

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

Aroma360, LLC,
Petitioner,

v.

AIR ESSSENTIALS, INC.
PATENT OWNER.

Case IPR2025-00705
Patent 9,527,094

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

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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”)

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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.

I. INTRODUCTION

Petitioner opposes Patent Owner’s (“PO”) Contingent Motion to Amend (“Motion”) to substitute claim 21 for challenged independent claim 7.

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

Second, the amendments introduce new § 112 defects. Substitute claim 21 adds limitations that lack written description support and render the claims indefinite.

Third, the amendments do not cure unpatentability. Substitute claim 21 is identical to the challenged claims except that it adds two additional phrases and makes two immaterial word changes (*e.g.*, replacing “restricts” with “disrupts”). The unchanged limitations remain unpatentable for the reasons already set out in the Petition. And the newly added limitations are also taught by the prior art Grounds cited in the Petition. Thus, the amendments do not support patentability, and the Board should deny Patent Owner’s motion to amend.

II. THE AMENDMENTS ARE PROCEDURALLY DEFICIENT

A motion to amend must comply with 35 U.S.C. § 316(d) and 37 C.F.R. § 42.121, including showing written description support and identifying support in earlier-filed applications for benefit claims. The Board’s precedential *Lectrosonics* decision requires that a motion to amend “set forth written description support for each proposed substitute claim as a whole, and not just the features added by the amendment.” *Lectrosonics, Inc. v. Zaxcom, Inc.*, IPR2018-01129, Paper No. 15 at 8 (PTAB Feb. 25, 2018) (precedential); *see also Apple Inc. v. Personalized Media Communications LLC*, IPR2016-00754, Paper No. 41 at 65 (PTAB Sept. 19, 2017) (“The requirement that the motion to amend must set forth the support in the original disclosure of the patent is with respect to each claim, not for a particular feature of a proposed substitute claim. In other words, it is inadequate to show written description support for just the claim feature added by the proposed substitute claim.”).

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

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

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

III. THE SUBSTITUTE CLAIM VIOLATES § 112

Substitute claim 21 adds new written-description and indefiniteness problems. In particular, the added “silencer chamber” and “maximize said disruption of flow” language broadens beyond what the specification actually describes and introduces result-oriented phrasing with no objective boundaries. The Motion should be denied

under § 112 even before the Board reaches the prior-art grounds.

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

Patent Owner’s new inlet-orientation limitation lacks written description support for two reasons. First, the ’094 patent discloses only directing a *fluid dispersion* toward the baffle, whereas substitute claim 21 broadens that disclosure to directing *fluid* toward the baffle. Second, the patent does not disclose the full scope of arranging the silencer inlet relative to the baffle “so as to maximize” disruption of flow across the breadth of the amended claim.

First, the specification does not disclose the full functional scope of arranging the silencer inlet relative to the baffle “so as to maximize” disruption of flow. The patent provides no objective structural or operational criteria, such as chamber dimensions, inlet angle, baffle spacing, pressure conditions, or flow-rate parameters, that would allow a POSITA to determine which inlet and baffle arrangements satisfy that limitation across its full breadth. Ex. 1047, ¶ 25; Ex. 1001, Figs. 1–2, 7:61–65, 8:10–20. At most, the patent describes one embodiment in which the inlet and baffle are arranged to direct the fluid dispersion toward the baffle. But disclosure of one way to achieve a desired result does not establish possession of all arrangements that would “maximize” disruption of flow. *LizardTech, Inc. v. Earth Resource Mapping, Inc.*, 424 F.3d 1336, 1346 (Fed. Cir. 2005); *Lockwood v. Am. Airlines, Inc.*, 107 F.3d 1565, 1572 (Fed. Cir. 1997).

Patent Owner therefore has not shown written-description support for this new limitation. PO Mot. to Amend 6–7, 10–11; Ex. 1001, 3:8–21, 5:24–60, 7:53–65, 7:61–65, 8:10–20; *Ariad Pharms., Inc. v. Eli Lilly & Co.*, 598 F.3d 1336, 1351 (Fed. Cir. 2010) (en banc).

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

Substitute claim 21 recites two amended phrases that lack objective boundaries or create material ambiguity, (1) “silencer chamber” and (2) “direct the flow of fluid towards the baffle so as to maximize said disruption of flow.”

1. The “silencer chamber” term is indefinite.

Substitute claim 21 is indefinite because the intrinsic record never supplies objective boundaries for whether “silencer chamber” denotes a chamber distinct from the silencer assembly or instead is the silencer assembly itself. The substitute claim expressly recites both “a silencer assembly” and “a silencer chamber,” with the baffle “disposed within said silencer chamber.” Yet, nothing in the intrinsic record informs a POSITA, with reasonable certainty, whether the “silencer chamber” is a separately bounded subcomponent of the silencer assembly or is coextensive with the assembly itself. Ex. 1047, ¶ 26. Thus, the claims, read in light of the specification and prosecution history, fail to “inform those skilled in the art about the scope of the invention with reasonable certainty.” *Nautilus, Inc. v. Biosig Instruments, Inc.*, 572 U.S. 898, 910 (2014); *see also Biosig Instruments, Inc. v. Nautilus, Inc.*, 783 F.3d 1374, 1382 (Fed. Cir. 2015) (explaining that the intrinsic

record must supply “objective boundaries” for the disputed term).

Here, the intrinsic record does not supply objective boundaries. In the parallel district-court case, Patent Owner argued that “silencer chamber” should be construed as “silencer assembly,” contending that the reference to “said silencer chamber” reflected an antecedent-basis mistake rather than a deliberate distinction between two different structures. Ex. 1018, 1–2, 4. Patent Owner now takes the opposite position by treating the “silencer chamber” as a distinct structural component within the expressly recited “silencer assembly.” Patent Owner’s abrupt reversal confirms the ambiguity in meaning of this term. If Patent Owner itself has at different times treated the term “silencer chamber” both as a distinct chamber and as nothing more than the assembly itself, the intrinsic record cannot be said to inform with reasonable certainty on the claim boundaries.

The specification does not resolve the problem. At most, it provides a single sentence stating that “silencer assembly 134” includes “baffle 136 disposed in a silencer chamber 138 between a silencer inlet 135 and a silencer outlet 137,” along with corresponding labels in Figures 1–2. Ex. 1001, 7:49–53; Figs. 1–2; *see also* Inst. Dec. 5–6; Ex. 1047, ¶ 26. But that isolated sentence and those labels do not define where the “silencer chamber” begins or ends, how it is bounded relative to the broader “silencer assembly,” or whether the chamber is a separately delimited structure rather than simply a named region within the assembly. That lack of objective boundaries renders the term indefinite. Unlike in *Biosig*, where the

specification and figures supplied enough context to define the disputed spatial relationship, 783 F.3d at 1382, the patent here identifies no wall boundaries, enclosure limits, separate housing, chamber volume, or other objective feature that would let a POSITA determine whether the “silencer chamber” is a subpart of the assembly or merely another name for it. A single depicted embodiment does not answer that claim-boundary question. See *Interval Licensing LLC v. AOL, Inc.*, 766 F.3d 1364, 1371 (Fed. Cir. 2014) (claims indefinite where intrinsic record failed to provide objective boundaries); *Datamize, LLC v. Plumtree Software, Inc.*, 417 F.3d 1342, 1350 (Fed. Cir. 2005) (same where term lacked an “objective anchor”); *Halliburton Energy Servs., Inc. v. M-I LLC*, 514 F.3d 1244, 1255 (Fed. Cir. 2008) (same where claim language did not permit meaningfully precise scope).

The record confirms the ambiguity in the *physical* scope of the claimed “silencer chamber.” The Petition explained that, “[i]n view of PO’s arguments in the parallel district court litigation,” Petitioner read “silencer chamber” as though it were replaced by “silencer assembly,” and the Petition applied that same assumption when mapping Sevy and Gao based on Patent Owner’s construction position. Pet. at 9, 58, 77. Dr. White’s testimony underscores why the claim does not supply self-defining structural boundaries: when asked to distinguish the “silencer inlet” from the baffle and identify the “silencer outlet,” he had to resort to fluid-mechanics abstractions—i.e., selecting a “control volume” and “control surfaces”—to describe where flow enters and exits, rather than pointing to any patent-defined physical boundary that

delineates a “silencer chamber” as a structure. White Tr. 18:9–22; 23:7–14. The need to infer boundaries from an analyst’s chosen control volume confirms that the intrinsic record does not objectively specify what physical structures delimit the claimed “silencer chamber,” and therefore does not provide the public notice § 112(b) requires.

2. The “direct the flow of fluid towards the baffle so as to maximize said disruption” term is indefinite.

Patent Owner’s newly proposed limitation is indefinite. The requirement that the inlet be arranged “so as to maximize said disruption of flow” is a standardless superlative with no objective benchmark. PO Mot. to Amend 10–11. The patent never defines “disruption of flow,” never identifies a baseline for comparison, and never provides a metric, test, or engineering criterion for determining when disruption has been “maximize[d].” Ex. 1047, ¶ 25; Ex. 1001, 6:49–57, 6:64–7:4, 7:24–36, 7:61–65. Under *Nautilus*, that is not enough. And under Federal Circuit precedent, terms of degree are indefinite when the intrinsic record fails to provide objective boundaries for applying them. *Interval Licensing*, 766 F.3d 1371; *Datamize*, 417 F.3d 1350; *Halliburton*, 514 F.3d 1255. Unlike cases like *Sonix*, where the patent supplied an objective baseline and examples for applying the term of degree, the ’094 patent offers none here. *Sonix Tech. Co. v. Publ’ns Int’l, Ltd.*, 844 F.3d 1370, 1378 (Fed. Cir. 2017).

Again, Dr. Micklow’s testimony confirms the absence of any objective

benchmark. Dr. Micklow testified that whether flow disruption increases or decreases sound depends on “the geometry and operating conditions,” including downstream conditions. Micklow Tr. 261:1–263:8. He further admitted that flow disruption can reduce noise in some circumstances and increase it in others. Micklow Tr. 263:5–8. And he testified that whether a restriction dampens sound cannot be answered “in general,” because it depends on “a particular type of restriction” and device-specific design criteria. Micklow Tr. 133:18–135:13. Those admissions are fatal to Patent Owner’s amendment. If the effect of “disruption of flow” depends on geometry, operating conditions, and design-specific criteria, then the patent needed to disclose objective benchmarks by which a POSITA could determine when disruption has been “maximized.” It does not.

Accordingly, substitute claim 21 fails § 112(b) because it introduces ambiguity by requiring the inlet arrangement to “maximize” disruption of flow without any disclosed benchmark, baseline, or measurement rule. Under *Nautilus*, *Biosig*, *Interval Licensing*, *Datamize*, and *Halliburton*, that lack of objective boundaries renders the amended limitation indefinite.

IV. SUBSTITUTE CLAIM 21 IS UNPATENTABLE OVER PRIOR ART

As discussed above, Patent Owner’s Motion proposes substitute claim 21 (substituting challenged claim 7) by retaining the core structure of original claim 7 and making four relevant amendments to the silencer limitation. PO Mot. to Amend 3–4, 10–11. Specifically, substitute claim 21: (1) adds “silencer chamber” to recite

“a silencer assembly having a silencer chamber, silencer inlet, a silencer outlet, and a baffle”; (2) adds “said baffle being disposed within said silencer chamber”; (3) replaces “partially ~~restricts~~ movement” with “partially disrupts movement”; and (4) adds the clause “wherein said silencer inlet is disposed relative to the baffle to direct the flow of fluid towards the baffle so as to maximize said disruption of flow.” PO Mot. to Amend 10–11; Ex. 1001, claim 7. Those amendments do not cure unpatentability because (a) substitute claim 21 retains the same core structure and requirements already mapped in the Petition to the asserted prior art, and (b) the newly added silencer limitations are also taught, or at minimum rendered obvious, by the same asserted references. Pet. 27–61, 73–83. Patent Owner offers only the conclusory assertion that the amendments “further clarify the structure and function of the silencer assembly and its components” and that “[n]one of the asserted references, individually or in combination, disclose or render obvious” the amended features. PO Mot. to Amend 5. The record proves otherwise.

A. Grounds 1 and 2 – Substitute Claim 21 Is Obvious Over Sevy (and, Alternatively, Sevy in View of Zeng)

Substitute claim 21 remains unpatentable over Grounds 1 and 2 for the same reasons as original claim 7 as to the unchanged limitations. The Petition already established the unpatentability of original claim 7 over Sevy and explained, in the alternative, how Zeng reinforces the same result. Pet. 27–43. Because substitute claim 21 leaves unchanged the preamble and the limitations directed to the diffusion

unit, discharge port, and diffusion assembly / atomizer assembly, the Petition’s existing analysis of those limitations continues to apply. Ex. 1001, claim 7; PO Mot. to Amend 10–11. The amended silencer language does not change that result for the reasons discussed below.

1. Sevy renders substitute claim 21 obvious

First, Sevy teaches amendment (3), which replaces “partially restricts movement” with “partially disrupts movement.” Sevy discloses separator plate 98 with apertures through which only sufficiently fine material passes, while larger droplets strike opening 100 or separator plate 98 and are returned; Sevy further explains that the components are sized so the air flows “twist and turn sufficiently” to return larger droplets to the reservoir. Ex. 1047, ¶¶ 28-29; Ex. 1009 ¶¶ [0068]–[0074], [0082]–[0084]. That is exactly the sort of flow disruption recited in substitute claim 21. Pet. 27–33.

And amendment (3) does not materially distinguish “restriction” from “disruption” in this context. The ’094 patent itself uses “disrupt” to describe the same baffle function, explaining that “[t]he baffle 136 is structured and disposed to further disrupt the flow of the fluid dispersion,” and that “the disruption in the flow . . . also creates a disruption and dampening of the sound waves associated therewith.” Ex. 1001, 7:53–8:2. Dr. Micklow’s testimony reinforces that “restriction” and “disruption” are not meaningfully distinct here. When asked whether all restrictions are disruptions, he could not identify a real-world example of a restriction that was

not also a disruption, offering only a hypothetical “isotropic nozzle” that he said “no one has ever done . . . yet.” Micklow Tr. 260:23–261:24; 262:4–18. He also agreed that engineers speak in terms of both “how am I going to disrupt the flow” and “what am I going to do to restrict the flow.” Micklow Tr. 260:10–20. Thus, replacing “restricts” with “disrupts” does not create a patentable distinction over Sevy’s separator-plate structure.

Sevy also teaches amendments (1), (2), and (4) of substitute claim 21. Its separator-plate region defines a bounded, staged flow path in which incoming atomized material encounters the plate structure, only a desired fraction passes onward, and larger droplets are intercepted and returned. Ex. 1009 ¶¶ [0068]–[0074], [0082]–[0084]. A POSITA would understand that region as a chambered silencer path with an inlet-side flow path, a disruptive structure disposed within it, and a downstream outlet path. Ex. 1047, ¶¶ 28-29. And Sevy’s disclosure that the flow must “twist and turn sufficiently” before larger droplets are returned confirms that the incoming flow is directed into the obstructing structure so as to increase disruption before discharge. Ex. 1047, ¶¶ 28-29. *Id.* Even if Sevy does not use the patent’s exact “silencer chamber” nomenclature, it discloses the same operative configuration.

2. Sevy in view of Zeng renders substitute claim 21 obvious

Sevy’s separator plate teaches the disrupting movement as recited in amendment (3) as discussed above, which remains the same when combined with

Zeng.

In addition, Zeng discloses a “noise reduction head 20” inside an “inner cover 30,” with only fully atomized material passing through opening 31 while larger, incompletely atomized material is intercepted and returned. Ex. 1011, 5–7, Figs. 2–4. As the Petition explained, Zeng identifies known drawbacks of conventional essential-oil atomizers, like hissing or whistling noise and incomplete atomization, and provides a chambered noise-reduction structure that addresses those problems when combined with Sevy. Pet. 37–43; Ex. 1011, 4–7.

Sevy in view of Zen thus teach amendment (1) by disclosing a chambered silencer arrangement, amendment (2) by disclosing a noise-reduction structure disposed within that chambered path, and amendment (4) by arranging the openings and blocking structure so the incoming flow is driven into a staged, obstructed path before only the desired fraction exits. Ex. 1011, 5–7. Dr. Micklow’s testimony supports that combination, agreeing that the same basic physics govern atomization systems across applications and that references from different application areas are not irrelevant for that reason. Micklow Tr. 61:5–16; 73:3–12; 75:16–21. Accordingly, Ground 2 renders substitute claim 21 obvious.

B. Grounds 3 and 4 – Substitute Claim 21 is Obvious Over Goubet (and, Alternatively, Goubet in View of Kaiser)

Substitute claim 21 remains unpatentable over Grounds 3 and 4. The Petition established that Goubet teaches the unchanged limitations, like the claimed diffusion

unit, diffusion chamber, discharge port, and diffusion assembly / atomizer assembly. Pet. 43–55; Ex. 1016, 2:1–3, 3:24–5:7. Because substitute claim 21 leaves those limitations unchanged, the Petition’s existing analysis applies without modification. Ex. 1001, claim 7; PO Mot. to Amend 10–11.

The newly added silencer limitations are likewise taught by Goubet for the reasons provided below.

1. Goubet teaches amendments (1) and (2)

Goubet expressly discloses “at least two concentric circular enclosures, an outer enclosure 12 and an inner enclosure 13, communicating with each other via a passage 14,” with “said two enclosures and said passage forming at least one baffle.” Ex. 1016, 2:16–19. Goubet further discloses inlet 15 to the outer enclosure and outlet 16 from the inner enclosure. Ex. 1016, 2:20–25, Fig. 3. In operation, droplets enter outer enclosure 12, pass through passage 14, strike surrounding walls, receive “many shocks,” break into microdroplets, and exit through outlet 16. Ex. 1016, 4:26–5:6. That is exactly the chambered inlet / baffle / outlet arrangement now recited through amendments (1) and (2). Ex. 1047, ¶¶ 30-33; *see also* Pet. 55–59.

That arrangement mirrors the ’094 patent’s own disclosure that “the silencer assembly 134 comprises a baffle 136 disposed in a silencer chamber 138 between a silencer inlet 135 and a silencer outlet 137.” Ex. 1001, 7:49–53. Goubet discloses the same operative structure, merely using different labels. Ex. 1016, 2:16–25, 4:26–5:16; Ex. 1001, 7:49–8:2. At minimum, Goubet renders obvious any suggestion that

amendments (1) and (2) require some specially named or specially shaped chamber because Goubet already discloses the same chambered baffle flow path and the same silencing / droplet-conditioning function. Ex. 1047, ¶¶ 30-33; Ex. 1016, 5:12–16. Dr. Micklow’s testimony reinforces that such diffuser structures involve straightforward engineering; he described venturi-driven consumer fragrance diffusers as “not rocket science,” “about as simple as you can get,” and “low-end engineering work.” Micklow Tr. 59:16–19; 60:16–24.

2. Goubet teaches amendment (3)

Goubet also teaches amendment (3), which replaces “partially restricts movement” with “partially disrupts movement.” The ’094 patent itself uses “disrupt” to describe the baffle’s flow-interference function. Ex. 1001, 7:53–8:2. And Goubet describes “the particular circular shape and the specific arrangement of the inlet, passage, and outlet” as creating “a very particular path” in which droplets strike chamber walls, receive “many shocks,” break into microdroplets, and are then “silently diffused.” Ex. 1016, 2:26–30, 4:26–5:16. That is disruption in the exact sense the ’094 patent uses the term. Ex. 1047, ¶¶ 30-34; Pet. 55–61.

Dr. Micklow’s testimony again confirms that “restriction” and “disruption” are not materially distinct. Micklow Tr. 260:10–20; 260:23–261:24; 262:4–18.

3. Goubet teaches amendment (4)

Goubet also teaches amendment (4), which adds “wherein said silencer inlet is disposed relative to the baffle to direct the flow of fluid towards the baffle so as

to maximize said disruption of flow.” PO Mot. to Amend 10–11. Goubet discloses that inlet 15 is “substantially diametrically opposed” to passage 14, and that outlet 16 is likewise “substantially diametrically opposed” to that passage. Ex. 1047, ¶¶ 33-34; Ex. 1016, 2:20–25. It then explains that, “[t]hus, due to the particular circular shape and the specific arrangement of the inlet, passage, and outlet,” droplets follow “a very particular path” such that droplet size is reduced “as much as possible.” Ex. 1016, 2:26–30. In operation, droplets are forced through inlet 15 into the enclosure, collide with surrounding walls, pass through passage 14, and sustain “many shocks” before exiting. Ex. 1047, ¶¶ 31-34; Ex. 1016, 4:26–5:4. That is precisely an inlet disposed relative to the baffle to direct flow toward the baffle and maximize disruption. *Id.*; *see also* Pet. 55–61.

At minimum, amendment (4) is obvious over Goubet. Goubet already teaches the same directional relationship and the same purpose—forcing droplets through a particular baffled path so breakup is achieved “as much as possible” before silent diffusion. Ex. 1047, ¶¶ 31-34; Ex. 1016, 2:26–30, 5:12–16. Recasting that disclosed arrangement in the ’094 patent’s words does not create patentable distinction. *Id.*; *see also* Ex. 1001, 7:61–65; Ex. 1016, 2:26–30, 5:12–16.

4. Goubert in view of Kaiser renders substitute claim 21 obvious

And Ground 4 renders substitute claim 21 obvious for the same reasons. The Petition’s use of Kaiser addressed the “fluid dispersion” requirement in the original

claim set, and the structure of Goubet discussed above remains (as the proposed combination includes additional enclosures in Goubet and does not remove any). *See* Pet. 44–49 and 63-64.

C. Grounds 5 and 6 – Substitute Claim 21 is Obvious Over Gao (and, Alternatively, Gao in View of Zeng)

Substitute claim 21 likewise is unpatentable over Grounds 5 and 6. As with the other grounds, the Petition already mapped the unchanged claim architecture to Gao and provided the alternative Zeng-based combination. Pet. 73–83. Because the preamble and non-silencer limitations remain unchanged, that analysis continues to apply. Ex. 1001, claim 7; PO Mot. to Amend 10–11.

The amended silencer limitations also do not distinguish these grounds for the reasons provided below.

1. Gao renders substitute claim 21 obvious

Gao teaches amendment (3) because it discloses baffle 3 above lower part cavity 10, with through hole 4 forming an outlet for the rising gas flow, such that the gas-liquid mixture hits inner wall 101 before smaller particles pass onward via through hole 4 and atomizing gas outlet 2. Ex. 1013 ¶¶ [0019]–[0025]. The Petition therefore shows that Gao’s baffle 3 is a structure that disrupts the flow path before discharge. Pet. 73–78. For the reasons discussed above, amendment (3) does not materially distinguish disruption from restriction, particularly in view of Dr. Micklow’s testimony. Micklow Tr. 260:10–20; 260:23–261:24; 262:4–18 .

Gao also teaches amendments (1), (2), and (4). Its disclose baffle / cavity / through-hole structure defines a staged flow path in which rising material encounters baffle 3 within the lower cavity region, collides with the inner wall, and then exits through hole 4 and atomizing gas outlet 2. Ex. 1013 ¶¶ [0019]–[0025]. A POSITA would understand that disclosed structure as defining a chambered flow region containing a disruptive structure and a downstream outlet path. And because the flow is forced upward into the baffle / wall / through-hole arrangement before discharge, Gao also teaches the added inlet-orientation concept in amendment (4). Ex. 1047, ¶¶ 35-36. Even if Gao does not use the patent’s precise “silencer chamber” terminology, it discloses the same operative configuration. *Id.*

2. Gao in view of Zeng renders substitute claim 21 obvious

And Ground 6 renders substitute claim 21 obvious for the same reasons as Ground 5.

The Petition explained that Gao already used a baffle to produce finer, more uniform particles, and that a POSA would have been motivated to use Zeng’s explicit noise-reduction structure to reduce hissing without sacrificing droplet-size control. Pet. 81–83; Ex. 1011, 4–7; Ex. 1013 ¶¶ [0007], [0019]–[0025]. Thus, the structure of Gao discussed above to render obvious substitute claim 21 remains the same under Ground 6.

V. CONCLUSION

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

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Respectfully submitted,

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

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

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