

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

AROMA360, LLC,
PETITIONER,

v.

AIR ESSSENTIALS, INC.
PATENT OWNER.

Case IPR 2025-00707
Patent 10,092,918

PETITIONER’S REPLY TO PATENT OWNER’S RESPONSE

LIST OF EXHIBITS

Exhibit No.	Description
Exhibit 1001	U.S. Patent No. 10,092,918
Exhibit 1002	Declaration of Dr. Christopher White
Exhibit 1003	Curriculum Vitae of Dr. Christopher White
Exhibit 1004	Prosecution History of U.S. Patent 10,092,918
Exhibit 1005	Prosecution History of Priority U.S. Patent 9,126,215
Exhibit 1006	Prosecution History of Provisional U.S. Patent 61/694,500
Exhibit 1007	U.S. Patent Publication 2009/0317504 (hereinafter, “Rajala”)
Exhibit 1008	U.S. Patent Publication 2009/0025794 (hereinafter, “Dorendorf”)
Exhibit 1009	U.S. Patent Publication 2010/0084484 (hereinafter “Sevy”)
Exhibit 1010	[Reserved]
Exhibit 1011	[Reserved]
Exhibit 1012	[Reserved]
Exhibit 1013	[Reserved]
Exhibit 1014	Sebastian Kaiser et al., <i>The Electrospray and Combustion at the Mesoscale</i> , 51 J. Mass Spectrom. Soc. Jpn. 42-49 (2003)
Exhibit 1015	French Patent Publication 2886160 (hereinafter, “Goubet”)

Exhibit No.	Description
Exhibit 1016	Certified English-language Translation of Goubet
Exhibit 1017	Amended Complaint filed in <i>Air Essentials, Inc. v. Aroma360, LLC</i> Case No. 1:24-cv-20594-KMW (SD. Fla) (originally filed on Feb. 15, 2024)
Exhibit 1018	Joint Claim Construction Statement filed in <i>Air Essentials, Inc. v. Aroma360, LLC</i> Case No. 1:24-cv-20594-KMW (SD. Fla).
Exhibit 1019	Waiver of the Service of Summons, in <i>Air Essentials, Inc. v. Aroma360, LLC</i> Case No. 1:24-cv-20594-KMW (SD. Fla)
Exhibit 1020	C. Schaschke, Dictionary of Chemical Engineering, OXFORD UNIVERSITY PRESS (2014)
Exhibit 1021	U.S. Patent No. 2,405,494 (hereinafter, “Dupuy”)
Exhibit 1022	Kaye, <i>Aromatic Output for HCI</i> , MAKING SCENTS, Jan. and Feb. 2004 (hereinafter, “Kaye”)
Exhibit 1023	U.S. Patent No. 2,820,406 (hereinafter, “Argentieri”)
Exhibit 1024	U.S. Patent No. 5,929,396 (hereinafter, “Awad”)
Exhibit 1025	E.P Spearman, J.A. Sattarty, and M.J., Reader-Harris, <i>Comparison of velocity and turbulence profiles downstream of perforated plate flow conditioners</i> , FLOW MEAS. INSTRUM., Vol. 7 No. 3/4, pp. 181-199 (1996)
Exhibit 1026	Lighthill, M. J., <i>On Sound Generated Aerodynamically</i> , I. General Theory. Proc. Roy. Soc. (London), Ser. A, vol. 211, no. 1107 (Mar. 20, 1952), pp. 564-587 (hereinafter, “Lighthill”)
Exhibit 1027	NOISE AND VIBRATION CONTROL ENGINEERING: PRINCIPLES AND APPLICATIONS (2006), Ed. I.L. Ver and L.L Beranke, Wiley & Sons, ISBN-10 0-471-91842-3 (hereinafter, “the Noise Control Book”)

Exhibit No.	Description
Exhibit 1028	HANDBOOK OF ATOMIZATION AND SPRAYS: THEORY AND APPLICATION (2011), Ed. N. Ashgriz, Springer, DOI 10.1007/978-1-4419-7264-4 (hereinafter, the “Handbook”)
Exhibit 1029	Perry’s Chemical Engineers’ Handbook (1997), Ed. R.H. Perry, D.W. Green, and J.O. Maloney McGraw Hill, ISBN 0-07-049841-5 (the “Perry Handbook”)
Exhibit 1030	C. Mundi, M. Sommerfeld, and C. Tropea, <i>Droplet-wall collisions: experimental studies of the deformation and breakup process</i> . INT. J. MULTIPHASE FLOW 21: 151-173
Exhibit 1031	Bernoulli, D. (1738) Hydrodynamica, ETH-Bibliothek Zürich https://doi.org/10.3931%2Fe-rara-3911
Exhibit 1032	White, F.M. (1994), Fluid Mechanics (3rd Edition), New York, NY: McGraw-Hill Higher Education
Exhibit 1033	Maxey M.R. and Riley, J.J., <i>Equation of motion for a small rigid sphere in a nonuniform flow</i> , PHYS. FLUIDS 26, 883-889 (1983)
Exhibit 1034	Sun W, Ji J, Li Y, and Xie X., <i>Dispersion and settling characteristics of evaporating droplets in ventilated room</i> , BUILDING & ENVIRONMENT, 42, 1011-1107 (2007)
Exhibit 1035	Peiss C.N. <i>Evaporation of small water drops maintained at constant volume</i> , J. APPL. PHYS. 65, 5235-5237 (1989)
Exhibit 1036	Kuz, V.A. <i>Evaporation of small drops</i> , J. APPL. PHYS. 69, 7034-7036, (1991)
Exhibit 1037	NASA SP-5108, Handbook for Industrial Noise Control (1981)
Exhibit 1038	Alonso, M., Huang, C.-H., <i>Particle segregation in aerosol flow</i> , J. OF AEROSOL SCIENCE 81, 24-33 (2015)
Exhibit 1039	Patent Owner’s Response to Petitioner’s Preliminary Invalidity Contentions in <i>Air Esscentials, Inc. v. Aroma360, LLC</i> Case No. 1:24-cv-20594-KMW (SD. Fla)

Exhibit No.	Description
Exhibit 1040	Patent Owner’s Preliminary Infringement Contentions in <i>Air Esscentials, Inc. v. Aroma360, LLC</i> Case No. 1:24-cv-20594-KMW (SD. Fla)
Exhibit 1041	Chinese Utility Model Patent 204072864 (hereinafter, “Gao-2”)
Exhibit 1042	Certified English-language Translation of Gao-2
Exhibit 1043	Prosecution History of U.S. Patent 9,527,094
Exhibit 1044	Joint Motion to Stay Pending Inter Partes Review in <i>Air Esscentials, Inc. v. Aroma360, LLC</i> Case No. 1:24-cv-20594-KMW (SD. Fla) (April 7, 2025)
Exhibit 1045	Order Granting Motion to Stay Pending Inter Partes Review in <i>Air Esscentials, Inc. v. Aroma360, LLC</i> Case No. 1:24-cv-20594-KMW (SD. Fla) (April 8, 2025)
Exhibit 1046	Transcript for Deposition of Dr. Gerald Micklow taken on March 25, 2026
Exhibit 1047	Supplemental Declaration of Dr. Christopher White
Exhibit 1048	H. M. Taylor and S. Karlin, <i>An Introduction to Stochastic Modeling</i> . Orlando, FL: Academic Press, 1984.
Exhibit 1049	R. A. Mugele and H. D. Evans, “ <i>Droplet size distribution in sprays</i> ,” <i>Industrial & Engineering Chemistry</i> , vol. 43, no. 6, pp. 1317–1324, 1951.
Exhibit 1050	[Reserved]
Exhibit 1051	Joint Claim Construction Statement filed in <i>Air Esscentials, Inc. v. Aroma360, LLC</i> Case No. 1:24-cv-20594-KMW (SD. Fla).

I. INTRODUCTION

Patent Owner's Response ("Response" or "Resp.") mischaracterizes the Petition, Dr. White's expert declaration, and the prior art's teachings. The Petition did not "invent" structure via annotations as Patent Owner alleges. Rather, the Petition describes and annotates the components and flow paths taught by the prior art references, explains how they facilitate the formation of "fluid dispersion" under the parties' stipulated construction, and maps the prior art teachings to the challenged claims.

As Dr. White explains, droplet-separation methods such as gravity settling and inertial impaction have long been used to remove large-diameter droplets from an air stream. Ex. 1002 ¶¶88–89. Inertial impaction employs direct impact and inertial forces between droplets and "target" bodies to preferentially capture larger droplets. Ex. 1002 ¶¶88–90. Upon impact, droplets may deposit as a liquid film or break up into smaller secondary droplets, thereby narrowing the size distribution of the mist. Ex. 1002 ¶91. The Petition applies these principles to the tortuous flow paths and baffles disclosed in Goubet and Gao-2, which operate as size-selective classifiers that remove coarse droplets and yield a discharged fluid dispersion comprising substantially uniform droplets under the parties' stipulated construction of the term "fluid dispersion." Pet. 43–44, 62–64; Ex. 1002 ¶¶88–91, 156–160, 199; Ex. 1016, 4:28–5:4, 5:12–16; Ex. 1042 ¶¶30, 32.

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 entire disclosure of the ’918 Patent—including the embodiment from which challenged claims 1 and 3-8 of the ’918 Patent are derived—or the parties’ claim constructions when arriving at his opinions. As such, Dr. Micklow’s opinions are unhelpful to the Board’s analysis, and are entitled to little, if any, weight. *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. Dr. Micklow Admitted He Did Not Consider Highly Relevant Portions of the ’918 Patent in Providing his Opinions

Patent Owner argues that Goubet does not disclose or render obvious the limitation reciting “said diffusion assembly is disposed between said upper chamber and said lower chamber.” Resp., 6; Ex. 1001, claims 1, 5. That limitation is *only* supported by the embodiment of FIG. 6. Pet. 9-14; *see also* Inst. Dec. 26-33. Yet, when asked if he considered FIG. 6 of the ’918 Patent in forming his opinions, Dr. Micklow replied, “No, I did not.” Ex. 1046, 200:14-16. Usurpingly then, Dr. Micklow was unable to articulate his understanding of this limitation given his opinion was limited to consideration of “Figures 1 through 3.” Ex. 1046, 200:5-9. (“I’ve looked mostly at Figures 1 through 3 on the particular patent [the ’918 Patent]. And those are the ones

that I based my opinions upon.”) (emphasis added).¹

In view of Dr. Micklow’s concession that he did not consider Figure 6, Patent Owner’s arguments regarding Figure 6 in the Response are nothing more than attorney argument. *See Icon Health & Fitness, Inc. v. Strava, Inc.* 849 F.3d 1034, 1043 (Fed. Cir. 2017) (“Attorney argument is not evidence.”)

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

The Petition referenced the parties’ Joint Claim Construction Statement from the underlying litigation—stipulating to the construction of several terms—and this Joint Claim Construction Statement was also discussed in the Board’s institution decision. Ex. 1050; *see* Inst. Dec. at 16.² Despite being cited in both the Petition and the Board’s institution decision, Dr. Micklow testified that he did not recall seeing the parties’ agreed-to claim constructions when preparing his declaration and 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

¹ Emphasis always added unless otherwise noted.

² The Board took judicial notice that Petitioner mistakenly refiled Exhibit 1008 instead of Exhibit 1018 with the Petition. Inst. Dec. at 16, FN 8. The correct document for Exhibit 1018 was clearly identified in the Petition and was filed as Ex. 1018 in companion cases IPR 2025-00705 and IPR 2025-00706. To correct any issues in the record, Petitioner is also filing the Joint Claim Construction Statement as Exhibit 1051 with this Reply.

principles.”).

This is particularly problematic because Dr. Micklow’s opinion that the prior art does not render the claims obvious is premised on an interpretation of certain claim limitations that are inconsistent with both parties’ constructions. In particular, the parties’ stipulated meaning of ‘fluid dispersion’ requires a plurality of droplets having “substantially the same diameter.” Ex. 1051, 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 ’918 Patent requires a “uniform spray” or a “uniform spray distribution.” Ex. 2002 ¶19; 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 accepted 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 ¶14. The Sauter Mean Diameter, however, does not represent a typical or most frequent particle diameter, and can be satisfied by a range of droplet diameters if the total volume and surface area relationships are similar. Ex. 1047 ¶10, 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 ¶9. That is, “uniform spray distribution” implies that particle size (diameter) has equal probability across a defined interval; or put differently, each particle diameter (across the entire collection) will occur with equal probability. Ex. 1047 ¶6. Thus, a uniform droplet size distribution can be comprised of droplets of substantially different diameters, unlike the parties agreed upon construction of ‘fluid dispersion, which requires droplets having substantially the same diameters. Ex. 1047 ¶10.

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 ¶9.

Thus, Dr. Micklow’s testimony, which is grounded in an incomplete reading of the challenged patent, and attempts to distinguish the prior art based on a scope of the claim that differs from the parties’ stipulated construction, should be given no weight.

III. GROUND 1 (GOUBET) RENDERS OBVIOUS CLAIMS 1 AND 3-8

A. Goubet Teaches that the Claimed Diffusion Assembly is “Disposed Between” the Upper and Lower Chambers

Patent Owner’s argument that Goubet does not teach a diffusion assembly

“disposed between” said upper and lower chamber rests on the incorrect premise that Petitioner’s annotations supply missing structure. Resp., 6–7. Yet, the annotations themselves do not provide any structure, they merely identify the structures in Goubet upon which the Petitioner relies.

The Petition explains—based on Goubet’s disclosed flow path—that after atomization, droplets exit chamber 5 through outlet 11 “towards the inside of the reservoir 2 and then towards the inlet 15 of the outer enclosure 12.” Ex. 1016, 4:23–28; Pet. 37–38; Ex. 1002 ¶147. That is precisely the configuration of an atomizer/diffusion assembly positioned **between** the upper region where the droplets traverse the enclosures 12, 13 before exiting outlet 16, and the lower region in/adjacent the reservoir into which outlet 11 discharges. Pet. 30–32, 37–38; Ex. 1016, 4:23–28; Ex. 1002 ¶¶131–135, 147.

The Petition’s identification of “upper” and “lower” chambers is grounded in Goubet’s disclosure where Goubet’s diffusion unit (diffuser head 4) and reservoir 2 at least partially define an enclosed diffusion chamber (shaded purple in the Petition), and the diffusion chamber “comprises an upper chamber and a lower chamber” as shown in Goubet’s Figure 1. Pet. 28–31; Ex. 1002 ¶¶127–132. Petitioner identified the diffusion assembly (air inlet channel 9 and atomizer assembly) and explained the atomizer assembly’s placement and function. Pet. 33–38; Ex. 1002 ¶¶136–147; Ex. 1016, 4:15–16, 4:19–22, 4:23–28.

Furthermore, the ’918 Patent does not support Patent Owner’s apparent

argument that the claims require the entirety of the diffusion assembly to be “between” the upper and lower chambers. Resp., 7; Ex. 1001, claims 1 and 3-8. In contrast, figure 6 shows portions of the diffusion assembly (e.g., air inlet 210) extending beyond the upper/lower chambers. Ex. 1001, Fig. 6.

B. 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—break droplets into microdroplets and reduce droplet size. Resp., 6–7; Ex. 2002 ¶19.

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 “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 contrary to Patent Owner’s assertion that Goubet’s passageway “necessitates that the droplets undergo multiple twists and turns, which would cause the droplets to remain in close contact and eventually coalesce into larger droplets.” Resp., 6–7; Ex. 2002 ¶19.

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. 43–44; Ex. 1002 ¶¶156–160; 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 ¶¶88–90. When droplets do impact solid surfaces, they may deposit or break up into smaller secondary droplets—mechanisms that remove coarse droplets from the flow. Ex. 1002 ¶91.

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., 6–7; Ex. 2002 ¶19. Such conclusory analysis does not undermine Goubet’s express teaching or Dr. White’s reasoned explanation. In addition, neither the claims nor the stipulated construction requires a “uniform spray” and thus Patent Owner’s argument is not grounded in a claimed limitation.

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. 44–45; Ex. 1002 ¶¶80–102, 156–160; 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.

C. Patent Owner’s “No Testing” Critique Does Not Undermine the Petition

Patent Owner argues Petitioner’s ‘fluid dispersion’ showing should fail because Dr. White allegedly did not perform testing or analyze a physical embodiment of Goubet. Resp., 7. This argument is not persuasive because the Petition’s showing is grounded in: (i) Goubet’s express description of mixing air and oil to create droplets; (ii) Goubet’s express description that wall collisions break droplets into microdroplets; and (iii) Dr. White’s explanation of how the disclosed multi-turn path reduces droplet size by filtering out larger droplets. Ex. 1016, 4:19–22, 4:28–5:4, 5:12–16; Pet. 27–28, 43–44; Ex. 1002 ¶¶156–160. Patent Owner identifies no contrary disclosure in Goubet; instead, it offers Dr. Micklow’s conclusory coalescence assertion that conflicts with Goubet’s stated purpose and mechanism. Ex. 1016, 4:28–5:4; PO Resp., 6–7; Ex. 2002 ¶19.

D. Patent Owner Does Not Separately Argue the Dependent Claims for Ground 1

Patent Owner relies entirely on its argument addressed above for dependent claims 3-4 and 6-8. Resp., 7. Accordingly, if the Board finds claims 1 and 5 are unpatentable, then dependent claims 3-4 and 6-8 are also unpatentable for the reasons set out in the Petition.

IV. GROUND 2 (GOUBET IN VIEW OF KAISER) RENDERS OBVIOUS CLAIMS 1 AND 3-8

Ground 2 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. 47–49; Ex. 1002 ¶¶166–171; 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, LLC v. Google Inc.*, 841 F.3d 995, 1001, 120 USPQ2d 1593, 1597 (Fed. Cir. 2016)). 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 ’918 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 ’918 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. 47-48; Ex. 1002 ¶166. 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 '918 Patent. Ex. 1014, 43; Ex. 1002 ¶166.

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

Patent Owner asserts Petitioner's motivation to combine is conclusory. Resp., 10. 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. Furthermore, a POSITA would have been motivated to modify Goubet by adding additional enclosures (beyond the disclosed “at least two”) to further decrease droplet size and improve uniformity. Ex. 1016, 2:16–19, 5:12–16; Pet. 44–48; Ex. 1002 ¶¶80–102, 166–168.

This motivation is grounded in Goubet’s own stated goal—to reduce droplet size as much as possible—and uses Kaiser’s teachings on droplet uniformity to achieve a predictable modification that produces a better smelling scent than Goubert does 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 2

Patent Owner relies entirely on its argument addressed above for dependent claims 3-4 and 6-8. Resp., 13. Accordingly, if the Board finds claims 1 and 5 are unpatentable, then dependent claims 3-4 and 6-8 are also unpatentable for the reasons set out in the Petition.

V. GROUND 3 (GAO-2) RENDERS OBVIOUS CLAIMS 1 AND 3-8

A. Gao-2 Discloses a “Mixing Chamber”

Patent Owner contends Gao-2 lacks the claimed ‘mixing chamber’ because

atomization occurs at the outlet of liquid suction hole 3224. Resp., 14–18 (citing Ex. 1042 ¶36). However, this argument does not address the structure of Gao-2 that the Petition reads on the claimed “mixing chamber.”

The Petition, and Dr. White’s declaration, map the claimed mixing chamber to the chamber defined by Gao-2’s atomization rotating core 322 (provided with cap 323), where essential oil is mixed with airflow prior to being discharged through spray outlet 3231 (*e.g.*, the atomizer exhaust aperture). Pet. 56–57; Ex. 1002 ¶¶184–186; Ex. 1042 ¶¶5, 36.

Gao-2’s flow path is straightforward and undisputed: (1) airflow enters through air inlet channel 311 and vent hole(s) 3215, and flows along guide grooves 3225 defined within atomization rotating core 322; (2) essential oil is drawn into and through liquid suction hole 3224; (3) within the chamber defined by the atomization rotating core 322, the oil and airflow meet, and Gao-2 explains the oil “then mixes with the airflow and is atomized at the outlet of the liquid suction hole 3224”; and (4) the atomized mist is then discharged through spray outlet 3231 (the atomizer’s exhaust aperture). Ex. 1042 ¶¶ 36, 38, 40; Pet. 56–57, 59–60; Ex. 1002 ¶186.

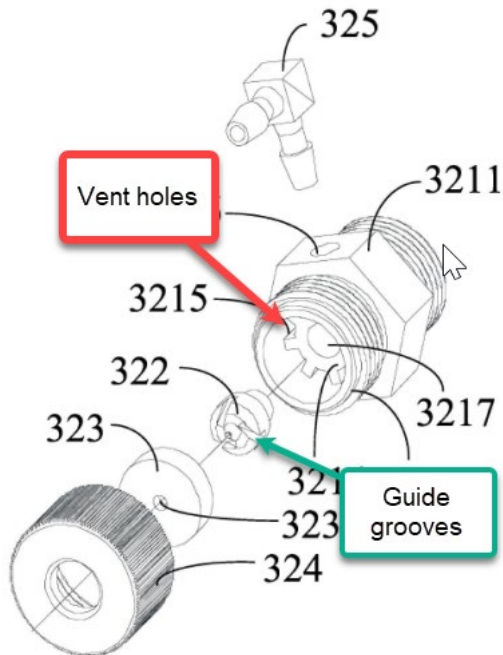


FIG. 8

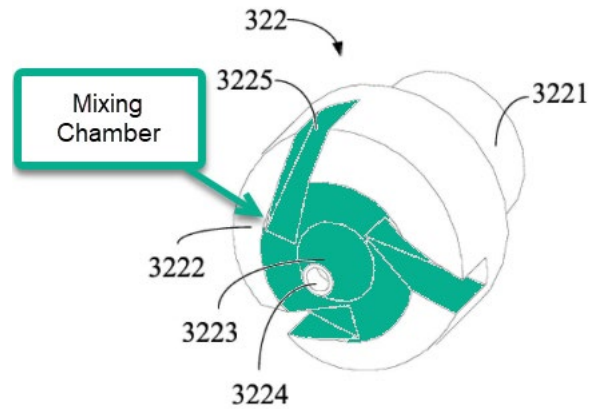


FIG. 9

The chamber defined by Gao-2's atomization rotating core 322 (*e.g.*, the mixing chamber), annotated in the above Figure 9, is located at the tip of the atomization rotating core 322 and is formed by the “plurality of guide grooves surrounding the outlet of the liquid suction hole” (*e.g.*, the chamber within rotating core 322 consisting of the space between the surface of guide grooves and the surface of cap 323 proximate the rotating core) Ex. 1042 ¶12. Gao-2 further explains that air “flows through the guide grooves 3225” before the atomized mist is sprayed from spray outlet 3231. Ex. 1042, ¶¶38. Because guide grooves 3225 are defined within atomization rotating core 322 and such that they “surround” suction hole 3224, a POSITA would understand Gao-2 to disclose a chamber within rotating core 322 in which air and oil are mixed before discharge – *i.e.*, a “mixing chamber.” Ex. 1042 ¶¶ 36–40; Pet. 56–57; Ex. 1002

¶186.

Patent Owner's argument—that mixing occurs at 3224 lacks a “mixing chamber”—reads Gao-2 too narrowly. Resp., 14–15. Even if some atomization occurs at the outlet of hole 3224 as Patent Owner contends, this argument does not negate that mixing occurs within the chamber structure defined by rotating core 322 before it is sprayed through the spray outlet 3231 of atomization spray cap 323 (*e.g.*, the atomizer exhaust aperture). Pet. 56–57; Ex. 1002 ¶186. The chamber structure of Gao-2 identified in the Petition satisfies the claims, which require that compressed air and operative fluid are “mixed together in said mixing chamber.” Ex. 1001, claim 1; Ex. 1001, 5:62–65.

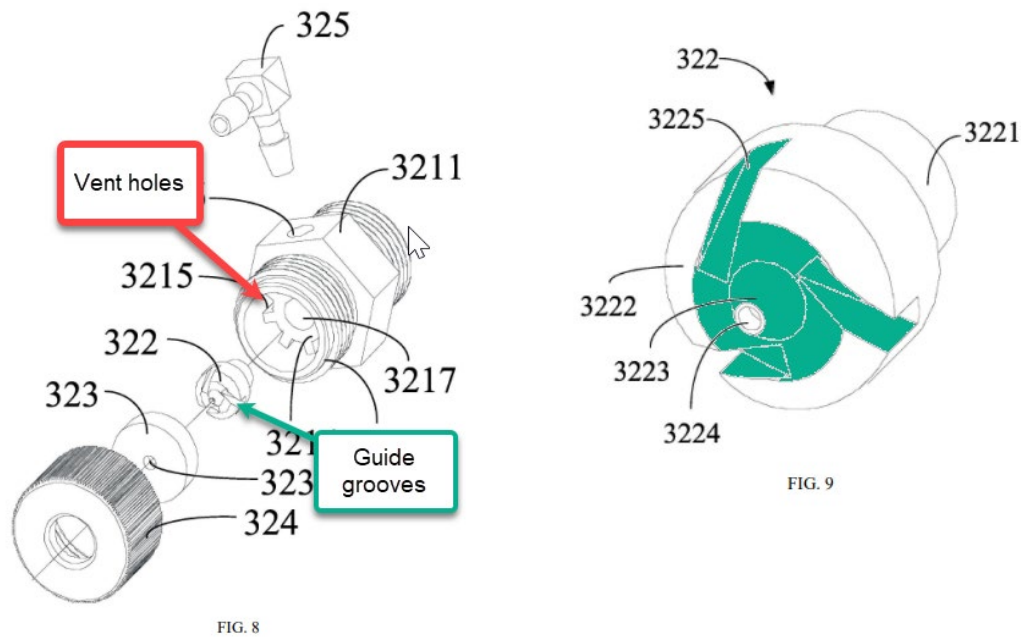
B. Patent Owner Mischaracterizes Dr. White's Testimony

Patent Owner's supposed contradiction between the Petition and Dr. White's declaration on the location of the “mixing chamber” in Gao-2 is manufactured from Patent Owner's self-serving interpretation of Petitioner's annotated figures. Resp., 15–17. The Petition consistently identifies the mixing chamber as the chamber of rotating core 322 and identifies spray outlet 3231 as the atomizer exhaust aperture. Pet. 56–57, 59–60. Dr. White said the same. Ex. 1002 ¶¶186, 190–191. To the extent Patent Owner isolates an imprecise callout in an annotated Petition figure, that labeling cannot override the Petition's express and repeated textual mapping.

Patent Owner contends Dr. White “counterfactually states that airflow passes ‘into rotating core 322’” and argues his testimony should be given “little weight.”

.Resp., 18. That argument fails because Dr. White’s opinions track Gao-2’s expressly disclosed structures and flow path.

As discussed, Gao-2 discloses that airflow passes through vent hole(s) 3215, then “flows *through* the guide grooves 3225,” which are grooves formed *within* atomization rotating core 322. Ex. 1042 ¶¶ 37, 38.



Gao-2 also discloses that liquid suction hole 3224 penetrates rotating core 322, that essential oil enters through that hole, and that the essential oil is then mixed with the airflow and atomized at the outlet of hole 3224 before being sprayed from spray outlet 3231. Ex. 1042 ¶¶ 36, 40. Specifically, “the multiple guide grooves 3225” define a chamber that results in “a cyclone at the outlet of the liquid suction hole 3224, which facilitates [] atomization” before mist is sprayed from spray outlet 3231. Ex. 1042 ¶ 37.

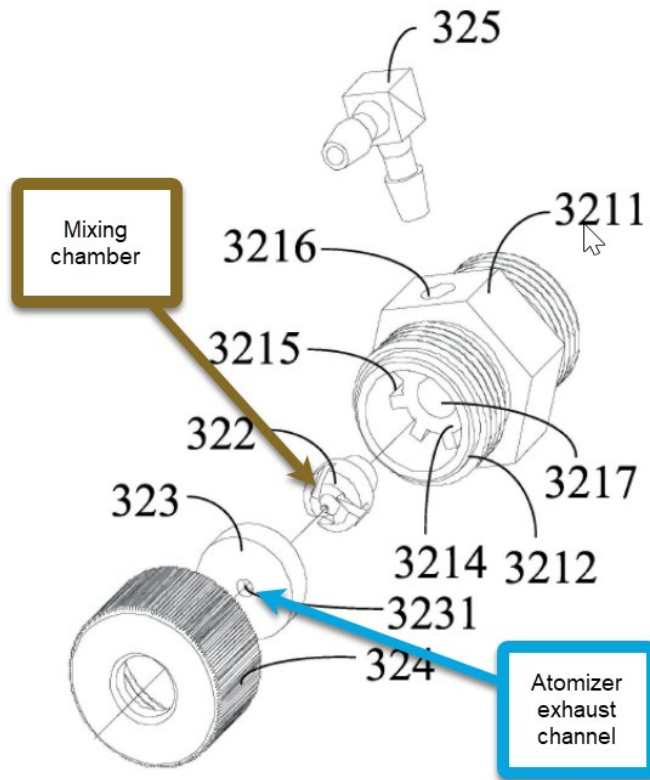


FIG. 8

As such, Dr. White’s testimony is consistent with Gao-2’s disclosure in identifying the chamber defined by rotating core 322 as the mixing chamber and spray outlet 3231 as the atomizer exhaust channel. Ex. 1002 ¶186. Patent Owner’s expert, Dr. Micklow, offers no contrary analysis of this disclosure in Gao-2. Therefore, Dr. White’s testimony should be given substantial weight.

C. Patent Owner’s “Coarse and Fine Mist” Argument Does Not Rebut the Petition’s Showing of “Fluid Dispersion”

In its Decision, the Board expressed confusion as to how Limitation 1[J] could be interpreted to mean that the claimed fluid dispersion is not present in the ‘mixing chamber’ in view of the recitation “to form fluid dispersion” in Limitation 1[J].. Inst.

Dec. 16-17. The Board requested the parties address this issue in their briefs, but Patent Owner declined this invitation and seeks a narrower construction of limitation 1[J] in this IPR than either party asked for in the parallel district court proceeding in a futile attempt to distinguish the claims from the prior art.

As explained below, Gao-2 teaches Limitation 1[J] regardless of if the Board adopts Patent Owner's or Petitioner's proposed constructions. *See* Ex. 1051.

1. Claimed “Fluid Dispersion” is the Mist Discharged into the Air

The Parties stipulated that the claimed ‘fluid dispersion’ means a “mixture of operative fluid in air comprising a plurality of substantially uniform droplets ... *dispersed throughout the air.*” Pet. 22; Ex. 1051, 5; see also Ex. 1001 at 11:65-66 (claim 1 recites in part “discharges a fluid dispersion into a surrounding airspace.”) Thus, the claimed fluid dispersion is the ultimate output of the claimed fluid dispersion assembly. While the internal components of the fluid dispersion assembly can operate “to form” this output, as the mixing chamber does in in limitation 1[J], the claimed ‘fluid dispersion’ refers to the mist that is generated at the mixing chamber *and* that is eventually discharged into the surrounding. This comports with the parties’ agreed upon construction of “fluid dispersion” and the claim language itself as well the disclosure of the ’918 Patent.

More specifically, Limitation 1[J] (and equivalent in claim 7) recites “to form the fluid dispersion.” Ex. 1001, claims 1 and 7. That is, the mixing chamber acts as a precursor step—in which the compressed air and the operative fluid are mixed—in the

overall process of forming the ‘fluid dispersion’ that is eventually “dispersed throughout the air.” This also aligns with claims 4 and 8, which further recite, “said diffusion chamber *facilitates* formation of the fluid dispersion prior to discharge of the fluid dispersion . . . into the surrounding airspace.” Ex. 1001, claims 4 and 8. This is also consistent with the disclosure of the ’918 Patent stating that the fluid produced in the mixing chamber requires additional downstream actions in the diffusion chamber to form the substantially uniform droplets required by the parties construction of fluid dispersion. Ex. 1001, 10:39-41 (“compressed air and [] the operable fluid are *initially* mixed together in the mixing chamber 226 to form a fluid dispersion. The diffusion chamber 112” is further structured to facilitate the formation of a plurality of substantially uniform droplets.”). Even Patent Owner’s expert witness agrees that mixing will occur downstream of the “mixing chamber” in the ’918 Patent such that droplets become more uniform Ex. 1046, 158:2-159:2 (when asked if the droplets become more uniform in size downstream of the mixing chamber, Dr. Micklow replied “that’s what you attempt to do in the diffusion chamber. Yes.”).

The above understanding of limitation 1[J], and the application of the prior art to this limitation, is consistent with Petitioner’s proposed construction of the “mixing chamber” and “diffusion chamber” features, which respectively require, that the compressed air and the fluid be “initially mixed together” and “further mixed together” to form the claimed fluid dispersion. Ex. 1051, 5-6. Similarly, Petitioner’s arguments would also teach limitation 1[J] under the Patent Owner’s proposed construction of

“mixing chamber” where “the operative fluid is combined with compressed air.”

Accordingly, limitation 1[J] (and equivalent in claim 7) do not require the claimed “fluid dispersion” be present in the mixing chamber. In contrast, these limitations require an initial combining/mixing of compressed air and fluid as a precursor step in the formation of the claimed fluid dispersion that is subsequently dispersed into the surrounding airspace. Ex. 1051, Ex. A.

2. Petition Relies on Goa-2’s “Fine” Mist as the Fluid Dispersion Rather than a “Coarse” Mist

The Petition explained that Gao-2 seeks to reduce droplet size and teaches that its spray outlet 3231 faces downward so that coarse droplets fall back into the bottle “while only the fine fragrant mist disperses outward.” Pet. 62–63 (quoting Ex. 1042 ¶30); Ex. 1002 ¶199. As described above, the relevant dispersion is the mist that is discharged into the surrounding airspace. Patent Owner incorrectly argues that Gao-2 discloses the “presence of both coarse *and* fine fragrant mist after *final* ejection of the atomized fluid from the device.” Resp., 19 (emphasis added by Patent Owner). Yet, this statement ignores the sentence quoted above where Gao-2 expressly states that “only the fine fragrant mist disperses outward” to the surrounding airspace.

3. Gao-2’s “Noise Reduction” Devices are Baffles that Filter Droplets by Size

The Petition further relied on Gao-2’s “noise reduction device(s)” projecting into the flow path to show droplet-size filtering before discharge. Ex. 1042 ¶32; Pet. 62–64. Dr. White explained that a POSITA would understand these devices

“continually separate the droplets into increasingly smaller and thus more uniform droplets,” because only droplets below a threshold size can navigate the turns without accumulating on the baffle surfaces. Ex. 1002 ¶199; Pet. 63–64. The Petition thus showed that Gao-2 at least suggests the droplets are divided into “substantially uniform microdroplets by the time [they] reach and pass through mist outlet 351,” satisfying the stipulated “fluid dispersion.” Pet. 63–64; Ex. 1002 ¶199.

D. Patent Owner Does Not Separately Argue the Dependent Claims for Ground 3

Patent Owner relies entirely on its argument addressed above for dependent claims 3-4 and 6-8. Accordingly, if the Board finds claims 1 and 5 are unpatentable, then dependent claims 3-4 and 6-8 are also unpatentable for the reasons set out in the Petition.

VI. GROUND 4 (GAO-2 IN VIEW OF GOUBET) RENDERS OBVIOUS CLAIMS 1 AND 3-8

Ground 4 addresses the “fluid dispersion” limitation from an alternative obviousness argument. The Petition explains that a POSITA would have been motivated by Goubet’s stated objective—to reduce droplet size as much as possible—to apply Goubet’s circular baffled flow path to Gao-2’s diffusion unit in order to further reduce droplet size thereby increasing uniformity and forming a fluid dispersion. Pet. 66–68; Ex. 1016, 5:12–16; Ex. 1002 ¶¶206–210.

A. Patent Owner’s Assertions Attack the References Individually

Patent Owner summarily asserts that “neither Gao-2 nor Goubet teaches a fluid

dispersion in accordance with the '918 Patent,” and that the combination would still lack “dispersion of uniform fluid droplets.” Resp., 20-21. This approach is legally flawed since it attacks the references individually rather than addressing what they would teach to a POSITA when combines. *Bradium Techs. LLC v. Iancu*, 923 F.3d 1032, 1050 (Fed. Cir. 2019).

Nonetheless, as explained above, Gao-2 discharges a “fine” mist into the surrounding air after coarse droplets are separated and after the baffles filter droplets by size, yielding a discharged fluid dispersion comprising substantially uniform droplets under the parties’ stipulated construction. Pet. 22, 62–64; Ex. 1042 ¶¶ 30, 32 Ex. 1002 ¶¶ 88–91, 199–201.

Goubet’s express disclosure improves on the goal of Gao-2’s “fine” mist by teaching a circular path allows “[droplet] size to be reduced as much as possible” before microdroplets are “silently diffused” into ambient air. Pet. 66–67; Ex. 1016, 5:12–16. Dr. White explained that, like Gao-2’s baffles, each turn in Goubet’s circular path filters out droplets above a threshold size, resulting in increasingly smaller and more uniform droplets. Pet. 67; Ex. 1002 ¶ 208. Patent Owner’s does not address how the combined teachings of Gao-2 and Goubet results in a device with droplet sizes “reduced as much as possible” to achieve a substantially uniform small droplet size for the “fine” mist dispersed into the surrounding air as a fluid dispersion.

B. There Is No “Mutual Exclusivity”

Patent Owner argues that “Gao-2 lacks a mixing chamber while Goubet introduces compressed air to operative fluid within a chamber,” and contends these “mutually exclusive functionalities could not be reasonably combined.” Resp., 21. The premise is incorrect. Pet. 56–57; Ex. 1042 ¶40; Ex. 1002 ¶186.

Ground 4 does not rely on Goubet to supply a “mixing chamber” or replace Gao-2’s atomization mechanism. Instead, the petition relies only on “modify[ing] the series of noise reduction devices 34 (e.g., baffles) [in Gao-2] into a series of spiraling encloses, as taught by Goubet” to increase the uniformity of the droplets. Pet. 66–68; Ex. 1016, 5:12–16; Ex. 1002 ¶¶206–210. Both references recognize the value of reducing droplet size, and Gao-2 expressly teaches one, two, or more noise-reduction devices akin to a series of circular baffles as taught by Goubet. Ex. 1042 ¶32; Ex. 1016, 5:12–16; Pet. 67–68; Ex. 1002 ¶¶209–210. 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.”).

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 3-4 and 6-8. Accordingly, if the Board finds claims 1 and 5 are unpatentable, then dependent claims 3-4 and 6-8 are also unpatentable for the reasons set out in the Petition.

VII. Conclusion

For the reasons discussed herein, the Board should confirm that claims 1 and 3–8 are unpatentable.

Date: April 15, 2026

Respectfully submitted,

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CERTIFICATION OF WORD COUNT

Petitioner certifies that the word count in this Reply, including all footnotes, is 5,599 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 PO:

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