

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

AROMA360, LLC,

Petitioner,

v.

AIR ESSCENTIALS, INC.,

Patent Owner.

Case IPR 2025-00706
U.S. Patent No. 10,583,449

PATENT OWNER'S REPLY IN SUPPORT OF
PATENT OWNER'S REVISED CONTINGENT MOTION TO AMEND

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PATENT OWNER'S EXHIBIT LIST

Exhibit Number	Filing Party	Title
2001	Patent Owner	Transcript for the Deposition of Dr. Christopher White, PhD.
2002	Patent Owner	Declaration of Dr. Gerald Micklow, PhD.
2003	Patent Owner	CV and Qualifications of Dr. Gerald Micklow, PhD
2004	Patent Owner	Certified Translation of CN 20183273U (GAO)
2005	Patent Owner	Cengel Fluid Mechanics
2006	Patent Owner	Munson Fundamentals of Fluid Mechanics 2d Edition
2007	Patent Owner	Heywood Internal Combustion Engine Fundamentals, 2d Edition
2008	Patent Owner	Martinez Liquid Sprays
2009	Patent Owner	Fox Introduction to Fluid Mechanics 4th Edition
2010	Patent Owner	Micklow Primary and Secondary Spray Breakup
2011	Patent Owner	Lefebvre Atomization and Sprays 2d Edition
2012	Patent Owner	Micklow Fuel Spray Modeling
2013	Patent Owner	Smith Scientific Design of Exhaust & Intake Systems
2014	Patent Owner	Lefebvre Atomization and Sprays
2015	Patent Owner	Patent Owner's Supplemental Evidence in Response to Petitioner's Objection to Evidence
2016	Patent Owner	Declaration of Dr. Gerald Micklow

I. INTRODUCTION

Petitioner has not carried its burden under 37 C.F.R. § 42.121(d)(2) of proving, by a preponderance of the evidence, unpatentability of Patent Owner's ("PO") substitute claim 20 and substitute claim 21. Petitioner's Response ("Response") to PO's Revised Motion to Amend ("Revised Motion") instead relies on conclusory restatements of its Petition that either fail for the same reasons or are inapplicable to the substitute claims, as well as novel and unsupported arguments to inapposite or inapplicable prior art. As such, the claims should be found patentable.

II. THE SUBSTITUTE CLAIMS COMPLY WITH § 112.

A. Claim 20 Is Definite.

The Federal Circuit has "rejected the proposition that claims involving terms of degree are inherently indefinite." *Sonix Tech Co. v. Publ'ns Int'l, Ltd.*, 844 F.3d 1370, 1377 (Fed. Cir. 2017) (citation omitted). "Claim 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." *Id.* (quotation omitted).

Petitioner's argument that the term "minimize contact" is indefinite as it provides "no objective boundary for determining when that result is achieved" is immediately undercut by its own—selective—citation to the specification, which defines "minimize contact" as "essentially preventing" contact between the operative fluid and the washer. Paper 30, Page 2.

Petitioner's argument fails for two reasons. First, "a patentee need not define his invention with mathematical precision in order to comply with the definiteness requirement." *Sonix*, 844 F.3d at 1377. Second, Petitioner fails to acknowledge the immediately following language in the specification:

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 FIGS. 1 and 2.

Ex. 1004, 76:15-19. This is 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." *Sonix*, 844 F.3d at 1377 (quotation omitted) (emphasis added). Dr. White's testimony, Ex. 1052, 40 should be afforded no weight as it fails to consider and directly contradicts the specification. *See Genuine Enabling Tech. LLC v. Nintendo Co.*, 29 F.4th 1365, 1373 (Fed. Cir. 2022).

B. Claim 21 Is Supported By The Specification.

Petitioner's objections to the written description support of claim 21 rely on obvious mischaracterizations of the Revised Motion. Petitioner manufactures an issue that the atomizer air inlet channel, as one component of the atomizer assembly, cannot be "defining" of the compressed-air flow path **through** the atomizer assembly. Paper 30, 3. Petitioner's selective and restrictive reading of the term

“defining” does not comport with the plain and ordinary meaning of the term,¹ and Petitioner has advanced no reason to construe it otherwise. The cited disclosure teaches an air inlet channel with a variable diameter and oriented perpendicularly to the compressed-air flow path. The circumference and orientation necessarily “defin[e]” a flow path by providing an outer boundary and direction. Paper 25, 9-10. Further, as shown in the cited Figures, the flow path through the atomizer assembly is necessarily linear, visibly following the air inlet channel’s orientation and circumference.

The argument that PO has attempted to combine incompatible embodiments also fails. Figures 1 and 6 are cited because both support the clarified geometry of the compressed-air flow path via the air inlet channel structure. PO is not required to cite disclosure that supports **all** of the added claim language at once. More pertinently, Petitioner has not explained what incompatible features are “stitched together” in claim 21.

Petitioner similarly manufactures an issue with an exhaust aperture “opening laterally from [a] mixing chamber into [a] diffusion chamber along an exhaust path transverse to a direction in which said operative fluid enters said mixing chamber through said fluid inlet.” Paper 30, 4. The Figures show that “the path of flow of the

¹ See, e.g., *Define*, Merriam-Webster, <https://www.merriam-webster.com/dictionary/define> [<https://perma.cc/ZK5T-FHZA>] (last visited July 8, 2026) (“to fix or mark the limits of”).

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. Ex. 1004, 79:6-11, FIGS. 1-2. Petitioner cannot twist the terms “lateral” or “transverse” so much that a 90-degree turn falls outside of their plain and ordinary meaning.

C. Substitute Claim 21 Is Definite.

Petitioner attempts to repackage its attack on the written support of claim 21 as a definiteness argument, asserting that a POSITA would not understand the structure encompassed by the terms “defining”, “laterally”, and “transverse”. Paper 30, 6-7. Petitioner adds only citations to Dr. White’s declaration which, as discussed above, must be disregarded to the extent that they contradict the specification. *See Genuine Enabling Tech*, 29 F.4th at 1373. Petitioner has thus failed to demonstrate that either substitute claim is deficient under § 112.

III. THE ASSERTED ART DOES NOT OBVIATE THE CLAIMS.

A. Grounds 1 and 2: Sevy, Alone Or Combined With Other References, Does Not Render The Substitute Claims Obvious.

Petitioner has failed to prove by a preponderance of the evidence that Sevy renders claim 20 obvious. Petitioner’s reliance on Sevy alone rests entirely on Dr. White’s unsupported conclusion that the addition of a drip tube and washer “does not change the atomization principle of operation.” Paper 30, 9; Ex. 1052, 47. This does not unseat Dr. Micklow’s conclusion that the addition of a drip tube to Sevy would fundamentally alter Sevy’s principle of operation by “introduc[ing] a different

fluid-management mechanism.” Ex. 2016, 11. Further, Dr. Micklow’s analysis addresses the relevant structure and principle of operation of Sevy with specific reference to its components **and their arrangement**, and should therefore be given more weight than Dr. White’s threadbare conclusions. Ex. 2016, 18.

Next, Petitioner misleadingly asserts that Van Roemburg discloses “an essential-oil atomizer with threaded portion 20 engaging oil bottle 25 and sealing engagement using O-rings.” As can be seen in Figure 2 of Van Roemburg, there is no O-ring or “sealing washer” disposed **between** the open bottle of essential oil 25 and the threaded portion 20 of the body. The only O-rings disclosed by Van Roemburg provide a sealing engagement between the top cap 31 and bottom cap 32 of the central body 30 itself, which is further secured with screws. In contrast, claim 20 specifies a “sealing washer disposed *between* said diffusion unit and the container...” (emphasis added).”

In support, Petitioner cites column 2, lines 25-33 and 58-62 of Van Roemburg (copied below), but a cursory review indicates that Van Roemburg does not disclose what Petitioner has argued:

In this particular embodiment of the invention, an essential oil atomizer 10 is provided, which is provided with engagement means, in this case a screw threaded portion 20 of body portion 30, to engage with the neck of an open bottle of essential oil 25, which is shown in phantom. Above this engagement means the atomizer System is provided with a generally cylindrical housing or body 30 for its component parts which may be of stainless steel or any other preferred material....In this

embodiment of the invention the system housing includes a top cap 31 and a bottom cap 32 which engage with its central body 30 in sealing engagement with the provision of appropriate O rings. The system housing is maintained in its assembled configuration by Screw means.

Ex. 1053, 2:25-33; 2:58-62. Petitioner's citation to Ex. 1052, 49 that "[u]sing a conventional washer or O-ring at a bottle-mounted atomizer interface would have been routine and predictable" is mere *ipse dixit* and cannot substitute for actual disclosure in the prior art. *K/S Himpp v. Hear-Wear Techs., LLC*, 751 F.3d 1362, 1365 (Fed. Cir. 2014). *Arris Solutions, Inc. v. Realtime Adaptive Streaming LLC*, IPR No. 2019-01585, Paper 7, 2020 Pat. App. LEXIS 10692, *22 (PTAB March 16, 2020). Because Van Roemburg lacks a "sealing washer disposed between said diffusion unit and the container," which Petitioner does not argue exists elsewhere in the cited combination, the combination of Sevy, Van Roemburg, and Rosener fails to render claim 20 unpatentable.

Petitioner's characterization of Rosener is similarly misleading. Claim 20 specifies that the "drip tube [is] disposed in an interconnecting relation *between* said enclosed diffusion chamber and said container" (emphasis added). However, as can be seen in Figures 2A and 2E, the "tube" 230 and "funnel shaped assembly" 235 of Rosener are disposed wholly **within** the "reservoir assembly" 210. By contrast, the claimed structure in claim 20 is "disposed to direct operative fluid accumulated in said enclosed diffusion chamber **into** said container." (emphasis added). The

fragrance oil need not be directed “into” the reservoir assembly of Rosener via a drip tube; once the fragrance oil is atomized and directed out of the discharge “orifice” 401 of the “atomizer complex” 215, the oil is **already inside** the container. Ex. 1054, 8:31-45. Moreover, Rosener teaches away from the claimed recitation of “minimize contact between said sealing washer and said operative fluid.” Figure 2E shows airflow path with arrow 408, and describes the “entrained aerosol particles” as flowing out of the funnel-shaped structure 235 and through the holes 240. In this configuration, the particles are released into the freeboard above the liquid 215 within the reservoir 205. If the cited combination contained a sealing washer (it does not as discussed above with respect to Van Roemburg), it would be here that contact “between said sealing washer and said operative fluid” would be **maximized**, and not minimized, as required by claim 20.

Petitioner’s citation to its expert is misplaced, as Dr. White does not contradict that Rosener lacks the claimed “interconnecting relation,” and merely states Rosener has “a drainage tube extending from the atomizer complex into the fragrance oil...” Ex. 1052, 50. Because Rosener lacks the claimed element, which Petitioner does not argue is disclosed elsewhere, the cited combination again fails to render claim 20 unpatentable.

The introduction of Gao does not salvage Sevy as to claim 21 because Gao does not suggest to or enable a POSITA to add a drip tube and washer to Sevy.

Supra, §III(A)(i). Indeed, Petitioner makes no such argument, instead creatively tweaking the claim language to remove dispositive structural elements. Most blatantly, neither Sevy nor Gao provides for an atomizer air inlet channel “defining a compressed-air flow path **through said atomizer assembly**”. *See* Paper 25, Claims Appendix (emphasis added). Petitioner omits the bolded language, which removes Sevy and Gao as anticipatory or obviating prior art. Unlike claim 21 and supporting Figure 2 of Exhibit 1004, Sevy and Gao do **not** include a compressed-air flow path which continues in the same direction and circumference defined by an atomizer air inlet channel through the atomizer assembly.

Petitioner has mapped the atomizer air inlet channel to channel 114 of Sevy and to gas flow pipe 51 of Gao. Paper 30, 11. Sevy’s channel 114, however, directs compressed air forward before it turns downward into chamber 116, then propels the fluid upward and forward again to orifice 118. Ex. 1009, Fig. 9. Gao’s gas flow pipe 51, meanwhile, projects a fluid spray into an “atomizer body” having an “atomization cavity 6” including a wall against which the fluid dispersion strikes to conduct atomization in an upward direction. Ex. 1013, Para. [0025]. To use Petitioner’s own logic, the disclosure of either Sevy or Gao “does not explain how the atomizer air inlet channel alone can define a flow path ‘**through** said atomizer assembly.’” Paper 30, 3. Petitioner cannot have it both ways: claim 21 is supported by disclosure showing a constant compressed-air flow path **through** an atomizer

assembly, while Petitioner does not so much as suggest—let alone evidence—such a path in Sevy or Gao.

B. Ground 3: Goubet Does Not Render the Substitute Claims Obvious.

Goubet does not render obvious claim 20 because Goubet's structure is entirely different from that of PO's claimed invention. The diffuser head 4 of Goubet has an operative fluid connection with the reservoir 2—droplet flow inlet 15—disposed horizontally away from the sealing interface between the diffuser head 4 and the reservoir 2. Ex. 1016, Fig. 1. The dip tube 8 of Goubet is connected via insertion to what appears to be a single structure with vertically uneven boundaries and no surface interface with the reservoir 2—instead, with the venturi cone 7. *Id.* If Petitioner means to add the washer to the diffuser head/reservoir interface of Goubet, the reservoir 2 **circumferentially penetrates** the diffuser head at a maximal distance from the diffusion chamber exit and the drip tube. *Id.* There is therefore no apparent place to add a washer to Goubet to achieve the objective taught by claim 20. Neither Petitioner's bald assertion nor the conclusory testimony of Dr. White indicate **how** a washer may be applied to Goubet, nor how a drip tube would “minimize contact between said sealing washer and said operative fluid.” Paper 25, 18.

Petitioner's argument as to claim 21 handwaves the actual requirements of the claim. Even if taken as true that Goubet “would still use compressed air, vacuum-driven oil entrainment through dip tube 8, mixing in diffusion chamber 5, and droplet

discharge from the chamber,” Petitioner offers no support for its assertion that “[a]ny necessary modification would be limited to predictable positioning within Goubet’s own venturi geometry.” Paper 30, 15. Nor does Petitioner address the limitation of the air inlet channel “defining” a compressed-air flow path through the atomizer assembly which, as explained above, concerns the continuous, straight compressed-air path through the assembly. *Supra*, §II. As above, Petitioner’s evidence does not overcome PO’s testimony of Dr. Micklow, who opined that Goubet would not suffer a drip tube without the need for “a different liquid-return mechanism” and that a POSITA therefore would not have been motivated to make such a change. Ex. 2016, 21-25. Petitioner has failed to prove that Goubet obviates claim 20 or claim 21.

C. New Ground: Gao-2 Does Not Render Claim 21 Obvious.

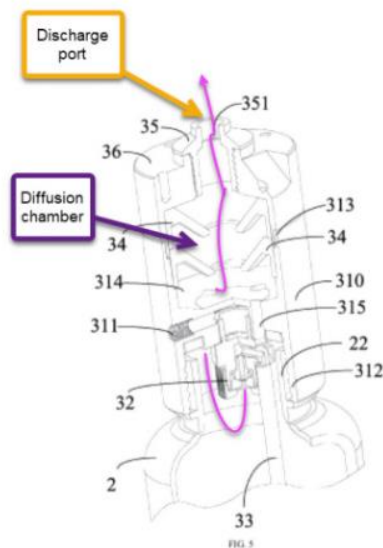
Petitioner’s assertion that Gao-2 is prior art rests on the notion that a single limitation is not enabled by a provisional filing made before any effective filing date of Gao-2 namely, that the fluid inlet “opening . . . disposed along said compressed-air flow path such that compressed air . . . flows past said opening . . . into said mixing chamber.” Response, pages 16-17. However, the Revised Motion traced that limitation of claim 21 to Provisional Application No. 61/694,500 (“the Provisional”), filed August 29, 2012. Revised Motion, 6-11; Ex. 1006, 38. The Provisional discloses the challenged arrangement nearly verbatim: operative fluid “is drawn into the mixing chamber 226 . . . as a result of the venturi effect of the

compressed air *flowing past the opening of the fluid inlet 227 into the mixing chamber 226.*” Ex. 1006, Labelled Page 28 of 40, Lines 5-9. The Provisional’s figures also clearly indicate this, and how the opening may be disposed. Accordingly, given its 2014 priority date, Gao-2 should not be considered prior art here, and any argument premised on it is moot.

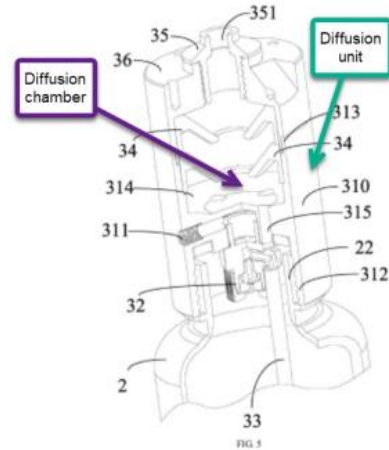
Even so, PO draws distinctions between amended Claim 21 and Gao-2, showing that Petitioner has not met its burden. First, as clearly explained in the Sur-Reply, Paper 26 of IPR 2025-00707, 12-16, Gao-2 has no mixing chamber, nor one that could be suggested as defined by claim 21 and the ‘449 Patent. The reference itself is unambiguous: “[t]he essential oil then mixes with the airflow and is atomized at the outlet of the liquid suction hole 3224, before being sprayed out from the spray outlet 3231.” Gao-2, 36. Immediately surrounding the liquid suction hole 3224 is the spray outlet 3231, with no genuine structure that could be a “mixing chamber,” despite Petitioner’s continued attempts to label one. *See* Paper 26 of IPR 2025-00707, 12-13 (showing Petitioner labeling the “mixing chamber” as distinct structures at different points).

Though PO asserts that Gao-2 has no “mixing chamber,” if the Board finds one, Gao-2 cannot be said to have an “atomizer exhaust aperture spaced from said discharge port and opening laterally from said mixing chamber into said diffusion chamber” as claim 21 so requires. Indeed, even accepting the portion of Gao-2 just

below the 3224 as the mixing chamber, 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.



Ex-1042, FIG. 5



Ex-1042, FIG. 5

Paper 26 of IPR 2025-00707, 12-13. Gao-2 does not render claim 21 unpatentable.

IV. CONCLUSION

For the reasons set forth above, Petitioner has failed to carry its burden under 37 C.F.R. § 42.121(d)(2) of proving by a preponderance of the evidence that Patent Owner's proposed substitute claims 20 or 21 are unpatentable. Patent Owner's Revised Contingent Motion to Amend is due to be granted.

Dated: July 9, 2026

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CERTIFICATE OF COMPLIANCE WITH PAGE COUNT LIMIT

Pursuant to 37 C.F.R. § 42.24(d), the undersigned certifies that the instant Reply remains within the twelve-page limit, not including exempted sections.

Dated: July 9, 2026

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CERTIFICATE OF SERVICE

The undersigned hereby certifies that a copy of the instant Reply has been served in its entirety on July 9, 2026, by causing the instant Reply and any accompanying documents to be electronically mailed to the following attorneys of record for the Petitioner:

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