

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

FISHER & PAYKEL HEALTHCARE LIMITED
Petitioner,

v.

RESMED LIMITED,
Patent Owner.

Case IPR2017-00059
Patent 8,960,196 B2

Before BARRY L. GROSSMAN, BEVERLY M. BUNTING, and
JAMES J. MAYBERRY, *Administrative Patent Judges*.

MAYBERRY, *Administrative Patent Judge*.

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

I. INTRODUCTION

Petitioner, Fisher & Paykel Healthcare Ltd. (“Fisher”), filed a Petition (Paper 1, “Pet.”) requesting *inter partes* review of claims 23–86 (the “Challenged Claims”) of U.S. Patent No. 8,960,196 B2 (Ex. 1001, the “’196 patent”). Patent Owner, ResMed Ltd. (“ResMed”), did not file a Preliminary Patent Owner Response to the Petition.¹ We instituted trial on all challenged claims. Paper 7, 30 (“Dec. on Inst.”).

After we instituted trial, ResMed filed a Patent Owner Response. Paper 13 (“PO Resp.”). Fisher filed a Reply to ResMed’s Patent Owner Response. Paper 19 (“Reply”). Oral hearing was conducted for this proceeding on November 30, 2017 and the record contains a transcript of the hearing. Paper 26 (“Tr.”).

Fisher relies on the Declaration testimony of Mr. Jason Eaton. Ex. 1106. ResMed relies on the Declaration testimony of Mr. Geoffrey Sleeper. Ex. 2002.

The Board has jurisdiction under 35 U.S.C. § 6. This Final Written Decision is issued pursuant to 35 U.S.C. § 318(a) and 37 C.F.R. § 42.73. For the reasons that follow, we conclude that Fisher has established, by a preponderance of the evidence, that claims 73–76, 78–82, and 84–86 of the ’196 patent are unpatentable. We further conclude that Fisher has not established, by a preponderance of the evidence, that claims 23–72, 77, and 83 of the ’196 patent are unpatentable.

¹ Our rules make filing a Preliminary Response optional. See 37 C.F.R. § 42.107 (“The patent owner *may* file a preliminary response to the petition.”) (emphasis added).

A. Related Matters

Fisher indicates that the '196 patent is involved in U.S. International Trade Commission Investigation No. 337–TA–1022. Pet. 6; *see also* Paper 4, 2 (providing ResMed's Mandatory Notices and identifying this ITC proceeding). Fisher and ResMed are also involved in district court litigation involving the '196 patent in the Southern District of California, in a case styled *Fisher & Paykel Healthcare Ltd. v. ResMed Corp.*, Case No. 3:16-cv-02068-DMS-WVG (S.D. Cal.). Pet. 6–7; Paper 4, 2. Fisher further indicates that it has filed, concurrent with this Petition, a second petition seeking *inter partes* review of the '196 patent. Pet. 7; *see also* Paper 4, 2 (identifying the proceeding as IPR2017-00057).

B. The '196 Patent

The '196 patent, titled “Mask System with Interchangeable Headgear Connectors,” issued February 24, 2015 with claims 1–86. Ex. 1101, (54), (45), 11:58–18:37. The '196 patent is generally directed “to a mask system used for treatment, e.g., of Sleep Disordered Breathing (SDB) with Continuous Positive Airway Pressure (CPAP) or Non-Invasive Positive Pressure Ventilation (NIPPV).” *Id.* at 1:14–17. Figures 1A, 1B, and 1C of the '196 patent depict an embodiment of the '196 patent and are reproduced below.

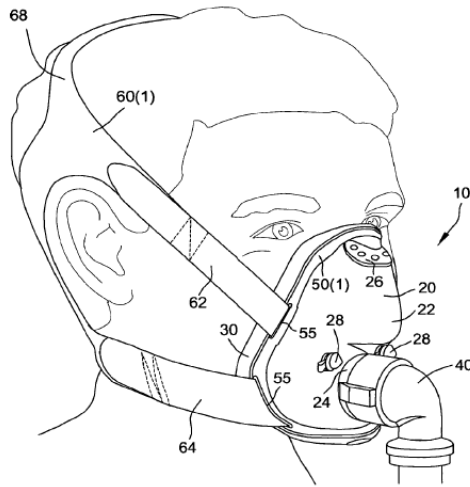


FIG. 1A

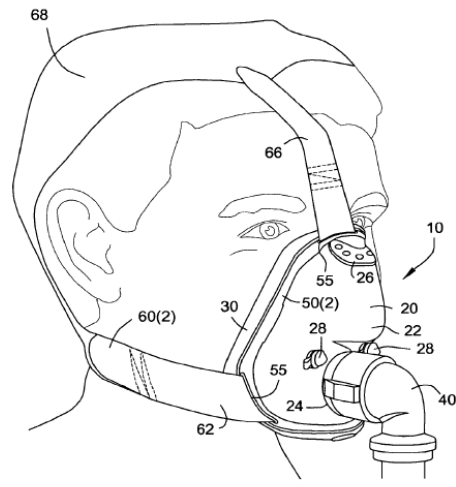


FIG. 1B

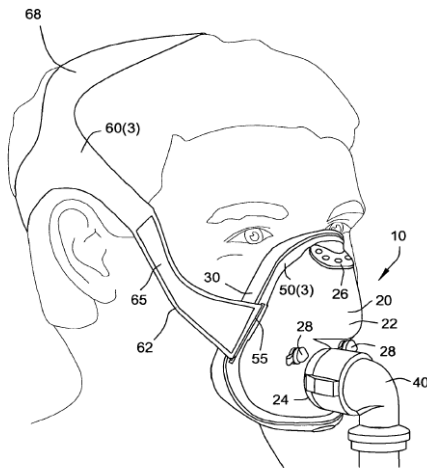


FIG. 1C

Figures 1A, 1B, and 1C depict “a mask system with interchangeable headgear connectors according to an embodiment of the” ’196 patent. Ex. 1101, 2:53–55. Mask system 10 includes frame 20 and cushion 30, which forms a seal where cushion 30 contacts the wearer’s face. *Id.* at 3:29–32. Frame 20 includes main body 22, annular elbow connection seal 24, vent assembly 26, and ports with port caps 28. *Id.* at 3:45–48. Elbow assembly

40 connects to annular elbow connection seal 24 to deliver breathable gas to the mask wearer. *Id.* at 3:32–34.

Mask system 10 also includes headgear connectors 50(1), 50(2), 50(3), depicted in Figures 1A, 1B, and 1C, respectively. *See* Ex. 1101, 6:1–4. Each of headgear connectors 50(1), 50(2), 50(3) includes attachment points that correspond to connection points for headgear 60(1), 60(2), 60(3). *Id.* As seen in Figures 1A, 1B, and 1C each headgear 60(1), 60(2), 60(3) configuration differs slightly from the other headgear configurations. *See id.* at 6:4–9. Headgear connectors 50(1), 50(2), 50(3) removably attach to frame 20, such that the headgear connector corresponding to the headgear configuration can be attached to the frame to accommodate the headgear. *See id.* at 3:49–67.

Figures 2A and 2B are reproduced below:

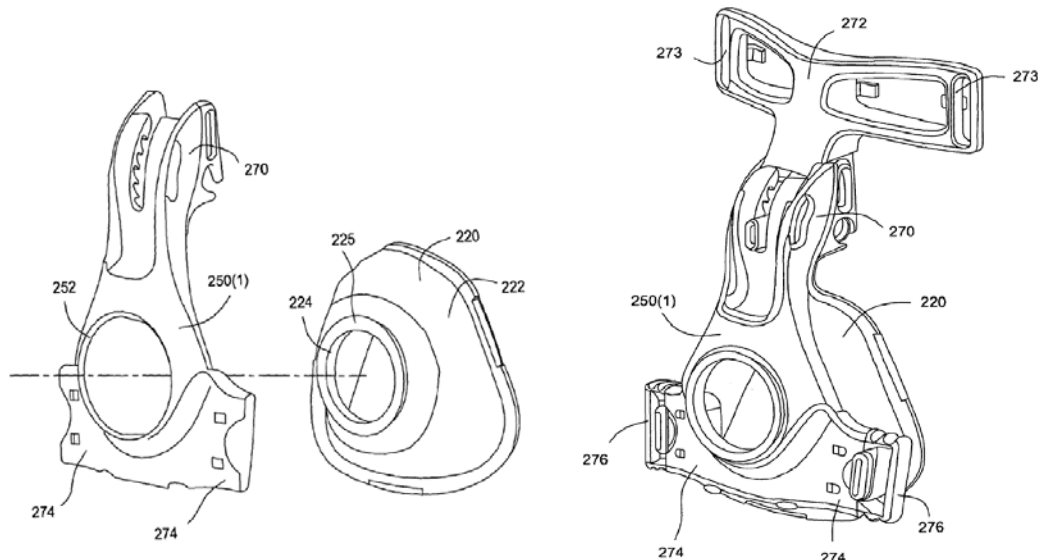


FIG. 2A

FIG. 2B

Figures 2A and 2B depict an alternative embodiment of the '196 patent's mask assembly. Ex. 1101, 2:58–60. In this embodiment, frame 220

connects with headgear connector 250(1). *Id.* at 6:10–11. Frame 220 includes main body 222 with annular elbow connection seal 224 forming a central bore in frame 220. *Id.* at 6:21–23. Central bore 224 includes interface structure 225, which connects with headgear connector 250(1) at opening 252. *Id.* at 6:28–38.

Headgear connector 250(1) includes structures for attaching a headgear, including openings 273 and clips 276. Ex. 1101, 6:60–7:2. Headgear connector 250(1) includes adjustable forehead support 272. *See id.* at 7:3–16.

C. Challenged Claims

Of the Challenged Claims, claims 23, 41, 57, and 73 are independent. These claims are reproduced below:

23. A mask for delivering breathable gas to a patient at positive pressure to treat sleep disordered breathing, the mask comprising:

- a rigid mask frame having a bore and an interfacing structure associated with the bore, said mask frame having no built-in or integral headgear attachment points;

- a sealing cushion provided to the mask frame and adapted to form a seal with the patient's face, the mask frame and the sealing cushion together forming a breathing cavity; and

- a headgear connector adapted to engage the interfacing structure with a snap-fit, said headgear connector including a pair of lower headgear clip anchors adapted to be engaged with respective ones of a pair of lower headgear clips to attach a pair of lower side straps, said headgear connector including a fixed forehead support, said fixed forehead support including a pair of openings adapted to attach to respective ones of a pair of upper side straps.

Ex. 1101, 13:1–19.

41. A mask for delivering breathable gas to a patient at positive pressure to treat sleep disordered breathing, the mask comprising:

- a one-piece rigid mask frame having a bore and an interfacing structure at least partly surrounding the bore, the rigid mask frame having no built-in or integral headgear attachment points;

- a soft sealing cushion provided to the rigid mask frame and adapted to form a seal with the patient's face;

- an elbow assembly, said elbow assembly being adapted to be connected to an air delivery tube to deliver the breathable gas to a breathing cavity defined by the rigid mask frame and the soft sealing cushion; and

- a headgear connector having an opening and an attachment structure associated with the opening, the attachment structure being adapted to engage the interfacing structure of the rigid mask frame to removably connect the headgear connector to the rigid mask frame, said bore and said opening being concentrically disposed about a common axis,

wherein the headgear connector and the rigid mask frame are detachably connected together by translating the rigid mask frame and the headgear connector towards one another along the common axis until a snap-fit connection is established between the attachment structure of the headgear connector and the interfacing structure of the rigid mask frame, and wherein said headgear connector includes a fixed forehead support.

Ex. 1101, 14:21–49.

57. A mask system for delivering breathable gas to a patient at positive pressure to treat sleep disordered breathing, the mask system comprising:

- a rigid mask frame having a bore and a cylindrical projection extending around the bore, the rigid mask frame having no built-in or integral headgear attachment points;

- a soft sealing cushion provided to the rigid mask frame and adapted to form a seal with the patient's face, said soft sealing cushion and said rigid mask frame defining a breathing cavity from which the breathable gas is accessible by the patient in use;

an elbow having a first end adapted to be connected to an air delivery tube and a second end in communication with the bore to deliver the breathable gas from the air delivery tube to the breathing cavity;

headgear including a pair of upper side straps, a pair of lower side straps, and a rear portion from which the upper side straps and the lower side straps extend; and

a headgear connector having an opening with an attachment structure associated with the opening, the attachment structure removably attached to the cylindrical projection of the rigid mask frame with a snap-fit such that when said cylindrical projection and said attachment structure are attached, the rigid mask frame and the headgear connector are not movable relative to one another,

wherein said opening and said bore are concentrically disposed about a common axis, wherein said headgear connector includes a pair of lower headgear clip anchors adapted to secure respective ones of the lower side straps, and

wherein said headgear connector includes a forehead support including a pair of openings adapted to attach to respective ones of the pair of upper side straps.

Ex. 1101, 15:52–16:19.

73. A mask for delivering breathable gas to a patient at positive pressure to treat sleep disordered breathing, the mask comprising:

a rigid mask frame having a bore and no built-in or integral headgear attachment points;

a soft sealing cushion attached to the rigid mask frame and adapted to form a seal with the patient's face, the rigid mask frame and the soft sealing cushion together forming a breathing cavity to receive the breathable gas; and

a headgear connector including a plurality of tabs structured to removably attach the headgear connector to the rigid mask frame with a snap-fit, a pair of crossbars to removably attach a pair of lower side straps, and an extension having a plurality of openings to removably attach a pair of upper side straps.

Ex. 1101, 17:8–22.

D. The Prior Art

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

Ogden	US 5,662,101	Sept. 2, 1997	Ex. 1102
Lovell	US 6,631,718 B1	Oct. 14, 2003	Ex. 1103
Gunaratnam	US 6,796,308 B2	Sept. 28, 2004	Ex. 1104
Geist	US 7,353,827 B2	Apr. 8, 2008	Ex. 1105

Dec. on Inst. 30.

E. Instituted Grounds of Unpatentability

We instituted trial following grounds of unpatentability:

References	Basis ²	Claims Challenged
Ogden, Lovell, and Gunaratnam	35 U.S.C. § 103(a)	23–78, 80–82, and 84–86
Ogden, Lovell, Gunaratnam, and Geist	35 U.S.C. § 103(a)	79 and 83

Dec. on Inst. 30.

II. ANALYSIS

A. Level of Ordinary Skill in the Art

“[T]he level of skill in the art is a prism or lens through which a judge, jury, or the Board views the prior art and the claimed invention.” *Okajima v. Bourdeau*, 261 F.3d 1350, 1355 (Fed. Cir. 2001). Fisher asserts that the level of ordinary skill in the art to which the ’196 patent pertains is “a

² The Leahy-Smith America Invents Act (“AIA”), Pub. L. No. 112-29, 125 Stat. 284, 296–307 (2011), took effect on September 16, 2012. Because the application for the patent at issue in this proceeding has an effective filing date before that date, we refer to the pre-AIA versions of the statute.

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. 12 (citing Ex. 1106 (Decl. of Jason Eaton) ¶ 27).

ResMed's declarant, Mr. Sleeper, defines the level of ordinary skill in the art as "a bachelor's degree in mechanical engineering, biomedical engineering, or a similar technical field, with at least two years of relevant product design experience. An increase in experience could compensate for less education, and an increase in education could likewise compensate for less experience." Ex. 2002 (Decl. of Geoffrey Sleeper) ¶ 12.

Factual indicators of the level of ordinary skill in the art include "the various prior art approaches employed, the types of problems encountered in the art, the rapidity with which innovations are made, the sophistication of the technology involved, and the educational background of those actively working in the field." *Jacobson Bros., Inc. v. United States*, 512 F.2d 1065, 1071 (Ct. Cl. 1975); *see also Orthopedic Equip. Co., Inc. v. United States*, 702 F.2d 1005, 1011 (Fed. Cir. 1983) (quoting with approval *Jacobson Bros.*).

We find both parties assert very similar definitions of the level of ordinary skill in the art. Both definitions include a degreed engineer with two years of experience. Fisher identifies the fields of experience as "masks, respiratory therapy, patient interfaces or relevant product design experience" and ResMed, through Mr. Sleeper, defines the field of experience as "relevant product design experience." Mr. Sleeper declares

that additional experience may compensate for less education and additional education may compensate for less experience.

We find, based on our review of the complete record, that the evidence of record supports a level of ordinary skill in the art consistent with the parties' definitions—a person having a bachelor's degree in mechanical engineering, biomedical engineering or other similar type of engineering degree combined with two years of experience in the field of masks, respiratory therapy, patient interfaces, or other relevant product design experience. We also find that additional experience may compensate for less education and additional education may compensate for less experience. Further, we note that our patentability analysis presented 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

In an *inter partes* review, claim terms in an unexpired patent are given their broadest reasonable construction in light of the specification of the patent in which they appear. 37 C.F.R. § 42.100(b). Under the broadest reasonable construction standard, claim terms are given their ordinary and customary meaning, as would be understood by one of ordinary skill in the art in the context of the entire disclosure. *In re Translogic Tech., Inc.*, 504 F.3d 1249, 1257 (Fed. Cir. 2007). Also, we are careful not to read a particular embodiment appearing in the written description into the claim if the claim language is broader than the embodiment. *See In re Van Geuns*, 988 F.2d 1181, 1184 (Fed. Cir. 1993) (“[L]imitations are not to be read into the claims from the specification.”).

Fisher contends that the terms of the Challenged Claims “should be accorded their ‘broadest reasonable construction’ in light of the specification of the ’196 [p]atent” and does not offer any express constructions for any term in the Challenged Claims. *See* Pet. 10. ResMed does not offer any express constructions of the claim terms. *See* PO Resp. 11–12. In our Decision on Institution, we did not expressly construe any claim term. *See* Dec. on Inst. 10.

Based on our review of the complete record, the parties dispute the meaning of the term “a headgear connector including a plurality of tabs structured to removably attach the headgear connector to the rigid mask frame with a snap-fit” of claim 73. *Compare* Tr. 20:11–24 with Tr. 34:12–36:2. Accordingly, we expressly construe this term, below. *See Vivid Techs., Inc. v. Am. Sci. & Eng’g, Inc.*, 200 F.3d 795, 803 (Fed. Cir. 1999) (construing *explicitly* only those claim terms in controversy and only to the extent necessary to resolve the controversy).

1. “a headgear connector including a plurality of tabs structured to removably attach the headgear connector to the rigid mask frame with a snap-fit”

Claim 73 recites, in relevant part, “a headgear connector including a plurality of tabs structured to removably attach the headgear connector to the rigid mask frame with a snap-fit.” Ex. 1101, 17:16–18. Fisher takes the position that this claim limitation requires the headgear connector to have a plurality of tabs, with the headgear connector structured to attach removably to the rigid mask frame with a snap-fit. That is, the broadest reasonable construction of this claim terms encompasses a structure having a plurality of tabs, but the plurality of tabs not necessarily providing the snap-fit structure. *See* Pet. 80 (contending that Ogden discloses the claim limitation

with single detent 43–channel 49 forming the snap fit); Tr. 20:15–18 (“We believe the broadest reasonable interpretation of that is that there is a plurality of tabs but there just must be a snap-fit. And we believe that the top tab of Ogden does, in fact, disclose that snap-fit.”).

ResMed takes the position that the *plurality* of tabs must form the snap-fit structure. See PO Resp. 27 (“Moreover, even if there was a ‘snap-fit,’ there would only be a snap-fit by a single tab (detent 43, illustrated below in Figure 1)—not the required plurality of tabs”); Tr. 35:7–9 (“The plurality of tabs are what need to have the snap-fit. And having one snap-fit for one tab is not enough to meet this claim language.”). As detailed below, we determine that the broadest reasonable construction of the disputed claim limitation encompasses a structure having a plurality of tabs, but the plurality of tabs not necessarily providing the snap-fit structure. That is, under the broadest reasonable construction, a single tab may provide the snap fit structure.

First, the plain reading of claim 73 supports our construction. See, e.g., *Phillips v. AWH Corp.*, 415 F.3d 1303, 1314 (Fed. Cir. 2005) (en banc) (“[T]he context in which a term is used in the [claim at issue] can be highly instructive.”). As a starting point, the plain meaning of the phrase “plurality of tabs” is two or more tabs and we discern nothing in the record to indicate a contrary meaning. See, e.g., *Dayco Prod., Inc. v. Total Containment, Inc.*, 258 F.3d 1317, 1327–28 (Fed. Cir. 2001) (“[W]e have held that ‘plurality,’ when used in a claim, refers to two or more items, absent some indication to the contrary.”).

The plain language of the claim also requires the two or more tabs be structured to attach removably the headgear connector to the rigid mask

frame. The claim language further requires this removable attaching be with a snap-fit. The language of the claim, however, does not require two or more tabs be associated with the snap-fit. That is, nothing in the plain language of the claim element precludes a structure that includes two or more tabs interfacing with the rigid mask, where only one of the tabs is associated with snap-fit aspect of the interfacing.

At oral hearing, ResMed’s counsel argued that the phrase “removably attach” modifies the phrase “plurality of tabs.” Tr. 35:15–16. Counsel argued that “the tabs, plural, are doing the attaching . . . [t]hrough snap-fit.” *Id.* at 17–18. We do not agree precisely with ResMed’s reading. The plain reading of the claim limitation require two or more tabs be structured to attach removably the headgear connector from the rigid mask. The claims require the headgear connector to be attached to the rigid mask with a snap-fit. The claim scope, under a broadest reasonable construction, does not, however, require the plurality of tabs to form the snap fit. The claim is broad enough to encompass a structure where one tab forms the snap fit and the one or more other tabs interface with the rigid mask in a way such that the headgear connector and rigid mask are removably attached.

Second, the language of other claims also informs our construction. “Other claims of the patent in question . . . can also be valuable sources of enlightenment as to the meaning of a claim term.” *Phillips*, 415 F.3d at 1314. Claim 77 recites “[t]he mask according to claim 73, wherein when said rigid mask frame and said headgear connector are attached, the rigid mask frame and the headgear connector are not movable relative to one another.” Ex. 1101, 17:30–33. This recitation supports the presumption that claim 73 is broader in scope, allowing the rigid mask frame and the headgear

connector to move relative to one another. As such, this allowing the rigid mask frame and the headgear connector to move relative to one another supports an interpretation of claim 73 that the plurality of tabs are not necessarily employed in the snap-fit structure, with one or more of the tabs facilitating this relative movement.

The Specification does not provide an explicit definition of the disputed claim limitation. ResMed argues that every embodiment of the '196 patent includes a plurality of tabs where the plurality forms the snap-fit structure. Tr. 35:23–36:2. ResMed, however, directs us to the embodiment depicted in Figure 1D of the '196 patent only, an embodiment that does not correspond to the recited structure of claim 73, as the embodiment of Figure 1D does not include a rigid mask frame having a bore as required by claim 73. *See* Ex. 1101, Fig. 1D–1 (depicting a mask frame without any bore). As such, that embodiment is not directly applicable to our inquiry, although it does provide some evidentiary support to ResMed's claim construction position.

The embodiment depicted in Figure 6A of the '196 patent is also not directly applicable to our inquiry, as it includes a plurality of tabs (380(1), 380(2), 380(3)) structured to connect a headgear connector with a rigid mask having a bore, but the tabs are on the mask, not the headgear connector. *See* Ex. 1101, 8:42–10:11, Figs. 6A, 6B-1, 6B-2, 6C-1, 6C-2. In this embodiment, however, the mask includes a plurality of tabs, where, in certain cases, only a single tab is used to snap-fit the headgear connector to the mask. *See id.* This structure provides support for our construction being the broadest reasonable construction of the limitation at issue in light of the Specification of the '196 patent. In reaching this determination, we find that

the evidence depicted in the embodiment of Fig. 6A outweighs the evidence depicted in Figure 1D, as the embodiments of Fig. 6A is more closely aligned to the structure recited in claim 73.

We are not directed to anything in the prosecution history by ResMed nor do we discern anything in the prosecution history contrary to our construction. *See, e.g.*, Ex. 1107, 23–44 (showing that claim 73 (application claim 74) was added in an RCE amendment, where the claims were subsequently allowed without further prosecution); Pet. 12 (providing a summary of the prosecution history).

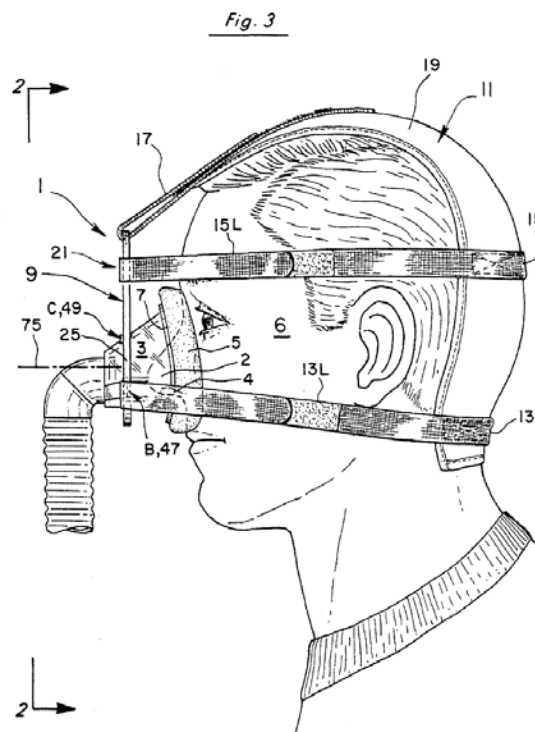
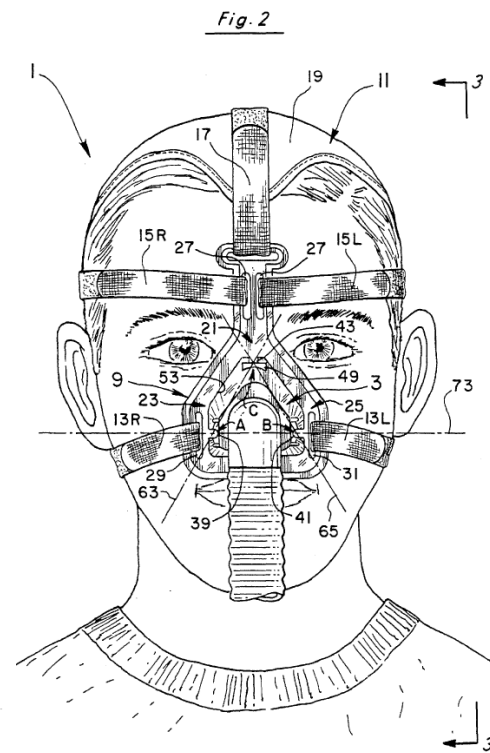
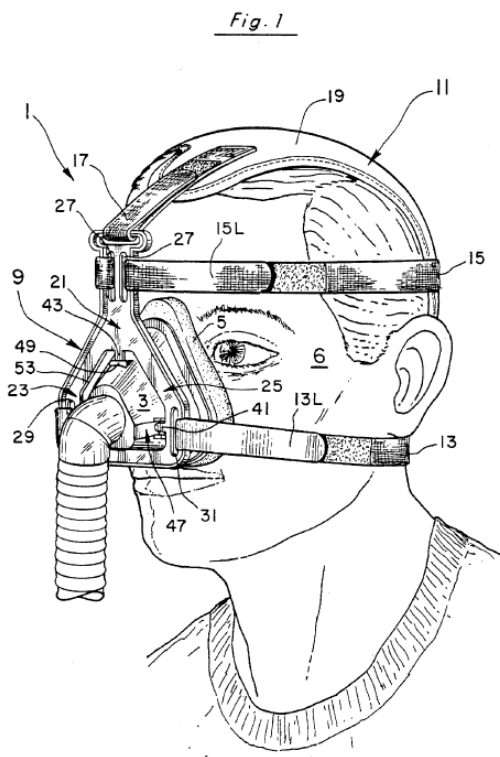
Having considered the entire record, we construe the limitation “a headgear connector including a plurality of tabs structured to removably attach the headgear connector to the rigid mask frame with a snap-fit,” broadly, but reasonably as encompassing a structure having a plurality of tabs, but the plurality of tabs not necessarily providing the snap-fit structure. That is, under the broadest reasonable construction, a single tab may provide the snap fit structure.

C. Overview of the Asserted Prior Art

The Petition relies on four prior art references in its asserted grounds of unpatentability—Ogden, Lovell, Gunaratnam, and Geist. We briefly discuss relevant portions of these references, below.

1. Ogden

Ogden, titled “Respiratory Facial Mask,” issued September 2, 1997. Ex. 1102, (54), (45). Ogden is generally directed to “respiratory facial masks” such as those used in respiratory care and therapy. *Id.* at 1:5–10. Ogden’s Figures 1–3 are reproduced below:



Figures 1, 2, and 3 depicts a perspective view, front view, and side view of Ogden's mask, respectively. Ex. 1102, 2:17–21. Mask assembly 1 covers a user's nose with rigid, cup-shaped shell 3. *Id.* at 2:46–54. Soft, pliable seal 5 is attached to cup 3 and forms a seal at the patient's face. *Id.* at 2:54–57. Shell 3 is held in position by rigid plate 9 and harness arrangement 11. *Id.* at 2:58–61.

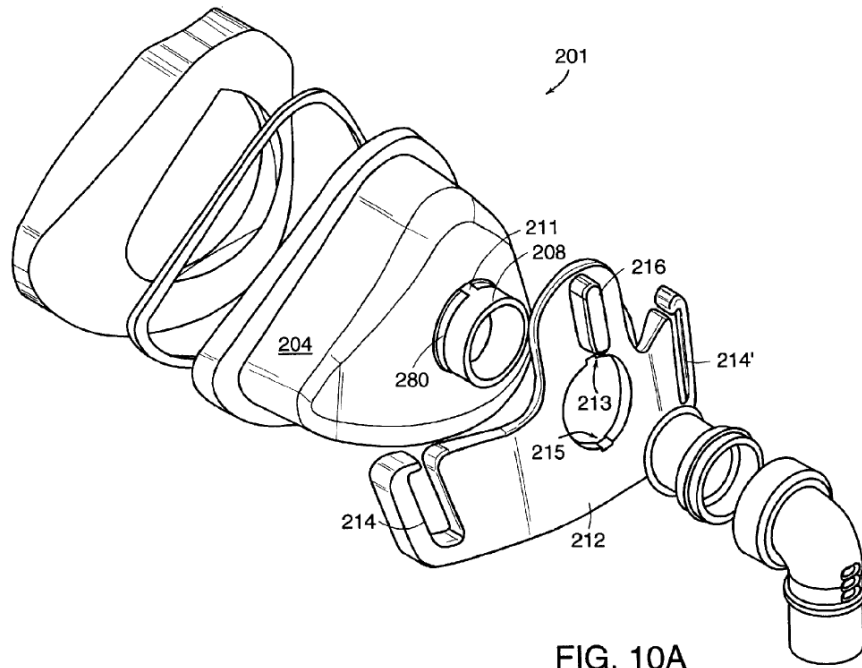
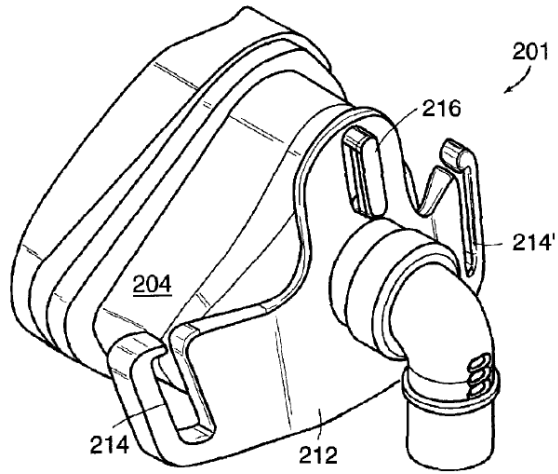
Rigid plate 9 is planar and attaches to cup 3 at locations A, B, and C using detents 39, 41, 43 and channels 45, 47, and 49. Ex. 1102, 3:26–29. Plate 9 provides five-point attachment to harness arrangement 11—an opening at the top of plate 9 for strap 17, two adjacent openings (loops 27) for straps 15R and 15L, and openings 29, 31 for straps 13R and 13L. *See id.* at 2:62–3:24.

Channels 45 and 47 for plate 9 are positioned on the sides of shell 3 and “loosely receive” detents 39 and 41 of rigid plate 9. Ex. 1102, 3:30–33. Channel 49 is located at the top ridge of shell 3 and “loosely receives” detent 43. *Id.* at 3:34–37. Channel 49 differs from channels 45 and 47 in that it maintains detent 43 within four end walls 55 of the channel. *Id.* at 3:43–46. Channel 45 and 47 have closed walls 57 and 59, respectively, but are open ended at the front. *Id.* at 3:46–49. Accordingly, rigid plate 9 rotates relative to the rigid shell 3 about axes 63 and 65 “to compensate for any unequal forces applied to [] rigid plate 9, as for example, by side straps 13R and 13L as the patient turns his or her head from side-to-side.” *Id.* at 3:49–55.

2. Lovell

Lovell, titled “Air Mask with Seal,” issued October 14, 2003. Ex. 1103, (54), (45). Lovell is generally directed to “nasal masks useful for providing pressurized air or therapeutic gas to a patient suffering from an

airflow limitation or other respiratory ailment.” *Id.* at1:6–8. Lovell’s
Figures 9, 10A, and 10B are reproduced below:



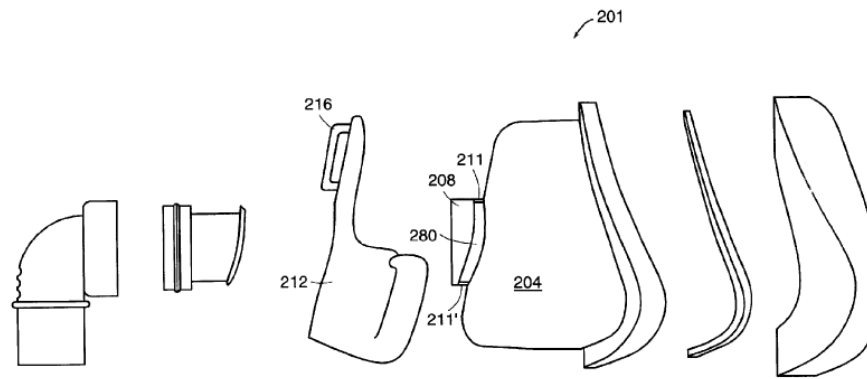


Figure 9 depicts “a schematic perspective view of a nasal mask according to an . . . embodiment of the invention” of Lovell. Ex. 1103, 4:1–2. Figure 10A depicts “a schematic exploded perspective view of the components of the nasal mask depicted in [Figure] 9” and Figure 10B depicts “a schematic exploded side view of the components of the nasal mask depicted in [Figure] 9.” *Id.* at 4:3–6.

Lovell’s mask 201 includes retainer 212, which is contoured to match the surface of shell 204 and is coupled to shell 204 at inlet 208. Ex. 1103, 9:36–46. Retainer 212 includes lower connection points 214, 214’ and upper connection point 216 to connect mask 201 to a user’s headgear. *Id.* at 9:49–51. Retainer 212 includes slots 213, 215 that engage with tabs 211, 211’ of shell 204 such that depressed annular region 280 mates with the edges of the opening in retainer 212. *Id.* at 9:43–66.

Lovell’s mask 201 also includes a cushion (“seal,” not numbered) and a conduit elbow for treatment gas. *See, e.g.*, Ex. 1103, 4:34–40 (discussing seal 2), 5:9–61 (discussing inlet system for treatment gas, including conduit elbow 10), 9:34–36 (disclosing that mask 201 “has many . . . of the features of the nasal mask 1 embodiment shown in [Figures] 1–8.”).

3. Gunaratnam

Gunaratnam, titled “Mask Cushion and Frame Assembly,” issued September 28, 2004. Ex. 1104, (54), (45). Gunaratnam is generally directed to connecting a mask used in the treatment of sleep disordered breathing (SDB) with a nasal or full-face mask cushion. *Id.* at 1:21–25. Gunaratnam’s Figures 5a and 5c are reproduced below:

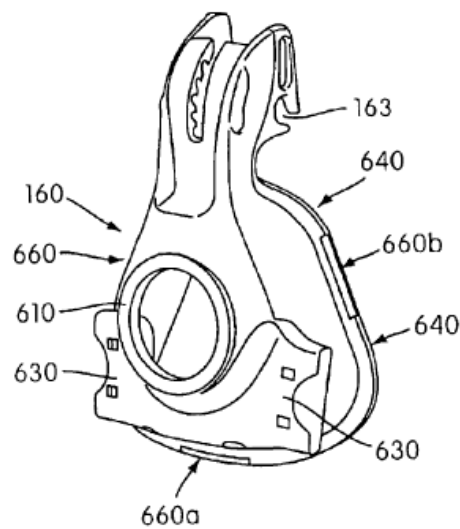


FIG. 5a

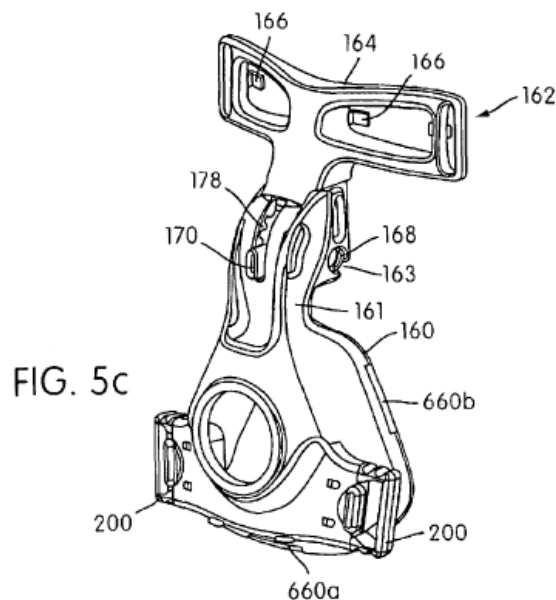


FIG. 5c

Figure 5a depicts “a front perspective view of a nasal mask frame,” and Figure 5c depicts “a front perspective view of a nasal mask frame and adjustable forehead support.” Ex. 1104, 3:6–12. Frame 160 is generally triangular and fits over a wearer’s nose and forms a breathing cavity. *Id.* at 4:26–30. Frame 160 includes gas inlet aperture 610, which connects to a conduit that delivers gas to the wearer. *Id.* at 4:21–25. The frame includes a front portion with connection points 630 for headgear. *Id.* 4:31-32.

The embodiment of Figure 5c includes adjustable forehead support 162 coupled to frame 160. Ex. 1104, 4:46–57. Figure 5c also depicts connector 200 for connecting the mask to a user’s headgear. *Id.* at 4:32–34.

4. Geist

Geist, titled “Mask, Mask Shell, and Seal with Improved Mounting, Mask Seal, Method of Mask Manufacture and Mask with Reduced Exhalation Noise,” issued April 8, 2008. Ex. 1105, (54), (45). Geist is directed to “a nasal CPAP (Continuous Positive Airway Pressure) mask particularly useful for supplying pressurized breathing gas.” *Id.* at 1:11–12. In relevant part, Geist discloses mask shell 12 with vent holes 60, where the vent holes vent exhaled breath from the mask’s user. *Id.* at 5:11–14.

D. Asserted Grounds of Unpatentability

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

We instituted trial on two grounds of unpatentability for the Challenged Claims of the '196 patent, both of which are based on obviousness. *See* Dec. on Inst. 30.

Section 103(a) [of 35 U.S.C.] forbids issuance of a patent when “the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains.”

KSR Int’l Co. v. Teleflex Inc., 550 U.S. 398, 406 (2007).

The question of obviousness is resolved on the basis of underlying factual determinations, including: (1) the scope and content of the prior art; (2) any differences between the claimed subject matter and the prior art; (3) the level of ordinary skill in the art; and (4) when available, secondary considerations, such as commercial success, long felt but unsolved needs, and failure of others. *Graham v. John Deere Co.*, 383 U.S. 1, 17–18 (1966). We address these underlying factual issues below.³

1. *Claims 23–78, 80–82, and 84–86 as allegedly unpatentable under 35 U.S.C. § 103(a) over Ogden, Lovell, and Gunaratnam*

a. Independent claim 23 and dependent claims 24–40

The subject matter of claim 23

Claim 23 recites “a rigid mask frame having a bore and an interfacing structure associated with the bore, said mask frame having no built-in or integral headgear attachment points.” Ex. 1101, 13:4–6 (the “mask frame” limitation of claim 23). Fisher contends that, “to the extent the ‘interfacing

³ We address the level of ordinary skill in the art in Section II.A., *supra*. Patent Owner does not direct us to any evidence concerning secondary considerations.

structure associated with the bore' is interpreted narrowly to mean an interfacing structure positioned *directly at the bore*, such interfacing structure was known in the art prior to the '196 [p]atent." Pet. 22.⁴ Fisher contends that Lovell discloses this subject matter, specifically identifying frame 204 with annular bore 208. *Id.* Fisher explains that "bore 208 includes, and is thus associated with, an interfacing structure (depressed annular regions 280 extending between two tabs 211, 211') that mates with the headgear connector 212" (that is, retainer 212). *Id.*

We find that Ogden, as modified by Lovell's teachings as contended by Fisher, discloses the mask frame limitation of claim 23. We find that Lovell discloses an interface structure associated with a bore of a mask. *See* Ex. 1103, Fig. 10A (depicting mask 204 with bore 208 and interface structures 211 and 280), 9:46–48 ("Two tabs 211, 211' included on the inlet 208 mate with two slots 213, 215 formed in the retainer 212 in a particular angular orientation."); Pet. 22. We are persuaded by Petitioner's arguments

⁴ In the Petition, Fisher contends that Ogden discloses the recited rigid mask frame and, specifically, that Ogden's shell 3 is the recited mask frame with a bore, with channels 45, 47, and 49 as the frame's interface structure. Pet. 19. Fisher explained that Ogden's cup-shaped shell 3 includes an opening to receive hose coupling 10 and that channels 45, 47, and 49 are positioned on shell 3 adjacent to this opening, such that, channels 45, 47, and 49 are associated with the bore of cup 3. *Id.* at 21. In our Decision on Institution, we found this position unpersuasive and Fisher confirmed at oral hearing that it was no longer relying on this position. *See* Dec. on Inst. 18–19; Tr. 10–11.

and evidence that modifying Ogden’s rigid mask frame with Lovell’s teachings of an interface structure results in the mask frame limitation.⁵

Claim 23 also recites “a sealing cushion provided to the mask frame and adapted to form a seal with the patient’s face, the mask frame and the sealing cushion together forming a breathing cavity.” Ex. 1101, 13:7–9 (the “sealing cushion” limitation of claim 23). We find, as contended by Fisher, that Ogden discloses the sealing cushion limitation. Ogden’s mask 1 includes cushion 5, which is adapted to form a seal with the patient’s face and, in conjunction with rigid frame 3, forms a breathing cavity. *See* Ex. 1102, 2:54–60 (“A soft, pliable seal 5 of elastomer, urethane foam, or rubber is attached (e.g., glued or press fit) about the rear perimeter portion 7 of the rigid shell 3 to engage and seal against the patient’s face. The rigid, cup-shaped shell 3 with its seal 5 (see FIGS. 1-3) is attached or secured in its sealing position enclosing the nose 2 and nares 4 of the patient 6.”); Fig. 8 (depicting cushion 5 forming a seal with the patient 6’s face and forming a breathing cavity with frame 3); Pet. 19–20. ResMed does not dispute that Ogden discloses the sealing cushion limitation of claim 23.

Claim 23 further recites “a headgear connector adapted to engage the interfacing structure with a snap-fit.” Ex. 1101, 13:11–12 (the “snap-fit” limitation of claim 23). We find that Ogden discloses a headgear connector—rigid plate 9. *See* Ex. 1102, 2:57–61 (“The rigid, cup-shaped

⁵ ResMed argues that, under Fisher’s proposed modification, the modified mask would not include the recited rigid mask frame, as a person having ordinary skill in the art would have adopted Lovell’s flexible mask frame. PO Resp. 72–76. We address this contention below, in our analysis of whether a person having ordinary skill in the art would have had reason to modify Ogden as Fisher proposes.

shell 3 with its seal 5 (see FIGS. 1-3) is attached or secured in its sealing position enclosing the nose 2 and nares 4 of the patient 6 by the rigid plate 9 and harness arrangement 11.”), Figs. 1–3 (depicting rigid plate 9 with attached straps 13, 15, 17 of harness arrangement 11); Pet. 19–20. We find that Ogden, as modified by Lovell as Fisher proposes, discloses the snap-fit limitation of claim 23. We find that Lovell discloses that depressed annular regions 280 extending between two tabs 211, 211' and mate with tabs formed in the annular opening of retainer 212 (Lovell's headgear connector). See Ex. 1103, 9:43–67 (describing how depressed annular region 280 and tabs 211, 211' interface with tabs 213, 215). We find that, based on the disclosure of Lovell, a person having ordinary skill in the art would understand that the circumference of the opening in retainer 212 would snap-fit into depressed annular region 280. See *id.* We credit Mr. Eaton's testimony in this regard. See Ex. 1106 ¶¶ 77–79. We credit this testimony, in part, because it is consistent with Lovell's disclosure, as Lovell discloses that depressed annular region 280 helps to maintain retainer 212 in place and that action requires the circumference of the opening in retainer 212 to fit into the depressed region. To accomplish this action, the interference fit between the circumference of the opening in retainer 212 and inlet 208 causes inlet 208 to slightly deflect, then recover when retainer 212 is against mask 204. See Ex. 1103, 9:43–67; Ex. 1106 ¶¶ 77–79. We understand that Fisher's proposed modification would incorporate the interface structure of Lovell into the connection of Ogden's headgear connector and rigid mask. See Pet. 23 (“Modifying the mask of Ogden to include the frame features of Lovell would have been a combination of familiar elements according to known methods that does no more than yield predictable results.”).

ResMed contends that Lovell does not disclose the recited snap-fit. PO Resp. 79. ResMed argues that the embodiment depicted in Lovell's Figure 10A discloses a connection that is "an 'interference fit . . . when fully seated'—not a snap-fit." *Id.* ResMed argues that the interference fit between the aperture in retainer 212 and inlet 208 compresses depressed region 280 when retainer 212 is slid onto inlet 208 and fully seats with mask 204. *Id.* at 79-80 (referencing Ex. 2002 ¶ 61).

This argument, however, mischaracterizes the disclosure of Lovell. Instead, we find that Lovell teaches that the aperture in retainer 212 is sized to form an interference fit with inlet 208, such that it may slightly depress inlet 208 as retainer 212 is slid onto inlet 208. This slight deflection recovers when retainer 212 is fully seated against shell 204, allowing depressed annular region 208 to retain retainer 212. Indeed, there would be no purpose for depressed annular region 208 if the circumferential wall of the aperture in retainer 212 did not engage that depression. *See* Ex. 1103, 9:43–64. As Mr. Eaton testifies, that engagement constitutes a snap-fit. *See, e.g.,* Ex. 2003 119:9–120:21 ("So, you've got a period of interference, deflection, followed by elastic recovery and engagement behind an undercut region. I think that's the simple definition of snap-fit, specifically an annular snap-fit."); *see also* Reply 19–21 (addressing the snap-fit limitation).

Further, we do not credit Mr. Sleeper's testimony in this regard. Mr. Sleeper declares that the tabs on retainer 212 would not deflect. *See* Ex. 2002 ¶ 61. This testimony ignores the possibility that inlet 208 deflects and also fails to explain adequately the role depressed annular region 280 plays in retaining retainer 212 under his explanation of how Lovell operates. *See*

Ex. 1112, 106:16–108:2 (recognizing that inlet 204 would compress when retainer 212 is slid onto inlet 204).

Claim 23 also requires the “headgear connector [to include] a pair of lower headgear clip anchors adapted to be engaged with respective ones of a pair of lower headgear clips to attach a pair of lower side straps.” Ex. 1101, 13:11–15 (the “headgear clip” limitation). Fisher recognizes that Ogden does not disclose the recited headgear clips. Pet. 23. Fisher contends that Gunaratnam discloses this structure, identifying clips 200 depicted in Gunaratnam’s Figure 5c. *Id.* We find that Gunaratnam discloses a headgear connector with a pair of lower headgear clip anchors adapted to be engaged with respective ones of a pair of lower headgear clips to attach a pair of lower side straps. *See* Ex. 1104, 4:31–33 (“On the front surface of the frame, are strap connection points (630) for connection of the mask to patient headgear. Connectors (200) are shown in FIGS. 5c-5f.”), Fig. 5c; compare *id.*, Fig. 5c with Ex. 1101 (depicting a near-identical mask structure, with a pair of lower headgear clips to attach a pair of lower side straps). ResMed does not dispute that Gunaratnam discloses the headgear clip limitation.

Claim 23 also requires the “headgear connector [to] include[e] a fixed forehead support, said fixed forehead support including a pair of openings adapted to attach to respective ones of a pair of upper side straps.” Ex. 1101, 13:16–19 (the “forehead support” limitation). Fisher contends that top portion 21 of plate 9 satisfies the forehead support limitation. Pet. 19, 25. Fisher explains that upper side straps 15L and 15R connect with top portion 21 and extend across the user’s forehead.

We reproduce Ogden’s Figure 3, below.

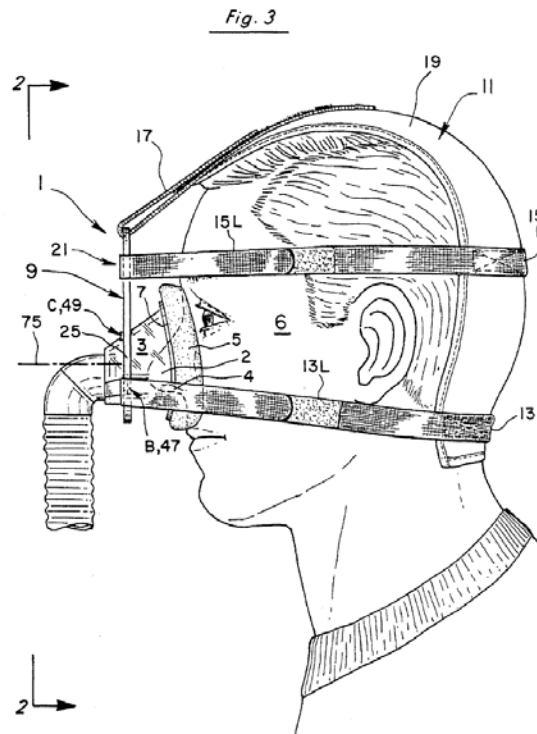


Figure 3 depicts a side view of a person wearing Ogden's mask. The figure shows top portion 21 does not contact the wearer's forehead and that the straps contact the side of a wear's head. We were not persuaded, in our Decision on Institution, that Ogden discloses the forehead support limitation. See Dec. on Inst. 23.⁶

Fisher alternatively contends that Gunaratnam discloses a top portion of a headgear connector with a forehead support structure that contours towards and contacts a wearer's forehead. Pet. 26 (identifying Gunaratnam's element 162 as the forehead support). Specifically, Fisher proposes to modify the forehead support of Ogden to contour toward and contact the user's forehead, as taught by Gunaratnam. See Pet. 26. We find

⁶ Upon our review of the complete record and applying the preponderance of the evidence standard, we adopt our analysis and findings in regard to Ogden not disclosing the forehead support limitation from the Decision on Institution in this Final Written Decision.

that Ogden, as modified by the teachings of Gunaratnam as proposed by Fisher, discloses the forehead support limitation. As seen in Gunaratnam's Figures 5c and 5e, Gunaratnam teaches to contour its forehead support towards the mask wearer's forehead. See Ex. 1104, 4:47–52 (“FIGS. 5c-5f also show an adjustable forehead support (162) connected to the frame (160). The adjustable forehead support (162) includes a bridge 50 portion (164) adapted to locate at least one and preferably two spaced apart pads (not shown) adapted to contact the forehead of the patient.”), Figs. 5c–5f; Pet. 26.

ResMed argues that Fisher's proposed combination does not disclose a fixed forehead support as required by claim 23, as Gunaratnam's forehead support is adjustable. PO Resp. 76–78. This argument is inapposite because it misunderstands Fisher's proposed modification. The Petition expressly states that Fisher proposes modifying Ogden's fixed top portion 21 to contour towards the wearer's forehead, as taught by Gunaratnam, a modification that we find would result in a fixed forehead support, not a substitution of Gunaratnam's forehead support. See Pet. 26; Reply 18–19; Ex. 1106 ¶ 55.

In summary, we find that Fisher's proposed combination of Ogden, Lovell, and Gunaratnam results in a mask for delivering breathable air to a patient that discloses all of the claim limitations of independent claim 23. We next address Fisher's reasoning for combining these three references.

Reasons to combine Ogden, Lovell, and Gunaratnam

In support of its proposed modification of Ogden with the teachings of Lovell, Fisher reasons that:

A person of skill in the art at the time of the invention would have recognized that positioning the interfacing structure at the bore of the mask frame, as taught by Lovell, would allow the headgear connector to be connected to the mask frame near the elbow connection and could better secure and seal the elbow to the mask frame.

Pet. 22–23. Fisher continues that “[m]odifying the mask of Ogden to include the frame features of Lovell would have been a combination of familiar elements according to known methods that does no more than yield predictable results.” *Id.* at 23. Fisher further reasons that “[a] person of skill would have recognized that modifying Ogden so that the headgear connector is not movable relative to the frame would provide more stability between the headgear connector and the mask frame.” *Id.* at 32 (citing Ex. 1106 ¶ 88). Fisher continues that “it is advantageous to be able to adjust the headgear and headgear connector to apply more or less pressure along the perimeter of the mask to maintain a comfortable and effective seal against the face.” *Id.* Mr. Eaton declares that a person having ordinary skill in the art would have appreciated the benefits of having a removable headgear connector, including having a common connector that could interface with different frames and removing the connector to facilitate cleaning. Ex. 1106 ¶ 87.

With respect to modifying Ogden with Gunaratnam’s teachings of lower headgear clips, Fisher contends that “[s]uch clips were commonly used to facilitate removal of the headgear straps from the headgear connector during cleaning and reattachment of the headgear straps without requiring any strap length adjustment.” Pet. 24 (citing Ex. 1106 ¶ 91). Fisher further contends that “[h]eadgear clips would also allow the user to secure the headgear to the mask after the mask is properly positioned on the user’s

face” and that the proposed “modification would have been a mere substitution of one known feature for another to obtain predictable results.” *Id.* Fisher’s contentions are supported by testimonial evidence from it expert, Mr. Easton. *See, e.g.,* Ex. 1106 ¶ 91 (“[H]eadgear clips aid in donning and doffing the mask, as one or more straps may be disconnected from the mask assembly such that the user need not stretch the straps over the head with the mask pulled tightly toward the face.”).

With respect to modifying Ogden with Gunaratnam’s teachings of a forehead support that contours towards the wearer’s forehead, Fisher contends that “[m]odifying the forehead support of Ogden to contour toward and contact the user’s forehead, as taught by Gunaratnam, would have been a combination of familiar elements according to known methods that does no more than yield predictable results.” Pet. 26. Fisher continues that “[a] person of skill in the art would have recognized that the contoured, fixed forehead support would provide greater stability, provide a greater field of view around the forehead support, and provide a more aesthetic streamlined interface.” *Id.* (citing Ex. 1106 ¶¶ 55, 92).

ResMed argues that a person having ordinary skill in the art would not have modified Ogden with Lovell’s plate-to-shell connection mechanism. PO Resp. 34. Specifically, ResMed argues that Fisher’s proposed modification of Ogden would change Ogden’s principle of operation. PO Resp. 52.

What a reference teaches and how a proposed modification of a reference would change its principle of operation are underlying factual inquiries in an obviousness analysis. *See, e.g., Icon Health & Fitness, Inc. v. Strava, Inc.*, 849 F.3d 1034, 1046 (Fed. Cir. 2017) (addressing the Board’s

factual findings with respect to a reference's principle of operation). We find that Ogden's principle of operation is to employ a rigid plate loosely mounted to a rigid shell, such that "in use, the rigid plate is free to move relative to the rigid shell in response to any unequal forces being applied to it by the side straps as the patient, for example, turns his or her head from side-to-side." Ex. 1102, 1:57–61; *see also* PO Resp. 52–53, 61 (indicating that Ogden's principle of operation is its loosely-mounted rigid plate).

Ogden's disclosure as a whole supports our finding as to its principle of operation. As Ogden discloses, the loose-fitted rigid plate "rotate[s] to compensate for any unequally applied forces as the patient moves his or her head." Ex. 1102, 4:17–20.

[W]hen the patient turns his or her head and instead of tending to lift the shell 3 and its seal 5 off the patient's face and breaking the seal as in FIG. 4, the rigid plate 9 of the present invention in FIG. 5 rotates relative to the rigid shell 3. This movement then compensates or equalizes the forces and keeps the shell 3 securingly in place with the center lines 69 and 71 of the shell 3 and the patient's face aligned.

Id. at 4:31–38; *see also* 4:61–5:3 (describing how Ogden's facial mask compensates for any unequal applied forces by the side straps through the operation of loosely-mounted rigid place 9); Fig. 4 (illustrating how the seal at a patient's face is broken by side-to-side movement with a rigid plate fixedly mounted to a rigid shell); *cf. id.* at 1:16–20 ("[A] common problem often arises that the mask will tend to unseat and leak as the patient turns his or her head (e.g., from side-to-side) or rolls over in bed and the straps contact and are deflected by a pillow, blanket, or other object."); PO Resp. 52 (describing the problem addressed by Ogden).

We reproduce Figures 4 and 5 from Ogden, below, to further illustrate the principle of operation of Ogden.

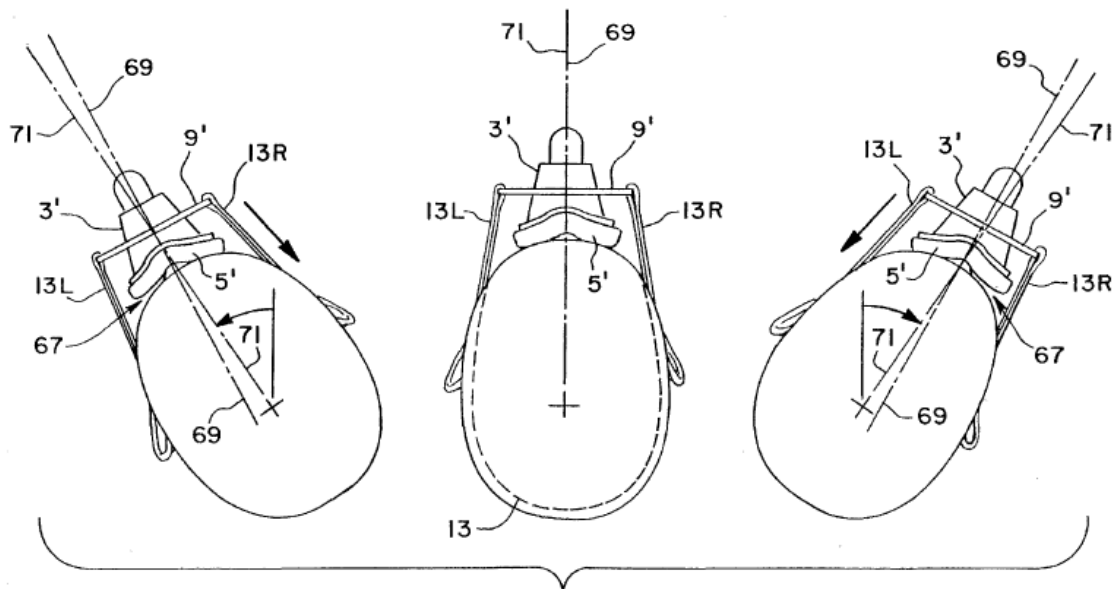


Fig. 4
(Prior Art)

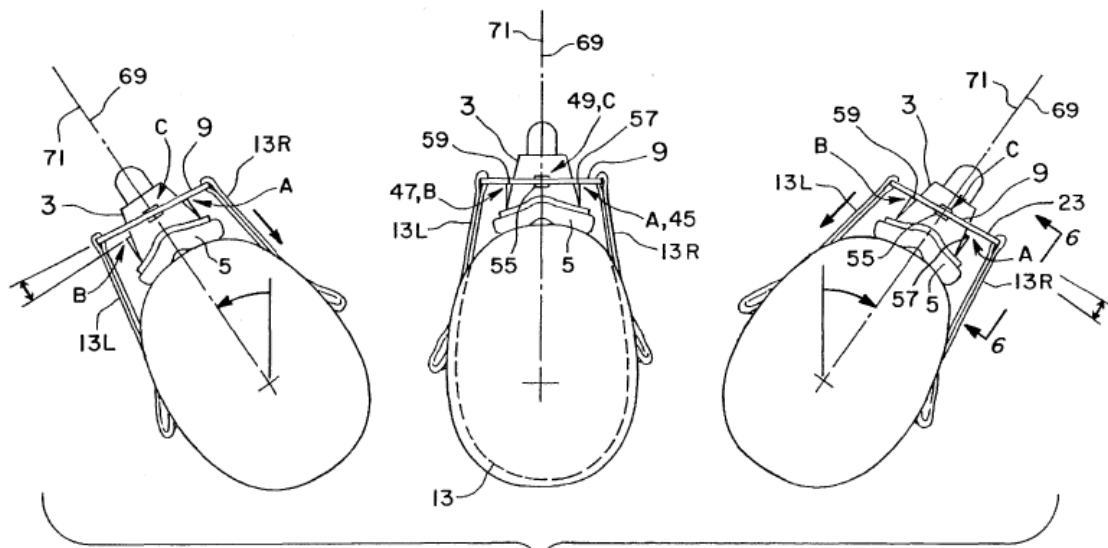


Fig. 5

Ogden's Figure 4 depicts "an overhead, schematic view of a prior mask assembly illustrating the manner in which the mask will tend to rock or cock and unseat itself as the patient turns his or her head from side-to-side."

Ex. 1102, 2:23–26. Figure 5 depicts “the manner in which the facial mask assembly of the present invention will rotate the rigid plate relative to the rigid shell to compensate for any unequally applied forces tending to unseat the mask as the patient turns his or her head from side-to-side.” *Id.* at 2:27–32. Furthermore, Ogden discloses a sole embodiment and its disclosure is narrowly focused to the operation of its loosely-mounted rigid plate. *See id.*, Figs. 1–3, 5–8 (depicting a single embodiment); *see also* PO Resp. 61 (“[A] POSITA would have understood that the principle of operation of Ogden’s mask is the ability of plate 9 to loosely rotate with respect to shell 3, and indeed, Ogden repeated [sic] urges the criticality of this principle feature in every column of Ogden’s specification and in the drawings.”).

Fisher contends that Ogden’s “principle of operation is its high level ability to provide respiratory care via a mask with a seal that is held in place by a harness and plate” and the ability of Ogden’s plate 9 to pivot “is simply a feature of the Ogden mask.” Reply 10. We find that this contention too broadly defines Ogden’s principle of operation and understates the role played by Ogden’s plate 9. Fisher’s definition provides the overall objective or intended purpose of any respiratory care mask with a headgear connector. The principle of operation of an apparatus is concerned with the fundamental aspects of how the apparatus operates. With respect to Ogden, it operates by employing a headgear connector plate that pivots to compensate for any unequal applied forces by the side straps when the wearer moves his or her head from side to side.

Fisher’s proposed modification of Ogden with Lovell’s interface structure between the mask frame and headgear connector results in a fixed connection between the mask frame and headgear connector. *See, e.g.*,

Reply 1 (recognizing that its proposed modification results in “a fixed headgear connector”). That is, this proposed modification eliminates the ability for Ogden’s rigid plate 9 to rotate to compensate for any unequal applied forces by the side straps when the wearer moves his or her head from side to side. Accordingly, we find that Fisher’s proposed modification would change the principle of operation of Ogden.

In reaching our obviousness determination, we “look with care at a patent . . . that claims as innovation the combination of two known devices according to their established functions.” *KSR Int’l Co.*, 550 U.S. at 418. We also consider, before holding a claimed invention obvious, whether combining references would violate the principle of operation of the modified reference. *See In re Mouttet*, 686 F.3d 1322, 1332 (Fed. Cir. 2012). Importantly, “obviousness must be determined in light of *all the facts*, and . . . a given course of action often has simultaneous advantages and disadvantages, and this does not necessarily obviate motivation to combine.” *Medichem, S.A. v. Rolabo, S.L.*, 437 F.3d 1157, 1165 (Fed. Cir. 2006) (emphasis added); *see also Winner Int’l Royalty Corp. v. Wang*, 202 F.3d 1340, 1349 n.8 (Fed. Cir. 2000) (“The fact that the motivating benefit comes at the expense of another benefit, however, should not nullify its use as a basis to modify the disclosure of one reference with the teachings of another. Instead, the benefits, both lost and gained, should be weighed against one another.”). Accordingly, we consider Fisher’s and ResMed’s further contentions with respect to modifying Ogden with the teachings of Lovell and Gunaratnam.

ResMed contends that Ogden teaches away from Fisher’s proposed modification of Ogden with Lovell’s interface structure, by making Ogden’s

mask inoperable for its intended purpose or otherwise discouraging a fixed headgear connector. PO. Resp. 54–55. In support of this position, ResMed states that “Ogden explains that mask assemblies in which a plate was ‘fixedly mounted’ to a shell would easily leak because headgear side straps would ‘tighten or pull harder on the rigid plate’ when the patient ‘turned his or her head to either side.’” *Id.* at 54 (citing Ex. 1102, 3:56–64; 4:9–12). ResMed states that Ogden’s Figure 4 depicts how masks with fixed headgear connectors leak. *Id.* at 54–55. ResMed argues that Fisher’s “proposal to modify Ogden is not simply selecting an alternative connection mechanism from a list of readily-available alternatives. Rather, [Fisher]’s proposal requires modifying Ogden’s mask in a manner for which Ogden expressly and repeatedly teaches away.” *Id.* at 55; *see* Tr. 27:8–10 (“[Ogden] expressly teaches against exactly what petitioners are trying to do, exactly the combination of taking the nonmovable plate from Lovell and putting it on Ogden.”). ResMed’s declarant, Mr. Sleeper, states that a person having ordinary skill in the art “having read Ogden would have recognized the critical flaw in modifying Ogden to fixedly mount its plate 9 to its shell 3, based on Ogden’s repeated statements that a loosely-mounted interface is necessary to avoid the problems in the purported prior art device.” Ex. 2002 ¶ 42.

Fisher replies that Ogden’s disclosure does not rise to the level of teaching away. Reply 4. Fisher explains that “Ogden does not teach that its movable headgear connector is the only solution for leaks and gaps caused by patient movement, but instead claims that it provides a more ‘simple and effective’ solution.” *Id.* at 5 (citing Ex. 1102, 1:37–41).

“A reference may be said to teach away when a person of ordinary skill, upon reading the reference . . . would be led in a direction divergent from the path that was taken by the applicant.” *In re Haruna*, 249 F.3d 1327, 1335 (Fed. Cir. 2001) (quoting *Tec Air, Inc. v. Denso Mfg. Mich. Inc.*, 192 F.3d 1353, 1360 (Fed. Cir. 1999)); *see, e.g., In re Fulton*, 391 F.3d 1195, 1201 (Fed. Cir. 2004) (holding that, to teach away, the prior art must “criticize, discredit, or otherwise discourage the solution claimed”). We find that Ogden’s disclosure fails to rise to the level of teaching away. Ogden provides a solution to a problem with fixed headgear connectors but does not criticize, discredit, or otherwise discourage fixed headgear connectors. Instead, Ogden illustrates that a specific prior art mask with a fixed headgear connector may result in leakage of supplied air to the mask and discloses an improvement to that specific mask. Ogden does not indicate that a fixed headgear connector renders a mask inoperable or otherwise indicates that a person having ordinary skill in the art would not consider a path that led to a mask with a fixed headgear connector. We also do not agree with ResMed’s characterization that Ogden expressly teaches away from the proposed combination. Ogden expressly teaches a solution, but does not expressly teach away from other solutions.

We note that, “[w]here the prior art contains ‘*apparently conflicting*’ teachings . . . each reference must be considered ‘for its power to suggest solutions to an artisan of ordinary skill’” *Medichem, S.A.*, 437 F.3d at 1165 (emphasis added). We find that other prior art of record teaches a fixed headgear connector, which dampens any alleged teaching away by Ogden. *See, e.g.,* Ex. 1104, Fig. 5c (depicting a headgear connector fixedly attached to a rigid mask frame); Ex. 1103, Fig. 10A (depicting a headgear

connector fixedly attached to a flexible mask frame); Ex. 1111, Fig. 1A (same). We further find, however, that Lovell and other prior art references employ a fixed headgear connector in conjunction with a *flexible mask frame*, as opposed to a rigid mask frame. See Ex. 1103, Fig. 10A; Ex. 1111, Fig. 1A. We find that a person having ordinary skill in the art would understand that a flexible mask frame behaves differently from a rigid frame. See Ex. 2002 ¶ 45 (“Lovell is clear that its flexible shell [and] the seal that is connected thereto provide the purportedly reliable seal.”).

Although we find that Ogden’s disclosure does not rise to the level of teaching away, its preference for a loose fitting headgear connector is still relevant to whether a person having ordinary skill in the art would have had reason to modify Ogden to fixedly attach a headgear connector. See *Polaris Indus., Inc. v. Arctic Cat, Inc.*, Nos. 2016-1807, 2016-2280, slip op. at 21 (Fed. Cir. Feb. 9, 2018) (“Even if a reference is not found to teach away, its statements regarding preferences are relevant to a finding regarding whether a skilled artisan would be motivated to combine that reference with another reference.”).

Fisher further contends that, to the extent that Ogden does discourage fixedly attaching the headgear connector to a rigid mask frame, a person having ordinary skill in the art would have understood that advances in cushion technology between the time of Ogden and the priority date of the ’196 patent would have compensated for the inability of the headgear connector to compensate for any unequal applied forces by the side straps when the wearer moves his or her head from side to side. Reply 7–8 (relying on deposition testimony of Mr. Eaton and Mr. Sleeper).

Specifically, Mr. Eaton testified that advances in sealing cushions make them “more ‘compliant and forgiving’ to small displacements of the mask frame.” Reply 8; *see also* Ex. 2003, 124:17–23 (“So later cushions . . . became a whole lot more compliant and able to maintain a seal given movement and displacement of the shell.”); *id.* at 125:5–15 (testifying that, by the priority date of the ’196 patent, technology advances made a moveable headgear connector unnecessary and that, at that time, he was not aware of any commercial products with moveable headgear connectors). Mr. Sleeper’s testimony confirms that certain cushion technology improvements between the time of Ogden and the priority date of the ’196 patent improved leakage performance of the mask seal due to side-to-side movement. *See* Ex. 1112, 38:1–42:12.

ResMed contends, at oral hearing, that Fisher’s reliance on advancements in cushion technology represents an improper argument, as it exceeds the scope of a proper Reply. Tr. 25:3–26:14.⁷ ResMed argues that Fisher identified Ogden’s seal 5 as meeting the limitation, not an improved seal. *Id.* at 24:8–25:2.

As an initial point, we find Fisher’s argument to be proper. Our rules provide that “[a] reply may only respond to arguments raised in the corresponding opposition, patent owner preliminary response, or patent owner response.” 37 C.F.R. § 42.23(b). ResMed argued, in the Patent Owner Response, that Ogden taught away from Fisher’s proposed

⁷ ResMed did not move to have Fisher’s Reply or Mr. Eaton’s testimony excluded in this proceeding. *See* 37 C.F.R. 42.20 (“Relief, other than a petition requesting the institution of a trial, must be requested in the form of a motion.”).

modification. Fisher’s reply properly responded to that argument—arguing that a person having ordinary skill in the art would have known to employ an improved cushion. *See, e.g., In re ICON Health & Fitness, Inc.*, 496 F.3d 1374, 1382 (Fed. Cir. 2007) (“But we do not ignore the modifications that one skilled in the art would make to a device borrowed from the prior art.”). We reject ResMed’s position that the exact cushion from Ogden must be the one considered, as that position ignores the creativity employed by an artisan of ordinary skill, based on his or her knowledge. We also do not find that allowing this argument violates ResMed’s due process. In forming its argument that a person having ordinary skill in the art would have been discouraged from making Fisher’s proposed modification, ResMed should have considered the level of ordinary skill in the art and what knowledge that artisan would have had. Included in that knowledge would be advancements in technology in the field of art to which the ’196 patent pertains.

Although we consider Fisher’s argument, we afford Mr. Eaton’s testimony little weight. We are not directed to evidence in the record to support Mr. Eaton’s testimony about the performance of mask cushions to compensate for leakage in a mask with a fixed headgear connector and rigid mask frame, with the exception of some testimony by Mr. Sleeper. *See* Ex. 1112, 38:1–42:12. Although Mr. Sleeper’s testimony provides some corroboration, it fails to support fully an assertion that a person having ordinary skill in the art would have understood that cushion technology would obviate the need for a moveable headgear connector for a mask with a rigid mask frame. *See id.* For example, Mr. Sleeper’s testimony did not

indicate if the Advantage Full-Face Mask included a rigid mask frame and a removably attached headgear connector. *See id.*

ResMed further contends that Fisher's articulated reasoning lacks rational underpinnings. *See* PO Resp. 62–68. Specifically, ResMed argues that Fisher's assertion that modifying Ogden with Lovell's interface structure would better secure and seal the elbow to the mask is unsupported. *See id.* at 62–63. ResMed explains that Ogden does not disclose any deficiency in its elbow seal nor does Lovell indicate that its interface structure improves the seal or security of the elbow. *Id.* ResMed argues that Lovell's elbow-to-frame connection could have been implemented in Ogden without fixedly attaching the headgear connector to the mask frame. *Id.* at 63 (referencing Ex. 2002 ¶ 49). Mr. Sleeper testifies that:

Implementing Lovell's elbow interface mechanism in Ogden's rigid mask frame could have been done . . . by adding a protruding inlet to Ogden's shell 3, inserting a swivel connector 9 through that protruding inlet, and changing the connection configuration of the elbow, [and] these changes would not have required rigidly fixing Ogden's plate to its frame/shell.

Ex. 2002 ¶ 49.

In reply, Fisher identifies testimony by its declarant to support its reasons to modify Ogden with Lovell's interface structure:

For example, the fixed headgear connector “would allow a user to adjust the distribution of forces along the perimeter of the mask to best balance comfort and seal.” Mr. Eaton further explained that some users require different pressure at different parts of the mask to maintain a comfortable and effective seal and Ogden does not have any provision to customize the balance of forces due to the movability of the headgear connector. Modifying the mask of Ogden in view of Lovell would also “make the mask more comfortable for the user and prevent leakage between the mask and the user's face.”

Reply 13 (citing Ex. 1106 ¶ 88). Mr. Eaton’s testimony relies on express disclosures in Lovell to support his opinions. *See* Ex. 1106 ¶ 88 (citing to Ex. 1103, 2:39–42, 6:55–7:3, 9:46–64).

In reviewing the complete record, we find that the entirety of Mr. Eaton’s testimony as to the advantages of modifying Ogden with Lovell’s interface structure relied on by Fisher is entitled to little weight, as it lacks a strong factual foundation. First, Mr. Eaton relies on the following disclosure in Lovell to support his opinion that the proposed modification “would make the mask more comfortable for the user and prevent leakage between the mask and the user’s face” (Ex. 1106 ¶ 88): “The design of nasal masks according to the invention provides solutions to several common problems with conventional designs. For example, the nasal mask’s seal distributes contact pressure, unlike many current masks.” Ex. 1103, 2:39–42. We find that this disclosure in Lovell does not provide strong support to Mr. Eaton’s opinion. Significantly, the prior passage in Lovell states: “The present invention . . . includes a comfortable soft seal affixed to a flexible shell. This soft seal both promotes a comfortable fit of the nasal mask on a user and a reliable seal between the nasal mask and a user’s facial skin.” *Id.* at 2:32–38. Mr. Eaton’s opinion does not explain adequately the contribution of a flexible shell to Lovell’s mask performance, as the proposed combination includes a rigid shell. Lovell’s disclosure at column 6, line 55 to column 7, line 3 concerning a four point restraining system applies to an embodiment different from the embodiment relied on by Fisher, depicted in Lovell’s Figure 10A. The embodiment of Figure 10A has a three point restraining system. *Compare* Ex. 1103, Fig. 10A *with id.* at Fig. 2A. As such, it does not support Mr. Eaton’s reasoning. Also, Lovell’s disclosure at

column 9, lines 46 to 64, merely describes how retainer 212 connects to shell 204, and does not describe any advantages of its system. Further, Mr. Eaton's opinion that the proposed modification could better secure and seal the elbow to the mask frame is without any evidentiary support. *See* 37 C.F.R. 42.65(a) ("Expert testimony that does not disclose the underlying facts or data on which the opinion is based is entitled to little or no weight. Testimony on United States patent law or patent examination practice will not be admitted.").

We also find that Mr. Eaton's testimony that a person having ordinary skill in the art would have appreciated the benefits of having a removable headgear connector, including having a common connector that could interface with different frames and removing the connector to facilitate cleaning provides little support to a reason for modifying Ogden with Lovell's interface structure. *See* Ex. 1106 ¶ 87. Ogden's loosely configured headgear connector is removable and, as such, would have these same benefits. *See* Ex. 1102, 3:25–46, 5:14–19, Figs. 6, 8 (disclosing how detent 43 interfaces with channel 49, such that plate 9 would be removable).

ResMed further contends that a person having ordinary skill in the art would not have modified Ogden to have a forehead support that would be contoured towards the wearer's forehead because such a feature would eliminate the side-to-side rotation of Ogden's plate 9. PO Resp. 71. Mr. Sleeper testifies that "a T-shaped forehead support, such as that shown by Gunaratnam, would have largely eliminated the ability of Ogden's mask to pivot side-to-side due to the 'T' portion of the forehead support." Ex. 2002 ¶ 56. We do not credit Mr. Sleeper's testimony, as it misunderstands Fisher's proposed modification. Fisher proposes to contour Ogden's upper

part of plate 9 towards the wearer's forehead, not to employ a T-shaped forehead support. *See* Reply 18.

In weighing all of the evidence for and against Fisher's proposed modifications of Ogden with the teachings of Lovell and Gunaratnam, we find that the evidence fails to show, by a preponderance of the evidence, that a person having ordinary skill in the art would have modified Ogden with Lovell's interface structure located at Ogden's bore. In weighing the evidence, we find that the evidence showing that such a modification would destroy Ogden's principle of operation outweighs the relatively unsupported evidence of benefits from the proposed modification. *See In re Mouttet*, 686 F.3d at 1332 (considering whether combining references would violate the principle of operation of the modified reference in reaching a conclusion on obviousness); *Winner Int'l Royalty Corp.*, 1349 n.8 ("The fact that the motivating benefit comes at the expense of another benefit, however, should not nullify its use as a basis to modify the disclosure of one reference with the teachings of another. Instead, *the benefits, both lost and gained, should be weighed against one another.*") (emphasis added).

Conclusion

For the reasons discussed above, we determine that Fisher has not demonstrated, by a preponderance of the evidence, that independent claim 23 is unpatentable under 35 U.S.C. § 103(a) over Ogden, Lovell, and Gunaratnam. We further determine that Fisher has not demonstrated, by a preponderance of the evidence, that claims 24–40, which depend, directly or

indirectly from claim 23, are unpatentable under 35 U.S.C. § 103(a) over Ogden, Lovell, and Gunaratnam for the same reasons.

b. Independent claims 41 and 57 and dependent claims 42–56 and 58–72

Independent claim 41 recites, in relevant part, “a one-piece rigid mask frame having a bore and an interfacing structure at least partly surrounding the bore.” Ex. 1101, 14:24–25. Similarly, independent claim 57 recites, in relevant part, “a rigid mask frame having a bore and a cylindrical projection extending around the bore” and “a headgear connector having an opening with an attachment structure associated with the opening, the attachment structure removably attached to the cylindrical projection of the rigid mask frame with a snap-fit such that . . . the rigid mask frame and the headgear connector are not movable relative to one another.” *Id.* at 15:55–16:11. Fisher proposes to modify Ogden with Lovell’s interface structure in a way similar to its proposal for claim 23. *See* Pet. 35 (cross-referencing its explanation for claim 23 as to how Lovell discloses certain subject matter), 38 (same).

As we discussed above in connection with our analysis of independent claim 23, in weighing all of the evidence for and against Fisher’s proposed modifications of Ogden with the teachings of Lovell and Gunaratnam, we find that the evidence fails to show, by a preponderance of the evidence, that a person having ordinary skill in the art would have modified Ogden with Lovell’s interface structure. Accordingly, for the same reasons as in our analysis for claim 23, we determine that Fisher has not demonstrated, by a preponderance of the evidence, that independent claims 41 and 57 are unpatentable under 35 U.S.C. § 103(a) over Ogden, Lovell, and Gunaratnam. We further determine that Fisher has not demonstrated, by a

preponderance of the evidence, that claims 42–56, which depend, directly or indirectly, from claim 41, and claims 58–72, which depend, directly or indirectly, from claim 57, are unpatentable under 35 U.S.C. § 103(a) over Ogden, Lovell, and Gunaratnam for the same reasons.

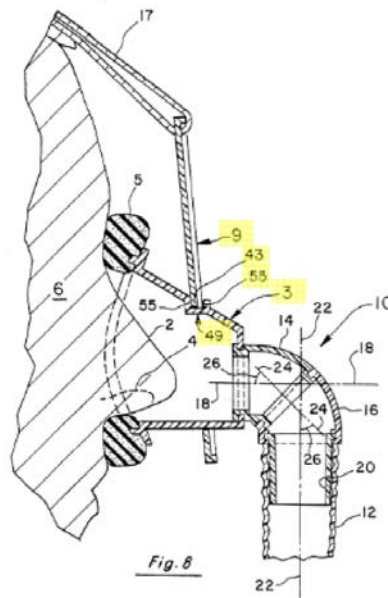
c. Independent claim 73

Claim 73 requires “a rigid mask frame having a bore and no built-in or integral headgear attachment points.” Ex. 1101, 17:11–12 (the “rigid mask frame” limitation of claim 73). Fisher contends that Ogden’s cup-shaped shell 3 is the recited mask frame with a bore. *See* Pet. 19, 46; *see also id.* at 80 (referencing the Petition’s analysis of claim 23 for this claim element). We find that Ogden’s shell 3 corresponds to the recited rigid mask frame. As seen in Ogden’s Figures 1 and 8, shell 3 includes a bore to receive coupling 10 and no built-in or integral headgear attachment points, as the attachment points are on plate 9, which attaches to harness 11 through straps 13, 15, 17. *See* Ex. 1102, 2:46–3:1, 5:35–41, Figs. 1, 8. ResMed does not dispute that Ogden discloses the rigid mask frame limitation of claim 73.

Claim 73 further requires “a soft sealing cushion attached to the rigid mask frame and adapted to form a seal with the patient’s face, the rigid mask frame and the soft sealing cushion together forming a breathing cavity to receive the breathable gas.” Ex. 1101, 17:13–16 (the “sealing cushion” limitation of claim 73). Fisher contends that seal 5 is the recited sealing cushion and that shell 3, in conjunction with seal 5, forms a breathing cavity. Pet. 19, 47–48; *see also id.* at 80 (referencing the Petition’s analysis of claim 23 for this claim element as well as identifying seal 5 attached to shell 3 as the corresponding structure). We find, as contended by Fisher, that Ogden discloses the sealing cushion limitation. Ogden’s mask 1 includes cushion 5,

which is adapted to form a seal with the patient's face and, in conjunction with rigid frame 3, forms a breathing cavity. *See* Ex. 1102, 2:54–60 (“A soft, pliable seal 5 of elastomer, urethane foam, or rubber is attached (e.g., glued or press fit) about the rear perimeter portion 7 of the rigid shell 3 to engage and seal against the patient's face. The rigid, cup-shaped shell 3 with its seal 5 (see FIGS. 1-3) is attached or secured in its sealing position enclosing the nose 2 and nares 4 of the patient 6.”); Fig. 8 (depicting cushion 5 forming a seal with the patient 6's face and forming a breathing cavity with frame 3); Pet. 19–20. ResMed does not dispute that Ogden discloses the sealing cushion limitation of claim 73.

Claim 73 further requires “a headgear connector including a plurality of tabs structured to removably attach the headgear connector to the rigid mask frame with a snap-fit.” Ex. 1101, 17:17–19 (the “snap-fit” limitation of claim 73). Fisher identifies rigid plate 9 as the headgear connector and detents 39, 41, and 43 as the recited tabs. Pet. 80; *see also id.* at 19 (identifying plate 9 and detents 39, 41, and 43 as “a headgear connector adapted to engage the interfacing structure with a snap-fit”); *id.* at 29 (describing how detent 43 snap-fits into channel 49). Fisher annotates Ogden's Figure 8, which we reproduce below, to support its position. *See* Pet. 29.



Ogden's Figure 8 presents a sectional view of shell 3, with Fisher's annotations highlighting detent 43 of plate 9 in channel 49 within end walls 55. We find that Ogden discloses a headgear connector including a plurality of tabs structured to attach removably the headgear connector to the rigid mask frame with a snap-fit as required by claim 73. We find that Ogden discloses a headgear connector with a plurality of tabs—plate 9 with detents 39, 41, and 43. *See* Ex. 1102, 3:25–37, Figs. 1–3, 8. We further find that Ogden expressly discloses that detent 43 snap-fits into channel 49. *See id.* at 5:15–17 (“[D]etent-channel 43, 49 at the top of the shell 3 at the third location C is preferably dimensioned to snap together to hold or maintain the rigid plate 9 on the rigid shell 3.”). Significantly, Ogden expressly discloses that “detent 43 and aperture 53 of rigid plate 9 are dimensioned so the detent 43 must be *slightly stressed* to ride up and over the front wall 55 of channel 49 but once in the channel 49, it is preferably a loose fit.” *Id.* at 5:19–22 (emphasis added). That is, we find that detent 43 deflects then recovers as it is moved into channel 49, consistent with a snap-fit. Also consistent with

our claim construction, more than one tab is not necessary to form the snap-fit structure in Ogden.

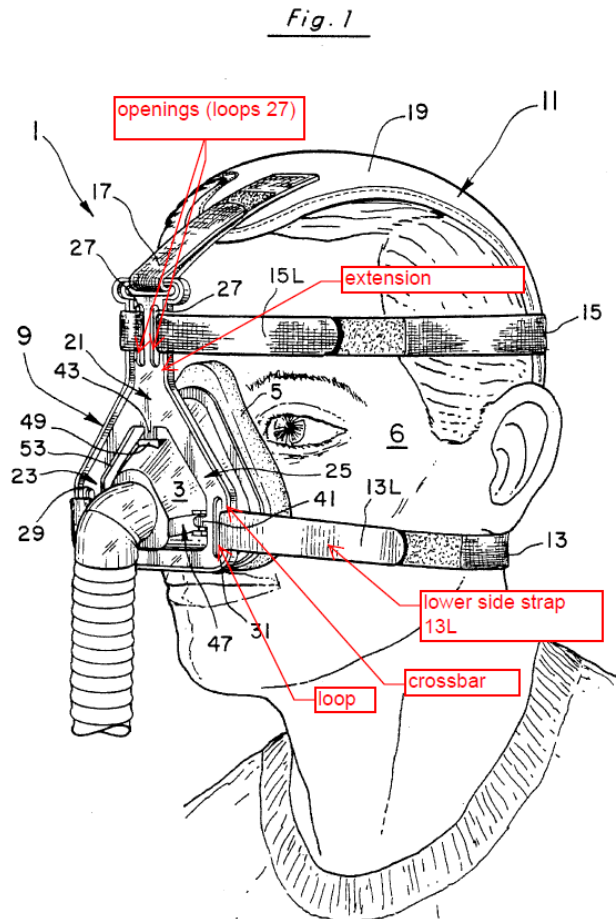
ResMed contends that Ogden does not disclose the snap fit limitation of claim 73. PO Resp. 27. First, ResMed argues that detent 43 into channel 49 is not a snap-fit as the resulting connection is a loose fit. *See id.* at 25–26. ResMed argues that “[s]imply put, Ogden refers to ‘snapping’ in the context of moving detent 43 into the loose/movable space of the channel 49, but plainly explains that the resulting fit is a ‘loose fit.’” *Id.* at 26. ResMed does not adequately explain, however, how a resulting loose fit negates the snap-fit nature of moving detent 43 into channel 49. Nor does ResMed offer a construction of the snap-fit limitation that would require a resulting tight fit from the snap fit.

Next, ResMed argues that, even if considered a snap-fit, only one tab forms the snap-fit, not a plurality of tabs. PO Resp. 27–29. This argument is not consistent with the broadest reasonable interpretation of the snap-fit limitation, which requires only one of the tabs to form the snap-fit structure.

Claim 73 further recites “a pair of crossbars to removably attach a pair of lower side straps, and an extension having a plurality of openings to removably attach a pair of upper side straps.” Ex. 1101, 17:19–22 (the “crossbars” limitation” of claim 73). Fisher contends that Ogden discloses lower straps 13R and 13L attached to side portions 23 and 25 through loops (openings 29, 31) in the side portions, respectively, as satisfying the above-quoted subject matter with respect to the lower side strap subject matter. Pet. 82; Ex. 1106 ¶ 83. Fisher further contends that Ogden discloses that upper side straps 15R and 15L pass through loops 27 of top portion 21 of rigid plate

9. Pet. 83; *see also* Ex. 1106 ¶ 83 (identifying the portion of plate 9 with loops 27 attached to upper side straps 15R and 15L as the recited extension).

We reproduce Ogden's Figure 1, below, with the added annotation identifying the recited pair of crossbars and extension with a plurality of openings.



25 that attaches lower strap 13L to plate 9. Side 23 has an identical structure for side strap 13R. *See* Ex. 1102, Fig. 2.

We find that the openings in plate 9 receive the lower side straps include crossbars (the structure forming the outside of the openings). *See* Ex. 1102, Figs. 1 and 2. We also find that the upper portion of plate 9 corresponds to the recited extension and includes a plurality (3) openings. *See id.* ResMed does not dispute that Ogden discloses the crossbars limitation of claim 73.

For the reasons discussed above, we determine that Fisher has demonstrated, by a preponderance of the evidence, that independent claim 73 is unpatentable under 35 U.S.C. § 103(a) over Ogden, Lovell, and Gunaratnam. Significantly, Fisher does not rely on any modifications based on the teachings of Lovell and Gunaratnam in its obviousness position for claim 73. Accordingly, we need not weigh any reasons for modifying Ogden.

d. Dependent claims 74–76, 78, 80, 81, and 84–86

Claim 74

Claim 74 depends from claim 73 and further recites “wherein the rigid mask frame and the soft sealing cushion comprise a full-face mask.” Ex. 1101, 17:22–24. We find, consistent with Fisher’s contentions, that Ogden discloses that its mask is “equally applicable to full face masks covering the patient’s nose and mouth.” Ex. 1102, 2:46–50; Pet. 51, 84. ResMed does not dispute that Ogden discloses the additional limitation of claim 74.

Claim 75

Claim 75 depends from claim 74 and further recites “wherein the soft sealing cushion is secured to the mask frame.” Ex. 1101, 17:25–26. We

find, consistent with Fisher's contentions, that Ogden discloses that its sealing cushion 5 is glued or press fit to shell 3. *See* Ex. 1102, 2:54–57 (“A soft, pliable seal 5 of elastomer, urethane foam, or rubber is attached (e.g., glued or press fit) about the rear perimeter portion 7 of the rigid shell 3.”); Pet. 51, 84. ResMed does not dispute that Ogden discloses the additional limitation of claim 75.

Claim 76

Claim 76 depends from claim 73 and “further compris[es] an elbow adapted to be connected to an air delivery tube to deliver the breathable gas to the breathing cavity.” Ex. 1101, 17:27–29. We find, consistent with Fisher's contentions, that Ogden discloses an elbow (swivel hose coupling 10) connected to an air delivery tube (hose 12) to deliver breathable air to the mask's breathing cavity. *See* Ex. 1102, 5:35–47 (“[C]oupling 10 has first and second sections 14 and 16 of hard or rigid plastic. The first rigid section 14 as best seen in FIG. 8 is mounted to the rigid shell 3 for rotation about the first axis 18. The flexible hose 12 (which can be connected to a respiratory device such as a ventilator or continuous positive airway pressure (CPAP) device) is then slid over the rigid tube 20. The tube 20 with the end of hose 12 press fit over it is mounted to the second rigid section 16 so the hose 12 and tube 20 can rotate relative to section 16 about a second axis 22.”), Figs. 1–3, 7, 8, 9; Pet. 52–53, 84. ResMed does not dispute that Ogden discloses the additional limitation of claim 76.

Claim 78

Claim 78 depends from claim 73 and further recites “wherein the bore is located on a front face of the rigid mask frame.” Ex. 1101, 17:34–35. We find, consistent with Fisher's contentions, that Ogden discloses a bore

located on a front face of shell 3. As seen in Ogden's Figures 1–3, 7, 8, and 9, hose coupling 10 mates with shell 3 at a bore located on the front face of shell 3. Ex. 1102, Figs. 1–3, 7, 8, and 9; Pet. 54–55, 85. ResMed does not dispute that Ogden discloses the additional limitation of claim 78.

Claim 80

Claim 80 depends from claim 73 and further recites “wherein said headgear connector is constructed of a similar material as the rigid mask frame.” Ex. 1101, 18:1–3. We find, consistent with Fisher's contentions, that Ogden discloses that its shell 3 and plate 9 are both constructed of hard plastic. See Ex. 1102, 2:51–53 (“[T]he present invention includes a rigid, cup-shaped shell 3 made of hard plastic.”), 3:25–26 (“The rigid plate 9 as illustrated in FIGS. 1-3 is preferably flat or planar and made of relatively hard plastic.”); Pet. 56–57, 85. ResMed does not dispute that Ogden discloses the additional limitation of claim 80.

Claim 81

Claim 81 depends from claim 73 and further recites “wherein said headgear connector and said rigid mask frame are constructed of a substantially rigid, non-malleable plastic material.” Ex. 1101, 18:4–6. We find, consistent with Fisher's contentions, that Ogden discloses that its shell 3 and plate 9 are both constructed of hard plastic, which would be substantially rigid and non-malleable. See Ex. 1102, 2:51–53 (“[T]he present invention includes a rigid, cup-shaped shell 3 made of hard plastic.”), 3:25–26 (“The rigid plate 9 as illustrated in FIGS. 1-3 is preferably flat or planar and made of relatively hard plastic.”); Pet. 57, 85. ResMed does not dispute that Ogden discloses the additional limitation of claim 81.

Claim 84

Claim 84 recites “[a] mask system for delivering breathable gas to a patient at positive pressure to treat sleep disordered breathing, the mask system comprising: a headgear including the pair of upper side straps, the pair of lower side straps, and a rear portion; and a mask according to claim 73.” Ex. 1101, 18:25–30.⁸ We find, consistent with Fisher’s contentions, that Ogden discloses a headgear including a pair of upper side straps (15L and 15R), the pair of lower side straps (13L and 13R), and a rear portion (19). See Ex. 1102, 2:62–3:10, Figs. 1–3, Pet. 58–59, 87. ResMed does not dispute that Ogden discloses the additional limitation of claim 84.

Claim 85

Claim 85 depends from claim 84 and further recites “wherein the pair of upper side straps are arranged to extend above the patient’s ears and the pair of lower side straps are arranged to extend below the patient’s ears.” Ex. 1101, 18:31–34. We find, consistent with Fisher’s contentions, that Ogden discloses a headgear with the upper straps extending above the wearer’s ears and lower straps extending below the wearer’s ears. See Ex. 1102, Figs. 1–3; Pet. 60, 87. ResMed does not dispute that Ogden discloses the additional limitation of claim 85.

⁸ For the purposes of our analysis, we consider claim 84 to be a dependent claim of claim 73, as it references claim 73 and specifies further limitations. See 35 U.S.C. § 112 (“[A] claim in dependent form shall contain a reference to a claim previously set forth and then specify a further limitation of the subject matter claimed. A claim in dependent form shall be construed to incorporate by reference all the limitations of the claim to which it refers.”). Our analysis would not change if claim 84 was interpreted to be an independent claim.

Claim 86

Claim 86 depends from claim 85 and further recites “wherein the rear portion of the headgear is adapted to cup the occiput [(the back)] of the patient’s head.” Ex. 1101, 18:35–37. We find, consistent with Fisher’s contentions, that Ogden discloses a headgear with its rear portion cupping the occiput of the wearer’s head, that is, the back of the head. See Ex. 1102, Figs. 1–3; Pet. 60–61, 87. Ogden’s Figure 3 clearly shows skull cap 19 cupping the back of the patient’s head. ResMed does not dispute that Ogden discloses the additional limitation of claim 85.

Conclusion for dependent claims 74–76, 78, 80, 81, and 84–86

With respect to dependent claims 74–76, 78, 80, 81, and 84–86, which each depend, directly or indirectly, from claim 73, we find, based on the analysis above and as presented in the Petition and not disputed by ResMed, that Ogden discloses the limitations in these claims. That is, Fisher does not rely on teachings from Lovell or Gunaratnam to modify Ogden to satisfy these claim limitations. For the reasons discussed above and the reasons discussed with respect to our analysis of claim 73, we determine that Fisher has demonstrated, by a preponderance of the evidence, that claims 74–76, 78, 80, 81, and 84–86 are unpatentable under 35 U.S.C. § 103(a) over Ogden, Lovell, and Gunaratnam.

e. Dependent claims 77 and 82

Claim 77

Claim 77 depends from claim 73 and further recites “wherein when said rigid mask frame and said headgear connector are attached, the rigid mask frame and the headgear connector are not movable relative to one another.” Ex. 1101, 17:30–33. Fisher proposes to modify Ogden with

Lovell's interface structure such that Ogden's headgear connector would be attached to its rigid mask frame in a way that the headgear connector and mask frame do not move relative to one another. *See* Pet. 30–32, 84–85 (cross-referencing the analysis in the Petition for claim 29).

We addressed Fisher's reasoning for its proposed modification in our analysis of independent claim 23 and found, in weighing all of the evidence for and against Fisher's proposed modifications of Ogden with the teachings of Lovell and Gunaratnam, that the evidence fails to show, by a preponderance of the evidence, that a person having ordinary skill in the art would have modified Ogden with Lovell's interface structure. Accordingly, for the same reasons as in our analysis for claim 23, we determine that Fisher has not demonstrated, by a preponderance of the evidence, that dependent claim 77 is unpatentable under 35 U.S.C. § 103(a) over Ogden, Lovell, and Gunaratnam.

Claim 82

Claim 82 depends from claim 81 and further recites “wherein said headgear connector and said rigid mask frame are constructed of polycarbonate.” Ex. 1101, 18:7–9. Fisher contends that, although Ogden discloses that its headgear connector and mask frame are made of hard plastic, Ogden does not disclose that the plastic is polycarbonate. Pet. 34 (addressing claim 36); *see id.* at 86 (cross-referencing the analysis of claim 36 for claim 82). Fisher further contends that Gunaratnam discloses a mask system with the frame and headgear connector made from polycarbonate. *Id.* at 34 (referencing Ex. 1104, 4:22–26, 5:34–35).

Fisher reasons that:

A person of skill in the art would have known to make the frame of Ogden out of polycarbonate, as taught by Gunaratnam. It was well-known at the time of the invention to use polycarbonate which provides a high degree of clarity, which makes a mask visually less obtrusive to the patient and allows clinicians to monitor condensation in the mask and the user's skin tone. Polycarbonate also provides good mechanical properties of strength, rigidity, and toughness, and it can also be cleaned, disinfected, and/or sterilized by most commonly used methods. Such a modification would have been a combination of familiar elements according to known methods that does no more than yield predictable results.

Pet. 34 (referencing Ex. 1106 ¶ 94). Mr. Eaton adds that “one skilled in the art would have known to use polycarbonate for the mask frame or any other rigid components of the mask assembly” in light of this reasoning. Ex. 1106 ¶ 94.

We find that Gunaratnam discloses using polycarbonate for the frame and headgear connector. *See* Ex. 1104, 4:21–23 (“The frame (160) is constructed as a substantially rigid shell of polycarbonate or similar transparent plastics material.”). We further find that, in Gunaratnam, frame 160 serves as both the frame and headgear connector. *See, e.g., id.* at 4:31–33 (“On the front surface of the frame, are strap connection points (630) for connection of the mask to patient headgear. Connectors (200) are shown in FIGS. 5c–5f”). Accordingly, Gunaratnam discloses making both the frame and headgear connector of polycarbonate.

We also find that Fisher provides a reason to modify Ogden with Gunaratnam's material and this reasoning includes a rational underpinning. *See KSR Int'l Co.*, 550 U.S. at 418 (citing *In re Kahn*, 441 F.3d 977, 988 (Fed. Cir. 2006)) (“[O]bviousness grounds cannot be sustained by mere

conclusory statements; instead, there must be some articulated reasoning with some rational underpinning to support the legal conclusion of obviousness.”). Fisher does not rely on Lovell for its contention regarding the unpatentability of claim 82. ResMed does not dispute that Gunaratnam discloses a frame made from polycarbonate or Fisher’s reasoning for modifying Ogden’s frame and headgear connector with Gunaratnam’s material.

Accordingly, for the reasons above, we determine that Fisher has demonstrated, by a preponderance of the evidence, that dependent claim 82 is unpatentable under 35 U.S.C. § 103(a) over Ogden, Lovell, and Gunaratnam.

2. Claims 79 and 83 as allegedly unpatentable under 35 U.S.C. § 103(a) over Ogden, Lovell, Gunaratnam, and Geist

Claim 79

Claim 79 depends from claim 73 and further recites “wherein the rigid mask frame further comprises a vent assembly for gas washout.” Ex. 1101, 17:36–38 (the “vent assembly” limitation).

Fisher recognizes that Ogden does not disclose the vent assembly limitation of claim 79 but contends that Geist discloses this subject matter. Pet. 44. Specifically, Fisher identifies vent 60 depicted in Geist’s Figure 10 as disclosing a vent assembly on a mask frame. *Id.*

Fisher asserts that “positioning the vent on the frame component was common prior to the earliest filing date of the ’196 [p]atent.” Pet. 44. Fisher reasons that “[a] person of skill would have known to include a vent assembly on the mask frame, as taught by Geist, as a matter of design choice among a finite number of identified, predictable locations. *Id.* (citing Ex. 1106 ¶ 101). Fisher further reasons that “it would have been advantageous

to place the vent on the mask frame instead of the elbow [as is done in Lovell] so that the vent is in direct fluid communication with the breathing chamber.” *Id.* at 44–45. Fisher explains that such a positioning “would reduce ‘dead space’ which is the volume in which expired air is trapped between the user’s nose and an upstream vent.” *Id.* at 45 (citing Ex. 1106 ¶ 101). In support of the predictability of the proposed modification, Fisher states that “[b]ecause Ogden, Lovell, Gunaratnam, and Geist all relate to structurally similar CPAP masks, the features of Lovell, Gunaratnam, and Geist would have been readily compatible and easily incorporated into the mask of Ogden with a reasonable expectation of success.” *Id.*

We find that Geist discloses a vent assembly in the mask frame for gas washout. See Ex. 1105, 5:11–14 (“The mask and mask vent holes of the present invention are illustrated in [Figures] 10-13. The vent holes are exit vent holes and are for venting the exhaled breath of a wearer of the mask 10.”), Fig. 10 (illustrating the vent assembly in mask shell 12 of mask 10).

We also find that Fisher has provided a reason, with rational underpinning, for modifying Ogden to add Geist’s vent to Ogden’s shell 3—to (1) put the vent in direct fluid communication with the breathing chamber and (2) reduce dead space. Fisher does not rely on Lovell or Gunaratnam for its contention regarding the unpatentability of claim 79. ResMed does not dispute that Geist discloses the vent assembly limitation nor does it dispute Fisher’s reasoning for modifying Ogden with Geist’s vent assembly.

Accordingly, for the reasons above, we determine that Fisher has demonstrated, by a preponderance of the evidence, that dependent claim 79 is unpatentable under 35 U.S.C. § 103(a) over Ogden, Lovell, Gunaratnam, and Geist.

Claim 83

Claim 83 depends from claim 73 and recites, in relevant part, “wherein when said rigid mask frame and said headgear connector are attached, the rigid mask frame and the headgear connector are not movable relative to one another.” Ex. 1101, 18:18–20 (the “non-moveable” limitation of claim 83). Similar to claim 77, as to the non-moveable limitation of claim 83, Fisher proposes to modify Ogden with Lovell’s interface structure such that Ogden’s headgear connector would be attached to its rigid mask frame in a way that the headgear connector and mask frame do not move relative to one another. *See* Pet. 30–32, 6 (cross-referencing the analysis in the Petition for claim 29 for this limitation of claim 83).

We addressed Fisher’s reasoning for its proposed modification in our analysis of independent claim 23 and found, in weighing all of the evidence for and against Fisher’s proposed modifications of Ogden with the teachings of Lovell and Gunaratnam, that the evidence fails to show, by a preponderance of the evidence, that a person having ordinary skill in the art would have modified Ogden with Lovell’s interface structure. Fisher does not assert that Geist contributes to its reasons to modify Ogden with Lovell’s teachings to arrive at the non-moveable limitation of claim 83. Accordingly, for the same reasons as in our analysis for claim 23, we determine that Fisher has not demonstrated, by a preponderance of the evidence, that dependent claim 83 is unpatentable under 35 U.S.C. § 103(a) over Ogden, Lovell, Gunaratnam, and Geist.

III. CONCLUSION

For the foregoing reasons, we conclude that Fisher has established, by a preponderance of the evidence, that claims 73–76, 78–82, and 84–86 of the '196 patent are unpatentable. We further conclude that Fisher has not established, by a preponderance of the evidence, that claims 23–72, 77, and 83 of the '196 patent are unpatentable.

IV. ORDER

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

ORDERED that claims 23–72 and 77 are *not* unpatentable under 35 U.S.C. § 103 over Ogden, Lovell, and Gunaratnam;

FURTHER ORDERED that claims 73–76, 78, 80–82, and 84–86 are unpatentable under 35 U.S.C. § 103 over Ogden, Lovell, and Gunaratnam;

FURTHER ORDERED that claim 79 is unpatentable under 35 U.S.C. § 103 over Ogden, Lovell, Gunaratnam, and Geist;

FURTHER ORDERED that claim 83 is *not* unpatentable under 35 U.S.C. § 103 over Ogden, Lovell, Gunaratnam, and Geist; and

FURTHER ORDERED because this is a Final Written Decision, parties to the proceeding seeking judicial review of the decision must comply with the notice and service requirements of 37 C.F.R. § 90.2.

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