

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

AROMA360, LLC,
Petitioner,

v.

AIR ESSSENTIALS, INC.,
Patent Owner.

IPR2025-00706
Patent 10,583,449 B1

Before CARL M. DeFRANCO, ERIC C. JESCHKE, and
RICHARD H. MARSCHALL, *Administrative Patent Judges*.

JESCHKE, *Administrative Patent Judge*.

JUDGMENT

Final Written Decision

Determining All Challenged Claims Unpatentable

35 U.S.C. § 318(a)

Denying Patent Owner's Revised Contingent
Motion to Amend as to Substituting Claims 20 and 21

35 U.S.C. § 316(d)

Dismissing Patent Owner's Motion to Exclude

37 C.F.R. § 42.64

I. BACKGROUND

Petitioner Aroma360, LLC challenges claims 1, 4, and 7–10 of U.S. Patent No. 10,583,449 B1 (Ex. 1001, “the challenged patent”), which is assigned to Patent Owner, Air Essentials, Inc. We have jurisdiction under 35 U.S.C. § 6, and we issue this Final Written Decision under 35 U.S.C. § 318(a) and 37 C.F.R. § 42.73. For the reasons below, we conclude that Petitioner has proven, by a preponderance of the evidence, the unpatentability of claims 1, 4, and 7–10. We also dismiss as moot Patent Owner’s Motion to Exclude, and we deny Patent Owner’s Revised Contingent Motion to Amend as to substituting proposed claims 20 and 21.

A. Procedural History

Petitioner filed a Petition seeking *inter partes* review of the challenged claims. Paper 2 (“Pet.”). Patent Owner timely filed a Preliminary Response. Paper 7. Patent Owner also filed an authorized brief addressing discretionary denial. Paper 6. After assessing the discretionary denial issues, the Director referred the proceeding to this panel to address the merits and other non-discretionary considerations. Paper 8. Upon review of the arguments and supporting evidence, we instituted an *inter partes* review of all claims and grounds asserted in the Petition. Paper 9 (“Decision on Institution” or “Dec. Inst.”).

After institution, Patent Owner filed a Patent Owner Response (Paper 15, “PO Resp.”) along with a Contingent Motion to Amend the Claims (Paper 14, “MTA”). Petitioner filed a Reply in support of the Petition (Paper 20, “Pet. Reply”) and also filed an opposition to Patent Owner’s Motion to Amend (Paper 19). On May 4, 2026, pursuant to Patent Owner’s request (*see* MTA 3), we issued Preliminary Guidance on Patent

Owner's Motion to Amend. Paper 21. Patent Owner then filed a Corrected Revised Contingent Motion to Amend with proposed substitute claims 20 and 21 (Paper 25, "RMTA"), and a Sur-reply to Petitioner's Reply (Paper 26, "PO Sur-reply"). Petitioner opposed Patent Owner's Revised MTA. Paper 30 ("RMTA Opp."). Patent Owner filed a Reply in support of its Revised MTA (Paper 33 ("RMTA Reply")), to which Petitioner filed a Sur-reply (Paper 38 ("RMTA Sur-reply")).

Petitioner relies on the declaration testimony of Dr. Christopher White, Ph.D., filed with the Petition (Ex. 1002, "White Pet. Decl."), on a Supplemental Declaration of Dr. White, filed with the Reply (Ex. 1047, "White Reply Decl."), and on a Second Supplemental Declaration of Dr. White, filed with the Opposition to Patent Owner's Revised MTA (Ex. 1052, "White RMTA Decl."). Patent Owner relies on the declaration testimony of Dr. Gerald Micklow, Ph.D., filed with the Patent Owner's Response (Ex. 2002 ("Micklow Decl.)) and on the declaration testimony of Dr. Micklow, filed with the Patent Owner's Revised Motion to Amend (Ex. 2016).¹

The parties did not request an oral hearing in this proceeding. *See* Paper 31 (Petitioner declining an oral hearing); Paper 32 (order stating that no oral hearing will be held).

¹ With the filing of the Sur-reply (Paper 26), Patent Owner filed an additional declaration testimony from Dr. Micklow (Ex. 2015). Because that declaration was improperly filed, we struck it from this proceeding. *See* Paper 36.

B. Related Proceedings

The parties identify a proceeding in the U.S. District Court for the Southern District of Florida involving the challenged patent: *Air Essentials, Inc. v. Aroma360, LLC*, No. 1:24-cv-20594-KMW (S.D. Fla.), filed February 15, 2024 (“the Florida Litigation”). Pet. 1; Paper 4 (Patent Owner’s Mandatory Notice) at 2. The Florida Litigation also involves U.S. Patent No. 9,527,094 B1 (“the ’094 patent”) and U.S. Patent No. 10,092,918 B1 (“the ’918 patent”). The Florida Litigation was stayed on April 8, 2025. *See* Paper 5; IPR2025-00707, Paper 5.

Petitioner also filed petitions for *inter partes* review of claims 7–9 and 11 of the ’094 patent in IPR2025-00705 and (2) claims 1 and 3–8 of the ’918 patent in IPR2025-00707.

C. The Challenged Patent

The challenged patent “relates generally to the field of dispersion of various fluids including, but not limited to, fragrant oils, essential oils, odor neutralizers, disinfectants, e.g., triethylene glycol, air sanitizers, and the like, into a generally enclosed airspace.” Ex. 1001, 1:7–11. According to the challenged patent, “there is a need for a fluid dispersion assembly that is designed to significantly reduce the amount of noise generated during operation” and to operate “quietly while generating a fluid dispersion in air having a uniform particle size distribution, such that dosing of an airspace with a particular liquid . . . can be predicted within acceptable limits.” *Id.* at 1:35–43.

Figure 2 is reproduced below:

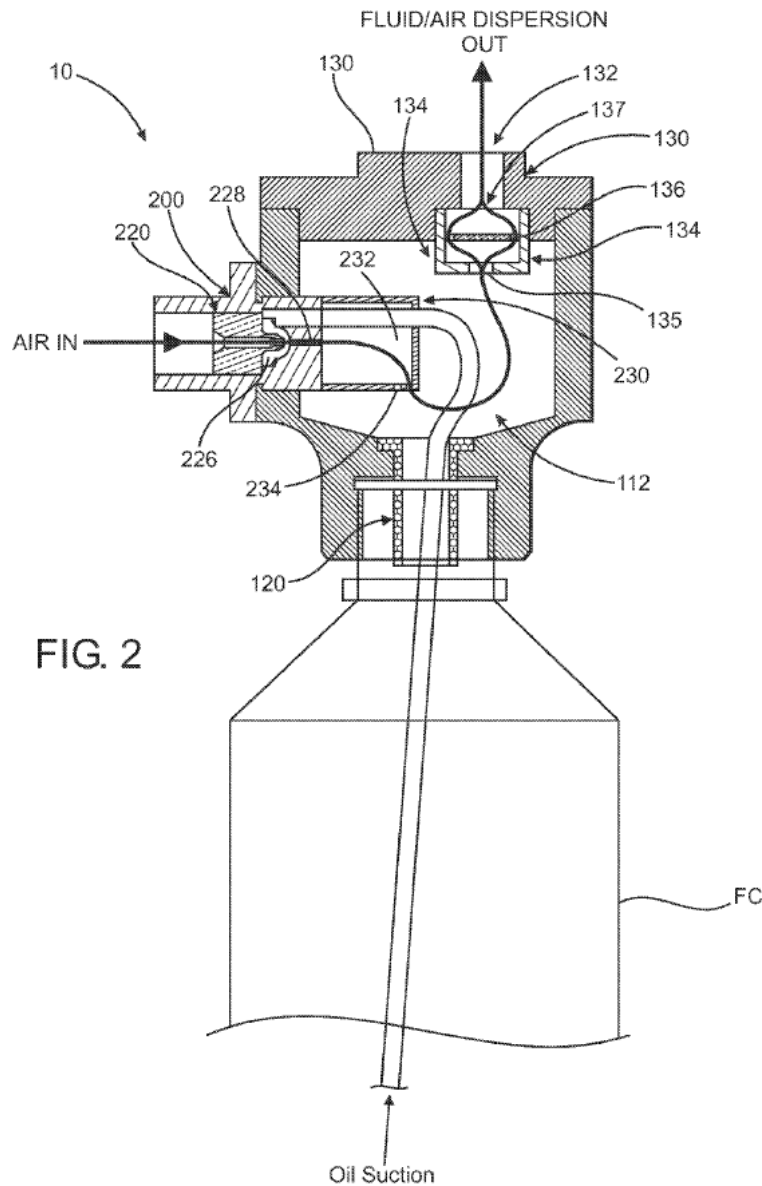


Figure 2 depicts a cross-sectional elevation view of a fluid dispersion assembly 10, powered by a compressed air source. Ex. 1001, 2:53–56, 3:9–12. An unnumbered diffusion unit “at least partially defines a diffusion chamber 112, and in at least one embodiment, the diffusion chamber 112 is

substantially enclosed within [the] diffusion unit.” *Id.* at 3:32–36.²

Discharge port 132 “provides a point of release of the fluid dispersion from the diffusion chamber 112 into the airspace surrounding the fluid dispersion assembly 10.” *Id.* at 3:63–67.

Depicted diffusion assembly 200 “comprises an air inlet 210 and an atomizer assembly 220.” Ex. 1001, 5:15–16. Atomizer assembly 220, in turn, “comprises an atomizer air inlet channel 222, a mixing chamber 226, and an atomizer exhaust channel 228.” *Id.* at 5:17–19.

D. The Challenged Claims

Petitioner challenges claims 1, 4, and 7–10, of which claims 1 and 7 are independent. Claim 4 depends from claim 1; claims 8–10 depend from claim 7. Independent claim 1 is reproduced below, reformatted from the version provided in the challenged patent and with bracketed labels added to identify each clause:

1. [1PRE] A fluid dispersion assembly operatively engages a container of an operative fluid and a compressed air source and generates and discharges a fluid dispersion into a surrounding airspace, said fluid dispersion assembly comprising:

[1A] a diffusion unit at least partially defining an enclosed diffusion chamber,

[1B] a discharge port disposed in fluid communication between said diffusion chamber and the surrounding airspace,

[1C] a diffusion assembly disposed in an operative engagement with said diffusion unit,

[1D] wherein said diffusion assembly comprises an atomizer assembly, said atomizer assembly comprising an

² In this Decision, we omit emphasis on reference numerals in quotations from the challenged patent and prior art references.

atomizer air inlet channel, a fluid inlet, a mixing chamber, and an atomizer exhaust aperture, and

[1E] said atomizer air inlet channel interconnected to the compressed air source and

[1F] said fluid inlet disposed in fluid communication with the operative fluid in the container,

[1G] the compressed air and the operative fluid mix together in said mixing chamber to form the fluid dispersion.

Ex. 1001, 15:24–45.³

E. Instituted Grounds of Unpatentability

We instituted *inter partes* review of the challenged claims based on the following grounds of unpatentability asserted by Petitioner:

Claim(s) Challenged	35 U.S.C. § ⁴	Reference(s)/Basis
1, 4, 7–10	103(a)	Goubet ⁵
1, 4, 7–10	103(a)	Goubet, Kaiser ⁶

³ We adopt and apply below Petitioner’s labels for the elements of the challenged claims. See Pet. (Appendix – Claim Limitation Listing).

⁴ The Leahy-Smith America Invents Act (“AIA”) included revisions to 35 U.S.C. §§ 102, 103 that became effective on March 16, 2013. Pub. L. No. 112-29, §§ 3(b)–3(c), 3(n)(1), 125 Stat. 284, 285–87, 293 (2011). Because there is no dispute that the challenged claims have an effective filing date before March 16, 2013, we apply the pre-AIA versions of these statutes. We would reach the same outcome, however, under the AIA versions.

⁵ French Patent and Trademark Office Publication FR 2 886 160, published December 1, 2006 (Ex. 1015 (French version) and Ex. 1016 (English translation), “Goubet”).

⁶ Sebastian Kaiser et al., *The Electrospray and Combustion at the Mesoscale*, 51 J. Mass Spectrom. Soc. Jpn. 42 (2003) (Ex. 1014, “Kaiser”).

Claim(s) Challenged	35 U.S.C. § ⁴	Reference(s)/Basis
1, 4, 7–10	102(b)	Gao ⁷
1, 4, 7–10	103(a)	Sevy ⁸
1, 4, 7–10	103(a)	Sevy, Gao

II. DISCUSSION

A. The Level of Ordinary Skill in the Art

The level of ordinary skill in the art is “a prism or lens” through which we view the prior art and the claimed invention. *Okajima v. Bourdeau*, 261 F.3d 1350, 1355 (Fed. Cir. 2001). The person of ordinary skill in the art is a hypothetical person presumed to have known the relevant prior art. *In re GPAC Inc.*, 57 F.3d 1573, 1579 (Fed. Cir. 1995). In determining the level of ordinary skill in the art, we may consider certain factors, including the “type of problems encountered in the art; prior art solutions to those problems; rapidity with which innovations are made; sophistication of the technology; and educational level of active workers in the field.” *Id.* (internal quotation marks and citation omitted).

Petitioner contends, with accompanying declaration testimony, that a person having ordinary skill in the art would have had either:

(1) a bachelor’s degree in mechanical engineering, aerospace engineering, chemical engineering, or a similar engineering field, with at least two years of work experience in fluid dynamics or fluid systems engineering; or (2) a master’s degree

⁷ Chinese National Intellectual Property Administration Utility Model Patent CN 201832737, published May 18, 2011 (Ex. 1012 (Chinese version) and Ex. 1013 (certified translation), “Gao”).

⁸ United States Published Patent Application US 2010/0084484 A1, published April 8, 2010 (Ex. 1009, “Sevy”).

in mechanical engineering, aerospace engineering, chemical engineering, or a similar engineering field, with at least one year of work experience in fluid dynamics or fluid systems engineering.

Pet. 12 (citing White Pet. Decl. ¶¶ 36–44).

In the Response, Patent Owner states that it “does not dispute” the definition of one of ordinary skill in the art proposed by Petitioner, but Patent Owner “reserves the right to address [the definition] should new issues materialize.” PO Resp. 6. Patent Owner did not address this issue in the Sur-reply.

As noted in the Decision on Institution, Petitioner’s proposed definition appears generally consistent with the record, including the prior art. *See* Dec. Inst. 8 (citing *In re GPAC Inc.*, 57 F.3d at 1579). We remove the phrase “at least” in both listed options, however, as that phrase adds ambiguity. Further, Patent Owner has not argued at trial that Petitioner’s proposal for the level of ordinary skill leads to an improper understanding of how a skilled artisan would have understood either the challenged patent or the prior art. In the analysis below, we continue to apply the level of ordinary skill in the art adopted in the Decision on Institution, as proposed by Petitioner.

B. Claim Construction

1. Applicable Standard

In *inter partes* reviews, the Board interprets claim language using the same claim construction standard that would be used in a civil action under 35 U.S.C. § 282(b), as described in *Phillips v. AWH Corp.*, 415 F.3d 1303 (Fed. Cir. 2005) (en banc). *See* 37 C.F.R. § 42.100(b). Under that standard, we generally give claim terms their ordinary and customary meaning, as

would be understood by a person of ordinary skill in the art at the time of the invention, in light of the language of the claims, the specification, and the prosecution history. *See Phillips*, 415 F.3d at 1313–14. Although extrinsic evidence, when available, may also be useful when construing claim terms under this standard, extrinsic evidence should be considered in the context of the intrinsic evidence. *See id.* at 1317–19.

2. *The Stipulated Constructions in the Florida Litigation*

Before we address one limitation disputed by the parties, and for completeness on the issue of claim construction, we note that, in late 2024, the parties filed in the Florida Litigation a Joint Claim Construction statement that included stipulated claim constructions and disputed claim constructions for terms in the challenged patent as well as the '094 patent and the '918 patent. *See* Ex. 1018, Exhibit A (Stipulated Claim Constructions), Exhibit B (Disputed Claim Constructions). The parties stipulated to the construction of the term “fluid dispersion” as recited in the challenged claim. *See id.*, Exhibit A.⁹

The stipulated construction of “fluid dispersion” merely restates the express definition of “fluid dispersion” from the challenged patent (although the definition is not cited or discussed in the parties’ filing). *Compare*

⁹ When staying the Florida Litigation, the District Court cancelled the scheduled claim construction hearing. *See* ECF No. 67 (April 8, 2025) (granting joint motion to stay); ECF No. 68 (April 8, 2025) (cancelling the claim construction hearing). Thus, the District Court has not substantively considered claim construction in the Florida Litigation. *Cf.* 37 C.F.R. § 42.100(b) (“Any prior claim construction determination concerning a term of the claim in a civil action, or a proceeding before the International Trade Commission, that is timely made of record in the *inter partes* review proceeding will be considered.”).

Ex. 1018, Exhibit A (“mixture of an operative fluid in air comprising a plurality of substantially uniform droplets (having substantially the same diameter) of the operative fluid dispersed throughout the air”), *with*

Ex. 1001, 3:18–30. To the extent necessary, we determine that the complete record supports the parties’ stipulated construction of “fluid dispersion,” and we apply that construction below.

3. *The “Form the Fluid Dispersion” Limitation*

Clause 1G in independent claim 1 and clause 8C in dependent claim 8 each recite that “the compressed air and the operative fluid mix together in said mixing chamber to form the fluid dispersion.” Ex. 1001, 15:43–54, 16:20–21 (the “form the fluid dispersion” limitation). Addressing this limitation as to the ground involving Sevy alone, Petitioner discusses the construction of “fluid dispersion” in the context of the “form the fluid dispersion” limitation. *See* Pet. 30–31. Petitioner states that, “[d]espite stipulating to the meaning of ‘fluid dispersion,’ [Patent Owner] construes this term differently depending on whether the ‘fluid dispersion’ is within the ‘mixing chamber’ or whether the ‘fluid dispersion’ is within the ‘diffusion chamber.’” Pet. 30 (citing Ex. 1018, Exhibit B). Petitioner adds that Patent Owner “has construed the term ‘diffusion chamber’ to mean ‘a region that is structured to facilitate the formation of the fluid dispersion (*e.g.*, substantially uniform droplets) prior to discharge,” but, “[i]n contrast, . . . has construed the term ‘mixing chamber’ to mean, ‘a region where the operative fluid is combined with compressed air.’” Pet. 30–31. “Put differently,” states Petitioner, “when the term fluid dispersion is claimed as being *within* the mixing chamber”—as in the “form the fluid dispersion” limitation—Patent Owner “construes the term to mean atomized droplets,

but the atomized droplets need not include ‘a plurality of substantially uniform droplets.’” Pet. 31 (citing White Pet. Decl. ¶¶ 164–168).

In the Reply, Petitioner devotes an entire section of the brief to this issue. *See* Pet. Reply 5–9 (“III. Clarification of Petitioner’s Position on Limitation 1[G]”). Petitioner first discusses the parties’ stipulation as to the term “fluid dispersion.” *Id.* at 5–6. Then, Petitioner states that the recitation “to form the fluid dispersion” shows that “the mixing chamber acts as a precursor step—in which the compressed air and the operative fluid are mixed—in the overall process of forming the ‘fluid dispersion’ that is eventually ‘dispersed throughout the air.’” *Id.* at 6; *see also id.* at 7 (stating that the “form the fluid dispersion” limitation “do[es] not require the ‘fluid dispersion’ be present in the mixing chamber”), 9 (arguing that the “form the fluid dispersion” limitation “does not require the presence of a fluid dispersion, meaning droplets ‘having substantially the same diameter,’ within the ‘mixing chamber’ itself”).

Patent Owner responds that, to satisfy the “form the fluid dispersion” limitation, a “fluid dispersion” under the parties stipulated construction (*see* § II.B.2) must be *fully formed* within the “mixing chamber.” *See* PO Sur-reply 23 (stating for an argument as to another ground that “[c]laim 1 unquestionably requires that the mixing of air and an operative fluid inside the mixing chamber produce a mixture comprising substantially uniform droplets”), 26 (arguing that “the claim and stipulated language clearly requires at least substantially uniform droplets to be formed within the mixing chamber”); *see also* PO Resp. 22 (arguing that the prior art “do[es] not disclose or suggest that a substantially uniform fluid dispersion is formed in the mixing chamber as required by Claim 1”). In other words, under

Patent Owner’s position in this proceeding, mere initial mixing of the compressed air and operative fluid is insufficient. *See id.* at 9 (“Claim 1 does not merely require that compressed air and operative fluid begin interacting somewhere before a fluid dispersion is later formed elsewhere.”).

The dispute between the parties as to the “form the fluid dispersion” limitation turns on claim construction. In the Decision on Institution, we asked the parties to address this issue in further briefing, and the parties did. *See* Dec. Inst. 16, 29, 33–34; Pet. 30–31; PO Resp. 11–12, 18–23, 33–35; Pet. Reply 5–9; PO Sur-reply 5–8, 9–10, 23–26. For the reasons below, the record supports Petitioner’s proposed construction of the “form the fluid dispersion” limitation—i.e., as requiring that the compressed air and the operative fluid are initially mixed together in the mixing chamber (but that a “fluid dispersion” under the stipulated construction need not be *fully formed* in the mixing chamber).

We start with the language of the claims. *TQ Delta, LLC v. DISH Network LLC*, 929 F.3d 1350, 1357 (Fed. Cir. 2019). At first glance, the language of the limitation at issue—which, again, recites “the compressed air and the operative fluid mix together in said mixing chamber to form the fluid dispersion”—would *seem* to require the “fluid dispersion” (under the stipulated construction) to be *fully formed* in the “mixing chamber.” In other words, the language of the limitation *alone* would seem to support Patent Owner’s proposed construction for the “form the fluid dispersion” limitation. But the claim construction analysis does not end with consideration of the claim language alone.

Next, we turn to the Specification. The Federal Circuit has said that the specification “is the single best guide to the meaning of a disputed term.”

Phillips, 415 F.3d at 1315 (quoting *Vitronics Corp. v. Conceptronic, Inc.*, 90 F.3d 1576, 1582 (Fed. Cir. 1996)). Here, the discussion in the Specification of *precisely the same language* as in the limitation at issue strongly supports that “to form a fluid dispersion” in the limitation at issue requires *only initial mixing* of the compressed air and operative fluid in the mixing chamber, with further “formation” of the “fluid dispersion” occurring *downstream* of the mixing chamber:

More importantly, the “predetermined amount” of compressed air and the “preselected amount” of the operable fluid are *initially mixed together* in the mixing chamber 226 *to form a fluid dispersion*. The diffusion chamber 112” is further structured to facilitate the formation of a plurality of substantially uniform droplets, as defined hereinabove, in the fluid dispersion prior to discharge from the diffusion chamber 112” through discharge port 132.

Ex. 1001, 10:62–11:2 (emphasis added) (discussing Figure 6), *quoted, in part, at* Pet. Reply 6–7¹⁰; *see also* Ex. 1001, 5:64–6:4 (same language, except without double primes, in a discussion of Figures 1 and 2). To be sure, certain passages in the Specification could be read to indicate that a “fluid dispersion” must be *fully formed* in the “mixing chamber.” *See, e.g.*, Ex. 1001, 6:11–12 (“More in particular, the suppression chamber 232 receives the fluid dispersion from the mixing chamber 226.”); *see also id.* at 7:22–33, 11:39–52 (both implying that a “fluid dispersion” is formed in the mixing chamber). But the passage block quoted directly above (and the similar one bridging columns 5 and 6) more directly addresses the issue at hand—i.e., the scope of “form the fluid dispersion”—by using the same

¹⁰ Petitioner mistakenly cited column 10, lines 39–41, but the text is from the quotation provided above.

language as the claim and thereby clarifying when formation of the “fluid dispersion” must take place.

Allowing for *further* “formation” of the “fluid dispersion” *downstream* of the “mixing chamber” is also strongly supported, under the doctrine of claim differentiation, by dependent claims 4 and 9 (as noted by Petitioner), which recite that the “diffusion chamber *facilitates* formation of the fluid dispersion prior to discharge of the fluid dispersion . . . into the surrounding airspace.” *See* Pet. Reply 6, 9 (“Utilizing the doctrine of claim differentiation noted by Patent Owner, it is unclear why claim 8 should be construed to require formation of ‘fluid dispersion’ in the mixing chamber, while claim 9 which depends therefrom, requires facilitating formation of the fluid dispersion in the diffusion chamber.”); *Liebel-Flarsheim Co. v. Medrad, Inc.*, 358 F.3d 898, 910 (Fed. Cir. 2004) (“[T]he presence of a dependent claim that adds a particular limitation raises a presumption that the limitation in question is not found in the independent claim.”). Patent Owner responds that “[a] downstream chamber” such as the “diffusion chamber” in these dependent claims “may further facilitate or condition a dispersion that has already been formed,” but Patent Owner does not adequately explain that position. PO Sur-reply 10. If a chamber downstream of the “mixing chamber”—such as the “diffusion chamber” in these dependent claims—“facilitates formation of the fluid dispersion,” we view that as supporting that the “fluid dispersion” was not *fully formed* in the “mixing chamber.”

The parties have not discussed the prosecution history or extrinsic evidence supporting their proposed constructions, and we do not independently find any such evidence relevant to our analysis. For the

reasons above, we conclude that the “form the fluid dispersion” limitation requires that the compressed air and the operative fluid are initially mixed together in the “mixing chamber” but that a “fluid dispersion” under the stipulated construction need not be *fully formed* in the “mixing chamber.” Our construction aligns with Petitioner’s position in the Florida Litigation, in which Petitioner defined a “mixing chamber” as a “chamber where compressed air and fluid are initially mixed together to form fluid dispersion” and defined a “diffusion chamber” as a “chamber where compressed air and fluid further mix together to form fluid dispersion prior to discharge.” Ex. 1018, Exhibit B, *discussed at* Pet Reply 7.

It also aligns with Patent Owner’s proposed constructions of “mixing chamber” and “diffusion chamber” in the Florida Litigation, which clarify that further “formation” of the “fluid dispersion” occurs *downstream* of the mixing chamber. *See* Ex. 1018, Exhibit B (defining “mixing chamber” as “Plain and Ordinary Meaning” or “Alternatively: a region where the operative fluid is combined with the compressed air”; defining “diffusion chamber” as “Plain and Ordinary Meaning” or “Alternatively: a region that is structured to facilitate the formation of the fluid dispersion prior to discharge”); *see also* Pet. Reply 7 (discussion Patent Owner’s positions). That same construction, however, conflicts with Patent Owner’s proposed construction *in this proceeding*, and Patent Owner has failed to explain the basis for its conflicting positions here as compared to the Florida Litigation. *See, e.g.*, PO Sur-reply 26 (arguing that “the claim and stipulated language clearly requires at least substantially uniform droplets to be formed within the mixing chamber”); Pet. Reply 8 (“Patent Owner appears to seek a construction for the term ‘mixing chamber’ that is contrary to the

construction it asked for in the underlying litigation.”); *cf. Revvo Techs. v. Cerebrum Sensor Techs., Inc.*, IPR2025-00632, Paper 20 at 3–4 (USPTO Dir. Rev. (Squires) Nov. 3, 2025) (precedential) (“[W]hen a petitioner takes alternative positions before the Board and a district court, that petitioner should, at a minimum, explain why alternative positions are warranted.”).

For the reasons above, we conclude that the “form the fluid dispersion” limitation requires that the compressed air and the operative fluid are initially mixed together in the “mixing chamber” but that a “fluid dispersion” under the stipulated construction need not be *fully formed* in the “mixing chamber.” We apply that construction below.

C. Petitioner’s Arguments Regarding Dr. Micklow

Petitioner argues that Dr. Micklow’s Declaration filed with the Patent Owner Response should be given no weight because “Dr. Micklow admitted during his deposition that he did not consider the entire disclosure of the [challenged p]atent or the parties’ claim constructions when arriving at his opinions.” Pet. Reply 1. Patent Owner does not respond to these arguments in the Sur-reply. We first address Petitioner’s argument that Dr. Micklow ignored relevant portions of the challenged patent and then we turn to the argument that Dr. Micklow did not consider or apply the parties’ claim constructions.

1. Allegedly Ignored Portions of the Challenged Patent

Petitioner first notes that Patent Owner argues that the prior art fails to disclose the “mixing chamber” limitation.¹¹ *See* Pet. Reply 1 (citing PO Resp. generally). According to Petitioner, Dr. Micklow’s testimony on this

¹¹ This refers to the recitation in clauses 1D and 7D for “a mixing chamber.”

issue should be given no weight because he admitted to not reviewing Figure 6 of the challenged patent, which Petitioner contends Patent Owner “focuses on” for the arguments as to that limitation. *See id.* at 1–2 (citing Ex. 1046, 200:14–16; PO Resp. 9, 19, 24, 34, 37).

Undermining Petitioner’s argument, however, Dr. Micklow did not provide *any* declaration testimony addressing the “mixing chamber” limitation. *See* Micklow Decl. ¶¶ 19–32 (discussing four of the five grounds in this proceeding and not addressing the “mixing chamber” limitation). Thus, we could not provide Petitioner the requested relief even if we were persuaded by the argument.

2. Allegedly Ignored Claim Constructions

Next, Petitioner argues that Dr. Micklow’s Declaration should be given no weight because his “opinion that the prior art does not render the claims obvious is founded on an interpretation of certain claim limitations that are inconsistent with both parties’ constructions.” Pet. Reply 2; *see also id.* at 2–5 (entire argument).

As an initial matter, the record here does not support any sound basis to disregard the *entirety* of Dr. Micklow’s Declaration for allegedly not reviewing the parties’ claim constructions. *See* Pet. Reply 2 (citing Ex. 1046, 115:15–18). Contrary to Petitioner’s argument, in the cited discussion, Dr. Micklow does not indicate that he applied an incorrect understanding of a claim term. *Cf. Cordis Corp. v. Bos. Sci. Corp.*, 658 F.3d 1347, 1357–58 (Fed. Cir. 2011) (disregarding testimony “based on an incorrect understanding of the claim construction”), *cited at* Pet. Reply 1. Instead, we read Dr. Micklow’s testimony as clarifying that he was not involved in claim construction at all and that, as stated, he “made [his]

opinions based on what [he] read in the patents.” Ex. 1046, 112:11–12; *see also id.* at 115:15–18 (“I don’t know if I would even apply claim construction. I applied engineering principles to a document that had been published with the patent office.”).

a. “Mixing Chamber”

Petitioner argues that we should “disregard” Dr. Micklow’s declaration testimony as to “mixing chamber” because his understanding includes features not present in a construction advanced by either party. Pet. Reply 2–3. Specifically, Petitioner states that Dr. Micklow “applied the understanding [he has] of a mixing chamber,” which is “a mixing chamber has significant volume and dimensions so that you can have a finely dispersed fluid at the exit of the mixing chamber.” Ex. 1046, 117:4–15, *quoted at* Pet. Reply 3.

The record here does not support Petitioner’s characterization of Dr. Micklow’s testimony as improper. As an initial matter, in the Florida Litigation, Patent Owner proposes to use the plain and ordinary meaning of “mixing chamber.” Ex. 1018, Exhibit B, at 1. Indeed, Petitioner acknowledges as much in the deposition question to Dr. Micklow, stating “So, for the term ‘mixing chamber,’ did you apply its plain and ordinary meaning?” Ex. 1046, 117:4–5. To that question, Dr. Micklow replied: “I applied the understanding I have of a mixing chamber, yes.” *Id.* at 117:7–9. When asked to provide that understanding (i.e., of the plain and ordinary meaning), Dr. Micklow provided the explanation above. We see nothing improper with providing such an understanding when sought in a deposition.

And again, Petitioner never asked, for example, whether Dr. Micklow applied the stated definition of “mixing chamber” or the plain and ordinary

meaning in his analysis in this proceeding. Moreover, Petitioner has not identified any portion of Dr. Micklow's Declaration that allegedly relies on the allegedly improper definition of "mixing chamber." For these reasons, we will not "disregard" Dr. Micklow's declaration testimony on this issue. *See* Pet. Reply 3.

b. "Fluid Dispersion"

Next, Petitioner argues that "[t]he parties' stipulated meaning of 'fluid dispersion' requires a plurality of droplets having 'substantially the same diameter,'" and that, "[i]n contrasting the prior art with the claimed invention of the [challenged p]atent, Dr. Micklow testified that in the diffusion chamber of the [challenged p]atent, 'you're attempting to obtain a "uniform spray distribution."'" Pet. Reply 3–4 (quoting Ex. 1046, 117:20–24). According to Petitioner, "in view of the explicit definition of the term 'fluid dispersion' set forth in the specification—a definition that was later stipulated to between the parties'" one of ordinary skill in the art "would appreciate that interpreting the 'fluid dispersion' limitation to mean a 'uniform spray distribution' would materially alter the scope and meaning of the challenged claims." *Id.* at 5 (citing White Reply Decl. ¶ 9).

The record does not support Petitioner's characterization of Dr. Micklow's testimony as "rely[ing] on [a] non-stipulated definition." Pet. Reply 5. As an initial matter, as discussed above (*see* § II.B.2), the parties merely restated the construction of "fluid dispersion" expressly set forth in the challenged patent. Moreover, none of the cited passages of Dr. Micklow's testimony squarely address any phrase included in the stipulated construction of "fluid dispersion." Instead, those passages discuss how one of ordinary skill in the art would *further understand* the language in

the stipulated construction, in order to apply *that understanding* to the prior art. As noted by Petitioner (Pet. Reply 3–5), Dr. Micklow discusses a “uniform distribution” and similar phrases, but those phrases are not in the stipulated construction. *See* Ex. 1051, Exhibit A; Ex. 1001, 3:18–30; Ex. 1046, 119:10–15 (discussing “uniform particle size distribution”), 148:5–10 (discussing the meaning of “uniform distribution”), 117:20–24 (discussing a “uniform spray distribution”), 149:3–150:3 (discussing the meaning of “uniform distribution”), 118:1–7 (same). Thus, we view Dr. Micklow as discussing a “uniform distribution” (for example) not to replace the stipulated construction, but rather, to identify a feature that, if present in the prior art, shows that the prior art is outside the scope of the proper understanding of the stipulated construction.

On the record here, Patent Owner’s *further interpretation* of the stipulated construction does not improperly stray from the stipulated construction. Thus, we will not “disregard” Dr. Micklow’s declaration testimony on this issue. Instead, we will give that testimony the appropriate weight given the strength of the underlying evidence. *See* PTAB Trial Practice Guide (online version) (“TPG”), § I.G (Expert Testimony) (“The Board has broad discretion to assign weight to be accorded expert testimony. *Yorkey v. Diab*, 601 F.3d 1279, 1284 (Fed. Cir. 2010). However, the testimony must be based on sufficient facts and data. Fed. R. Evid. 702(b). ‘Expert testimony that does not disclose the underlying facts or data on which the opinion is based is entitled to little or no weight.’ 37 C.F.R. § 42.65(a).”).

D. Asserted Obviousness of Claims 1, 4, and 7–10 Based on Goubet

Petitioner asserts that claims 1, 4, and 7–10 would have been obvious based on Goubet. Pet. 3–4, 42–58; Pet. Reply 16–18. Patent Owner provides arguments addressing this asserted ground.¹² PO Resp. 26–27; PO Sur-reply 16–17. We first summarize aspects of the relied-upon prior art.

1. Overview of Goubet

Goubet discloses “an essential oil diffuser.” Ex. 1016, 1:1.

Figure 1 of Goubet is reproduced below:

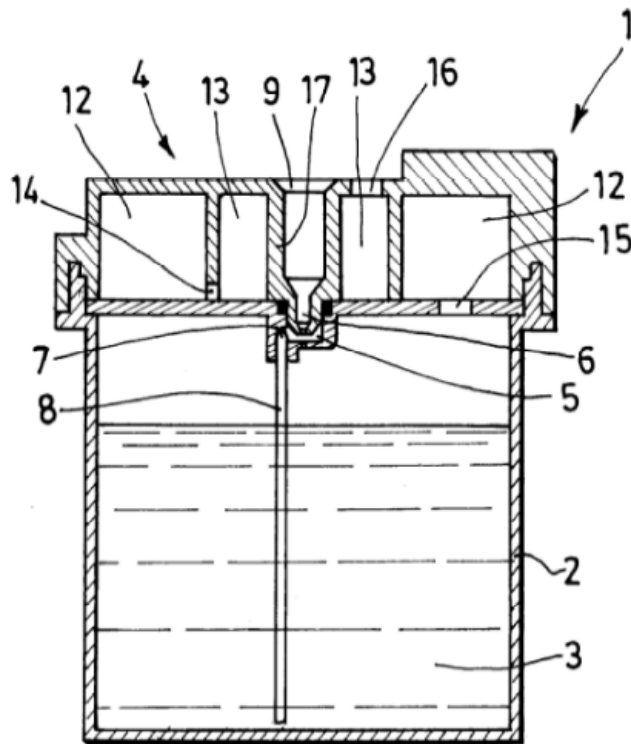


FIG.1

¹² We address Petitioner’s grounds in an order different than they are presented in the Petition.

Figure 1 is “a cross-sectional view of a diffuser.” Ex. 1016, 3:18. Depicted oil diffuser 1 includes oil reservoir 2 (with oil 3), diffuser head 4, and diffusion chamber 5 (within which oil droplets are produced). *See id.* at 3:24–26, 3:30–31. Diffuser head 4 includes outer enclosure 12 and inner enclosure 13, “communicating with each other via a passage 14, said two enclosures and said passage forming at least one baffle.” *Id.* at 4:3–6. “[O]uter chamber 12 communicates with the inside of the reservoir 2 via a droplet flow inlet 15” and “inner chamber 13 comprises an outlet 16 for the microdroplets to the ambient air.” *Id.* at 4:7–12.

Figures 2 and 3 are reproduced below:

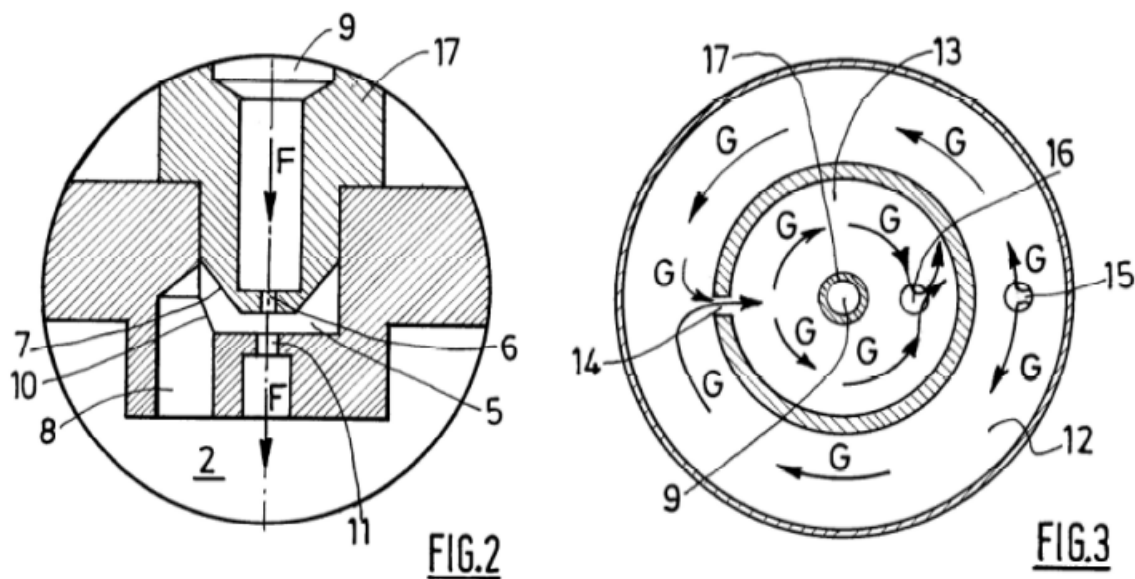


Figure 2 depicts a partial view of a diffuser head and Figure 3 is a simplified diagram showing the path of the droplets in the concentric chambers of the diffuser. *See* Ex. 1016, 3:19–23. As shown in Figure 2, diffusion chamber 5 includes compressed air inlet 6, venturi cone 7, oil inlet 10, which expels oil from dip tube 10 into chamber 5. *See id.* at 3:31–4:2. In operation, compressed air travels from inlet air channel 9 through air inlet 6 into diffusion chamber 5, in which “[a]ir and essential oil

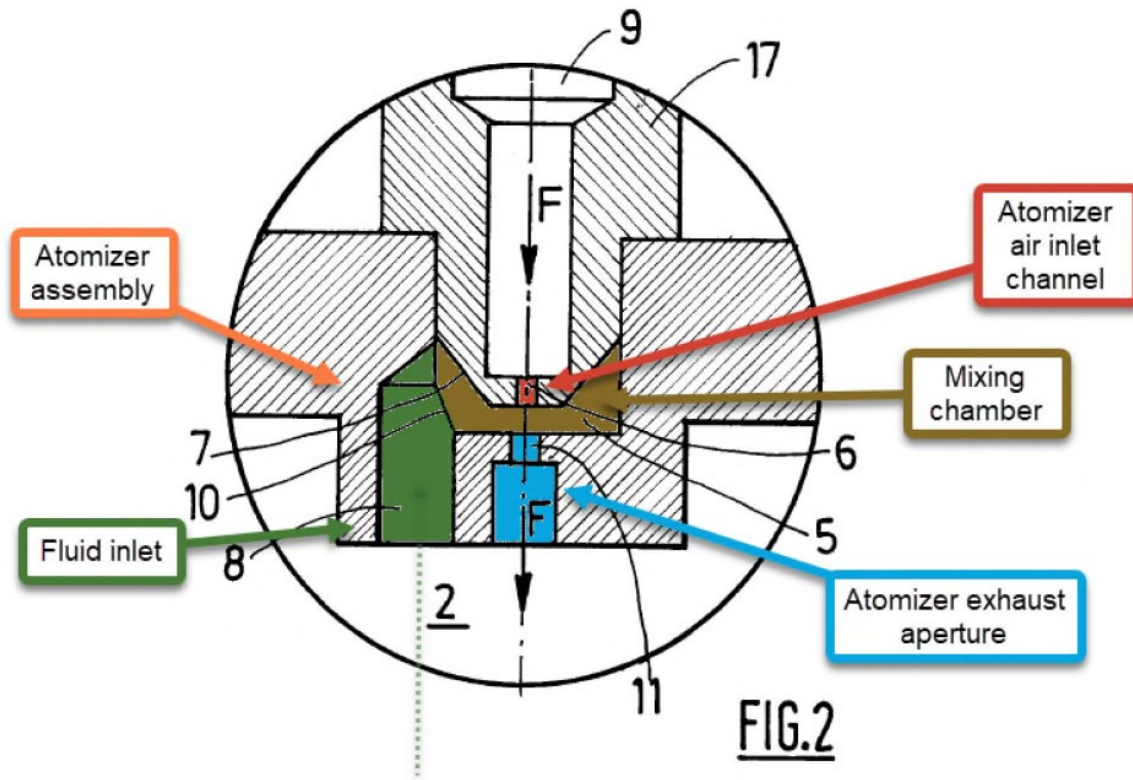
and mixed” and “a flow of oil droplets is created.” *Id.* at 4:15–22. The flow of oil droplets then travels through outlet 11, inside reservoir 2, towards inlet 15, and into outer enclosure 12. *Id.* at 4:23–28. The droplets then follow the path indicated by arrows G in Figure 3, through passage 14, entering inner enclosure 13 before exiting outlet 16 to the ambient air. *Id.* at 4:28–5:7.

2. Independent Claim 1

For independent claim 1, Petitioner contends that Goubet discloses or suggests each limitation. Pet. 42–55; White Pet. Decl. ¶¶ 198–228. To support its arguments, Petitioner identifies certain passages in the cited references and explains the significance of each passage with respect to the corresponding claim limitation. Pet. 42–55. Patent Owner argues that Goubet does not disclose the “form the fluid dispersion” limitation (in clause 1G). *See* PO Resp. 26–27; PO Sur-reply 16–17. We address that below.

a. The “Form the Fluid Dispersion” Limitation

Clause 1G recites “the compressed air and the operative fluid mix together in said mixing chamber to *form the fluid dispersion*.” Ex. 1001, 15:43–45 (emphasis added). As background for the discussion below, we reproduce Petitioner’s annotated version of Figure 2 of Goubet:



Ex-1016, FIG. 2

Pet. 53; *see* Pet. 51–54 (addressing clause 1D), 54–55 (referring to clause 1D in a discussion of clause 1G); White Pet. Decl. ¶¶ 219–225, 228. In the annotated version of Figure 2 of Goubet above, Petitioner added (1) an orange text box and arrow identifying an “Atomizer assembly,” (2) a red text box and arrow identifying an “Atomizer air inlet channel,” (3) a brown text box and arrow identifying a “Mixing chamber,” (4) a blue text box and arrow identifying an “Atomizer exhaust aperture,” and (5) a green text box and arrow identifying a “Fluid inlet.” Pet. 53.

Petitioner highlights the teachings in Goubet of compressed air flowing in the direction of arrow F in Figure 2, through air inlet channel 9 to compressed air inlet 6, and into diffusion chamber 5 (the identified “mixing chamber”). *See* Pet. 52–53 (citing Ex. 1016, 4:15–18). Then, Petitioner

relies on these teachings in Goubet that mixing of the air and fluid occurs in diffusion chamber 5:

When the compressed air flows into the diffusion chamber 5, the essential oil 3 is drawn into the diffusion chamber 5 by the vacuum created and flows into this diffusion chamber 5 through the upper end 10 of the dip tube 8. Air and essential oil are mixed within the diffusion chamber 5 and a flow of oil droplets is created.

Ex. 1016, 4:19–22, *quoted at* Pet. 53; *see also* Pet. 54–55 (relying on the discussion of clause 1D to address clause 1G).

Patent Owner contends that Goubet does not disclose or suggest the “form the fluid dispersion” limitation. *See* PO Resp. 26–27; PO Sur-reply 16–17. Specifically, Patent Owner contends that one of ordinary skill in the art “would appreciate that the circular shape of the baffle formed by enclosures 12 and 13 and passage 14 [in Goubet] necessitates that the droplets undergo multiple twists and turns, which would cause the droplets to remain in close contact and eventually coalesce into larger droplets.” PO Resp. 27 (citing Micklow Decl. ¶ 26). Patent Owner adds that “fine atomization of a liquid to create the uniform microdroplets required for a ‘fluid dispersion’ is time-dependent; the relatively short time spent traversing the baffle of Goubet would result in a non-uniform spray.” *Id.* (citing Micklow Decl. ¶ 26).

The complete record, developed at trial, more strongly supports Petitioner’s positions here. As discussed above, the parties have defined “fluid dispersion”—in line with the definition in the challenged patent—as a “mixture of an operative fluid in air comprising a plurality of substantially uniform droplets (having substantially the same diameter) of the operative fluid dispersed throughout the air.” *See* § II.B. But, as also discussed above

(*see* § II.B.3), we agree with Petitioner that this limitation does not require the *completed* formation of the “fluid dispersion” in the “mixing chamber”; instead, only initial mixing is required there. *See also* Dec. Inst. 29 (asking the parties to address in the briefing at trial how this limitation could be met under Petitioner’s understanding).

Thus, Patent Owner’s arguments requiring the *complete* formation of the “fluid dispersion” within the “mixing chamber” are not indicative of a deficiency in Petitioner’s position. *See In re Self*, 671 F.2d 1344, 1348 (CCPA 1982) (rejecting arguments “not based on limitations appearing in the claims”). The record supports that initial mixing of the compressed air and fluid occurs in diffusion chamber 5 in Goubet (i.e., the identified “mixing chamber”). *See* Ex. 1016, 4:21–22 (“Air and essential oil are mixed within the diffusion chamber 5 and a flow of oil droplets is created.”), *cited at* Pet. 53, 54–55; White Pet. Decl. ¶¶ 222–223, 228.

Patent Owner cites a single paragraph from Dr. Micklow’s Declaration, which largely parrots the statements from the Response. *Compare* PO Resp. 27, *with* Micklow Decl. ¶ 26; *Xerox Corp. v. Bytemark, Inc.*, IPR2022-00624, Paper 9 at 14–17 (PTAB Aug. 24, 2022) (precedential) (determining that “conclusory and unsupported” declarant testimony was entitled to little weight as it merely repeated, *verbatim*, the petition’s assertions without “cit[ing] any additional supporting evidence or provid[ing] any technical reasoning”). Moreover, for the reasons discussed above (*see* § II.B.3), a “fluid dispersion” under the stipulated construction need not be *fully formed* in the “mixing chamber” to satisfy the “form the fluid dispersion” limitation in independent claim 1.

We turn now to Patent Owner’s argument that Petitioner has not carried its burden on this issue because Dr. White “has not conducted any testing or analysis of any embodiment of Goubet.” PO Resp. 27. Patent Owner fails to provide any legal support for this requirement. We view Goubet’s disclosures and Dr. White’s discussion of what one of ordinary skill in the art would have understood from those express disclosures as sufficient to support Petitioner’s arguments as to the “form the fluid dispersion” limitation. *See In re Lamberti*, 545 F.2d 747, 750 (CCPA 1976) (“[T]he question under 35 U.S.C. § 103 is not merely what the references expressly teach, but what they would have suggested to one of ordinary skill in the art at the time the invention was made.”); *see also In re Preda*, 401 F.2d 825, 826–27 (CCPA 1968) (“[I]n considering the disclosure of a reference, it is proper to take into account not only specific teachings of the reference but also the inferences which one skilled in the art would reasonably be expected to draw therefrom.”).

For the reasons above, we find, based on the complete record, that Petitioner has shown by a preponderance of the evidence that Goubet discloses or suggests the “form the fluid dispersion” limitation.

b. The Remaining Limitations of Claim 1

To address the remaining limitations in independent claim 1, Petitioner discusses why Goubet discloses or suggests each limitation. *See* Pet. 42–55; White Pet. Decl. ¶¶ 198–228. The record evidence, as presented, supports Petitioner’s position as to the additional limitations in independent claim 1. Patent Owner does not present arguments addressing these limitations. We find, based on the complete record, that Petitioner has

demonstrated by a preponderance of the evidence that Goubet discloses or suggests the remaining limitations in claim 1.

c. Conclusion for Claim 1

For the reasons above, we determine, based on the complete record, that Petitioner has demonstrated by a preponderance of the evidence that claim 1 would have been obvious based on Goubet.

3. Claim 4

For dependent claim 4 (which depends from claim 1), Petitioner contends that Goubet discloses or suggests each limitation. Pet. 55–57; White Pet. Decl. ¶¶ 229–235. Patent Owner does not present any arguments specifically addressing claim 4 but rather relies on the same arguments addressing independent claim 1. *See* PO Resp. 27; PO Sur-reply 11.

We determine, based on the complete record, that Goubet discloses or suggests the subject matter of claim 4. We also determine that Petitioner has adequately explained why one of ordinary skill in the art would have had reason to modify Goubet as proposed and that there would have been a reasonable expectation of success. Based on the complete record, we determine that Petitioner has demonstrated by a preponderance of the evidence that claim 4 would have been obvious based on Goubet.

4. Independent Claim 7

For independent claim 7, Petitioner references its positions with respect to claim 1. *See* Pet. 57; White Pet. Decl. ¶¶ 236–240. Patent Owner does not present any arguments addressing this claim aside from the

arguments addressing claim 1, discussed above.¹³ *See* PO Resp. 26–27; PO Sur-reply 16–17. For the same reasons discussed above in the discussion of independent claim 1, we find that Goubet discloses or suggests the limitations of claim 7. We determine, based on the complete record, that Petitioner has demonstrated by a preponderance of the evidence that claim 7 would have been obvious based on Goubet.

5. Claims 8–10

For dependent claims 8–10 (all of which depend from claim 7), Petitioner contends that Goubet discloses or suggests each limitation. Pet. 57–58; White Pet. Decl. ¶¶ 241–245. Patent Owner does not present any arguments specifically addressing claims 8–10 but rather relies on the same arguments addressing independent claims 1 and 7. *See* PO Resp. 26–27; PO Sur-reply 16–17.

We determine, based on the complete record, that Goubet discloses or suggests the subject matter of claims 8–10. We also determine that Petitioner has adequately explained why one of ordinary skill in the art would have had reason to modify Goubet as proposed and that there would have been a reasonable expectation of success. Based on the complete record, we determine that Petitioner has demonstrated by a preponderance of the evidence that claims 8–10 would have been obvious based on Goubet.

¹³ Notably, claim 7 does not recite the “form the fluid dispersion” limitation present in independent claim 1. To the extent Patent Owner relies on the recitations of “fluid dispersion” in the preambles of independent claims 1 and 7, Patent Owner has not argued that the language of the preambles is limiting.

E. Asserted Obviousness of Claims 1, 4, and 7–10 Based on Goubet and Kaiser

Petitioner asserts that claims 1, 4, and 7–10 would have been obvious based on Goubet and Kaiser. Pet. 3–4, 58–60; Pet. Reply 18–21. Patent Owner provides arguments addressing this ground. PO Resp. 27–33; PO Sur-reply 17–22. We first summarize aspects of the relied-upon prior art.

1. Overview of Kaiser

In this asserted ground, Petitioner relies on Kaiser, in addition to Goubet (summarized above (*see* § II.D.1)). Kaiser generally relates to combustor design for power generation. *See* Ex. 1014 at 42. Kaiser discloses that “[c]ritical to uniform evaporation and burning is a good control of the size distribution of the resulting aerosol.” *Id.* at 43.

2. Independent Claims 1 and 7

For independent claims 1 and 7, Petitioner contends that the proposed combination of Goubet and Kaiser discloses each limitation. Pet. 58–60; Pet. Reply 18–21. Patent Owner challenges the articulated reasons to combine Goubet and Kaiser as proposed. *See* PO Resp. 31–32. We view this issue as dispositive for this ground, and we address it below.

a. The Reasons to Combine Goubet and Kaiser

Petitioner states that “Goubet does not explicitly disclose that its microdroplets are ‘substantially uniform’ in diameter.” Pet. 59; *see also* Ex. 1018, Exhibit A (construing “fluid dispersion”). Thus, for this ground, Petitioner “relies on Kaiser in combination with Goubet for limitation 1[PRE], Claim 4, 7[PRE], and Claim 9 that recite the ‘fluid dispersion’ term.” Pet. 59. According to Petitioner “Kaiser demonstrates that it was well known in the field at the time of the invention that droplets of greater uniformity result in uniform droplet evaporation.” Pet. 59 (citing Ex. 1014

at 43 (“[C]ritical to uniform evaporation and burning is a good control of the size distribution of the resulting aerosol”). Petitioner also states that one of ordinary skill in the art “would have been motivated to modify Goubet to include additional enclosures to further reduce the size (diameter) of the droplets for the reasons” described in the ground based on Goubet alone. Pet. 59 (with no citation). Petitioner adds that one of ordinary skill in the art “would have been motivated to add the additional enclosures in view of Kaiser’s teaching that uniform droplets result in uniform evaporation, which, in turn, would improve the smoothness (*i.e.*, less harsh) of the aroma generated as the oil droplets evaporate in the surrounding airspace.” *Id.*

Patent Owner argues that Petitioner has failed to articulate a legally sufficient reasoning to combine Goubet with Kaiser. PO Resp. 31–32. Specifically, Patent Owner contends that “it is not enough that two systems were merely ‘known’ to combine them for purposes of evaluating obviousness; there must be a reason a skilled artisan would have made the specific substitution or combination.” *Id.* at 31.

“To satisfy its burden of proving obviousness, a petitioner cannot employ mere conclusory statements. The petitioner must instead articulate specific reasoning, based on evidence of record, to support the legal conclusion of obviousness.” *In re Magnum Oil Tools Int’l, Ltd.*, 829 F.3d 1364, 1380 (Fed. Cir. 2016); *TriVascular, Inc. v. Samuels*, 812 F.3d 1056, 1066 (Fed. Cir. 2016) (“Although the *KSR* test is flexible, the Board ‘must still be careful not to allow hindsight reconstruction of references . . . without any explanation as to *how* or *why* the references would be combined to produce the claimed invention.’”) (citation omitted).

Based on the complete record, we agree with Patent Owner that “Petitioner’s asserted motivation boils down to the conclusory statement that given Goubet and Kaiser, ‘it was well known in the field at the time of the invention that droplets of greater uniformity result in uniform droplet evaporation.’” PO Resp. 31 (quoting Pet. 59). We agree with Patent Owner that Petitioner’s discussion of the alleged reasons to combine (Pet. 59) is insufficient to support the proposed combination here. *See Magnum Oil*, 829 F.3d at 1380. Specifically, we are not persuaded that Kaiser’s teachings—which relate to *combustion* (Ex. 1014 at 43)—would have led one of ordinary skill in the art to the proposed modifications, which would allegedly “improve the smoothness (i.e., less harsh) *of the aroma generated* as the oil droplets evaporate in the surrounding airspace.” *See* Pet. 59 (emphasis added); White Pet. Decl. ¶ 251 (same); *see* PO Resp. 32 (“Rather, Dr. White merely describes the ability to achieve the effect as in the claimed patent, not why a [person of ordinary skill in the art] would look to the field of electrospray injection and combustion in mesoscale power-generation systems, using high-voltage electric fields to generate charged fuel droplets for controlled combustion in catalytic micro-combustors when considering atomization for scents.”).

For these reasons, we determine, in light of the complete record, that Petitioner has not shown by a preponderance of the evidence that one of ordinary skill in the art at the time of the invention would have had reason to combine Goubet and Kaiser, as proposed.

b. Conclusion for Claims 1 and 7

For the reasons above, we determine, based on the complete record, that Petitioner has not demonstrated by a preponderance of the evidence that claims 1 and 7 would have been obvious based on Goubet and Kaiser.

3. Claims 4 and 8–10

For dependent claim 4 (which depends from claim 1) and for dependent claims 8–10 (which depend from claim 7), Petitioner contends that the proposed combination of Goubet and Kaiser satisfies each limitation. Pet. 58–60; Pet. Reply 18–21. As discussed above (*see* § II.E.2.b), Petitioner has not demonstrated by a preponderance of the evidence that independent claims 1 and 7 would have been obvious based on Goubet and Kaiser. Thus, we determine, based on the complete record, that Petitioner has not demonstrated by a preponderance of the evidence that claims 4 and 8–10 would have been obvious based on Goubet and Kaiser.

F. Asserted Anticipation of Claims 1, 4, and 7–10 by Gao

Petitioner asserts that claims 1, 4, and 7–10 are anticipated by Gao. Pet. 3–4, 60–73; Pet. Reply 21–25. Patent Owner provides arguments addressing this asserted ground. PO Resp. 33–39; PO Sur-reply 23–27. We first summarize aspects of the relied-upon prior art.

1. Overview of Gao

Gao discloses “an atomizer used for atomizing essence or essential oil.” Ex. 1013 at 5 (¶ 1).

Figures 1 and 2 of Gao are reproduced below:

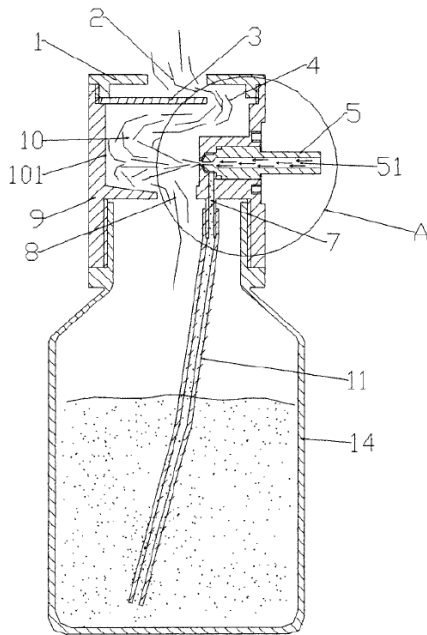


FIG. 1

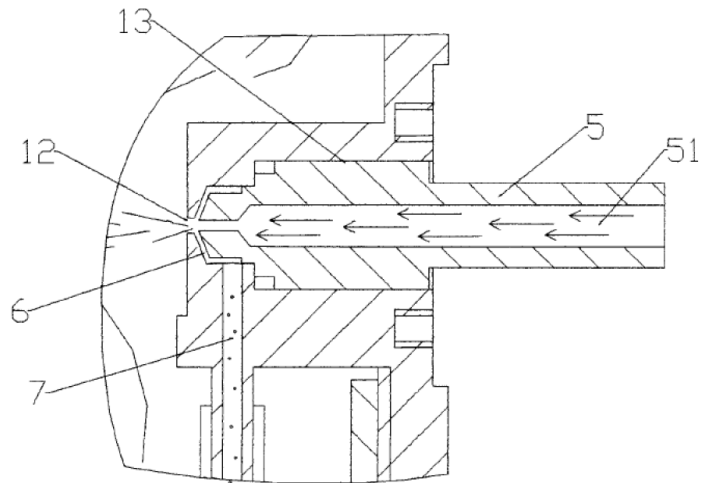


FIG. 2

Figure 1 depicts “the structure of an atomizer for atomizing essence or essential oil.” Ex. 1013 at 7 (¶ 16). Figure 2 depicts an enlarged schematic of “A” in Figure 1. *Id.* (¶ 17). The depicted atomizer includes liquid pipeline 7, which brings stored liquid up via hose 11 to combine with gas from gas flow nozzle 5 in atomizing cavity 6. *See id.* at 8 (¶ 19), 8–9 (¶ 25). The gas-liquid mixture is then ejected through gas flow spray hole 12 into inner wall 101, where “the liquid is atomized into micron-sized fine particles.” *Id.* at 8–9 (¶ 25). Gao discloses that “[t]he smallest particles will float in the air, and drift out through the through hole 4 and the atomizing gas outlet 2 with the rising gas flow to be converted into gas through heat exchange with the air.” *Id.* at 9 (¶ 25).

2. Independent Claim 1

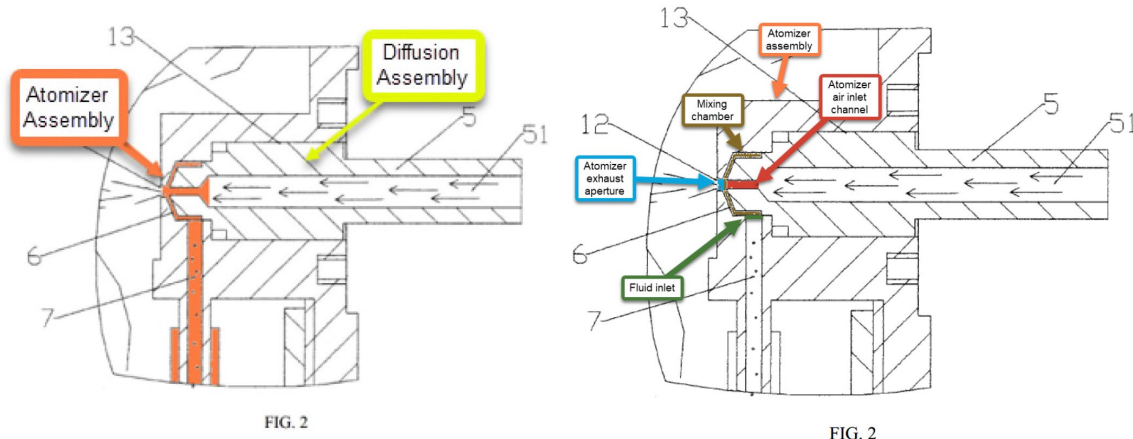
For independent claim 1, Petitioner contends that Gao discloses each limitation. Pet. 60–71. To support its arguments, Petitioner identifies

certain passages in Gao and explains the significance of each passage with respect to the corresponding claim limitation. *Id.* Patent Owner argues that (1) Gao does not disclose the “mixing chamber” limitation in clause 1D and (2) Gao does not disclose the “form the fluid dispersion” limitation in clause 1G. *See* PO Resp. 33–38; PO Sur-reply 23–26. We address in turn each of Patent Owner’s arguments.

a. The “Mixing Chamber” Limitation

Clauses 1D and 7D each recite “wherein said diffusion assembly comprises an atomizer assembly, said atomizer assembly comprising an atomizer air inlet channel, a fluid inlet, *a mixing chamber*, and an atomizer exhaust aperture.” Ex. 1001, 15:33–39, 16:9–15 (emphasis added).

Petitioner provides these annotated versions of Figure 2 of Gao to explain its positions as to the clauses:



Pet. 70, 69; *see also* Pet. 68–70 (citing White Pet. Decl. ¶¶ 277–282) (entire discussion), Pet. 72 (relying on the same for clause 7D). In the annotated version of Figure 2 at left above, Petitioner added (1) a text box and orange shading identifying an “Atomizer assembly” and (2) a text box identifying a “Diffusion assembly.” Pet. 70. In the annotated version of Figure 2 on the right above, Petitioner added (1) a text box identifying an “Atomizer

assembly,” (2) a text box and red shading identifying an “Atomizer air inlet channel,” (3) a text box and brown shading identifying a “Mixing chamber,” (4) a text box and blue shading identifying an “Atomizer exhaust aperture,” and (5) a text box and green shading identifying a “Fluid inlet.” Pet. 69.

Patent Owner argues that Gao does not disclose or suggest the “mixing chamber” limitation. *See* PO Resp. 36–38 (presenting an argument for claim 7 but implicitly relying on the same argument as to claim 1). Specifically, Patent Owner argues that Gao does not disclose a “mixing chamber” in “the context of fluid dispersion system,” which allegedly requires “a discrete volumetric region within the atomizer assembly that receives compressed air and operative fluid and permits controlled interaction between them prior to downstream processing.” *Id.* at 36. According to Patent Owner, a “‘mixing chamber,’ as understood in this art, is not a mere opening or constriction, but a spatial region that allows interaction, pressure equalization, and flow development.” *Id.* Patent Owner also contends that a “mixing chamber” also must “accelerate[] flow, increase[] turbulence, and cause[] a pressure drop.” *Id.* at 38.

On the complete record, this argument does not identify a deficiency in Petitioner’s position as to the “mixing chamber” limitation. As argued by Petitioner, with this argument, Patent Owner attempts to import several alleged structural and functional requirements that have no basis in the record here. *See* Pet. Reply 23 (“Patent Owner’s attempt to import geometrical, acoustic, and operational features from the specification into the term ‘mixing chamber’ (contrary to the claim language and the parties’ construction) has no legal basis.”); *see also Laitram Corp. v. NEC Corp.*, 163 F.3d 1342, 1347 (Fed. Cir. 1998) (stating that “it is the *claims*, not the

written description, which define the scope of the patent right”). Indeed, the *only* citations in this entire section of the Patent Owner Response are to the claim language and Figure 6 of the challenged patent. *See* PO Resp. 36–38. The record here does not support Patent Owner’s narrow construction of a “mixing chamber.”

In contrast, Petitioner implicitly proposes to construe a “mixing chamber” in the limitation at issue as a chamber in which compressed air and operative fluid are initially mixed (thus *beginning* the process of forming a “fluid dispersion”). *See* Pet. Reply 23 (“Gao’s atomization cavity 6 meets either Parties’ construction of the ‘mixing chamber’ limitation because compressed air and fluid are ‘mixed’ therein before the gas-liquid mixture is ejected through the gas flow port, starting to form the fluid dispersion in the process.” (citing Ex. 1018, Exhibit B)). This aligns with the construction of the “form the fluid dispersion” limitation, which, as discussed above (*see* § II.B.3) requires that the compressed air and the operative fluid are initially mixed together in the “mixing chamber” but a “fluid dispersion” under the stipulated construction need not be *fully formed* in the “mixing chamber.”

Turning to applying Petitioner’s proposed construction of “mixing chamber,” we find that Gao discloses a chamber in which compressed air and operative fluid are initially mixed. Specifically, as noted by Petitioner, Gao expressly discloses that mixing of compressed air and the operative fluid occurs in atomizing cavity 6 (i.e., the identified “mixing chamber”):

The atomization process of the atomizer is as follows: the gas inlet on a side of the atomizer, i.e., the inlet of the gas flow pipe 51, is connected to the air pump. When the air pump is in operation, a gas flow is blown out through the pipe. *The liquid is*

sucked into the atomizing cavity 6 based on the siphon principle, and the liquid and the gas are fully mixed.

Ex. 1013 ¶ 25 (emphasis added), *quoted at* Pet. 68–69. Patent Owner’s arguments attempting to distinguish Gao rely entirely on Patent Owner’s improperly narrow construction of a “mixing chamber,” discussed above. *See, e.g.*, PO Resp. 37 (arguing that atomizing cavity 6 in Gao “lacks internal volume, residence time, or spatial extent, and thus cannot reasonably be characterized as a ‘chamber’”). Indeed, Patent Owner does not argue that Gao fails to disclose or suggest the “mixing chamber” limitation under Petitioner’s proposed construction. *See* PO Resp. 36–38; PO Sur-reply 23–27.

For the reasons above, we find, based on the complete record, that Petitioner has shown by a preponderance of the evidence that Gao discloses the “mixing chamber” limitation.

b. The “Form the Fluid Dispersion” Limitation

Clause 1G recites “the compressed air and the operative fluid mix together in said mixing chamber to *form the fluid dispersion.*” Ex. 1001, 15:43–45 (emphasis added). For this limitation, Petitioner refers back to the discussion of clause 1D (specifically, the “mixing chamber” limitation), at issue in the prior section. *See* Pet. 71. Petitioner states, “[a]s demonstrated in this [ground] with respect to limitation 1[D], the compressed air and the operative fluid mix together in said mixing chamber (*e.g.*, atomizing cavity 6).” *Id.* (citing Ex. 1013 ¶ 25, Fig. 2).

Patent Owner contends that Goubet does not disclose or suggest the “form the fluid dispersion” limitation. *See* PO Resp. 33–35; PO Sur-reply 23–26. All of Patent Owner’s arguments as to this limitation, however, rely on Patent Owner’s proposed construction, which, as discussed above (*see*

§ II.B.3), requires that a “fluid dispersion” under the parties stipulated construction must be *fully formed* within the “mixing chamber.” *See, e.g.*, PO Resp. 34 (arguing that “Gao does not teach forming the claimed fluid dispersion ***within the mixing chamber prior*** to discharge”), 35 (arguing that “Gao cannot teach nor inherently describe a substantially uniform fluid dispersion is formed in the mixing chamber as required by Claim 1”); PO Sur-reply 23 (asserting that “Claim 1 unquestionably requires that the mixing of air and an operative fluid inside the mixing chamber produce a mixture comprising substantially uniform droplets”), 25 (arguing that “nothing within Gao, nor Petitioner’s Reply indicates that post-atomization, the atomization of Gao will be ***substantially uniform droplets required by the stipulated construction of fluid dispersion***”), 25 (“Starting to form a fluid dispersion is not the same as forming one. Claim 1 requires the latter.”), 26 (asserting that, “even if those substantially uniform droplets are later refined into even more uniform droplets, the claim and stipulated language clearly requires at least substantially uniform droplets to be formed within the mixing chamber”).

But, as discussed above (*see* § II.B.3), we agree with Petitioner that this limitation does not require the *completed* formation of the “fluid dispersion” in the “mixing chamber”; instead, only initial mixing is required there. *See also* Dec. Inst. 29 (asking the parties to address in the briefing at trial how this limitation could be met under Petitioner’s understanding).

Thus, Patent Owner’s arguments requiring the *complete* formation of the “fluid dispersion” within the “mixing chamber” are not indicative of a deficiency in Petitioner’s position. *See In re Self*, 671 F.2d at 1348 (rejecting arguments “not based on limitations appearing in the claims”).

For the reasons discussed above (*see* § II.F.2.a), the record supports that initial mixing of the compressed air and fluid occurs in atomizing cavity 6 in Gao (i.e., the identified “mixing chamber”). *See* Ex. 1013 ¶ 25 (“The liquid is sucked into the atomizing cavity 6 based on the siphon principle, and the liquid and the gas are fully mixed.”), *cited at* Pet. 68–69; White Pet. Decl. ¶¶ 280–282.

Patent Owner cites testimony from Dr. Micklow in support of the contention that Gao “would not[] result in a fluid dispersion at all.” *See* PO Resp. 35 (citing Micklow Decl. ¶¶ 24–25). But for the reasons discussed above (*see* § II.B.3), a “fluid dispersion” under the stipulated construction need not be *fully formed* in the “mixing chamber” to satisfy the “form the fluid dispersion” limitation in independent claim 1.

For the reasons above, we find, based on the complete record, that Petitioner has shown by a preponderance of the evidence that Gao discloses or suggests the “form the fluid dispersion” limitation.

c. The Remaining Limitations of Claim 1

To address the remaining limitations in independent claim 1, Petitioner discusses why Gao discloses each limitation. *See* Pet. 60–71; White Pet. Decl. ¶¶ 261–288. The record evidence, as presented, supports Petitioner’s position as to the additional limitations in independent claim 1. Patent Owner does not present arguments addressing these limitations. We find, based on the complete record, that Petitioner has demonstrated by a preponderance of the evidence that Gao discloses the remaining limitations in claim 1.

d. Conclusion for Claim 1

For the reasons above, we determine, based on the complete record, that Petitioner has demonstrated by a preponderance of the evidence that claim 1 is anticipated by Gao.

3. Claim 4

For dependent claim 4 (which depends from claim 1), Petitioner contends that Gao discloses each limitation. Pet. 71–72; White Pet. Decl. ¶¶ 289–292. Patent Owner does not present any arguments specifically addressing claim 4 but rather relies on the same arguments addressing independent claim 1. See PO Resp. 36, 39; PO Sur-reply 27.

We determine, based on the complete record, that Gao discloses the subject matter of claim 4. Based on the complete record, we determine that Petitioner has demonstrated by a preponderance of the evidence that claim 4 is anticipated by Gao.

4. Independent Claim 7

For independent claim 7, Petitioner references its positions with respect to claim 1. See Pet. 72; White Pet. Decl. ¶¶ 293–297. Patent Owner acknowledges that independent claim 7 does not recite the “form the fluid dispersion” limitation, but Patent Owner argues that Gao does not disclose the “mixing chamber” limitation. See PO Resp. 36–38; PO Sur-reply 27. For the same reasons discussed above as to independent claim 1 (see § II.F.2.a), we find, based on the complete record, that Petitioner has shown by a preponderance of the evidence that Gao discloses the “mixing chamber” limitation.

The record evidence, as presented, also supports Petitioner’s position as to the additional limitations in independent claim 7. Patent Owner does

not present arguments addressing these limitations. We find, based on the complete record, that Petitioner has demonstrated by a preponderance of the evidence that Gao discloses the remaining limitations in claim 7. Based on the complete record, we determine that Petitioner has demonstrated by a preponderance of the evidence that claim 7 is anticipated by Gao.

5. Claim 8

For dependent claim 8, Petitioner references its positions with respect to claim 1. *See* Pet. 72–73; White Pet. Decl. ¶ 298. Patent Owner relies on the arguments addressing independent claim 7 (from which claim 8 depends) and argues that Gao does not disclose the “form the fluid dispersion” limitation for the same reasons argues as to independent claim 1. *See* PO Resp. 39; PO Sur-reply 27. For the same reasons discussed above as to independent claim 1 (*see* § II.F.2.b), we find, based on the complete record, that Petitioner has shown by a preponderance of the evidence that Gao discloses the “form the fluid dispersion” limitation.

The record evidence, as presented, also supports Petitioner’s position as to the additional limitations in dependent claim 8. Patent Owner does not present arguments addressing these limitations. We find, based on the complete record, that Petitioner has demonstrated by a preponderance of the evidence that Gao discloses the remaining limitations in claim 8. Based on the complete record, we determine that Petitioner has demonstrated by a preponderance of the evidence that claim 8 is anticipated by Gao.

6. Claims 9 and 10

For dependent claims 9 and 10 (which depends from claim 7), Petitioner contends that Gao discloses each limitation. Pet. 73; White Pet. Decl. ¶¶ 299–302. Patent Owner does not present any arguments

specifically addressing claims 9 and 10 but rather relies on the arguments addressing independent claim 7. *See* PO Resp. 39; PO Sur-reply 27.

We determine, based on the complete record, that Gao discloses the subject matter of claims 9 and 10. Based on the complete record, we determine that Petitioner has demonstrated by a preponderance of the evidence that claims 9 and 10 are anticipated by Gao.

G. Asserted Obviousness of Claims 1, 4, and 7–10 Based on Sevy

Petitioner asserts that claims 1, 4, and 7–10 would have been obvious based on Sevy. Pet. 3–4, 20–37; Pet. Reply 9–13. Patent Owner provides arguments addressing this asserted ground. PO Resp. 6–18; PO Sur-reply 3–15. We first summarize aspects of the relied-upon prior art.

1. Overview of Sevy

Sevy relates to “atomizers and, more particularly, to novel systems and methods for integrating air supplies, reservoirs and atomizers into an integrated system.” Ex. 1009 ¶ 2. Sevy discloses that “it would be an advance in the art to provide an atomizer that provides a better atomization or a smaller mean or average size of droplet in the distribution of atomized droplets compared with prior art devices capable of atomizing.” *Id.* ¶ 9.

Figure 1 of Sevy is reproduced below:

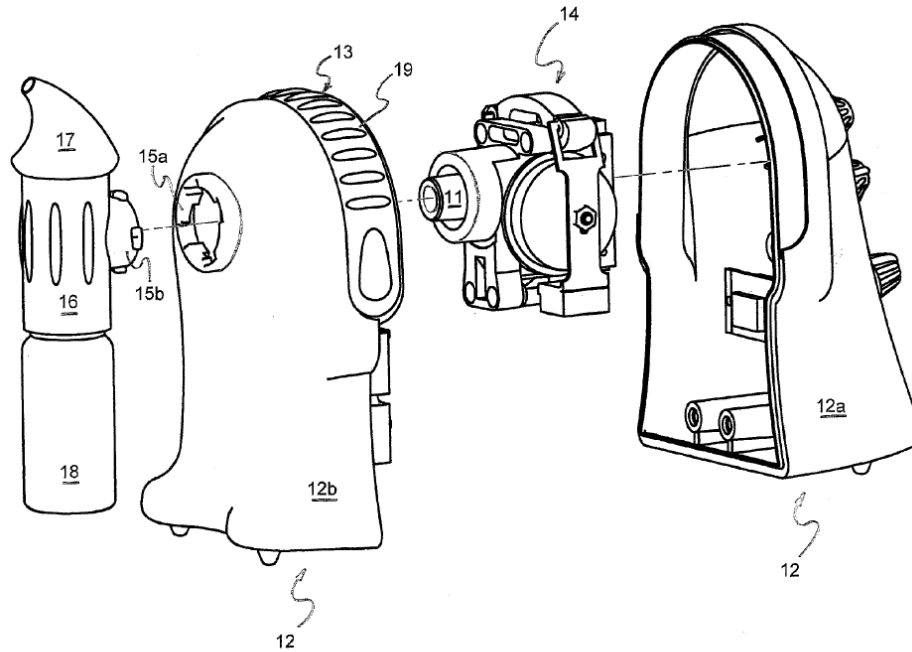


FIG-1

Figure 1 is an exploded view of an integrated atomizer apparatus. Ex. 1009 ¶ 31. The depicted embodiment includes housing 12, pump 14 (with outlet 11 from pump 14), atomizer 16, director 17, and reservoir 18. *Id.* ¶ 41. Sevy discloses that “[a]ir from the pump 14 drives atomization in the atomizer 16 to discharge atomized liquids out the director 17” with the liquids “drawn by the atomizer 16 from the reservoir 18.” *Id.*

Figure 9 is reproduced below:

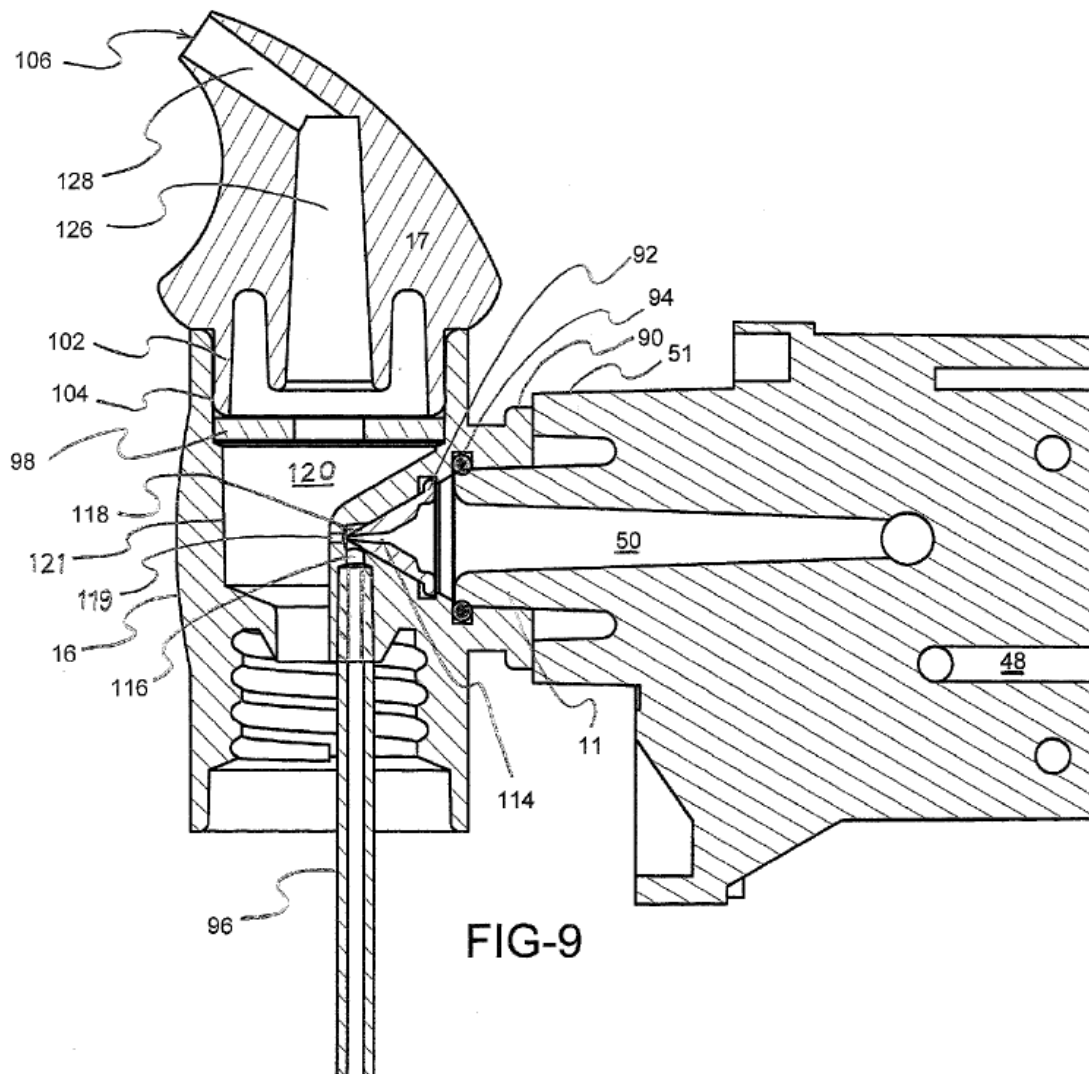


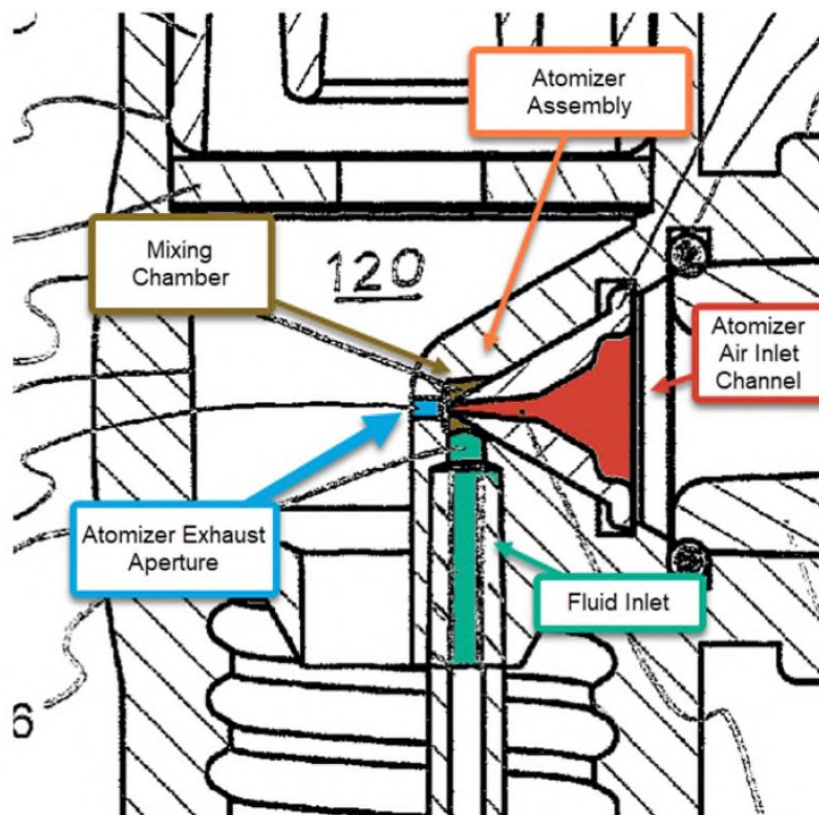
Figure 9 is a “detailed cross-sectional, side elevation view of the pump body and the atomizer body.” Ex. 1009 ¶ 39. In this embodiment, nozzle 92 encloses channel 114 leading from passage 50 to orifice 118 and exit orifice 119 permits discharge of fluids, including air from orifice 118 and liquid from siphon tube 96. *Id.* ¶¶ 79–80. Sevy discloses that the “entire mixture of air and droplets passes through the exit orifice 119 toward the separator 120, and particularly toward the wall 121 thereof.” *Id.* ¶ 82.

2. Independent Claims 1 and 7

For independent claims 1 and 7, Petitioner contends that Sevy discloses or suggests each limitation. Pet. 20–31, 36; Pet. Reply 9–13. Patent Owner argues that Sevy lacks the “mixing chamber” limitation in clauses 1D and 7D. See PO Resp. 8–10; PO Sur-reply 5–8. We view this issue as dispositive for this ground, and we address it below.

a. The “Mixing Chamber” Limitation

Clauses 1D and 7D each recite “wherein said diffusion assembly comprises an atomizer assembly, said atomizer assembly comprising an atomizer air inlet channel, a fluid inlet, a *mixing chamber*, and an atomizer exhaust aperture.” Ex. 1001, 15:33–39, 16:9–15 (emphasis added). Petitioner provides this annotated partial image of Figure 9 of Sevy to explain its position as to this limitation:



Pet. 28; *see also* Pet. 28–29 (citing White Pet. Decl. ¶¶ 149–159) (identifying the structures of the “atomizer assembly”). In the annotated partial image of Figure 9 here, Petitioner added (1) a text box and red shading identifying an “Atomizer Air Inlet Channel,” (2) a text box and teal shading identifying a “Fluid Inlet,” (3) a text box and blue shading identifying an “Atomizer Exhaust Aperture,” (4) a text box and brown shading identifying a “Mixing Chamber,” and (5) a text box identifying an “Atomizer Assembly.” Pet. 28.

Petitioner summarizes the operation of the apparatus in Sevy as relevant to the “mixing chamber” limitation. *See* Pet. 27–29. Air from a pump flows through passage 50 (*see* full Figure 9 above) and through channel 114 (shown in red and marked as “Atomizer Air Inlet Channel” in the annotated partial version of Figure 9 above). Pet. 27 (citing Ex. 1009 ¶¶ 75–79). According to Petitioner, “[w]hen pressure is reduced in cavity 116, liquid is drawn up from the reservoir 18, through siphon tube 96 and into the cavity 16, where it is comminuted by a blast of high-speed air.” Pet. 28 (citing Ex. 1009 ¶¶ 80–81). Then, “[t]he liquid from the siphon 96 is atomized into droplets of various size [and] [t]he entire mixture of air and droplets passes through the exit orifice 119.” *Id.* (quoting Ex. 1009 ¶ 82 (with alterations by Petitioner)). Petitioner also quotes a discussion of the three openings in cavity 116 (generally shown in brown and marked as “Mixing Chamber” in the annotated partial version of Figure 9 above):

The cavity 116 has three openings. [(1)] From the pump side, the cavity is open to the orifice 118 of the nozzle 92. [(2)] From below, the cavity 116 is open to the siphon 96 leading to the reservoir 18. [(3)] Toward the atomizer 16, the cavity 116 is open to yet another orifice 119. The exit orifice 119 permits discharge

of fluids including air from the orifice 118 and liquid from the siphon tube 96 out the exit orifice 119.

Ex. 1009 ¶ 80, *quoted at* Pet. 27. With that background, Petitioner identifies the “mixing chamber” as the brown volume in the annotated partial version of Figure 9 above and by stating “e.g., cavity 116 where the liquid from siphon 96 and the blast of high speed air are initially mixed together to atomize the liquid into liquid droplets.” Pet. 28–29 (citing White Pet. Decl. ¶¶ 149–159). For the “mixing chamber” limitation in clause 7D, Petitioner relies on the same disclosures. *See* Pet. 36 (citing White Pet. Decl. ¶¶ 179–183).

Patent Owner argues that Sevy does not disclose or suggest the “mixing chamber” limitation in claims 1 and 7. *See* PO Resp. 8–10 (arguing that Sevy does not disclose “the Mixing Chamber of Claim 7”), 11 (stating that “Independent claim 1 imposes an additional requirement *beyond* claim 7” (emphasis added)). For this argument, Patent Owner repeats several of the positions addressed above (as to the ground based on Goubet alone), arguing for a narrow understanding of the “mixing chamber” limitation. *See* § II.F.2.a. For example, Patent Owner again argues that Sevy does not disclose a “mixing chamber” in “the context of fluid dispersion system,” which allegedly requires “a discrete volumetric region within the atomizer assembly that receives compressed air and operative fluid and permits controlled interaction between them prior to downstream processing.” PO Resp. 9. And again, Patent Owner takes the position that a “‘mixing chamber,’ as understood in this art, is not a mere opening or constriction, but a spatial region that allows interaction, pressure equalization, and flow development.” *Id.* Although we do not agree with Patent Owner’s narrow understanding of the “mixing chamber” limitation

(*see* § II.F.2.a), we determine that Petitioner has not carried its burden here to show that Sevy discloses or suggests the “mixing chamber” limitation even under the construction applied above—a chamber in which compressed air and operative fluid are initially mixed.

First, we address the structure or volume identified as the “mixing chamber.” Patent Owner asserts in the Response that Petitioner identifies orifice 118 as the “mixing chamber.” *See, e.g.*, PO Resp. 8 (“Petitioner’s Ground 1 challenge rests on the assertion that Sevy discloses the ‘mixing chamber’ recited in independent claims 1 and 7 of the [challenged] patent, which Petitioner identifies as orifice 118 in Sevy.”), 10 (“A person of ordinary skill in the art would understand orifice 118 to be a nozzle or restriction—not a mixing chamber.”).

Although we disagree with Patent Owner’s understanding of the identified structure, we understand the confusion. Specifically, the volume colored in brown in the annotated partial version of Figure 9 above is located *very close* to the end of the lead line for orifice 118. But the text of Sevy makes clear that orifice 118 is the outlet of nozzle 92, which encloses cavity 114 colored in red in the annotated partial version of Figure 9 above. *See, e.g.*, Ex. 1009 ¶ 79. And the text of the Petition makes clear that Petitioner identifies cavity 116—i.e., the brown volume in the annotated partial version of Figure 9 above—as the “mixing chamber.” *See* Pet. 28–29 (stating “a mixing chamber (*e.g.*, cavity 116 where the liquid from siphon 96 and the blast of high speed air are initially mixed together to atomize the liquid into liquid droplets)”; *see also* Pet. Reply 10 (“The Petition, and Dr. White’s declaration, unmistakably map the claimed ‘mixing chamber’ to Sevy’s cavity 116 (shaded brown below).”). Despite Petitioner’s express

reliance on Sevy's cavity 116, the shaded brown area in Figure 9 does not correspond to the structure that Sevy itself labels cavity 116, which appears below the shaded brown region at the top of what Petitioner shades green and identifies as the fluid inlet. Ex. 1009, Fig. 9; Pet. 28. To the extent that Petitioner seeks to identify some *portion* of cavity 116 as the "mixing chamber" with brown shading, Petitioner fails to acknowledge that (1) Sevy identifies a different structure as cavity 116 and (2) Petitioner contends that Sevy's cavity 116 satisfies a different claim limitation. *See* Pet. 28–29 (alleging that the region shaded green and encompassing cavity 116 teaches the claimed fluid inlet). In addition, Petitioner fails to explain how the shaded brown area, assuming it amounts to only some portion of cavity 116, forms a "chamber."

Regardless, for the reasons below, Petitioner has not carried its burden here to show that *even the identified volume* satisfies the "mixing chamber" limitation under the construction applied above—a chamber in which compressed air and operative fluid are initially mixed. On the complete record, Petitioner has not persuasively demonstrated that initial mixing of the air and liquid in Sevy occurs in the identified "mixing chamber"—i.e., the brown volume in the annotated partial version of Figure 9 above. Petitioner relies on two disclosures—that "[t]he liquid from the siphon 96 is atomized into droplets of various sizes" and "[t]he entire mixture of air and droplets passes through the exit orifice 119" (Ex. 1009 ¶ 82)—coupled with the position that one of ordinary skill in the art would *infer* from those disclosures that initial mixing *must* have occurred *in* the identified "mixing chamber." *See* Pet. 28. Making clear this is Petitioner's position, in the Reply, Petitioner quotes the two disclosures at issue and states: "*Thus*, Sevy

expressly teaches that initial mixing of compressed air and fluid occurs in cavity/chamber 116, before passing through exit orifice 119, such that Sevy's cavity/chamber 116 meets the limitation 'mixing chamber' under Patent Owner's or Petitioner's proposed construction." Pet Reply 11–12 (citing Ex. 1018, Exhibit B) (emphasis added).

As an initial matter, we do not agree with Petitioner that, with the two disclosures at issue, "Sevy *expressly* teaches that initial mixing of compressed air and fluid occurs in cavity/chamber 116." *Cf.* Pet. Reply 12 (emphasis added). Moreover, Petitioner has not adequately supported the position that one of ordinary skill in the art would *reasonably* infer from those disclosures that initial mixing *must* have occurred in the identified "mixing chamber." *See In re Baxter Travenol Labs*, 952 F.2d 388, 390 (Fed. Cir. 1991) (the dispositive question for anticipation is "whether one skilled in the art would reasonably understand or infer" that a reference discloses all limitations of the claimed invention). Specifically, looking at the annotated partial version of Figure 9 of Sevy, it is clear that exit orifice 119 is the downstream exit of the cylindrical identified "Atomizer Exhaust Aperture" (shown in blue). Given the proximity of orifice 118 (ejecting air) to the intake of the identified "Atomizer Exhaust Aperture" (shown in blue), initial mixing of the air and liquid could reasonably occur in the upstream portion of the identified "Atomizer Exhaust Aperture" (in blue) rather than in the identified "mixing chamber" (in brown), much of which is *tangential to—* and *upstream of—* the orifice 118 (which ejects the air). *See* Pet. 28.

The declaration testimony of Dr. White also does not provide support to Petitioner's position. Dr. White states that it is his "opinion that [one of ordinary skill in the art] would understand that Sevy's cavity 116 where the

liquid from siphon 96 and the blast of high-speed air are initially mixed together to atomize the liquid into liquid droplets corresponds to the claimed mixing chamber.” White Pet. Decl. ¶ 157, *cited at* Pet. 29. But Dr. White fails to explain the technical basis for the factual predicate of that statement—i.e., *why* one of ordinary skill in the art would have understood Sevy’s cavity 116 *as the location* “where the liquid from siphon 96 and the blast of high-speed air are initially mixed together to atomize the liquid into liquid droplets.” *Cf.* White Pet. Decl. ¶ 157. Put simply, the complete record here does not strongly enough support the inference Petitioner proposes as to the specific location of the initial mixing. *See Bosies v. Benedict*, 27 F.3d 539, 542 (Fed. Cir. 1994) (noting that the preponderance of the evidence standard “requires the fact finder ‘to believe that the existence of a fact is more probable than its nonexistence’” (quoting *In re Winship*, 397 U.S. 358, 371 (1970))).

For the reasons above, we find, based on the complete record, that Petitioner has not shown by a preponderance of the evidence that Sevy discloses or suggests the “mixing chamber” limitation in independent claims 1 and 7.

b. Conclusion for Claims 1 and 7

For the reasons above, we determine, based on the complete record, that Petitioner has not demonstrated by a preponderance of the evidence that claims 1 and 7 would have been obvious based on Sevy.

3. Claims 4 and 8–10

For dependent claim 4 (which depends from claim 1) and dependent claims 8–10 (which depend from claim 7), Petitioner contends that Sevy discloses or suggests each limitation. Pet. 31–37; Pet. Reply 9–13. As

discussed above (*see* § II.G.2.b), Petitioner has not demonstrated by a preponderance of the evidence that independent claims 1 and 7, from which claims 4 and 8–10 depend, would have been obvious based on Sevy. Thus, we determine, based on the complete record, that Petitioner has not demonstrated by a preponderance of the evidence that claims 4 and 8–10 would have been obvious based on Sevy.

H. Asserted Obviousness of Claims 1, 4, and 7–10 Based on Sevy and Gao

Petitioner asserts that claims 1, 4, and 7–10 would have been obvious based on Sevy and Gao. Pet. 3–4, 38–42; Pet. Reply 13–15. Patent Owner provides arguments addressing this asserted ground. PO Resp. 18–26; PO Sur-reply 15–16. In this ground, Petitioner relies on Sevy (summarized above (*see* § II.G.1)) and Gao (summarized above (*see* § II.F.1)).

1. Independent Claims 1 and 7

For independent claims 1 and 7, Petitioner contends that the proposed combination of Sevy and Gao discloses each limitation. Pet. 38–42; Pet. Reply 13–15. Patent Owner argues that the proposed combination of Sevy and Gao lacks the “mixing chamber” limitation in clauses 1D and 7D. *See* PO Resp. 18–23, 23–25; PO Sur-reply 15–16. We view this issue as dispositive for this ground, and we address it below.

a. The “Mixing Chamber” Limitation

In the context of this ground based on Sevy and Gao, as to the “mixing chamber” limitation in clauses 1D and 7D, Petitioner relies on Sevy in the same manner discussed in the context of the ground based on Sevy alone (*see* § II.G.2.a). *See* Pet. 42 (“Limitations 1[A]–1[G] and 7[A]–7[E] are taught by Sevy for the reasons previously provided in” the ground based

on Sevy alone); *see also* Pet. Reply 15 (stating that this ground “generally relies on Sevy for all structural features of the claims”).

Patent Owner argues that the proposed combination of Sevy and Gao does not disclose or suggest the “mixing chamber” limitation in claim 1 or claim 7. *See* PO Resp. 18–25. Again, although we do not agree with Patent Owner’s narrow understanding of the “mixing chamber” limitation (*see* PO Resp. 24), we determine that Petitioner has not carried its burden to show that the proposed combination of Sevy and Gao discloses or suggests the “mixing chamber” limitation even under the construction applied above—a chamber in which compressed air and operative fluid are initially mixed.

For these reasons, we find, based on the complete record, that Petitioner has not shown by a preponderance of the evidence that the combination of Sevy and Gao discloses or suggests the “mixing chamber” limitation in independent claims 1 and 7.

b. Conclusion for Claims 1 and 7

For the reasons above, we determine, based on the complete record, that Petitioner has not demonstrated by a preponderance of the evidence that claims 1 and 7 would have been obvious based on Sevy and Gao.

2. Claims 4 and 8–10

For dependent claim 4 (which depends from claim 1) and dependent claims 8–10 (which depend from claim 7), Petitioner contends that Sevy and Gao discloses or suggests each limitation. Pet. 42; Pet. Reply 13–15. As discussed above (*see* § II.H.1.b), Petitioner has not demonstrated by a preponderance of the evidence that independent claims 1 and 7, from which claims 4 and 8–10 depend, would have been obvious based on Sevy and Gao. Thus, we determine, based on the complete record, that Petitioner has

not demonstrated by a preponderance of the evidence that claims 4 and 8–10 would have been obvious based on Sevy and Gao.

I. Revised Motion to Amend

Under 35 U.S.C. § 316(d)(1) and 37 C.F.R. § 42.121(a), Patent Owner moves to substitute cancelled claims 1, 4, and 7–10 with proposed claims 20 and 21. RMTA 3–4.

1. Proposed Substitute Claims

Patent Owner submits the following proposed substitute independent claim 20, which corresponds to independent claim 1 (with added material underlined, deleted material double bracketed, and internal designations added in single brackets¹⁴):

20. [20PRE] A fluid dispersion assembly operatively engages a container of an operative fluid and a compressed air source and generates and discharges a fluid dispersion into a surrounding airspace, said fluid dispersion assembly comprising:

[20A] a diffusion unit at least partially defining an enclosed diffusion chamber,

[20B] a discharge port disposed in fluid communication between said diffusion chamber and the surrounding airspace,

[20C] a diffusion assembly disposed in an operative engagement with said diffusion unit,

[20D] wherein said diffusion assembly comprises an atomizer assembly, said atomizer assembly comprising an atomizer air inlet channel, a fluid inlet, a mixing chamber, and an atomizer exhaust aperture, and

[20E] said atomizer air inlet channel interconnected to the compressed air source and

¹⁴ We add designations for the clauses of proposed substitute claims 20 and 21 to aid in the discussion below.

[20F] said fluid inlet disposed in fluid communication with the operative fluid in the container,

[20G] the compressed air and the operative fluid mix together in said mixing chamber to form the fluid dispersion[[]],

[20H] a sealing washer disposed between said diffusion unit and the container, and

[20I] a drip tube disposed in an interconnecting relation between said enclosed diffusion chamber and said container through said sealing washer, said drip tube disposed to direct operative fluid accumulated in said enclosed diffusion chamber into said container and to minimize contact between said sealing washer and said operative fluid.

RM TA 18–19¹⁵ (Claims App.). Proposed substitute claim 20 corresponds to cancelled claim 1. *See id.* at 18 (Claims App.). Patent Owner does not propose substitute claims corresponding to cancelled claim 4.

Patent Owner submits the following proposed substitute independent claim 21, which corresponds to independent claim 7 (with added material underlined, deleted material double bracketed, and internal designations added in single brackets):

21. [21PRE] A fluid dispersion assembly is operatively interconnected to a container of an operative fluid and a compressed air source to generate and discharge a fluid dispersion into a surrounding airspace, said fluid dispersion assembly comprising:

[21A] a diffusion unit at least partially defining a diffusion chamber,

¹⁵ To the extent Patent Owner’s statements of the proposed substitute claims do not accurately reflect added or deleted language from the original claims, we indicate the additions or deletions, as appropriate.

[21B] a discharge port disposed in fluid communication between said diffusion chamber and the surrounding airspace, and

[21C] a diffusion assembly disposed in an operative engagement with said diffusion unit,

[21D] wherein said diffusion assembly comprises an atomizer assembly, said atomizer assembly comprising an atomizer air inlet channel, a fluid inlet, a mixing chamber, and an atomizer exhaust aperture[.].

[21E] said atomizer air inlet channel interconnected to the compressed air source and defining a compressed-air flow path through said atomizer assembly;

[21F] said fluid inlet disposed in fluid communication with the operative fluid in the container and comprising an opening into said mixing chamber, said opening disposed along said compressed-air flow path such that compressed air from the compressed air source flows past said opening of said fluid inlet into said mixing chamber,

[21G] said mixing chamber disposed along said compressed-air flow path after said atomizer air inlet channel and before said atomizer exhaust aperture, and

[21H] said atomizer exhaust aperture spaced from said discharge port and opening laterally from said mixing chamber into said diffusion chamber along an exhaust path transverse to a direction in which said operative fluid enters said mixing chamber through said fluid inlet.

RMTA 19–20 (Claims App.). Proposed substitute claim 21 corresponds to cancelled claim 7. *See id.* at 19 (Claims App.). Patent Owner does not propose substitute claims corresponding to cancelled claims 8–10.

2. Legal Standard

In an *inter partes* review, amended claims are not added to a patent as a matter of right; rather, they must be proposed as a part of a motion to amend. 35 U.S.C. § 316(d). In reviewing a motion to amend, the Board

assesses the patentability of the proposed substitute claims “without placing the burden of persuasion on the patent owner.” *Aqua Prods., Inc. v. Matal*, 872 F.3d 1290, 1328 (Fed. Cir. 2017) (en banc); *see Lectrosonics, Inc. v. Zaxcom, Inc.*, IPR2018-01129, Paper 15 at 3–4 (PTAB Feb. 25, 2019) (precedential). Instead, petitioners have the burden of persuasion to show, by a preponderance of the evidence, that any proposed substitute claims are unpatentable. *See* 37 C.F.R. § 42.121(d)(2).

Notwithstanding the foregoing, a patent owner’s proposed substitute claim(s) must meet the statutory requirements of 35 U.S.C. § 316(d) and the procedural requirements of 37 C.F.R. § 42.121. *Lectrosonics*, Paper 15 at 4–8. In particular, a patent owner must demonstrate: (1) the amendment proposes a reasonable number of substitute claims; (2) the proposed claims are supported in the original disclosure (and any earlier filed disclosure for which the benefit of a filing date is sought); (3) the amendment responds to a ground of unpatentability involved in the trial; and (4) the amendment does not seek to enlarge the scope of the claims of the patent or introduce new subject matter. *See* 35 U.S.C. § 316(d); 37 C.F.R. § 42.121.

3. *Claim Construction*

Neither Patent Owner nor Petitioner proposes that any language in the amendments in the proposed substitute claims needs express construction. *See* RMTA; RMTA Opp.; RMTA Reply; RMTA Sur-reply. We agree.

4. *Statutory and Regulatory Requirements*

“Before considering the patentability of any substitute claims, . . . the Board first must determine whether the motion to amend meets the statutory and regulatory requirements set forth in 35 U.S.C. § 316(d) and 37 C.F.R. § 42.121.” *Lectrosonics*, Paper 15 at 4.

a. Reasonable Number of Substitute Claims

First, we consider whether the Revised Motion to Amend proposes a reasonable number of substitute claims. *See* 35 U.S.C. § 316(d)(1)(B). We apply “a rebuttable presumption that a reasonable number of substitute claims per challenged claim is one (1) substitute claim.” *Lectrosonics*, Paper 15 at 4–5 (citing 37 C.F.R. § 42.121(a)(3)). Patent Owner proposes two substitute claims for six challenged claims. RMTA 5. Thus, Patent Owner has proposed a reasonable number of substitute claims.

b. Responsive to a Ground of Unpatentability

Second, we consider whether the proposed substitute claims respond to a ground of unpatentability involved in this trial. *Lectrosonics*, Paper 15 at 5–6. Proposed substitute claim 20 amends the language of claim 1 to recite additional features of a fluid dispersion assembly, and proposed substitute claim 21 amends the language of claim 7 to recite additional features of a fluid dispersion assembly. RMTA 18–20 (Claims App.).

Patent Owner asserts that the proposed substitute claim is patentable over the instituted grounds and references at issue in this proceeding, based on the amended language. RMTA 4–5. We conclude that the proposed substitute claims are responsive to grounds of unpatentability involved in this trial because Patent Owner adds limitations in a manner intended to address the prior art cited by Petitioner in relation to the originally challenged claims.

c. Scope of the Substitute Claims

Third, we consider the scope of the substitute claims, as “[a] motion to amend may not present substitute claims that enlarge the scope of the claims of the challenged patent or introduce new subject matter.” *Lectrosonics*,

Paper 15 at 6 (citing 35 U.S.C. § 316(d)(3); 37 C.F.R. § 42.121(a)(2)(ii)). Patent Owner states that “the proposed substitute claims only add non-broadening limitations which do not enlarge the scope of the corresponding original claims” and that, “[o]n the contrary, the newly included recitation further specifies the scope of the original claims.” RMTA 4. Petitioner does not address this issue in the briefing. We conclude that proposed substitute claims 20 and 21 do not enlarge the scope of the claims of the challenged patent or introduce new subject matter.

5. Asserted Indefiniteness of Proposed Substitute Claim 20

In clause 20I, proposed substitute claim 20 recites “a drip tube disposed in an interconnecting relation between said enclosed diffusion chamber and said container through said sealing washer, said drip tube disposed to direct operative fluid accumulated in said enclosed diffusion chamber into said container and *to minimize contact* between said sealing washer and said operative fluid.” RMTA 18–19 (Claims App.) (emphasis added).

Petitioner argues that proposed substitute claim 20 “is indefinite because it requires the drip tube to ‘minimize contact’ between the sealing washer and the operative fluid but provides no objective boundary for determining when that result is achieved.” RMTA Opp. 1. According to Petitioner, claim 20 “does not state how much contact is permitted, what baseline applies, whether incidental wetting defeats the limitation, or what metric, test, or engineering criterion [one of ordinary skill in the art] should use to determine whether contact has been sufficiently ‘minimize[d].” *Id.* (citing White RMTA Decl. ¶¶ 38–40; Ex. 1001, 4:28–43, 9:29–44). Petitioner adds that “[t]he specification does not cure the problem.” *Id.* at 2.

As a threshold matter, we address the propriety of Petitioner asserting indefiniteness of proposed substitute claim 20 in the context of an *inter partes* review. Although a petitioner cannot assert indefiniteness of the original claims in the context of an *inter partes* review (*see* 35 U.S.C. § 311(b)), a petitioner *may* assert indefiniteness of substitute claims proposed in a motion to amend. *See Amazon.com, Inc. v. Uniloc Luxembourg S.A.*, IPR2017-00948, Paper 34 at 5 (PTAB Jan. 18, 2019) (precedential) (“In contrast to § 311(b), the statutory provision providing a right to a motion to amend, 35 U.S.C. § 316(d), does not prevent us from considering unpatentability under sections other than § 102 and § 103 with respect to substitute claims.”), *aff’d Uniloc 2017 LLC v. Hulu, LLC*, 966 F.3d 1295 (Fed. Cir. 2020); *see also* TPG § II.H (discussing the precedential decision in *Amazon.com* and stating that, in opposition to a motion to amend, a “petitioner may raise, and the Board may consider, other grounds of unpatentability, including 35 U.S.C. §§ 101 and 112, as to proposed substitute claims”).

We turn now to the merits of Petitioner’s indefiniteness arguments. To satisfy the definiteness requirement of § 112(b), a claim must, when “viewed in light of the specification and prosecution history, inform those skilled in the art about the scope of the invention with reasonable certainty.” *Nautilus, Inc. v. Biosig Instruments, Inc.*, 572 U.S. 898, 910 (2014). Terms of degree are not “inherently indefinite” and “[c]laim language employing terms of degree has long been found definite where it provided enough certainty to one of skill in the art when read in the context of the invention.” *Interval Licensing LLC v. AOL, Inc.*, 766 F.3d 1364, 1370 (Fed. Cir. 2014). To satisfy the statute, “[t]he claims, when read in light of the specification

and the prosecution history, must provide objective boundaries for those of skill in the art” as to the terms of degree. *Id.* at 1371.

On the complete record developed at trial, and for the reasons below, we agree with Petitioner that proposed substitute claim 20, when read in light of the specification and the prosecution history, does not provide objective boundaries that a person of skill in the art could use to determine whether a particular “drip tube” is “disposed to direct operative fluid accumulated in said enclosed diffusion chamber into said container and *to minimize contact* between said sealing washer and said operative fluid.”

For completeness and to provide context for the discussion below, we reproduce here the portions of the Specification highlighted by Patent Owner in the Revised Motion to Amend as to the clause at issue:

[A] drip tube 120 is disposed in an interconnecting relation between the diffusion unit 100 and the fluid container (FC). As shown in Figures 1 and 2, the drip tube 120 is disposed through a sealing washer 170, and thus, the drip tube 120 serves to minimize contact between the sealing washer 170 and the operative fluid, by essentially preventing the operative fluid from making contact in and around the sealing washer 170 disposed between the fluid container (FC) and the container interconnect 140. More in particular, the drip tube 120 channels any operative fluid which may agglomerate and/or accumulate in the diffusion chamber 112 through the drip tube 120 directly back into the fluid container (FC) without contacting the sealing washer 170, once again, as shown in Figures 1 and 2.

Ex. 1004, 76:7–19; *see also* RMTA 8 (citing, as supporting clause 20I, Ex. 1006, 25:1–13, Figs. 1–2 & Ex. 1004, 75:22–25,¹⁶ Figs. 1–2); Ex. 1001, 4:29–43, 9:29–44 (providing same).

In the Reply to the Revised Motion to Amend, Patent Owner contends that the claim language at issue is *not* indefinite because the second sentence from the passage quoted above “defines ‘minimize contact’ as ‘essentially preventing’ contact between the operative fluid and the washer.” RMTA Reply 3 (citing RMTA Opp. 2 (citing Ex. 1001, 4:28–43)). In addition, Patent Owner argues that the third sentence in the passage quoted above provides “precisely the guidance that ‘allow[s] a skilled artisan to compare a potentially infringing product **with the examples in the specification** to determine whether interference . . . is substantial.”” *Id.* at 4 (alteration and emphasis by Patent Owner) (quoting *Sonix Tech Co. v. Publ’ns Int’l, Ltd.*, 844 F.3d 1370, 1377 (Fed. Cir. 2017)).

The complete record developed at trial more strongly supports Petitioner’s position that the claim language at issue, when read in light of the Specification and prosecution history, does not provide objective boundaries for one of ordinary skill in the art as to the phrase “to minimize contact.” Specifically, and as argued by Petitioner, the passage from the Specification block quoted above provides *conflicting guidance* for how to “minimize contact” between the “sealing washer” and the “operative fluid.”

¹⁶ Column 25, lines 1–13 of Exhibit 1006 contains disclosures similar to the passage block quoted from the challenged patent above. Exhibit 1004 lacks pagination, but page 76 of that Exhibit (page 9 of the native pagination of the specification) has similar disclosure at lines 7 to 19. Patent Owner’s citation to page 75, lines 22–25 of Exhibit 1004 (RMTA 8) appears to be in error.

See RMTA Opp. 2; RMTA Sur-reply 2 (“‘Without contacting’ describes a no-contact endpoint, while ‘essentially preventing’ allows some undefined deviation from that endpoint.”). Specifically, the second sentence in the block quote above states that a drip tube will “minimize contact” “*by essentially preventing*” contact between the “sealing washer” and the “operative fluid,” but then, the very next sentence states that same drip tube will *entirely prevent contact* between the “sealing washer” and the “operative fluid.” Ex. 1001, 4:29–43. We agree with Petitioner that these passages “do not define ‘minimize’ or explain what standard applies, such as how much contact is permitted or how much contact is reduced from an unstated baseline.” RMTA Opp. 2 (citing White RMTA Decl. ¶ 40); *see Enviro Tech Chem. Servs., Inc. v. Safe Foods Corp.*, 174 F.4th 919, 922–923 (Fed. Cir. 2026) (affirming a district court’s finding of indefiniteness of a term of degree based, in part, on the specification’s “conflicting guidance” on the scope of the term at issue).

This determination is supported by the testimony of Dr. White, who states that one of ordinary skill in the art would have understood the passage block quoted above “as describing a general design objective, but [it] do[es] not explain whether the claimed arrangement permits some incidental wetting, requires no contact, or is satisfied by any reduction relative to an unstated baseline.” White RMTA Decl. ¶ 40, *cited at* RMTA Opp. 2. Patent Owner contends that this statement by Dr. White “should be afforded no weight as it fails to consider and directly contradicts the specification.” RMTA Reply 4. We disagree. Instead, for the same reasons discussed above, we view Dr. White’s observation as aligning with an ordinary understanding of the contradictory guidance provided in the Specification.

Further, Patent Owner provides no testimony from Dr. Micklow on this issue. *See* RMTA Reply 3–4 (not citing any declaration testimony).

For these reasons, Petitioner has demonstrated, by a preponderance of the evidence, that proposed substitute claim 20 is indefinite.

*6. Asserted Lack of Written Description Support for, and
Asserted Indefiniteness of, Proposed Substitute Claim 21*

Clause 21H in proposed substitute claim 21 recites “said atomizer exhaust aperture spaced from said discharge port and opening laterally from said mixing chamber into said diffusion chamber along an exhaust path transverse to a direction in which said operative fluid enters said mixing chamber through said fluid inlet.” RMTA 20 (Claims App.) (the “atomizer exhaust aperture” limitation). Petitioner argues that this limitation lacks written description support in the aspects cited by Patent Owner. *See* RMTA Opp. 4–6. For the reasons below, the record supports Petitioner’s argument.

For clause 21H, Patent Owner relies on Figures 1 and 2 of the challenged patent as well as the following disclosure:

As shown in Figures 1 and 2, the fluid inlet 227 is substantially perpendicular to a compressed air flowpath through the atomizer assembly 200. More in particular, and with reference to Figure 1, the compressed air flowpath extends horizontally through the air inlet 210, atomizer air inlet channel 222, mixing chamber 226, and out through the atomizer exhaust 228.

Ex. 1004, 79:6–11, *cited at* RMTA 10–11 (also citing Ex. 1006, 28:1–9); *see* Ex. 1001, 5:44–50 (corresponding passage in the challenged patent).

As argued by Petitioner, the relied-upon aspects of the Specification do not provide adequate written description support for the aspect of the claim language at issue reciting the “atomizer exhaust aperture . . . opening laterally from said mixing chamber into said diffusion chamber.” RMTA

Opp. 5. As argued by Petitioner, at most, relied-upon Figures 1 and 2 show atomizer exhaust aperture 228 communicating from mixing chamber 226 to *suppression chamber* 232—not directly to diffusion chamber 112. *See* Ex. 1001, 6:8–12 (“The suppressor assembly 230 comprises a suppression chamber 232, disposed in a communicating relation with the atomizer exhaust channel 228 of the atomizer assembly 220. More in particular, the suppression chamber 232 receives the fluid dispersion from the mixing chamber 226.”); *see also* RMTA Sur-reply 4 (“Claim 21 requires the atomizer exhaust aperture itself to open from the mixing chamber into the diffusion chamber.”). And the relied-upon text (quoted above) does not even mention a “diffusion chamber,” let alone disclose the claimed configuration of one.

Moreover, atomizer exhaust aperture 228 in relied-upon Figures 1 and 2 does not “open[] laterally” from mixing chamber 226 at all. *See* Ex. 1001, Figs. 1 & 2. Instead, atomizer exhaust aperture 228 communicates the air/fluid mixture from mixing chamber 226 along in the same general direction as that mixture has previously travelled, e.g., through atomizer air inlet channel 222. *See id.*

Patent Owner responds that Figures 1 and 2 “show that ‘the path of flow of the fluid dispersion [is] out of the atomizer assembly 200 and into diffusion chamber 112’ by taking a 90-degree turn through the suppressor discharge port 234.” RMTA Reply 5–6 (citing Ex. 1004, 79:6–11, Figs. 1–2).¹⁷ This statement generally summarizes aspects of Figures 1 and 2.

¹⁷ Although Patent Owner cites page 79, lines 6–11 of Exhibit 1004 (original relied on as allegedly supporting the limitation at issue (*see* RMTA

But, put simply, the limitation at issue does not track that statement *at all*; instead, the limitation at issue recites a largely *different set of components* in a *completely different configuration*. For this reason, we find, based on the complete record, that Petitioner has shown by a preponderance of the evidence that proposed claim 21 lacks adequate written description support.

We turn now to the alleged indefiniteness of the “atomizer exhaust aperture” limitation. Petitioner argues that one of ordinary skill in the art “would not understand, with reasonable certainty, what structure is encompassed by an atomizer exhaust aperture ‘opening laterally from said mixing chamber.’” RMTA Opp. 6–7. According to Petitioner, “[t]he mixing chamber is a three-dimensional structure, and neither the claim nor the specification identifies the relevant plane, axis, or frame of reference for determining whether an atomizer exhaust aperture opens ‘laterally’ from the mixing chamber.” *Id.* at 7 (citing White RMTA Decl. ¶¶ 43–45).

Again, Patent Owner does not address the merits of Petitioner’s position but rather characterizes it as an “attempt[] to repackage [the] attack on the written support of claim 21 as a definiteness argument.” RMTA Reply 6.

We agree with Petitioner that the language of the limitation at issue, when viewed in light of the specification, does not inform one of skill in the art of the scope of the invention with reasonable certainty. *See Nautilus, Inc.*, 572 U.S. at 910. Specifically, when considering Figures 1 and 2—which, again, show atomizer exhaust aperture 228 communicates the air/fluid mixture from mixing chamber 226 to suppression chamber 232 (not

10)), the text quoted here actually comes from page 80, lines 16–17, which corresponds to column 6, lines 15–16 of Exhibit 1001.

diffusion chamber 112) along the same general direction as that mixture previously travelled, e.g., through atomizer air inlet channel 222—one of skill in the art would not have understood with reasonable certainty the scope of the phrase the “atomizer exhaust aperture . . . opening laterally from said mixing chamber into said diffusion chamber” in the limitation at issue. Namely, if Figures 1 and 2 show the “atomizer exhaust aperture . . . opening *laterally from said mixing chamber into said diffusion chamber*,” what are the limits of that language? The view is supported by the testimony of Dr. White. *See* White RMTA Decl. ¶ 43, *cited at* RMTA Opp. 6–7. Patent Owner again seeks to discount this testimony “to the extent that [it] contradict[s] the specification” (RMTA Reply 6), but for the reasons discussed above, the testimony aligns with the Specification here. Further, Patent Owner provides no testimony from Dr. Micklow on this issue. *See* RMTA Reply 6 (not citing any declaration testimony).

Further highlighting the confusion as to the scope of the “atomizer exhaust aperture” limitation, Patent Owner seeks to distinguish the prior art because in the prior art, “there is no atomizer exhaust aperture opening from the mixing chamber into a diffusion chamber, *as multiple structures lie between what Petitioner labels as the mixing chamber and the diffusion chamber*.” RMTA Reply 13–14 (emphasis added). Patent Owner does not present evidentiary support for this proposed construction of the “atomizer exhaust aperture” limitation—as requiring *direct* communication from the “mixing chamber” to the “diffusion chamber” via the “atomizer exhaust aperture.” For the purposes here, we note (again) that relied-upon Figures 1 and 2 show atomizer exhaust aperture 228 communicating from mixing chamber 226 to *suppression chamber* 232—not directly to diffusion

chamber 112. *See* Ex. 1001, Figs. 1 & 2, 6:8–12; *see also PPC Broadband, Inc.*, 815 F.3d at 755. For this reason, we find, based on the complete record, that Petitioner has shown by a preponderance of the evidence that proposed claim 21 is indefinite.

7. Asserted Obviousness of Proposed Substitute Claims 20 and 21 Based on Prior Art

Petitioner contends that proposed substitute claim 20 would have been obvious based on (1) Sevy, (2) Sevy, Van Roemburg,¹⁸ and Rosener,¹⁹ (3) Goubet and that proposed substitute claim 21 would have been obvious based on (1) Sevy, (2) Sevy and Gao, (3) Goubet, and Gao-2²⁰. RMTA Opp. 8–25; RMTA Sur-reply 6–12. Patent Owner opposes. RMTA Reply 6–14.

For the reasons discussed above, the scope of proposed substitute claims 20 and 21 is indefinite. *See* §§ II.I.5, II.I.6. Given the nature of the indefiniteness on the complete record here, we determined that we are unable to perform the necessary analysis of comparing the scope of proposed substitute claims 20 and 21 to the prior art. *See In re Steele*, 305 F.2d 859, 862–63 (CCPA 1962) (holding that the Board erred in affirming a rejection of indefinite claims under 35 U.S.C. § 103 because the rejection was based on speculative assumptions as to the meaning of the claims). Thus, we do

¹⁸ United States Patent US 7,913,993 B2, issued March 29, 2011 (Ex. 1053, “Van Roemburg”).

¹⁹ United States Patent US 8,857,735 B2, issued October 14, 2014 (Ex. 1054, “Rosener”).

²⁰ Chinese National Intellectual Property Administration Utility Model Patent CN 204072864 U, published January 7, 2015 (Ex. 1041 (Chinese version) and Ex. 1042 (certified translation), “Gao-2”).

not address the issue of the asserted obviousness of proposed substitute claims 20 and 21.

J. Patent Owner's Motion to Exclude

Patent Owner filed a motion to exclude evidence (Paper 34 (“MTE”)); *see also* Paper 37 (Patent Owner’s reply brief)), which Petitioner opposed (Paper 35). Patent Owner moves to exclude certain testimony in the deposition transcript of Patent Owner’s own declarant, Dr. Micklow. *See* MTE 3 (listing Ex. 1046, 111:20–25, 115:15–18, 117:4–15, 157:20–159:2, 200:14–16). We reference three of the five passages Patent Owner seeks to exclude above in a discussion of Petitioner’s arguments regarding Dr. Micklow, which we do not find persuasive. *See* § II.C (citing Ex. 1046, 115:15–18, 117:4–15, 200:14–16).

We dismiss Patent Owner’s motion as moot because in this Decision we do not rely on the portions of Dr. Micklow’s deposition testimony identified in a manner adverse to Patent Owner. *See* TPG, § II.K (“In the Board’s experience, consideration of the objected-to evidence is often unnecessary to resolve the patentability of the challenged claims, and the motion to exclude is moot.”).

III. CONCLUSION

Upon consideration of the briefing and the evidence of record, we determine that Petitioner (1) has proven, by a preponderance of the evidence, that claims 1, 4, and 7–10 would have been obvious based on Goubet, (2) has not proven, by a preponderance of the evidence, that claims 1, 4, and 7–10 would have been obvious based on Goubet and Kaiser, (3) has proven, by a preponderance of the evidence, that claims 1, 4, and 7–10 are anticipated by Gao, (4) has not proven, by a preponderance of the evidence,

that claims 1, 4, and 7–10 would have been obvious based on Sevy, and (5) has not proven, by a preponderance of the evidence, that claims 1, 4, and 7–10 would have been obvious based on Sevy and Gao.²¹

Upon consideration of the briefing and the evidence of record, we also (1) deny Patent Owner’s Revised Motion to Amend as to substituting proposed claims 20 and 21 and (2) dismiss Patent Owner’s Motion to Exclude.

²¹ Should Patent Owner wish to pursue amendment of the challenged claims in a reissue or reexamination proceeding subsequent to the issuance of this decision, we draw Patent Owner’s attention to the April 2019 Notice Regarding Options for Amendments by Patent Owner Through Reissue or Reexamination During a Pending AIA Trial Proceeding, 84 Fed. Reg. 16,654 (Apr. 22, 2019). If Patent Owner chooses to file a reissue application or a request for reexamination of the challenged patent, we remind Patent Owner of its continuing obligation to notify the Board of any such related matters in updated mandatory notices. *See* 37 C.F.R. §§ 42.8(a)(3), (b)(2).

In summary:

Claims	35 U.S.C. §	Reference(s)/ Basis	Claims Shown Unpatentable	Claims Not Shown Unpatentable
1, 4, 7–10	103(a)	Goubet	1, 4, 7–10	
1, 4, 7–10	103(a)	Goubet, Kaiser		1, 4, 7–10
1, 4, 7–10	102(b)	Gao	1, 4, 7–10	
1, 4, 7–10	103(a)	Sevy		1, 4, 7–10
1, 4, 7–10	103(a)	Sevy, Gao		1, 4, 7–10
Overall Outcome			1, 4, 7–10	

Motion to Amend Outcome	Claim(s)
Original Claims Cancelled by Amendment	
Substitute Claims Proposed in the Amendment	20, 21
Substitute Claims: Motion to Amend Granted	
Substitute Claims: Motion to Amend Denied	20, 21
Substitute Claims: Not Reached	

IV. ORDER

Accordingly, it is hereby:

ORDERED that Petitioner has proven, by a preponderance of the evidence, that claims 1, 4 and 7–10 are unpatentable;

ORDERED that Patent Owner's Revised Contingent Motion to Amend is *denied* as to proposed substitute claims 20 and 21;

FURTHER ORDERED that Patent Owner's Motion to Exclude is *dismissed*; and

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

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Patent 10,583,449 B1

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