UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

AROMA360, LLC
Petitioner,

v.

AIR ESSCENTIALS, INC.
Patent Owner.

Case IPR 2025-00705
Patent 9,527,094

PETITION FOR *INTER PARTES* REVIEW

OF U.S. PATENT NO. 9,527,094

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I. INTRODUCTION

Aroma360, LLC ("Petitioner") requests *Inter Partes* Review ("IPR") of claims 7-9 and 11 ("challenged claims") of U.S. Patent No. 9,527,094 ("the '094 Patent") (Ex-1001), assigned to Patent Owner Air Esscentials, Inc. ("PO").

II. MANDATORY NOTICES UNDER 37 C.F.R. § 42.8

Petitioner satisfies each requirement for IPR of the '094 Patent pursuant to 37 C.F.R. § 42.8(a)(1).

A. Real Party in Interest Under 37 C.F.R. § 42.8(b)(1)

The Real Party in Interest is AROMA 360, LLC having a principal place of business at 2058 N.W. Miami Court, Miami, FL 33127.

B. Related Matters Under 37 C.F.R. § 42.8(b)(2)

PO has asserted the '094 Patent against Petitioner in *Air Esscentials, Inc. v. Aroma360, LLC*, Case No. 1:24-cv-20594-KMW (S.D. Fla).

C. Lead and Back-Up Counsel Under 37 C.F.R. § 42.8(b)(3)

Petitioner is represented by the following counsel:

Lead Counsel	Backup Counsel
James P. Murphy Reg. No. 55,474 Polsinelli PC 1000 Louisiana Street Suite 6400 Houston, Texas 77002 Tel: (713) 374-1631 jpmurphy@polsinelli.com	William A. Di Bianca Reg. No. 58,653 Polsinelli PC 600 Third Avenue 42nd Floor New York, NY 10016 Tel: (212) 803-9955 bdibianca@polsinelli.com Jordan T. Riviello Reg. No. 72,515 Polsinelli PC 600 Third Avenue 42nd Floor New York, NY 10016 Tel: (212) 413-2898 jriviello@polsinelli.com Joshua L. Rayes Reg. No. 74,645 Polsinelli LLP Three Embarcadero Center Suite 2400 San Francisco, CA 94115 Tel: (415) 248-2141 jrayes@polsinelli.com

Pursuant to 37 C.F.R. § 42.10(b), Powers of Attorney have been filed with this Petition.

D. Service Information Under 37 C.F.R. § 42.8(b)(4)

Petitioner consents to electronic service by email at the above email addresses provided for lead and backup counsel.

III. FEES AUTHORIZATION

Pursuant to 37 C.F.R. § 42.15(a) and § 42.103(a), the USPTO is authorized to charge any and all fees for this Petition, not submitted herewith, to Deposit Account No. 50-1662.

IV. GROUNDS FOR STANDING

Petitioner certifies that the ’094 Patent is available for IPR, and that Petitioner is not barred or estopped from requesting review. 37 C.F.R. § 42.104(a). Petitioner agreed to waive service of the underlying infringement complaint of the ’094 Patent on March 18, 2024, and the waiver was then filed with the district court on March 27, 2024. Ex-1019. This Petition was filed within one year of the date of that waiver of service. *See Motorola Mobility LLC v. Arnouse*, IPR2013-00010, Paper 20 at 6 (P.T.A.B. Jan. 30, 2013) (informative) (“in the situation where the petitioner waives service of a summons, the one-year time period begins on the date on which such a waiver is filed”).

V. PRECISE RELIEF REQUESTED

Petitioner requests review and cancellation of claim 7-9 and 11 as unpatentable based on the following grounds, supported by a declaration from Dr. Christopher White. Ex-1002; Ex-1003.

Ground	Prior Art	Basis	Claims Challenged
1	Sevy	§103	7-9 and 11

2	Sevy in view of Zeng	§103	7-9 and 11
3	Goubet	§103	7-9 and 11
4	Goubet in view of Kaiser	§103	7-9 and 11
5	Gao	§103	7-9 and 11
6	Gao in view of Zeng	§103	7-9 and 11

VI. THE CHALLENGED PATENT

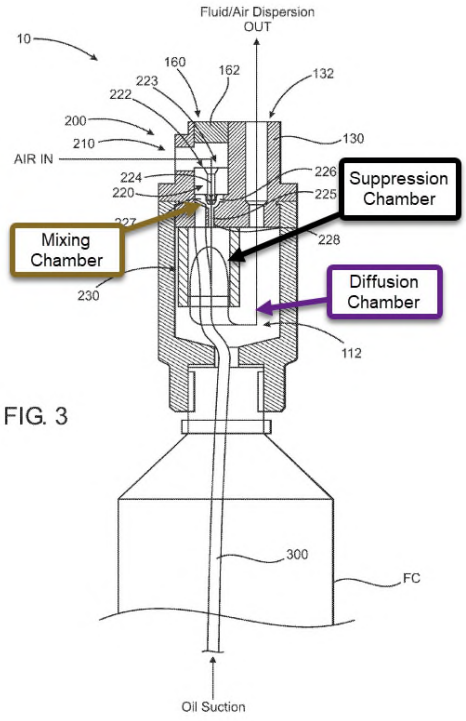
The ’094 Patent, assigned to Air Esscentials, Inc. (“PO”), is directed to a fluid dispersion assembly that is powered by compressed air and designed to deliver fluids, such as fragrant oils and essential oils, into the air. Ex-1001, 1:6-51. The ’094 Patent contends that known fluid dispersion assemblies of this type are “often unacceptably noisy” and states there is a need for a fluid dispersion assembly that operates quietly while generating a fluid dispersion having a “uniform particle size distribution.” *Id.*, 1:24-31.

However, devices configured to disperse fluid particles of substantially uniform size, have been well known for decades, and are colloquially referred to as monodisperse devices. *See, e.g.*, Ex-1002, ¶116. Noise was also a known issue for these devices and many such devices included structures, such as baffles, to reduce noise during operation. *See, e.g.*, Ex-1002, ¶¶79-90.

A. Summary of the Disclosure of the ’094 Patent

The ’094 Patent describes several embodiments of the fluid dispersion assembly, each with distinct configurations designed to disrupt the flow of fluid dispersion and,

as a result, reduce noise generated during operation. Ex-1001. In a first embodiment, as annotated in FIG. 3,[1] the fluid dispersion assembly includes "a suppression chamber." *Id.*, 5:62-67. "[T]he suppression chamber 232 receives the fluid dispersion from the mixing chamber 226 … [and] helps to suppress the noise generated during operation of the fluid dispersion assembly 10 as it *disrupts the path of flow of the fluid dispersion* out of atomizer assembly 200 and into diffusion chamber 112, and therefore, *disrupts and dampens sound waves associated therewith*." (emphasis added)[2]. *Id*., 6:1-8.



Ex-1001, FIG. 3

[1] All colorizations and/or annotations of the '094 Patent and/or prior art figures in this Petition are provided by Petitioner unless otherwise noted.

[2] Emphasis always added by Petitioner unless otherwise noted.

In a second and alternative embodiment, shown below in FIG. 5, fluid dispersion assembly 10 has a "modified diffusion chamber 112'" that is structured in an "upside down L-shaped configuration" defining an "axial portion 114" and a "transverse portion 115." *Id.*, 7:1-12. Thus, "fluid dispersion discharged … into diffusion chamber 112' is interrupted and redirected by virtue of axial portion 114 and transverse portion 115 … [and] *serves to suppress or dampen sound waves generated therein, in a similar manner as the suppression chamber 232* of the previously disclosed embodiments." *Id.*, 7:24-37.

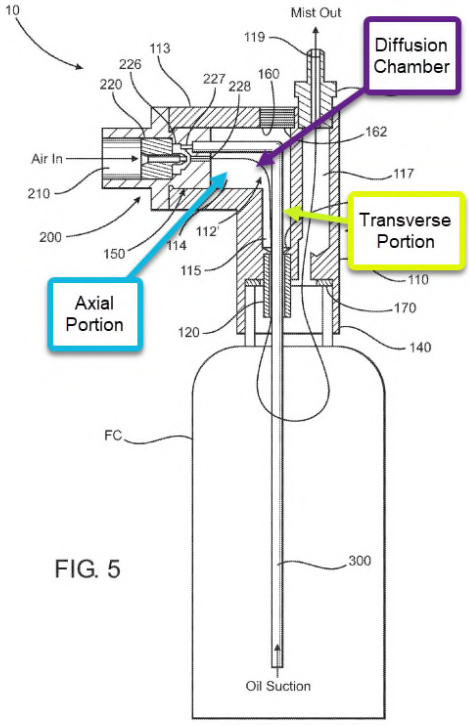


FIG. 5

Ex-1001, FIG. 5

In a third embodiment, as depicted in FIG. 2, the fluid dispersion assembly 10 "includes a silencer assembly 134 in communication with the discharge port 132."

Id., 7:31-34. "The silencer assembly 134 comprises a baffle 136 … structured and disposed to further disrupt the flow of the fluid dispersion through the fluid dispersion assembly." *Id.*, 6:49-57. "Once again, as disclosed above with respect to the suppressor assembly 230, *the disruption in the flow of the fluid dispersion through the silencer assembly 134 also creates a disruption of the sound waves associated therewith.*" *Id.*, 6:64-7:4.

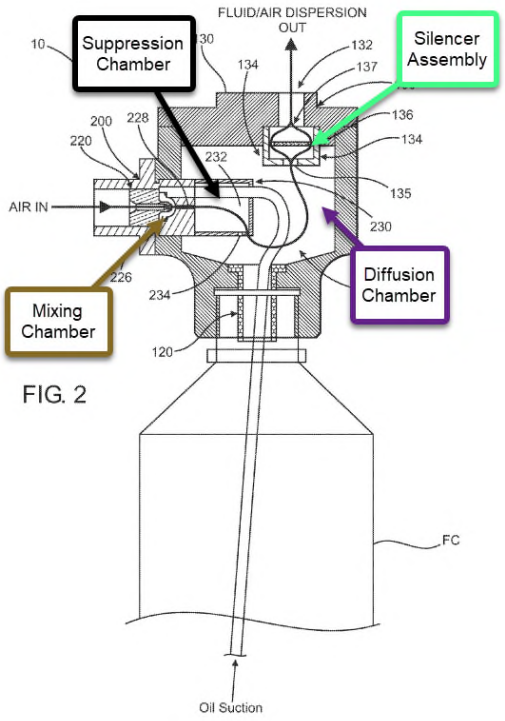


FIG. 2

Ex-1001, FIG. 2

B. Priority Date of the '094 Patent

The '094 Patent was filed on September 3, 2015, as Application No. 14/844,650 ("the '650 Application"). Ex-1001, INID Codes (21), (22); *see also* Ex-1004. The '094 Patent is a continuation of Application No. 13/383,364 ("the '364

Application") filed March 15, 2013, now U.S. Patent No. 9,126,215 ("the '215 Patent"). EX1001, INID Codes (60), (63); *see also* Ex-1005. The '215 Patent claims the benefit of U.S. Provisional Patent Application No. 61/694,500 ("the Provisional Application") filed August 29, 2012. Ex-1006. Therefore, the '094 Patent is entitled to a priority date no earlier than August 29, 2012. All references relied upon in this Petition are thus prior art to the '094 Patent.

C. Summary of the Prosecution of the '094 Patent

The Examiner did not issue any prior art rejections during prosecution of the '094 Patent. The '650 Application matured into the '094 Patent after Applicant filed a Terminal Disclaimer with respect to the priority patent, the '215 Patent. Ex-1004, pgs. 68-71; *Id.*, 79-80.

D. Summary of the claimed subject matter of the '094 Patent

Challenged claims 7-9 and 11 pertain to the "silencer assembly" embodiment depicted below in FIG. 2 of the '094 Patent.[3] Claim 7 is the only independent claim challenged herein. Claim 7 does not require a "suppression chamber," despite the

[3] In the single office action issued during prosecution of the priority '364 Application, Rajala was cited for teaching a monodispersed spraying apparatus and Dorendorf was cited for teaching a sound dampening feature. Ex-1005; Ex-1007; Ex-1008. The '364 Application matured into the '215 Patent after PO amended the only independent claim directed to the embodiment presented in FIG. 2 to include both the "suppression chamber" and the "silencer chamber" features. *See also* Ex-1002, ¶¶46-52.

’094 Patent *only* describing or illustrating this embodiment as “further includ[ing] a silencer assembly.” Ex-1001, 7:49-52.

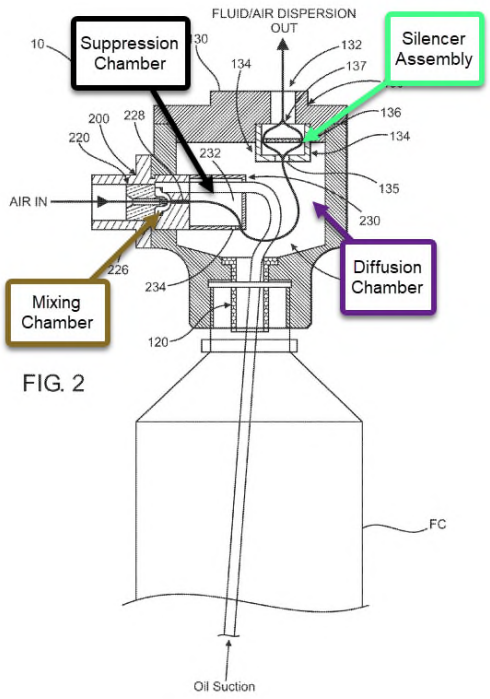


FIG. 2

Ex-1001, FIG. 2

Claim 7 recites, *inter alia*, “a silencer assembly having a silencer inlet, a silencer outlet, and a baffle, wherein said baffle partially restricts movement of the fluid dispersion through said silencer chamber from said silencer inlet to said silencer outlet, thereby dampening sound waves generated during operation of said fluid dispersion assembly.” Ex-1001 (claim 7). In the parallel district court litigation, PO contends that the term “silencer chamber” contains an inadvertent clerical error and argues that the term should be construed to mean “silencer assembly” in attempt to read the term “silencer chamber” out of the claim and broaden its scope. Ex-1018.

VII. LEVEL OF ORDINARY SKILL IN THE ART

This Petition is supported by the declaration of Dr. Christopher White. *See generally* Ex-1002. In the declaration, Dr. White opines on the knowledge of a POSITA with respect to the issues raised herein. *Id*.

In view of the subject matter of the ’094 Patent, a person of ordinary skill in the art (“POSITA”) would have 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 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. *Id.*, ¶¶37-44. Dr. White meets this level of skill based on his education and experience. *Id.*; *see also* Ex-1003 (Dr. White’s CV).

VIII. CLAIM CONSTRUCTION

For purposes of this IPR, Petitioner views the scope of the challenged claims in a manner consistent with PO’s broad infringement allegations and proposed claim constructions PO submitted in the parallel district court proceeding.[4] Ex-1017, Ex-1018, Ex-1039, Ex-1040. Petitioner does not believe any construction is necessary

[4] A *Markman* hearing is scheduled to occur on April 17, 2025. Petitioner may request leave to submit the district court’s claim construction in this proceeding as soon as it becomes available.

to determine the claims are obvious over the cited prior art.[5] *Wellman, Inc. v. Eastman Chem. Co.*, 642 F.3d 1355, 1361 (Fed. Cir. 2011) ("claim terms need only be construed to the extent necessary to resolve the controversy").

IX. STATE OF TECHNOLOGY & SUMMARY OF THE PRIOR ART

A. State of Technology at the Time of the Alleged Invention

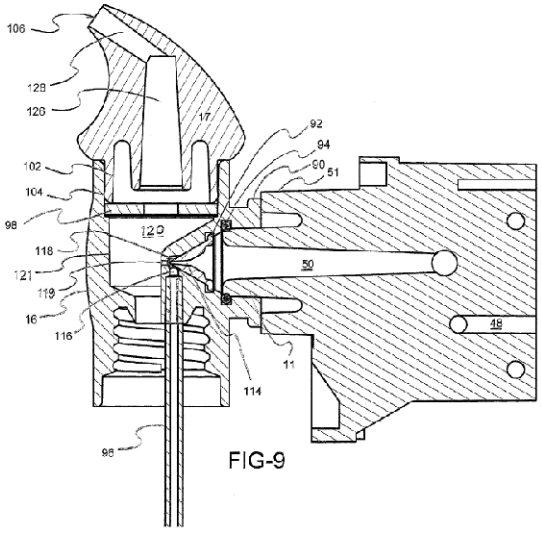
Fluid dispersion assemblies have been used for decades. Ex-1002, ¶¶73-78 (discussing Ex-1020, Ex-1021, Ex-1022, Ex-1038). Such assemblies have also long used compressed air and utilized the venturi effect to aspirate fluid upward from a reservoir. *Id.*, *see also id.*, ¶¶79-123 (discussing, *inter alia*, EX1031 and EX1032). While there are several design considerations for fluid dispersion assemblies, the considerations most relevant to this IPR—(1) size and uniformity of droplets, and (2) minimizing noise associated with compressed air—were known long before the '094 Patent. Ex-1002, ¶¶73-123. Advantages of producing small and substantially uniform droplets, as well as structural design mechanisms for producing the same, have been long studied and were well known before the invention of the '094 Patent. *See, e.g.*, Ex-1002, ¶¶ 91-123 (discussing, *inter alia*, Ex-1028, Ex-1029, Ex-1030, Ex-1033, Ex-1034, Ex-1035, Ex-1036, Ex-1037). It has also been long known how

[5] Petitioner reserves the right to present its own construction of any claim of the '094 Patent, including constructions that disagree with PO's infringement allegations and proposed constructions. *See* Ex-1018 (providing both Parties' proposed construction of certain claim terms).

to reduce noise in fluid dispersion assemblies, including by using a baffle. *See, e.g.*, Ex-1002, ¶¶ 79-90 (discussing, *inter alia*, Ex-1023, Ex-1024, Ex-1025, Ex-1026, Ex-1027). Thus, the benefits of the "silencer assembly" were well-known before the alleged invention of the '094 Patent, as were ways to achieve those benefits.

B. U.S. Patent Publication No. 2010/0084484 ("Sevy") (Ex-1009)

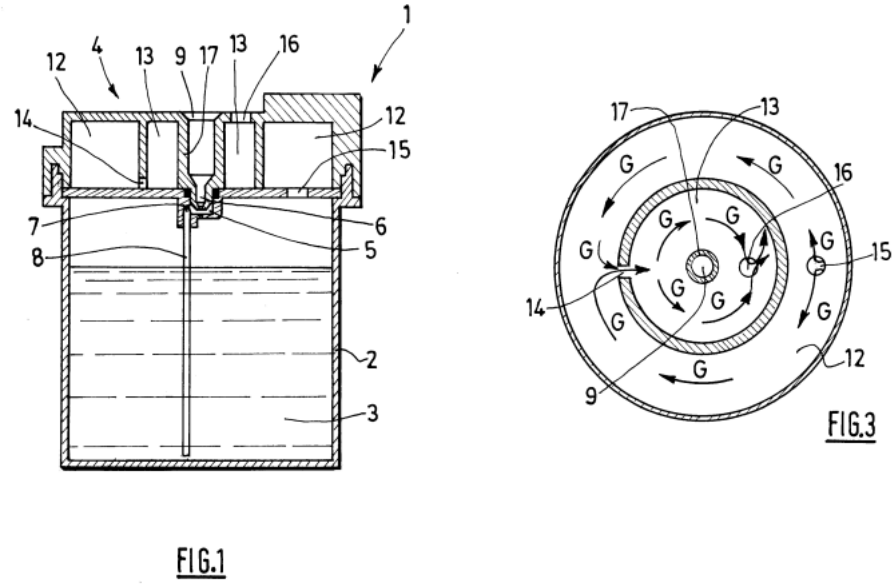
Sevy was published on April 8, 2010, and is prior art to the claims of the '094 Patent under 35 U.S.C. §102(b). Ex-1009, Cover. Sevy teaches an essential-oil atomizer, a cross-section of which is shown in FIG. 9 below, which includes a separator plate 98 (e.g., a baffle) defining apertures 99 for restricting droplets of a certain size, thereby limiting, or disrupting, the flow of fluid dispersion. *Id.*, ¶[0070].



Ex-1009, FIG. 9

C. French Patent Publication No. 2886160 ("Goubet") (Ex-1015)[6]

Goubet was published on December 1, 2006, and is prior art to the claims of the '094 Patent under 35 U.S.C. §102(b). EX-1016, Cover. Goubet teaches an essential oil diffuser that includes a diffusion head defining an outer enclosure 12 and an inner enclosure 13 that communicate with each other through a passage 14 to form a baffled path through which atomized droplets flow. Ex-1016, pgs. 4-5. The baffled path, as illustrated in FIGS. 2 and 3 below, breaks the atomized oil droplets into micro-droplets and diffuses the micro-droplets into ambient air. *Id.*, pgs. 4-5.



Ex-1015, FIGS. 1 and 3

[6] The certified translation of Goubet is provided as Ex-1016. Citations and quotations herein to Goubet will refer exclusively to this certified translation.

D. Chinese Utility Model Patent 201832737 ("Gao")[7] (Ex-1012)

Gao was published on May 18, 2011, and is prior art to the claims of the '094 Patent under 35 U.S.C. §102(b). Ex-1013, Cover. Gao teaches an atomizer, a cross-section of which is shown in FIG. 1 below, includes a baffle 3 such that the "mist can be controlled below 3 microns. *Id.*, ¶[0025], Abstract ("atomized particles are finer and more uniform, the aroma is more uniform, and the aroma diffusion area is large.").

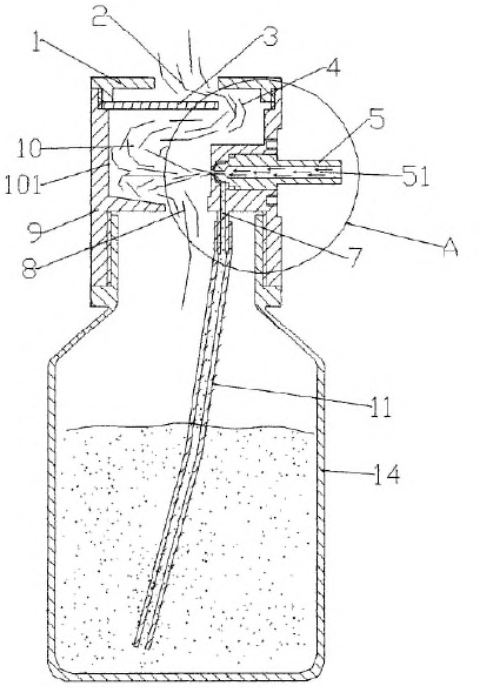


FIG. 1

Ex-1013, FIG. 1

[7] The certified translation of Gao is provided as Ex-1013. Citations and quotations herein to Gao will refer exclusively to this certified translation.

E. Taiwanese Patent Publication 200528150 ("Zeng")[8] (Ex-1010)

Zeng was published on September 1, 2005. Ex-1011, Cover. Zeng is prior art to the '094 Patent under 35 U.S.C. §102(b). As shown in FIG. 3, Zeng discloses an atomizer having a silencing function, specifically a "noise reduction head 20" that reduces the sound of the atomizer during operation. See EX 1011, pg. 3.

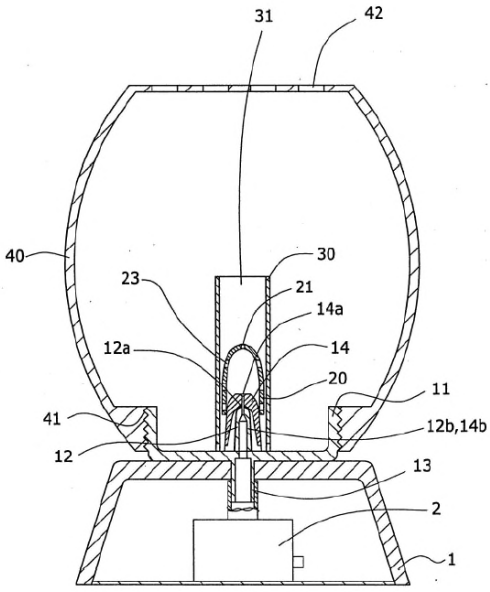


FIG. 3

Ex-1011, FIG. 3

F. Sebastian Kaiser et al., *The Electrospray and Combustion at the Mesoscale*, ("Kaiser") (Ex-1014)

Kaiser was published in 2003 (several years before the earliest priority date of the '094). Ex-1014, Cover. Therefore, Kaiser is prior art to the '094 Patent under

[8] The certified translation of Zeng is provided as Ex-1011. Citations and quotations herein to Zeng will refer exclusively to this certified translation.

35 U.S.C. §102(b). Kaiser describes that the correlation between droplet evaporation rate and uniform droplet size was a well understood phenomenon in the field, at the time of the invention. Ex-1014, pg. 43 ("critical to uniform evaporation and burning is a good control of the size distribution of the resulting aerosol.").

X. REASONS THE CHALLENGED CLAIMS ARE UNPATENTABLE UNDER 37 C.F.R. § 42.104(b)(4)

A. Overview of Argument

The '094 Patent relates to "a fluid dispersion assembly." Ex-1001, 1:6-10. Claim 7 is the sole independent claim challenged herein and is directed to a fluid dispersion assembly including an atomizer assembly and a silencer assembly designed to disrupt the flow of the fluid dispersion, and thus, reduce noise generated during operation. *Id.*, claim 7. Sevy, Goubet, and Gao each individually teach this subject matter in addition to the other limitations of the challenged claims.

Ground 1 addresses claims 7-9 and 11 in view of Sevy, which does not explicitly recite the phrase "substantially uniform droplets" as is required by the limitation "fluid dispersion." Yet, a POSITA would have found this limitation obvious in view of Sevy's teaching to provide an atomizer having "a better atomization or a smaller mean or average size of droplet in the distribution of atomized droplets." Ex-1009, ¶[0009]; *see also* Ex-1002, ¶¶91-118. Various features of Sevy's atomizer would produce this result. *See, e.g.* Ex-1002, ¶¶ 91-118. For example, Sevy discloses that when the droplets contact an internal wall of

atomizer 16 (*e.g.*, the diffusion chamber), "the droplets further atomize into a cloud containing many more droplets of much smaller size." Ex-1009, ¶[0067].

Sevy also does not recite the terms "silencer assembly" or "baffle." Yet, Sevy discloses a "separator plate" having apertures which disrupt the flow of fluid dispersion, and as such, a POSITA would appreciate that this structure is an orifice baffle plate that has a silencing effect.

Ground 2 addresses that if PO argues that the challenged claims are not obvious in view of Sevy alone, then they would also have been obvious over Sevy in view of Zeng's additional teaching of a noise reduction head. As such, the arguments for Ground 2 are substantially the same for the majority of the limitations in the challenged claims but provide a separate alternative basis to render obvious the "fluid dispersion" and "silencer assembly" limitations.

Ground 3 addresses claims 7-9 and 11 in view of Goubet. Goubet does not explicitly teach an atomizer that forms "substantially uniform droplets." Yet, this limitation is obvious in view of Goubet's teaching that the dual circular enclosures of the diffusion head are designed to move the droplets along a baffled path that allows "their size to be reduced as much as possible" to improve their diffusion in the ambient air. Ex-1016, pg. 2. This teaching at the very least suggests that the microdroplets are uniform in size as it is well-known that monodispersed droplets exhibit superior dispersion and diffusion properties. *See, e.g.*, Ex-1002, ¶118.

Ground 4 addresses that if PO argues that the challenged claims are not obvious in view of Goubet alone, then they would also have been obvious over Goubet in view of Kaiser, which teaches that substantially uniform atomized droplets were well-known. Ex-10014, pg. 43. Accordingly, if Goubet's diffusion head is found not to produce substantially uniform atomized droplets, a POSITA would have been motivated to add additional circular enclosures until such result was achieved in light of Kaiser. *See, e.g.*, Ex-1002, ¶¶297-309. As such, the arguments for Ground 4 are substantially the same for the majority of the limitations in the challenged claims but provide separate alternative basis to teach the "fluid dispersion" limitation.

Ground 5 addresses claims 7-9 and 11 in view of Gao, which does not explicitly recite noise reduction. Gao nevertheless teaches a "baffle plate 3," which disrupts fluid flow prior to discharge, and thus, teaches the claimed "silencer assembly." *See, e.g.*, Ex-1002, ¶¶310-379.

Ground 6 addresses that if PO argues that the challenged claims are not obvious in view of Sevy alone, then they would also have been obvious over Sevy in view of Zeng's additional teaching of a noise reduction head. As such, the arguments for Ground 6 are the same for most of the limitations in the challenged claims but provide an additional and alternative basis to render obvious the "fluid dispersion" and "silencer assembly" limitations. *See, e.g.*, Ex-1002, ¶¶380-389.

B. Ground 1: Claims 7-9 and 11 are Unpatentable Under 35 U.S.C. §103 as Obvious Over Sevy

1) Claim 7

7[PRE] 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:

To the extent the preamble is limiting, it is taught or suggested by Sevy. Ex-1002, ¶¶142-148. Sevy is titled and directed to an "integrated, essential-oil atomizer" for distributing essential oils into the atmosphere of a room. Ex-1009, ¶[0004]. The apparatus, as shown in annotated FIG. 1 below, includes an atomizer 16 that is secured to a reservoir 18, and a director 17 for discharging atomized liquids into the air. Ex-1009, ¶[0041].

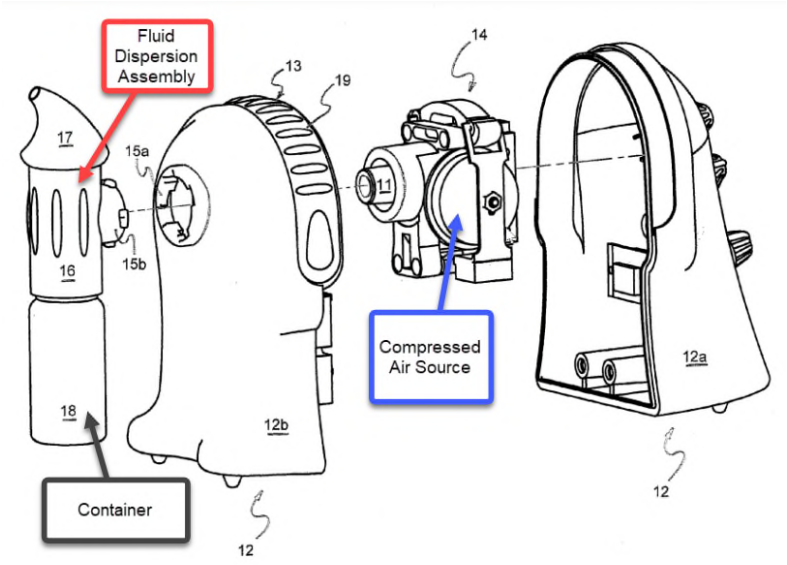


FIG-1

Ex-1009, FIG. 1

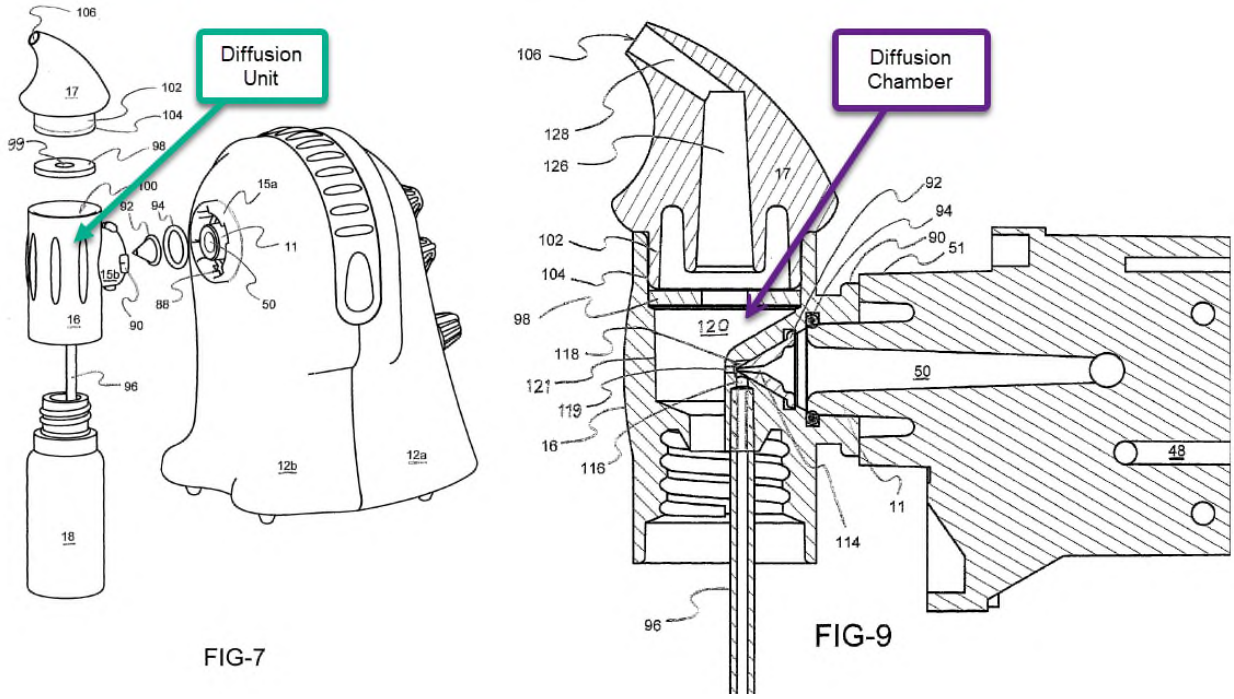
"Within the housing 12, may be located a pump 14." Ex-1009, ¶[0041]. "Air from the pump 14 drives atomization in the atomizer 16 to discharge atomized liquids out of the director 17" and into the atmosphere. *Id.* Sevy's fluid dispersion assembly (*e.g.*, the combination of atomizer 16 and director 17) is thus operatively interconnected to the container (*e.g.*, reservoir 18) of operative fluid and pump 14 for discharging a fluid dispersion into a surrounding airspace. Ex-1002, ¶147.

The pump is a motorized diaphragm type pump that "compress[es] air to a pressure greater than ambient pressure." Ex-1009, claim 16 and ¶¶ [0020], [0028], [0041], [0056], [0057]. PO contends the term "compressed air source" should be given its ordinary meaning or construed as a "source of air that is above ambient pressure." Ex-1018, Exhibit B. Accordingly, motorized pump 14 is a compressed air source because it compresses air to a pressure greater than ambient pressure. Ex-1002, ¶148.

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

The atomizer 16 of Sevy has a hollow interior referred to in the specification as "separator 120" or "separator chamber." Ex-1009, ¶[0082]. The separator chamber is illustrated in FIG. 9 below. During use, nozzle 92 atomizes liquid into droplets, and the atomized droplets are thrown into separator chamber 120 and against the interior wall 121 of atomizer 16. Ex-1009, ¶[0082]. Upon impact with the wall 121, "the droplets further atomize into a cloud containing many more

droplets of much smaller size." *Id.*, ¶ [0067]. The comparatively smaller droplets become entrained in the air inside atomizer 16 before they are discharged through director 17 and into the surrounding airspace. *Id.* ¶¶[0082], [0084]. A POSITA would understand that particles entrained within an airflow will spontaneously diffuse within the area in which they are contained, in this case, atomizer 16. Ex-1002, ¶¶98-99, 150, 187. Atomizer 16 is thus a "diffusion unit" that at least partially defines a "diffusion chamber." *Id.*, ¶¶149-151.

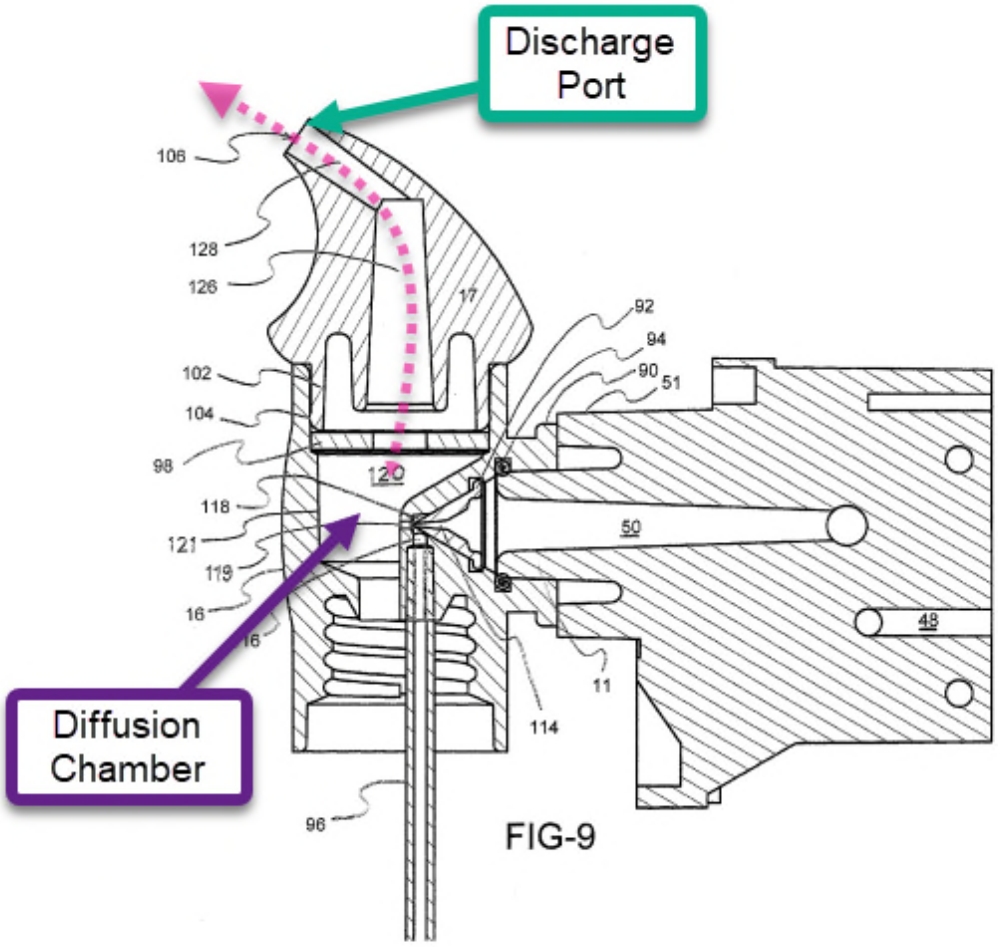


Ex-1009, FIGS. 7 and 9

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

Sevy discloses a port 106 formed in the director 17 through which atomized liquid droplets are passed. Ex-1009, ¶[0072]. It is explained that "[a]ir from the

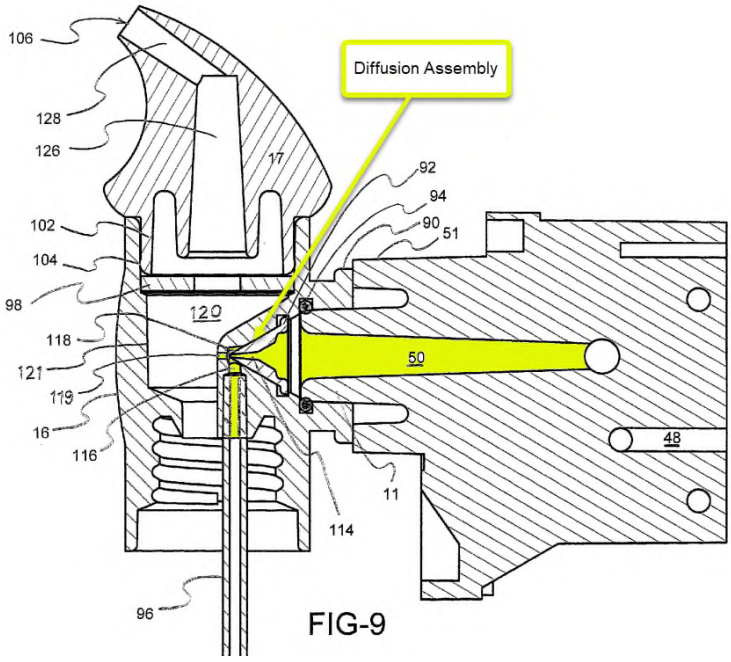
pump 14 drives atomization in the atomizer 16 to discharge atomized liquids out of the director 17." *Id.*, ¶¶ [0041], [0072] ("director 17 may be turned in a particular direction to discharge a jet of air . . . through the atomizer to a directed flow out the port 106."). This flow is illustrated in FIG. 9 of Sevy, below, in which the pink arrow depicts the flow of the atomized droplets. Therefore, Sevy teaches a discharge port (*e.g.*, port 106) disposed in fluid communication between said diffusion chamber (*e.g.*, separator chamber 120) and the surrounding airspace. Ex-1002, ¶¶152-154.



Ex-1009, FIG. 9

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

The specification of the ’094 Patent recites “the diffusion assembly 200 comprises an air inlet 210 and an atomizer assembly.” Ex-1001, 5:5-6. Sevy teaches a similar and corresponding structure. Ex-1002, ¶¶155-157. Specifically, Sevy discloses an air inlet (*e.g.*, passage 50) that passes air from pump 14 to atomizer 16. Ex-1009, ¶¶ [0075]-[0079]. Sevy further recites “[t]he momentum of the jet of air . . . creates a localized vacuum at the top of the siphon 96, drawing liquid up the siphon 96 from the reservoir 18, and transferring momentum into that liquid to atomize it and throw it into the atomizer 16.” *Id.*, ¶[0067]. Sevy’s diffusion assembly (*e.g.*, the combination of the air inlet (*e.g.*, passage 50) and the atomizer assembly that atomizes the liquid) is shaded yellow in annotated FIG. 9 below.



Ex-1009, FIG. 9

Sevy therefore teaches a diffusion assembly disposed in operative engagement with said diffusion unit (*e.g.*, atomizer 16).

7[D] wherein said diffusion assembly comprises an atomizer assembly, and

Sevy teaches a nozzle 92 that is formed separately from atomizer 16, and that sits within a cavity[9] of atomizer 16 to form a seal therewith. Ex-1009, ¶[0065]. Nozzle 92 is shown below in enlarged and partial FIG. 9.

As illustrated, nozzle 92 encloses a channel 114 leading from passage 50 toward an orifice 118 of the nozzle. *Id.*, ¶[0079]. Air flows through the essential-oil atomizer of Sevy from pump 14, and specifically pump body 46, into passage 50, and then into channel 114. *Id.*, ¶[0075]-[0079]. In this regard, channel 114 is in fluid communication with pump 14, and thus, an "atomizer air inlet channel."

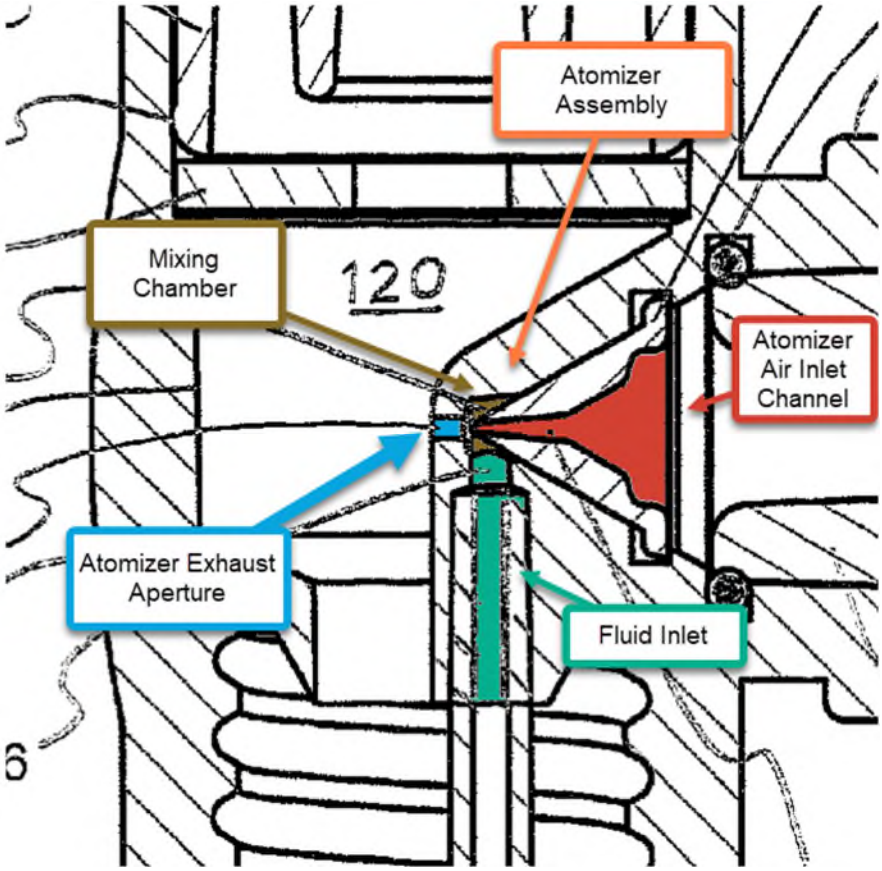
Referring to FIG. 9, "the cavity 116 has three openings." Ex-1009, ¶ [0080].

I. "From the pump side, the cavity is open to the orifice 118 of the nozzle 92." *Id.*

II. "From below, the cavity 116 is open to the siphon 96 leading to the reservoir 18." *Id.*

[9] Sevy uses the terms "cavity" and "chamber" interchangeably to refer to feature 116.

III. "Toward the atomizer 16, the cavity 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." *Id.*



EX-1009, FIG. 9 (partial and enlarged)

When pressure is reduced in cavity 116, liquid is drawn up from the reservoir 18, through siphon tube 96 and into cavity 16 at orifice 118, where it is comminuted by a blast of high-speed air. *Id.*, ¶[0080], [0081]. As a result, "[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.*, ¶ [0082].

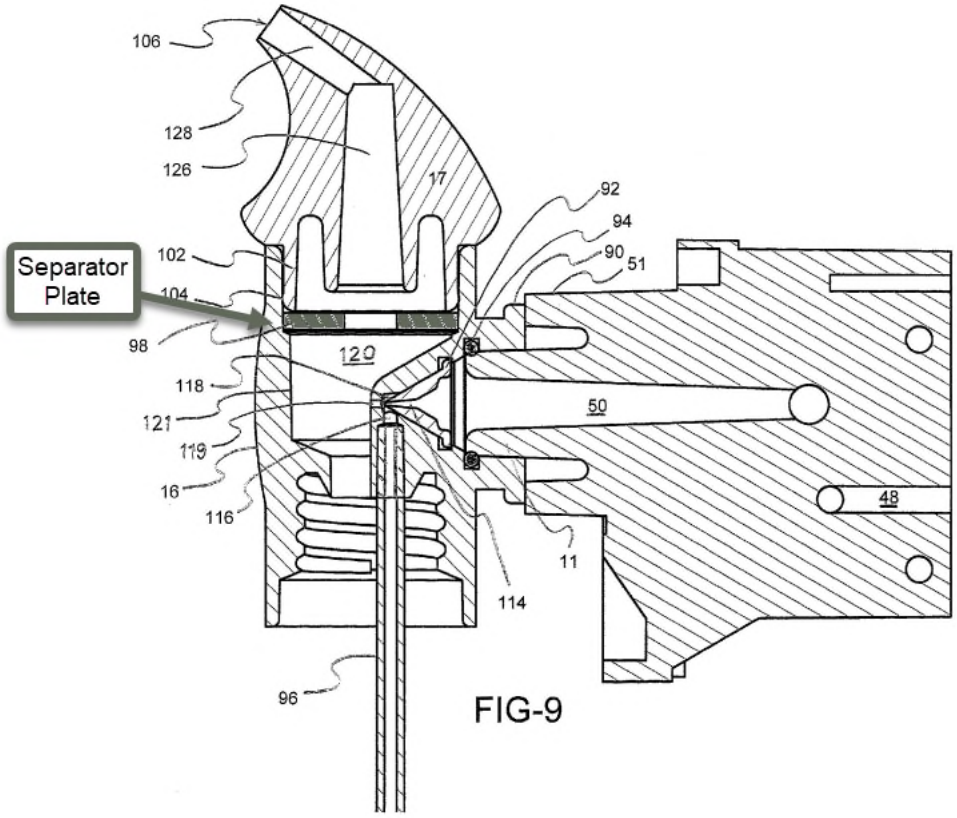
Consequently, Sevy teaches an atomizer assembly including an atomizer air inlet channel (*e.g.*, channel 114 that passes air received from passage 50 to cavity 116), a fluid inlet (*e.g.*, the upper end of siphon tube 96 that receives liquid from reservoir 18), a mixing chamber (*e.g.*, cavity 116 where the liquid from siphon 96 and the blast of high speed air are initially mixed together to atomize the liquid into liquid droplets), and an atomizer exhaust channel (*e.g.*, exit orifice 119 through which the initially atomized droplets are ejected into the diffusion chamber). Ex-1002, ¶¶158-165.

7[E] a silencer assembly having a silencer inlet, a silencer outlet, and a baffle,

The Parties have stipulated that the claim limitation "baffle" should be construed to mean a "structure that disrupts the flow of fluid dispersion through the fluid dispersion assembly." Ex-1018, Exhibit A. Moreover, PO contends that the limitation "silencer assembly" should be given its plain and ordinary meaning, or alternatively, construes the term to means an "assembly that reduces the amount of noise generated during operation of the fluid dispersion assembly as the fluid dispersion flows therethrough." *Id.*, Exhibit B.

Separator Plate 98 is a Baffle

The essential-oil atomizer of Sevy includes a separator plate 98 disposed within an opening of atomizer 16. Ex-1009, ¶[0068]. The separator plate is shaded gray in FIG. 9 below.



Ex-1009, FIG. 9

"The separator plate may have one or more apertures 99 located centrally, peripherally, or otherwise." *Id.*, ¶[0083]. In this regard, "[d]roplets that cannot move with the air flow, typically because they have too large a size and mass … will strike the walls of the opening 100 or the separator plate 98. *Id*, ¶[0069]. On the other hand, "more finely divided droplets form a cloud moving with the flow of air out of the

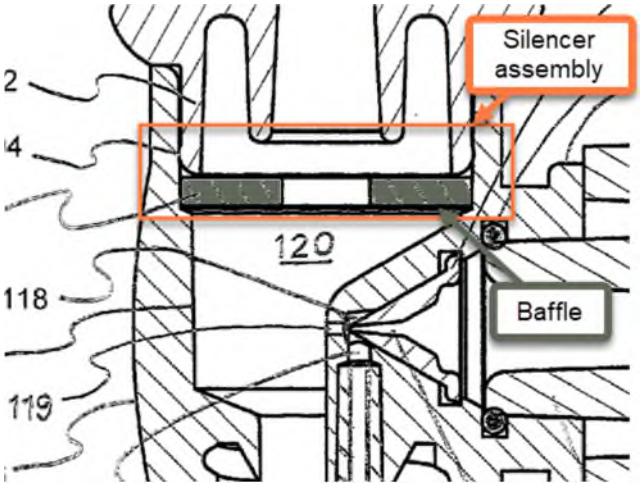
opening 100 of the atomizer 16 and through the apertures 99 of the separator plate 98." *Id.*, ¶[0070].

Sevy further recites "various components are sized to cause air flows that will *twist and turn* sufficiently to recapture and return most [of] the droplets above [certain] sizes back into the reservoir." (*emphasis added*). *Id.*, ¶[0074]. A POSITA would appreciate that separator plate 98 is one such component and would recognize that the separator plate is an "orifice baffle" or an "orifice baffle plate." Ex-1002, ¶¶83-84, 97, 160-173. Orifice baffles have openings (*e.g.*, apertures) and are designed to enhance mixing by creating localized jet flows when fluid passes therethrough. *Id*. Orifice baffles are used in various applications to enhance uniform mixing. *Id*. Thus, a POSITA would understand that Sevy's separator plate 98 is designed not only to restrict droplets over a certain size, but also to cause disrupt and thoroughly mix the fluid dispersion. *Id.* Therefore, separator plate 98 is a baffle. *Id*.

Silencer Assembly

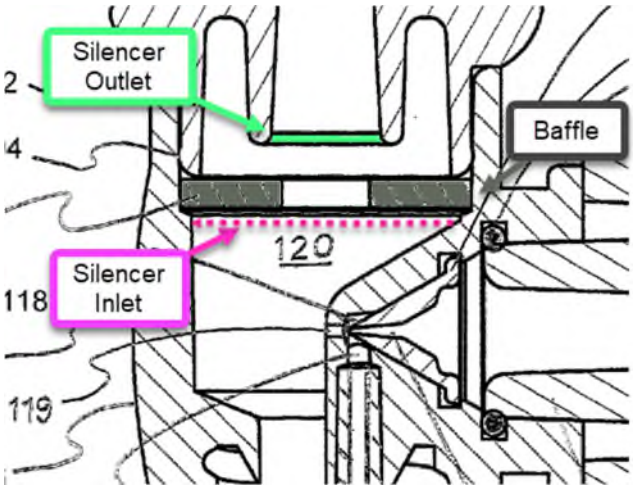
Sevy does not refer to the combination of the inlet, the separator plate, and the outlet as a "silencer assembly." However, a POSITA would understand that a structure that disrupts fluid dispersion as it flows from the inlet to the outlet, such as a baffle, would also limit sound associated therewith. *Id.*, ¶¶174-177; *see also* Ex-1001, 6:1-8, 7:1-11, and 7:64-8:2 (teaching that sound dampening is a byproduct of

disrupted fluid dispersion). Consequently, Sevy teaches a silencer assembly including a baffle as depicted below.



Ex-1009, FIG. 9 (partial and enlarged)

As shown in FIG. 9 below, the relatively small droplets flow through a silencer inlet (*e.g.*, the inlet formed by the tapered ledge in the opening of atomizer 16) and then through the apertures of the baffle (*e.g.*, separator plate 98) before passing through a silencer outlet (*e.g.*, the outlet in fluid communication with passage 126).



Ex-1009, FIG. 9 (partial and enlarged)

Sevy thus discloses a silencer assembly having a silencer inlet, a silencer outlet, and a baffle.

> **7[F] wherein said baffle partially restricts movement of the fluid dispersion through said silencer chamber from said silencer inlet to said silencer outlet, thereby dampening sound waves generated during operation of said fluid dispersion assembly.**

PO contends that the term "silencer chamber" contains "a clerical error" and should be construed to mean "silencer assembly." Ex-1018, pg. 1. Accordingly, the below remarks are set forth as though the term "silencer chamber" was replaced with the term "silencer assembly."[10]

Although Sevy does not explicitly use the term "substantially uniform" in describing the size of the atomized droplets ranging in diameter from about 1 to 5 microns, a POSITA would appreciate that these droplets meet the limitation "fluid dispersion." Ex-1002, ¶¶178-188. In particular, Sevy discloses "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." Ex-1009, ¶[0009]. A POSITA would understand that smaller droplets will follow the airflow in the room and quickly spread throughout the entire room. Ex-1002, ¶¶182-

[10] Petitioner briefly submits that Sevy discloses a silencer chamber between the silencer inlet and silencer outlet identified above and reserves its right to supplement this Petition with additional arguments that Sevy teaches a silencer chamber if PO modifies its construction of this limitation or the PTAB disagrees with same.

188. Sevy recognizes this principle. Ex-1009, ¶[0024] ("spraying the droplets into a separator removes droplets insufficiently small *to be carried indefinitely by ambient air movement*. The separator and flow are sized to release with the air flow those droplets having *an effective diameter of from about 1 micron to about 5 microns*."). Indeed, droplets within this range do not materially differ from one another in their ability to be carried substantially indefinitely by ambient air. Ex-1002, ¶¶91-118.

In describing the term "substantially uniform droplets," the specification of the '094 Patent recites "[i]n at least one embodiment, the plurality of "substantially uniform droplets" each have a diameter in the range of one micron (1 μm), in another embodiment, the diameter of the droplets is in the range of about three microns (3 μm), and, in one further embodiment, droplet diameter is in the range of about five microns (5 μm)." Ex-1001, 3:15-21. Although these examples are provided as three distinct embodiments (*e.g.*, 1, 3, or 5), it cannot be ignored that droplets within this range will not materially differ from one another with respect to their ability to be carried by ambient air, and that the narrow range taught by Sevy spans the from the smallest embodiment to largest embodiment taught by the '094 Patent.

Furthermore, it is also well known that the evaporation rate of droplets depends on several factors including the size (*e.g.*, surface area) of the droplet. Ex-1002, ¶¶91-118. Sevy also recognizes this principle. Ex-1009, ¶[0074]

("[e]vaporation is a function of vapor pressure of a material, local concentration, and surface area available to evaporate molecules therefrom"). Thus, a POSITA would understand a "better atomization" in the context of the '094 Patent to means a smaller and more uniform droplet, which will result in the droplets spreading quickly and indefinitely throughout the room, and evaporating at a uniform rate, to release a consistent scent. Ex-1002, ¶¶91-118, 178-188.

However, if PO argues that atomized droplets on the order of 1 to 5 microns do not meet the limitation "fluid dispersion," Petitioner submits that it would have been obvious to modify to the location, size, and/or amount of apertures 99 in the separator 98 to achieve an even narrower range of droplet sizes, such that a plurality (at least two of the droplets) are substantially uniform, to further improve the recognized dispersion and evaporation properties. Ex-1002, ¶¶91-118, 178-188; Ex-1009, ¶[0068] ("the separator plate may include one or more apertures 99 located centrally, peripherally, or otherwise"). Therefore, Sevy teaches a diffusion chamber that facilitates formation of the fluid dispersion prior to discharge of the fluid dispersion from said diffusion chamber through said discharge port and into the surrounding airspace.

As demonstrated above with respect to the claim limitation set forth in 7[E], Sevy discloses a baffle (*e.g.*, separator plate 98) that restricts movement of the relatively small droplets (*e.g.*, the fluid dispersion) entrained in the air through said

silencer assembly from said silencer inlet to said silencer outlet. Again, a POSITA would appreciate that a structure that disrupts fluid flow, such as a baffle, would also dampen or limit sound during operation of the device. Ex-1001, 6:1-8, 7:1-11, and 7:64-8:2 (teaching that sound dampening is a byproduct of disrupted fluid flow). Accordingly, Sevy renders claim 7 obvious under 35 U.S.C. §103.

2) Claim 8

The fluid dispersion assembly as recited in claim 7 wherein said atomizer assembly comprising an atomizer air inlet channel, a fluid inlet, a mixing chamber, and an atomizer exhaust channel.

Sevy discloses an atomizer assembly including an air inlet channel, a fluid inlet, a mixing chamber, and an atomizer exhaust channel for the reasons demonstrated above in claim limitation 7[D]. *See* Ex-1002, ¶¶189-190.

3) Claim 9

9[A] The fluid dispersion assembly as recited in claim 8 wherein said atomizer air inlet channel is interconnected to the compressed air source and said fluid inlet disposed in fluid communication with the operative fluid in the container,

As demonstrated in claim limitation 7[D], the atomizer air inlet channel (*e.g.*, channel 114) is interconnected to the compressed air source (*e.g.*, pump 14) via passage 50, and the fluid inlet (*e.g.*, the upper end of siphon tube 96) is in fluid communication with the fluid in the container (*e.g.*, reservoir 18). Ex-1009, ¶¶[0077], ¶[0079], [0081]; *see* Ex-1002, ¶¶191-193.

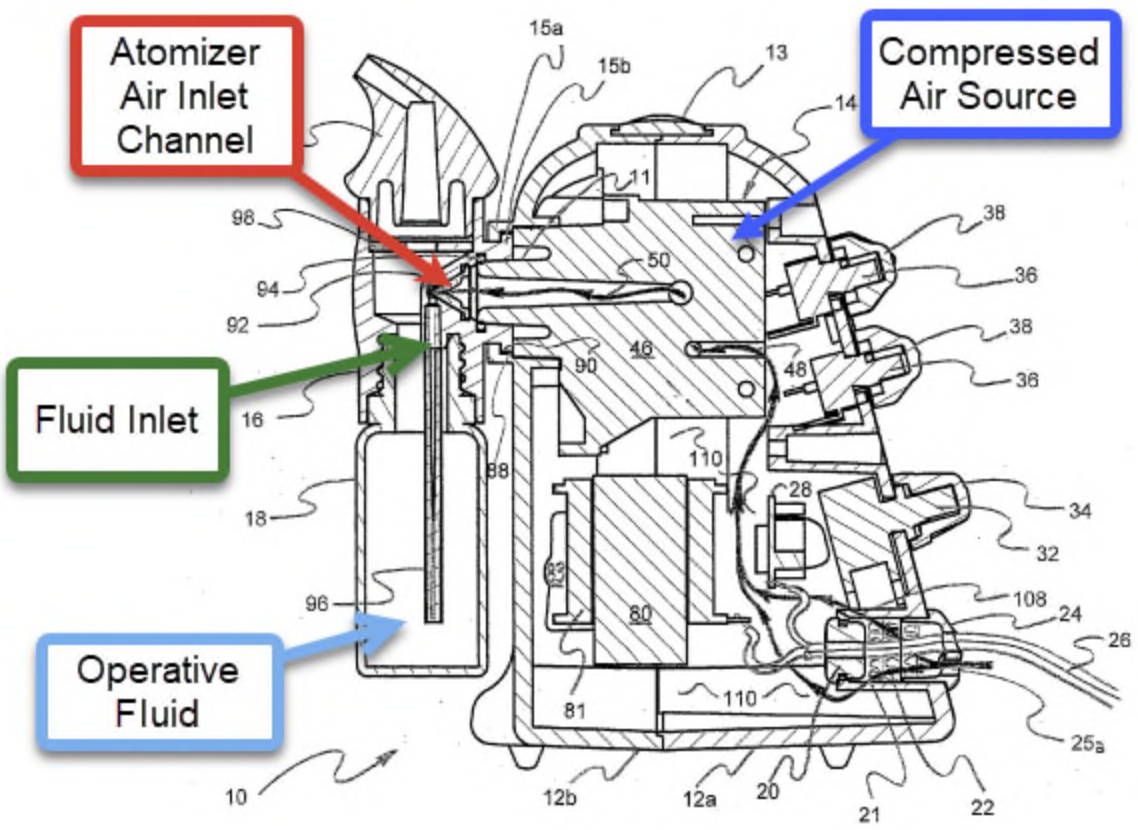
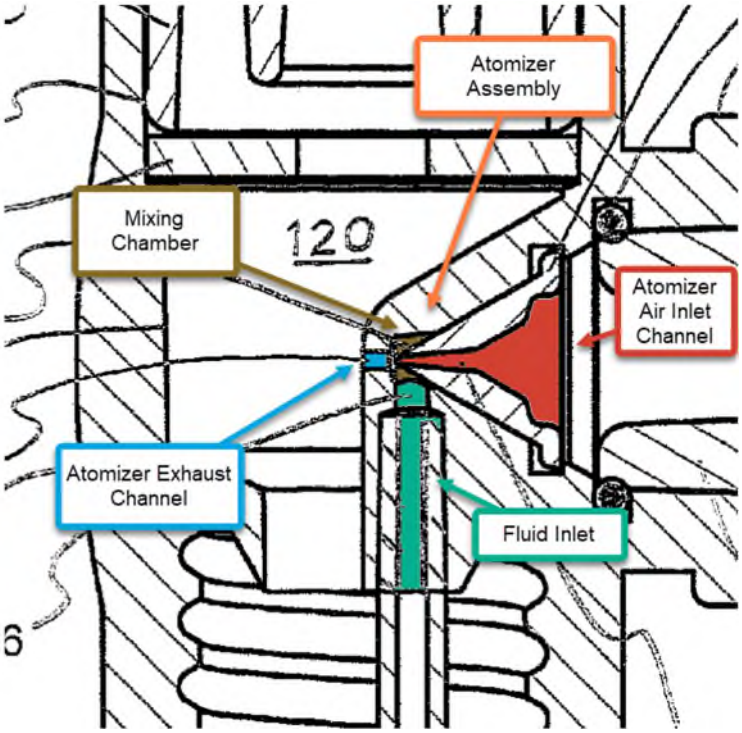


FIG-8

Ex-1009, FIGS. 8

9[B] wherein the compressed air and the operative fluid are mixed together in said mixing chamber to form the fluid dispersion.

As demonstrated in limitation 7[D], Sevy teaches that reduced pressure in cavity 116 draws liquid through siphon tube 96 into the cavity, where it is mixed with a blast of high-speed air to form atomized droplets. Ex-1009, ¶[0081]; *Id.*, FIG. 9.



Ex-1009, FIG. 9 (partial and enlarged)

Despite stipulating to the meaning of "fluid dispersion," PO 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." Ex-1018, Exhibit B. Particularly, PO construes 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." *Id*. In contrast, PO construes the term "mixing chamber" to mean, "a region where the operative fluid is combined with compressed air." *Id*. Put differently, when the term fluid dispersion is claimed as being *within* the mixing chamber, as is the case in limitation 9[B], PO construes the term to mean atomized droplets, but the atomized droplets need not include "a

plurality of substantially uniform droplets."[11] As described herein, Sevy teaches that within the mixing chamber (*e.g.*, cavity 116), the operative fluid is atomized by compressed air. Ex-1002, ¶¶194-197.

4) Claim 11

The fluid dispersion assembly as recited in claim 7 wherein said diffusion chamber facilitates formation of the fluid dispersion prior to discharge of the fluid dispersion from said diffusion chamber through said discharge port and into the surrounding airspace.

The process in which liquid is atomized is set forth in claim limitation 7[D]. Large droplets break into smaller droplets "as they dash against the wall 121" of atomizer 16. Ex-1009, ¶ [0082]. Droplets on the order of from about 1 to about 5 microns in diameter are entrained in the air and ultimately pass through the separator plate 98 and into ambient air. *Id.*, ¶¶[0082], [0084]. As set forth in claim limitation 7[F], droplets of this size are of substantially the same size and meet the claim limitation "fluid dispersion." Should the PTAB conclude that the droplets are not "fluid dispersion," Petitioner submits that it would have been obvious to modify to the apertures 99 in the separator 98 to form droplets that meet this limitation for the reasons stated above with respect to claim limitation 7[F]. Ex-1002, ¶¶198-201.

[11] PO's construction of the term "fluid dispersion," as used in limitation 9[B], is equally applicable to the same limitation in Grounds 2-6. For brevity, this construction is only discussed here in Ground 1.

C. Ground 2: Claims 7-9 and 11 are Unpatentable Under 35 U.S.C. §103 as Obvious Over Sevy in view of Zeng

As discussed in Ground 1, Sevy alone renders obvious claims 7-9 and 11. As part of that analysis, Petitioner noted that Sevy discloses an assembly including a baffle (*e.g.*, separator plate 98) that disrupts and restricts the flow of atomized droplets, which therefore at least suggests that Sevy would have a dampening effect on sound waves and meet the "silencer assembly" limitation. Ex-1002, ¶¶79-90, 202-214. However, Sevy does not explicitly disclose that the separator plate 98 has a sound dampening effect. For this reason, in Ground 2, and in addressing the limitations set forth in 7[E] and 7[F], Petitioner also relies on Zeng which explicitly discloses a noise reduction head 20 for this purpose. Ex-1011, pg. 2.

Ground 2 still relies on the teachings of Sevy for the other limitations of claims 7-9 and 11 as previously discussed in Ground 1.

1) Claim 7

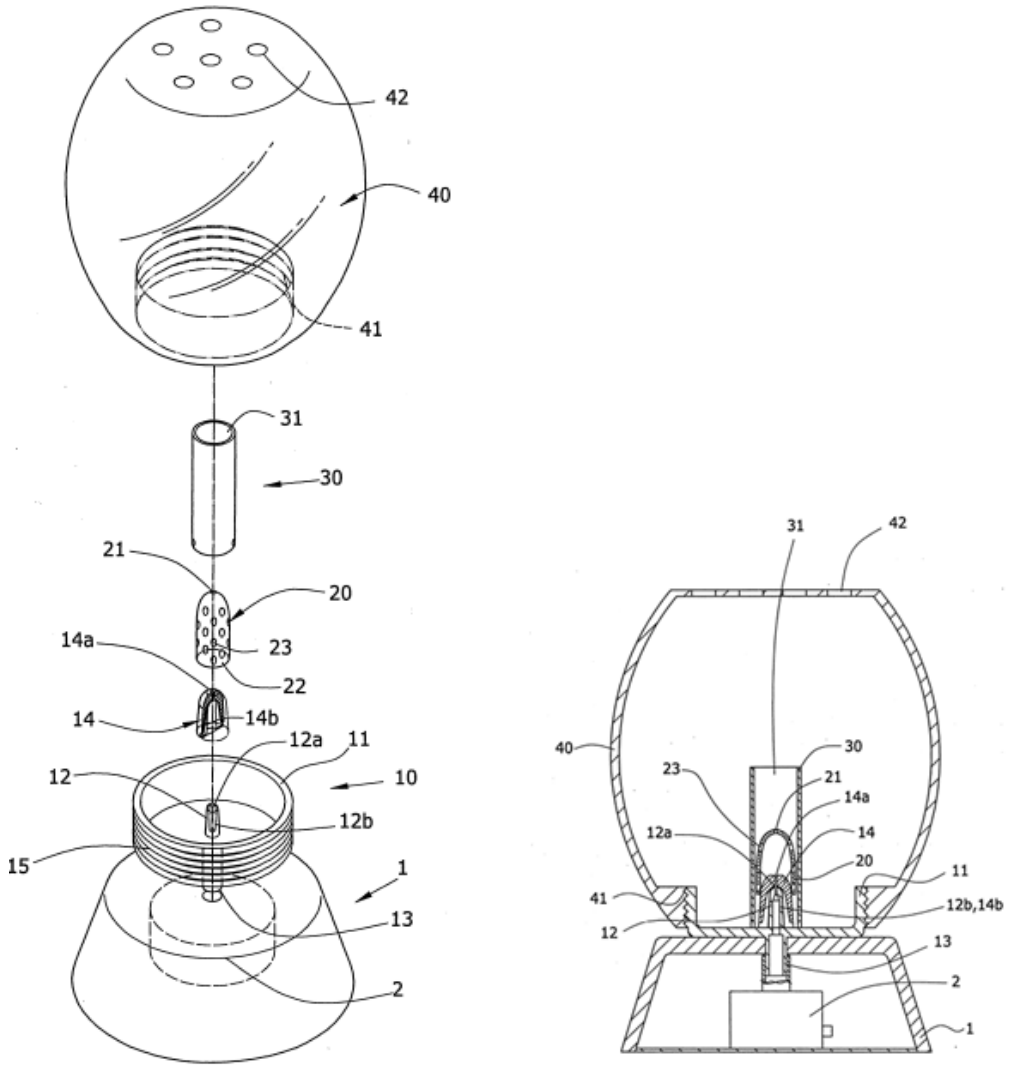
7[E] a silencer assembly having a silencer inlet, a silencer outlet, and a baffle,

7[F] wherein said baffle partially restricts movement of the fluid dispersion through said silencer chamber from said silencer inlet to said silencer outlet, thereby dampening sound waves generated during operation of said fluid dispersion assembly.

Zeng is titled and is directed to an "atomizer with noise reduction function." Ex-1011, Cover. Zeng recites the device is "equipped with a silencer, which not only reduces the spray sound of the atomizer when atomizing the essential oil, but also

reduces . . . the volume of the essential oil molecules, so that the atomization can become better." Ex-1011, pg. 4. Sevy and Zeng thus both teach essential oil atomizers that improve atomization by reducing the size/volume of the atomized droplets, and are analogous art. Ex-1009, ¶[0009]; Ex-1011, pg. 1.

Zeng's atomizer includes a diffuser body 1 housing an air blowing motor 2 (*e.g.*, a compressed air source), a blowing pipe 12 in communication with the air blowing motor, an outer cover 40 defining a receptacle base part 11 arranged to receive essential oil 3, an inner cover 30, and a noise reduction head 20 disposed within the inner cover. Ex-1011, pgs. 6-7. When air is blown through blow pipe 12, a siphon phenomenon occurs, and the essential oil 3 enters grooves 12b, 14b and is sucked upward toward an orifice of blow pipe 12. *Id*., pgs. 5. The essential oil 3 is then atomized to form essential oil molecules, of "different sizes," that pass-through air holes 23 formed in the noise reduction head 20. *Id*., pg. 5, FIGS. 2-3.

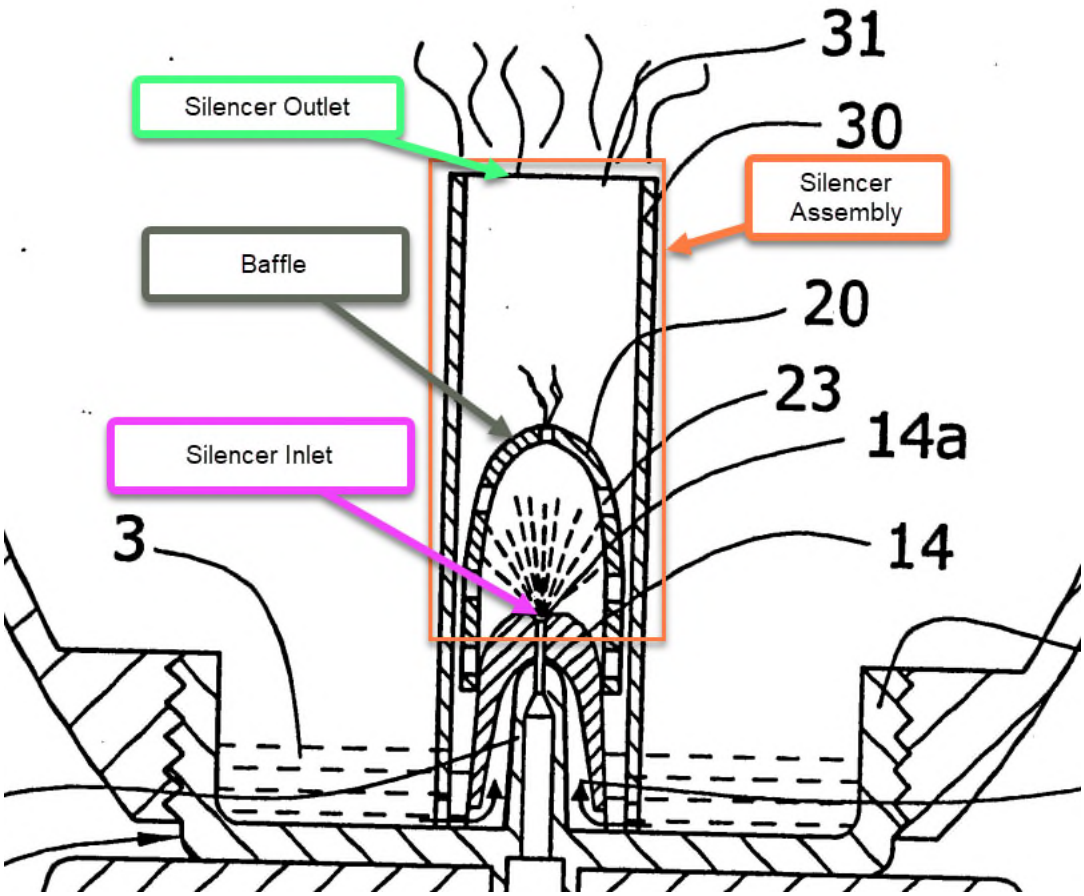


Ex-1011, FIGS. 2 and 3

Oil molecules that are too large are blocked by inner cover 30 and the droplets flow back to seat 11, and "only the completely atomized essential oil molecules" pass through the opening 31 of inner cover 30 and vent holes 42 of outer cover 40 before entering the surrounding airspace. Ex-1011, pg. 5. A POSITA would understand the teaching of "completely atomized" molecules to mean those of

substantially the same size and contrasted with droplets of different sizes (*i.e.*, not completely atomized). Ex-1002, ¶212.

A POSITA would also recognize that Zeng's noise reduction head 20 is a dome shaped "orifice baffle" designed to dampen sound and the combination of the noise reduction head 20 and the inner cover 30 forms a silencer assembly that only permits small and uniform molecules (*e.g.*, fluid dispersion) to pass through the opening 31 of inner cover 30. Ex-1002, ¶¶211-212.



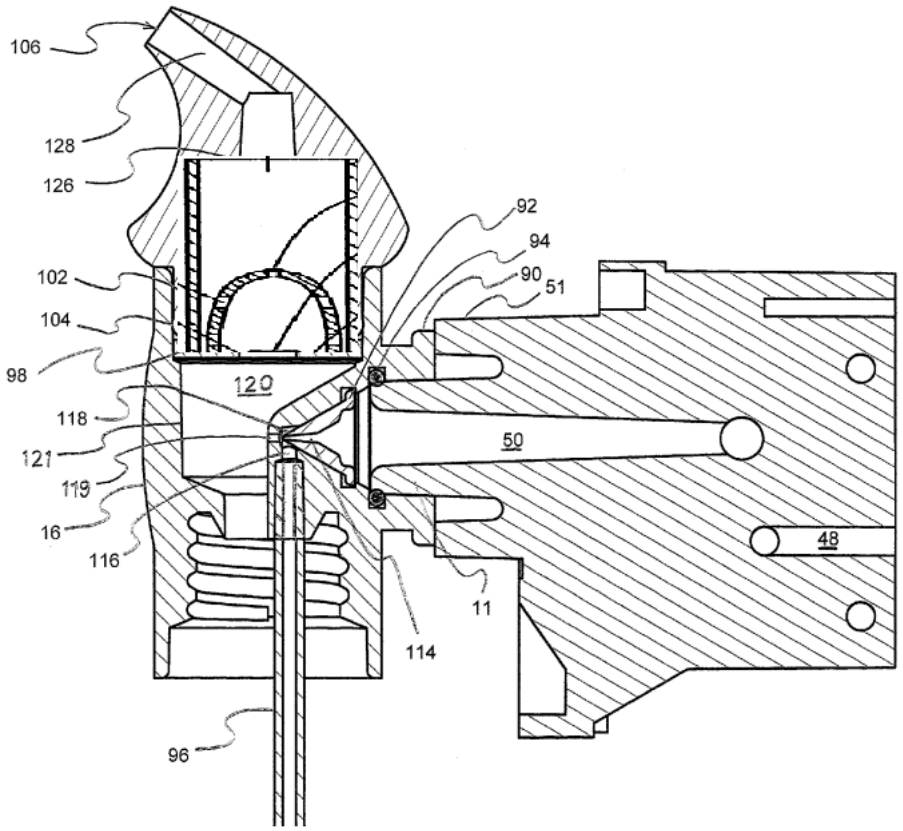
Ex-1011, FIG. 3 (partial and enlarged)

As a result, a POSITA would be motivated to combine Zeng with Sevy to improve atomization (*e.g.*, form uniform aerosolized particles) and to dampen sound waves, thereby enhancing user experience. Zeng identified drawbacks with conventional essential oil atomizers relying on compressed air insofar as they produced a "hissing" sound and did not optimally atomize essential oil droplets. *See* Ex-1011, pg. 1. A POSITA would have thus been motivated to incorporate a silencer assembly as taught by Zeng into Sevy's atomizer 16 to more uniformly atomize the droplets and minimize the hissing noise. Ex-1002, ¶¶206-214.

A POSITA would implement the combination of Sevy and Zeng without undue experimentation. First, a POSITA would appreciate that Sevy's separator plate 98 and Zeng's silencer assembly (*e.g.*, noise reduction head 20 and inner cover 30) are both orifice baffles that serve the same purpose, namely, preventing large molecules of differing sizes from passing therethrough. Ex-1009, ¶[0084] (permitting only relatively small droplets ranging from 1 μm to 5 μm to pass therethrough.); Ex-1011, pg. 5 ("only the completely atomized essential oil molecules can pass through the opening 31 of the inner cover 30") . Second, Zeng teaches that its noise reduction head 20 ***additionally*** has a sound dampening effect. Ex-1011, pg. 3.

Thus, to provide droplet uniformity and a reduction in noise, a POSITA would have been motivated to combine a silencer assembly as taught by Zeng with the

atomizer 16 of Sevy by replacing Sevy's separator plate 98 and passage 126 with Zeng's noise reduction head 20 and inner cover 30. Ex-1002, ¶¶206-214. This motivation would improve atomization uniformity and reduce the amount of noise generated during operation of Sevy's fluid dispersion assembly as the fluid dispersion flows therethrough. The combination is roughly illustrated below.



The physical space occupied by Zeng's silencer assembly would be substantially the same as the physical space previously occupied by Sevy's separator plate 98 and passage 126. Ex-1002, ¶214. In addition, Zeng's silencer assembly would only permit relatively small droplets to pass therethrough similar to Sevy's

separator plate. The combination would thus be a simple substitution of one known element for another to achieve the same desired effect of improved atomization and noise reduction. Ex-1002, ¶214. *See KSR Int'l Co. v. Teleflex Inc.*, 550 U.S. 398, 401 (2007) (holding it is obvious to substitute one known element for another to obtain predictable results). Accordingly, claim 7 is rendered obvious in view of the combination of Sevy and Zeng**.**

Other Limitations of Claim 7

Limitations 7[PRE]–7[D] are taught by Sevy for the reasons previously provided in Ground 1 as such limitations are wholly unrelated to the silencer assembly. S*ee* Section X(B); Ex-1002, ¶¶142-188.

2) Claims 8, 9 and 11

Claims 8, 9, and 11 are taught by Sevy for the reasons previously provided in Ground 1 as such limitations are also wholly unrelated to the silencer assembly. S*ee* Section VIII(C)(2) and (3); Ex-1002, ¶¶189-201.

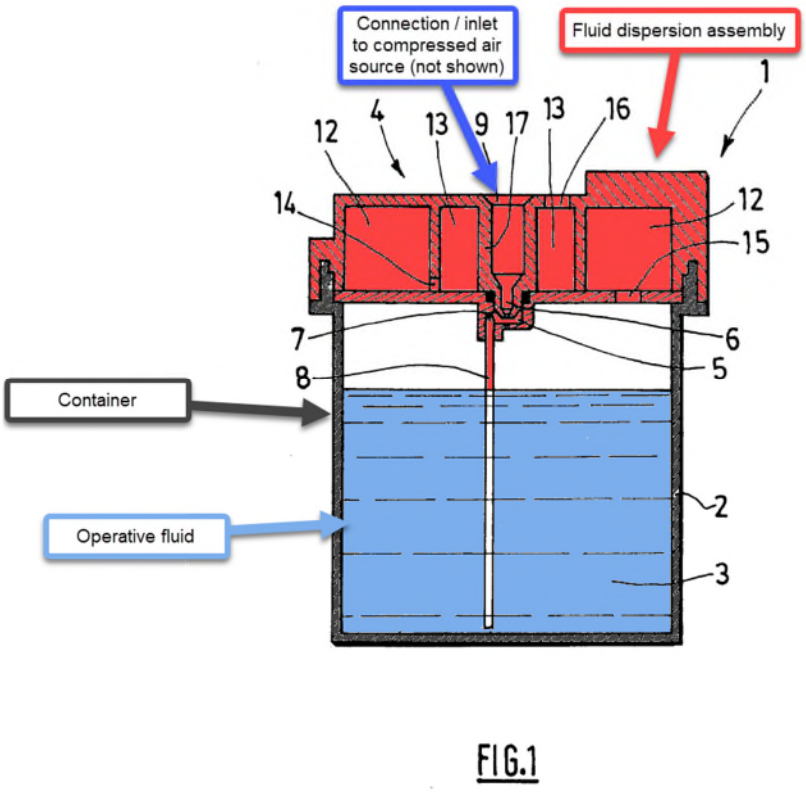
D. Ground 3: Claims 7-9 and 11 are Unpatentable Under 35 U.S.C. §103 as Obvious Over Goubet

1) Claim 7

7[PRE] 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:

To the extent the preamble is limiting, it is taught by Goubet, which is titled "essential oil diffuser" and shown in FIG. 1 below. Ex-1016, Cover. The essential

oil diffuser of Goubet is designed to break oil droplets into microdroplets and diffuse them into the ambient air in the form of an oil vapor. Ex-1016, 2:1-3.



Ex-1016, FIG. 1

The diffuser 1 of Goubet includes a reservoir 2 designed to store oil 3 and a diffuser head 4. Ex-1016, 3:24-25. "The diffuser head 4 comprises a diffusion chamber 5 within which oil droplets are produced." Ex-1016, 3:30-31. Thus, the diffusion head 4 of Goubet meets the limitation of a fluid dispersion assembly. Ex-1002, ¶¶217-234.

"The diffuser head may be attached to the reservoir by ultrasonic welding or by any other means, such as gluing or screwing." *Id.*, 3:24-25. Goubet teaches, "[t]he

diffusion chamber 5 comprises … an oil inlet in the form of the upper end 10 of a dip tube 8 connected to the essential oil 3 contained in the reservoir 2." Ex-1016, 3:31-4:2. Accordingly, Goubet teaches a fluid dispersion assembly (*e.g.*, diffuser head 4) that is operatively interconnected to a container (*e.g.*, reservoir 2) of operative fluid (*e.g.*, oil 3).

Goubet further discloses, "[c]ompressed air is supplied by a compressor, not shown, [that] penetrates the diffuser head 4 via an air inlet channel 9, connected to said diffusion chamber 5." Ex-1016, 4:15-16; *see also* FIG. 2 (where arrows F illustrate the path of compressed air through diffuser head 4). Thus, Goubet teaches a compressed air source (*e.g.* the compressor (not shown)) that is operatively interconnected to the fluid dispersion assembly (*e.g.*, diffuser head 4).

In operation, "[w]hen the compressed air flows into the diffusion chamber 5, the essential oil 3 is drawn into the diffusion chamber 5 by the vacuum created … [a]ir and essential oil are mixed within the diffusion chamber 5 and a flow of oil droplets is created." Ex-1016, 4:19-22. The microdroplets are eventually discharged from diffuser head 4 into ambient air through outlet 16. Ex-1016, 4:10-11.

Consequently, Goubet teaches a fluid dispersion assembly (*e.g.*, diffuser head 4) that is operatively interconnected to a container (*e.g.*, reservoir 2) of an operative fluid (*e.g.*, oil 3) and a compressed air source (*e.g.*, air compressor described but not illustrated in Goubet) to generate and discharge a fluid dispersion

(*e.g.*, microdroplets) into a surrounding airspace (*e.g.*, the ambient air). *See* Ex-1002, ¶¶217-234.

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

The diffuser head 4 of Goubet comprises "vaporization means, arranged to break the oil droplets into microdroplets and to diffuse said microdroplets into the ambient air in the form of an oil vapor." Ex-1016, 2:1-3. In one preferred embodiment, shown in FIGS. 1 and 3, the "vaporization means comprise at least two concentric circular enclosures, an outer enclosure [12] and an inner enclosure [13], communicating with each other through a passage [14], said two enclosures and said passage forming at least one baffle." Ex-1016, 2:16-19.

Goubet goes on to disclose, "[w]ithin this outer enclosure 12, [the droplets] collide with the walls separating the outer enclosure 12 from the inner enclosure 13 and . . . the droplets are broken up into microdroplets." Ex-1016, 4:28-5:4. Thereafter, "[t]he microdroplets are diffused into the ambient air in the form of essential oil vapour." Ex-1016, 5:6-7.

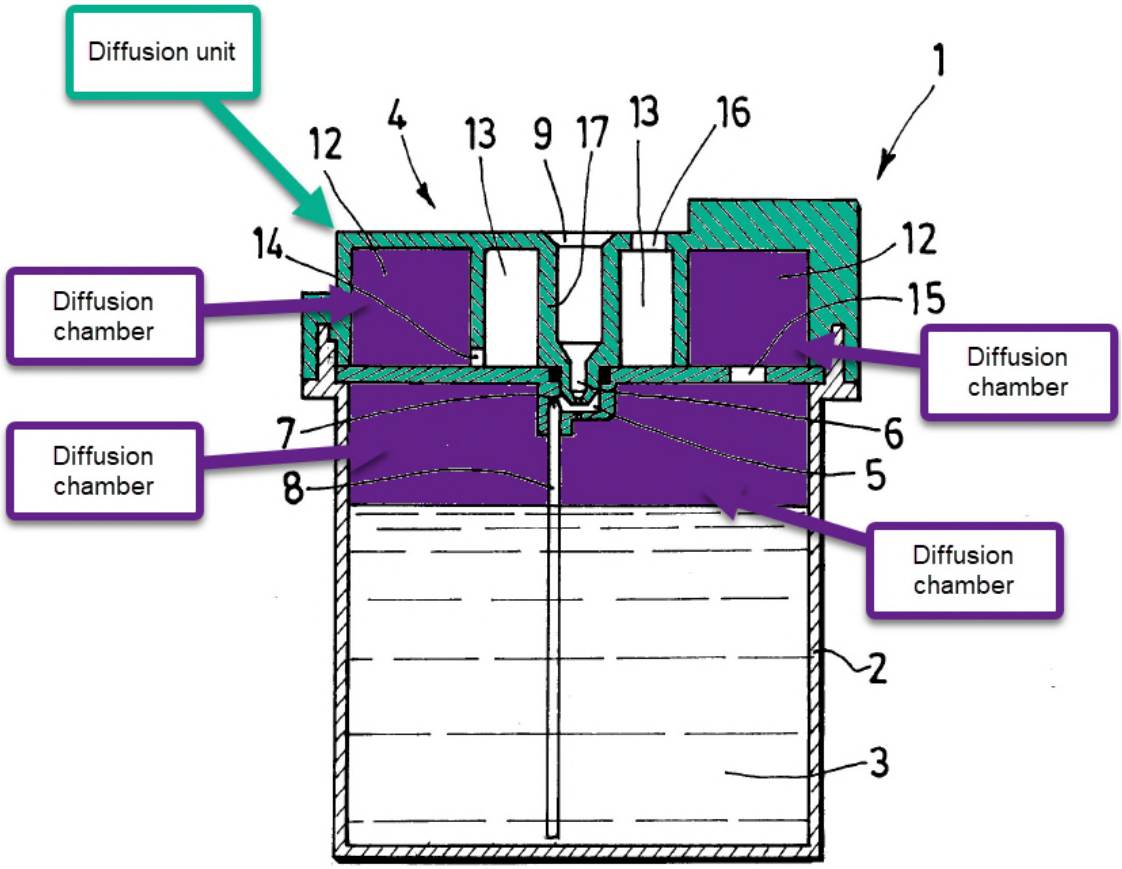
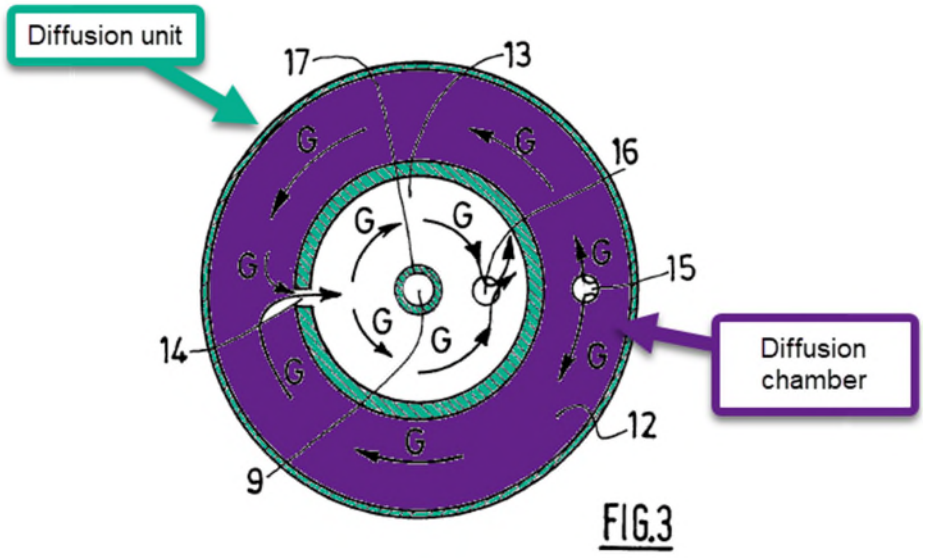


FIG.1

Ex-1016, FIG. 1



Ex-1016, FIG. 3

Therefore, the walls of diffuser head 4 (*e.g.*, including the walls separating the outer enclosure 12 from the inner enclosure 13) meet the limitation of a diffusion unit. As described with respect to the fluid flow path and depicted above, the diffusion unit at least partially defines a diffusion chamber (*e.g.*, shaded purple in FIG. 3) within which the droplets are broken into microdroplets. *See* Ex-1002, ¶¶235-238.

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

In describing diffuser head 4, Goubet recites "[t]he inner chamber 13 comprises an outlet 16 for the microdroplets to [exit to] the ambient air." Ex-1016, 4:10-11. Outlet 16 is illustrated in FIG. 1 below.

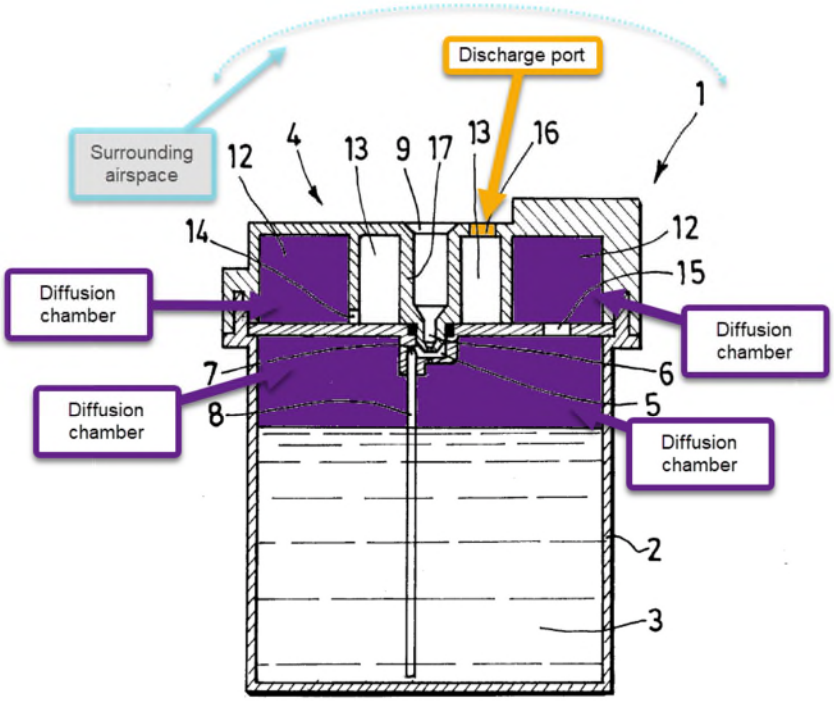
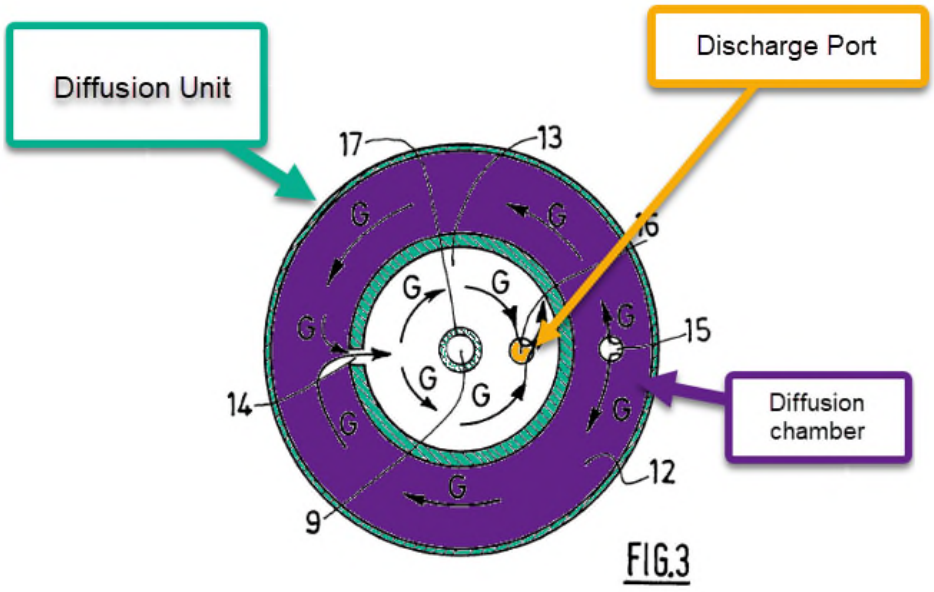


FIG.1

Ex-1016, FIG. 1

The droplet flow path is illustrated by the arrows G in FIG. 3 below. Ex-1016, 4:25. As shown, the droplets travel from outer enclosure 12 (*e.g.*, a portion of the diffusion chamber), to inner enclosure 13, through outlet 16 (*e.g.*, discharge port) and into ambient air. Thus, Goubet teaches a discharge port (*e.g.*, outlet 16) disposed in fluid communication between said diffusion chamber (*e.g.*, annotated in purple) and the surrounding airspace. *See* Ex-1002, ¶¶239-242.



Ex-1016, FIG. 3

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

Again, in the ’094 Patent, the diffusion assembly 200 is described as “compris[ing] an air inlet 210 and an atomizer assembly.” Ex-1001, 5:5-6. Goubet teaches a corresponding structure. Specifically, Goubet recites “[c]ompressed air is supplied by a compressor, not shown, and penetrates the diffuser head 4 via an air inlet channel 9, connected to said diffusion chamber 5.” Thus, Goubet teaches an air inlet in the form of air inlet channel 9. Ex-1016, 4:15-16.

Goubet further recites “essential oil 3 is drawn into the diffusion chamber through the upper end 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. A POSITA would appreciate that mixing liquid with compressed air describes an

atomization process. Ex-1002, ¶[246; *see also* Ex-1016, 5:16 (referring to the droplets as "highly atomized oil mist"). Therefore, Goubet teaches an atomizer assembly (*e.g.*, the assembly of components that atomize oil 3). Goubet also teaches a diffusion assembly (*e.g.*, the combination of air inlet channel 9 and the atomizer assembly (*e.g.*, the assembly of components that atomize liquid)) as depicted in FIGS. 1 and 2 below.

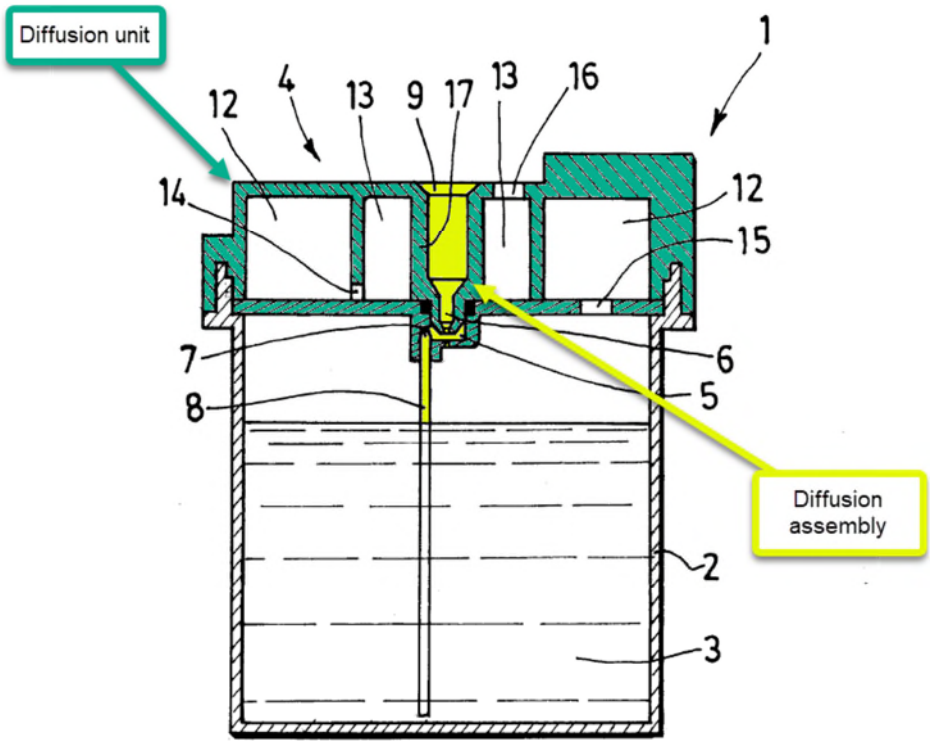
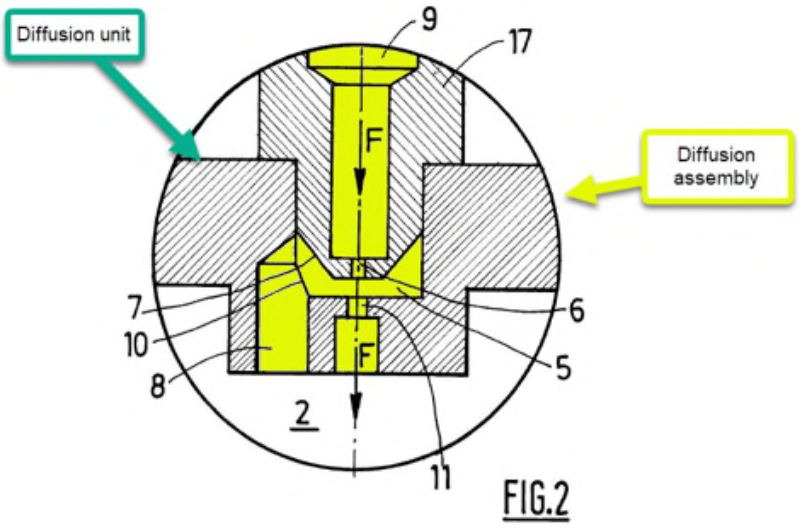


FIG.1

Ex-1016, FIG. 1

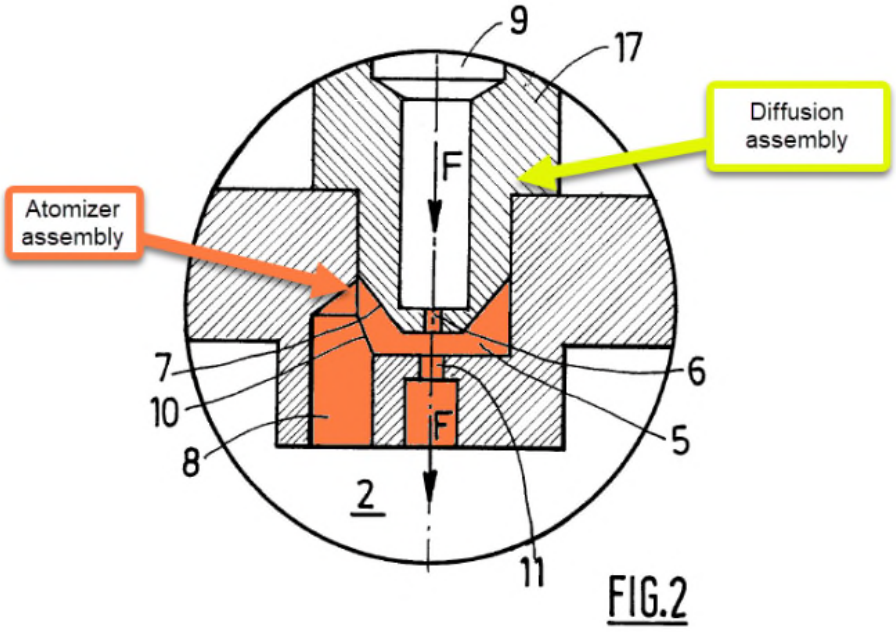


Ex-1016, FIG. 2

FIG. 1 shows Goubet's diffusion assembly being disposed within wall 17 of diffuser head 4, and therefore, disposed in operative engagement with the diffusion unit. Goubet additionally recites "[u]nder the effect of the compressed air pressure, the droplets leaving the diffusion chamber 5 are pushed towards the inside of the reservoir 2 and then towards the inlet 15 of the outer enclosure 12, into which they emerge." Ex-1016, 4:26-28. As a result, Goubet teaches that the diffusion assembly (*e.g.*, the combination of air inlet channel 9 and the assembly of components that atomize oil 3) is in operative engagement with said diffusion unit, and specifically the diffusion chamber (*e.g.*, shaded purple) thereof. *See* Ex-1002, ¶¶243-249.

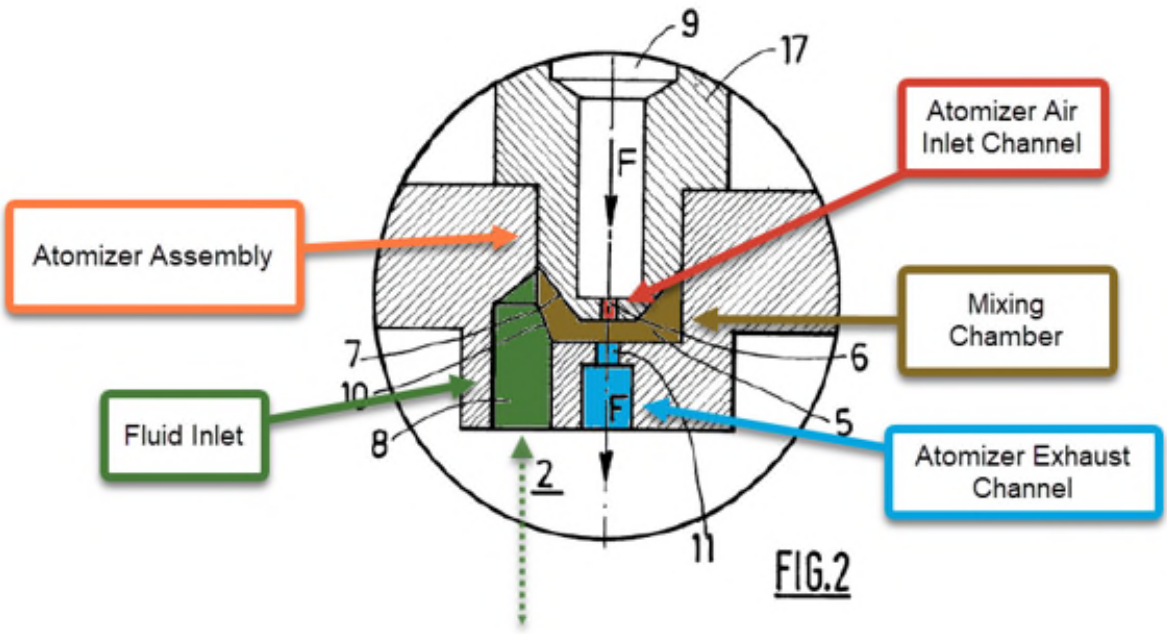
7[D] wherein said diffusion assembly comprises an atomizer assembly, and

Goubet teaches a diffusion assembly including an atomizer assembly as demonstrated in 7[C]. The atomizer assembly is annotated in FIG. 2 below.



Ex-1016, FIG. 2

The components of Goubet's atomizer assembly are detailed further and annotated in another FIG. 2 below. Specifically, Goubet's atomizer assembly includes a diffusion chamber 5, a compressed air inlet 6, a venturi cone 7, and an upper end of a dip tube 8. Ex-1016, 3:31-4:2. In use, compressed air flows in the direction illustrated by arrow F in FIG. 2, and more specifically from the compressor (not shown), through air inlet channel 9 to compressed air inlet 6, and then into diffusion chamber 5. Ex-1016, 4:15-18. Accordingly, the atomizer assembly of Goubet includes an atomizer air inlet channel (*e.g.*, compressed air inlet 6).



Ex-1016, FIG. 2

Goubet further teaches, "[w]hen the compressed air flows into the diffusion chamber 5, the essential oil 3 is drawn into the diffusion chamber 5 by the vacuum [force] . . . through the upper end 10 of the dip tube 8." *Id.*, 4:19-21. The atomizer assembly of Goubet thus includes a fluid inlet (*e.g.*, the upper end of the dip tube 8).

Goubet goes on to recite, "[a]ir and essential oil are mixed within the diffusion chamber 5 and a flow of oil droplets is created." *Id.*, 4:21-22; *Id.*, 5:15-16 (creating atomized oil mist). Goubet's atomizer assembly therefore includes a mixing chamber (*e.g.*, diffusion chamber 5). Afterwards, the flow of "oil droplets is then carried along by the compressed air and exits the diffusion chamber 5 through an outlet 11 towards the inside of the reservoir 2." *Id.*, 4:23:24. The atomizer assembly thus also includes an atomizer exhaust channel (*e.g.*, outlet 11).

Thus, Goubet teaches an atomizer assembly having each of the components described in the ’094 Patent, namely an atomizer air inlet channel, a fluid inlet, a mixing chamber, and an atomizer exhaust channel. *See* Ex-1002, ¶¶250-253.

7[E] a silencer assembly having a silencer inlet, a silencer outlet, and a baffle,

In view of PO’s construction of the term “silencer assembly,” Goubet at least suggests, a silencer assembly having a silencer inlet, a silencer outlet, and a baffle. The diffuser head of Goubet defines “two concentric circular enclosures, an outer enclosure 12 and an inner enclosure 13, communicating with each other via a passage 14, said two enclosers and said passage forming at least one baffle.” *Id*., 4:3-6. Goubet further recites, “the droplets follow a very particular path, allowing their size to be reduced as much as possible.” *Id*., 2:26-27. Along this path, the droplets collide with . . . the walls separating the inner enclosure from the walls 17 of the compressed air inlet channel . . . [and] as a result of the many shocks they receive, the droplets are broken up into micro-droplets.” *Id.*, 1016, 4:29-5:4. Goubet explains that “this reduction in droplet size enables a non-harsh, highly atomized oil mist or vapour to be ***silently diffused***.” *Id.*, 1016, 5:15-16. Accordingly, Goubet teaches a silencer assembly as shown in FIG. 1 below.

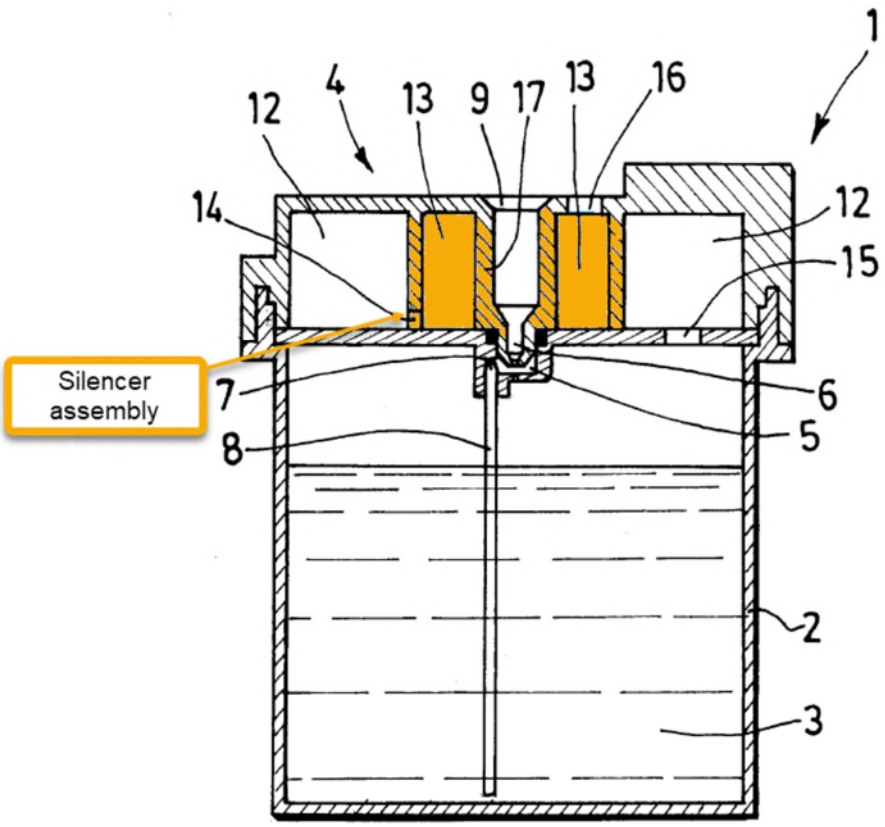


FIG.1

Ex-1016, FIG. 1

The droplets flow through the silencer assembly of Goubet as follow. As shown in FIGS. 1 and 3, droplets within outer enclosure 12 pass through the passage 14, then strike the inward facing surfaces of the walls facing the inner enclosure 13 and the droplets are broken up into microdroplets before the mirco-droplets exit outlet 16. Ex-1016, 4:31-5:6.

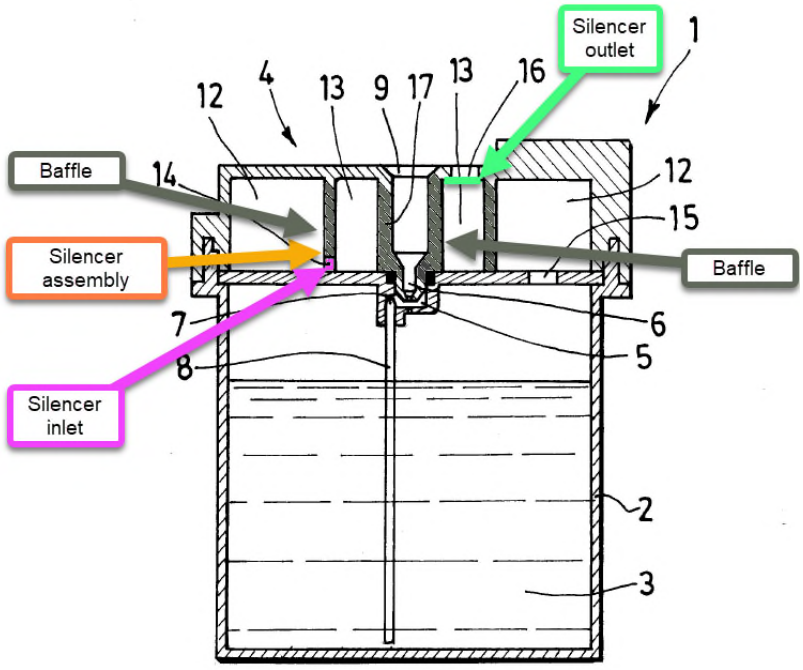


FIG.1

Ex-1016, FIG. 1

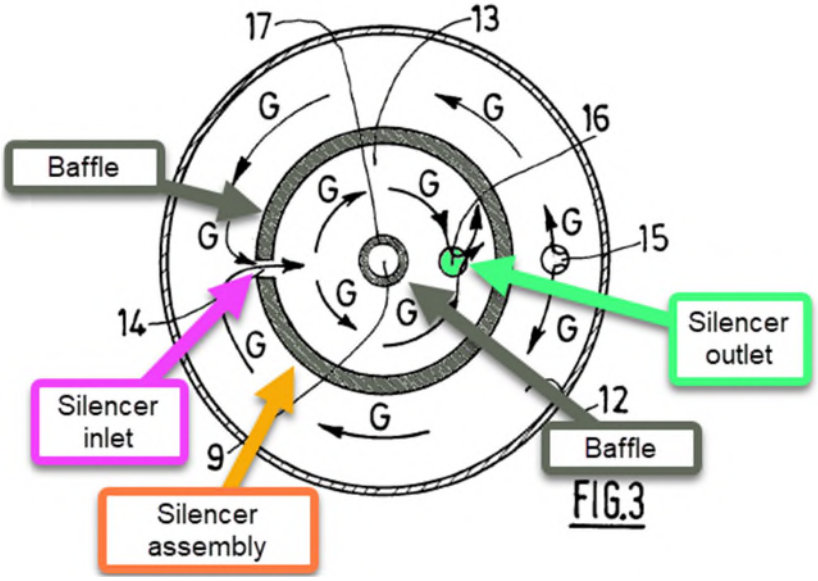


FIG.3

Ex-1016, FIG. 3

In this regard, Goubet's silencer assembly includes a silencer inlet (*e.g.*, passage 14) and a silencer outlet (*e.g.*, opening of inner enclosure 13 leading to outlet 16).

Petitioner and PO have stipulated that the claim limitation "baffle" should be construed to mean a "structure that disrupts the flow of fluid dispersion through the fluid dispersion assembly." Ex-1018, Exhibit B. Thus, the surfaces of the walls facing the inner enclosure 13 meet the limitation of a "baffle" as they cause "many shocks" and thus disrupt the flow of diffusion by breaking down the droplets into microdroplets. *Id.*, 1016, 4:31-5:6. Again, a POSITA would appreciate that a structure that disrupts fluid flow, such as a baffle, would also dampen or limit sound during operation of the device. Ex-1002, ¶¶254-264. This well-known principle is also noted in the '094 Patent itself. Ex-1001, 6:1-8, 7:1-11, and 7:64-8:2 (teaching that sound dampening is a byproduct of disrupted fluid flow).

> **7[F] wherein said baffle partially restricts movement of the fluid dispersion through said silencer chamber from said silencer inlet to said silencer outlet, thereby dampening sound waves generated during operation of said fluid dispersion assembly.**

In view of PO's arguments in the parallel district court litigation, Petitioner is viewing the term "silencer chamber" to mean "silencer assembly." *See* Ex-1018, pg.

1. The below remarks are set forth as though the term "silencer chamber" was replaced with the term "silencer assembly."[12]

As demonstrated in claim limitation 7[E] Goubet teaches a baffle (*e.g.*, surface of the walls facing the inner enclosure) that partially restricts movement of the fluid dispersion through said silencer assembly from said silencer inlet (*e.g.*, passage 14) to said silencer outlet (*e.g.*, outlet 16), thereby dampening sound waves generated during operation of said atomized droplets.

Fluid Dispersion

Although Goubet does not explicitly teach that the microdroplets are "substantially uniform" in diameter, a POSITA would appreciate that Goubet at least suggests this limitation. First, when discussing known essential oil diffusers, Goubet submits that "compressed air generally arrives in the diffuser head rather abruptly, with the result that a large quantity of oil droplets is rapidly diffused into the ambient atmosphere … [and] such diffusion is also noisy." Ex-1016, 1:10-13. To remedy this problem, the atomizer of Goubet includes vaporization means defining a circular and very particular "path, allowing [the droplet] size *to be reduced as much as possible*" before the microdroplets are "silently diffused" into the ambient air (*emphasis added*). *See* Ex-1016, 5:12-16.

[12] Petitioner nevertheless submits that Goubet discloses a silencer chamber in the form of inner enclosure 13.

The microdroplets that have been "reduced [in size] as much as possible" within the confines of Goubet's structure meet the "fluid dispersion" limitation. Ex-1002, ¶212. A POSITA would appreciate that the circular shape of the baffled path will continually separate the droplets into increasingly smaller and thus more uniform droplets. Ex-1002, ¶¶265-276. More particularly, only droplets of a particular size (and smaller) will be able to follow the air flow to navigate each additional turn without accumulating on surface of one of the walls. *Id.* Each turn will continually filter out droplets over a certain size, such that only smaller and more substantially uniform droplets of a particular size will continue to flow along the path. As a result, the dual enclosure and circular flow path of Goubet at least suggest that the droplets are divided into substantially uniform microdroplets by the time the microdroplets reach and pass through outlet 16, thereby meeting the limitation "fluid dispersion". *Id.*

If PO argues that the resulting atomized droplets do not meet the "fluid dispersion" limitation, it would have been obvious to modify Goubet to include additional enclosures to further decrease the diameter of the microdroplets, which would result in greater uniformity in the diameters of the microdroplets that eventually are discharged into the surrounding airspace. Ex-1002, ¶¶277-280. Goubet's objective of reducing droplet size as much as possible would have motivated a POSITA to add additional enclosures to the dual enclosure design. Ex-

1016, 5:13-16; 2:16-18 (reciting "said vaporization means comprise at least two concentric circular enclosures" and thus suggesting additional circular enclosures were already contemplated). A POSITA would appreciate that additional enclosures would result in further atomization and thus smaller, and more uniform droplets. A POSITA would have had a reasonable expectation of success in adding additional enclosures because the combination would not require undue experimentation or modification of the existing components and because a further enclosure would not introduce any incompatibilities with Goubet's existing design. Ex-1002, ¶¶277-280. Goubet thus renders obvious claim 7 of the '094 Patent.

2) Claim 8

The fluid dispersion assembly as recited in claim 7 wherein said atomizer assembly comprising an atomizer air inlet channel, a fluid inlet, a mixing chamber, and an atomizer exhaust channel.

Goubet discloses an atomizer assembly including an air inlet channel, a fluid inlet, a mixing chamber, and an atomizer exhaust channel as demonstrated above with respect to claim limitation 7[D]. Ex-1002, ¶¶281-285.

3) Claim 9

9[A] The fluid dispersion assembly as recited in claim 8 wherein said atomizer air inlet channel is interconnected to the compressed air source and said fluid inlet disposed in fluid communication with the operative fluid in the container,

As demonstrated above with respect to the claim limitation 7[D], Goubet teaches: (1) an atomizer air inlet channel (*e.g.*, compressed air inlet channel 6) that

is interconnected to the compressed air source (not shown) via air inlet channel 9; and (2) a fluid inlet (*e.g.,* the upper end 10 of the dip tube 8) in fluid communication with the operative fluid (*e.g.,* oil 3) in the container (*e.g.,* reservoir 2). EX-1002, ¶¶286-289.

9[B] wherein the compressed air and the operative fluid are mixed together in said mixing chamber to form the fluid dispersion.

Goubet teaches compressed air and essential oil are mixed together in the mixing chamber (*e.g.,* diffusion chamber 5) to form the fluid dispersion as demonstrated above for claim limitation 7[D]. Again, PO construes the term "mixing chamber" as a region where the operative fluid is combined with compressed air. *Id*. Ex-1018, Exhibit B. Thus, when the fluid dispersion is within the "mixing chamber," as is the case in limitation 9[B], the atomized liquid need not include "a plurality of substantially uniform droplets." Instead, the operative fluid need only be combined with compressed air. This is taught by Goubet. Ex-1002, ¶¶290-292.

4) Claim 11

The fluid dispersion assembly as recited in claim 7 wherein said diffusion chamber facilitates formation of the fluid dispersion prior to discharge of the fluid dispersion from said diffusion chamber through said discharge port and into the surrounding airspace.

Goubet teaches that the dual enclosures facilitate formation of the fluid dispersion (*e.g.,* micro-droplets) prior to discharge of the micro-droplets from said diffusion chamber through said discharge port (*e.g.,* 16) and into the surrounding

airspace, as demonstrated in claim limitation 7[D]. Therefore, Goubet discloses a diffusion chamber that facilitates formation of the fluid dispersion (*e.g.*, microdroplets) prior to discharge from said diffusion chamber through said discharge port (*e.g.*, outlet 16) and into the surrounding airspace. Ex-1002, ¶¶293-296.

E. Ground 4: Claim 7-9 and 11 are Unpatentable under 35 U.S.C. §103 as Obvious by Goubet in view of Kaiser

As discussed in Ground 3, Goubet alone renders obvious claims 7-9 and 11. As part of that analysis, Petitioner noted that Goubet teaches a silencer assembly that includes a baffle that disrupts and restricts the flow of atomized droplets, which at least suggests that Goubet would have a dampening effect on sound waves and meet the limitation of a "silencer assembly." Ex-1002, ¶¶297-309.

1) Claim 7

7[F] wherein said baffle partially restricts movement of the fluid dispersion through said silencer chamber from said silencer inlet to said silencer outlet, thereby dampening sound waves generated during operation of said fluid dispersion assembly.

Goubet does not explicitly disclose that the droplets are substantially uniform. For this reason, in Ground 4, and in addressing limitation 7[F], Petitioner also relies on Kaiser which describes that it was well known in the field at the time of the invention to produce uniform droplets to improve uniform evaporation rates. Ex-1014, pg. 43 ("critical to uniform evaporation and burning is a good control of the

size distribution of the resulting aerosol"). *Id.* Accordingly, if Goubet does not teach a 'fluid dispersion,' a POSITA would have been motivated to modify Goubet to include additional enclosures that result in fluid dispersion, as described above.

Notably, Ground 4 still relies on the teachings of Goubet for the other limitations of claims 7-9 and 11 as discussed in Ground 3.

F. Ground 5: Claims 7-9 and 11 are Unpatentable Under 35 U.S.C. §103 as obvious over Gao

1) Claim 7

7[PRE] 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:

To the extent the preamble is limiting, it is taught by Gao. Gao is titled "atomizer for atomizing essence or essential oil." Ex-1013, Cover.

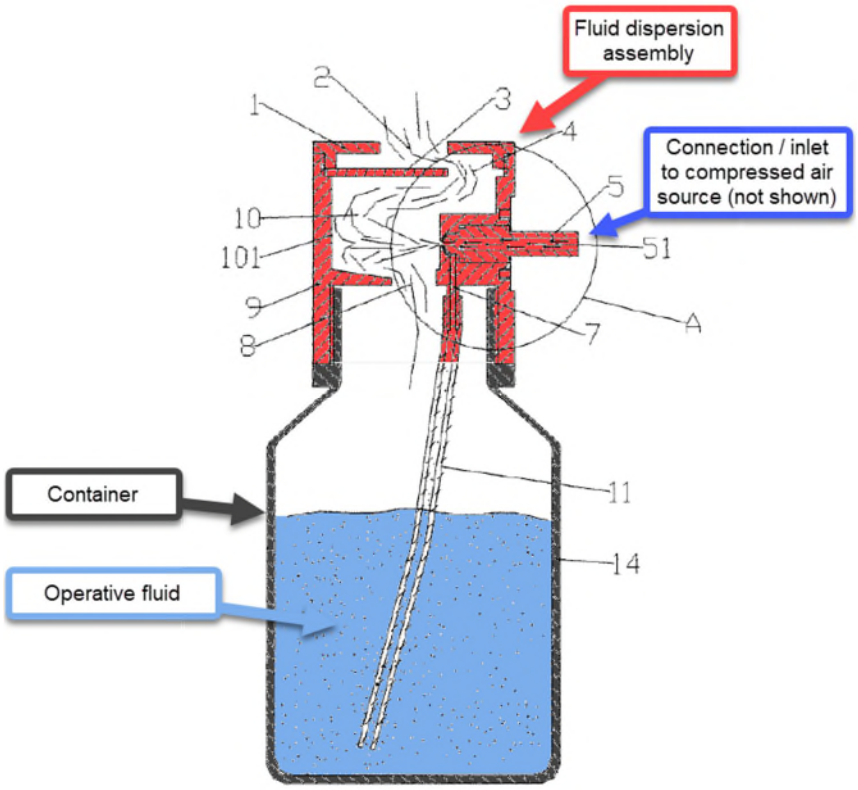


FIG. 1

Ex-1013, FIG. 1

As shown above in FIG. 1, Gao teaches a fluid dispersion assembly (*e.g.*, the atomizer). Gao's atomizer includes a "a main body 9 and a cover body 1." Ex-1013, ¶[0020]. The main body 9 has "an upper cavity and a lower cavity," and the inner wall of the lower cavity "is provided with an internal thread for fixing the entire atomizer on an essence or essential oil bottle 14." *Id.*, ¶[0020]. Accordingly, the fluid dispersion assembly (*e.g.*, the atomizer) is interconnected to a container of an operative fluid (*e.g.*, essential oil bottle 14) via the threading for atomizing essential oil.

Gao further teaches that the "atomizer body is provided with a first cavity and a second cavity 13." *Id.*, ¶[0019]. A "gas flow nozzle 5 is fixed in the second cavity 13." *Id.* "A coaxial gas flow pipe 51 is provided inside the gas flow nozzle 5." *Id.*, ¶[0023]. 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 [not shown]." *Id.*, ¶[0025]. Accordingly, Gao teaches that the fluid dispersion assembly (*e.g.*, the atomizer) is operatively interconnected to an 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." *Id.*, ¶[0025]. The Siphon principle is the fundamental idea that fluids flow from an area of higher pressure to areas of lower pressure. Ex-1002 ¶¶95, 318. Given PO's previously discussed proposed construction of a "compressed air source," and the pump of Gao, which blows pressurized air into the atomizer to produce the siphon principle, Gao's pump meets the "compressed air source" limitation.

Therefore, Gao teaches a fluid dispersion assembly (*e.g.*, the atomizer) that is operatively interconnected to a container (*e.g.*, essence or essential oil bottle 14) of an operative fluid (*e.g.*, essence or essential oil) and a compressed air source (*e.g.*, the pump) to generate and discharge a fluid dispersion (*e.g.*, atomized essential oil) into a surrounding airspace. Ex-1002, ¶¶310-321.

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

Gao discloses "liquid and gas are fully mixed" as a result of the siphon principle. Ex-1013, ¶[0025]. "The high-speed gas-liquid mixture is then ejected through a gas flow … port and hits an inner wall 101 of the lower part cavity 10, thus the liquid is atomized into micron-sized fine particles." *Id.* Thus, Gao teaches a diffusion unit (*e.g.*, main body 9), which at least partially defines a diffusion chamber (*e.g.*, lower part cavity 10 in which atomization occurs). Ex-1013, FIG. 1; *see* Ex-1002, ¶¶322-326.

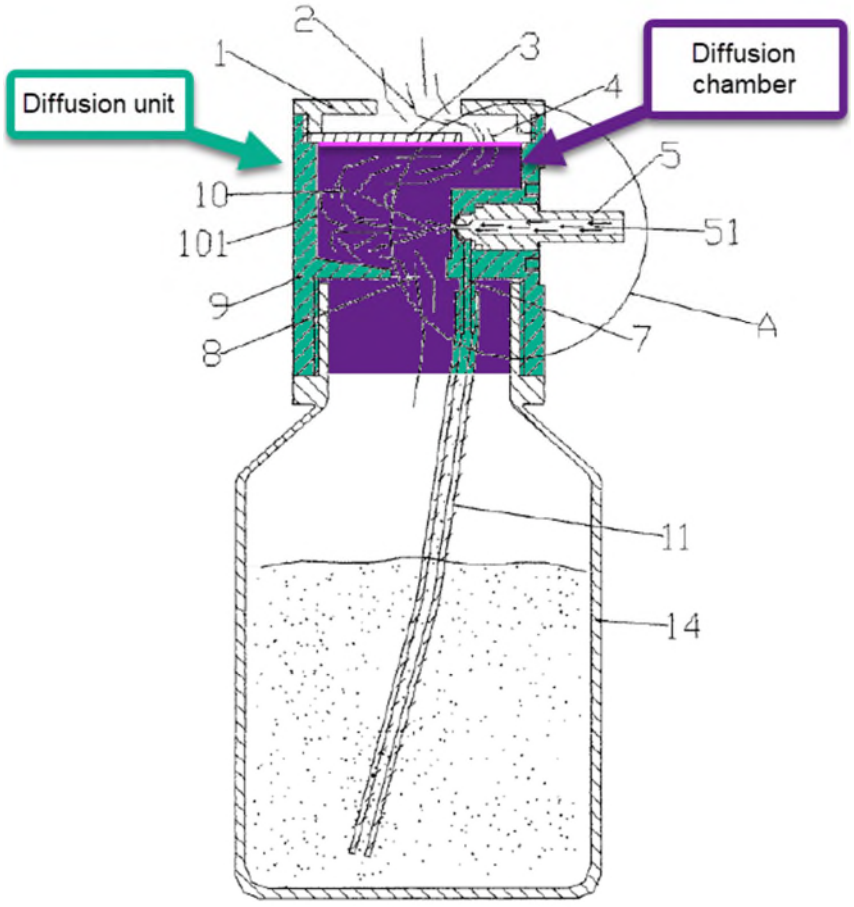


FIG. 1

Ex-1013, FIG. 1

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

Gao teaches that after the micron-sized fine particles are formed, "[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." Ex-1013, ¶[0025], FIG. 1.

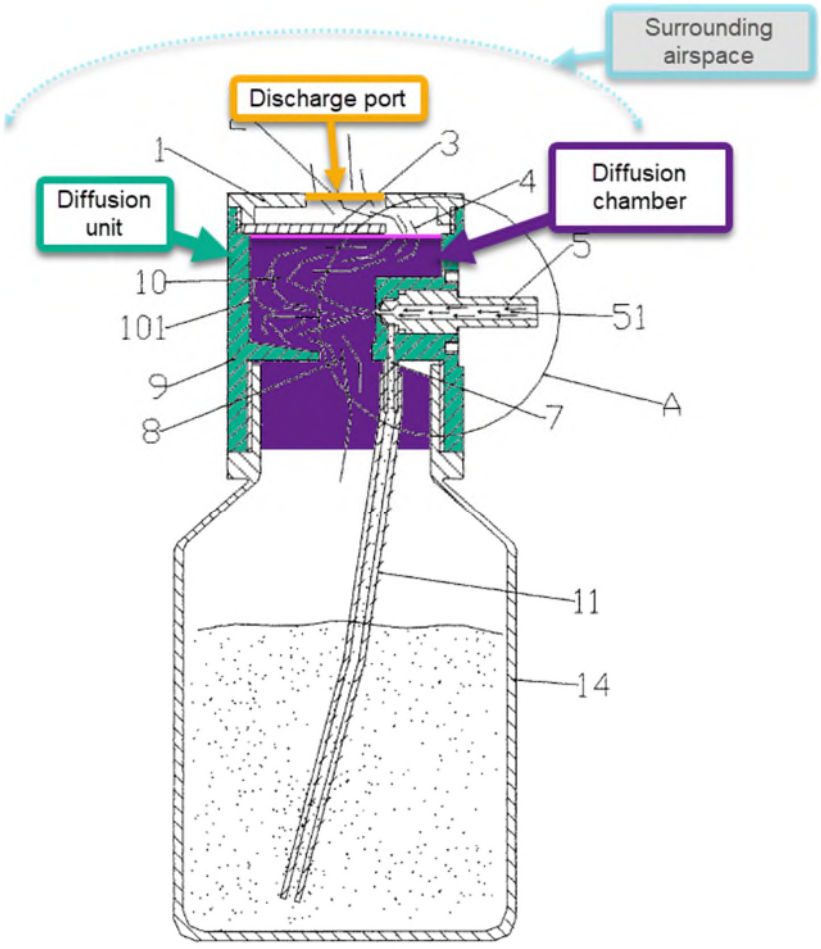


图 1

Ex-1013, FIG. 1

Accordingly, Gao teaches a discharge port (*e.g.*, gas outlet 2) that is disposed in fluid communication between the diffusion chamber (*e.g.*, lower part cavity 10 in which the micron-sized fine particles are formed) and the surrounding airspace. *see* Ex-1002, ¶¶327-329.

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

The ’094 Patent explains that “the diffusion assembly 200 comprises an air inlet 210 and an atomizer assembly.” Ex-1001, 5:5-6. Gao teaches a corresponding structure.

With reference to FIGS. 1 and 2 of Gao, the “gas flow nozzle 5 is fixed in the second cavity 13.” Ex-1013, ¶[0019]. “A coaxial gas flow pipe 51 is provided inside the gas flow nozzle 5.” *Id.*, ¶[0023]. 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 [not shown].” *Id.*, ¶[0025]. Thus, Gao teaches an air inlet, the inlet of the gas flow pipe 51.

Gao further discloses “[t]he liquid is sucked into the atomizing cavity 6 based on the siphon principle, and the liquid and the gas are fully mixed … then ejected through a gas flow flow port.” *Id.*, 1013, ¶[0025]. A POSITA would appreciate that mixing liquid with air is an atomization process. Ex-1013, ¶[0025] (referring to the cavity as an “atomizing cavity” in which the liquid is atomized); *see also* Ex-1002, ¶332. Thus, Gao discloses an atomizer assembly. As described above, the combination of Gao’s inlet of the gas flow pipe 51 and Gao’s atomizer assembly

forms structure that corresponds to the diffusion chamber. As shown in FIG. 1, a portion of Gao's diffusion assembly is disposed in operative engagement with the diffusion unit. Ex-1013, FIGS. 1 and 2 (reproduced below) depicting a portion of the diffusion assembly being fixed within the second cavity of the main body 9 (*e.g.*, diffusion unit). *See* Ex-1002, 330-333.

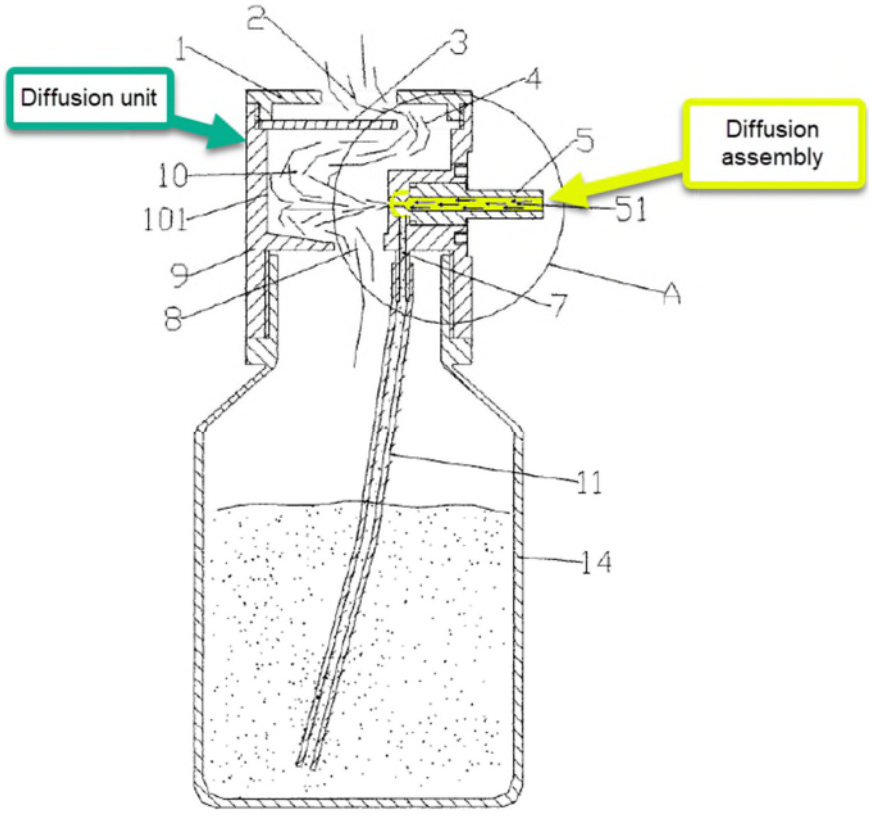


FIG. 1

Ex-1013, FIG. 1

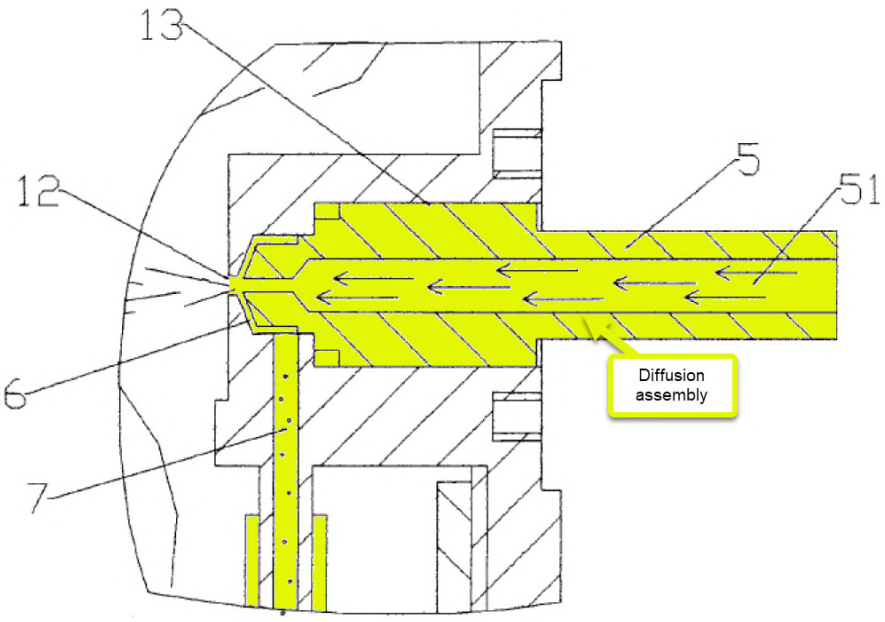


FIG. 2

Ex-1013, FIG. 2

7[D] wherein said diffusion assembly comprises an atomizer assembly, and

Gao discloses a diffusion assembly for the reasons set forth in claim limitations 7[C]. The atomizer assembly thereof, and its operation, is described in further detail hereinafter and annotated in FIG. 2 below.

Gao's "gas inlet on [the] side of the atomizer, *i.e.*, inlet of the gas flow pipe 51, is connected to the air pump." Thus, Gao teaches an atomizer air inlet channel. Ex-1013, ¶[0025]. "A gap is provided between the gas flow nozzle 5 and the bottom wall of the second cavity 13. An atomizing cavity 6 is formed between the gas flow nozzle 5 and the bottom wall of the second cavity. A liquid pipeline 7 is further provided on the atomizer body, and the liquid pipeline 7 is in communication with the atomizing cavity 6." Ex-1013, ¶[0019].

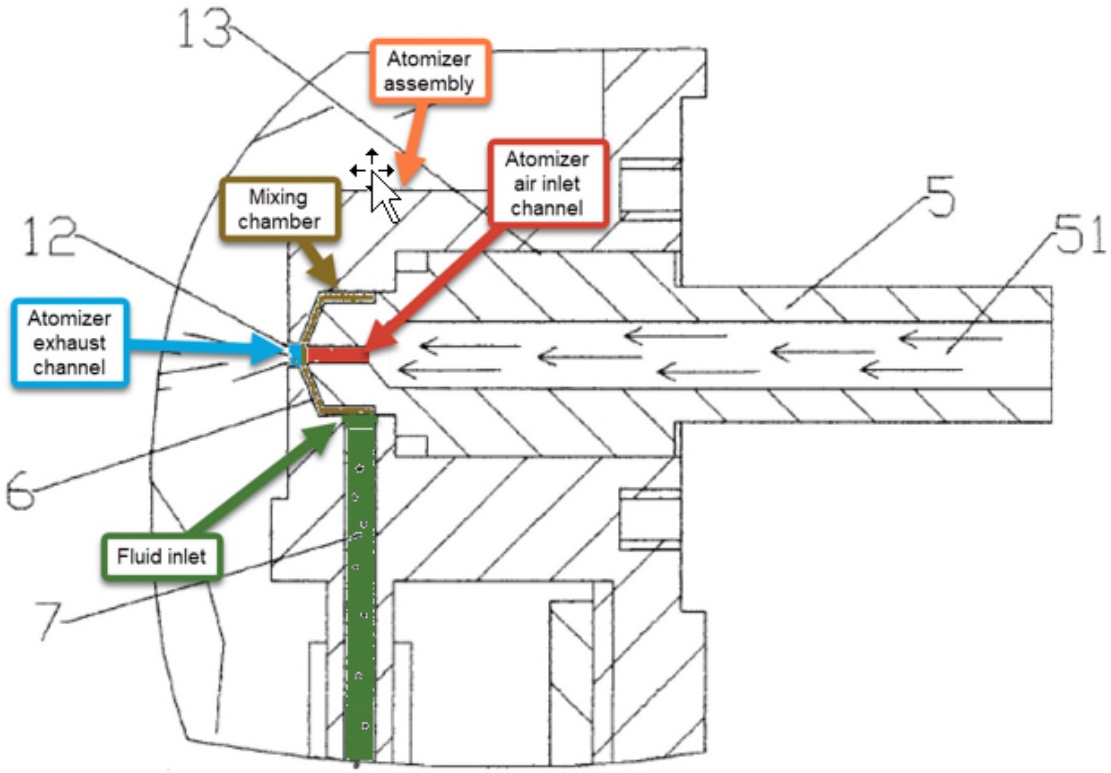


FIG. 2

Ex-1013, FIG. 2

Further, "[w]hen 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, ¶[0025]. Thus, Gao teaches a fluid inlet (*e.g.*, liquid pipeline 7) and a mixing chamber (*e.g.*, atomizing cavity 6). *Id.* "The high-speed gas-liquid mixture is then ejected through a gas flow flow port [12]." *Id.* Thus, Gao also teaches an atomizer exhaust channel.

Therefore, as shown in FIG. 2, Gao teaches an atomizer assembly comprising an atomizer air inlet channel (*e.g.*, inlet of gas flow pipe 51), a fluid inlet (*e.g.* upper

end of liquid pipeline 7), a mixing chamber (*e.g.*, atomizing cavity 6), and an atomizer exhaust channel (*e.g.*, gas flow spray hole 12). *See* Ex-1002, ¶¶334-339.

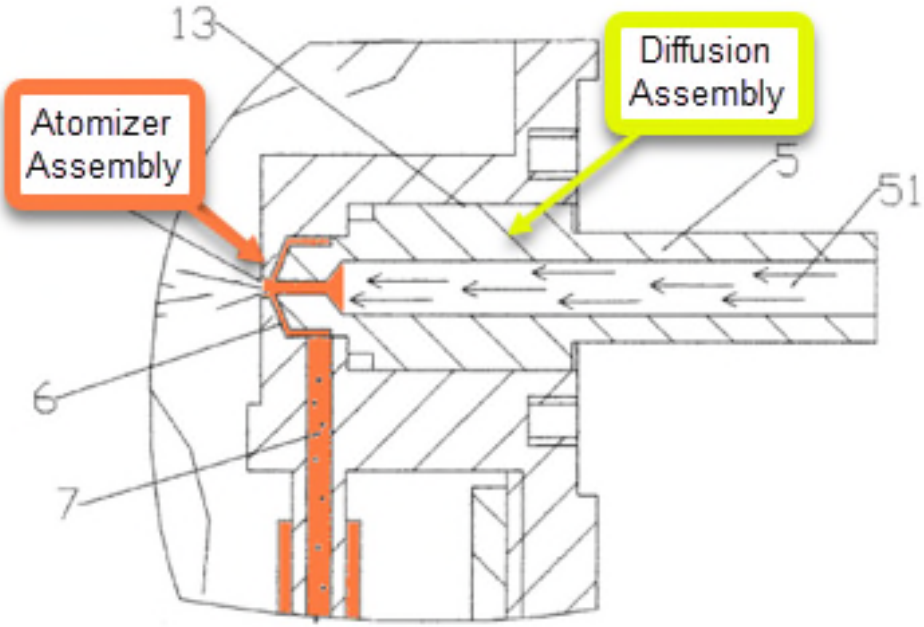


FIG. 2

Ex-1013, FIG. 2

7[E] a silencer assembly having a silencer inlet, a silencer outlet, and a baffle,

Gao discloses a silencer assembly having a silencer inlet, a silencer outlet, and a baffle as demonstrated below. PO contends that the claim limitation "silencer assembly" should be given its plain and ordinary meaning, or alternatively, construes the term to mean an "assembly that reduces the amount of noise generated during operation of the fluid dispersion assembly as the fluid dispersion flows therethrough." Ex-1018, Exhibit B.

Gao teaches that "[a]n upper part of the first cavity is provided with a baffle 3." Ex-1013, ¶[0019]; *see* also Ex-1013, FIG. 1 (depicting the baffle 3 of Gao).

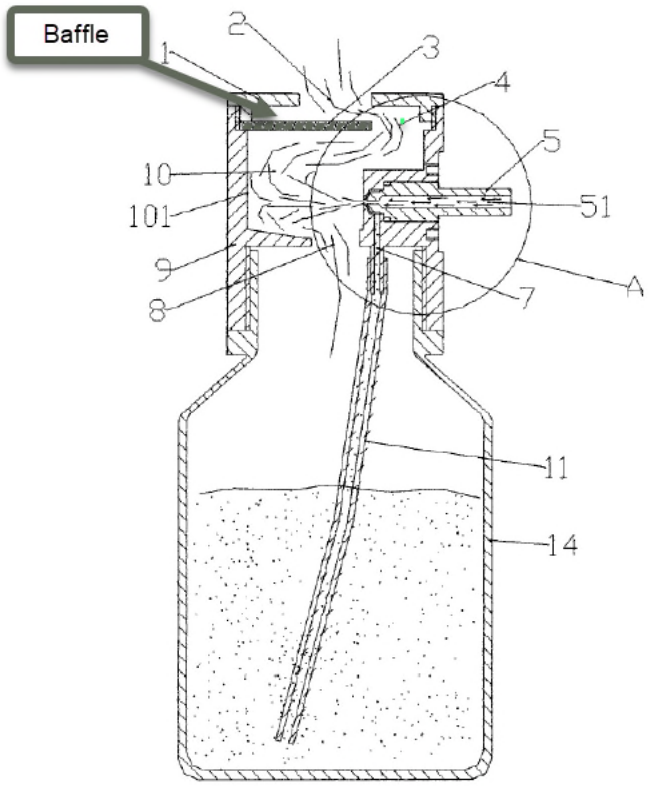


FIG. 1

Ex-1013, FIG. 1

The baffle 3 is fixed to an upper part of the upper cavity by the cover body 1. As shown baffle 3 also forms an inlet for the rising gas flow below the baffle (as depicted in purple). *See also* Ex-1013, FIG. 1 (depicting the flow twisting and turning as it travels from the diffusion chamber (*e.g.*, the lower part cavity 10) and around baffle 3 (across through hole 4) its way to gas outlet 2.

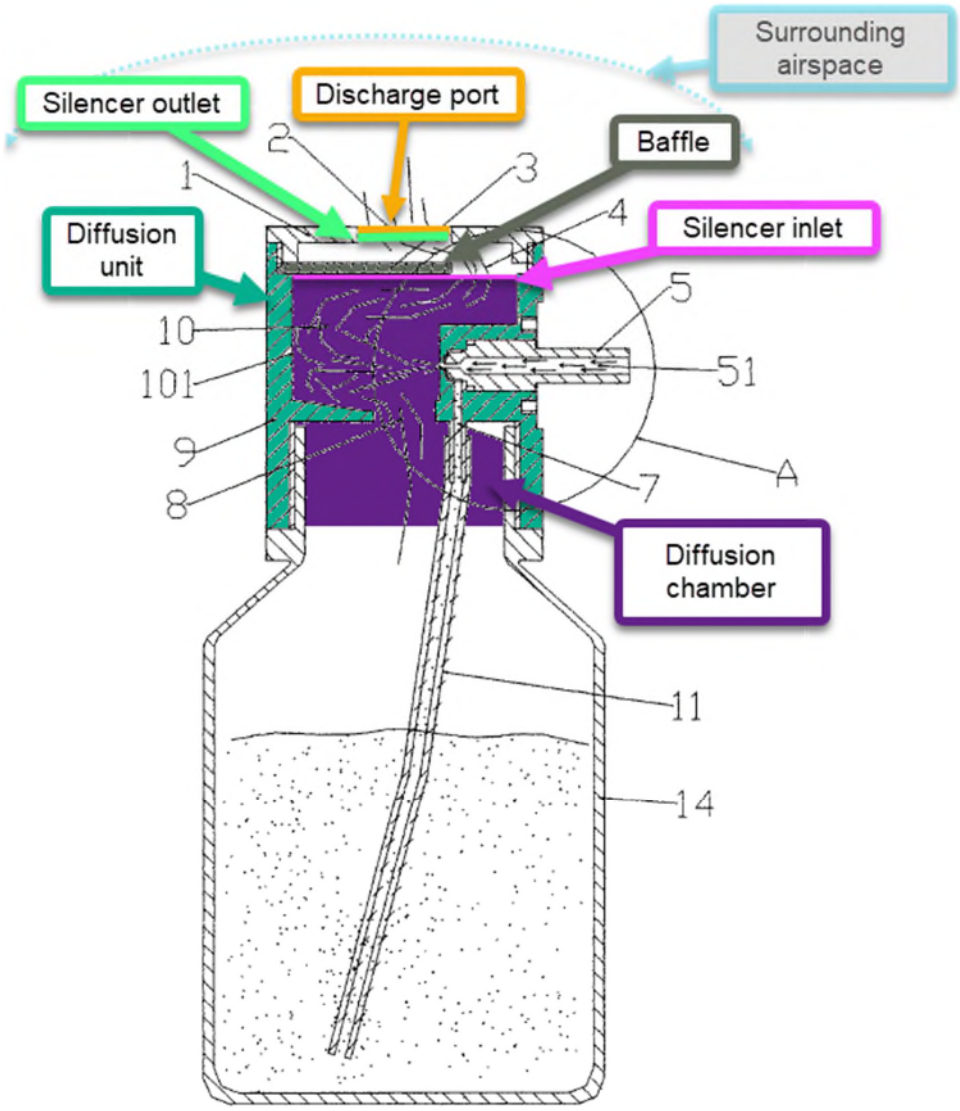


图 1

Ex-1013, FIG. 1

For the reasons discussed in grounds 1 and 3 with respect to limitation 7[E], a POSITA would understand that a baffle that disrupts fluid flow, like Gao's baffle 3, would also limit sound associated therewith. Ex-1001, 6:1-8, 7:1-11, and 7:64-8:2 (teaching that sound dampening is a byproduct of disrupted fluid flow); *see also* Ex-1002, ¶¶340-350. Consequently, Gao teaches a silencer

assembly including a baffle, and thus, the above-described inlet and outlet also respectively meet the "silencer inlet" and "silencer outlet" limitations. The silencer assembly of Gao is shown below.

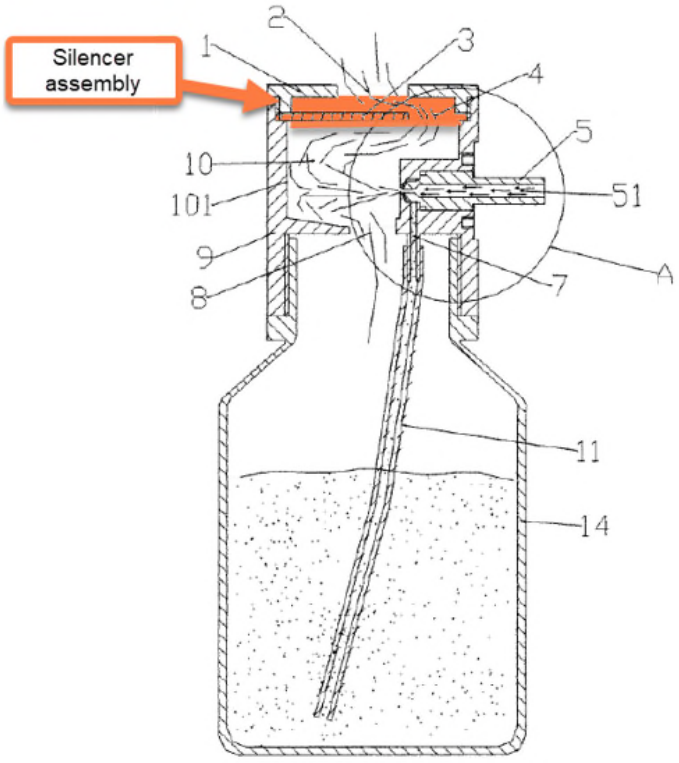


FIG. 1

Ex-1013, FIG. 1

7[F] wherein said baffle partially restricts movement of the fluid dispersion through said silencer chamber from said silencer inlet to said silencer outlet, thereby dampening sound waves generated during operation of said fluid dispersion assembly.

The below remarks are set forth as though the term "silencer chamber" was replaced with the term "silencer assembly"[13] in view of PO's construction of the term "silencer chamber." Ex-1018, pg. 1.

Gao identifies a problem with conventional atomizers insofar as they generate particles in a large range from 1-50 microns. Ex-1013, ¶[0005]. Gao thus provides an atomizer that produces particles that "are finer and more uniform, the aroma is more uniform, and the aroma diffusion area is large." Ex-1013, Abstract; Ex-1013, ¶[0007], ¶[0025] ("the mist can be controlled below 3 microns"). Petitioner emphasizes that this size is within, and on the lower-end of, the range of droplets disclosed in the '094 Patent, and meets the "fluid dispersion" limitation.

As shown in annotated FIG. 1 of Gao below, baffle 3 partially restricts movement of the fluid dispersion by causing the flow to twist and turn through the silencer inlet, hole 4, and silencer outlet, before it exits the discharge port (*e.g.*, gas outlet 2).

[13] Gao nevertheless discloses a silencer chamber formed within cover body 1.

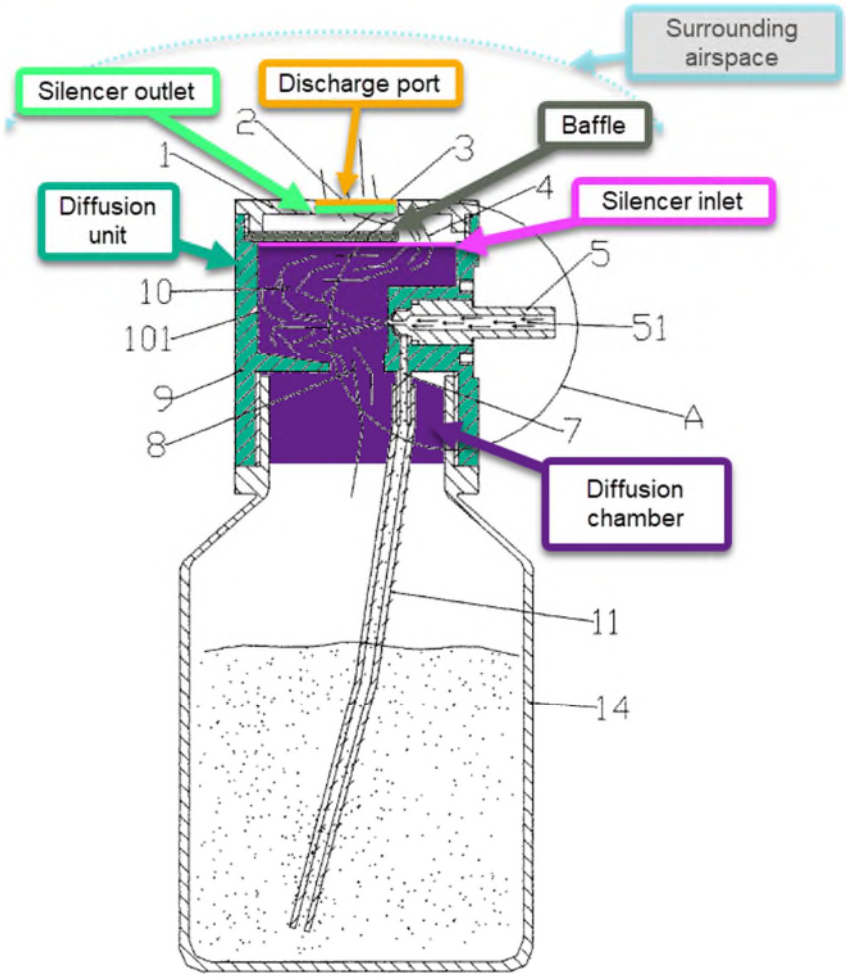


图 1

Ex-1013, FIG. 1

A POSITA would appreciate that baffle 3, which disrupts fluid flow, would also dampen sound waves generated during operation of said fluid dispersion assembly. Ex-1002, ¶¶351-361; *see also* Ex-1001, 6:1-8, 7:1-11, and 7:64-8:2 (sound dampening is a byproduct of disrupted fluid flow).

2) Claim 8

The fluid dispersion assembly as recited in claim 7 wherein said atomizer assembly comprising an atomizer air inlet channel, a fluid inlet, a mixing chamber, and an atomizer exhaust channel.

As demonstrated in limitation 7[D], Gao teaches an atomizer assembly comprising an atomizer air inlet channel (*e.g.,* the inlet of gas flow pipe 51), a fluid inlet (*e.g.* the upper end of liquid pipeline 7), a mixing chamber (*e.g.*, atomizing cavity 6), and an atomizer exhaust channel (*e.g.*, gas flow spray hole 12). *See* Ex-1002, ¶¶362-367.

3) Claim 9

9[A] The fluid dispersion assembly as recited in claim 8 wherein said atomizer air inlet channel is interconnected to the compressed air source and said fluid inlet disposed in fluid communication with the operative fluid in the container,

As demonstrated in limitation 7[D], Gao teaches the atomizer air inlet channel (*e.g.*, the inlet of the gas flow pipe 51) is interconnected to the compressed air source (*e.g.*, the air pump) and the fluid inlet (*e.g.*, the upper end of liquid pipeline 7) is disposed in fluid communication with the operative fluid in the container (*e.g.*, essence or essential oil bottle 14). *See* Ex-1002, ¶¶368-370.

9[B] wherein the compressed air and the operative fluid are mixed together in said mixing chamber to form the fluid dispersion.

As demonstrated in limitation 7[D], Gao teaches the compressed air and the operative fluid are mixed together in said mixing chamber (*e.g.,* atomizing cavity (6)) to form the fluid dispersion. The fluid dispersion limitation is discussed in limitation 7[F]. *See* Ex-1002, ¶¶371-376.

4) Claim 11

The fluid dispersion assembly as recited in claim 7 wherein said diffusion chamber facilitates formation of the fluid dispersion prior to discharge of the fluid dispersion from said diffusion chamber through said discharge port and into the surrounding airspace.

As described above, the atomized particles produced by Gao's atomizer are "more uniform" and "can be controlled below 3 microns." Ex-1013, Abstract; *Id.*, ¶[0007]; *Id.*, ¶[0025] (reciting the present atomizer "can effectively maintain the natural aroma of essence and essential oil; in addition, the atomized particles are finer and more uniform, the aroma is more uniform, and the aroma diffusion area is large"). Accordingly, the droplets of Gao meet the limitation "fluid dispersion" as further explained in limitations 7[D] and 7[F]. Further, in view of the arguments set forth in limitation 7[D], Gao teaches the "diffusion chamber facilitates formation of the fluid dispersion prior to discharge of the fluid dispersion from said diffusion chamber through said discharge port and into the surrounding airspace." *See* Ex-1002, ¶¶377-379.

G. Ground 6: Claims 7-9 and 11 are Unpatentable Under 35 U.S.C. §103 as Obvious over Gao in view of Zeng.

As discussed in Ground 5, Gao alone renders obvious claims 7-9 and 11. As part of that analysis, Petitioner noted that Gao discloses an assembly including a baffle 3 that disrupts and restricts the flow of atomized droplets, which therefore, at least suggests that Gao would have a dampening effect on sound waves and meet the "silencer assembly" limitation. *See* Ex-1002, ¶¶380-381. Nevertheless, Gao does not

explicitly recite that baffle 3 has a sound dampening effect. For this reason, in Ground 6, and in addressing the limitations set forth in 7[E] and 7[F], Petitioner also relies on Zeng, which explicitly discloses a noise reduction head 20 for this purpose. Ex-1011, pg. 2.

Notably, Ground 6 still relies on the teachings of Gao for the other limitations of claims 7-9 and 11 as previously discussed in Ground 5.

1) Claim 7

7[E] a silencer assembly having a silencer inlet, a silencer outlet, and a baffle,

7[F] wherein said baffle partially restricts movement of the fluid dispersion through said silencer chamber from said silencer inlet to said silencer outlet, thereby dampening sound waves generated during operation of said fluid dispersion assembly.

As discussed in detail in Ground 2, Zeng teaches an essential oil atomizer that improves atomization by reducing the size/volume of the atomized droplets. Gao similarly teaches such an atomizer. Gao and Zeng are thus analogous references. Ex-1011, at pg. 1; Ex-1013, ¶[0025].

Zeng recognizes drawbacks of conventional atomizers, including their production of: (1) large droplets of varying sizes; and (2) an irritating "hissing" or "whistling" noise during operation. Ex-1011, at pg. 4-5. To address these drawbacks, Zeng proposes a noise reduction head 20 and inner cover 30 that cooperate to form a silencer assembly designed to dampen sound and only permit small and uniform

molecules (*e.g.*, fluid dispersion) to pass through the opening 31 of inner cover 30 (*e.g.*, the silencer assembly).

A POSITA would have been motivated to combine the teachings of Zeng with Gao to dampen the hissing noise, while maintaining the small and uniform droplets taught by Gao to enhance user experience. Ex-1011, at pg. 4-5; *see* Ex-1002, ¶¶382-389.

A POSITA would combine Zeng with Gao without undue experimentation. First, a POSITA would appreciate that Gao's baffle restricts fluid flow and produces "more uniform" droplets that "can be controlled below 3 microns" to produce a more "uniform smell." Ex-1013, ¶¶[0004], [0025]. Second, Zeng's silencer assembly (*e.g.*, the noise reduction head 20 and the inner cover 30) serves the same purpose as Gao's baffle, namely, preventing large molecules of differing sizes from passing therethrough, *and* additionally, has a sound dampening effect. Thus, to reduce noise without sacrificing atomization quality (enlarging droplet size), a POSITA would have been motivated to modify Gao in at least two ways.

Modification 1

First, a POSITA would have been motivated to substitute Gao's baffle 3 and cover body 1 with Zeng's silencer 20 and inner cover 30, which would reduce the hissing sound generated during operation of the fluid dispersion assembly as the fluid dispersion flows therethrough without enlarging droplet size. The combination

of Zeng's silencer 20 and inner cover 30 would replace Gao's baffle 3 and cover body 1 and sit on the ledge formed within Gao's main body 9. As such, Zeng's silencer assembly would be a simple substitution of known parts for Gao's silencer assembly that would not require undue experimentation. Furthermore, such modification would achieve the same desired technical effect. *See* Ex-1002, ¶¶382-386.

Modification 2

Second, a POSITA would have alternatively been motivated to modify Gao's existing orifice baffle into a dome shape orifice baffle as taught by Zeng to produce an improved noise reducing effect. Such a modification would be small change in structure that would not require undue experimentation or modification of other components within of the atomizer. *Id.*, ¶ 387-389.

2) Other Limitations of Claim 7

Limitations 7[PRE]–7[D] are taught by Gao for the reasons previously provided in Ground 5 as such limitations are wholly unrelated to the silencer assembly. S*ee* Section X(F)(1); Ex-1002, ¶¶310-339.

3) Claims 8, 9 and 11

Claims 8, 9, and 11 are taught by Gao for the reasons previously provided in Ground 5 as such limitations are also wholly unrelated to the silencer assembly. S*ee* Section X(F)(2)-(3); Ex-1002, ¶¶362-379.

XI. DISCRETIONARY DENIAL IS NOT APPROPRIATE

A. 35 U.S.C. § 325(d)

Under § 325(d), the Board uses the following two-part framework to determine whether to exercise its discretion and deny institution of review: (1) whether the same or substantially the same art previously was presented to the Office or whether the same or substantially the same arguments previously were presented to the Office; and (2) if either condition of first part of the framework is satisfied, whether the petitioner has demonstrated that the Office erred in a manner material to the patentability of challenged claims. *Advanced Bionic v. Med-EL Elektromedizinische Geräte*, IPR2019-01469, 2020 WL 740292, at *3-4 (P.T.A.B. Feb. 13, 2020) (precedential). The Court should not exercise its discretion here because this Petition (1) presents substantially different art and arguments that were not previously presented to the Office, and (2) even if part one of the framework could be satisfied, the Examiner erred in a manner material to the patentability of challenged claims.

First, Grounds 2-6 rely on Goubet, Gao, and Zeng, none of which were previously presented to the Office. While Sevy was presented during prosecution, there is no indication the Examiner considered its teachings to dampen sound waves as argued in this Petition. Ex-1005, 2:41-47; Ex-1006, 9:18-22. And, moreover, the arguments presented herein are supported by Dr. White's detailed Declaration explaining how a POSITA would view the teachings of the references herein. Ex-

1002. Therefore, part one of the *Advanced Bionics* test favors institution, as the Grounds set forth herein were not considered by the Examiner.

Second, even assuming part one of the framework could be satisfied, the Examiner mistakenly allowed the ’094 Patent claims by overlooking teachings in the prior art that renders the challenged claims obvious. Applicant’s argument that “silencer assembly” renders the claims patentable is flawed because such integration is an obvious design choice that operates as expected, as explained by Dr. White’s declaration. *See* MPEP 2411.04(V)(B).

B. 35 U.S.C. § 314(a)

Apple, Inc. v. Fintiv, Inc., IPR2020-00019, Paper 11 (P.T.A.B. Mar. 20, 2020) (precedential) favors institution because this Petition presents compelling evidence of unpatentability and, per PTO interim guidance, Petitioner stipulates that if the Board institutes this IPR then Petitioner will not seek resolution in the district court litigation of invalidity based on the grounds in this Petition, or any grounds that could have reasonably been raised in this Petition. *See Sotera Wireless, Inc. v. Masimo Corp.*, IPR2020-01019, Paper 12 at 17 (P.T.A.B. Dec. 1, 2020) (precedential); 35 U.S.C. §311.

XII. CONCLUSION

In view of the foregoing, claims 7-9 and 11 of the ’094 Patent are not patentable and Petitioner respectfully requests this IPR be instituted.

Date: March 18, 2025

Respectfully submitted,

/James P. Murphy/

James P. Murphy, Reg. No. 55,474
Polsinelli, PC
1000 Louisiana Street, Suite 6400
Houston, Texas 77002
Tele: (713) 374-1631
Fax: (713) 374-1601

APPENDIX - Claim Limitation Listing

Claim 7

7[PRE] 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:

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

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

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

7[D] wherein said diffusion assembly comprises an atomizer assembly, and

7[E] a silencer assembly having a silencer inlet, a silencer outlet, and a baffle,

7[F] wherein said baffle partially restricts movement of the fluid dispersion through said silencer chamber from said silencer inlet to said silencer outlet, thereby dampening sound waves generated during operation of said fluid dispersion assembly.

Claim 8

The fluid dispersion assembly as recited in claim 7 wherein said atomizer assembly comprising an atomizer air inlet channel, a fluid inlet, a mixing chamber, and an atomizer exhaust channel.

Claim 9

9[A] The fluid dispersion assembly as recited in claim 8 wherein said atomizer air inlet channel is interconnected to the compressed air source and said fluid inlet disposed in fluid communication with the operative fluid in the container,

9[B] wherein the compressed air and the operative fluid are mixed together in said mixing chamber to form the fluid dispersion.

Claim 11

The fluid dispersion assembly as recited in claim 7 wherein said diffusion chamber facilitates formation of the fluid dispersion prior to discharge of the fluid dispersion from said diffusion chamber through said discharge port and into the surrounding airspace.

CERTIFICATE OF WORD COUNT

Pursuant 37 C.F.R. § 42.24(a)(1)(i), Petitioner certifies that this Petition includes 13,354 words, as measured by Microsoft Word, where such word count excludes the table of contents, mandatory notices, mandatory notices under § 42.8, certificates of service, this certificate of word count, appendix of exhibits or claim listing, and exhibits.

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

The undersigned hereby certifies that a copy of the accompanying Petition for *inter partes* review, all accompanying exhibits, and the Power of Attorney has been served on March 18, 2025, by delivering a copy via Federal Express to attorney of record for U.S. Patent No. 9,527,094 at the following address:

Peter A. Matos
Malloy & Malloy, P.L.
2800 S.W. Third Avenue
Miami, FL 33129

A courtesy copy was sent to the below counsel via electronic mail:

Peter A. Matos
Malloy & Malloy, P.L.
2800 S.W. Third Avenue
Miami, FL 33129
pmatos@malloylaw.com

W. John Egan
Malloy & Malloy, P.L,
2800 S.W. Third Avenue
Miami, FL 33129
johnegan@malloylaw.com

Tyler Litwak
Malloy & Malloy, P.L.
2800 S.W. Third Avenue
Miami, FL 33129
tlitwak@malloylaw.com

Dated: March 18, 2025

Respectfully submitted,

/James P. Murphy/

James P. Murphy (Reg. No. 55,474)
Polsinelli PC
1000 Louisiana Street
Suite 6400
Houston, Texas 77002
Tel: (713) 374-1631
jpmurphy@polsinelli.com

Attorney for Petitioner