

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

AROMA360, LLC.,
PETITIONER,

v.

AIR ESSSENTIALS, INC.
PATENT OWNER.

Case IPR 2025-00705
Patent 9,527,094

PETITIONER'S REPLY TO PATENT OWNER'S RESPONSE

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Exhibit 1025	E.P Spearman, J.A. Sattarty, and M.J., Reader-Harris, <i>Comparison of velocity and turbulence profiles downstream of perforated plate flow conditioners</i> , FLOW MEAS. INSTRUM., Vol. 7 No. 3/4, pp. 181-199 (1996)
Exhibit 1026	Lighthill, M. J., <i>On Sound Generated Aerodynamically</i> , I. General Theory. Proc. Roy. Soc. (London), Ser. A, vol. 211, no. 1107 (Mar. 20, 1952), pp. 564-587 (hereinafter, “Lighthill”)
Exhibit 1027	NOISE AND VIBRATION CONTROL ENGINEERING: PRINCIPLES AND APPLICATIONS (2006), Ed. I.L. Ver and L.L Beranke, Wiley & Sons, ISBN-10 0-471-44942-3 (hereinafter, “the Noise Control Book”)
Exhibit 1028	HANDBOOK OF ATOMIZATION AND SPRAYS: THEORY AND APPLICATION (2011), Ed. N. Ashgriz, Springer, DOI 10.1007/978-1-4419-7264-4 (hereinafter, the “Handbook”)

Exhibit 1029	Perry's Chemical Engineers' Handbook (1997), Ed. R.H. Perry, D.W. Green, and J.O. Maloney McGraw Hill, ISBN 0-07-049841-5 (the "Perry Handbook")
Exhibit 1030	C. Mundi, M. Sommerfeld, and C. Tropea, <i>Droplet-wall collisions: experimental studies of the deformation and breakup process</i> . INT. J. MULTIPHASE FLOW 21: 151-173
Exhibit 1031	Bernoulli, D. (1738) Hydrodynamica, ETH-Bibliothek Zürich https://doi.org/10.3931%2Fe-rara-3911
Exhibit 1032	White, F.M. (1994), Fluid Mechanics (3rd Edition), New York, NY: McGraw-Hill Higher Education
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Exhibit 1048	H. M. Taylor and S. Karlin, <i>An Introduction to Stochastic Modeling</i> . Orlando, FL: Academic Press, 1984.
Exhibit 1049	R. A. Mugele and H. D. Evans, “ <i>Droplet size distribution in sprays,</i> ” <i>Industrial & Engineering Chemistry</i> , vol. 43, no. 6, pp. 1317–1324, 1951.
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I. INTRODUCTION

Patent Owner's Response ("Response" or "Resp.") interprets certain claim limitations inconsistently with the parties' constructions and mischaracterizes the Petition, Dr. White's expert declaration, and the prior art..

II. PATENT OWNER'S EXPERT DECLARATION SHOULD BE GIVEN NO WEIGHT

Patent Owner supports its Response with a declaration from Dr. Gerald Micklow, but Dr. Micklow admitted during his deposition that he did not consider the parties' claim constructions when preparing his declaration and testified that he instead applied his own understanding of the terms. Ex. 1046, 115:15-18 (Dr. Micklow stated "I don't know if I would even apply claim construction. I applied engineering principles."). Later, Dr. Micklow confirmed that he "wasn't involved in the claim constructions" and that he was "not here to opine" on that part of the analysis. Ex. 1046, 112:4-12, 113:13-20. *See, e.g., Cordis Corp. v. Boston Sci. Corp.*, 658 F.3d 1347, 1357-58 (Fed. Cir. 2011) (affirming the district court's disregard of expert testimony based on an incorrect understanding of the claim construction).

A. The Parties' Advanced Specific Claim Constructions in the Underlying Litigation That Define the Proper Analytical Framework

The Petition referenced the parties' Joint Claim Construction Statement from the underlying litigation, and this Joint Claim Construction Statement was also discussed in the Board's institution decision. Ex. 1018; Exhibit A; *see* Inst. Dec. 16

and 18-19. Relevant to this Reply, the agreed-to terms include ‘fluid dispersion’ and ‘baffle,’ and the disputed terms include ‘mixing chamber’ and ‘diffusion chamber.’ Ex. 1018, Ex. A, B.

Petitioner highlights these terms to illustrate that Dr. Micklow’s declaration is premised on understandings of claim scope that are inconsistent with the constructions advanced by both of the parties.

B. Dr. Micklow Admitted He Did Not Consider or Apply the Parties Claim Constructions in Providing his Opinions

1. “Fluid Dispersion”

For example, the parties’ stipulated meaning of ‘fluid dispersion’ requires a plurality of droplets having “substantially the same diameter.” Ex. 1018, Ex. A. On the other hand, Dr. Micklow doesn’t compare individual droplet diameters but instead calculates an average “distribution” of the droplet collection. Ex. 1046, 119:10-15; 148:5-10.

Along these lines, Dr. Micklow opines that the prior art devices will produce “non-uniform spray” whereas he alleges the ’094 Patent requires a “uniform spray” or a “uniform spray distribution.” Ex. 2002, ¶29; Ex. 1046, 117:20-24; 149:3-150:3. In describing the meaning of “uniform distribution,” Dr. Micklow testified, “[w]ell, you’re going to have a radius of the particle. *And by the way, there are quite a few different radiuses.* The one I use most often is the Sauter mean radius.” Ex. 1046, 118:1-7. Dr. White agrees that the Sauter mean radius (or diameter) is one acceptable

way in which a POSITA would interpret the term “uniform distribution” and notes that the Sauter mean diameter refers to the *average* diameter of a droplet collection that has the same volume-to-surface ratio as the population. Ex. 1047, ¶¶13-14. The Sauter Mean Diameter, however, does not represent a typical or most frequent particle diameter, and can be satisfied by a wide range of droplet diameters if the total volume and surface area relationships are similar. Ex. 1047, ¶15.

Dr. White’s supplemental declaration further explains that the engineering definition of a “uniform spray distribution” is related to but distinct from the parties’ stipulated construction of “fluid dispersion.” Ex. 1047, ¶5. That is, “uniform spray distribution” implies that particle size (diameter) has equal probability across a defined interval. Ex. 1047, ¶12.

In view of the explicit definition of the term “fluid dispersion” set forth in the specification—a definition that was later stipulated to between the parties’—a POSITA would have understood that interpreting the “fluid dispersion” limitation as a “uniform spray distribution” would materially alter the scope and meaning of the challenged claims. Ex. 1047 ¶13. Therefore, Dr. Micklow’s opinions on whether limitations involving “fluid dispersion” are met by the prior art are not reliable or helpful to the Board’s analysis.

2. “Baffle”

In direct contrast to the parties’ stipulated construction of the term “baffle,” Dr. Micklow defines a baffle as a structure that provides “cancellation of the unsteady

pressure fluxes occurring within that domain of interest.” Ex. 1046, 125:24-127:3. The Board should give little, if any, weight to Dr. Micklow’s opinions on whether the prior art references include a “baffle” given his failure to apply the parties agreed claim construction. Ex. 1018, Ex. A.

3. “Mixing Chamber”

When asked how he interpreted the term “mixing chamber,” Dr. Micklow testified that he “applied the understanding [he has] of a mixing chamber” and his understanding is “a mixing chamber has significant volume and dimensions so that you can have a finely dispersed fluid at the exit of the mixing chamber.” Ex. 1046, 117:4–15.

Neither Patent Owner, nor Petitioner, advance a construction for the term “mixing chamber” that requires the chamber have any particular volume, much less, “a significant volume and dimensions,” nor does either parties’ proposed construction require “finely dispersed fluid at the exit.” Ex. 1018, Exhibit. B. The Board should give little, if any, weight to Dr. Micklow’s opinions on whether the prior art references include a “mixing chamber.”

4. “Diffusion Chamber”

Dr. Micklow interprets the “diffusion chamber” as a chamber “where you’re decelerating the flow” and “attempting to obtain a uniform spray distribution that is a fine spray with a uniform distribution across the exit.” Ex. 1046, 117:16–24. Notably, this definition refers to “uniform distribution” and not “droplets having substantially

the same diameter” as stipulated by the parties.

Furthermore, Dr. Micklow’s definition adds additional requirements not agreed-to by the parties, including “deceleration” and “uniform spray distribution ... across the exit.” Ex. 1018, Exhibit. B; Ex. 1046, 117:16–24. The Board should give little, if any, weight to Dr. Micklow’s opinions on whether the prior art references include a “diffusion chamber”.

III. GROUND 1 (SEVY) RENDERS OBVIOUS CLAIMS 7–9 AND 11

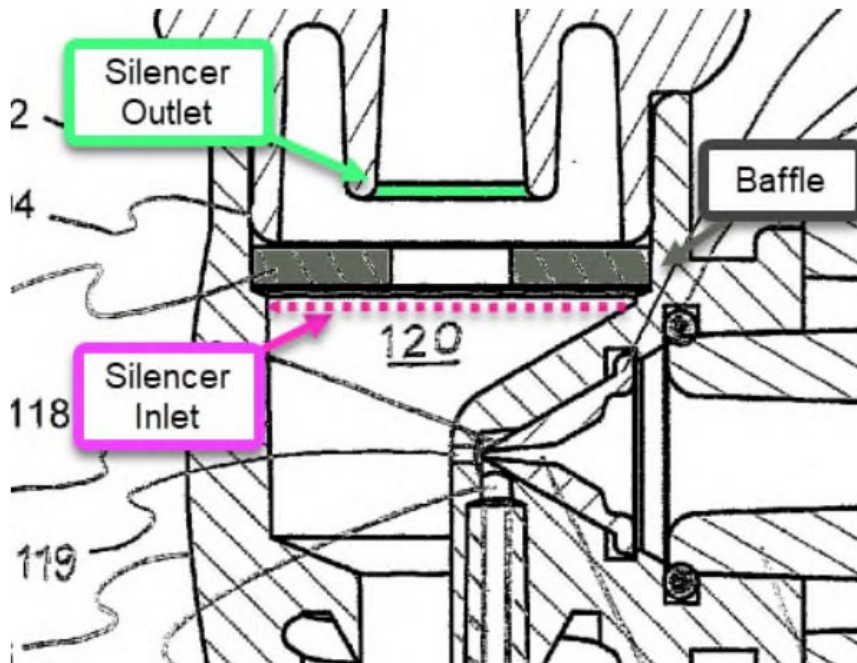
A. Patent Owner’s “Previously Considered” Argument is Misplaced

Patent Owner’s contention that Sevy was “previously considered” is a request to revisit the Board’s discretionary institution determination under 35 U.S.C. § 325(d)—an issue the Board has already resolved—and has no bearing on the merits of unpatentability. Resp., 7; Ex. 1001, cover. In any event, the Examiner did not have the benefit of analysis in the Petition, including Dr. White’s expert declaration, which explains how Sevy renders obvious claims 7-9 and 11.

B. The Petition Maps Distinct Structures to the Inlet, Baffle, and Outlet

The Response contends Petitioner “collapses” multiple claim elements into an “undifferentiated flow path.” Resp., 6, 8–9. However, the authorities cited by Patent Owner merely stand for the proposition that separately recited claim elements cannot be treated as the same element. *See, e.g., Becton, Dickinson & Co. v. Tyco Healthcare Grp., LP*, 616 F.3d 1249, 1254 (Fed. Cir. 2010). The Petition does not do that. Instead, the Petition identifies *distinct* structures disclosed by Sevy that correspond to the

silencer assembly structures claimed: baffle (separator plate 98); silencer inlet (the inlet upstream of separator plate 98 and defined by the tapered ledge); and silencer outlet (the outlet downstream of separator plate 98 and in fluid communication with passage 126). Pet. 26–30; Ex. 1009 ¶¶68–70, 84, FIG. 9; Ex. 1002 ¶¶168–177.



EX1009, FIG. 9

Patent Owner asserts Sevy’s silencer inlet/outlet are “not differentiable” from other components and argues Dr. White could not articulate a “meaningful structural basis” to distinguish the “‘silencer inlet’ or ‘silencer outlet’ from the surrounding flow path.” Resp., 9–11. In contrast, at deposition, Dr. White identified Sevy’s “silencer inlet” as the “tapered region” upstream of the separator plate. Ex. 2001, 18:1–22. Furthermore, Dr. White was never asked to identify the “silencer outlet” at his

deposition. *See generally* Ex. 2001. However, in his declaration, Dr. White identified the “silencer outlet” as the outlet provided downstream of the separator plate/baffle and in fluid communication with passage 126. Ex. 1002 ¶¶176–177. Dr. White’s testimony is consistent with the Petition’s mapping. Pet. 26–29.

In addition, Sevy expressly discloses a separator plate 98 that (i) includes apertures 99, (ii) causes larger droplets to strike the plate, and (iii) allows finer droplets to pass through the apertures and proceed downstream. Ex. 1009 ¶¶68–70, 84. In view of this disclosure, Dr. White explained that separator plate 98 functions as an “orifice baffle plate” that disrupts flow by creating “a pressure drop” and turbulence suppression. Ex. 1002 ¶¶171–173. The parties agree that a “baffle” is a “structure that disrupts the flow of the fluid dispersion through the fluid dispersion assembly.” Ex. 1018, Ex. A. Thus, Sevy discloses the claimed baffle. Pet. 26–28; Ex. 1002 ¶¶168–173.

C. Sevy Discloses a Silencer Assembly

Patent Owner also alleges that Sevy does not disclose a “silencer assembly” as “a distinct structural unit” and that Sevy’s separator plate 98 (the baffle) would “not inherently dampen sound.” Resp., 11–13.

For context, both parties agree that the term “silencer assembly” is an “assembly” that “reduces the amount of noise during operation” and only disagree over what constitutes the operation. Ex. 1018, Exhibit B. As explained in the Petition and discussed below, a POSITA would understand that separator plate 98 would

dampen sound even though it is not expressly disclosed in Sevy. In addition, the term “assembly” is a generic structural label referring to a collection of components arranged to perform a function (*e.g.*, reduce noise), and does not require that those components form “a distinct structural unit,” as Patent Owner contends. Moreover, Patent Owner does not explain what it means by “distinct structural unit” and provides no case citation supporting this theory.

1. A POSITA understands that flow disruption produces sound dampening as the '094 Patent acknowledges

Dr. White explains that sound dampening is a by-product of flow restriction to help explain that Sevy’s separator plate will limit sound generated during operation. Ex. 1002, ¶¶174–175, 187–188; *see also* Ex. 1002, ¶¶79-87. This well-known principle was also acknowledged in the '094 Patent in independent claim 7 that recites the baffle “partially restricts movement of the fluid dispersion ... thereby dampening sound waves.” Ex. 1001, 9:34–42.

2. Patent Owner’s own expert conceded baffles can dampen sound waves

Patent Owner’s expert testified that baffles “will dampen sound waves” if “designed properly.” Ex. 1046, 243:4–14. Dr. Micklow’s conclusory opinion that separator plate 98 will increase noise is based on the incorrect assumption that Sevy’s baffle plate 98 is structured with a single large central hole. Ex. 1046, 144:22-145:3. Dr. Micklow overlooks the fact that Sevy expressly states the “separator plate 98 may include one *or more* apertures 99 located centrally, *peripherally*, or *otherwise*.” Ex.

1009, ¶68. Dr. Micklow admits that if separator plate 98 had “multiple holes” that “it could” help alleviate noise, and that a POSITA “definitely could” modify the size and locations of the holes to make Sevy less noisy. Ex. 1046, 181:812, 183:21-184:13. Dr. Micklow’s testimony undercuts Patent Owner’s suggestion that Sevy’s separator plate will increase, not dampen, noise. Resp., 11–13; Ex. 2002 ¶¶19–22; Ex. 1046, 243:4–14. Thus, Sevy teaches that its baffle would have a dampening effect to a POSITA to meet the “silencer assembly” limitation.

D. Sevy Is Analogous Art

Patent Owner argues Sevy is “inapposite” because it is a small, low-pressure consumer diffuser whereas “the ’094 patent is directed to high-capacity fluid dispersion systems intended for large or commercial environments.” Resp. 13–14; Ex. 1009, ¶6; Ex. 1001, 1:24–28; 3:33–37. Nothing in claim 7 limits the invention to “high-capacity” or “commercial environments” or to a particular pressure range. Ex. 1001, 9:23–41. As defined by inventor of the ’094 Patent, the invention “relates generally to the field of dispersion *of various fluids* including, *but not limited to*, *fragrant oils... into a generally enclosed* airspace. Ex. 1001, 1:5-10.

Sevy is directed to a “fluid dispersion assembly” that generates/discharges a fine essential oil mist into a room “or another enclosed space.” Ex. 1001, 9:23–33; Ex. 1009, ¶4. Therefore, Sevy is squarely in the same field of endeavor as the claimed invention. Patent Owner’s reliance on a specific pressure (*e.g.*, 5-50 psig) discussed in one particular embodiment doesn’t render Sevy “inapposite” as Patent Owner

contends. Resp. 13–14. *Unwired Planet, LLC v. Google Inc.*, 841 F.3d 995, 1001, (Fed. Cir. 2016) (“The field of endeavor is not limited to the specific point of novelty, the narrowest possible conception of the field, or the particular focus within a given field.”) (internal quotations omitted).

E. Patent Owner Does Not Separately Argue Dependent Claims 8, 9, and 11

Patent Owner relies entirely on its argument addressed above for dependent claims 8, 9, and 11. Resp., 16. Accordingly, if the Board finds claim 7 is unpatentable, then dependent claims 8, 9, and 11 are also unpatentable for the reasons set out in the Petition.

IV. GROUND 2 (SEVY IN VIEW OF ZENG) RENDERS OBVIOUS CLAIMS 7–9 AND 11

Ground 2 addresses the “dampening sound waves” limitation from an alternative obviousness position, where Petitioner relies on Zeng for its express disclosure of a noise reduction head 20. Pet. 37–43; Ex. 1002, ¶¶140, 202-214; Ex. 1010, 6-7. Zeng explains conventional essential oil atomizers commonly produce a “hissing” sound and do not optimally atomize oil droplets. Pet. 41; Ex. 1002, ¶210; Ex. 1011, 1. Zeng’s solution to this known problem provides a POSITA with motivation to combine Sevy and Zeng, as set forth in the Petition, to improve atomization (droplet uniformity) and dampen sound waves. Pet. 41; Ex. 1002, ¶¶206-214; Ex. 1001, 1:20-41. As explained by Dr. White, this motivation is grounded in the teachings of the references themselves and is not based on hindsight gleaned from the

'094 Patent. Ex. 1002, ¶¶206-214.

A. Zeng Does not Teach Away from the Proposed Modification Nor Does the Combination Render Zeng Inoperable

Patent Owner's Response argues the proposed combination set forth in Ground 2 would be "inoperable" because the combination places Zeng's structure "downstream" of Sevy's separator plate and "far" from where a "'tension film' (*i.e.*, a fluid membrane)" can form—a feature Patent Owner alleges is "critical." Resp. 17-19. Patent Owner's argument mischaracterizes the proposed combination and the disclosure of Zeng.

First, the Petition (and Dr. White's declaration) explain that a POSITA would have been motivated to substitute Sevy's separator plate 98 and passage 126 for Zeng's noise reduction head 20 and inner cover 30. Pet. 41-42; Ex. 1002 ¶¶213-214. Thus, Zeng's noise reduction head 20 would replace Sevy's separator plate 98 (in the same location) and not be located downstream thereof. Resp., 23-24. This is a simple substitution of known parts, each of which are designed to serve at least the same purpose (*e.g.*, reduce droplet size and improve uniformity). *See KSR Int'l Co. v. Teleflex Inc.*, 550 U.S. 398, 416 (2007). Pet. 41-42; Ex. 1002 ¶¶206-214.

Second, Patent Owner erroneously alleges that the "tension film" (*i.e.*, the fluid membrane) is critical to Zeng's function. Resp., 18-19. Nowhere does Zeng teach the "tension film" is critical. *See generally*, Ex. 1011. In contrast, Zeng states, essential oil molecules expand at the noise reduction head forming a tension film, "thereby

preventing the essential oil molecules from being directly sprayed out from the opening and causing incomplete atomization.” Ex. 1011, 5. In the very next line, Zeng discloses “the present invention only allow[s] the completely atomized essential oil *to pass through the openings* of the inner cover and outer cover and the ventilation holes.” Ex. 1011, 5-6. Put differently, it is the openings—not the film tension film—that acts as a size-selective classifier in Zeng. The tension film is merely the *by-product* of the filtering process that results from large droplets accumulating on the surface of the noise reduction head and not the “critical feature” that causes the filtering of other droplets as Patent Owner suggests. This comports Dr. White’s explanation of size-selective classifiers designed to remove droplets from an air flow upon impact by causing them to deposit as a liquid film. Ex. 1002 ¶¶88–91.

Finally, the fact that Zeng teaches a different solution than Sevy is not evidence of teaching away. *In re Mouttet*, 686 F.3d 1322, 1334 (Fed. Cir. 2012). Patent Owner points to no disclosure in Sevy or Zeng that criticizes, discredits, or otherwise discourages a POSITA from modifying Sevy to incorporate Zeng’s teaching for the noise reduction head and inner cover.

B. The Combination Does Not Inhibit Atomization

Patent Owner’s coalescence/obstruction argument that inhibits atomization conflicts with the express teachings of Sevy and Zeng. Resp., 20-22. Sevy teaches that larger droplets strike walls or the separator plate, agglomerate, and drip back toward the reservoir; smaller droplets pass through apertures and proceed downstream.

Ex. 1009 ¶¶69–70, 82–84. Likewise, Zeng teaches that large, incompletely atomized droplets are blocked by the inner cover, form a film, and “flow back to the seat” (the receptacle region), while only completely atomized molecules pass through the inner cover opening and out. Ex. 1011, 7; Ex. 1002 ¶208. Thus, the very “coalescence/return” behavior Patent Owner characterizes as “inhibiting atomization” is described by both references as part of the intended droplet-filtering operation and described by Dr. White in his declaration as size-selective classification. Ex. 1009 ¶¶69–70, 82; Ex. 1011, 7; Ex. 1002 ¶¶88–91.

C. Patent Owner Does Not Separately Argue Dependent Claims 8, 9, and 11

Patent Owner relies entirely on its argument addressed above for dependent claims 8, 9, and 11. Resp., 23-24. Accordingly, if the Board finds claim 7 is unpatentable, then dependent claims 8, 9, and 11 are also unpatentable for the reasons set out in the Petition.

V. GROUND 3 (GOUBET) RENDERS CLAIMS 7-9 AND 11 OBVIOUS

A. Patent Owner’s “Upper and Lower Chamber” Argument References a Nonexistent Limitation

Patent Owner asserts Ground 3 fails because Goubet does not disclose “an atomizer assembly disposed between an upper and lower chamber.” Resp., 24. However, the “upper chamber” and “lower chamber” limitation are not recited

anywhere in claims 7–9 and 11 of the '094 Patent.¹ Ex. 1001, claims 7-9 and 11.

B. The Petition Maps Distinct Structures to the Discharge Port and Silencer Outlet

Patent Owner advances the same general argument it raised for Ground 1—but this time alleges that Petitioner reads “one indivisible feature of Goubet” on the claimed discharge port and silencer outlet elements. Resp., 24-27. These arguments are not persuasive because the Petition identifies *distinct* structures disclosed in Goubet that correspond to the claimed discharge port (*e.g.*, the opening of outlet 16 leading to the surrounding airspace) and the claimed silencer outlet (the opening of inner enclosure 13 leading to outlet 16). Pet. 48–50, 56-58; Ex. 1002 ¶¶239–242, 254-265. At deposition, Dr. White testified these features are distinct as they are indeed separated by a small conduit. Ex. 2001, 21:21-23:14.

C. Goubet Teaches a “Fluid Dispersion”

Patent Owner’s “fluid dispersion” attack incorrectly assumes that Goubet’s baffled flow path would cause coalescence and non-uniformity, notwithstanding Goubet’s express disclosure that the vaporization means is configured to do the opposite. Resp., 27-28; Ex. 2002 ¶28-29.

Goubet discloses that the droplets and air are channeled through the passage 14 before exiting via outlet 16, and when the droplets “collide with the walls,” the droplets

¹ Patent Owner appears to be making an argument only relevant to companion case IPR2025-00707, which Petitioner addresses in that proceeding.

“are broken up into microdroplets.” Ex. 1016, 4:28–5:4; Pet. 28. Goubet further teaches that these microdroplets are “diffuse[d] ... into the ambient air,” and that the droplet size is “reduced as much as possible” before the microdroplets are “silently diffused” into ambient air. Ex. 1016, 2:1–3, 5:6–7, 5:12–16; Pet. 25–26, 28, 42–44. That disclosure is directly contrary to Patent Owner’s assertion that Goubet’s passageway “would cause the droplets to remain in close contact and eventually coalesce into larger droplets.” Resp., 27-28; Ex. 2002 ¶¶28-29.

Goubet’s express teaching is confirmed by Dr. White who explained that Goubet’s circular baffled path continually separates droplets into increasingly smaller droplets as larger droplets accumulate on walls and are filtered out at each turn. Pet. 58-61; Ex. 1002 ¶¶265–280; Ex. 1016, 5:12–16. This is because larger droplets have greater inertia and are preferentially removed in tortuous flow paths by inertial impaction on walls and baffles, especially when multiple “targets” are encountered in series. Ex. 1002 ¶¶100-102. When droplets do impact solid surfaces, they may deposit or break up into smaller secondary droplets—mechanisms that remove coarse droplets from the flow and narrow the distribution of droplets that remain airborne. Ex. 1002 ¶102.

Patent Owner does not attempt to undermine Dr. White’s well-reasoned explanation for how larger droplets would be filtered out consistent with Goubet’s express teachings. Instead, Patent Owner argues the time droplets spend traversing Goubet’s baffle is “relatively short” resulting in a “non-uniform spray” without any

analysis. Resp., Resp., 27-28; Ex. 2002 ¶¶28-29. Such conclusory analysis does not undermine Goubet’s express teaching or Dr. White’s reasoned explanation.

Finally, the Petition explains that if Goubet’s teachings did not expressly satisfy the “fluid dispersion” requirement, it would have been obvious to modify Goubet to include additional enclosures to further decrease droplet size and improve uniformity. Pet. 60-61; Ex. 1002 ¶¶277-280; Ex. 1016, 2:16–19, 5:12–16. Additional enclosures would resolve Patent Owner’s alleged problem with Goubet of a “relatively short” transit time for droplets. Patent Owner does not address or attempt to rebut this proposed modification to Goubet.

D. Patent Owner Does Not Separately Argue Dependent Claims 8, 9, and 11

Patent Owner relies entirely on its argument addressed above for dependent claims 8, 9, and 11. Resp., 28. Accordingly, if the Board finds claim 7 is unpatentable, then dependent claims 8, 9, and 11 are also unpatentable for the reasons set out in the Petition.

VI. GROUND 4 (GOUBET IN VIEW OF KAISER) RENDERS OBVIOUS CLAIMS 7–9 AND 11

Ground 4 addresses the “fluid dispersion” issue from an alternative angle, where Petitioner relies on Kaiser to teach the well-known relationship between droplet size and evaporation that motivates a POSITA to improve droplet uniformity in Goubet. Pet. 63–64; Ex. 1002 ¶¶297-309; Ex. 1014, 43.

A. Kaiser is Analogous Art

A reference is analogous art to the claimed invention if: (1) the reference is from the same field of endeavor as the claimed invention; or (2) the reference is reasonably pertinent to the problem faced by the inventor. *Virtek Vision Int'l ULC v. Assembly Guidance Sys. Inc.*, 97 F.4th 882, 886-87 (Fed. Cir. 2024); MPEP §2141.01(a). While it is not necessary for a reference to fulfill both tests in order to qualify as analogous art, Kaiser satisfies both.

1. Kaiser is from the Same Field of Endeavor as the Claim Invention

“The field of endeavor is not limited to the specific point of novelty, the narrowest possible conception of the field, or the particular focus within a given field.” *Unwired Planet*, 841 F.3d 995, 1001 (internal quotation omitted). Yet, Patent Owner appears to suggest that the field of endeavor should be limited to “scent dispersion, consumer appliances, or acoustic attenuation.” Resp., 10. This argument should be rejected. As defined by inventor of the '094 Patent, the invention “relates generally to the field of dispersion of *various fluids* including, *but not limited to*, fragrant oils... into a *generally enclosed* airspace. Ex. 1001, 1:7-11.

Kaiser expressly teaches “[f]uel atomization, dispersion and vaporization as well as mixing with the coflowing air stream occurred in the cylindrical chamber.” Ex. 1014, 44. Although Kaiser’s ultimate objective is combustion, its teachings relate directly to dispersing liquid (fuel) uniformly within an enclosed airspace (cylindrical chamber) and includes teachings on droplet formation, electrostatic self-dispersion, airflow interaction, and confinement-induced mixing patterns. Therefore, Kaiser is in

the same field of endeavor as the '094 Patent since it relates to dispersion of a fluid into a generally enclosed airspace.

2. Kaiser is Reasonably Pertinent to the Problem of Droplet Size

In addition, Kaiser is analogous art because it is reasonably pertinent to one of the problems purportedly solved by the '918 Patent (the formation of substantially uniform droplets). *Donner Technology, LLC v. Pro Stage Gear, LLC*, 979 F.3d 1353, 1359 (Fed. Cir. 2020) (reference is analogous art if it “is reasonably pertinent to one or more of the particular problems to which the [] patent [at issue] relates.”).

Petitioner relies on Kaiser for the directly relevant principle that “good control of the size distribution of the resulting aerosol” is “critical to uniform evaporation” as a reason to modify Goubet’s existing structure with additional enclosures to further reduce droplet size and improve uniformity. Ex. 1014, 43; Pet. 63-64; Ex. 1002 ¶300. Dr. White applied Kaiser to argue that it is well-known that uniform evaporation (and thus uniform scenting) is a by-product of uniform droplet size and supported this argument by citing to Kaiser’s disclosure, which states “the size of the generated droplets and, consequently, the droplet evaporation time are monotonic function.” Ex. 1014, 43.

Dr. Micklow, Patent Owner’s expert witness, acknowledged Kaiser was pertinent to problem of controlling droplet size during his own deposition. While answering a question about droplet formation, Dr. Micklow testified, “to get that perfect smell to your nose, you want to have uniform particle size. And you want them

to be small. Right? In combustion, you want them to be small, so you get a rapid burn.”
Ex. 1046, 21:16-19.

Thus, Kaiser is analogous art because it is pertinent to the problem of controlling droplet-size even if the purpose and method of solving that problem was different than the '094 Patent. Ex. 1014, 43; Ex. 1002 ¶300.

B. A POSITA Would Have Motivation to Combine Goubet and Kaiser

Patent Owner asserts Petitioner’s motivation to combine is conclusory. Resp., 32. Yet, Patent Owner overlooks the fact that not only was producing uniform droplets a well-known desirable outcome, but that Petitioner provides evidence that a POSITA would have appreciated the benefits of doing so with the proposed combination. *Belden Inc. v. Berk-Tek LLC*, 805 F.3d 1064, 1075 (Fed. Cir. 2015) (question is whether a POSITA “would recognize the potential benefits and pursue the variation.”).

As explained in the petition, a POSITA would understand that more uniform droplets yield a less harsh scent. Pet. 47; Ex. 1002 ¶167. As such, a POSITA would have been motivated to modify Goubet by adding additional enclosures (beyond the disclosed “at least two” concentric enclosures) to further decrease droplet size and improve uniformity. Ex. 1016, 2:16–19, 5:12–16; Pet. 55; Ex. 1002 ¶¶297-303.

Thus, this motivation is grounded in Goubet’s own stated goal—to reduce droplet size as much as possible—while using Kaiser teachings on droplet uniformity to achieve a predictable modification that produces a better smelling scent than the

Goubert device by itself. Again, neither Patent Owner nor its expert dispute that this would have been a known benefit achieved from the proposed modification.

C. Patent Owner Does Not Separately Argue the Dependent Claims for Ground 4

Patent Owner relies entirely on its argument addressed above for dependent claims 8, 9, and 11. Resp., 33. Accordingly, if the Board finds claim 7 is unpatentable, then dependent claims 8, 9, and 11 are also unpatentable for the reasons set out in the Petition.

VII. Ground 5 (GAO) RENDERS OBVIOUS CLAIMS 7–9 AND 11

A. The Petition Maps Distinct Structures to the Silencer Inlet, Silencer Outlet, Baffle and Silencer Assembly

Like with previous grounds, Patent Owner again advances an argument that Petitioner reads the same structure on Gao’s “silencer inlet,” “silencer outlet,” and “silencer assembly” elements. Resp., 34-37. However, the Petition identifies Gao’s silencer inlet (upstream of the baffle) and silencer outlet (downstream of the baffle) as mapped in the Petition and reproduced below. Pet. 74-76; Ex. 1002 ¶¶340–350. These identifications are grounded in Gao’s disclosed flow path, and as Dr. White explained at his deposition, represent control surfaces separating fluid volumes that a POSITA would naturally separately identify (based on their locations relative to the baffle 3) when performing a fluid mechanical analysis. Ex. 1013, ¶25; Ex. 1002 ¶¶345–346; Ex. 2010, 28:8-19. Patent Owner has not provided any expert testimony to dispute Dr. White’s opinion on this.

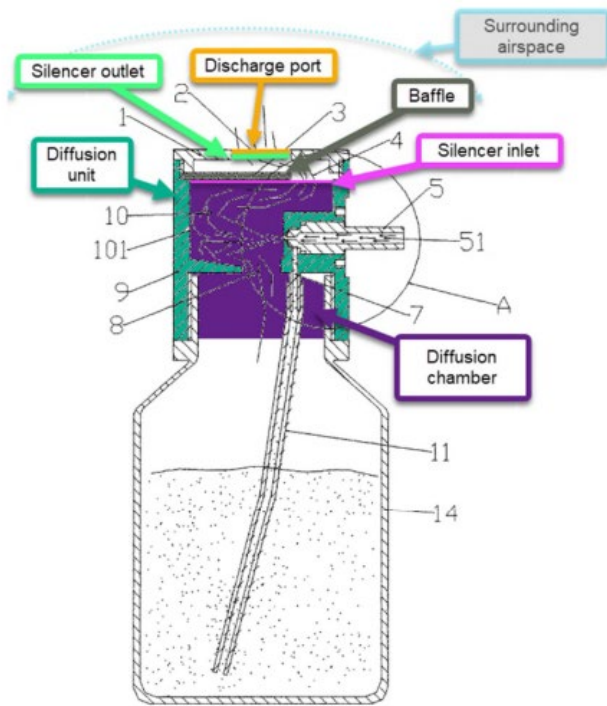


图 1

Ex-1013, FIG. 1

As mentioned in Ground 1, the term “assembly” is a generic label referring to a collection of components arranged to perform a function (*e.g.*, reduce noise), and does not require a “distinct structural unit” as Patent Owner contends. Resp., 38. For these reasons, the “silencer assembly” limitation is met by Gao’s “silencer inlet,” “baffle,” and “silencer outlet” because air flow is disrupted (as it twists and turns around Gao’s baffle 3) as it travel through Gao’s silencer assembly. Pet. 74-76; Ex. 1002 ¶¶340–350; Ex. 1013, figure 1. Therefore, as explained by Dr. White, Gao’s baffle would have a sound dampening effect, thereby rendering the assembly a ‘silencer assembly’ under Petitioner’s and Patent Owner’s proposed constructions. Pet. 74-76; Ex. 1002

¶¶340–350.

B. Patent Owner’s Translation Dispute Does Not Negate Gao’s Described Function

Patent Owner asserts Petitioner and Patent Owner “differ on the translation of Gao,” particularly whether numeral 3 is translated as “baffle” or “panel.” Resp., 37. Petitioner’s certified human translation of numeral 3 being a “baffle” is consistent with the rest of Gao’s description and is also the word used by independent translation software, such as provided by Google. *See* Ex. 1050. Notwithstanding the foregoing, even if Patent Owner’s translation of “panel” were correct, it would not change the outcome. The “panel” would meet the parties’ agreed-to construction of “baffle” because Patent Owner’s translation of Gao teaches “the smallest particles will float in the air” and figure 1 of Gao illustrates that the baffle/panel causes a disruption in the flow path as fluid dispersion travels from the silencer inlet to the silencer outlet (*e.g.*, the fluid dispersion twists and turns around the baffle/panel). Ex. 2004, ¶25, figure 1.

VIII. GROUND 6 (GAO IN VIEW OF ZENG) RENDERS OBVIOUS CLAIMS 7–9 AND 11

Ground 6 addresses the “dampening sound waves” limitation from an alternative obviousness argument, where Petitioner relies on Zeng for its explicit disclosure of a noise reduction head 20.

A. Patent Owner’s Assertions Attack the References Individually

Patent Owner summarily asserts that “Gao in view Zeng does not render [the challenged claims] obvious” and then individually attacks Gao and Zeng for substantially the same reasons mentioned in Grounds 2 (regarding Zeng) and 5 (regarding Gao). Resp., 40-43. Yet, attacking references individually is legally flawed. *Bradium Techs. LLC v. Iancu*, 923 F.3d 1032, 1050 (Fed. Cir. 2019).

Nonetheless, Gao discharges “micron-sized fine particles” that can be controlled “below 3 microns” and meets the substantially uniform droplets under the parties’ stipulated construction of “fluid dispersion.” Pet. 82; Ex. 1013, ¶25; Ex. 1002, ¶385. For the reasons set forth in Ground 5, Gao teaches that its baffle has a dampening effect to a POSITA. Pet. 80-81; Ex. 1002, ¶380. Nevertheless, a POSITA would have been apply the teachings of noise reduction head 20 in Zeng with Gao to dampen the “hissing” sound identified as a common problem with conventional atomizers to improve user experience. Pet. 81-82; Ex. 1011, 1; Ex. 1002, ¶383-384.

The individual attacks on Gao and Zeng fail for each of the reasons set forth in Grounds 2 and 5. Specifically, Zeng’s tension film is not a “critical feature” as Patent

Owner alleges. As explained in Ground 2, Zeng’s openings act as the size-selective classifiers, and the tension film is merely a by-product of the filtering of larger droplets out of the airstream. Patent Owner offers no technical explanation why adapting one known droplet size filtering path for another would be incompatible or beyond the level of skill for a POSITA., Resp., 21.. *KSR Int’l Co. v. Teleflex Inc.*, 550 U.S. 398, 417 (2007)(“if a technique has been used to improve one device, and a person of ordinary skill in the art would recognize that it would improve similar devices in the same way, using the technique is obvious unless its actual application is beyond his or her skill.”).

The Petition also sets forth an alternative modification—Modification 2. Pet. 83; Ex. 1002 ¶¶387-389. Here, Zeng’s noise reduction head 20 provides a POSITA with motivation to modify Gao’s existing orifice baffle into a dome shaped orifice baffle for improved noise reducing effects. Pet. 83; Ex. 1002 ¶387. This modification, which Patent Owner ignores, would eliminates Patent Owner’s “tension film” argument. Moreover, this modification would only require a small change to the structure of Goa’s existing baffle. Pet. 83; Ex. 1002 ¶387. Patent Owner’s expert admits this is exactly the type of modification that would be obvious and simply for a POSITA to perform without undue experimentation or other modifications of other components within of the device). Ex. 1046, 181:812, 183:21-184:13. Patent Owner Does Not Separately Argue the Dependent Claims for Ground 6

Patent Owner relies entirely on its argument addressed above for dependent claims 8, 9, and 11. Accordingly, if the Board finds claim 7 is unpatentable, then dependent claims 8, 9, and 11 are also unpatentable for the reasons set out in the Petition.

IX. Conclusion

For the reasons above and set out in the Petition, the Board should find claims 7–9 and 11 unpatentable.

Date: April 15, 2026

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

William A. Di Bianca
Reg. No. 58,653
Jordan T. Riviello
Reg. No. 72,515
Polsinelli PC
600 Third Avenue
42nd Floor
New York, NY 10016

Joshua L. Rayes
Reg. No. 74,645

Polsinelli LLP
Three Embarcadero Center
Suite 2400
San Francisco, CA 94115

CERTIFICATION OF WORD COUNT

Petitioner certifies that the word count in this Reply, including all footnotes, is 5,588 words as counted by the word-processing program (Microsoft Word for Office 365) used to generate this Reply, where such word count excludes the table of contents, mandatory notices, certificate of service, list of exhibits, and this certificate of word count. This Reply is in compliance with the 5,600 word limit set forth in 37 C.F.R. § 42.24(c)(1).

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

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

Peter A. Matos
pmatos@malloylaw.com

W. John Egan
johnegan@malloylaw.com

Victor Bruzos
vbruzos@malloylaw.com

Rafay Asrar
rasrar@malloylaw.com

Tyler Litwak
tlitwak@malloylaw.com

litigation@malloylaw.com

/Ericka McNeil/

Ericka McNeil

Polsinelli PC
1000 Louisiana Street
Suite 6400
Houston, Texas 77002