

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

FISHER & PAYKEL HEALTHCARE LIMITED,
Petitioner,

v.

RESMED LIMITED,
Patent Owner.

Case IPR2017-00061
Patent 9,119,931 B2

Before RICHARD E. RICE, BARRY L. GROSSMAN, and
JAMES J. MAYBERRY, *Administrative Patent Judges*.

RICE, *Administrative Patent Judge*.

DECISION
Instituting Inter Partes Review
37 C.F.R. § 42.108

I. INTRODUCTION

A. Background

Fisher & Paykel Healthcare Limited (“Petitioner”) filed a Petition (Paper 1, “Pet.”) requesting an *inter partes* review of claims 1, 4–8, 10–22, 25, 26, 28–37, and 40–42 of U.S. Patent No. 9,119,931 B2 (Ex. 1001, “the ’931 Patent”). Petitioner supported the Petition with a declaration from Jason Eaton, P.E. (Ex. 1013). ResMed Limited (“Patent Owner”) did not file a preliminary response to the Petition.¹

Under 35 U.S.C. § 314, an *inter partes* review may not be instituted “unless . . . there is a reasonable likelihood that the petitioner would prevail with respect to at least 1 of the claims challenged in the petition.” 35 U.S.C. § 314(a). Upon considering the Petition and the evidence filed therewith, we determine that Petitioner has shown a reasonable likelihood that it would prevail with respect to claims 33–37 and 40–42, but not claims 1, 4–8, 10–22, 25, 26, 28–32.

Accordingly, we institute an *inter partes* review of claims 33–37 and 40–42.

B. Related Matters

The parties identify a related federal district court case involving the ’931 Patent: *Fisher & Paykel Healthcare Ltd. v. ResMed Corp.*, Case No. 3:16-cv-02068-GPC-WVG (S.D. Cal.). Pet. 7–8; Paper 4, 2. The parties also indicate that the ’931 Patent is involved in U.S. International Trade Commission Investigation No. 337–TA–1022. Pet. 7; Paper 4, 2.

¹ See 37 C.F.R. § 42.107 (providing that filing a preliminary response to the petition is not obligatory).

Petitioner has filed three additional petitions for *inter partes* review of the '931 Patent. *See* IPR2017-00062, IPR2017-00064, IPR2017-00065; Pet. 8; Paper 4, 2.

C. The '931 Patent

The '931 Patent, titled "Mask System," issued on September 1, 2015, and claims priority based on a series of applications dating back to February 27, 2009, as well as several provisional applications dating back to September 19, 2008. Ex. 1001, 1:6–17. The '931 Patent relates generally to a mask system for treatment of "Sleep Disordered Breathing" using "Continuous Positive Airway Pressure ['CPAP']" or "Non-Invasive Positive Pressure Ventilation." *Id.* at 1:21–24.

Figure 3 of the '931 Patent is reproduced below.

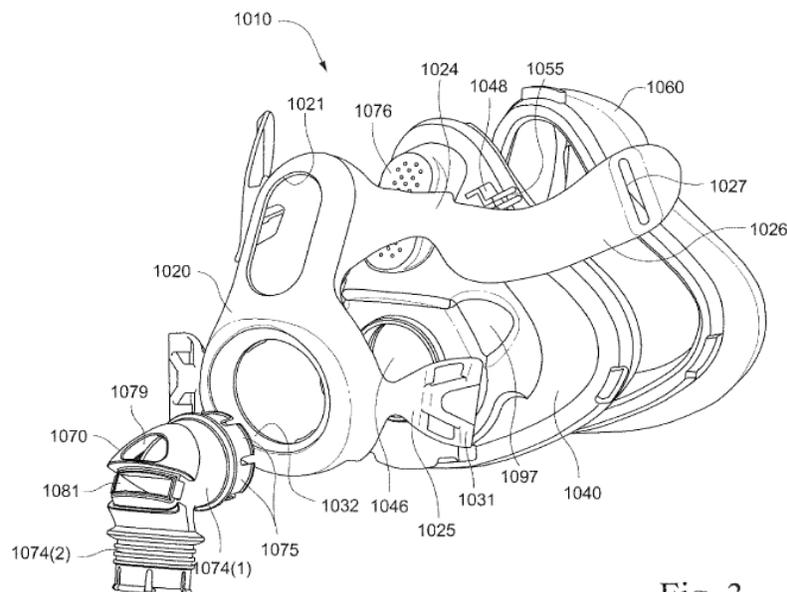
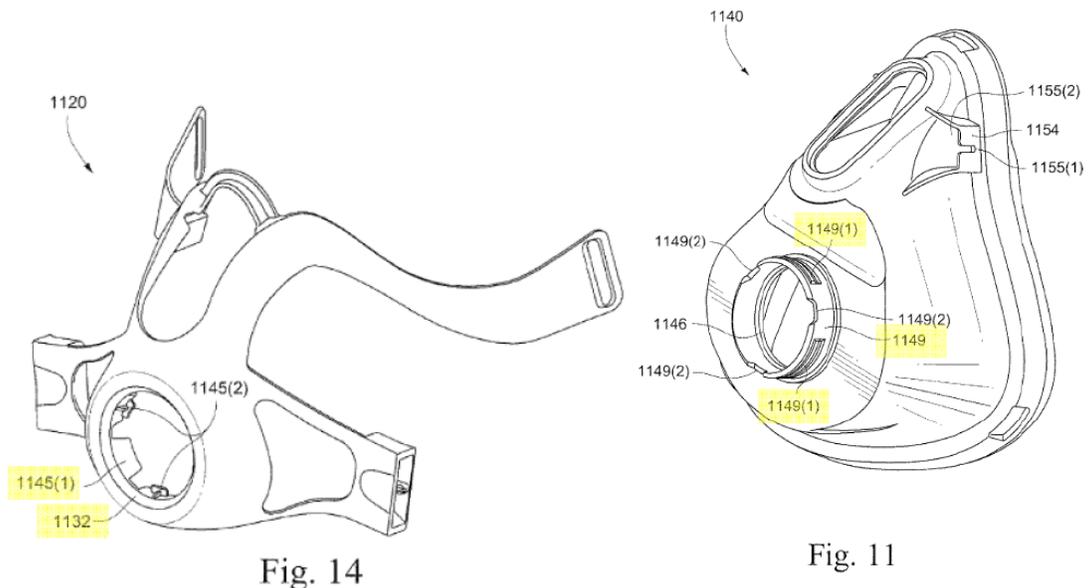


Fig. 3

Figure 3 depicts mask system 1010 comprising frame 1040, mask cushion 1060, shroud 1020, and elbow 1070. *Id.* at 6:51–53. The frame

defines a breathing chamber adapted to receive the patient's nose and mouth and includes an opening 1046 that communicates with elbow 1070. *Id.* at 6:60–64. The frame 1040 also includes vent arrangement 1076, shown in Figure 3, that protrudes from frame 1040. *Id.* at 7:22–23. Opening or vent receiving hole 1021 in shroud 1020 accommodates the protruding vent arrangement. *Id.* at 7:21–23.

Petitioner's annotated versions of Figures 14 and 11 of the '931 Patent are reproduced below:



Pet. 20. According to Petitioner, the annotated Figure 14 above depicts a retaining mechanism at opening 1132 of shroud 1120. *Id.* (citing Ex. 1001, 18:48–53). The retaining mechanism includes snap fingers 1145(1) that engage collar 1149 of frame 1140 (depicted in annotated Figure 11 above). *See id.* (citing Ex. 1001, 18:62–67).

Of the challenged claims, claims 1 and 33 are independent. Claims 4–8, 10–22, 25, 26, and 28–32 depend, directly or indirectly, from claim 1.

Claims 34–37, and 40–42 depend, directly or indirectly, from claim 33.

Claims 1 and 33 are reproduced below:

1. A mask system, comprising:
 - (i) a shroud module; wherein the shroud module includes headgear connectors adapted to removably attach to respective headgear straps of headgear; and
 - (ii) a cushion module, comprising:
 - a rigid or semi-rigid frame defining a breathing chamber; and
 - a cushion to form a seal with the patient's face in a nasal bridge region, a cheek region and a lower lip/chin region of the patient's face,wherein the cushion is constructed of a first, relatively soft, elastomeric material and the frame is constructed of a second material that is more rigid than the cushion,wherein the shroud module and the cushion module are configured to be removably and non-rotatably coupleable to one another; and
- wherein the frame includes a protruding vent arrangement having a plurality of holes, wherein the shroud module includes a first opening to accommodate said protruding vent arrangement, and further wherein the shroud module includes a second opening positioned to align with a frame opening of the frame leading to the breathing chamber.

Ex. 1001, 24:6–29.

33. A mask system, comprising:
 - (i) a shroud module; wherein the shroud module includes headgear connectors adapted to removably attach to respective headgear straps of headgear; and
 - (ii) a cushion module, comprising:
 - a frame defining a breathing chamber; and

a cushion to form a seal with the patient's face in at least a nasal bridge region and a cheek region of the patient's face,

wherein the cushion is constructed of a first, relatively soft, elastomeric material and the frame is constructed of a second material that is more rigid than the cushion, and a nasal bridge portion of the cushion includes one or more folds to provide in use a higher level of adaptability or flexibility to the nasal bridge region of the cushion module relative to another region of the cushion module;

wherein the shroud module and the cushion module are configured to be removably coupleable to one another, and

wherein the shroud module includes a front opening of substantively circular shape and a retaining portion extending rearwardly from the front opening, towards the frame, and structured to snap-fit with the cushion module.

Id. at 26:54–27:11.

D. Overview of Prosecution History

During prosecution of the '931 Patent, the Examiner issued a final rejection of all pending claims, except claims 29 and 33. Ex. 1014, 343–61. The Examiner indicated that application claims 29 and 33 (each of which recited “a protruding vent arrangement”) would be allowable if rewritten in independent form. *Id.* at 359. In response, the applicant, *inter alia*, added the subject matter of claim 29 to claim 1, canceled claim 29, and added new claims 34–83. *Id.* at 447. With respect to application claim 22 (which issued as claim 33), Petitioner argued that the combination of references applied by the Examiner did not satisfy the claim requirement for “a shroud module [that] includes a front opening and a retaining portion extending rearwardly from the front opening and [] structured to retain the cushion

module.” *Id.* After a subsequent telephonic interview, the Examiner allowed the claims subject to an Examiner’s Amendment. *Id.* at 462–72.

E. The Asserted Grounds

Petitioner challenges claims 1, 4–8, 10–22, 25, 26, 28–37, and 40–42 on the following grounds (Pet. 14–16):

Reference(s)	Basis	Claims Challenged
D’Souza ² and Ultra Mirage ³	§ 103(a)	1, 6, 10, 11, 18, 31, and 32
D’Souza, Ultra Mirage, and Matula-II ⁴	§ 103(a)	4, 5, 26, 33, 37, and 40–42
D’Souza, Ultra Mirage, and FlexiFit ⁵	§ 103(a)	7 and 8
D’Souza, Ultra Mirage, and Barnett ⁶	§ 103(a)	12, 14, 16, and 17
D’Souza, Ultra Mirage, and Lovell ⁷	§ 103(a)	13
D’Souza, Ultra Mirage, and Jaffre ⁸	§ 103(a)	15

² WO 2007/041751 A1, pub. Apr. 19, 2007 (Ex. 1002, “D’Souza”).

³ ResMed product brochure describing the “Ultra Mirage™ Full Face Mask” (Ex. 1003, “Ultra Mirage”). Petitioner has proffered evidence to establish that the brochure was publicly available by September 1, 2006. Pet. 11–12 (citing Ex. 1003, 1–2, 7–8; Ex. 1013 ¶¶ 55–56).

⁴ US 2007/0044804 A1, pub. Mar. 1, 2007 (Ex. 10054, “Matula-II”).

⁵ Fisher & Paykel Healthcare Corporation Limited product brochure describing the “FlexiFit™431 Full Face Mask” (Ex. 1006, “FlexiFit”). Petitioner has proffered evidence to establish that the brochure was publicly available by October 16, 2006. Pet. 12–13 (citing Ex. 1006, 1–2, 5, 8, 11; Ex. 1013 ¶¶ 55, 57; 1016, 1–4).

⁶ US 6,412,488 B1, iss. July 2, 2002 (Ex. 1007, “Barnett”).

⁷ US 6,631,718 B1, iss. Oct. 14, 2003 (Ex. 1008, “Lovell”).

⁸ US 6,851,425 B2, iss. Feb. 8, 2005 (Ex. 1012, “Jaffre”).

Reference(s)	Basis	Claims Challenged
D'Souza, Ultra Mirage, FlexiFit, and Gunaratnam-II ⁹	§ 103(a)	19–21 and 25
D'Souza, Ultra Mirage, FlexiFit, Gunaratnam-II, and Matula-II	§ 103(a)	22
D'Souza, Ultra Mirage, Matula-II, FlexiFit, and Barnett	§ 103(a)	28–30
D'Souza, Ultra Mirage, Matula-II, and Barnett	§ 103(a)	34 and 36
D'Souza, Ultra Mirage, Matula-II, and FlexiFit	§ 103(a)	35

II. ANALYSIS

A. *Level of Skill in the Art*

Petitioner asserts that a person having ordinary skill in the art (“PHOSITA”) “would have at least a bachelor’s degree in mechanical engineering, biomedical engineering or other similar type of engineering degree combined with at least two years of experience in the field of masks, respiratory therapy, patient interfaces or relevant product design experience.” Pet. 21 (citing Ex. 1013 ¶ 27). Based on our review of the Petition and evidence, including Mr. Eaton’s testimony, we find that Petitioner’s asserted level of skill in the art is reasonable and, for the purposes of this Decision, we adopt that definition.

B. *Claim Construction*

In an *inter partes* review, the Board gives claim terms in an unexpired patent their broadest reasonable interpretation in light of the specification of

⁹ US 2004/0226566 A1, pub. Nov. 18, 2004 (Ex. 1010, “Gunaratnam-II”).

the patent in which they appear. 37 C.F.R. § 42.100(b); *see Cuozzo Speed Techs., LLC v. Lee*, 136 S. Ct. 2131, 2144–46 (2016). Under that standard, a claim term generally is given its ordinary and customary meaning, as would be understood by one of ordinary skill in the art in the context of the entire disclosure. *See In re Translogic Tech., Inc.*, 504 F.3d 1249, 1257 (Fed. Cir. 2007). While our claim interpretation cannot be divorced from the specification and the record evidence, *see Microsoft Corp. v. Proxyconn, Inc.*, 789 F.3d 1292, 1298 (Fed. Cir. 2015) (quoting *In re NTP, Inc.*, 654 F.3d 1279, 1288 (Fed. Cir. 2011)), we must be careful not to import limitations from the specification that are not part of the claim language. *See SuperGuide Corp. v. DirectTV Enters., Inc.*, 358 F.3d 870, 875 (Fed. Cir. 2004). Any special definition for a claim term must be set forth in the specification with reasonable clarity, deliberateness, and precision. *See In re Paulsen*, 30 F.3d 1475, 1480 (Fed. Cir. 1994).

1. “*a protruding vent arrangement having a plurality of holes*” (claim 1)

Claim 1 recites “the frame includes *a protruding vent arrangement having a plurality of holes*, wherein the shroud module includes a first opening to accommodate said protruding vent arrangement” (emphasis added). Petitioner does not propose an explicit construction for this or any other claim term, but rather contends generally that all claim terms should “have their ordinary and customary meaning[s] in light of the Specification, as commonly understood by those of ordinary skill in the art at the time of the invention.” Pet 16.

In its obviousness analysis, Petitioner argues, however, that the “protruding vent arrangement” claim term would be satisfied by adding a

plurality of vent holes to a portion of D'Souza's frame 414 that extends through an opening in shroud 412. *Id.* at 28–29, 33–34; *see* Ex. 1013 ¶¶ 72–73. As such, Petitioner contends, implicitly, that the “protruding vent arrangement” claim term broadly encompasses vent holes in a portion of the frame that extends through an opening in the shroud module.

We disagree. Petitioner's implicit claim construction is contrary to the plain language of claim 1, which requires the frame to have a “vent arrangement” that is “protruding” (rather than reciting that the frame has a protruding portion that includes a vent arrangement having a plurality of holes). Petitioner's construction also is inconsistent with the Specification. As described in the Specification and depicted in Figure 3 (reproduced above on page 3), protruding vent arrangement 1076 is a discrete vent structure that extends above the surrounding surface of frame 1040 and contains a plurality of vent holes. Ex. 1001, 7:18–23 (“The top end of the shroud 1020 . . . includes an opening or vent receiving hole 1021 to accommodate *the vent arrangement 1076 that protrudes from the frame 1040*” (emphasis added)), Fig. 3. Contrary to Petitioner's implicit claim construction, protruding vent arrangement 1076 is described in the Specification as extending from the surface of the frame, and not merely as extending through an opening in shroud 1020. *See id.*

Further, claim 1 separately recites that “the shroud module includes a first opening to accommodate said protruding vent arrangement.” That language would be rendered “merely superfluous” under Petitioner's implicit construction that “a protruding vent arrangement” is a portion of the frame with vent holes that extends through an opening in the shroud. *See Bicon, Inc. v. Straumann Co.*, 441 F.3d 945, 950 (Fed. Cir. 2006) (stating

that “claims are interpreted with an eye toward giving effect to all terms in the claim,” so that physical structures and characteristics specifically described in a claim are not rendered “merely superfluous”).

We determine that the broadest reasonable interpretation consistent with the Specification of “a protruding vent arrangement having a plurality of vent holes” is a discrete vent structure that extends above the surrounding surface of the frame and contains a plurality of vent holes.

2. *Other Claim Terms*

We determine that no other explicit claim interpretation is required for the purposes of this Decision. *See Vivid Techs., Inc. v. Am. Sci. & Eng’g, Inc.*, 200 F.3d 795, 803 (Fed. Cir. 1999).

C. *Asserted Obviousness*

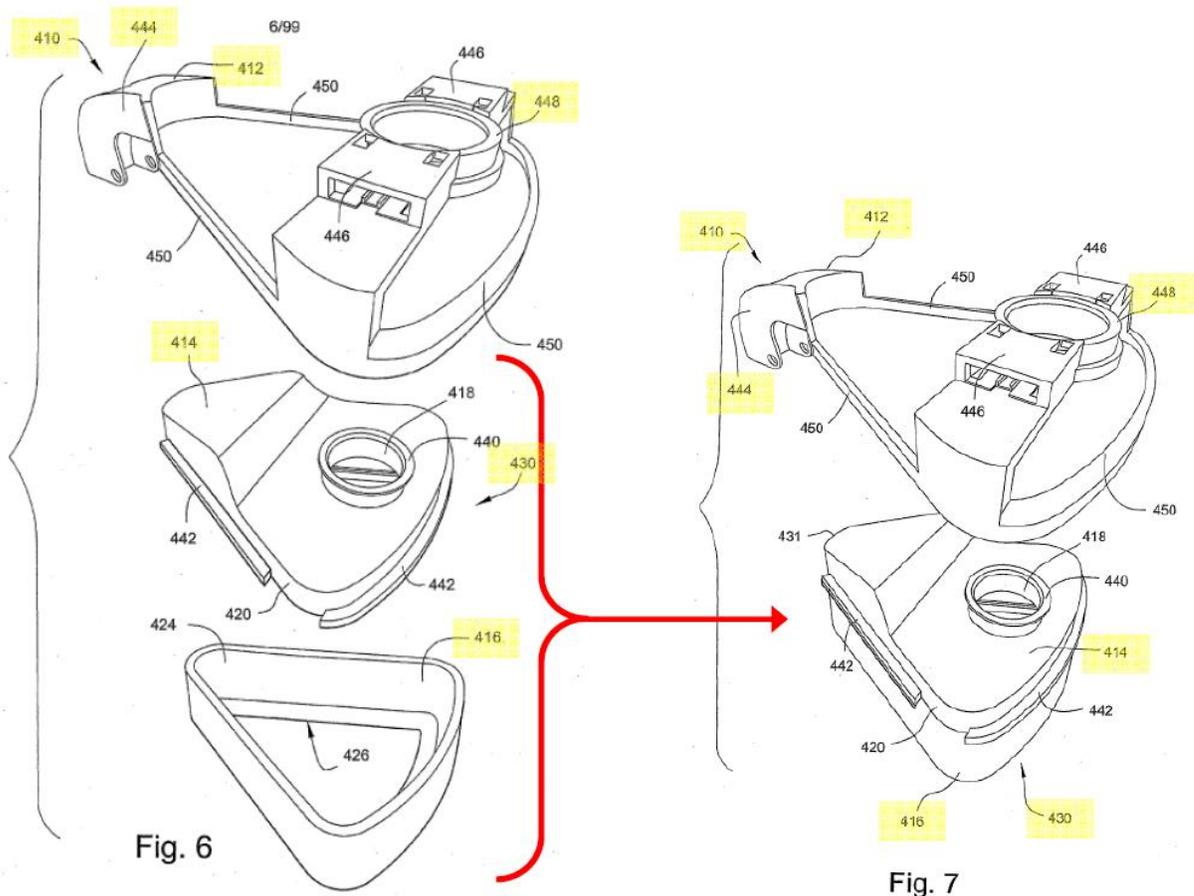
A claim is unpatentable for obviousness under 35 U.S.C. § 103(a) if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which the subject matter pertains. *See KSR Int’l Co. v. Teleflex Inc.*, 550 U.S. 398, 406 (2007). In analyzing the obviousness of a combination of prior art elements, it can be important to identify a reason that would have prompted one of skill in the art to combine the elements in the way the claimed invention does. *Id.* The question of obviousness is resolved on the basis of underlying factual determinations, including: (1) the scope and content of the prior art; (2) any differences between the claimed subject matter and the prior art; (3) the level of skill in the art; and (4) objective evidence of nonobviousness, i.e., secondary considerations, if in evidence. *See Graham v. John Deere Co.*, 383 U.S. 1, 17–18 (1966).

Petitioner challenges claims 1, 6, 10, 11, 18, 31, and 32 as obvious over D'Souza and Ultra Mirage. Petitioner challenges claims 4, 5, 7, 8, 12–16, 17, 19–21, 22, 25, 26, and 28–30 as obvious over D'Souza and Ultra Mirage in view of one or more of Matula-II, Flexi-Fit, Barnett, Lovell, Jaffe, and Gunaratnam-II.

1. D'Souza and Ultra Mirage

a. Overview of D'Souza

Petitioner's annotated versions of Figures 6 and 7 of D'Souza are reproduced below.

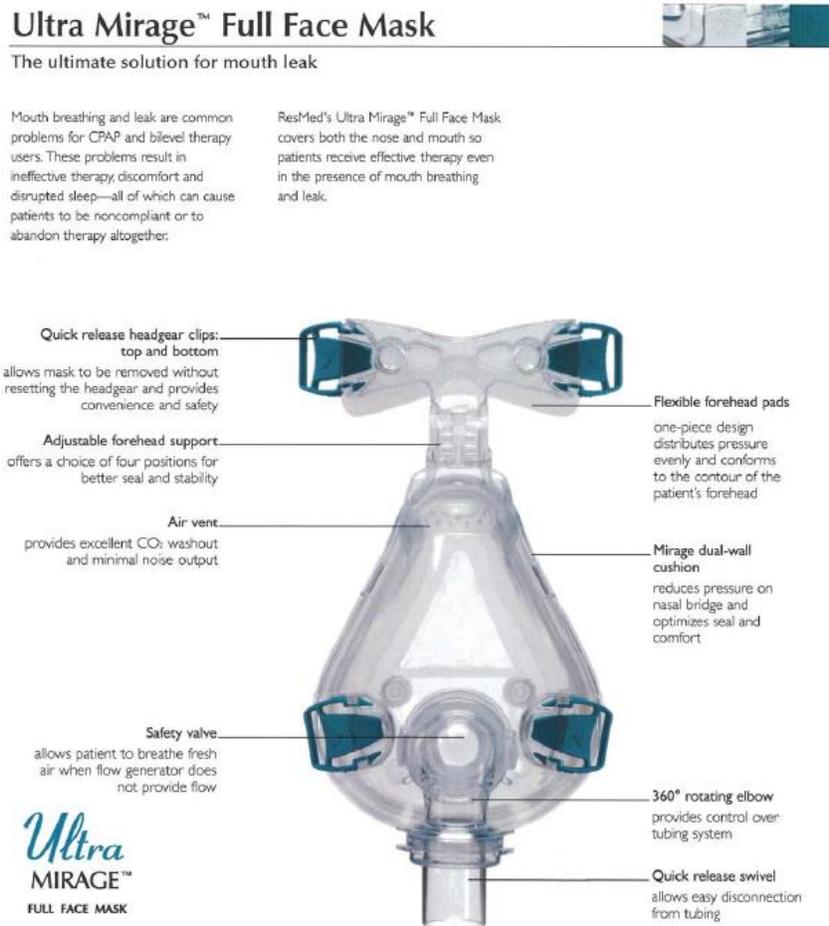


See Pet. 23; Ex. 1002, Figs. 6, 7. The figures above depict D'Souza's mask assembly 410 comprising skeleton frame 412 (asserted "shroud module"),

frame 414 (asserted “frame”), and cushion 416. *Id.* at 25; Ex. 1002 ¶ 97. As illustrated in the figures, frame 414 interlocks with cushion 416 to form cushion/frame sub-assembly 430 (asserted “cushion module”). Pet. 25; Ex. 1002 ¶ 97.

b. Overview of Ultra Mirage

Ultra Mirage discloses a full face CPAP mask with top and bottom removable headgear clips, an air vent to provide CO₂ washout, and a rotating elbow with a quick release swivel. *See* Pet. 24–25; Ex. 1003, 6. A figure in Ultra Mirage, which is reproduced below, illustrates the mask.

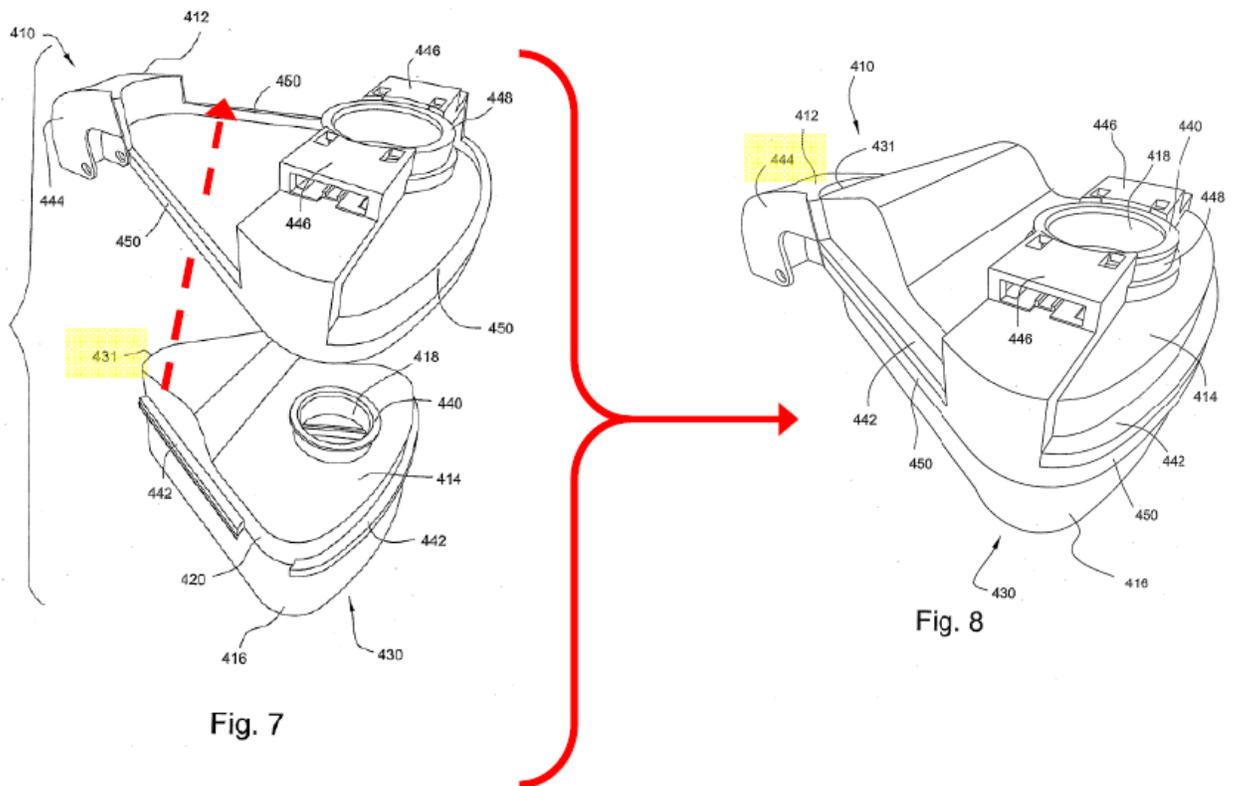


See id. at 24–25; Ex. 1003, 6. Various elements of the mask, including the air vent, are identified in the Ultra Mirage figure.

c. Analysis of Claims 1, 4–8, 10–22, 25, 26, 28–32

Claim 1 recites, *inter alia*, that “the frame includes a protruding vent arrangement having a plurality of holes, wherein the shroud module includes a first opening to accommodate said protruding vent arrangement” (emphasis added).

With respect to this claim requirement, Petitioner asserts: “As shown in Figs. 7–8 of D’Souza [reproduced below], when the mask assembly 410 is assembled, the top portion 431 (nasal bridge region) of the frame 414 protrudes through the opening (between the elongated frame members 450) in the shroud 412.” Pet. 28 (citing Ex. 1002 ¶ 101); Ex. 1002, Figs. 7, 8.



Petitioner acknowledges that D’Souza “does not expressly disclose a vent on the protrusion,” but argues that “vents positioned in the region of the D’Souza protrusion (nasal bridge region) were common in prior art CPAP

masks.” *Id.* at 29 (citing Ex. 1013 ¶¶ 64, 72–73). Petitioner further argues that “Ultra Mirage teaches an air vent positioned in the nasal bridge region to provide CO₂ washout and minimize noise output,” and “a skilled artisan would have been motivated to provide the vent of Ultra Mirage in the same nasal bridge region of D’Souza, and thus on the protruding portion of D’Souza.” *Id.* (citing Ex. 1003, 6; Ex. 1013 ¶¶ 64, 72–73).

Petitioner’s argument, that adding a plurality of vent holes to a portion of D’Souza’s frame 414 that extends through an opening in shroud 412 would satisfy the claim requirement, is based on an improper claim construction, as discussed above. *See supra* Section II.B.1. Under our claim interpretation, the claim term requires a discrete vent structure that extends above the surrounding surface of the frame and contains a plurality of vent holes. *See id.* Petitioner does not contend that Ultra Mirage teaches or suggests “a protruding vent arrangement having a plurality of vent holes.” Rather, Petitioner contends that Ultra Mirage teaches positioning a plurality of vent holes in the nasal bridge region of a mask. Merely positioning a plurality of vent holes in the nasal bridge region of D’Souza’s mask would not result in a discrete vent structure that extends above the surrounding surface of the frame and contains a plurality of vent holes, as required under our claim interpretation. The vent holes would be flush with the surrounding surface of the nasal bridge region. We are unpersuaded, therefore, that the combination of D’Souza and Ultra Mirage teaches or suggests “a protruding vent arrangement having a plurality of holes.”

For the reasons given, we determine that Petitioner has not established a reasonable likelihood of prevailing on its challenge to independent claim 1 as obvious over D’Souza and Ultra Mirage. For the same reasons, Petitioner

has not shown a reasonable likelihood of prevailing on its challenge to claims 6, 10, 11, 18, 31, and 32, which depend, directly or indirectly, from claim 1.

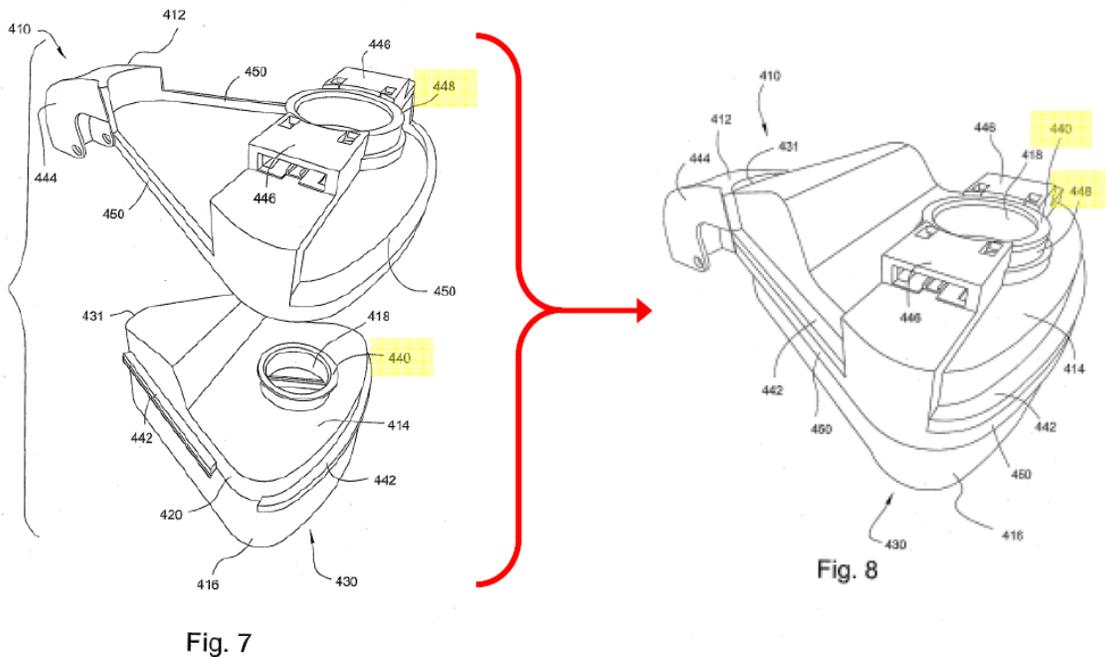
Claims 4, 5, 7, 8, 12–16, 17, 19–21, 22, 25, 26, and 28–30 also depend, directly or indirectly, from independent claim 1. For its challenges to those claims, Petitioner relies on D’Souza and Ultra Mirage in view of one or more of Matula-II, Flexi-Fit, Barnett, Lovell, Jaffe, and Gunaratnam-II. *See* Pet. 34–86. As Petitioner does not argue that any of those references remedies the deficiency with respect to independent claim 1, discussed above, we also determine that Petitioner has not established a reasonable likelihood of prevailing on its challenges to dependent claims 4, 5, 7, 8, 12–16, 17, 19–21, 22, 25, 26, and 28–30.

2. D’Souza, Ultra Mirage, and Matula-II

Petitioner contends that claims 33, 37, and 40–42 would have been obvious over D’Souza, Ultra Mirage, and Matula-II.

a. Overview of D’Souza

As shown in Petitioner’s annotated versions of Figures 7 and 8 of D’Souza, reproduced below, skeleton frame 412 interlocks with cushion/frame sub-assembly 430 (asserted “cushion module”). *See* Pet. 38; Ex. 1002 ¶ 96, Figs. 7, 8.



Figures 7 and 8 of D'Souza illustrate that frame 414 of the asserted cushion module includes an opening 418, which is surrounded by an annular wall 440; and skeleton frame 412 (asserted “shroud module”) includes “an annular elbow connection seal 448 adapted to engage an inlet conduit, e.g., elbow.” Ex. 1002 ¶¶ 98, 100. To assemble and interlock the shroud module and cushion module, the large-diameter collar on the end of annular wall 440 must be passed through the opening in annular seal 448 to rest against the front/top edge of annular seal 448. *See id.* ¶ 101, Figs. 7, 8; Pet. 38.

b. Overview of Matula-II

Petitioner asserts that Matula-II discloses a CPAP mask including faceplate 36 coupled to seal member 38. Pet. 35 (citing Ex. 1005 ¶¶ 52–53). Petitioner provides an annotated version of Figure 4 of Matula-II (reproduced below).

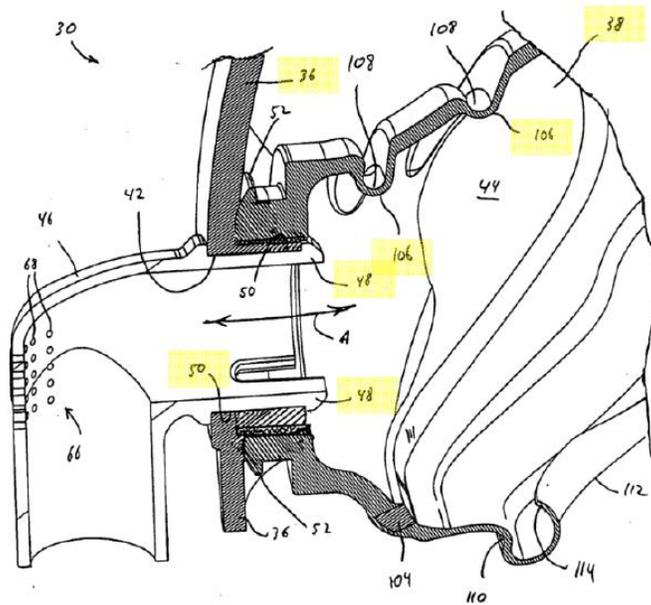


Fig. 4

As shown in Figure 4, Matula-II discloses coupling member or elbow piece 46, which has a pair of prongs 48 that define a channel (channel 50). Ex. 1005 ¶¶ 49, 53. Petitioner explains that channel 50 receives the wall of faceplate 36 and the end of seal member 38. Pet. 35 (citing Ex. 1005 ¶ 53).

c. Analysis of Claims 33, 37, and 40–42

Claim 33 recites, *inter alia*, that “the shroud module includes . . . a retaining portion extending rearwardly from the front opening, towards the frame, and structured to snap-fit with the cushion module” (“the rearwardly extending retaining portion” requirement).

Petitioner contends that “D’Souza teaches a shroud module having an annular opening 448 with a retaining portion extending rearwardly from the opening 448.” *Id.* at 40 (citing Ex. 1002 ¶ 101). As discussed below, Petitioner has not persuaded us that the asserted retaining portion is structured to snap-fit with the cushion module, as required by claim 33.

Petitioner argues:

The shroud 412 includes a retaining portion 448 structured to engage the collar 440. [Ex. 1002] ¶ 101. The shroud and frame are constructed from plastic and their assembly would require elastic deformation of the collar 440 or the retaining portion 448 for the larger diameter collar 440 to pass through the retaining portion 448. Thus, the retaining portion 448 engages the collar 440 with a snap-fit. *Id.* ¶¶ 98, 100; Ex. 1013 ¶¶ 85–86. As shown in Fig. 8 of D’Souza (above), *the collar 440 snaps over the front/top edge of the retaining portion 448.* Ex. 1013 ¶ 86.

Pet. 38 (emphasis added). At most, this argument explains how the large-diameter collar on the end of annular wall 440 is structured to interlock or snap-fit with the shroud module. This argument does not explain how the rearwardly extending portion of annular seal 448 is structured to snap-fit with the cushion module, as the claim requires.

Alternatively, Petitioner argues that “to the extent D’Souza provides insufficient teachings for a removable snap-fit, Matula-II teaches a plurality of snap fingers 48 that elastically deform to mechanically and removably couple the seal member 38 to the faceplate 36.” *Id.* at 41 (citing Ex. 1005 ¶ 53). As a reason to modify D’Souza’s interlock mechanism to satisfy the “rearwardly extending retaining portion” requirement, Petitioner argues: “Based on the teachings of Matula-II, a skilled artisan would have been motivated to incorporate such snap fingers into the removable interlocking arrangement of D’Souza.” *Id.* (citing Ex. 1013 ¶ 91). Petitioner additionally argues:

A skilled artisan would have also been motivated to modify the rearward extending retaining portion of D’Souza to include the plurality of rearward extending snap fingers, as taught by Matula-II, to facilitate formation of the removable snap-fit of D’Souza. Ex. 1013 ¶¶ 94–95. Although the Matula-II snap

fingers are on the elbow, incorporating such snap fingers into the retaining portion of D'Souza would have involved a simple substitution of one known feature for another to obtain predictable results and achieve the same purpose of providing a removable mechanical interlock between the shroud and the cushion module.

Id. at 42 (citing Ex. 1002 ¶ 96).

At this stage of the proceeding, we are persuaded by the cited testimony of Mr. Eaton that a PHOSITA would have modified D'Souza's interlock mechanism by removing the large diameter collar from the end of annular wall 440 and substituting snap fingers, as taught by Matula-II, on the rearwardly extending portion of annular seal 448 (asserted retaining portion). We set forth below Mr. Eaton's testimony explaining that a reason for the substitution would have been the well-known advantages of axially oriented snap fingers over radially oriented compression/expansion features such as D'Souza's large diameter collar:

94. As I have explained above, D'Souza describes a CPAP mask assembly with a snap-fit between the cushion frame and shroud. A person of skill in the art seeking to practice the arrangement described in D'Souza would have recognized that the degree of deformation required to allow assembly of the collar and the rearward extending retaining portion, as shown in the figures, appears to exceed acceptable material strain limits of commonly used rigid plastics such as polycarbonate, and thus could have made it difficult or even impossible to assemble these components. A well-known solution to the problem of snap-fit features exceeding material strain limits was to create slots that segment the interfering features on one or both mating parts into one or more fingers or beams. These fingers or beams can deform along the length of the finger or beam by bending, and allow greater deflection than could be achieved by the radial compression/expansion of cylindrical features, such as those depicted in D'Souza.

95. A person skilled in the art would have known to look to other mask assembly designs where mating cylindrical features were intended to axially engage in a snap fit. This type of an arrangement of snap fingers is taught by Matula-II, where engaging geometry on the elbow is segmented to create a plurality of snap fingers that permit deflection during assembly to the shroud, then elastically recover to an assembled and interlocked position. A person of skill in the art at the time of the invention would have been motivated to modify the rearward extending retaining portion of D'Souza to include a plurality of rearward extending snap fingers on the retaining portion, based on the teaching of Matula-II. While the snap fingers of Matula-II are located in the elbow, incorporating such snap fingers into the retaining portion of D'Souza would have involved simply substituting one known feature for another with a predictable result. Although the location of the snap fingers would have been a matter of design preference, one of skill in the art would have recognized that it would have been advantageous to add snap fingers to the shroud rather than the mask frame based on the simplicity of molding the required snap finger geometry without compromising the airtight surfaces of the mask frame.

Ex. 1013 ¶¶ 94–95.

Claim 33 also recites, *inter alia*, that “the shroud module includes headgear connectors adapted to removably attach to respective headgear straps of headgear.” Petitioner argues that a PHOSITA “would have been motivated to provide removable headgear straps to the mask assembly of D'Souza to enable quick and easy mask fitting and removal (e.g., for cleaning or replacement).” Pet. 33 (citing Ex. 1013 ¶ 71; Ex. 1003, 6). At this stage of the proceeding, we are persuaded that a PHOSITA would have combined the teachings of D'Souza and Ultra Mirage to provide removable headgear straps to D'Souza's mask assembly.

Petitioner provides arguments and a claim chart identifying where all of the limitations of claims 33, 37, and 40–42 are taught by D'Souza, Ultra

Mirage, and Matula-II. Pet. 34–42, 86–90. We have reviewed Petitioner’s arguments and the underlying evidence cited in support and are persuaded at this stage of the proceeding that Petitioner sufficiently establishes that claims 33, 37, and 40–42 would have been obvious over D’Souza, Ultra Mirage, and Matula-II.

For the reasons given, we determine that Petitioner has established a reasonable likelihood of prevailing on its challenge to claims 33, 37, and 40–42 as obvious over D’Souza, Ultra Mirage, and Matula-II.

3. *D’Souza, Ultra Mirage, Matula-II, and Barnett*

Petitioner contends that claims 34 and 36 would have been obvious over D’Souza, Ultra Mirage, Matula-II, and Barnett. Claim 34 recites: “The mask system of claim 33, further comprising an elbow module directly mechanically interlocked with the shroud module while allowing 360 degree rotation of the elbow module.” Claim 36 recites: “The mask system of claim 33, further comprising an elbow module adapted to be connected to an air delivery tube that delivers breathable gas to the patient, wherein the shroud module is structured to directly retain and carry the elbow module.”

Petitioner sufficiently establishes at this stage of the proceeding that “D’Souza discloses an elbow adapted to engage the mask assembly (Ex. 1002 ¶ 100) and Ultra Mirage discloses that the elbow rotates 360° (Ex. 1003 at 6).” *Id.* at 48. While D’Souza and Ultra Mirage do not disclose an elbow that directly connects to the shroud module, Petitioner establishes sufficiently at this stage of the proceeding that “Barnett discloses an elbow 36 that is mounted to the shroud 34 and freely rotates 360°.” *Id.* (citing Ex. 1007, 3:52–57). At this stage of the proceeding, we determine that Petitioner also has provided adequate reasoning with rational

underpinning to show that a PHOSITA would have been motivated to combine the teachings of D’Souza, Ultra Mirage, Matula-II, and Barnett to arrive at the features of claims 34 and 36. *See id.* at 50 (citing Ex. 1013 ¶¶ 110–111), 63 (citing Ex. 1013 ¶ 138).

For the reasons given, we determine that Petitioner has established a reasonable likelihood of prevailing on its challenge to claims 34 and 36 as obvious over D’Souza, Ultra Mirage, Matula-II, and Barnett.

4. *D’Souza, Ultra Mirage, Matula-II, and FlexiFit*

Claim 35 recites:

The mask system of claim 33, wherein the shroud module includes upper and lower headgear connectors on each side of the shroud module; wherein each upper headgear connector includes a slot adapted to receive a respective headgear strap in use; and wherein each lower headgear connector is adapted to be removably interlocked with a headgear clip associated with a respective headgear strap.

Petitioner argues that “D’Souza does not expressly disclose upper headgear connectors, but Ultra Mirage teaches a shroud having a forehead support with headgear connectors.” Pet. 30 (citing Ex. 1013 ¶¶ 65–66). Petitioner additionally asserts that “a skilled artisan would have known to add upper headgear connectors as taught by Ultra Mirage to the forehead support of D’Souza to secure the upper portion of the mask assembly and to stabilize the mask assembly.” *Id.* at 33 (citing Ex. 1013 ¶ 71).

Petitioner also argues that “D’Souza does not expressly disclose upper headgear connector slots and Ultra Mirage shows the slots on headgear clips, but . . . FlexiFit discloses attaching upper horizontal straps to corresponding slots in the mask base.” *Id.* at 44 (citing Ex. 1006, 10; Ex. 1013 ¶ 98). As a

reason to modify the headgear connector configuration of D'Souza and Ultra Mirage, Petitioner asserts:

When headgear is pulled over a user's head, lower headgear straps undergo tension, making it difficult to position the lower headgear straps. [Ex. 1013 ¶¶ 100–101.] A skilled artisan would have been motivated to provide removable lower headgear clips as taught by FlexiFit, so that the user would not have to force the lower headgear straps over his/her head. *Id.* Since upper headgear straps undergo less tension than lower headgear straps when positioning the headgear, a skilled artisan would have known that a simpler design option would have been to provide upper headgear connectors with slots as taught by FlexiFit and that such an alternative arrangement would simplify manufacturing and reduce parts. *Id.*

Id. at 45–46.

Petitioner sufficiently establishes at this stage of the proceeding that D'Souza, Ultra Mirage, and FlexiFit teach or suggest the limitations added by claim 35. Further, at this stage of the proceeding, we determine that Petitioner has provided adequate reasoning with rational underpinning to show that a PHOSITA would have been motivated to combine the teachings of D'Souza, Ultra Mirage, Matula-II, and FlexiFit to arrive at the features of claim 35. *See id.* at 63 (citing Ex. 1013 ¶¶ 139–140), 88–89; *see* Ex. 1013 ¶¶ 96–101, 130–132.

For the reasons given, we determine that Petitioner has established a reasonable likelihood of prevailing on its challenge to claim 35 as obvious over D'Souza, Ultra Mirage, Matula-II, and FlexiFit.

III. CONCLUSION

For the reasons give, Petitioner has shown a reasonable likelihood that it would prevail in establishing unpatentability of claims 33–37 and 40–42,

but not claims 1, 4–8, 10–22, 25, 26, 28–32. At this stage of the proceeding, the Board has not made a final determination with respect to the patentability of any of the challenged claims, nor with respect to claim construction.

IV. ORDER

In consideration of the foregoing, it is hereby:

ORDERED that pursuant to 35 U.S.C. § 314(a), an *inter partes* review is hereby instituted based on the following grounds:

- A. claims 33, 37, and 40–42 of U.S. Patent No. 9,119,931 B2 as obvious over D’Souza, Ultra Mirage, and Matula-II;
- B. claims 34 and 36 of U.S. Patent No. 9,119,931 B2 as obvious over D’Souza, Ultra Mirage, Matula-II, and Barnett; and
- C. claim 35 of U.S. Patent No. 9,119,931 B2 as obvious over D’Souza, Ultra Mirage, Matula-II, and FlexiFit;

FURTHER ORDERED that no other ground of unpatentability asserted in the Petition is authorized for this *inter partes* review; and

FURTHER ORDERED that pursuant to 35 U.S.C. § 314(c) and 37 C.F.R. § 42.4, notice is hereby given of the institution of a trial; the trial will commence on the entry date of this Decision.

IPR2017-00061
Patent 9,119,931 B2

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