

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
U.S. Patent No. 9,527,094

PATENT OWNER'S
SUR-REPLY

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PATENT OWNER'S UPDATED EXHIBIT LIST

Exhibit Number	Filing Party	Title
2001	Patent Owner	Transcript for the Deposition of Dr. Christopher White, PhD.
2002	Patent Owner	Declaration of Dr. Gerald Micklow, PhD.
2003	Patent Owner	CV and Qualifications of Dr. Gerald Micklow, PhD
2004	Patent Owner	Certified Translation of CN 20183273U (GAO)
2005	Patent Owner	Cengel Fluid Mechanics
2006	Patent Owner	Munson Fundamentals of Fluid Mechanics 2d Edition
2007	Patent Owner	Heywood Internal Combustion Engine Fundamentals, 2d Edition
2008	Patent Owner	Martinez Liquid Sprays
2009	Patent Owner	Fox Introduction to Fluid Mechanics 4th Edition
2010	Patent Owner	Micklow Primary and Secondary Spray Breakup
2011	Patent Owner	Lefebvre Atomization and Sprays 2d Edition
2012	Patent Owner	Micklow Fuel Spray Modeling
2013	Patent Owner	Smith Scientific Design of Exhaust & Intake Systems
2014	Patent Owner	Lefebvre Atomization and Sprays
2015	Patent Owner	Patent Owner's Supplemental Evidence in Response to Petitioner's Objection to Evidence

I. INTRODUCTION

Petitioner has not carried its burden under 35 U.S.C. § 316(e) of proving unpatentability by a preponderance of the evidence on any of the five grounds. Across each ground, Petitioner's Reply relies on annotated labels, after-the-fact expert characterizations, and hindsight-driven combinations to fill gaps in what the prior art actually discloses, rather than identifying any express teaching that cures the deficiencies in the Petition. On the full record, including the testimony of Dr. Micklow ("Micklow") and the deposition admissions of Dr. White ("White"), the references do not teach or suggest U.S. Patent No. 9,527,094's (the "'094 Patent") claimed structures and functions, and the challenged claims should not be found obvious.

II. MICKLOW'S SUPPLEMENTAL DECLARATION

Petitioner filed an Objection to Evidence [Paper 19], wherein Petitioner objected to Exhibit 2002 under FRE 702. In response, on April 15, 2026 Patent Owner ("PO") served supplemental evidence in response to Petitioner's Objection to Evidence, namely, a Declaration of Micklow, each document of which is attached hereto as Exhibit 2015.

III. GROUND 1

Petitioner's Reply does not cure the deficiencies identified in PO's Response (the "POR") regarding Petitioner's Ground 1 challenge based on Sevy. Petitioner

still bears the ultimate burden under 35 U.S.C. § 316(e). Paper 9, 17-19. On the full record—including Micklow’s technical testimony, White’s deposition admissions, and Petitioner’s continued failure to identify any express acoustic disclosure in Sevy—Petitioner has not shown that claims 7–9 and 11 are unpatentable over Sevy.

A. Sevy’s Prior Consideration Remains Relevant

Petitioner mischaracterizes PO’s prosecution-history argument as “a request to revisit the Board’s discretionary institution determination under 35 U.S.C. § 325(d).” Paper 21, 5. PO does not ask the Board to revisit institution. Rather, PO explained that Sevy’s prior consideration by the Office bears on the weight of Petitioner’s merits showing, particularly where Petitioner relies on the same reference without identifying express disclosure of the claimed “silencer assembly” or constituent structural elements. Paper 16, 6–8.

The Board did not find that Sevy expressly discloses a “silencer assembly” or that it describes separator plate 98 as dampening sound. Paper 9, 18-19. The Board recognized that PO was “correct that Sevy does not expressly refer to the identified structures as a ‘silencer assembly’ or as dampening sound,” but concluded, on the preliminary record, that Petitioner had adequately supported an inherency theory. *Id.* Petitioner’s Reply does not materially advance that theory; it merely repeats it.

Petitioner argues only that Examiner “did not have the benefit of analysis in the Petition, including White’s expert declaration.” Paper 21, 5. However, expert

testimony cannot substitute for missing disclosure in the prior art, and the Petition’s annotations cannot transform Sevy into a reference that expressly teaches a “silencer inlet,” “silencer outlet,” and “silencer assembly.” White’s Supplemental Declaration confirms this. Rather than identify disclosure in Sevy, White now characterizes Sevy as a “bounded, staged flow path” that “functions as a chambered ‘silencer’ or separator region,” with alleged “inlet-side” and “downstream outlet” regions. Ex. 1047 ¶¶ 28–29. That is a litigation-driven characterization of Sevy’s existing droplet-separation path.

Petitioner is not relying on newly discovered art or newly identified structures disclosed in Sevy. It asks the Board to accept litigation labels and expert inference in place of structural disclosure, which is insufficient.

B. Petitioner Still Collapses the Claimed Silencer Components

The Institution Decision reflects that Petitioner’s theory depends on annotated images, not express disclosure in Sevy. *See* Paper 9, 17–18. Petitioner’s annotations identify a gray “Baffle,” a dotted pink “Silencer Inlet,” and a green “Silencer Outlet,” but Sevy itself does not name, describe, or structurally delineate those alleged components. *Id.*

Petitioner identifies the “baffle” as separator plate 98, the “silencer inlet” as “the inlet upstream of separator plate 98 and defined by the tapered ledge,” and the “silencer outlet” as “the outlet downstream of separator plate 98 and in fluid

communication with passage 126.” Paper 21, 5–6. The alleged inlet and outlet are not disclosed by Sevy as structures of a silencer assembly; they are analytical boundaries Petitioner draws around Sevy’s existing flow path. *Becton, Dickinson* prohibits treating separately recited claim elements as indistinct aspects of the same structure or flow path. *Becton, Dickinson & Co. v. Tyco Healthcare Grp., LP*, 616 F.3d 1249, 1254 (Fed. Cir. 2010).

White’s deposition testimony underscores the problem. When asked whether there was “any particular point or structure” distinguishing the “silencer inlet” from the “baffle,” White identified only a “tapered section below the separator plate” and then shifted to a “control volume” analysis, explaining that one would draw a control surface below the separator plate “if one was performing a fluid dynamical analysis of this silencer assembly.” Ex. 2001, 18:1–22. Petitioner’s alleged inlet is not a disclosed structural component in Sevy, but a boundary selected for after-the-fact fluid-mechanics analysis.

White’s Supplemental Declaration likewise frames the alleged structure as a “separator-plate region,” “chambered inlet-side region,” and “downstream outlet path.” Ex. 1047 ¶¶ 28–29. But a “region” or “control volume” selected for analysis is not the same as a disclosed silencer assembly.

C. Petitioner's Inherency Theory Still Fails

Petitioner's Reply also fails to rebut PO's showing that Sevy does not disclose or suggest the claimed "silencer assembly." The Institution Decision recognized that Sevy does not expressly refer to the identified structures as a "silencer assembly" or as dampening sound. Paper 9, 18–19. The full record now shows that inherency theory fails.

To prove inherency, Petitioner must show that the limitation is necessarily present, not merely possible or probable. Paper 9, 19 (citing *Southwire Co. v. Cerro Wire LLC*, 870 F.3d 1306, 1311 (Fed. Cir. 2017)). Petitioner has not made that showing. Sevy does not identify separator plate 98 as an acoustic element; does not disclose materials, geometry, spacing, or flow paths designed to reduce acoustic output; and does not describe any interaction between separator plate 98 and sound waves generated during operation. Paper 16, 11–13.

Instead, Petitioner relies on the inference that separator plate 98 disrupts and restricts droplet flow, and that this disruption would therefore dampen sound. Paper 21, 7–9. However, Micklow explained that the opposite effect occurs. Ex. 2002 ¶¶ 19–23; Paper 16, 11–13.

White's deposition confirms that Petitioner's "orifice baffle" theory is not grounded in any express teaching of Sevy. When asked whether he recalled "anything in Sevy's written description" stating that separator plate 98 would "act

as an orifice baffle or otherwise condition the flow of fluid,” White answered that it was his opinion “based on a POSITA” and “based on physics.” Ex. 2001, 13:16–14:2. When asked whether that conclusion was based on “any measurements, calculations, or simulations,” White testified that it was based on “physics” and his experience. *Id.* at 14:3–16.

Nor does Petitioner’s reliance on the parties’ stipulated construction of “baffle” cure that defect. Claim 7 does not recite a free-standing “baffle” in isolation. It recites a “silencer assembly having a silencer inlet, a silencer outlet, and a baffle,” and then requires that the baffle partially restrict movement through the silencer chamber “thereby dampening sound waves.” Ex. 1001, Claim 7. Petitioner cannot isolate “baffle” from the surrounding claim language and ignore the required silencing context.

Petitioner’s reliance on Micklow’s deposition fares no better. Petitioner asserts that Micklow “conceded baffles can dampen sound waves” if “designed properly.” Paper 21, 8. But that testimony supports PO, not Petitioner. Micklow’s point was that acoustic dampening is design-dependent and how noise can be effected by design Ex. 1046, 180:8–181:24. He further testified that relevant dimensions and conditions must be tuned to address pressure fluctuations. *See id.* at 178:1–10.

Petitioner’s multiple-hole argument likewise fails. The Reply emphasizes that Sevy’s separator plate “may include one or more apertures 99 located centrally, peripherally, or otherwise.” Paper 21, 8–9. But a generic disclosure that apertures may vary in number or location is not a disclosure of an acoustically designed silencer assembly. It identifies no aperture configuration selected to dampen sound, and no relevant design parameters such as geometry, spacing, pressure, fluid properties, or operating conditions. Ex. 1046, 180:8–181:24.

Petitioner’s argument reduces to this: because separator plate 98 disrupts droplet flow, and because some properly designed baffles can dampen sound, Sevy’s separator plate must necessarily dampen sound. That is speculation, not inherency. Sevy’s separator plate 98 is disclosed as a droplet-separation structure, not a silencing structure. Ex. 1009 ¶¶ 68–70, 82–84.

D. Petitioner’s Reply Does Not Cure Sevy’s Different Principle and Purpose

Petitioner’s Reply does not answer PO’s point that Sevy operates on a fundamentally different principle and solves a different problem than the ’094 patent. Paper 16, 13–15. PO illustrated that Sevy is directed to a small, self-contained fragrance diffuser intended for, e.g., a dresser. Ex. 1009 ¶0006; Paper 16, 14. By contrast, the ’094 patent addresses high-capacity fluid dispersion systems using compressed air at operative pressures that may range from about 5 to 50 psig, where

operational noise is a central design problem. Ex. 1001, 1:24–28, 3:33–37; Paper 16, 14–15.

Petitioner has not identified any disclosure in Sevy addressing the same operating regime or the same noise problem addressed in the ‘094 Patent, nor has it shown that Sevy was designed for the high-pressure, commercial-scale forced-air diffusion environment addressed by the ’094 patent.

Thus, Sevy’s different purpose reinforces the same conclusion: Petitioner’s silencer-assembly mapping is hindsight-driven and unsupported.

E. Dependent Claims

Petitioner asserts that PO “does not separately argue dependent claims 8, 9, and 11” and that those claims fall if claim 7 falls. Paper 21, 10. Because Petitioner has not shown that independent claim 7 is unpatentable over Sevy, Petitioner likewise has not shown that dependent claims 8, 9, and 11 are unpatentable over Sevy. Paper 16, 16. Thus, Ground 1 should be rejected as to claims 7–9 and 11.

IV. GROUND 2

Petitioner’s Reply does not cure the deficiencies identified in the POR regarding Petitioner’s Ground 2 challenge based on Sevy in view of Zeng. At institution, the Board found that Petitioner had made a sufficient preliminary showing that Zeng discloses or suggests clauses 7[E] and 7[F], but expressly reached “no conclusion” as to whether Petitioner had made a sufficient showing that a

POSITA would have combined Sevy and Zeng as proposed. Paper 9, 26–28. Petitioner still has not met its burden because its combination extracts Zeng’s noise reduction head 20 and inner cover 30 from Zeng’s operative configuration while ignoring PO’s coalescence, obstruction, and acoustic evidence.

A. Petitioner’s Reframe Still Removes Zeng from Its Operative Context

Petitioner’s Reply attempts to avoid PO’s inoperability argument by asserting that PO mischaracterized the proposed combination as placing Zeng’s structure “downstream” of Sevy’s separator plate 98. Paper 21, 11–12. According to Petitioner, Zeng’s noise reduction head 20 would “replace Sevy’s separator plate 98 (in the same location) and not be located downstream thereof.” *Id.* That reframe does not cure the defect.

The problem is not whether Zeng’s structure is placed “downstream” or whether it replaces separator plate 98 in approximately the same physical region; it is that Petitioner’s combination removes Zeng’s noise reduction head 20 and inner cover 30 from Zeng’s operative context, including the relationship between the atomizing structure, opening hole 21, noise reduction head 20, ventilation holes 23, and inner cover 30. *See* Ex. 1011, 5–7. In essence, Zeng describes a specific arrangement in which essential oil molecules interact with the noise reduction head and related openings.

Petitioner's Reply therefore confirms, rather than cures, the hindsight nature of the proposed combination. Petitioner is extracting selected components from Zeng and relocating them into Sevy's assembly to serve as a substitute for Sevy's separator plate and passage 126. Paper 21, 11–12. Petitioner still does not explain why a POSITA would expect Zeng's extracted structure to operate in Sevy in the same way it allegedly operates in Zeng, particularly where the surrounding atomizer geometry, flow path, and droplet-generation mechanism are different.

Nor does labeling the proposal a "simple substitution" resolve the issue. *KSR* does not permit a petitioner to invoke "simple substitution" without showing that the substituted component would perform predictably in the new environment. *KSR Int'l Co. v. Teleflex Inc.*, 550 U.S. 398, 416-18 (2007). Here, PO explained that Zeng's components are not mere drop-in replacements because their function depends on Zeng's particular spatial and fluid-dynamic configuration. Paper 16, 17–24. Petitioner's Reply does not rebut that point with any testing, modeling, or evidence that Zeng's noise reduction head 20 and inner cover 30 would function predictably when substituted into Sevy.

Petitioner next argues that PO "erroneously alleges" that Zeng's tension film is critical, and that the tension film is merely a "by-product" of filtering large droplets. Paper 21, 11-12. Zeng states that essential oil molecules expand at the noise reduction head to form a tension film, "thereby preventing the essential oil molecules

from being directly sprayed out from the opening and causing incomplete atomization.” Ex. 1011, 5. That language does not describe an irrelevant by-product. It describes a mechanism that prevents direct spray-out and incomplete atomization. Petitioner cannot convert Zeng’s stated functional mechanism into an incidental consequence merely by relabeling it.

Petitioner further argues that “it is the openings—not the film tension film—that acts as a size-selective classifier in Zeng.” Paper 21, 12. But Zeng describes the tension film, the noise reduction head, the ventilation holes, and the inner cover as part of an interacting atomization structure. Ex. 1011, 5–7. Petitioner again isolates one feature while ignoring Zeng’s operative context.

Thus, Petitioner’s “by-product” characterization asks the Board to disregard Zeng’s own explanation of why the tension film matters.

B. Petitioner Does Not Rebut Coalescence, Inhibited Atomization, or Lack of Reasonable Success

Petitioner also argues that PO’s coalescence/obstruction argument “conflicts with the express teachings of Sevy and Zeng” because both references allegedly allow larger droplets to be blocked, collected, or returned while smaller droplets proceed downstream. Paper 21, 12-13. That argument misses PO’s point.

PO did not dispute that Sevy and Zeng disclose mechanisms for addressing larger droplets in their own devices. Rather, PO explained that Petitioner’s proposed

combination would introduce conditions that inhibit atomization and droplet expulsion, including droplet adhesion and coalescence on the outer surface of Zeng's noise reduction head 20. Paper 16, 20–23; Ex. 2002 ¶¶ 24–27.

Micklow's deposition testimony confirms this. He explained that droplets passing across Zeng's structure would adhere due to surface-tension effects, particularly near the edges of noise reduction head 20 and ventilation holes 23, where droplets can form larger droplets and condense. Ex. 1046, 267:7–268:7. He further testified that, if Zeng's structure were incorporated into Sevy, the resulting arrangement would be expected to inhibit atomization due to oil/vapor coalescence and would not dampen sound waves during operation. *Id.* at 272:9–273:8.

Petitioner points to the fact that Sevy and Zeng each permit some smaller droplets to continue downstream. Paper 21, 12–13. But each reference having its own droplet-handling mechanism does not establish that their combination would improve atomization or provide sound dampening. Nor does it establish a reasonable expectation that Zeng's components would function predictably when substituted into Sevy.

Petitioner argues that Zeng provides a motivation to combine because it addresses “hissing” sound and atomization quality, and because a POSITA allegedly would have substituted Zeng's noise reduction head 20 and inner cover 30 into Sevy to improve atomization and dampen sound. Paper 21, 10–13. But the Board already

noted at institution that it reached “no conclusion” on whether Petitioner had made a sufficient showing that a POSITA would have combined Sevy and Zeng as proposed. Paper 9, 28.

Petitioner’s motivation theory begins with the challenged claim’s requirement for sound dampening, identifies Zeng’s “noise reduction head,” and then substitutes selected Zeng components into Sevy. But Petitioner still does not adequately explain why a POSITA would have made that specific substitution in view of the differences between the references, the role of Zeng’s tension-film mechanism, and the coalescence/obstruction problems identified by PO. Paper 16, 17–24.

Petitioner also does not establish a reasonable expectation of success. PO’s evidence shows that incorporating Zeng’s noise reduction head 20 and inner cover 30 into Sevy would be expected to inhibit atomization, compromise droplet expulsion, and fail to provide a predictable acoustic benefit. Ex. 2002 ¶¶ 24–27. Micklow also testified that he saw no mechanism by which the proposed Zeng structure would dampen sound waves in the combined system. Ex. 1046, 272:4–11.

Petitioner’s reliance on *KSR* does not save Ground 2. *KSR* recognizes that substituting one known element for another may support obviousness where the substitution yields predictable results, but Petitioner still must show that the proposed substitution would have predictably performed in the new environment. *KSR Int’l Co. v. Teleflex Inc.*, 550 U.S. 398, 416–18 (2007); Paper 21, 12. Likewise,

although the Institution Decision noted that obviousness does not require bodily incorporation of one reference into another, the question remains what the combined teachings would have suggested to a POSITA. Paper 9, 27 (citing *In re Keller*, 642 F.2d 413, 425 (CCPA 1981)).

Petitioner also argues that the absence of express criticism or discouragement means there can be no teaching away. Paper 21, 12–13. But even apart from formal teaching away, Petitioner still must prove a reason to combine with a reasonable expectation of success. It has not done so. The proposed combination would discard or disrupt Zeng’s operative arrangement and introduce droplet coalescence and obstruction problems, while failing to show any predictable sound-dampening benefit.

Thus, even under *KSR* and *In re Keller*, Ground 2 fails. Petitioner’s proposed combination is not supported by a reasoned technical rationale, and PO’s evidence shows that the substitution would be expected to inhibit atomization, promote coalescence, and fail to provide a predictable acoustic benefit. Ex. 2002 ¶¶ 24–27; Ex. 1046, 272:4–273:3. Under § 316(e), that is insufficient.

C. Claims 8-9, 11

Petitioner does not identify any separate disclosure or reasoning for dependent claims 8, 9, and 11 under Ground 2 that cures the deficiencies in its challenge to independent claim 7. Paper 21, 10–13. Because Petitioner has not shown that claim

7 is unpatentable over Sevy in view of Zeng, Petitioner likewise has not shown that dependent claims 8, 9, and 11 are unpatentable under Ground 2. Ground 2 should therefore be rejected as to claims 7–9 and 11.

V. GROUND 3

A. Petitioner Still Conflates the Discharge Port and Silencer Outlet

Petitioner maintains its spurious assertion that there are “distinct structures disclosed in Goubet that correspond to the claimed discharge port and silencer outlet elements.” Paper 21, 14. In support, Petitioner point to “the opening of outlet 16” and “the opening of inner enclosure 13.” *Id.* No such “openings” are identified as structural components of Goubet; the word “opening” never appears in Goubet. *See generally* Exhibit 1016. As previously noted, Petitioner itself has identified these “openings” as the same within its annotations of Goubet’s figures. Paper 16, 25. Further undermining Petitioner’s self-defeating argument is White’s testimony that the purportedly distinct features are “separated by a small conduit.” Paper 21, 14. Just as with the “openings,” Petitioner fails to identify a structure in Goubet corresponding to this “small conduit” which Petitioner now asks the Board to take on faith. *Id.* Petitioner’s continued attempts to create structurally distinct and functionally relevant claim limitations from whole cloth must fail.

B. Goubet Still Cannot Create a Fluid Dispersion as Claimed

Further fatal to Petitioner's argument, Goubet does not teach or disclose a system that produces a fluid dispersion according to the '449 Patent. Petitioner's reliance on "Goubet's express teaching" [Paper 21, 16] fails because Goubet never "express[ly] teach[es]" **uniformity** in any amount. *See generally* Exhibit 1016. Petitioner has admitted this. Paper 9, 39 ("Petitioner states that 'Goubet does not explicitly disclose that the droplets are substantially uniform.>"). Petitioner instead cites to Goubet as teaching that droplet size is "reduced as much as possible" [Paper 20, 15] without acknowledging that what is "possible" depends on the constraints of a given system and is not an objective term; what is "possible" for Goubet does not limit what is "possible" under the '449 Patent. White's testimony suffers from the same flaw, as "separat[ing] droplets into increasingly smaller droplets" [Paper 20, 15] does not necessitate producing a substantially uniform dispersion. Finally, despite Petitioner's conclusory dismissal of Micklow's analysis [Paper 20, 15-16], Micklow has explained that Goubet's baffle path would not produce a plurality of substantially uniform droplets. Exhibit 2002, Para. 26. Petitioner cannot carry its burden of proving otherwise by simply disagreeing with Dr. Micklow.

C. Dependent Claims

Because Petitioner has not established the unpatentability of claim 7 under Ground 3, its attacks on the dependent claims also fail. Paper 16, 28.

VI. GROUND 4

Petitioner's Reply does not cure the deficiencies the Board identified in its Institution Decision. On the full record, Kaiser is neither analogous art, nor would a POSITA combine it with Goubet as Petitioner so proposes. Paper 9, 40 (“On the current record ... we reach no conclusion as to whether Petitioner has made a sufficient showing that one of ordinary skill in the art would have combined Goubet and Kaiser as proposed”). Petitioner's Reply misreads *Unwired Planet, LLC v. Google Inc.*, 841 F.3d 995 (Fed. Cir 2016); distorts the problems addressed by the ‘094 Patent; and ignores record testimony on how a POSITA would view Kaiser. Accordingly, the Board should reject Ground 4.

A. Petitioner's Field-of-Endeavor Theory Entirely Mischaracterizes the *Unwired Planet* Case

Kaiser “operates in a fundamentally different atomization regime from the fluid-flow-driven mechanisms of the ’094 Patent, one based on electrosprays, in which charged droplets are formed from capillaries and dispersed through Coulombic repulsion.” Paper 16, 30 (citing Ex. 2002 ¶ 30).

When considering *Unwired Planet*, 841 F.3d at 1001, although “[a] field of endeavor is” indeed “not limited to the specific point of novelty or a particular focus within a given field,” Petitioner entirely overlooks the unquestionably identical fields of endeavors at issue within the referenced case. *See Unwired Planet*, 841 F.3d

at 1001 (finding the patent as teaching methods for ordering and displaying information, such as within menus, on graphical user interfaces where the prior art reference generally dealt with graphical user interface design and included a chapter devoted to menu design with specific suggestions for how to order menu items and an example related to the problem the patent addressed). The Court found that the patent and reference overlapped not only because reference had directly relevant information on graphical user interfaces, including an example, which is what the patent taught, *but also because “a skilled artisan ... would reasonably look to [the prior art reference], which teaches solutions to the same problem.”* *Id* (emphasis added).

Petitioner's proposed definition of the '094 Patent's field as “the field of dispersion of various fluids including, but not limited to, fragrant oils... into a generally enclosed airspace” [Paper 21, 17 (citing Ex. 1001, 1:7:11)] attempts to piecemeal any technology that involves liquid/fluid entering a confined space, e.g., fire suppression, agricultural pesticide application, fuel injection, and ink-jet printing as sharing a field of endeavor with the '094 Patent. None of those technologies, nor Kaiser's high-voltage electrospray combustion technology, satisfy *Unwired Planet's* requirement to support an analogous field of endeavor finding. Petitioner's argument fails.

B. Petitioner’s Citation Confirms that Kaiser is Not Reasonably Pertinent to the Problem Solved by the ‘094 Patent

Petitioner's reasonable-pertinence argument fares no better. Petitioner cites *Donner* for the rule that a reference is analogous art if it “is reasonably pertinent to one of the problems purportedly solved by the ‘918 Patent....” Paper 21, 18 (citing *Donner Tech., LLC v. Pro Stage Gear, LLC*, 979 F.3d 1353, 1359 (Fed. Cir. 2020)). PO makes clear, this proceeding relates to the ‘094 Patent, not the ‘918 Patent. Either way, Petitioner ignores the core holding of the case. See *Donner*, 979 F.3d at 1360-61 (reversing the Board's analogous-art determination because the reasonable-pertinence inquiry “must be carried out from the vantage point of a [POSITA] who is considering turning to the teachings of references outside her field of endeavor,” and the relevant question is whether a POSITA “would reasonably have consulted” the reference in solving the relevant problem).

Donner forecloses exactly Petitioner’s argument. Petitioner relies on White's general statement that uniform droplet size correlates with uniform evaporation and that Kaiser can be consulted to modify Goubet’s existing structure for producing more uniform droplets. Paper 21, 18 (citing Ex. 1014, 43; Paper 2, 63-64; Ex. 1002 ¶300). *Again, at no point does Petitioner explain if a POSTIA would have reasonably consulted the reference in solving the relevant problem, Petitioner only*

argues that it could have been done. See MPEP § 2145(X)(A) (forbidding hindsight-driven reconstruction of references to render claims obvious).

Petitioner then targets an irrelevant portion from Micklow's deposition pertaining to how the human nose detects scent, that “in combustion, you want [particles] to be small, so you get a rapid burn.” Paper 21, 18-19 (citing Ex. 1046, 21:16-19). As should be apparent, neither Petitioner’s reliance on White’s declaration, nor Micklow’s deposition speaks to the controlling *Donner* question: whether a POSITA solving problems set forth in the ‘094 Patent would have consulted Kaiser, a paper on high-voltage electrospray injection for catalytic combustion in mesoscale power systems. But, within the Deposition of Micklow, *when discussing Kaiser*, this question is answered, which Petitioner conveniently ignores.

Micklow testified that he has “never seen [electrospray] used” in spray atomization “in [his] 50 years as an engineer” “because it's not practical.” Ex. 1046, 236:9-13. He testified that Kaiser “is just not the type of system we’re modeling here....a mechanical engineer or somebody that did fluid flow wouldn't think about [Kaiser].” Ex. 1046, 237:21-238:12. He testified that electrospray “would not be a choice of a mechanical engineer designing a system like this.” Ex. 1046, 240:3-7. That is precisely the POSITA-vantage-point testimony *Donner* deems dispositive. *Donner*, 979 F.3d at 1360-61.

Petitioner has not established that a POSITA would have reasonably consulted Kaiser, and Kaiser is therefore not reasonably pertinent to the problems with which the '094 Patent inventor was involved. POSITA accordingly would lack motivation to combine Goubet and Kaiser, and the claim should not be found unpatentable on that basis.

C. Dependent Claims

Because Petitioner has not established the unpatentability of claim 7 under Ground 4, the dependent claims also fail. Paper 16, 33-34.

VII. GROUND 5

Petitioner cannot meet its burden under 35 U.S.C. § 316(e) by asking the Board to read in structures that Gao does not disclose, among other reasons. Specifically, at institution, the Board acknowledged that Gao does not disclose the claimed “silencer inlet,” “silencer outlet,” and “silencer assembly.” Paper 9, Paper 45 (“[T]he features relied on are not expressly discussed or given reference numerals in Gao (even if they are in the challenged patent) does not undermine Petitioner’s showing at this stage of the proceeding.”). Petitioner’s Reply does not cure that deficiency and merely reiterates points from the Petition. Paper 21, 21. Instead, Petitioner advances a “control surfaces” theory that asks the Board to scribble on Gao’s figures and leaves Micklow’s acoustic testimony entirely unaddressed.

A. Petitioner Has Not Addressed the Board's Acknowledgment That Gao Does Not Disclose the Claimed Structures

The Board acknowledged features Petitioner relies on to try and show Gao renders the claimed patent obvious “are not expressly discussed or given reference numerals in Gao (even if they are in the challenged patent).” Paper 9, 45. PO thus explained, “[w]here a claim lists elements separate, the clear implication of the claim language is that those elements are distinct components of the patented invention[.]” Paper 16, 34-36 (citing *Becton, Dickinson & Co.*, 616 F.3d 1249, 1254 (Fed. Cir. 2010)). Petitioner marked up Gao with labels to make it appear to contain the claimed elements.

Petitioner's Reply addresses neither that acknowledgement nor PO's cited authorities holding that prior art cannot be distorted or modified to contain claim structures or perform claim functions. *Id.*; see also *In re Chudik*, 851 F.3d 1365, 1372 (Fed. Cir. 2017); see also *Topliff v. Topliff*, 145 U.S. 156, 161 (1892); Paper 16, 35.

Instead, Petitioner now grounds its position in White's testimony that the silencer inlet and outlet “represent control surfaces separating fluid volumes that a POSITA would naturally separately identify... when performing a fluid mechanical analysis.” Paper 21, 20 (citing Ex. 1013, ¶ 25; Ex. 1002 ¶¶ 345-346; Ex. 2010, 28:8-19). This Proceeding, however, concerns real claimed structures and functions; not

applying theoretical fluid mechanics to concoct structures that are simply not there. *Becton, Dickinson & Co*, 616 F.3d at 124 (Fed. Cir. 2010) (“[w]here a claim lists elements separate, the clear implication of the claim language is that those elements are distinct components of the patented invention.”). A "control surface" is a conceptual boundary an engineer draws on a diagram to isolate a region of fluid for calculation; it is not a physical component disclosed in Gao. *See* Ex. 2001, 18, Lines 13-17, 23, Lines 4-11, 28, Lines 8-19 (where White mentions that one would “draw” a control surface for purposes of a fluid mechanics analysis); Ex. 1013; Ex. 2004. The claim requires a silencer inlet, silencer outlet, and silencer assembly, physical structures with disclosed locations and functions. Gao does not disclose these structures. Petitioner cannot satisfy that requirement by having the Board draw analytical lines on Gao's Figure 1 where Gao itself disclosed none.

Again, prior art cannot be distorted from its obvious design to satisfy claim limitations. *See In re Chudik*, 851 F.3d at 1374 (reversing anticipation where the Board's mapping required modifying the reference to make it engage the claimed surface); *see also Topliff*, 145 U.S. at 161 (1892) (a reference does not anticipate or render obvious a claim merely because it could be modified to perform the claimed function).

White's deposition confirms as much: when asked to identify a meaningful structural basis in Gao for the silencer inlet and outlet, he could not. Paper 16, 36-37.

B. Petitioner Has Not Engaged with Micklow's Testimony on Acoustic Function

Petitioner's argument on the silencer assembly's acoustic function, without acknowledging Micklow's declaration, casts heavy doubt on Gao's ability to render the '094 obvious. Petitioner asserts that Gao's baffle/panel "would have a sound dampening effect" per White. Paper 21, 21 (citing Paper 1, 74-76; Ex. 1002 ¶¶340-350). However, Micklow's declaration reaches the opposite conclusion: a flat divider plate that merely obstructs fluid flow without contoured geometry or phased flow paths does not dampen sound, but increases turbulence and amplifies unsteady pressure fluctuations. Ex. 2002, ¶¶ 37-38. Those effects increase, rather than reduce, sound generated during operation. *Id.* ¶ 38. Petitioner does not engage with Micklow's testimony on this point at all, and thus Gao should not be found to render the '094 Patent obvious, as Gao may achieve an effect opposite (namely, a loud apparatus) to one objective that the '094 Patent (namely, a quiet assembly) sets out to achieve.

C. Dependent Claims

Because Petitioner has not established the unpatentability of claim 7 under Ground 5, the dependent claims fail for the reasons set out in the POR. Paper 16, 39.

VIII. GROUND 6

PO does not attack Gao and Zeng individually, and Petitioner's reliance on *Bradium* to say PO did is misplaced. *See Bradium Technologies LLC v. Iancu*, 923 F.3d 1032, 1050 (Fed. Cir. 2019) (finding that obviousness cannot be overcome by attacking references individually where the rejection is based upon the teaching of a combination of the references). PO's position is that the *combination* Petitioner proposes fails to teach or suggest the '094 Patent as claimed, as its structure would not make sense per a POSITA, and that there would be no motivation to combine the references. Paper 16, 42 ("Incorporating Zeng into Gao's undifferentiated flow path would therefore disrupt the very operative principle on which Zeng relies, eliminating the membrane formation that defines Zeng's functionality. The result would be a combined device that is inoperable for Zeng's intended purpose.") (citing *In re Gordon*, 73 F.2d 900, 902 (Fed. Cir. 1984).

Related to Petitioner's "Modification 2," still, the introduction of Zeng to Gao instead disrupts Zeng's own operative principle because Zeng's noise-reduction head depends on the formation of a tension film that requires spatial and structural conditions absent from Gao. The proposed combination would therefore render Zeng unsatisfactory for its intended purpose under, for the same reasons discussed in

Ground 2 above. Ex. 2002, ¶¶ 24-27. Even so, assuming Zeng's noise reduction head is placed within the baffle/panel orifice of Gao as Petitioner so proposes (Paper 21, 25), the combination of the two would still be missing the "silencer inlet" "silencer outlet" and "silencer assembly" for the reasons as discussed in Gao. Petitioner has not made a showing otherwise. Accordingly, Petitioner has not met its burden to show that the references, considered together, actually teach the claimed invention with a reasonable expectation of success. As such, the Claims of the '094 Patent should be maintained in force.

IX. CONCLUSION

For the reasons set forth above and in the POR, Petitioner has not carried its burden under 35 U.S.C. § 316(e) of proving by a preponderance of the evidence that the challenged claims of the '094 Patent are unpatentable on any of the five grounds. Petitioner's Reply does not cure the deficiencies in the Petition's reliance on Sevy, Sevy in view of Zeng, Goubet, Goubet in view of Kaiser, or Gao in view of Zeng, and the testimony of Micklow and the admissions of White confirm those deficiencies on the full record. The challenged claims should be upheld as patentable.

Dated: May 15, 2026

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CERTIFICATE OF COMPLIANCE WITH WORD COUNT LIMIT

Pursuant to 37 C.F.R. § 42.24(d), the undersigned certifies that this PO's Sur-Reply (the "POSR") contains **5,594** words, excluding the parts of the POSR exempted by 37 C.F.R. § 42.24(c), as determined by the word count function of the word-processing program used to prepare this document.

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CERTIFICATE OF SERVICE

The undersigned hereby certifies that a copy of PO's Sur-Reply (the "POSR") has been served in its entirety on May 15, 2026, by causing the POSR and accompany documents (if any) to be electronically mailed to the following attorneys of record for Petitioner:

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