

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

AROMA360, LLC,
PETITIONER,

v.

AIR ESSSENTIALS, INC.
PATENT OWNER.

Case IPR2025-00706
Patent 10,583,449

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

LIST OF EXHIBITS

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Exhibit 1007	U.S. Patent Publication 2009/0317504 (hereinafter, “Rajala”)
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Exhibit 1012	Chinese Utility Model Patent 201832737 (hereinafter, “Gao”)
Exhibit 1013	Certified English-language Translation of Gao
Exhibit 1014	Sebastian Kaiser et al., <i>The Electrospray and Combustion at the Mesoscale</i> , 51 J. Mass Spectrom. Soc. Jpn. 42-49 (2003)
Exhibit 1015	French Patent Publication 2886160 (hereinafter, “Goubet”)
Exhibit 1016	Certified English-language Translation of Goubet

Exhibit No.	Description
Exhibit 1017	Amended Complaint filed in <i>Air Essentials, Inc. v. Aroma360, LLC</i> Case No. 1:24-cv-20594-KMW (SD. Fla) (originally filed on Feb. 15, 2024)
Exhibit 1018	Joint Claim Construction Statement filed in <i>Air Essentials, Inc. v. Aroma360, LLC</i> Case No. 1:24-cv-20594-KMW (SD. Fla).
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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”)
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 No.	Description
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)
Exhibit 1035	Peiss C.N. <i>Evaporation of small water drops maintained at constant volume</i> , J. APPL. PHYS. 65, 5235-5237 (1989)
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)
Exhibit 1039	Patent Owner's Response to Petitioner's Preliminary Invalidity Contentions in <i>Air Esscentials, Inc. v. Aroma360, LLC</i> Case No. 1:24-cv-20594-KMW (SD. Fla)
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Exhibit No.	Description
Exhibit 1041	[Reserved]
Exhibit 1042	[Reserved]
Exhibit 1043	[Reserved]
Exhibit 1044	Joint Motion to Stay Pending Inter Partes Review in <i>Air Essentials, Inc. v. Aroma360, LLC</i> Case No. 1:24-cv-20594-KMW (SD. Fla) (April 7, 2025)
Exhibit 1045	Order Granting Motion to Stay Pending Inter Partes Review in <i>Air Essentials, Inc. v. Aroma360, LLC</i> Case No. 1:24-cv-20594-KMW (SD. Fla) (April 8, 2025)
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	[Reserved]

I. INTRODUCTION

Petitioner opposes Patent Owner's Contingent Motion to Amend ("Motion") to substitute claims 20 and 21 for challenged independent claims 1 and 7.

First, Patent Owner's Motion does not comply with the requirements for a motion to amend under 37 C.F.R. § 42.121(b). Patent Owner does not show written-description support for substitute claims 20 and 21 "as a whole." Instead, Patent Owner offers only a table of "New Claim Recitation[s]" and expressly states those citations are "not considered exhaustive nor meant to limit the meaning or construction" of the corresponding claim terms. PO Mot. to Amend 6–7. That threshold defect alone warrants denial of entry. *Lectrosonics, Inc. v. Zaxcom, Inc.*, IPR2018-01129, Paper 15 at 4 (PTAB Feb. 25, 2019) (precedential); 37 C.F.R. § 42.121(b).

Second, the amendments do not cure unpatentability. Substitute claim 20 retains original claim 1 and adds only a former-claim-3 drip-tube limitation. Substitute claim 21 retains original claim 7 and adds only a fluid-inlet / air-flow relationship already addressed in the Petition in connection with original claim 8. The unchanged limitations remain unpatentable for the reasons already set out in the Petition, and the added limitations are likewise taught, or at minimum rendered obvious, by the same asserted prior art.

II. THE AMENDMENTS ARE PROCEDURALLY DEFICIENT

A motion to amend must comply with 35 U.S.C. § 316(d) and 37 C.F.R. § 42.121, including showing written-description support and identifying support in earlier-filed applications for benefit claims. The Board’s precedential *Lectrosonics* decision requires that a motion to amend “set forth written description support for each proposed substitute claim as a whole, and not just the features added by the amendment.” *Lectrosonics, Inc. v. Zaxcom, Inc.*, IPR2018-01129, Paper No. 15 at 8 (PTAB Feb. 25, 2019) (precedential); *see also Apple Inc. v. Personalized Media Communications LLC*, IPR2016-00754, Paper No. 41 at 65 (PTAB Sept. 19, 2017) (“The requirement that the motion to amend must set forth the support in the original disclosure of the patent is with respect to each claim, not for a particular feature of a proposed substitute claim. In other words, it is inadequate to show written description support for just the claim feature added by the proposed substitute claim.”).

Here, Patent Owner failed to meet this requirement. Patent Owner’s written-description support is a table listing “New Claim Recitation[s],” which only cites alleged support for the new limitations. Patent Owner does not identify support for the remainder of substitute claims 20 and 21, which recite a multi-component “fluid dispersion assembly” including a diffusion unit, a diffusion chamber, a discharge port, a diffusion assembly with an atomizer assembly, a mixing chamber, and multiple functional relationships. Contrary to the Board’s clear requirement, Patent

Owner’s Motion does not “set forth written description support for each proposed substitute claim as a whole,” and instead limits such support to “just the features added by the amendment.” *Lectrosonics*, Paper No. 15 at 8. Thus, Patent Owner failed to satisfy the “procedural obligations imposed by the Director” and the proposed amendments cannot be “entered into the IPR.” *Aqua Prods., Inc. v. Matal*, 872 F.3d 1290, 1306 (Fed. Cir. 2017) (en banc); *see also id.* at 1308 (“proposed amended claims are ‘entered into’ and become part of the ‘inter partes review instituted under this chapter’ so long as the patentee shows that they are nonbroadening, *supported by the specification...*”) (emphasis added).

Patent Owner’s omission is confirmed by the table and footnote in the Motion, which state that the support citations are only for the “New Claim Recitation[s]” and are “not considered exhaustive nor meant to limit the meaning or construction of the corresponding claim terms.” PO Mot. to Amend 6–7. Patent Owner’s non-exhaustive list aimed only at new limitations does not satisfy the Board’s requirement. Thus, the Board need not reach the question of patentability and the Motion should be denied for failure to satisfy 37 C.F.R. §42.121(b).

III. THE SUBSTITUTE CLAIMS ARE UNPATENTABLE OVER PRIOR ART

Patent Owner’s Motion proposes substitute claims 20 (substituting challenged claim 1) and 21 (substituting challenged claim 7) by adding new limitations directed to (i) a “drip tube disposed in an interconnecting relation” between an enclosed

diffusion chamber and a container (substitute claim 20) and (ii) a fluid-inlet/air-flow relationship (substitute claim 21). PO Mot. to Amend 10–12; Ex. 1001, claims 1, 3, 7–8. Those amendments do not cure unpatentability because (a) the substitute claims retain the same core structure and requirements already mapped in the Petition, limitation-by-limitation, to the asserted prior art, and (b) the newly added limitations are likewise taught or rendered obvious by the same asserted prior art. Pet. 20–73. Substitute claims 20 and 21 remain obvious over the grounds set out in the Petition, as explained below.

A. Grounds 1 and 2 – Substitute Claims 20 and 21 Are Obvious Over Sevy (and, Alternatively, Sevy In View of Gao)

1. The prior art teaches or renders obvious substitute claim 20.

Substitute claim 20 carries forward original claim 1 and adds only one final limitation. PO Mot. to Amend 10–11. The Petition already mapped original claim 1, limitation-by-limitation, to the asserted prior art under Grounds 1–4, and those showings continue to apply because the claim language is unchanged.

Regarding the new drip-tube limitation, substitute claim 20 adds “a drip tube disposed in an interconnecting relation between said enclosed diffusion chamber and the container.” PO Mot. to Amend 10–11. Sevy teaches that added limitation, or at least renders it obvious. Sevy discloses (i) the chamber/container interface and (ii) the same practical issue the alleged “drip tube” addresses: accumulated liquid returns toward the reservoir. Sevy explains that atomizer 16 may secure to reservoir 18

“such as by threads or the like,” i.e., at the same diffusion-unit/container interface targeted by Patent Owner’s amendment. Ex. 1009 ¶ 41; Pet. 37. Sevy also explains that, after droplets strike wall 121, some droplets agglomerate and “drip down toward the reservoir 18.” Ex. 1009 ¶ 82; Pet. 31–33. Thus, Sevy already discloses the relevant container/chamber interface and the return of accumulated liquid toward the container.

A POSITA would recognize that, once a reference discloses liquid accumulation and dripping back toward the reservoir, adding a simple drip-return tube or drain feature at that same interface is a routine, predictable design refinement. It directs the return flow. It reduces mess and pooling. It improves repeatability. It also reduces unintended liquid contact with internal components to enhance longevity (e.g., by mitigating corrosion or residue buildup). This refinement would not change the diffuser’s principle of operation. Ex. 1047, ¶ 38.

Dr. Micklow’s testimony reinforces the predictability and routine nature of such modifications in this art. He characterized venturi-driven consumer fragrance diffusers as “not rocket science,” “about as simple as you can get,” and “low-end engineering work.” Ex. 1046, 59:16–19; 60:16–24. In that context, providing a basic drip-return path at the disclosed interface to manage liquid that Sevy already teaches will drip back toward the reservoir is exactly the type of straightforward engineering choice a POSITA would implement with a reasonable expectation of success. *Id.*; *see also* Ex. 1047, ¶ 38.

Dr. Micklow’s testimony reinforces the predictability and routine nature of such modifications in this art. He characterized venturi-driven consumer fragrance diffusers as “not rocket science,” “about as simple as you can get,” and “low-end engineering work” to a POSITA. Ex. 1046, 59:16–19; 60:16–24. In that context, providing a basic drip-return path at the disclosed interface to manage liquid that Sevy already teaches will drip back toward the reservoir is exactly the type of straightforward engineering choice a POSITA would implement with a reasonable expectation of success. *Id.*; *see also* Ex. 1047, ¶ 38

Ground 2, which relies on Gao as another basis for the “fluid dispersion” term, would render the claims obvious for the same reason as Ground 1. Pet. 38–42. In the proposed combination, nothing in Gao displaces Sevy’s container/chamber interface structure or its disclosed return of agglomerated liquid toward the reservoir.

2. The prior art teaches or renders obvious substitute claim 21.

Substitute claim 21 carries forward original claim 7 verbatim and adds only one final clause. The Petition already showed original claim 7 unpatentable under Grounds 1 and 2. *See, e.g.*, Pet. 36, 44. Because substitute claim 21 leaves original claim 7 otherwise unchanged, those existing showings continue to apply to the unchanged limitations of substitute claim 21.

Regarding the added clause, substitute claim 21 adds “said fluid inlet disposed relative to said atomizer air inlet channel such that compressed air from the compressed air source flows over said fluid inlet and into said mixing chamber.” PO

Mot. to Amend 11–12. Original claim 8 depends from claim 7 and further recites that “said fluid inlet [is] disposed relative to said atomizer air inlet channel such that compressed air from the compressed air source flows over said fluid inlet and into said mixing chamber.” Ex. 1001, claim 8. The Petition separately mapped that claim-8 relationship to Sevy. Pet. 36.

Sevy teaches that channel 114 carries air from passage 50 toward orifice 118. Ex. 1009 ¶¶ 79–82; Pet. 27–30. Cavity 116 is open from below to siphon tube 96. Ex. 1009 ¶¶ 79–82. When pressure is reduced in cavity 116, liquid is drawn from reservoir 18 through siphon tube 96 to orifice 118 and mixed with the high-speed air stream and the mixture exits through exit orifice 119. Ex. 1009 ¶¶ 79–82; Pet. 27–30. In view of that disclosure, a POSITA would find it obvious to arrange the relative placement of the siphon tube opening and the air-flow path at orifice 118 so that compressed air flows over (or across) the fluid-inlet opening and into the mixing cavity 116 because that is the predictable configuration required for suction-based entrainment and mixing in the disclosed eductor architecture. Ex. 1047, ¶¶ 39–40.

Ground 2, which relies on Gao as an additional basis for the “fluid dispersion” limitation, would render the claims obvious for the same reason as Ground 1. In the proposed combination, nothing in Gao displaces Sevy’s fluid inlet or air path. Pet. 38–42.

B. Grounds 3 and 4 – Substitute Claim 20 Is Obvious Over Goubet (and, Alternatively, Goubet In View of Kaiser)

1. The prior art renders obvious substitute claim 20.

Ground 3 likewise renders substitute claim 20 unpatentable. Goubet discloses diffuser head 4 is attached to reservoir 2. Ex. 1016, 3:26–27, 4:1–2, 4:15–24; Pet. 52–55. Dip tube 8 draws essential oil from the reservoir into diffusion chamber 5 while compressed air and essential oil mix within diffusion chamber 5 with the resulting oil droplets exiting diffusion chamber 5 through outlet 11 “towards the inside of the reservoir 2.” *Id.* Goubet thus already discloses the same head/container interface and a droplet-flow path directed back toward the reservoir interior. At minimum, adding a drip-return tube at that same interface would have been obvious. Ex. 1047, ¶ 38.

A POSITA would recognize that once a reference discloses a diffuser head/reservoir interface and a droplet-flow path back toward the reservoir interior (as Goubet does), adding a simple drip-return tube or drain feature at that same interface is a routine, predictable refinement. Ex. 1047, ¶ 38. Such a change would predictably direct the return flow, reduce mess and pooling, improve repeatability, and limit liquid contact with internal components to enhance longevity (e.g., by mitigating corrosion or residue buildup), all without changing the diffuser’s principle of operation. Ex. 1047, ¶ 38.

Ground 4, which relies on Kaiser as an additional basis for the “fluid dispersion” limitation, would render the claims obvious for the same reason as Ground 3. In the proposed combination, nothing in Kaiser displaces Goubet’s

disclosed head/reservoir structure. Pet. 38–42.

2. The prior art renders obvious substitute claim 21.

Ground 3 also renders substitute claim 21 unpatentable. Original claim 8 depends from claim 7 and further recites that “said fluid inlet [is] disposed relative to said atomizer air inlet channel such that compressed air from the compressed air source flows over said fluid inlet and into said mixing chamber.” Ex. 1001, claim 8. The Petition mapped that relationship to Goubet. Pet. 54–55.

Goubet discloses that compressed air penetrates the diffuser head via air inlet channel 9, enters diffusion chamber 5 through compressed air inlet 6, and flows through the venturi region (cone 7). Ex. 1016, 4:15–16; 3:31–4:2; Fig. 2. Goubet further discloses that the chamber includes an oil inlet at the upper end 10 of dip tube 8 connected to essential oil 3 in reservoir 2. Ex. 1016, 3:31–4:2; Fig. 2. Goubet explains that “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,” i.e., the compressed air flow across the oil-inlet opening creates suction that draws oil into the chamber where air and oil are mixed. Ex. 1016, 4:19–22. Figure 2 depicts the compressed-air flow path (arrows F) flowing past the dip-tube inlet (10) at the venturi region and into diffusion chamber 5. Ex. 1016, Fig. 2. In view of Goubet’s disclosure and Figure 2, a POSITA would understand that the fluid inlet (dip tube end 10) is disposed relative to the air-inlet path such that compressed air flows over (or across) the fluid inlet and into the mixing region (diffusion chamber 5) where air

and oil mix. Ex. 1047, ¶¶ 39, 41; Ex. 1016, 4:15–22; Fig. 2.

Ground 4 only makes that showing stronger. Kaiser was cited only as an additional basis for droplet-size uniformity. Pet. 58–60. Because Goubet itself teaches the relevant fluid-inlet/air-flow relationship, Goubet in view of Kaiser does as well since the proposed modification to add additional enclosures does not alter this relationship in Goubet.

IV. CONCLUSION

For the foregoing reasons, Petitioner respectfully requests that the Board deny entry of Patent Owner’s proposed substitute claims for failing to comply with the regulatory requirements. Even if entered, the Board should deny Patent Owner’s Motion to Amend as the prior art renders the proposed substitute claims obvious.

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CERTIFICATE OF SERVICE UNDER 37 CFR § 42.6(e)(4)

The undersigned hereby certifies that a copy of the accompanying Petitioner's Opposition to the Motion to Amend and all accompanying exhibits have been served on April 15, 2026, via electronic mail directed to the following counsel of record for the Patent Owner:

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