

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

AROMA360, LLC,

Petitioner,

v.

AIR ESSSENTIALS, INC.,

Patent Owner.

IPR2025-00707

U.S. Patent No. 10,092,918

**PETITIONER'S OPPOSITION TO PATENT OWNER'S
REVISED CONTINGENT MOTION TO AMEND**

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Exhibit 1020	C. Schaschke, Dictionary of Chemical Engineering, OXFORD UNIVERSITY PRESS (2014)
Exhibit 1021	U.S. Patent No. 2,405,494 (hereinafter, “Dupuy”)
Exhibit 1022	Kaye, <i>Aromatic Output for HCI</i> , MAKING SCENTS, Jan. and Feb. 2004 (hereinafter, “Kaye”)
Exhibit 1023	U.S. Patent No. 2,820,406 (hereinafter, “Argentieri”)
Exhibit 1024	U.S. Patent No. 5,929,396 (hereinafter, “Awad”)
Exhibit 1025	E.P Spearman, J.A. Sattarty, and M.J., Reader-Harris, <i>Comparison of velocity and turbulence profiles downstream of perforated plate flow conditioners</i> , FLOW MEAS. INSTRUM., Vol. 7 No. 3/4, pp. 181-199 (1996)
Exhibit 1026	Lighthill, M. J., <i>On Sound Generated Aerodynamically</i> , I. General Theory. Proc. Roy. Soc. (London), Ser. A, vol. 211, no. 1107 (Mar. 20, 1952), pp. 564-587 (hereinafter, “Lighthill”)
Exhibit 1027	NOISE AND VIBRATION CONTROL ENGINEERING: PRINCIPLES AND APPLICATIONS (2006), Ed. I.L. Ver and L.L Beranke, Wiley & Sons, ISBN-10 0-471-91842-3 (hereinafter, “the Noise Control Book”)

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Exhibit 1028	HANDBOOK OF ATOMIZATION AND SPRAYS: THEORY AND APPLICATION (2011), Ed. N. Ashgriz, Springer, DOI 10.1007/978-1-4419-7264-4 (hereinafter, the “Handbook”)
Exhibit 1029	Perry’s Chemical Engineers’ Handbook (1997), Ed. R.H. Perry, D.W. Green, and J.O. Maloney McGraw Hill, ISBN 0-07-049841-5 (the “Perry Handbook”)
Exhibit 1030	C. Mundi, M. Sommerfeld, and C. Tropea, <i>Droplet-wall collisions: experimental studies of the deformation and breakup process</i> . INT. J. MULTIPHASE FLOW 21: 151-173
Exhibit 1031	Bernoulli, D. (1738) Hydrodynamica, ETH-Bibliothek Zürich https://doi.org/10.3931%2Fe-rara-3911
Exhibit 1032	White, F.M. (1994), Fluid Mechanics (3rd Edition), New York, NY: McGraw-Hill Higher Education
Exhibit 1033	Maxey M.R. and Riley, J.J., <i>Equation of motion for a small rigid sphere in a nonuniform flow</i> , PHYS. FLUIDS 26, 883-889 (1983)
Exhibit 1034	Sun W, Ji J, Li Y, and Xie X., <i>Dispersion and settling characteristics of evaporating droplets in ventilated room</i> , BUILDING & ENVIRONMENT, 42, 1011-1107 (2007)
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Exhibit 1036	Kuz, V.A. <i>Evaporation of small drops</i> , J. APPL. PHYS. 69, 7034-7036, (1991)
Exhibit 1037	NASA SP-5108, Handbook for Industrial Noise Control (1981)
Exhibit 1038	Alonso, M., Huang, C.-H., <i>Particle segregation in aerosol flow</i> , J. OF AEROSOL SCIENCE 81, 24-33 (2015)
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Exhibit 1046	Transcript for Deposition of Dr. Gerald Micklow taken on March 25, 2026
Exhibit 1047	Supplemental Declaration of Dr. Christopher White
Exhibit 1048	H. M. Taylor and S. Karlin, <i>An Introduction to Stochastic Modeling</i> . Orlando, FL: Academic Press, 1984.
Exhibit 1049	R. A. Mugele and H. D. Evans, “ <i>Droplet size distribution in sprays</i> ,” <i>Industrial & Engineering Chemistry</i> , vol. 43, no. 6, pp. 1317–1324, 1951.
Exhibit 1050	[Reserved]
Exhibit 1051	Joint Claim Construction Statement filed in <i>Air Esscentials, Inc. v. Aroma360, LLC</i> Case No. 1:24-cv-20594-KMW (SD. Fla).
Exhibit 1052	Second Supplemental Declaration of Dr. Christopher White

I. INTRODUCTION

Petitioner opposes Patent Owner’s Revised Contingent Motion to Amend (“Revised MTA”), which seeks to substitute proposed substitute claims 16 and 17 for challenged claims 1 and 5. Proposed substitute claims 16 and 17 may be referred to herein as “claim 16” and “claim 17” (and collectively, the “Substitute Claims”). The Substitute Claims remain inadmissible because they: (i) are procedurally deficient; (ii) violate 35 U.S.C. § 112; and (iii) are unpatentable over the prior art.

II. THE REVISED MOTION TO AMEND HAS CONFLICTING AMENDMENTS AND IS PROCEDURALLY DEFICIENT

The Revised MTA is procedurally deficient for at least three reasons. First, Patent Owner’s proposed claim language for the Substitute Claims is unclear because the limitations presented in the table on pages 6–10 of the Revised MTA is materially inconsistent with the limitations set forth in the Claim Appendix on pages 17–19 as shown below. *Compare* Revised MTA at 6-10, *with id.* at 17-19.

Claim 16 at pages 6-9	Claim 16 at pages 17-18 (Claim Appendix)
“said atomizer air inlet channel interconnected to the compressed air source and said fluid inlet disposed in fluid communication with the operative fluid in the container”	“said atomizer air inlet channel interconnected to the compressed air source <u>and defining a compressed-air flow path through said atomizer assembly,</u> ”
“and opening into said mixing chamber at an opening of said fluid inlet	“[[and]] said fluid inlet disposed in fluid communication with the operative fluid

intersecting said compressed-air flow path,”	in the container, wherein the compressed air and <u>opening into said mixing chamber at an inlet junction intersecting said compressed airflow path,</u> ”
“wherein the compressed air and the operative fluid are mixed together in said mixing chamber to form the fluid dispersion.”	“the operative fluid are mixed together in said mixing chamber to form the fluid dispersion.”
Claim 17 at pages 9-10	Claim 17 at pages 18-19 (Claim Appendix)
N/A	“ <u>said atomizer air inlet channel is interconnected to the compressed air source and defines a compressed-air flow path through said atomizer assembly;</u> ”
“said atomizer exhaust aperture is spaced from said discharge port and opens laterally from said mixing chamber into said lower chamber along an exhaust path that is transverse to said fluid inlet”	N/A
N/A	“ <u>said fluid inlet is substantially perpendicular to a flow path of compressed air from the compressed air</u>

	<u>source as the compressed air flows across said fluid inlet.”</u>
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Second, if Patent Owner intended the Substitute Claims to be those set forth in the body of the Revised MTA, Patent Owner fails to provide a claim listing with markups showing the changes as required under 37 CFR §42.121(b) (“Any motion to amend claims must include a claim listing [that] show[s] the changes clearly.”). While changes may be shown in an appendix, the differences highlighted above render the claim listing meaningless.

Third, if Patent Owner intended the substitute claims to be those set forth in the appendix, Patent Owner fails to provide any written description support for such claim language. See 37 CFR §42.121(b)(1) and (2); *Lectrosonics, Inc. v. Zaxcom, Inc.*, IPR2018-01129, Paper 15 at 4 (PTAB Feb. 25, 2019) (precedential); *accord Apple Inc. v. Personalized Media Communications LLC*, IPR20216-00754, Paper No. 41 at 65 (PTAB Sept. 19, 2017)

Moreover, these inconsistencies are highly prejudicial to Petitioner because it is unclear which set of substitute claims Petitioner must address in its Opposition to the Revised MTA. The Board should therefore deny the Revised MTA.

III. THE SUBSTITUTE CLAIMS¹ VIOLATE § 112

A. Claim 16 Lacks Written Description Support

Claim 16 adds the following limitation:

“said atomizer exhaust aperture spaced from said discharge port and opening laterally from said mixing chamber into said lower chamber along an exhaust path transverse to a direction in which the operative fluid enters said mixing chamber through said fluid inlet”

Patent Owner argues this limitation finds support in Application 15/353,951 (Ex. 1004) at page 171, line 10 to page 172, line 2, page 194, and Figure 5. Revised MTA at 10. Patent Owner also argues this limitation is supported by Application 61/694,500 (Ex. 1006) at page 28, lines 1-9, pages 14-15, and Figures 2-3. *Id.* Yet, almost none of the language in this confusing and unclear limitation appears anywhere in the specification.

More specifically, none of the embodiments pointed to by Patent Owner (Figures 2-3 and 5) provide written support for the limitation “said atomizer exhaust aperture. . . opening. . . from said mixing chamber into said lower chamber.” The “atomizer exhaust apertures” of Figures 1-3, are described and illustrated as being in direct communication with the “suppression chamber (232)” not the claimed

¹ In the remainder of this Opposition, Petitioner primarily addresses the proposed substitute claims set forth on pages 6–10 of the Revised MTA because those are the claims for which Patent Owner attempts to establish written description support.

“lower chamber.” Ex. 1004, 169:3-6; Figures 1-3. Similarly, the “atomizer exhaust aperture” of Figure 5 is described and illustrated as being in direct communication with the “first axial portion (114) of the [modified] diffusion chamber 112’” (which is located at the top of the modified diffusion chamber). Ex. 1004, Figure 5.

In fact, in its previous Institution Decision, the Board preliminarily determined that “Patent Owner has not adequately shown § 112 support” for the “lower chamber” limitation in the priority documents, which contain Figures 1-5. Inst. Dec. at page 33. Thus, it follows that the limitation “said atomizer exhaust aperture. . . opening laterally from said mixing chamber *into said lower chamber*” is not supported by the written description cited by Patent Owner.

If Patent Owner attempts to argue that Figure 6 provides written support for this limitation, the Board should not consider these arguments because it would constitute a new argument presented for the first time in a reply. Written description cannot be shown by relying on two mutually exclusive embodiments, like Figures 1 and 6, that disclose materially different atomizer assembly configurations. *See Parus Holdings, Inc. v. Google LLC*, 70 F.4th 1365, 1374 (Fed. Cir. 2023) (agreeing with Board of no written description support where Patent Owner relied on two embodiments that could not be combined); *Flash-Control, LLC v. Intel Corp.*, No. 2020-2141, 2021 WL 2944592, at *4 (Fed. Cir. July 14, 2021) (“A patent owner

cannot show written description support by picking and choosing claim elements from different embodiments that are never linked together in the specification.”).

Here, Figure 6 is repeatedly disclosed as an “alternative embodiment” comprising a “modified diffusion unit” with respect to the other embodiments, including Figure 1. Ex. 1004, 180:8-9. (“Figure 6 is illustrative of an alternative embodiment of a diffusion unit 100 having a modified diffusion chamber 112”...) The modifications to the Figure 6 diffusion unit, include substantial modifications to the atomizer assembly (which is part of the diffusion unit). *Compare* Ex. 1004 Fig. 5, *with id.* at Fig. 1. In addition, the phrase “opening *laterally*” is not found anywhere in the specification. Rather, the written disclosure describes and illustrates the “lower chamber” as being “disposed below and adjacent” the atomizer exhaust aperture. Ex. 1004, 180:2-23; Figure 6. Thus, Figure 6, and its corresponding description, fare no better in supporting the limitation “said atomizer exhaust aperture. . . *opening laterally* from said mixing chamber into said lower chamber.”

The “opening laterally” limitation becomes even more confusing and devoid of support in view of the additional recitations of the claim, namely “opening laterally. . . along an exhaust path transverse to a direction in which said operative fluid enters” the mixing chamber. Patent Owner has not explained the meaning of this limitation or demonstrated that it is supported by Application No. 15/353,951 (or its priority application). Instead, Patent Owner merely asserts that the limitation

is supported by Figures 2–3 and 5, and certain corresponding portions of the specification, even though those disclosures use virtually none of the language recited in the claim limitation. Accordingly, Patent Owner has failed to establish written description support for this limitation.

B. Claim 16 Is Indefinite Under 35 U.S.C. § 112(b)

1. “and opening into said mixing chamber at an opening of said fluid inlet intersecting said compressed-air flow path”

This limitation recites “intersecting said compressed-air flow path” but there is no antecedent basis for “said” compressed-air flow path. Given there could be numerous possible compress-air flow paths in the claimed assembly, the lack of antecedent basis precludes ascribing a reasonably ascertainable meaning to the scope of this claim. *See Energizer Holdings, Inc. v. Int’l Trade Comm’n*, 435 F.3d 1366, 1370 (Fed. Cir. 2006). While it appears that Patent Owner tried to include an antecedent basis in the alternative substitute claim 16 provided in the claim listing on pages 17-18, that claim cannot be somehow merged into the alternative substitute claim 16 shown on pages 6-9 given the multitude of different limitations. *See Supra*. In addition, Patent Owner provided no written description support for the substitute claim listing on pages 17-19 and thus those limitations cannot be entered. *Lectrosonics*, Paper 15 at 4.

2. **“said atomizer exhaust aperture spaced from said discharge port and opening laterally from said mixing chamber into said lower chamber along an exhaust path transverse to a direction in which the operative fluid enters said mixing chamber through said fluid inlet”**

A POSITA would not understand the scope of this limitation since they could not determine with reasonably certainty what structure is encompassed by an atomizer exhaust aperture “opening laterally from said mixing chamber into said lower chamber.” Ex. 1052, ¶86-90; *Nautilus, Inc. v. Biosig Instruments, Inc.*, 572 U.S. 898, 901 (2014). The mixing chamber is a three-dimensional structure and there is no discussion in the specification, or recitation in the claim, identifying what axis/plane an atomizer exhaust aperture would need to lie in to be consider “opening laterally from the mixing chamber.” Ex. 1052, ¶86.

Likewise, it is not clear what orientation or direction is encompassed by an “exhaust path transverse to a direction in which the operative fluid enters said mixing chamber.” Ex. 1052, ¶91-92. For example, the direction in which fluid enters the mixing chamber could be interpreted to mean the direction in which fluid is carried through the fluid inlet (*e.g.* vertical in Figure 6) or the direction in which fluid is blown by the compressed air as the liquid reaches the fluid inlet (horizontal in Figure 6). *Id.* While the term “enters” suggests initial entrance on its face, this interpretation is contradictory to the intrinsic evidence. That is, fluid initially travels into the mixing chamber in an upward direction until it reaches the fluid inlet, before

it is blown horizontally by the compressed air, and before it downwardly exits the exhaust aperture. *Id.* The exhaust aperture, however, has a vertical axis that is parallel to the fluid inlet, and two parallel axes are not transverse to one another. *Id.* There is no discussion of these various ambiguous directional limitations in the specification, and the figures do not convey to a POSITA with reasonable certainty what arrangements these limitations are intended to encompass.

C. Claim 17 Lacks Written Description Support Under 35 U.S.C. § 112(a)

Claim 17 adds the following limitation:

“said atomizer exhaust aperture is spaced from said discharge port and opens laterally from said mixing chamber into said lower chamber along an exhaust path that is transverse to said fluid inlet”

Notably, this limitation is substantially identical to the limitation of claim 16 discussed above in Section III(A). Here, however, Patent Owner alleges that this limitation finds support in **Figure 6** (not Figure 5 as alleged with respect to the substantially identical limitation contained in claim 16). Revised MTA at 11. This limitation lacks written support for each of the reasons discussed in Section III(A), which addresses Figure 6.

D. Claim 17 Is Indefinite Under 35 U.S.C. § 112(b)

1. “said opening disposed along said compressed-air flow path”

In the claim limitation “along said compressed-air flow path,” there is no antecedent basis for which possible compressed-air flow path is intended rendering

this limitation indefinite. *See Energizer Holdings*, 435 F.3d at 1370. While it appears that Patent Owner tried to include an antecedent basis in the alternative substitute claim 17 provided in the claim listing on pages 18-19, that claim cannot be merged into the proposed substitute claim 17 shown on pages 9-10 given the multitude of different limitations. *See Supra*. In addition, Patent Owner provided no written description support for the substitute claim listing on pages 18-19 and thus those limitations cannot be entered. *Lectrosonics*, Paper 15 at 4.

Nonetheless, even if the Board were to consider the alternative claim (recited in the appendix) which recites “said atomizer air inlet channel is interconnected to the compressed air source and defines a compressed-air flow path through said atomizer assembly,” that limitation too would be indefinite. A POSITA would not understand with reasonably certainty how the atomizer inlet channel interconnected to the compressed air source “defines” a flow path through the atomizer assembly. Ex. 1052, ¶93. The atomizer air inlet merely directs air into the mixing chamber but cannot define the path air travels through the atomizer assembly itself, which instead depends on other structural features within the atomizer assembly. Indeed, the disclosed flow path is defined by multiple internal components of the atomizer assembly and not just the atomizer air inlet channel, including the mixing chamber and atomizer exhaust. *See, e.g.*, Ex. 1004, 79:6-11 (Figure 1) and 91:8-14 (Figure 6). Ex. 1052, ¶93.

2. **“said atomizer exhaust aperture is spaced from said discharge port and opens laterally from said mixing chamber into said lower chamber along an exhaust path that is transverse to said fluid inlet”**

This limitation is substantially identical to the limitation discussed above with respect to claim 16 and indefinite for each of the reasons discussed in Section III(B)(1).

IV. THE SUBSTITUTE CLAIMS ARE UNPATENTABLE OVER PRIOR ART

The Substitute Claims remain unpatentable assuming they are not indefinite. The Petition already mapped the unchanged limitations, and the revised amendments only add orientation/directional language to claims 16 and 17. To the extent these added limitations do not render the claims indefinite, those amendments do not cure unpatentability because (a) the Substitute Claims retain the same core structure and requirements already mapped in the Petition to the asserted prior art, and (b) the newly added limitations are likewise taught by the same asserted prior art under the scope of the claims as can be best understood by Petitioner. Pet. 25–69. As such, the Substitute Claims remain obvious over the grounds set out in the Petition.

A. Grounds 1 and 2 - Claim 16 is Obvious Over Goubet (and, Alternatively, Goubet In View of Kaiser)

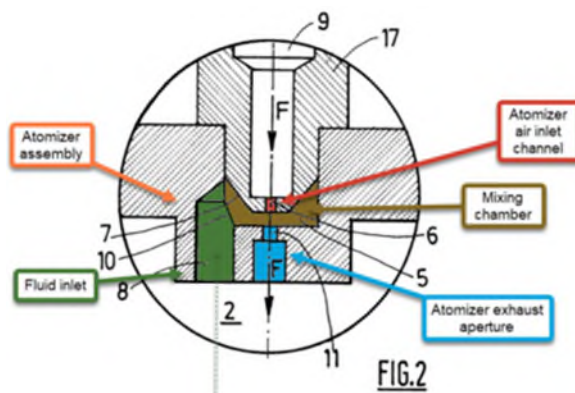
The Petition already provides an element-by-element showing that these identical claim limitations are disclosed or rendered obvious by the asserted prior art, including Goubet under Ground 1, and the same evidence applies because the

claim language is unchanged. Pet. 25–41; Revised MTA, 11–12. Regarding the new limitations, those too are taught by Goubet and, as such, claim 16 is still obvious over Grounds 1 and 2

The Petition also provided alternative obviousness showings using Kaiser to the extent Goubet is found not to disclose the “fluid dispersion” limitation. Specifically, the Petition explained Kaiser’s teaching of the well-known importance of controlling droplet-size distribution for uniform evaporation, resulting in substantially uniform aerosol. Pet. 44–49; Ex. 1014, 43. The new limitations added to claim 16 does not alter the “fluid dispersion” requirement, so Petition’s existing Kaiser-based analysis continues to apply to that unchanged requirement.

1. “and opening into said mixing chamber at an opening of said fluid inlet intersecting said compressed-air flow path”

Goubet teaches this limitation. Goubet’s diffuser head includes a chamber 5, compressed-air inlet 6, venturi cone 7, and an oil inlet “in the form of the upper end 10 of a dip tube 8” connected to oil in reservoir 2. Ex. 1016, 3:31–4:2, Fig. 2.



Compressed air enters through air inlet channel 9 and compressed-air inlet 6, flows into chamber 5, creates a vacuum, draws oil through upper end 10 of dip tube 8, and mixes air and oil in chamber 5. Ex. 1016, 4:15–22; Pet. 36–40; Ex. 1002 ¶¶143–145. That disclosure places the fluid-inlet opening at the point where the compressed-air flow creates suction and entrains oil, thereby teaching an opening into the mixing chamber intersecting the compressed-air flow path. Ex. 1016, 4:15–22, Fig. 2; Ex. 1047 ¶41.

2. “said mixing chamber disposed along said compressed-air flow path after said atomizer air inlet channel and before said atomizer exhaust aperture”

The Petition maps Goubet’s compressed-air inlet 6 to the atomizer air inlet channel, Goubet’s chamber 5 to the mixing chamber, and Goubet’s outlet 11 to the atomizer exhaust aperture. Pet. 36–40. Goubet discloses that compressed air flows from air inlet channel 9 through inlet 6 into diffusion chamber 5, where air and oil are mixed, and the resulting oil droplets then exit diffusion chamber 5 through outlet 11. Ex. 1016, 4:15–24, Fig. 2; Ex. 1002 ¶¶143–148.

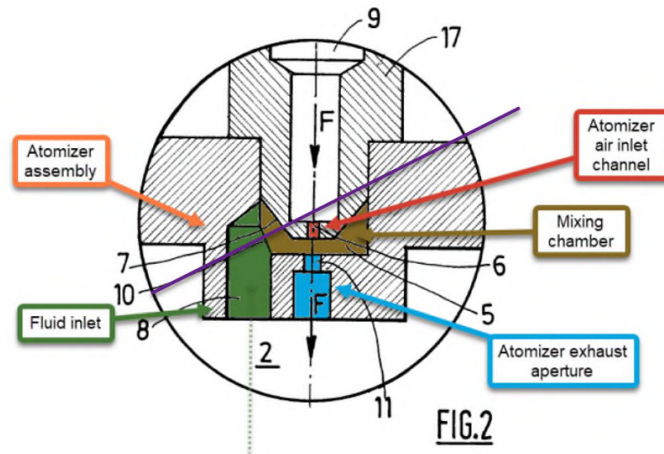
3. “said atomizer exhaust aperture spaced from said discharge port and opening laterally from said mixing chamber into said lower chamber along an exhaust path transverse to a direction in which the operative fluid enters said mixing chamber through said fluid inlet”

Goubet’s atomizer exhaust aperture (outlet 11) is spaced from and located upstream Goubet’s discharge port (outlet 16) through which microdroplets exit to

ambient air. Ex. 1016, 4:10–24, FIG. 1; Pet. 21-33, 37–42; Ex. 1002 ¶¶133-135, 145, 148, 155. Because outlet 11 is upstream of, and physically distinct from, outlet 16, Goubet teaches the claimed spacing from the discharge port.

Goubet also teaches that outlet 11 opens from the mixing chamber into the lower chamber. The Petition maps chamber 5 to the mixing chamber and identifies the lower chamber below diffuser head 4, and Goubet states that droplets leaving chamber 5 are pushed toward the inside of reservoir 2 and then toward inlet 15 of outer enclosure 12. Pet. 38–42; Ex. 1016, 4:23–28, Fig. 1; Ex. 1002 ¶¶147, 155. That is the same exhaust path from the mixing chamber into the lower chamber disclosed by Figure 6 of the '918 Patent. Pet. 38–42; Ex. 1016, 4:23–5:7, Figs. 1–3. Therefore, Goubet discloses the opening laterally limitation as best understood by Petitioner.

Goubet further teaches, or at least renders obvious, the transverse-flow aspect. Figure 2 depicts oil entering chamber 5 through angled upper end 10 of dip tube 8 (the axis of the angled upper end 10 of dip tube 8 is annotated in purple below), while the resulting mixture exits chamber 5 vertically through outlet 11 (shown by the arrows labeled F) and toward the reservoir/lower chamber. A POSITA would understand those distinct flow paths in the venturi atomizer to be transverse. Ex. 1016, Fig. 2; Pet. 36–42; Ex. 1047 ¶41.



Ex-1016, FIG. 2

To the extent Patent Owner contends “opening laterally” requires a stricter horizontal side-wall opening, this would have been an obvious modification given Goubet’s structure and geometry. Ex. 1052, ¶¶94-97. Dr. White explains that modifying the orientation of Goubet’s exhaust aperture would result in the atomized droplets being retained in chamber 5 for a longer period of time, which would increase the frequency of droplet/wall collisions within chamber 5. *Id.* In turn, each collision would cause the droplets to break into microdroplets, further reducing the droplet size. *Id.* Because reducing droplet size is an objective of Goubet, and that result is achieved via collisions, Goubet itself provides the motivation for making this modification. Ex. 1016, 4:28–5:4, 5:12–16. Moreover, because the middle portion of the diffusion unit’s floor dips—at the location where the diffusion assembly is housed—sideways/horizontal dispersion of the droplets through the modified exhaust aperture will cause the droplets to exit the exhaust aperture into

the lower chamber. Ex. 1052, ¶95. Dr. White explains that this modification could be made without undue experimentation and would not introduce any incompatibilities with Goubet’s existing design resulting in a reasonably certainty of success. Ex. 1052, ¶97.

4. Alternatively, Goubet in view of Kaiser Render Obvious Claim 16

Goubet alone teaches the venturi-based air inlet, fluid oil-inlet, and mixing-chamber geometry as discussed above. Ex. 1016, 3:31–4:2, 4:15–16, Fig. 2. The Petition’s stated rationale for applying Kaiser, which addresses any “fluid dispersion” uniformity requirement remains unchanged and is not affected by the added limitations of claim 16.

B. Grounds 3 and 4 - Claim 16 is Obvious Over Gao-2 (and, Alternatively, Gao-2 in View of Goubet)

The Petition mapped the core architecture of claim 1 to Gao-2 under Ground 3 and provided an alternative under Ground 4 (Gao-2 in view of Goubet) to alternatively teach the “fluid dispersion” limitation. Pet. 51–69; Ex. 1042. Those showings apply equally to claim 16. Regarding the new limitations, those too are taught by Gao-2 and thus claim 16 is still obvious over Grounds 3 and 4.

1. “and opening into said mixing chamber at an opening of said fluid inlet intersecting said compressed-air flow path”

Gao-2 discloses airflow entering through air inlet channel 311, passing through vent holes 3215 and guide grooves 3225, and being discharged through

spray outlet 3231. Ex. 1042 ¶¶[0036]–[0038], Figs. 7, 9, 10, Ex. 1052, ¶99. Gao-2 also discloses liquid suction channel 3216 and liquid suction hole 3224, through which essential oil is drawn by negative pressure and mixed with airflow at the outlet of liquid suction hole 3224 before discharge through spray outlet 3231. Ex. 1042 ¶¶[0036]–[0040], Figs. 7, 10; Ex. 1047 ¶46.

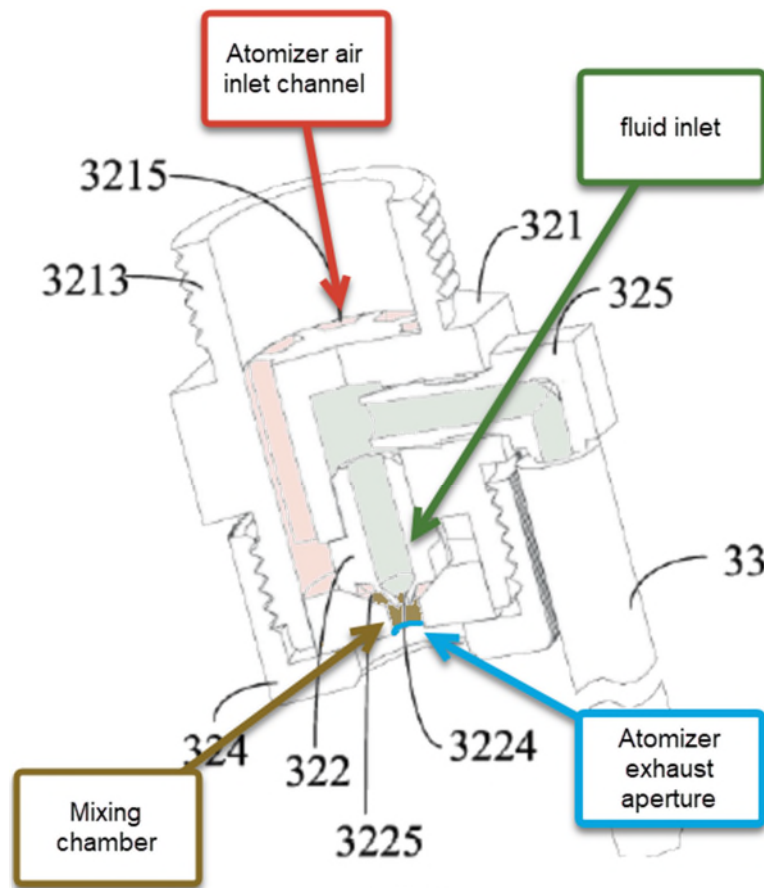


FIG. 10

That is the same intersection of fluid-inlet opening and compressed-air flow path recited in claim 16. Ex. 1042 ¶¶[0036]–[0040], Figs. 7, 10; Pet. 56–58. A POSITA would understand this intersection to be within the chamber of rotating core

323 (*e.g.*, volume between the grooved lower surface of the rotating core 323 and the surface of cap 323 located upstream of spray outlet 3231). Ex. 1052, ¶100.

2. “said mixing chamber disposed along said compressed-air flow path after said atomizer air inlet channel and before said atomizer exhaust aperture”

Gao-2 teaches the same order. The Petition maps Gao-2’s vent holes 3215/air delivery path to the atomizer air inlet channel, the chamber within atomization rotating core 322 (annotated above) to the mixing chamber, and spray outlet 3231 to the atomizer exhaust aperture. Pet. 56–60, Ex. 1052, ¶100. Gao-2 discloses airflow passing through vent holes 3215/guide grooves 3225 into the atomization region, mixing with oil, and then being sprayed from spray outlet 3231. Ex. 1042 ¶¶[0036]–[0040], Figs. 7, 10; Ex. 1047 ¶46. Thus, Gao-2’s mixing chamber lies after the atomizer air inlet channel and before the atomizer exhaust aperture.

3. “said atomizer exhaust aperture spaced from said discharge port and opening laterally from said mixing chamber into said lower chamber along an exhaust path transverse to a direction in which the operative fluid enters said mixing chamber through said fluid inlet”

Gao-2’s spray outlet 3231 is the upstream atomizer exhaust aperture because oil and airflow mix and atomize at the outlet of liquid suction hole 3224 before being sprayed from spray outlet 3231. Ex. 1042 ¶[0036], Fig. 10; Pet. 56–58; Ex. 1047 ¶46. Gao-2’s discharge port is a separate downstream mist outlet 351, through which

mist exits to air. Ex. 1042 ¶¶[0031]–[0034], Fig. 5; Pet. 53–54, 56–62. Thus, spray outlet 3231 is thus spaced from the discharge port 351.

Gao-2 further teaches the transverse aspect as best understood. Gao-2 depicts liquid suction channel 3216/liquid suction hole 3224 introducing liquid into the atomization region, while airflow passes through vent holes 3215 and guide grooves 3225 and the atomized mist exits through spray outlet 3231. Ex. 1042 ¶¶[0036]–[0038], Figs. 7, 9, 10; Ex. 1047 ¶46. The Board already preliminarily credited Petitioner’s related showing that Gao-2’s fluid-inlet geometry is perpendicular/transverse to the airflow path, and Gao-2’s spray outlet 3231 is likewise the upstream atomizer exhaust aperture mapped in the Petition. Board Preliminary Guidance 16–18; Pet. 56–62; Ex. 1042 ¶¶[0036]–[0038], Figs. 7, 10.

4. Alternatively, Gao-2 in view of Goubet Render Obvious Claim 16

The Petition’s Ground 4 provides an alternative to meet the “fluid dispersion” limitation based on Gao-2 in view of Goubet. Pet. 61–69. Because claim 16 only adds a mixing-chamber-geometry requirement that is taught by Gao-2, claim 16 is also unpatentable over Gao-2 in view of Goubet.

C. Grounds 1 and 2 - Claim 17 is Obvious Over Goubet (and, Alternatively, Goubet in View of Kaiser)

Claim 17 remains unpatentable for the same reasons as original claim 5 as to unchanged limitations. Claim 17 retains all limitations of original challenged claim 5 and only adds new limitations that are also taught by Goubet.

1. “said atomizer assembly comprises an atomizer air inlet channel, a fluid inlet, a mixing chamber, and an atomizer exhaust aperture”

The Petition maps Goubet’s compressed-air inlet 6 to the atomizer air inlet channel, upper end 10 of dip tube 8 to the fluid inlet, chamber 5 to the mixing chamber, and outlet 11 to the atomizer exhaust aperture. Pet. 36–40; Ex. 1016, 3:31–4:24, Fig. 2; Ex. 1002 ¶¶143–148.

2. “said fluid inlet is in fluid communication with the operative fluid in the container and comprises an opening into said mixing chamber, said opening disposed along said compressed-air flow path such that said fluid inlet is substantially perpendicular to said compressed-air flow path as the compressed air flows across said opening”

Goubet also teaches this limitation. Goubet discloses an oil inlet formed by upper end 10 of dip tube 8 connected to oil 3 in reservoir 2, and compressed air flowing through inlet channel 9/inlet 6 into diffusion chamber 5 to draw oil into the chamber by vacuum. Ex. 1016, 3:31–4:22, Fig. 2. The Board already preliminarily agreed that Goubet Fig. 2 depicts a fluid inlet substantially perpendicular to a compressed-air flow path. Board Preliminary Guidance 12–13; Ex. 1016, Fig. 2.

That is precisely the perpendicular “flows across” relationship now recited in claim 17.

3. **“said mixing chamber disposed along said compressed-air flow path after said atomizer air inlet channel and before said atomizer exhaust aperture”**

Goubet teaches this limitation for the same reason it teaches the corresponding limitation in claim 16. *See Supra.* Ex. 1016, 4:15–24, Fig. 2; Pet. 36–40; Ex. 1002 ¶¶143–148.

4. **“said atomizer exhaust aperture is spaced from said discharge port and opens laterally from said mixing chamber into said lower chamber along an exhaust path that is transverse to said fluid inlet”**

Goubet teaches the claimed spacing and lower-chamber relationship. Goubet’s outlet 11 is where oil droplets exit diffusion chamber 5 toward reservoir 2, while outlet 16 is the distinct discharge port to ambient air. Ex. 1016, 4:10–28, Figs. 1–3; Pet. 31–42; Ex. 1002 ¶¶134–155. The Petition already explained that outlet 11 is in communicating relation between the mixing chamber and lower chamber to facilitate transfer of the fluid dispersion therebetween. Pet. 41–42; Ex. 1016, 4:23–28; Ex. 1002 ¶¶154–155. That is the same upstream “atomizer exhaust aperture”/lower chamber relationship recited in claim 17. Pet. 36–42; Ex. 1016, 4:10–28, Figs. 1–3.

Goubet also teaches, or renders obvious, that the exhaust path is transverse to the fluid inlet. Goubet’s Figure 2 depicts the dip-tube oil inlet entering the

venturi/mixing region and outlet 11 providing a separate exit path from diffusion chamber 5 toward the reservoir/lower chamber, and Goubet expressly explains that compressed air creates vacuum at the oil inlet and carries droplets out through outlet 11. Ex. 1016, 4:15–24, Fig. 2; Ex. 1047 ¶41. The Board already credited Goubet’s transverse/perpendicular fluid-inlet relationship for the prior version of claim 17. Board Preliminary Guidance 12–13.

5. Alternatively, Goubet in view of Kaiser render obvious claim 17

As explained above for claim 16, the Petition’s stated rationale for applying Kaiser, which addresses any “fluid dispersion” uniformity requirement by relying on known principles of droplet-size distribution control, remains unchanged and is not affected by the added limitations of claim 17. Because claim 17 retains all limitations of original claim 5 already shown unpatentable in the Petition, claim 17 is also unpatentable over Goubet in view of Kaiser.

D. Grounds 3 and 4 — Claim 17 Is Obvious Over Gao-2 (and, Alternatively, Gao-2 in View of Goubet)

Claim 17 remains unpatentable over Gao-2 for the same reasons set out in the Petition as to the unchanged limitations. Claim 17 carries forward original claim 5 and additional limitations. These newly added limitations are taught by Gao-2, as explained below.

1. **“said atomizer assembly comprises an atomizer air inlet channel, a fluid inlet, a mixing chamber, and an atomizer exhaust aperture”**

Gao-2 also teaches this limitation. The Petition maps Gao-2’s vent holes 3215/airflow path to the atomizer air inlet channel, liquid suction tube/connector 33/325 and liquid suction hole 3224 to the fluid inlet, the chamber within rotating core 322 (annotated above) to the mixing chamber, and spray outlet 3231 to the atomizer exhaust aperture. Pet. 56–60; Ex. 1042 ¶¶[0036]–[0040], Figs. 7, 10; Ex. 1002 ¶¶183–191.

2. **“said fluid inlet is in fluid communication with the operative fluid in the container and comprises an opening into said mixing chamber, said opening disposed along said compressed-air flow path such that said fluid inlet is substantially perpendicular to said compressed-air flow path as the compressed air flows across said opening”**

Gao-2 also teaches this limitation. Gao-2 discloses liquid suction tube 33, connector 325, liquid suction channel 3216, and liquid suction hole 3224, which provide fluid communication between the essential oil bottle and the atomization core. Ex. 1042 ¶¶[0035]–[0036], Figs. 7, 10. Gao-2 discloses high-speed airflow creating negative pressure near the outlet of liquid suction hole 3224, drawing oil into the atomization region where it mixes with airflow. Ex. 1042 ¶[0036]. The Board already preliminarily agreed that Gao-2’s Figure 7 shows the relevant fluid inlet structure perpendicular to the flow path. Board Preliminary Guidance 16–18; Ex. 1042 ¶¶[0036]–[0038], Fig. 7.

3. “said mixing chamber disposed along said compressed-air flow path after said atomizer air inlet channel and before said atomizer exhaust aperture”

Gao-2 teaches the same ordering. Airflow passes from air inlet channel 311 through vent holes 3215 and guide grooves 3225 into the atomization/mixing chamber, where oil is drawn through liquid suction hole 3224 and mixed with airflow, before discharge through spray outlet 3231. Ex. 1042 ¶¶[0036]–[0040], Figs. 7, 10; Ex. 1047 ¶46; Pet. 56–60.

4. “said atomizer exhaust aperture is spaced from said discharge port and opens laterally from said mixing chamber into said lower chamber along an exhaust path that is transverse to said fluid inlet”

Gao-2 likewise teaches the claimed spacing and lower-chamber relationship. Gao-2’s spray outlet 3231 is the atomizer exhaust aperture because oil mixes with airflow and is atomized before being sprayed through spray outlet 3231. Ex. 1042 ¶[0036], Fig. 10; Pet. 56–60. Gao-2’s mist outlet 351 is the discharge port because, after mist enters the lower chamber and passes upward through mist passage holes 315 and the upper chamber, it exits through mist outlet 351 into the surrounding airspace. Ex. 1042 ¶¶[0031]–[0034], Fig. 5; Pet. 53–54. Thus, spray outlet 3231 is spaced from discharge port 351 and opens from the atomizer/mixing region into the lower chamber before downstream discharge. Ex. 1042 ¶¶[0031]–[0036], Figs. 5, 10; Pet. 53–62.

Gao-2 also teaches the transverse relationship. Gao-2's liquid suction path enters through connector 325/channel 3216/hole 3224, while airflow passes through vent holes 3215 and guide grooves 3225 and the mixture exits through spray outlet 3231. Ex. 1042 ¶¶[0036]–[0038], Figs. 7, 10; Ex. 1047 ¶46. The Board preliminarily agreed that Gao-2's Fig. 7 shows a perpendicular fluid inlet structure, and the same geometry supports the revised claim's "transverse to said fluid inlet" exhaust path. Board Preliminary Guidance 16–18; Ex. 1042 ¶¶[0036]–[0038], Figs. 7, 10.

5. Alternatively, Gao-2 in view of Goubet render obvious Claim 17

To the extent Patent Owner contends Gao-2 does not expressly disclose every aspect of the newly added limitations, Goubet reinforces Gao-2's suction-based atomizer architecture and transverse fluid-inlet relationship. Goubet discloses compressed air flowing into a diffusion chamber, drawing oil through an oil inlet by vacuum, mixing air and oil, and exhausting droplets through outlet 11 before final discharge through outlet 16. Ex. 1016, 4:10–28, Fig. 2. Gao-2 discloses the same suction-based mixing principle, with oil drawn through liquid suction hole 3224 and discharged through spray outlet 3231 into the lower chamber before exiting through mist outlet 351. Ex. 1042 ¶¶[0030]–[0040], Figs. 5, 7, 10.

V. CONCLUSION

For the foregoing reasons, Petitioner respectfully requests that the Board deny Patent Owner's Revised MTA.

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Respectfully submitted,

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CERTIFICATE OF SERVICE (37 C.F.R. § 42.6(e)(4))

The undersigned hereby certifies that a copy of the accompanying Petitioner's Opposition to the Revised Motion to Amend and all accompanying exhibits have been served on June 25, 2026, via electronic mail directed to the following counsel of record for the Patent Owner:

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