

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

SCENTAIR TECHNOLOGIES, LLC,
Petitioner,

v.

PROLITEC, INC.,
Patent Owner.

IPR2021-00014
Patent 9,745,976 B2

Before GRACE KARAFFA OBERMANN, KRISTINA M. KALAN, and
BRIAN D. RANGE, *Administrative Patent Judges*.

RANGE, *Administrative Patent Judge*.

JUDGMENT
Final Written Decision
Determining Some Challenged Claims Unpatentable
35 U.S.C. § 318(a)

I. INTRODUCTION

ScentAir Technologies, LLC (“Petitioner”) filed a Petition (Paper 2, “Pet.”) requesting *inter partes* review of Claims 1–25 of U.S. Patent No. 9,745,976 B2 (Ex. 1001, “the ’976 patent”). Prolitec Inc. (“Patent Owner”) filed a Preliminary Response. Paper 8 (“Prelim. Resp.”). We instituted this *inter partes* review of all challenged claims based on all grounds asserted in the Petition. Paper 10 (“Dec.”). Thereafter, in timely sequence, Patent Owner filed a Response (Paper 12, “Resp.”), Petitioner filed a Reply (Paper 14, “Reply”), and Patent Owner filed a Sur-reply (Paper 15, “Sur-reply”). The parties presented final arguments in a hearing held by video on February 1, 2022. *See* Paper 21 (“Tr.”) (hearing transcript).

We have jurisdiction under 35 U.S.C. § 6. The evidentiary standard is a preponderance of the evidence. *See* 35 U.S.C. § 316(e) (2018); 37 C.F.R. § 42.1(d) (2019). We issue this Final Written Decision pursuant to 35 U.S.C. § 318(a) and 37 C.F.R. § 42.73. For the reasons that follow, we determine that Petitioner has shown by a preponderance of the evidence that claims 1–6, 8–14, 21, 24, and 25 of the ’976 patent are unpatentable. We also determine that Petitioner has *not* shown by a preponderance of the evidence that claims 7, 15–20, 22, and 23 of the ’976 patent are unpatentable.

II. BACKGROUND

A. Related Matters

The parties identify the following pending litigation involving the ’976 patent: *Prolitec Inc. v. ScentAir Technologies, LLC*, No. 1:20-cv-00984-RGS (D. Del.) (“District Court Action”). Pet. 5; Paper 4, 2. The parties also identify related matters IPR2021-00013, in which we denied

institution of *inter partes* review, and IPR2021-00012, in which we file concurrently herewith a final written decision. Pet. 5; Paper 4 at 2.¹

B. Real Parties in Interest

Petitioner identifies ScentAir Technologies, LLC and ScentAir Holdings, Inc. as real parties in interest. Pet. 5. Patent Owner identifies Prolitec Inc. as the real party in interest. Paper 4 at 2. We accept the parties' contentions regarding real parties in interest for purposes of this Decision.

C. The '976 Patent (Ex. 1001)

The '976 patent is titled "Removable Cartridge for Liquid Diffusion Device and Cartridge Insert Thereof." Ex. 1001, code (54). The challenged claims relate to a diffusion device cartridge having a housing, a venturi device, and an insert having a body, an inlet, and outlet zone, and a tortuous passage extending between the inlet zone and the outlet zone. *Id.* at code (57), 18:48–67. A diffusion device dispenses scent or other liquids throughout a desired space. *Id.* at 1:15–17.

We reproduce below Figure 4, which illustrates an embodiment disclosed in the '976 patent.

¹ Petitioner states that it filed a related petition for *inter partes* review of U.S. Patent No. 8,885,827. Pet. 5. We are unaware of any petition filed in our forum that challenges that patent.

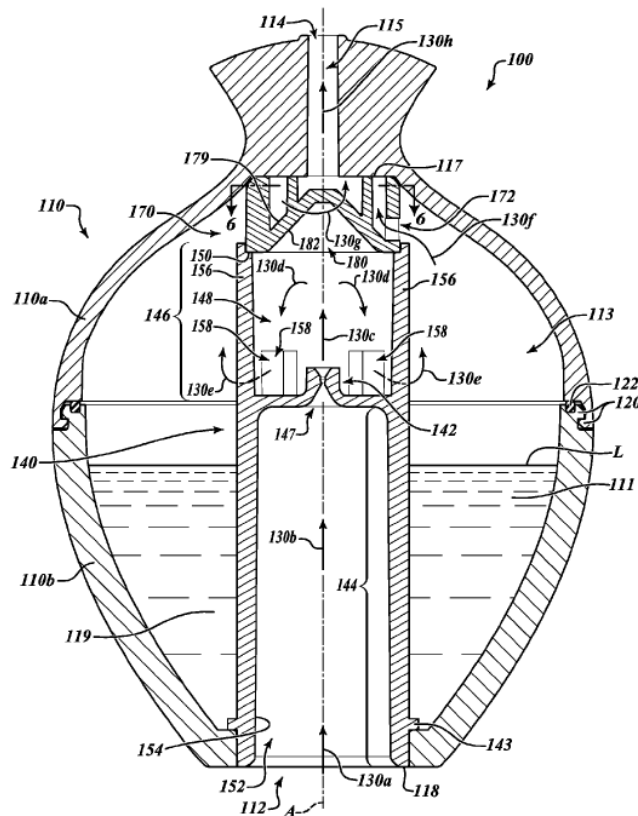


FIG. 4

Figure 4 is cross-sectional view showing the internal components and structures of a cartridge for a diffusion device. *Id.* at 3:1–2, 7:6–8. Cartridge 100 includes housing 110, which defines a fluid receptacle having internal cavity 113 partially filled with liquid 111. *Id.* at 6:21–25. Arrows labeled 130a–130h show the flow path of gas through cartridge 100. *Id.* at 7:8–13. Pressurized gas enters cartridge inlet 112 and flows through diffusion head 140, which includes venturi device 142 for drawing liquid 111 into the moving gas stream. *Id.* at 7:21–27.

A gas-liquid mixture of atomized liquid (i.e., diffused liquid) discharges from venturi device 142 into expansion chamber 148. *Id.* at 7:34–47. At least some of the diffused liquid collects on impact surface 182 and is routed back to remaining fluid 111 in the fluid reservoir for reintroduction

into the gas stream by venturi device 142. *Id.* Other diffused liquid in expansion chamber 148 redirects down through passageways 158 into a portion of internal cavity 113 above fluid level L of liquid 111. *Id.* at 7:47–54. Diffused liquid may then be propelled into inlet 172 of cartridge insert 170. *Id.* at 7:59–62. From inlet 172, diffused liquid proceeds through a tortuous passage before passing through outlet passageway 115 that leads to cartridge outlet 114, where the diffused liquid discharges from cartridge 100. *Id.* at 7:62–67.

A convoluted path of the diffused fluid from expansion chamber 148 to cartridge outlet 114, including the tortuous passage, may refine the liquid particle size distribution of the diffused liquid such that only fine particles discharge from cartridge 100 whereas larger particles collect on inner surfaces of cartridge 100 and precipitate out of the gas to rejoin remaining liquid 111. *Id.* at 8:1–10.

Figure 6 of the '976 patent is reproduced below.

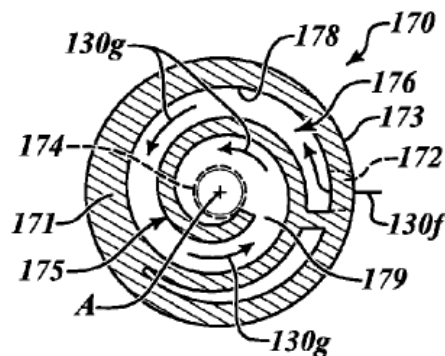


FIG. 6

Figure 6 is a cross-sectional view of cartridge insert 170 showing the flow path of diffused liquid. *Id.* at 3:6–9. Insert 170 includes body 171, which contains tortuous passage 176. *Id.* at 10:16–20. In the illustrated embodiment, tortuous passage 176 is helical, but the passage may take other

forms. *Id.* at 10:48–52. For example, “tortuous passage 176 may include a path with a plurality of straight segments angled relative to each other” or “may include a path that combines linear and non-linear path segments.” *Id.* at 10:55–59. When summarizing the invention, the ’976 patent states that “[t]he tortuous passage may follow a non-linear path that assists in preventing liquid from leaking from the cartridge when the cartridge is upended.” *Id.* at 2:9–11. When describing its embodiments, the ’976 Patent states that “[i]rrespective of particular configuration, the tortuous passage 176 follows a non-linear path that, among other things, assists in preventing liquid 111 from leaking from the cartridge 100 when the cartridge 100 is upended.” *Id.* at 11:1–4.

C. Challenged Claims

Petitioner challenges claims 1–25 of the ’976 patent. Pet. 4. Claims 1, 9, 24, and 25 are independent claims. Claim 1 is illustrative of the claimed subject matter and is reproduced below.

1. A cartridge for use with a liquid diffusing device, the cartridge comprising:
 - a cartridge housing defining an internal housing cavity partially filled with a liquid;
 - a venturi device for generating a diffused liquid from the liquid contained in the internal housing cavity; and
 - an insert provided downstream of the venturi device, the insert including:
 - a body;
 - an inlet provided in the body to receive diffused liquid generated within the cartridge during operation of the liquid diffusing device;

an outlet zone defined at least in part by the body through which to discharge the diffused liquid toward an external environment; and

a tortuous passage extending between the inlet and the outlet zone to aid in further reducing an average particle size of the diffused liquid as the diffused liquid moves through the tortuous passage, the tortuous passage being open in an upward direction.

Ex. 1001, 18:48–67.

E. Asserted Grounds of Unpatentability

Petitioner asserts the following six grounds of unpatentability:

Ground	Claim(s) Challenged	35 U.S.C. §	Reference(s)/Basis
1	1, 4, 6–10, 13, 15–17, 21, 22, 24, 25 ²	103	Rosener, ³ the knowledge of a person of ordinary skill in the art (POSA)
2	2, 11	103	Rosener, King ⁴
3	3, 5, 12, 14, 23	103	Rosener, Dautrebande ⁵
4	5, 14, 23 ⁶	103	Rosener, Svoboda

² The statement of asserted Ground 1 in the Petition omits claim 7, which depends from claim 1, and includes claim 15, which depends from claim 9. *See* Pet. 7, 21. However, the Petition’s claim chart corresponding to Ground 1 addresses claim 7 but not claim 15. *Id.* at 29–30, 33. Accordingly, we understand asserted Ground 1 to challenge claims 1, 4, 6–10, 13, 15–17, 21, 22, 24, and 25 as unpatentable over Rosener and the knowledge of a person of ordinary skill in the art.

³ US 2011/0089252 A1, published Apr. 21, 2011 (Ex. 1004).

⁴ US 7,493,898 B2, issued Feb. 24, 2009 (Ex. 1006).

⁵ US 2,605,089, issued July 29, 1952 (Ex. 1007).

⁶ The statement of asserted Ground 4 in the Petition lists claims 5 and 14 as being challenged based on Rosener in view of Svoboda. Pet. 7. The Petition, however, actually challenges claim 5, 14, and 23 as obvious over Rosener in view of Svoboda. *Id.* at 46–48. Accordingly, we address Ground 4 as challenging claims 5, 14, and 23 as obvious over Rosener and Svoboda.

Ground	Claim(s) Challenged	35 U.S.C. §	Reference(s)/Basis
5	1–22, 24, 25	103	Rubin, ⁷ the knowledge of a POSA
6	23	103	Rubin, Dautrebande

Pet. 7–8. The Petition is supported by the Declaration of Dr. Timothy L. Morse. Ex. 1003 (corrected). The Response is supported by the Declaration of Dr. Michael Mello. Ex. 2005. The Reply is supported by the Reply Declaration of Dr. Timothy Morse. Ex. 1015.

Based on their statements of qualifications and their curricula vitae, we determine that Dr. Morse and Dr. Mello are qualified to provide testimony about the knowledge, understanding, and opinions of a person of ordinary skill in the art at the time of the invention. Ex. 1003 ¶¶ 2–6, attached *curriculum vitae*; Ex. 2005 ¶¶ 4–14, App’x A. We discuss Dr. Morse’s qualifications further in our analysis of Patent Owner’s argument that Petitioner has not shown adequately Dr. Morse’s competency to provide expert opinion testimony. *See* Resp. 79–81.

III. PRELIMINARY MATTERS

A. Level of Ordinary Skill in the Art

The level of ordinary skill in the art at the time of the invention is a factual determination that provides a primary guarantee of objectivity in an obviousness analysis. *Al-Site Corp. v. VSI Int’l Inc.*, 174 F.3d 1308, 1324 (Fed. Cir. 1999) (citing *Graham v. John Deere Co.*, 383 U.S. 1, 17–18 (1966); *Ryko Mfg. Co. v. Nu-Star, Inc.*, 950 F.2d 714, 718 (Fed. Cir. 1991)). Petitioner asserts that a person of ordinary skill in the art “would typically have a bachelor’s degree in mechanical or chemical engineering as well as at

⁷ WO 2012/026963 A2, published Mar. 1, 2012 (Ex. 1005).

least three years of experience working with, designing, or studying liquid diffusion devices or similar devices.” Pet. 14; Ex. 1003 ¶ 13. Patent Owner does not dispute that definition or advance an alternative definition.

The prior art asserted in the Petition appears, on this record, as representative of the level of ordinary skill in the art. *See Okajima v. Bourdeau*, 261 F.3d 1350, 1355 (Fed. Cir. 2001). To the extent a more specific definition is required, we adopt Petitioner’s unopposed definition (Pet. 16) because it is consistent with the disclosures of the ’976 patent and the prior art references that form the basis for Petitioner’s challenges. *See, e.g.*, Ex. 1001, 1:7–43 (abstract and overview of technical field of invention of the ’976 patent); Ex. 1004, code (57), ¶ 3 (abstract and background of Rosener’s invention); Ex. 1005, code (57), 1:1–13:12 (abstract and background of Rubin’s invention).

B. Claim Interpretation

We interpret claims using the same standard applied in a civil action under 35 U.S.C. § 282(b), “including construing the claim in accordance with the ordinary and customary meaning of such claim as understood by one of ordinary skill in the art and the prosecution history pertaining to the patent.” 37 C.F.R. § 42.100(b) (2020). Under that standard, we interpret the claim language as it would be understood by one of ordinary skill in the art in light of the specification. *In re Suitco Surface, Inc.*, 603 F.3d 1255, 1260 (Fed. Cir. 2010); *see In re Translogic Tech., Inc.*, 504 F.3d 1249, 1257 (Fed. Cir. 2007) (“The ordinary and customary meaning ‘is the meaning that the term would have to a person of ordinary skill in the art in question.’”) (quoting *Phillips v. AWH Corp.*, 415 F.3d 1303, 1313 (Fed. Cir. 2005)). We construe only terms in controversy and then only to the extent necessary to

resolve the controversy. *Nidec Motor Corp. v. Zhongshan Broad Ocean Motor Co.*, 868 F.3d 1013, 1017 (Fed. Cir. 2017).

When addressing the meanings that the Board should assign to the words of the challenged claims, Petitioner argues only “that all terms should be construed to have their ordinary and customary meaning.” Pet. 16. Patent Owner, by contrast, requests the Board to construe the word “toward.” Resp. 6–10. Specifically, Patent Owner argues that “toward” should be construed to mean “aimed in the direction of.” Resp. 6–7.

The term “toward” appears in each independent claim and is inherited by every dependent challenged claim. Resp. 6–10; *see* Ex. 1001, 18:62 (claim 1), 19:35 (claim 9), 20:55 (claim 24), 21:4 (claim 25). Claim 1, for example, recites “an outlet zone defined at least in part by the body through which to discharge the diffused liquid *toward* an external environment.” Ex. 1001, 18:60–62 (emphasis added). The other claims similarly recite an outlet zone through which to discharge liquid “toward an external environment.” *Id.* at 19:35, 20:55, 21:4.

We determine that “toward” in the context of these claims means “in the direction of.” This definition is consistent with the ordinary dictionary definition that Patent Owner advances. Resp. 10; Ex. 2003, 3 (ordinary dictionary defining toward as “in the direction of” or, alternatively, as “along a course leading to”). Patent Owner argues that the ’976 patent describes embodiments supporting Patent Owner’s construction of “toward,” but directs us to no disclosure that requires “aiming.” To the contrary, the ’976 patent suggests that liquid moves “toward” something such as an end point so long as it advances along a path leading to the end point. Reply 1–4 (Petitioner collecting examples). For example, ’976 patent Figures 5 and 6

illustrate fluid taking a spiral flow pattern to outlet zone 174. The specification explains that the liquid takes a “curvilinear path . . . as it moves from the inlet 172 *toward* the outlet zone 174.” Ex. 1001, 10:50–55; *see also* Ex. 1015 ¶¶ 8–16 (Dr. Morse providing testimony regarding this and other ’976 patent embodiments). Thus, contrary to Patent Owner’s position, the specification uses the word “toward” to describe liquid that moves in the direction of the outlet—without reference to aiming—and even where the liquid’s movement encounters obstacles or otherwise fails to travel in a straight line to the outlet.

We agree with Petitioner that “‘aimed’ is found nowhere in the intrinsic evidence and is contrary to the specification” of the ’976 patent. Reply 1. Further, Patent Owner’s own extrinsic evidence does not include the word “aimed” in the definition of “toward.” Ex. 2003, 3. Against that backdrop, for reasons stated above, we determine that “toward” in the context of the challenged claims means “in the direction of.”

To the extent that the scope of the word “toward” or any other claim term requires further discussion, we provide it in our analysis of Petitioner’s challenges, which we address below.

C. Overview of Principal Prior Art References

The challenges rest on five principal prior art references—Rosener, King, Dautrebande, Svoboda, and Rubin. Pet. 7–8. Patent Owner does not challenge the prior art status of those references, but addresses the merits of Petitioner’s challenges as if they qualify as prior art. *See generally* Resp.

1. Rosener

Rosener is titled “Fragrance Nebulizer with Drainer System.” Ex. 1004, code (54). Rosener discloses a reservoir assembly for storing

fragrance oil and an atomizer that converts that oil into a scented mist. *Id.*

¶ 24. The atomized fragrance oil includes particles of various sizes, some of which are too large to be used as output. *Id.* ¶ 26.

Rosener separates small atomized particles, which are suitable for output, from larger atomized particles through impaction by “forcing the airstream” containing the particles of various sizes “to go around tight bends and corners.” *Id.* ¶¶ 26–27; Ex. 1003 ¶ 37; Pet. 17. This “expose[s] the stream of entrained particles to a lot of surfaces.” *Id.*

2. King

King is titled “Inhalation Apparatus.” Ex. 1006, code (54). King describes an inhalation device (an inhaler) and particularly “an improved aerosol inhalation apparatus for medicinal use that delivers a mist of properly sized particles of medicament to the patient.” *Id.* at 1:6–10.

King discloses a housing 22 attached to a nebulizer means. *Id.* at 3:27–33. The housing 22 includes a “baffle means for providing a circuitous flow path through the first chamber.” *Id.* at 1:31–45, 6:13–25. King teaches that its baffle means may be “a generally spiral-shaped wall 100 (FIG 20.)” *Id.* at 6:21–22.

3. Dautrebande

Somewhat similar to King, Dautrebande relates to “aerosol therapy” in which “it is very important to obtain aerosols of very low particle size” to achieve the “desired” effect of having “the aerosol penetrate to the innermost passages or zones in the lungs.” Ex. 1007, 1:6–10. Dautrebande discloses an “apparatus for obtaining improved aerosols of relatively high stability by obligatory filtration through a turbulent body of liquid” and, in

particular, “to aerosols having a mean particle size or diameter of not over about 0.5 micron.” *Id.* at 1:1–5.

A primary objective in Dautrebande “is to produce improved aerosols having a mean particle size of not over 0.5 micron.” *Id.* at 1:24–26. In Dautrebande’s device, “larger and unstable particles are removed from” a liquid that is “dispersed in the form of a cloud or a mist.” 2:41–3:1. Those “unstable particles” in the aerosol “tend to deposit and coalesce” in a “somewhat S-shaped tapered tubular aerosol conduit member” positioned “directly over the aerosol generating zone 2.” 2:4–7, 2:41–3:9.

4. Svoboda

Svoboda describes a “device and method for aerosolizing a liquid” by mixing “a gas under pressure and a liquid so that the liquid is formed in minute droplets and is carried on the stream of gas.” Ex. 1008, code (57) (Abstract), 1:5–10. The device of Svoboda includes, among other structures, a container that holds a liquid, a venturi tube having an upstream opening, a discharge opening, and a deflector surface. *Id.* at Fig. 1, 2:4–25. The upstream opening is “adapted for connection to a source of pressurized gas.” *Id.* at 2:6–8.

Svoboda’s venturi tube is “dimensioned and positioned to withdraw” liquid from a container through a liquid conduit means and “project a mixture of liquid and gas out” at high velocity in a directed stream in a first direction. *Id.* at 2:12–16. A deflector surface intersects the directed stream, “causing a dispersion of the liquid and gas forming a flow mass in a second direction,” namely, “at an angle to the first direction,” which “causes further reduction in liquid droplet size.” *Id.* at 2:18–23, 2:35–36. The aerosolized air strikes concentric projection rings to further add turbulence to the flow mass

and reduce the size of the particles of aerosolized liquid. *Id.* at 2:35–57. Svoboda explains that gas will travel faster through a “necked down portion” of its venturi tube. Ex. 1008, 4:4–8, Fig. 1.

5. Rubin

Rubin relates to systems and methods “for aerosolizing and delivering therapeutic substances in a device” with airflow regulation. Ex. 1005, code 57 (Abstract). Rubin is concerned with an “aerosol” that is a “nebulous collection of atomized liquid droplets or fine powder particles that can be available for inhalation.” *Id.* at 2:8–11.

In the “aerosolized therapy” method of Rubin, “medicament” formulations, containing “aerosol particles with a mass median aerodynamic diameter” of “between 0.5 and 5 micrometers,” are employed “for lung delivery.” *Id.* at 2:12–25. “When in use, a high-pressure air jet passes through” a “jet nozzle” then “out through” a “tapered air outlet,” which causes liquid to flow into a fluid introducing gap. *Id.* at 22:10–13. “Liquid becomes nebulized into aerosol as high-pressure forces this liquid through” a restricted opening of the device. *Id.* at 22:14–16.

“Newly generated aerosol is dispersed as it comes in contact with a diffuser dispersing baffle” at high velocity. *Id.* at 22:16–18. An interior chamber “contains a conical section,” which Rubin describes as a “chimney.” *Id.* at 22:19–20. Extension guides protrude from the walls of the chimney and “cause ambient air entering the device to take a more tortuous flow path through” the device, thereby ensuring “that an adequate amount of

aerosol is entrained in this airflow to reduce particle size” or “prevent particles from colliding and growing.” *Id.* at 22:22–23, 22:30–35.

Rubin discloses that the extension guides of the chimney “may be curved or spiral-shaped to cause cyclonic action of aerosol entrained airflow.” *Id.* at 22:35–23:3. During an inhalation step, particles are carried out of the device through an air outlet. *Id.* at 23:25–33.

IV. ANALYSIS OF THE CHALLENGES

We organize our analysis into three main sections, addressing, in turn, the grounds that assert Rosener, grounds that assert Rubin, and Patent Owner’s arguments regarding the qualifications of Petitioner’s witness, Dr. Morse.

A. Grounds That Assert Rosener

Petitioner asserts three obviousness grounds based on the combined disclosures of Rosener (in view of the knowledge of a person of ordinary skill in the art), alone or in combination with King, Dautrebande, or Svoboda. Pet. 7. Collectively, these three grounds challenge the patentability of claims 1–17, and 21–25. *Id.*

For reasons explained in the next subparts, we find that Petitioner shows by a preponderance of the evidence that each of claims 1–6, 8–14, 21, 24, and 25 is unpatentable as obvious. We further find that Petitioner fails to show by a preponderance of the evidence that any of claims 7, 15–17, 22, or 23 is unpatentable as obvious.

Independent Claim 1

Petitioner asserts that independent claim 1 is unpatentable as obvious over Rosener in view of the knowledge of a person of ordinary skill in the art. Pet. 7. Claim 1 is directed to a “cartridge for use with a liquid diffusing

device” where the cartridge comprises a cartridge housing, a venturi device, and an insert having various recited features. Ex. 1001, 18:48–67. We address each recitation of claim 1 below.

Claim 1’s preamble recites, “A cartridge for use with a liquid diffusing device, the cartridge comprising.” To the extent claim 1’s preamble is limiting, we find that a preponderance of evidence supports that Rosener teaches a cartridge for use with a liquid diffusing device. Pet. 21; Ex. 1004 ¶¶ 21, 24, 34. Patent Owner does not contest this point. *See* Resp. 21–35.

Claim 1 recites “a cartridge housing defining an internal housing cavity partially filled with a liquid.” A preponderance of the evidence supports that Rosener teaches such a housing. Pet. 22–23; Ex. 1004, Fig. 2A, ¶ 24 (“an implementation of a scent delivery system 200 includes a reservoir assembly 205 for storing fragrance oil 210 and an atomizer complex 215”).

Claim 1 also recites “a venturi device for generating a diffused liquid from the liquid contained in the internal housing cavity.” A preponderance of the evidence supports that Rosener teaches such a venturi device. Pet. 23; Ex. 1004, Fig. 2C, ¶ 24 (“When the oil enters the venturi chamber, it is subjected to the pressurized airflow, which serves to atomize the oil into a mist.”).

Claim 1 further recites “an insert provided downstream of the venturi device; the insert including: a body; [and] an inlet provided in the body to receive diffused liquid generated within the cartridge during operation of the liquid diffusing device.” A preponderance of the evidence supports that Rosener teaches an insert with these features. Pet. 23–25; Ex. 1004, Fig. 2E, ¶¶ 26–30.

Claim 1’s insert also includes “an outlet zone defined at least in part by the body through which to discharge the diffused liquid toward an external environment.” Rosener teaches such an outlet zone. Pet. 25–27; Ex. 1004, Fig. 2B, Fig. 2D, ¶ 30.

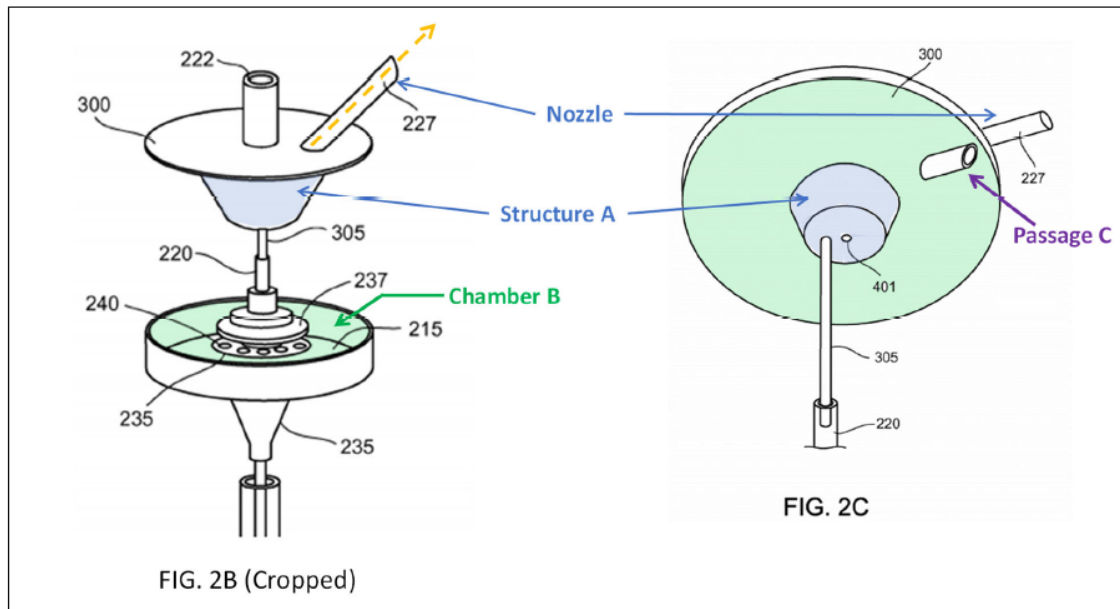
Patent Owner argues that Petitioner does not clearly identify an “outlet zone.” Resp. 24–25. We disagree. Petitioner states that Rosener discloses “an outlet zone (past holes 240 in the atomizer complex 215) which is defined in part by the body (funnel-shaped assembly 235, cylindrical section 404, and the tapered structure above 401 [J]).” Pet. 26–27. Petitioner also reproduces Figures 2B, 2D and 2E of Rosener and colorizes a portion of Figure 2E to illustrate what portion of the Rosener structure is an outlet zone. *Id.*; *see also* Ex. 1003, 32–34.

Patent Owner further argues that Petitioner does not explain how the Rosener device is capable of “discharging diffused liquid *toward* an external environment.” Resp. 25 (Patent Owner’s emphasis). As we explain above in our discussion of claim construction, however, the term “toward” does not require aiming. A preponderance of the evidence supports that air flows through the outlet zone Petitioner identified in the direction of the external environment—and along a course leading to—the external environment. Ex. 1004 ¶ 30 (“The path of the airflow through the device is shown by arrows 408, which turns and flows upwards through the holes 240 carrying with it the entrained aerosol particles of desirable small size. These particles then enter the interior of the atomizer complex 215 and are discharged through nozzle 227.”); *see also* Reply 7–9.

Alternatively, even if we were to adopt Patent Owner’s view that claim 1 requires that diffused liquid exiting holes 240 must be “**aimed in the**

direction of the external environment,” we would find that Rosener’s holes 240 meet the limitation. Resp. 26 (emphasis in original). Specifically, under that “aimed” interpretation, Petitioner identifies Rosener’s outlet zone as being the structure “past holes 240 in the atomizer complex 215 which is defined in part by the body (funnel-shaped assembly 235, cylindrical section 404, and the tapered structure above 401 []).” Pet. 26–27. Petitioner reproduces Rosener Figure 2D, which illustrates via the upper-left arrow 408 that the structure past hole 240 aims airflow up and to the left. *Id.* at 26. This direction is “toward the external environment” because the arrows point in a direction leading outside of the device.

Patent Owner further argues that the “toward the external environment” recitation is not met because an ordinarily skilled artisan would have recognized that, with Rosener’s device, “aerosol changes direction multiple times before it enters nozzle 227 to get discharged into the external environment.” Resp. 28. In making this argument, Patent Owner refers to annotated versions of Rosener’s Figures 2B (cropped) and 2C, which we reproduce below.



Rosener Figure 2B and 2C illustrate an example implementation of Rosener's scent delivery system. Ex. 1004 ¶ 14. Patent Owner annotates Figure 2B by labeling the area above atomizer complex 215 as Chamber B and coloring that area green. Resp. 28. Patent Owner labels the frustum-shaped structure below top portion 300 as Structure A and colors that area blue. *Id.* Patent Owner labels output nozzle 227 as a “nozzle” and draws a dotted yellow line extending up and to the right through the nozzle to indicate air flow out of the structure. *Id.*

Patent Owner's arguments, in this regard, are unavailing. As explained above, the outlet zone that Petitioner identifies directs diffused liquid along a path; that path may involve bends and turns, but it ultimately exits into an external environment. Thus, the path proceeds toward the external environment. *See* Tr. 12:24–13:12; Ex. 1015 ¶¶ 8–16. Moreover, even under Patent Owner's “aimed” claim construction, the outlet zone aims liquid toward an external environment (i.e., in the direction of, or along a path leading to, the external environment) even if structure prevents a

straight-line flow between the outlet zone and ultimate escape from the Rosener device.

Claim 1's insert also includes "a tortuous passage extending between the inlet and the outlet zone to aid in further reducing an average particle size of the diffused liquid as the diffused liquid moves through the tortuous passage, the tortuous passage being open in an upward direction." A preponderance of the evidence supports that Rosener discloses such a tortuous passage. Pet. 27–28; Ex. 1004 Fig. 2B, 2D, ¶ 27. In particular, Petitioner cites paragraph 27 of Rosener which explains that "physical impaction may be achieved by forcing the airstream with entrained particles to go around tight bends and corners or through small holes." Pet. 27. Petitioner further explains that Rosener describes physical impaction for the purpose of separating small airborne particles from big particles. *Id.*; see also Ex. 1004 ¶ 30 ("The path of the airflow through the device is shown by arrows 40-8, which turns and flows upwards through the holes 240 carrying with it the entrained aerosol particles of desirable small size.").

For the reasons explained above, Petitioner has established by a preponderance of the evidence that the subject matter of claim 1 of the '976 patent would have been obvious over Rosener.

Independent Claims 9, 24, and 25

Independent claims 9, 24 and 25 include many recitations similar to or the same as the recitations of independent claim 1. To the extent claim 9 and claim 24's recitations are the same or similar to claim 1, those recitations would have been obvious for the reasons explained above.

Patent Owner argues that claims 9 and 25 differ from claim 1 because claims 9 and 25 recite that the "insert include[s] ... an outlet zone."

Resp. 24–25. Patent Owner argues that Petitioner does not adequately explain how its alleged outlet zone “past holes 240 in the atomizer complex 215” is included in Rosener’s insert. *Id.*

Petitioner adequately explains how Rosener teaches this recitation. Pet. 31, 35–36 (addressing claims 9 and 25 by referring back to [1c]–[1g]). Contrary to Patent Owner’s argument, claim 1 is not substantively different from claim 9 or claim 25 in this regard. Rather, claim 1 recites “the insert *including* . . . an outlet zone defined at least in part by the body.” Ex. 1001 18:54–62 (emphasis added). Based on the language of claim 1, we conclude the recited outlet zone can be an included part of the insert even if the outlet zone is defined in part by the body. Petitioner identifies Rosener as having precisely such an outlet zone “past holes 240 in the atomizer complex 215.” Pet. 26. We find that Rosener Figures 2B and 2D illustrate this outlet zone area. Moreover, as Petitioner explains, Rosener’s outlet zone past holes 240 is similar to the ’976 Patent’s outlet zone above the opening in its insert. Reply 9; Ex. 1003 p. 31, 33–34.

Claim 9 also recites “the tortuous passage being partially capped by the cartridge housing to enclose a portion of the tortuous passage and to define an aerosol outlet at a remaining uncovered portion.” Ex. 1001 19:37–41. We find that a preponderance of the evidence supports that Rosener teaches this recitation. Pet. 31; Ex. 1004 Figs 2B–2E, ¶¶ 28–30.

Claim 25 further recites “wherein any diffused liquid that exits the cartridge must pass through the tortuous zone.” Ex. 1001 21:7–8. A preponderance of the evidence supports that Rosener teaches this recitation. Pet. 33–34 (addressing similar language of claim 21), 36 (addressing claim 25 by referring to explanation for claim 21); Ex. 1003, p. 41; Ex. 1004 Fig.

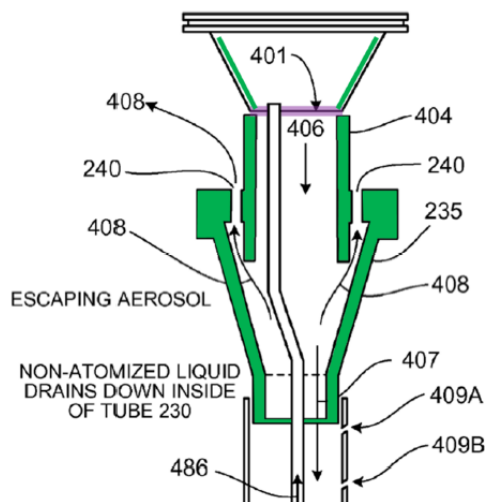
2E (showing arrows 406 and 408 showing flow through tortuous passage before exiting), ¶¶ 26–27 (suggesting “tight bends and corners” to separate particles before discharge); *see also infra* at 40.

Petitioner, thus, has established by a preponderance of the evidence that the subject matter of claims 9, 24, and 25 of the ’976 patent would have been obvious over Rosener.

Dependent Claims 2 and 11

Claim 2 recites “[t]he cartridge of claim 1 wherein the inlet of the insert is located at a periphery of the body, the outlet zone is located at a central region of the body, and the tortuous passage spirals between the inlet and outlet zone.” Ex. 1001, 19:1–4. Claim 11 is similar but depends from claim 9. *Id.* at 46–49. Petitioner’s second ground asserts that claims 2 and 11 would have been obvious over Rosener in view of King. Pet. 36.

A preponderance of the evidence supports that Rosener discloses an outlet zone located centrally along the insert body and an inlet located along the periphery of the body. Pet. 38–40. In particular, Petitioner reproduces and annotates Rosener Figure 2E to illustrate Rosener’s inlet and outlet zones. Pet. 25. We reproduce that illustration below.



Rosener Figure 2E illustrates “an example of implementation of a scent delivery system that includes a reservoir assembly for storing fragrance oil and an atomizer complex.” Ex. 1004 ¶ 14. Petitioner colors the horizontal line labeled 401 magenta in order to the “inlet zone.” Pet. 24. Petitioner colors certain semi-vertical and vertical portions of the device green in order to indicate the body of the insert. *Id.* Petitioner indicates that Rosener has an outlet zone “past holes 240 in the atomizer complex 215” as also illustrated by Rosener Figure 2B. Pet. 26–27. We find, based on Rosener’s illustrations and related text, that the identified inlet zone is at a periphery (i.e., the upper end) of the identified body and the outlet zone is at a central region of the body (i.e., between the upper and lower ends of the body).

Petitioner states that “Rosener does not explicitly describe a tortuous passage spiraling between the inlet and outlet zone.” Pet. 36. Petitioner argues that King teaches an aerosol inhalation apparatus including a baffle means that can comprise a generally spiral-shaped wall. *Id.* at 17–18 (citing Ex. 1006 1:6–10, 6:21–22, Fig. 20; Ex. 1003 ¶¶ 44–46). Petitioner further argues that a person of ordinary skill in the art would have had reason to incorporate King’s spiral structure into the tortuous passage of Rosener because both references “address the problem of creating desirably small airborne particles through impaction on a surface area in a tortuous passage” and “concern atomizing liquids, and particularly creating atomized droplets of sufficiently small dimension and homogenous distribution.” *Id.* at 36–38 (citing Ex. 1004 ¶¶ 17–18, 27, 1006 1:6–10, 1:26–30, 1:60–64, 3:42–48; Ex. 1003 ¶ 54).

Patent Owner argues that Petitioner’s position fails because King does not teach removing large liquid particles by impaction. Resp. 37–38. Patent

Owner argues that King's spiral is instead used to create a circuitous flow path such that "patient breathing parameters are minimized and substantially all the aerosolized medication from the nebulizer 32 is delivered to the patient." *Id.* at 38 (citing, e.g., Ex. 1006 2:15–18, 6:7–12). Patent Owner further argues that, for King, "particle size distribution of the aerosol remains unchanged as it flows through the spiral-shaped wall 100." *Id.* at 38–39 (citing Ex. 2005 ¶ 94). Patent Owner further argues that incorporation of King's spiral into Rosener would prevent collision with Rosener's walls, thereby preventing separation of large liquid particles. Resp. 40–42.

Based on the record before us, the preponderance of the evidence supports Petitioner's position. King is concerned with delivering small particles to a patient: King states, for example, that an object of its invention is to "deliver to the patient essentially the same particle size distribution of the aerosol mist that originates from the nebulizer itself." Ex. 1006 2:19–22; *see also id.* at [57] (stating that its apparatus delivers medication "in essentially the same particle size distribution of the aerosol mist"); 1:7–10 (stating that invention "delivers a mist of properly sized aerosol particles"); 1:60–65 (stating that invention "functions in a manner to assure that the medicament particles delivered to the patient will be of optimum size"). King states that in "this latest form of the invention this important baffle means comprises a generally spiral-shaped wall 100 (Fig. 20)." *Id.* at 6:20–22. A person of ordinary skill in the art would have understood that design of the passage, through which aerosolized particles pass, will affect the size of output particles. Ex. 1003 ¶ 60; Ex. 1004 ¶ 27 (teaching that, for example, "tight bends" may be use to separate small airborne particles from big particles).

We find that a person of ordinary skill in the art would have recognized that the spiral structure of King’s passage is an example of a “tight bend” (as referenced by Rosener) that can help control what size of particle progresses through the entire passage. Ex. 1006 6:16–22 (explaining that “this important baffle means comprises a generally spiral-shaped wall 100” and serves to “provid[e] a circuitous fluid flow path through the first chamber”)⁸; Ex. 1003 ¶¶ 56–61. A person of ordinary skill in the art’s use of a spiral structure, as taught by King, to further control particle size via tight bends, as taught by Rosener, would have been obvious because it would have been a “predictable use of a prior art elements according to their established function.” *KSR Int’l, Co. v. Teleflex Inc.*, 550 U.S. 398, 417 (2007). Rather than a spiral disrupting Rosener’s separation as Patent Owner argues, the combined teachings of Rosener and King suggest that King’s spiral would assist in achieving separation and particle size control (as Rosener and King teach). Dr. Morse’s testimony is credible in this regard and supports our findings and conclusion along with the references themselves. Ex. 1003 ¶¶ 54–56.

Thus, for the reasons explained above, Petitioner has established by a preponderance of the evidence that the subject matter of claims 2 and 11 of the ’976 patent would have been obvious over Rosener in view of King.

Dependent Claims 3 and 12

Claim 3 recites, “[t]he cartridge of claim 1 wherein the body of the insert is formed as a single, unitary piece that includes the tortuous passage.”

⁸ This feature of King distinguishes the instant case from those in related IPR2021-00012, where Petitioner advances a reference (referred to as Knoch) that discloses its surfaces as creating an ensuing spiral vortex.

Ex. 1001 19:5–7. Claim 12 is similar but depends from claim 9. *Id.* at 19:50–51. Petitioner’s third ground asserts that claims 3 and 12 are obvious over Rosener in view of Dautrebande. Pet. 7.

Petitioner agrees that Rosener does not explicitly teach that its insert is formed as a single unitary piece. Petitioner argues that Dautrebande is directed toward an apparatus for obtaining improved aerosols and teaches a single, unitary piece aerosol conduit member 6 that includes a tortuous passage. Pet. 18–20, 43–44; Ex. 1007, Fig. 1. Petitioner provides reasons why a person of ordinary skill in the art would have combined the teachings of Rosener and Dautrebande and provides citations to both references to support this argument. Pet. 40–42.

Patent Owner argues Petitioner has not adequately established that a person of ordinary skill in the art would have had reason to combine the teachings of Rosener and Dautrebande. Resp. 42–44. We disagree. Both Rosener and Dautrebande concern atomizing liquids of sufficient small size. Pet. 41–42; Ex. 1004, 17–18; Ex. 1007, 1:1–14, Ex. 1003 ¶ 58. Both references teach use of a tortuous passage to separate small particles from undesirable large particles by surface impaction. Pet. 41–42; Ex. 1004 ¶ 27; Ex. 1007, 1:24–28, 1:35–42, 3:2–9 (explaining that after going through turns, unstable particles “will tend to deposit and coalesce ... at the right angle turns”).

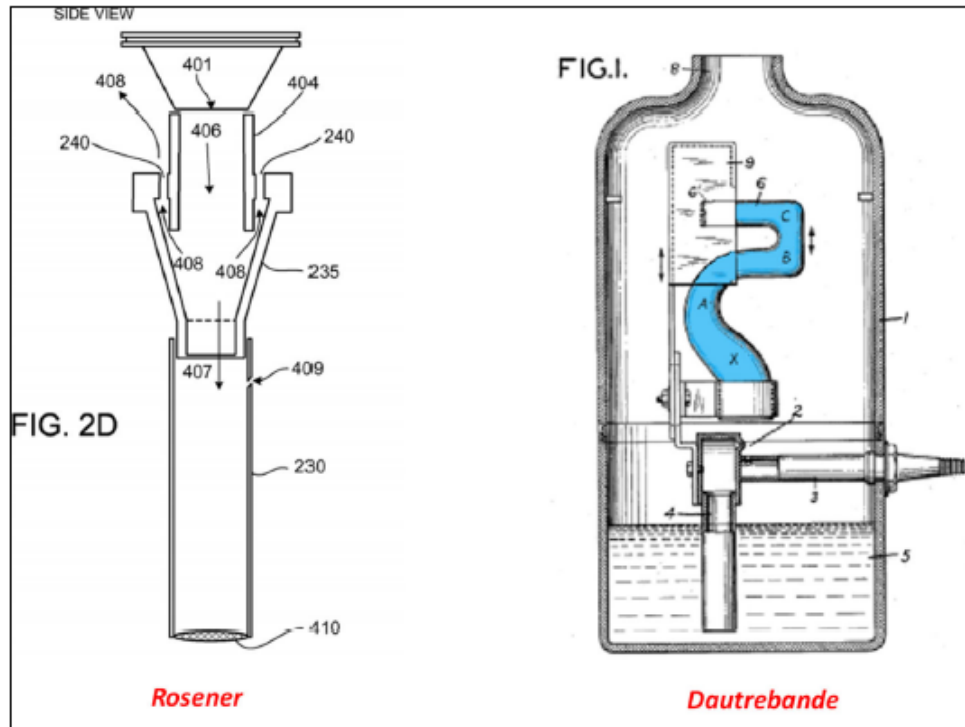
Dautrebande teaches, for example, that formation and use of turbulent liquid masses (created by turns in a curved conduit) “is critical in the production of aerosol of the preferred small size and uniformity.” Ex. 1007, 3:14–20. A person of ordinary skill in the art would have recognized that Dautrebande’s insert—constructed of a single piece with curved zones—is

useful for achieving small aerosolized liquid particles and, from that teaching, would have viewed the single-piece construction of Dautrebande, in particular, as an interchangeable, alternative approach for modifying Rosener's two-piece tortuous passage as a single piece. Pet. 40–46. We agree with Petitioner that the proposed modification represents a “predictable” use of a prior art element according to its established function. *Id.* at 41–42; *see also KSR*, 550 U.S. at 417.

Patent Owner further argues that Petitioner does not adequately explain how a person of ordinary skill in the art would have incorporated aerosol conduit member 6 into Rosener. Resp. 43–44. Petitioner, however, relies on teachings of Rosener concerning, for example, use of a unitary curved member. Pet. 43–44. As explained above, Petitioner does not propose that a person of ordinary skill would incorporate Dautrebande's physical structure into Rosener. *See In re Mouttet*, 686 F.3d 1322, 1332 (Fed. Cir. 2012) (“It is well-established that a determination of obviousness based on teachings from multiple references does not require an actual, physical substitution of elements.”). Patent Owner's argument that Petitioner fails to explain “why” an ordinarily skilled artisan would have applied the single-piece approach of Dautrebande to the two-piece approach of Rosener is answered by the interchangeability of those two approaches to achieve the same result. Resp. 44.

We also disagree with Patent Owner's somewhat related argument that Petitioner does not explain adequately “how” a person of ordinary skill in the art would have incorporated Dautrebande's conduit member 6 into Rosener's device. *Id.* (Patent Owner's emphasis). Here again, Patent Owner misconstrues the proposed modification as requiring a bodily incorporation

of the physical structure of Dautrebande's conduit member 6 to replace Rosener's tortuous passage. Reply 12–13 (Petitioner, refuting that the modification requires bodily incorporation); *see also In re Mouttet*, 686 F.3d at 1332. Below, we reproduce Patent Owner's illustration, which is useful in assessing the challenge.



Resp. 45. The above illustration shows Rosener's Figure 2D on the left and Dautrebande's Figure 1 (cropped) on the right. The above illustration further shows Petitioner's annotation to Dautrebande's Figure 1, in which s-shaped conduit 6 is shaded blue. Petitioner asserts that the unitary s-shaped conduit 6 in Dautrebande would have suggested the use of a single, unitary body in place of the two-section body, or insert, of Rosener's device. Pet. 26–27, 42–46.

We agree with Petitioner that Dautrebande's use of a single, unitary body would have suggested a modification in which the two-section body of

Rosener is provided as a single, unitary body. Pet. 40–44. That suggestion does not require a physical incorporation of Dautrebande’s conduit 6 into Rosener’s device. Petitioner directs us to a preponderance of the evidence supporting that a person of ordinary skill in the art “would have been motivated to incorporate that ‘basic approach’ of Dautrebande” into Rosener’s device. Reply 13–14; Ex. 1003 ¶¶ 55–60.

Thus, for the reasons explained above, Petitioner has established by a preponderance of the evidence that the subject matter of claims 3 and 12 of the ’976 patent would have been obvious over Rosener in view of Dautrebande.

Dependent Claims 4 and 13

Claim 4 recites “[t]he cartridge of claim 1 wherein a lower portion of the body of the insert includes an indentation having an impact surface to be impinged upon by diffused liquid during operation of the liquid diffusing device.” Ex. 1001 19:8–11. Claim 13 is similar but depends from claim 9. *Id.* at 19:52–56. Petitioner asserts that claims 4 and 13 would have been obvious over Rosener in view of the knowledge of a person of ordinary skill in the art. Pet. 7.

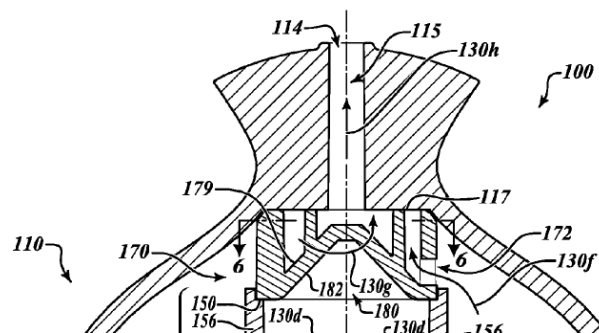
Petitioner argues that Rosener teaches a lower portion of the body of the insert that is funnel-shaped (a frustoconical shape with an open bottom) and that the particles collide with this funnel-shaped section. Pet. 28–29 (citing, e.g., Ex. 1004 ¶ 30). Patent Owner argues that the funnel-shaped portion of assembly 235 is not an “indentation” because an “indentation” is “an angular cut in an edge” or “recess in a surface.” Resp. 32–34.

The preponderance of the evidence supports Petitioner’s position. The frustoconical shaped lower portion of Rosener’s insert is a recessed surface

that satisfies the “indentation” limitation of claims 4 and 13. *See* Reply 10–11; Ex. 1004, Fig. 2E. Rosener explains this structure’s purpose: “[e]xcess oil ... drains ... into the funnel-shaped structure 235.” Ex. 1004 ¶ 25. The ’976 patent describes its indentation in similar terms:

[T]he insert 170 may include a lower portion having an indentation or depression 180 that includes an impact surface 182 to be impinged upon by the diffused liquid generated by the venturi device 142 during operation. In some instances, the impact surface 182 may be concave and may diverge in a downward direction to direct liquid condensed or collected thereon radially outward and downward. In some embodiments, the impact surface 182 may be a conical or frustoconical surface.

Ex. 1001, 9:14–37; *see also id.* at Fig. 4. We reproduce below Figure 4 (cropped) from the ’976 patent, which depicts impact surface 182 as a frustoconical surface.



Ex. 1001, Fig. 4. Figure 4 is a cropped illustration of the top portion of cross-sectional view showing internal components and structures of a cartridge for a diffusion device as disclosed in the ’976 patent. *Id.* at 3:1–2, 7:21–8:10. Among other features, Figure 4 illustrates “impact structure or surface 182” on which “at least some of the diffused liquid impacts and collects” then “is routed back to any remaining fluid in the reservoir.” *Id.* at 7:42–47.

The '976 patent discloses that, as shown in Figure 4, “impact surface 182 may be a conical or frustoconical surface.” *Id.* at 9:28–30. Patent Owner, however, argues that an ordinarily skilled artisan would have recognized that the indentation that includes impact surface 182 is a “hollow of any size on a plain surface having no natural outlet for surface drainage,” which would exclude Rosener’s funnel-shaped structure 235 because drainage flows through the structure. Resp. 33–34. That argument is based on extrinsic opinion testimony keyed to a dictionary definition of “depression,” not the claim term “indentation.” *Id.* (citing Ex. 2004, 3, 5). As Petitioner points out, “The term in the challenged claims is ‘indentation,’ not ‘depression.’” Reply 11 (quoting Ex. 1001, 19:9, 19:53).

The '976 patent allows that “the insert may include an ‘indentation *or* depression,’ not that the indentation must be a depression.” Reply 11 (quoting Ex. 1001, 9–6, 14:44–45) (Peticioner’s emphasis). Against that backdrop, we determine that a preponderance of the evidence supports Petitioner’s position that the indentation limitation of claims 4 and 13 encompasses Rosener’s funnel-shaped impact surface 235, which is a “frustoconical” impact surface as disclosed in the '976 patent. Ex. 1001, Fig. 4, 9:28–30; Reply 10.

Thus, for the reasons explained above, Petitioner has established by a preponderance of the evidence that the subject matter of claims 4 and 13 of the '976 patent would have been obvious over Rosener in view of the knowledge of a person of ordinary skill in the art.

Dependent Claims 5 and 14

Claim 5 recites “[t]he cartridge of claim 4 wherein the impact surface diverges in a downward direction to direct liquid condensed thereon radially

outward and downward.” Ex. 1001, 19:13–15. Claim 14 is similar but depends from claim 13. *Id.* at 19:57–59. Petitioner asserts that claims 5 and 14 would have been obvious over Rosener in view of Dautrebande. Pet. 7.

Petitioner argues that a lower end of Dautrebande’s aerosol conduit member 6 has a larger diameter than its upper end. Pet. 44–45 (citing Ex. 1007, 2:13–15, 2:47–55). Petitioner further argues that a person of ordinary skill in the art would have had reason to incorporate principles of Dautrebande’s aerosol conduit member 6 into Rosener (in conjunction with Rosener’s “tight bends and corners”) to help achieve Rosener’s desired sufficiently small airborne particles. Pet. 40–42.

Patent Owner argues that a person of ordinary skill in the art would not incorporate Dautrebande’s conduit member into Rosener because doing so would render Rosener’s device inoperable. Resp. 44–46. It is well established that “it is not necessary that the inventions of the references be physically combinable to render obvious the invention under review.” *In re Sneed*, 710 F.2d 1544, 1550 (Fed. Cir. 1983). In addition, “[c]ombining the *teachings* of references does not involve an ability to combine their specific structures.” *In re Nievelt*, 482 F.2d 965, 968 (CCPA 1973) (emphasis in original). On this record, we find Patent Owner’s position does not take account of what the combined disclosures of Rosener and Dautrebande fairly would have suggested to an ordinarily skilled artisan.

The preponderance of the evidence supports Petitioner’s arguments. Petitioner proposes that a particular feature of Dautrebande’s aerosol conduit member 6 be incorporated into Rosener’s tortuous passage. Pet. 40–44. The references support a suggestion to do so. Air flows upward through the tortuous passage of Rosener just as it flows upwards through Dautrebande’s

aerosol conduit member 6. Reply 14–15; Ex. 1004, Fig. 2E; Ex. 1007. Both devices concern creating atomized droplets of a sufficiently small dimension. Ex. 1004 ¶ 18; Ex. 1007, 1:1–14. A person of ordinary skill in the art would have, therefore, expected that Rosener’s tortuous passage would have benefitted from a divergent shape as claim 1 recites for the same reason Dautrebande benefits from such a shape. Ex. 1003 ¶ 58. *See KSR Int’l, Co.*, 550 U.S. at 417.

Against that backdrop, we do not agree that Petitioner argues for a modification in which conduit member 6 of Dautrebande physically replaces Rosener’s tortuous passage. Pet. 40–46. Petitioner argues, and we agree on this record, that an ordinarily skilled artisan “viewing Rosener would have looked to Dautrebande (and vice versa) to inform possible or alternative approaches to perform the same functions within the same general structure.” *Id.* at 41–42; Ex. 1003 ¶ 58. The modification Petitioner proposes “uses a known element for its known purpose to yield a predictable result” to achieve sufficiently small airborne particles through surface impaction. Pet. 40–46. Petitioner directs us to a preponderance of the evidence supporting that an ordinarily skilled artisan “would have improved Rosener’s funnel-shaped assembly with the general structure taught by Dautrebande” by taking account of Dautrebande’s suggestion for inclusion of a divergent shape as specified in claims 5 and 14. Reply 15; Ex. 1003 ¶¶ 58, 60.

Thus, for the reasons explained above, Petitioner has established by a preponderance of the evidence that the subject matter of claims 5 and 14 of the ’976 patent would have been obvious over Rosener in view of Dautrebande.

Petitioner also challenges claims 5 and 14 based on Rosener in view of Svoboda. Pet. 7, 46–48.⁹ Here again, Petitioner demonstrates that an ordinarily skilled artisan would have considered “an impaction surface that diverges in a downward direction” as an “alternative” approach for use in Rosener’s device, as suggested by Svoboda. Pet. 47–48. Patent Owner’s counterarguments are based on the erroneous assumption that Petitioner argues for a bodily incorporation of Svoboda’s deflector member into Rosener’s device. Resp. 46–49. Like the ground based on Dautrebande, however, the ground based on Svoboda is based on suggestions of interchangeable, “alternative approaches,” rather than physical incorporation of components, into Rosener’s device. Pet. 47. On this record, we determine that Patent Owner’s counterarguments do not take account of what the combined disclosures of Rosener and Svoboda fairly would have suggested to an ordinarily skilled artisan. Resp. 46–49.

For the above reasons, we determine that Petitioner has established by a preponderance of the evidence that the subject matter of claims 5 and 14 would have been obvious over Rosener in view of Dautrebande or Svoboda.

Dependent Claim 6

Claim 6 recites “[t]he cartridge of claim 1 wherein the tortuous passage of the insert is at least partially defined by a vertical sidewall of the body.” Ex. 1001 19:16–18. Petitioner asserts that claim 6 is unpatentable as obvious over Rosener in view of the knowledge of a person of ordinary skill in the art. Petitioner argues that the interior and exterior walls of Rosener’s

⁹ The Petition mixes analysis of claims 5 and 14 and claim 23 in a confusing manner. Pet. 46–47. We, nonetheless, assess the Petition on the merits.

cylindrical section 404, which has vertical side walls as seen in Figure 2D, “necessarily would define the tortuous passage.” Pet. 29.

The preponderance of the evidence supports Petitioner’s position. In particular Rosener Figure 2D illustrates vertical side walls of cylindrical section 404. Ex. 1004, Fig. 2D. The airstream path is guided by a physical structure that includes tight bends and corners that comprise a tortuous passage within the meaning of claim 6. *Id.* ¶ 27. Patent Owner does not present argument directed at this claim in particular. For the reasons explained above, Petitioner has established by a preponderance of the evidence that the subject matter of claim 6 of the ’976 patent would have been obvious over Rosener.

Dependent Claims 7 and 16

Claim 7 recites “[t]he cartridge of claim 1 wherein the tortuous passage of the insert follows a non-linear path that assists in preventing liquid from leaking from the cartridge when the cartridge is upended.” Ex. 1001 19:19–22. Claim 16 is similar but depends from claim 9. *Id.* at 19:52–54.

Claims 7 and 16 include functional language; the claims recite structure that must be capable of performing the recited language. *Cf. In re Swinehart*, 58 C.C.P.A. 1027, 439 F.2d 210, 212 (CCPA 1971) (“[T]here is nothing intrinsically wrong with [defining something by what it does rather than what it is] in drafting patent claims.”). The written description explains what is meant by the claim phrase, “assist in preventing liquid from leaking,” namely, that a tortuous passage may assist in preventing liquid from leaking when it slows progression of fluid toward the outlet zone:

Irrespective of particular configuration, the tortuous passage 176 follows a non-linear path that, among other things, assists in prevent[ing] liquid 111 from leaking from the cartridge 100 when the cartridge 100 is upended. For example, if the cartridge 100 is temporarily held upside down, the tortuous passage will assist in slowing the progression of liquid 111 within the cartridge 100 toward the outlet zone 174 and hence the outlet 114 of the cartridge.

Ex. 1001, 11:1–10.

As explained above, we find that, as Petitioner argues, Rosener teaches a tortuous passage with tight bends and corners. Pet. 29–30. But as to whether or not this tortuous passage would meet claim 7 and 16’s leaking recitation, the Petition’s argument and explanation is inadequate:

A POSA would understand that if the cartridge of Rosener was upended, the tortuous path consisting of the tight bend from the inside of the cylindrical section 404 into the narrow channel between the cylindrical section 404 and the funnel-shaped assembly 235, through the small holes 240 and along the tapered structure above 401 incorporated in Rosener would assist in preventing the liquid from leaking.

Pet. 29–30. To support this statement, Petitioner cites the declaration of Dr. Morse whose written testimony mirrors this same language without further explanation. Ex. 1003 ¶¶ 36–37.

Patent Owner argues that Petitioner’s assertions are inadequately supported. As Patent Owner explains, if Rosener’s device were upended, liquid would be able to flow through holes 240 and out of the device. Resp. 15; *see also* Ex. 2005 ¶¶ 60–69 (Dr. Mello explaining why a Rosener tortuous passage would not assist in preventing leaking). Moreover, as Patent Owner further points out, Rosener suggests using “enhancements,” such as a valve, to prevent leaking if its device is inverted. Ex. 1003 ¶ 33; *see also* Resp. 16.

Ultimately, to determine whether Rosener's suggested tortuous passage is a structure capable performing the functionality of claims 7 and 16, we would need to determine that, because of Rosener's tortuous passage, liquid would take more time to leak when the device is upended than if the tortuous passage was not present. The record before us, however, does not adequately support such a finding. Here again, the paucity of information provided by Petitioner, who bears the burden of showing unpatentability, tips against a conclusion that these claims are proven unpatentable.

Although tight bends and corners *might* make the flow take longer to leak from the cartridge (as Petitioner urges at Reply 4–6), Petitioner does not establish that this is the case and, moreover, does not establish that it is not the case that the tight bends and corners might make the liquid take *less* time to leak from the cartridge. As Patent Owner argues, where a channel narrows in a direction of flow, a fluid's speed may increase in accordance with Bernoulli's principle. Sur-Reply 7–8.¹⁰ This principle is evidenced by the Svoboda reference, which explains that gas will travel faster through the “necked down portion 29” of its venturi tube. Ex. 1008, 4:4–8, Fig. 1, 2 (illustrating necked down portion 29). Accordingly, the record is unclear as to whether the tight bends and corners would speed up or slow down the flow of liquid from the cartridge. Additionally, Rosener does not refer to its tortuous passage as preventing leaking, and if the tortuous passage were capable of doing so, it is unclear why the valve would be necessary. *See*

¹⁰ The record also lacks evidence regarding to what extent other factors such as fluid viscosity, pressure differentials, and friction losses could potentially also affect flow speed. This lack of evidence, again, underscores Petitioner's failure to meet its burden to show unpatentability of these claims.

generally Ex. 1004; *see also* Ex. 2005 ¶ 68 (Dr. Mello’s written testimony on point).

In any event, for reasons explained by Patent Owner, Petitioner’s analysis regarding the path and speed of liquid flow when Rosener’s device is upended is insufficient to support the unpatentability of claims 7 and 16 (Sur-Reply 1–18), at least because Petitioner fails to take account of leakage through orifice 401 or because of Rosener’s express need for a valve to provide for a device that “may be inverted without causing the fragrance oil to pour out” (*id.* at 12). *See* Ex. 1004 Fig. 2D (illustrating position of orifice 401), ¶ 33 (describing Rosener’s valve); *see also* Resp. 11–17 (Patent Owner’s arguments); Pet. 29–30, 33; Reply 4–6 (Petitioner’s analysis).

In this proceeding, Petitioner has the burden of establishing that it would have been obvious for a person of skill in the art to employ a “tortuous passage of the insert [that] follows a non-linear path that assists in preventing leaking from the cartridge when the cartridge is upended.” Ex. 1001, 19:19–22. For the reasons explained above, the Petition does not meet this burden by a preponderance of the evidence, and Petitioner does not sufficiently establish obviousness of claims 7 and 16 over Rosener.

Dependent Claim 8

Dependent claim 8 recites, “[t]he cartridge of claim 1 wherein a cross-sectional profile of a least a portion of the tortuous passage of the insert narrows in a downstream direction.” Ex. 1001, 19:23–25. Petitioner asserts that dependent claim 8 is unpatentable as obvious over Rosener in view of the knowledge of a person of ordinary skill in the art. Pet. 7. Rosener’s funnel-shaped structure indicates the recited narrowing in a downstream direction. Ex. 1004, Figs. 2D, 2E, ¶ 29; Pet. 30. Patent Owner does not

present argument directed at this claim in particular. For the reasons explained above, Petitioner has established by a preponderance of the evidence that the subject matter of claim 8 of the '976 patent would have been obvious over Rosener.

Dependent Claim 10

Dependent claim 10 recites, “[t]he cartridge of claim 9 wherein the tortuous passage of the insert is configured to aid in further reducing an average particle size of the diffused liquid as the diffused liquid moves through the tortuous passage.” Petitioner asserts that dependent claim 10 is unpatentable as obvious over Rosener in view of the knowledge of a person of ordinary skill in the art. Pet. 7. Rosener suggests such a tortuous passage having such a configuration. Ex. 1004 ¶¶ 26–27; Pet. 32–34. Patent Owner does not present argument directed at this claim in particular. Based on the complete record, Petitioner has established by a preponderance of the evidence that the subject matter of claim 10 of the '976 patent would have been obvious over Rosener.

Dependent Claim 15

Dependent claim 15 recites, “[t]he cartridge of claim 9 wherein the tortuous passage is at least partially defined by a vertical sidewall of the insert.” Ex. 1001, 19:60–61. Petitioner list of grounds asserts that dependent claim 15 is unpatentable as obvious over Rosener in view of the knowledge of a person of ordinary skill in the art. Pet. 7. Petitioner did not, however, provide an explanation for this assertion. Pet. 33; *see also* Pet. *passim* (omitting any explanation for claim 15). Petitioner, thus, does not sufficiently establish obviousness of claim 15 over Rosener.

Dependent Claim 17

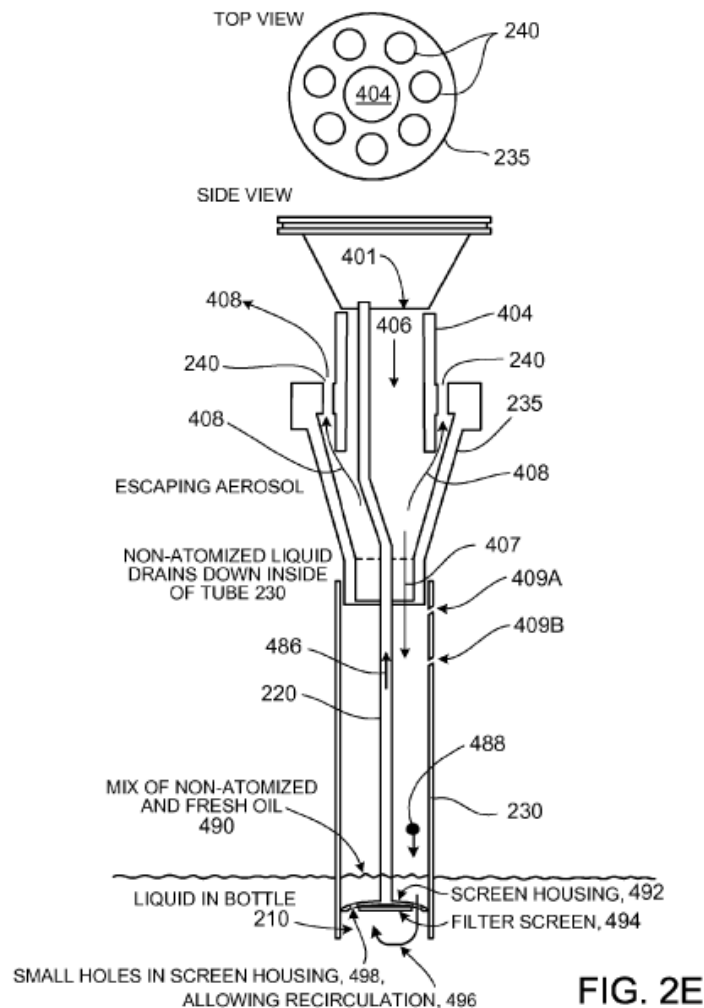
Dependent claim 17 recites, “[t]he cartridge of claim 9 wherein the insert is provided between the cartridge housing and the venturi device.” Ex. 1001, 19:66–67. Petitioner asserts that dependent claim 17 is unpatentable as obvious over Rosener in view of the knowledge of a person of ordinary skill in the art. Pet. 7. When addressing claim 17, the Petition does not reference the correct claim language. Pet. 33 (quoting claim 17 as “[t]he cartridge of claim 9 wherein a cross sectional profile of at least a portion of the tortuous passage of the insert narrows in a downstream direction). The Petition also refers back to disclosures for claims 8 and 9. *Id.* Claims 8 and 9, however, do not include the same language as claim 17, and Petitioner’s explanation for claims 8 and 9 does not adequately address the language of claim 17. Petitioner, thus, does not sufficiently establish obviousness of claim 17 over Rosener.

Dependent Claim 21

Dependent claim 21 recites, “[t]he cartridge of claim 9 wherein the tortuous passage of the insert provides the sole passage for the diffused liquid generated by the venturi device to exit the cartridge.” Ex. 1001, 20:24–26. Petitioner asserts that dependent claim 21 is unpatentable as obvious over Rosener in view of the knowledge of a person of ordinary skill in the art. Pet. 7.

We discuss Rosener’s teachings regarding a tortuous passage above when we address, for example, claim 1. Rosener suggests the benefit of diffused liquid passing through a tortuous passage before exiting the device. Ex. 1004 ¶¶ 26–27, Fig. 2E; Pet. 34. Rosener’s Figure 2E, reproduced below, supports Petitioner’s view that “any non-atomized liquid drains down

the inside of the tube 230,” therefore, “any diffused liquid that exits the cartridge through holes 240 and output nozzle 227 must pass through the tortuous passage” defined by cylindrical section 404 and funnel-shaped structure 235.



Ex. 1004, Fig. 2E. Figure 2E illustrates an example of Rosener’s scent delivery system and “includes a reservoir assembly for storing fragrance oil and an atomizer complex.” *Id.* ¶ 14. Rosener thus suggests that its tortuous passage would be the sole exit for the diffused liquid. Patent Owner does not present argument directed at this claim in particular. On this record, Petitioner has established by a preponderance of the evidence that the

subject matter of claim 21 of the '976 patent would have been obvious over Rosener.

Dependent Claim 22

Claim 22 recites, “[t]he cartridge of claim 9 wherein the tortuous passage of the insert is configured to provide a convoluted flow path that retards a flow of the liquid to be diffused through the insert when the cartridge is temporarily held upside-down.” Ex. 1001, 20:27–30. Petitioner asserts that dependent claim 22 is unpatentable as obvious over Rosener in view of the knowledge of a person of ordinary skill in the art. Pet. 7. To address this claim, Petitioner refers to its argument regarding claims 7 and 9. *Id.* Claim 7 is similar to this claim. For the reasons we explain above with regard to claim 7, Petitioner does not sufficiently establish obviousness of claim 22 over Rosener.

Dependent Claim 23

Claim 23 recites:

The cartridge of claim 9 wherein an initial fill level of the liquid to be diffused is below the venturi device when the removable cartridge is upright and below a central axis of the cartridge housing when the removable cartridge is upended and rests sideways, and wherein the tortuous passage of the insert is configured to provide a convoluted flow path that includes a portion above the central axis when the cartridge is suspended and rests sideways to prevent the liquid to be diffused from traversing the entirety of the tortuous passage.

Ex. 1001. 20:31–40. Petitioner asserts that claim 23 is obvious over Rosener in view of Dautrebande. Pet. 7. The Petition incorrectly reproduces the text of claim 23. *Id.* at 45–46 (referring to “[t]he cartridge of claim 9 wherein the tortuous passage of the insert is configured to provide a convoluted flow path that retards the flow of the liquid to be diffused through the insert when

the cartridge is temporarily held upside-down” instead of the correct claim language). In discussing claim 23, the Petition does not address claim 23’s language regarding, for example, “a portion above the central axis when the cartridge is suspended and rests sideways.” *Id.*; *see also* Resp. 46. Petitioner, thus, does not sufficiently establish obviousness of claims 23 over Rosener in view of Dautrebande.

Petitioner also asserts that claim 23 is obvious over Rosener in view of Svoboda. Pet. 46–48. Petitioner, however, did not identify this challenge in its summary of grounds or in the heading of its argument. *Id.* at 7, 46. It is, thus, unclear whether Patent Owner had adequate notice of this ground.

Even if we assess this ground, Petitioner fails to adequately address claim 23 with Svoboda. In particular, the Petition provides no explanation why the combination of Rosener and Svoboda would meet claim 23’s recitations regarding, for example, “a portion above the central axis when the cartridge is suspended and rests sideways.” Pet. 46–48; *see also generally* Pet. The Petition cites the declaration of Dr. Morse, but Dr. Morse also does not explain how Svoboda meets this recitation. Ex. 1003 ¶ 63. Petitioner, thus, does not sufficiently establish obviousness of claim 23 over Rosener in view of Svoboda.

B. Grounds That Assert Rubin

Petitioner asserts two obviousness grounds based on the disclosures of Rubin (in view of the knowledge of a person of ordinary skill in the art), alone or in combination with Dautrebande. Pet. 7–8. Collectively, these two grounds challenge the patentability of claims 1–25. *Id.*

As explained below, Petitioner fails to show by a preponderance of the evidence that any claims are obvious based on these two grounds. In

particular, Petitioner fails to establish that Rubin teaches or suggests claim 1’s recitation of “the insert including ... a tortuous passage extending between the inlet and the outlet zone.” Ex. 1001 18:53–64. Petitioner also fails to adequately show that Rubin teaches or suggests the other independent claims’ similar recitations. *Id.* at 19:36–37 (claim 9), 20:56–57 (claim 24), 21:5–6 (claim 25).

As a threshold matter, we clarify that the claims’ recited tortuous passage must be, as Patent Owner argues, a permanent, physical structure of the insert (as opposed to, for example, a transient airflow path formed only during normal operation of the device). *See, e.g.*, Sur-reply 23–29; Ex. 1001, Figs. 1–10 (consistently illustrating the tortuous passage as a permanent, physical structure of the apparatus). To the extent Petitioner argues that a transient airflow *path* satisfies the tortuous *passage* structure required by the challenged claims, we reject this new argument for two independent reasons: it comes too late (in the Reply) and, in any event, it is not persuasive on this record.

As to timing, to the extent Petitioner argues that a transient airflow path may satisfy the claims’ tortuous passage structure, it does so for the first time in Reply. Reply 17–21 (Petitioner’s new arguments regarding Rubin’s alleged tortuous passage). A “petitioner may not submit new evidence or argument in reply that it could have presented earlier, e.g., to make out a prima facie case of unpatentability.” Patent Trial and Appeal Board Consolidated Trial Practice Guide (Nov. 2019), 73, *available at* <https://www.uspto.gov/sites/default/files/documents/tpgnov.pdf?MURL=>; *see also* 37 C.F.R. § 42.23(b). Here, this alternative argument comes too late because it would change the theory of Petitioner’s case. *Compare* Pet. 52–53

(arguing that separation of particles by size occurs when “an impact surface (chimney 121)” is “impinged upon by diffused liquid”), *with* Reply 17–21 (seeming to argue that Rubin’s transient airflow path may meet the “tortuous passage” limitation). Petitioner provides no explanation as to why it did not earlier make an argument equating that airflow path to tortuous passage structure, and even in the Reply, Petitioner is unclear as to whether it affirmatively takes such a position.

As to the merits, Petitioner’s new theory is not adequately supported by the ’976 patent’s claim language or written description. Reply 17–21 (and evidence cited therein). To the contrary, we agree with Patent Owner that that an ordinarily skilled artisan “would recognize that a ‘tortuous flow path’ is different from a ‘tortuous passage.’” Sur-reply 30 (citing Ex. 2005 ¶¶ 115–119, Dr. Morse’s written testimony, keyed to disclosures in the ’976 patent).

The language of the ’976 patent claims clarifies that the tortuous passage of the claimed invention is a physical structure of the insert. Claim 1 recites a “cartridge” comprising an “insert.” The insert “include[es]” “a body,” “an inlet,” “an outlet zone defined at least in part by the body,” and “a tortuous passage.” The cartridge is physical apparatus. Ex. 1001, code (57). The insert is physical apparatus because it is part of the physical cartridge and it includes physical structure such as the body, inlet, and outlet zone. Given this context, a person of skill in the art would recognize that the “tortuous passage” must also be physical structure because the physical insert includes the tortuous passage. The other independent claims are similar in this regard.

The dependent claims further confirm that the tortuous passage must be physical by requiring, for example, that the “body” of the insert “is formed as a single, unitary piece that includes the tortuous passage” (claims 3 and 12), that “the tortuous passage is at least partially defined by a vertical sidewall of the body” (claim 6), that “a cross-sectional profile of at least a portion of the tortuous passage of the insert narrows in a downstream direction” (claim 8), that the “tortuous passage is partially capped by the cartridge housing to enclose a portion of the tortuous passage” (claim 9), that the tortuous passage “is at least partially defined by a vertical sidewall of the insert” (claim 15), that the tortuous passage is configured to assist in preventing liquid from leaking when the cartridge is upended (claims 7 and 16), that the tortuous passage “is configured to provide a convoluted flow path that retards a flow of the liquid to be diffused through the insert when the cartridge is temporarily held upside down” (claim 22), and that “the tortuous passage of the insert is configured to provide a convoluted flow path that includes a portion above the central axis when the cartridge is upended and rests sideways” (claim 23). Ex. 1001, 18:16–42, 18:48–21:10. Petitioner directs us to no persuasive evidence that any challenged claim is written in terms broad enough to permit a transient path of aerosolized particles, as opposed to a physical structure, to meet the requirement for a tortuous passage.

We next turn to Petitioner’s identification of an alleged tortuous passage in Rubin. In particular, Petitioner refers to various labeled parts of Rubin’s Figure 5 when comparing claim 1 to Rubin. We reproduce Rubin’s Figure 5 below.

extension guides 122 bounds a ‘tortuous passage [that] extend[s] between the inlet and the outlet zone.’ Resp. 51; Sur-Reply 25–30.

We emphasize that claim 1 requires a “tortuous passage *extending between* the inlet and the outlet zone.” Ex. 1001, 18:63–64 (emphasis added). Based on Petitioner’s identification of “the bottom opening of interior chamber 120” as being an inlet and “air outlet 123” as being an outlet, Petitioner bears the burden of establishing Rubin teaches a tortuous passage extending between these two points. We agree with Patent Owner, however, that Rubin does not explain how air travels from the alleged inlet to the alleged outlet. Resp. 51–53. In particular, although Rubin states that it has an airflow passage between its inlet and outlet (Ex. 1005, 10:1–4), it is unclear on this record, and Petitioner does not direct us to a preponderance of the evidence showing, what path air takes between “the bottom opening of interior chamber 120” and “air outlet 123.”

Patent Owner’s declarant, Dr. Mello, testifies that Rubin does not clearly explain how its aerosol travels from the bottom opening of interior chamber 120 (the alleged inlet) to air outlet 123 (the alleged outlet). Ex. 2005 ¶ 113. We find Dr. Mello’s testimony credible and agree that Rubin is silent in this regard. Petitioner does not persuasively dispute this point. *See* Tr. 22:20–23:5 (counsel for Petitioner agreeing that Rubin does not disclose the specifics of a passage from inlet to outlet); 34:4–36:20 (counsel for Petitioner stating that “Rubin does not explicitly disclose ... how the aerosolized liquid gets from chamber 120 out to the outlet zone 123”). Rubin’s uncertainty regarding the path of its airflow from alleged inlet to alleged outlet is fatal to Petitioner’s Rubin grounds; if Petitioner cannot establish what path the air takes between inlet and outlet, Petitioner

cannot establish that any structure *extending between* the inlet and outlet constitutes a tortuous passage.

Rubin distinguishes the path that aerosol entrained air makes through the device (i.e., the path of air flowing from alleged inlet to alleged outlet) from the path that ambient air takes (air that does not include entrained liquid that does not enter through the alleged inlet). When referring to a tortuous flow path, Rubin explains its chimney 121 and extension guides 122 “cause *ambient air* entering the device to take a more tortuous flow path,” Ex. 1005, 22:29–35. It is the flow of ambient air through a tortuous flow path that results in “cyclonic action of aerosol entrained airflow” to control particle size:

The interior chamber 120 of the device contains a conical section or chimney 121, which extends downward and surrounds the jet nozzle 110. Jacket 116 may be adjoined to chimney 121. Extension guides 122 may protrude from the walls of the chimney 121. Chimney 121 and its extension guides 122 prevent undesirable, larger droplets from exiting the device, and instead, cause such droplets to condense and return to the liquid reservoir 114. In this manner, smaller particles with a mass median aerodynamic diameter, MMAD, ideal for inhalation are able to freely exit the device through air outlet 123. Furthermore, chimney 121 and its extension guides 122 cause ambient air entering the device to take a more tortuous flow path through device to ensure that an adequate amount of aerosol is entrained in this airflow to reduce particle size and/or to prevent particles from colliding and growing. Extension guides 122 of the chimney 121, or other baffles residing in the device, may be curved or spiral-shaped to cause cyclonic action of aerosol entrained airflow.

Ex. 1005, 22:19–22:3. From this key passage of Rubin, we know that ambient air takes a downward path through chimney 121 and past extension guides 122. Thus, the ambient air may traverse what could be called a

physical tortuous passage. This point, however, does not establish that a physical tortuous passage necessarily extends between the asserted inlet (“the bottom opening of interior chamber 120”) and outlet (“air outlet 123”) or that aerosol entrained airflow encounters a physical tortuous passage.

The flow of ambient air through the chimney and past extension guides ultimately results in “cyclonic action of aerosol entrained airflow” and in “prevent[ing] undesirable, larger droplets from exiting the device.” Ex. 1005, 22:19–22:25. While the “[e]xtension guides 122 of the chimney ... may be [shaped] to cause cyclonic action of aerosol entrained airflow,” the shape may cause this cyclonic action by directing the ambient air. In other words, ambient air taking a more tortuous path may result in the described cyclonic action and separation without aerosol entrained air flowing from the inlet, through the chimney and past the extension guides, and to the outlet. *See* Ex. 2005 ¶¶ 115–117 (Patent Owner’s witness, Dr. Mello, explaining that Rubin teaches chimney and baffles induce a spiral vortex for ambient air rather than a tortuous passage from inlet to outlet). Petitioner does not persuasively demonstrate that the inlet air flows through the chimney and past extension guides to the outlet and, thus, Petitioner fails to demonstrate that the chimney and extension guides can be a tortuous passage extending between the inlet and the outlet.

We also recognize that, based on Rubin Figure 5, liquid entrained air will flow directly upward through jet nozzle 110 and through bottom opening of interior chamber 120 (the alleged inlet) and, although the path is not described in Rubin, may eventually turn rightward toward air outlet 123 (the alleged outlet). Ex. 1005, Fig. 5; *see also id.* at 22:3–18 (explaining jet nozzle 110), 22:26–29 (explaining that ideal sized droplets exit the device

through air outlet 123). As explained above, however, Petitioner has not met its burden of identifying a tortuous passage extending between the inlet and outlet points. Moreover, it is the cyclonic action of a transient airflow path, which forms only during normal operation of Rubin's device, that separates large from small aerosolized liquid particles.

Petitioner's use of Dautrebande as a second reference to address claim 23 does not cure the deficiency above. Petitioner argues that it would have been obvious to combine Dautrebande's curved zones into Rubin because both references make use of a tortuous passage to separate airborne particles. Pet. 64–65. As explained above, however, Rubin makes use of ambient air creating a vortex, and Petitioner does not establish that Rubin uses a tortuous passage between inlet and outlet. Therefore, Petitioner's reasoning that a person of skill in the art would have used of Dautrebande's curved zones is not supported by a preponderance of the evidence.

For this proceeding, Petitioner has the burden of establishing obviousness by a preponderance of the evidence. Here, as explained above, Rubin is too ambiguous as to whether it has a tortuous passage structure between the alleged inlet and the alleged outlet for Petitioner to meet that burden. Accordingly, Petitioner grounds based in whole or in part on Rubin do not sufficiently establish obviousness of any challenged claim.

C. Patent Owner's Argument Regarding Qualification of Dr. Morse

Patent Owner argues that the '976 patent has an earliest priority date of April 22, 2014, and that Petitioner's declarant, Dr. Morse, incorrectly reviewed the '976 patent in light of the general knowledge in the art as of

August 25, 2015. Resp. 79–81. Petitioner argues that this date difference was due to typographical errors. Reply 30.

Dr. Morse, in his Reply Declaration, confirms that the opinions in the original declaration would not change based on the April 22, 2014, priority date. Ex. 1015 ¶ 7. Patent Owner identifies no relevant events that took place between April 22, 2014, and August 25, 2015, and Patent Owner makes no argument why a person of skill in the art would view anything differently on these two dates. As such, we find that the error in Dr. Morse’s declaration is immaterial to our analysis.

In any event, to the extent we agree that Petitioner establishes unpatentability as explained above, the prior art references themselves are adequate for Petitioner’s showing of unpatentability even if we were to provide little or no weight to Dr. Morse’s testimony.

IV. CONCLUSION

Petitioner has established by a preponderance of the evidence that claims 1–6, 8–14, 21, 24, and 25 of the ’976 patent are unpatentable. Petitioner has not established by a preponderance of the evidence that claims 7, 15–20, 22, or 23 of the ’976 patent are unpatentable.

Claims	35 U.S.C. §	Reference(s)	Claims Shown Unpatentable	Claims Not Shown Unpatentable
1, 4, 6–10, 13, 16, 17, 21, 22, 24, 25	103	Rosener	1, 4, 6, 8–10, 13, 21, 24, 25	7, 15–17, 22
2, 11	103	Rosener, King	2, 11	
3, 5, 12, 14, 23	103	Rosener, Dautrebande	3, 5, 12, 14	23

5, 14, 23	103	Rosener, Svoboda	5, 14	23
1–22, 24, 25	103	Rubin		1–22, 24, 25
23	103	Rubin, Dautrebande		23
Overall Outcome			1–6, 8–14, 21, 24, 25	7, 15–20, 22, 23

V. ORDER¹¹

It is

ORDERED that Petitioner has proven by a preponderance of the evidence that claims 1–6, 8–14, 21, 24, and 25 of U.S. Patent No. 9,745,976 B2 are unpatentable;

FURTHER ORDERED that Petitioner has not proven by a preponderance of the evidence that claims 7, 15–20, 22, and 23 of the U.S. Patent No. 9,745,976 B2 are unpatentable;

FURTHER ORDERED that, because this is a final written decision, parties to this proceeding seeking judicial review of this Decision must comply with the notice and service requirements of 37 C.F.R. § 90.2.

¹¹ Should Patent Owner wish to pursue amendment of the challenged claims in a reissue or reexamination proceeding subsequent to the issuance of this decision, we draw Patent Owner’s attention to the April 2019 *Notice Regarding Options for Amendments by Patent Owner Through Reissue or Reexamination During a Pending AIA Trial Proceeding*. See 84 Fed. Reg. 16,654 (Apr. 22, 2019). If Patent Owner chooses to file a reissue application or a request for reexamination of the challenged patent, we remind Patent Owner of its continuing obligation to notify the Board of any such related matters in updated mandatory notices. See 37 C.F.R. § 42.8(a)(3), (b)(2).

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