Fig. 12; Ex. 1472, 29:20-27, Figs. 1 and 4; Ex. 1471) (referencing Pet. 76-83).

The record evidence, summarized above, supports Petitioner's position as to the limitations in these claims, which we adopt as our own. We find, based on the complete record, that Petitioner has demonstrated by a preponderance of the evidence that Chaffee as modified by Scott, and further modified by Pisante, satisfies the limitations in claims 10 and 11. Patent Owner [\*118] does not present arguments addressing these claims. We determine, based on the complete record, that Petitioner has demonstrated by a preponderance of the evidence that claims 10 and 11 would have been obvious based on Chaffee, Scott, and Pisante.

*g. Dependent Claim 12*

To address claim 12, Petitioner provides the following annotated version of Figure 5 of Chaffee:

Pet. 91. Figure 5 depicts a cross-sectional view of one embodiment of fluid controller 80. *See* Ex. 1406, 2:38-39. In the annotated version of Figure 5 above, Petitioner added (1) a text box identifying element 84 as a "Motor," (2) a text box identifying element 86 as an "Impeller," (3) a text box identifying element 90 as "Housing," (4) an orange overlay to the three structural elements making up "Chaffee's Housing," (5) an orange overlay to motor 84, and (6) a blue overlay to impeller 86. Pet. 91. Referring to the annotated version of Figure 5, Petitioner states that "Chaffee's impeller 86 (blue) and motor 84 (orange) (the fan and motor) are received in the Housing (orange), which is described as 'surround[ing] the inner workings of the pump.'" Pet. 91 (quoting Ex. 1406, 4:18-19) (citing Ex. 1402 PP 354-355).

Although Petitioner only references Chaffee with this discussion of claim 12, we understand Petitioner to rely on Chaffee as modified by Scott to address the additional limitation in this claim. For example, to address the "fan and motor" limitation in claim 1 (from which claim 12 depends directly) in the context of this ground, we understand Petitioner to propose modifying Chaffee based on Scott. *See supra* § II.D.3.a.2.

With that understanding, the record evidence, summarized above, supports Petitioner's position as to the limitations in this claim, which we adopt as our own. We find, based on the complete record, that Petitioner has demonstrated by a preponderance of the evidence that Chaffee as modified by Scott [\*119] satisfies this limitation. Patent Owner does not present arguments addressing this claim. We determine, based on the complete record, that Petitioner has demonstrated by a preponderance of the evidence that claim 12 would have been obvious based on Chaffee and Scott.

*h. Claims 16-23*

For independent claim 16 and claims 17-23, which depend from claim 16, Petitioner references its positions with respect to claims 1-9, 11, and 12. *See* Pet. 92 (citing Ex. 1402 PP 356-357) (referencing Pet. 66, 67-91). For the same reasons discussed above, we find that Chaffee as modified by Scott (as to claims 1-3, 7, and 12) and as further modified by Pisante (as to claims 4-6, 8, 9, and 11) satisfies the limitations of these claims. Patent Owner does not present arguments addressing these claims aside from the arguments discussed above as to claim 1. We determine, based on the complete record, that Petitioner

has demonstrated by a preponderance of the evidence that claims 16-23 would have been obvious based on Chaffee, Scott, and Pisante.

### *E. Motions to Exclude Evidence*

#### *1. Petitioner's Motion to Exclude Evidence*

Petitioner filed a motion to exclude Exhibits 2030-2033, 2434, 2435, 2443, 2444, and 2775, which Petitioner contends are not cited in the Patent Owner Response, Sur-reply, or any expert declaration. Paper 98, 1.<sup>38</sup> Petitioner seeks to exclude this evidence (the "Uncited Exhibits") as irrelevant under Federal Rules of Evidence Rules 401 and 402. *Id.* Petitioner also argues that certain paragraphs in Exhibit 2429 (Dr. Stevick's declaration) and Exhibit 2638 (Dr. Becker's declaration) (collectively, the "Declaration Portions") should be excluded. [Id. at 4-7](#).

##### *a. Uncited Exhibits*

With respect to the Uncited Exhibits, Petitioner argues that prior Board decisions provide that exhibits not cited in a patent owner's papers should be excluded. [\*120] Paper 98, 1-3.

In opposition, Patent Owner argues that some of the Uncited Exhibits are exhibits to depositions. Paper 100, 4-5. Specifically, Patent Owner argues that Exhibits 2030-2033 are exhibits to Dr. Beaman's deposition testimony (Exhibits 2040 and 2753). [Id. at 4-5](#). Patent Owner adds that Petitioner did not properly object, as it did not object to the evidence during the depositions. [Id. at 4](#).<sup>39</sup> In addition, Patent Owner argues that there is no Exhibit 2775 in this proceeding. [Id. at 13](#).

Petitioner replies that Patent Owner addresses only a subset of the exhibits covered in Petitioner's motion. Paper 105, 1 n.1 (identifying Exhibits 2434, 2435, 2443, and 2444 as uncontested by Patent Owner). As to the contested exhibits, Petitioner argues 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 motion. [Id. at 3-4](#). Petitioner maintains that Patent Owner's argument that Petitioner failed to object at the deposition is nonsensical. [Id. at 4](#). Petitioner argues that it 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.*

As to Exhibit 2775, [\*121] we deny Petitioner's motion. As noted by Patent Owner, that exhibit number was not used in this proceeding. Paper 100, at 13. As to Exhibits 2434, 2435, 2443, and 2444, which are not contested by Patent Owner, we deny Petitioner's 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 2018 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 Petitioner's motion as to the other Uncited Exhibits (Exhibits 2030-2033). As Patent Owner explains, these exhibits were used in conducting Dr. Beaman's depositions (Ex. 2040 and Ex.

<sup>38</sup> Petitioner's Motion to Exclude does not include page numbers. We start numbering with page 1 after the cover page.

<sup>39</sup> 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 100, 4.

2753) and the complete deposition transcripts are in the record. Although we do not rely on these exhibits in our Decision, we do cite one of Dr. Beaman's depositions. We determine that it is proper to maintain Exhibits 2030-2033 in the record, as they are relevant to testimony in the depositions, even if that testimony [\*122] is not ultimately relied upon by Patent Owner or Petitioner in this proceeding.

If we followed Petitioner's 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 for 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, Petitioner argues that this evidence represents arguments that are improperly incorporated by reference by Patent Owner. Paper 98, 4-7. Patent Owner responds that a motion to exclude evidence is not the proper vehicle to address incorporation by reference. Paper 100, 5-6. Patent Owner explains that [\*123] we ruled on a motion to strike directed to the Declaration Portions. *Id.* at 6; *see* Paper 70 (Order denying Petitioner's motion to strike portions of the Patent Owner Response). Patent Owner also argues that Petitioner has not met its burden in seeking exclusion of the Declaration Portions. Paper 100, at 6-8. Finally, Patent Owner argues that it did not improperly incorporate arguments from its experts' declarations. *Id.* at 8-12. In reply, Petitioner reiterates that the Declaration Portions were improperly incorporated by reference into the Patent Owner Response. Paper 105, 4-5.

We deny Petitioner's motion to exclude the Declaration Portions. Motions to exclude evidence are used to exclude evidence that is inadmissible. *See* Trial Practice Guide 2018 Update, 16-17. Petitioner does not argue that the Declaration Portions represent *inadmissible* evidence. Paper 98, 4-7; Paper 105, 4-5. Instead, Petitioner argues that the Declaration Portions represent improper *argument*, rather than evidence. *See* Paper 98, 4-7; Paper 105, 4-5. Petitioner fails to provide any basis under the Federal Rules of Evidence as to why the Declaration Portions are inadmissible. *See* Paper 98, 4-7; Paper 105, 4-5; Trial Practice Guide 2018 Update, 16 ("A motion to exclude must explain why the evidence is not admissible (e.g., relevance or hearsay)."). Although Petitioner did object to Exhibits 2429 and 2638, the objections were directed to bases under the Federal Rules of Evidence not argued in its motion. *See* Paper 49, 2, 16-17. As such, it is unclear on this record why Petitioner contends that the Declaration Portions are inadmissible.

Petitioner appears to use its motion to exclude to reargue its 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* Paper 98, 4-7; *see also* Paper 70 (denying Petitioner's motion to strike). We already addressed Petitioner's motion to strike and how we would address any arguments improperly incorporated by reference. Paper 70.

#### [\*124] 2. Patent Owner's Motion to Exclude Evidence



We now turn to Patent Owner's motion, in which Patent Owner seeks to exclude the entirety or portions of several exhibits filed by Petitioner and also seeks to exclude certain testimony cited by Petitioner. We address each category of information in turn below.

*a. Exhibits 1468-1470, and References to These Exhibits in Dr. Beaman's Declaration*

Patent Owner contends that Exhibits 1468-1470, and references to these exhibits in Dr. Beaman's declaration (Exhibit 1402) should be excluded under Federal Rules of Evidence 402, 403, and 1002. Paper 99, 1-2. According to Patent Owner, Exhibits 1468-1470 are animations that do not accurately or completely represent the evidence underlying the animations. *Id. at 1*.

In opposition to Patent Owner's motion generally, Petitioner argues that Patent Owner fails to follow the proper rules and procedures, and that we should deny the motion, in its entirety, on that basis. Paper 101, 1-2 (quoting Trial Practice Guide 2018 Update, 16). We decline to deny Patent Owner's motion on this basis. We note that Petitioner's motion, addressed above, also fails to follow the procedure outlined in the Trial Practice Guide. *See* Paper 98.

As to the merits, we deny Patent Owner's motion as to Exhibits 1468-1470 as moot, as we do not rely on them in this Decision. *See* Trial Practice Guide 2018 Update, 17. We also do not rely on any of the paragraphs of Dr. Beaman's declaration (Ex. 1402) that refer to these exhibits. *See id.*

*b. Exhibit 1411*

Patent Owner argues that Exhibit 1411 should be excluded under Federal Rule of Evidence 1002 "as not being an original" and under Federal Rule of Evidence 1003 "as not being an admissible duplicate due to it being an inaccurate copy with portions of the document cut off." Paper 99, 2 (discussing Ex. 1411, 11 (and "odd numbered pages following that")). We deny Patent Owner's motion as [\*125] to Exhibit 1411 as moot, as we do not rely on it in this Decision. *See* Trial Practice Guide 2018 Update, 17.

*c. Exhibits 1665-1669*

Patent Owner "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 99, 2. Patent Owner argues that these exhibits improperly incorporate attorney argument into Petitioner's Reply. *Id.* at 2-4. These exhibits relate to Petitioner's allegations that Patent Owner improperly incorporates arguments from declarations into its Patent Owner Response. *See id.*

In opposition, Petitioner argues that Patent Owner does not cite any evidentiary basis for excluding these exhibits, and argues that a motion to exclude is not the proper procedure to challenge these exhibits. Paper 101, 5 (discussing Trial Practice Guide 2018 Update, 17). Patent Owner replies that, by filing Exhibits 1665-1669, Petitioner exceeded the word count for a Reply. Paper 104, 2-3.

We do not exclude Exhibits 1665-1669 because Patent Owner provides no evidentiary basis as to 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 Petitioner's 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 2018 Update, 17-18; *cf.* Paper 70, 5 (addressing Petitioner's motion to strike).

*d. Exhibit 1625*

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. Paper 99, 5. [\*126] According to Patent Owner, Dr. Beaman's declaration mischaracterizes testimony from Patent Owner's declarant in support of its Preliminary Response (Dr. William K. Durfee) based on characterizations of the testimony from Petitioner's counsel. *Id. at 5-6*. 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 6*.

Petitioner responds that Patent Owner does not provide a basis under the Federal Rules of Evidence to exclude Dr. Beaman's testimony. Paper 101, 8. Petitioner adds 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. at 8-9*. According to Petitioner, the testimony sought to be excluded identifies inconsistencies between Patent Owner's declarants' testimony. *Id. at 9*.

In reply, Patent Owner argues that Dr. Beaman's testimony lacks proper foundation. Paper 104, 3-4.

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 its opening brief on its motion to exclude. *See* Paper 77, 5 (P 11) ("Team Worldwide objects to the Reply Declaration [\*127] of Joseph J. Beaman, Jr. (Exhibit 1625), which mischaracterizes Exhibit 2401 and/or exceeds the proper scope of reply."); Paper 99, 5-6 (contending that Exhibit 1625 "mischaracterizes Patent Owner's early expert testimonial evidence (Exhibit 2401) and/or exceeds the proper scope of reply"). Accordingly, Patent Owner does not identify an evidentiary basis to exclude the evidence. Also, neither Patent Owner's motion to exclude nor its objection identifies, with particularity, those portions of Dr. Beaman's Reply declaration to be excluded, as Patent Owner's citations were presented as exemplary only. *See* Paper 77, 5 (P 11) ("See, for example, Exhibit 1625 at PP 7, 8, 14, 15, 76, 86, and 91."); Paper 99, at 5 (same), 6 (same).

*e. Exhibit 1650*

Patent Owner states to have "objected to the Declaration of Ryan Slate in Support of Petitioner[s] Reply (Ex. 1650) on the basis that as of the discussions between the Parties conducted to date Patent Owner was not afforded a proper opportunity to cross-examine Mr. Slate." Paper 99, 6. Patent Owner does not address this evidence in reply to Petitioner's contention that this objection should be withdrawn. *See* Paper 101, 10; Paper 104. We view the [\*128] portion of Patent Owner's motion addressing this exhibit as withdrawn.

*f. Exhibits 1651-1654 and 1679*

Patent Owner contends that Exhibits 1651-1654 and 1679 include hearsay, are irrelevant, are unfairly prejudicial, and lack foundation. Paper 99, 7. 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 2018 Update, 17.<sup>40</sup>

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<sup>40</sup> Although we discuss Exhibits 1651 and 1652 above ( *see supra* p. 75), we determine that Petitioner has not shown how those exhibits support its argument. Because our discussion above does not rely on Exhibits 1651 and 1652 in the overall determination as to unpatentability, and to maintain a complete record of this proceeding, we do not exclude these exhibits.

### III. CONCLUSION

Upon consideration of the Petition, Response, Reply, Sur-reply and the evidence of record, we determine that Petitioner (1) has proven by a preponderance of the evidence that claims 1-12 and 16-23 of the '394 patent would have been obvious based on Chaffee and Wu, and (2) has proven by a preponderance of the evidence that claims 1-12 and 16-23 would have been obvious based on Chaffee, Scott, and Pisante.<sup>41</sup>

We deny Petitioner's and Patent Owner's motions to exclude evidence.

### IV. ORDER

For the reasons above, it is:

ORDERED that Petitioner has proven by a preponderance of the evidence that claims 1-12 and 16-23 are unpatentable;

FURTHER ORDERED that Petitioner's and Patent Owner's motions to exclude evidence (Papers 98, 99) are denied;

FURTHER ORDERED that, pursuant to [35 U.S.C. § 318\(b\)](#), upon expiration of the time for appeal of this [\*129] decision, or the termination of any such appeal, a certificate shall issue canceling claims 1-12 and 16-23;

FURTHER ORDERED that the parties shall file, within 10 days of entry of this Decision, a joint motion to seal this Decision, and shall provide, along with the joint motion, an exhibit with a proposed redacted public version of this Decision; 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](#).

In summary:

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<sup>41</sup> 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](#), 84 Fed. Reg. 16,654 (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).

Claims	35 U.S.C. §	References	Claims	Claims
			Shown	Show
			Unpatentable	Unpaten
1-12, 16-23	103	Chaffee and Wu	1-12, 16-23	
1-12, 16-23	103	Chaffee, Scott,	1-12, 16-23 and Pisante	
Overall Outcome			1-12, 16-23	

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