

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

NJOY, LLC and NJOY HOLDINGS, INC.,
Petitioner,

v.

JUUL LABS, INC.,
Patent Owner.

IPR2024-00231
Patent 10,130,123 B2

Before KRISTINA M. KALAN, KIMBERLY McGRAW, and
AVELYN M. ROSS, *Administrative Patent Judges*.

ROSS, *Administrative Patent Judge*.

DECISION
Granting Institution of *Inter Partes* Review
35 U.S.C. § 314

I. INTRODUCTION

NJOY, LLC and NJOY Holdings, Inc. (collectively, “Petitioner”) filed a Petition (Paper 2, “Pet.”) requesting an *inter partes* review of claims 14–16, 18, 27–29, 31, and 32 of U.S. Patent No. 10,130,123 B2 (Ex. 1001, “the ’123 patent”). JUUL Labs, Inc. (“Patent Owner”) filed a Preliminary Response to the Petition. Paper 7 (confidential); Paper 8 (redacted) (“Prelim. Resp.”)¹. With Board authorization (Ex. 3001), Petitioner filed a Reply² (Paper 11 (confidential); Paper 13 (redacted)), and Patent Owner filed a Sur-reply (Paper 12).

We have authority to determine whether to institute an *inter partes* review. 35 U.S.C. § 314 (2018); 37 C.F.R. § 42.4(a). The standard for instituting an *inter partes* review is set forth in 35 U.S.C. § 314(a), which provides that an *inter partes* review may not be instituted “unless the Director determines . . . there is a reasonable likelihood that the petitioner would prevail with respect to at least [one] of the claims challenged in the petition.”

For the reasons set forth below, upon considering the Petition, Preliminary Response, Reply, Sur-reply, and evidence of record, we determine that Petitioner has established a reasonable likelihood of prevailing with respect to at least one challenged claim. Accordingly, we grant the Petition and institute an *inter partes* review.

¹ In this Decision, we refer to the redacted versions of the Patent Owner Preliminary Response.

² In this Decision, we refer to the redacted version of Petitioner’s Reply.

A. Real Parties-in-Interest

Petitioner identifies NJOY, LLC, NJOY Holdings, Inc., Altria Group, Inc., Altria Group Distribution Company, Altria Client Services LLC, and Shenzhen Smoore Technology Limited as real parties-in-interest. Pet. 1.

Patent Owner identifies itself as the real party-in-interest. Paper 6, 2.

B. Related Proceedings

The parties identify *Certain Vaporizer Devices, Cartridges Used Therewith, and Components Thereof*, 337-TA-1368 (ITC) and *JUUL Labs, Inc. v. NJOY, LLC*, 23-cv-01204 (D. Ariz.) as related proceedings. Pet. 1; Paper 6, 2.

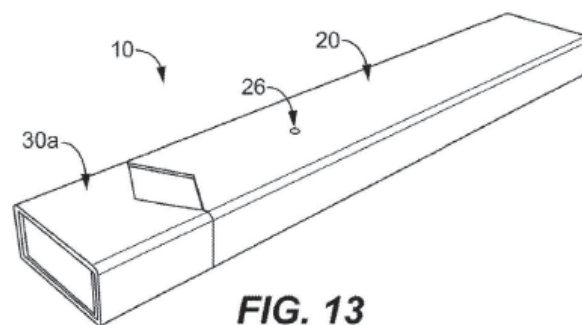
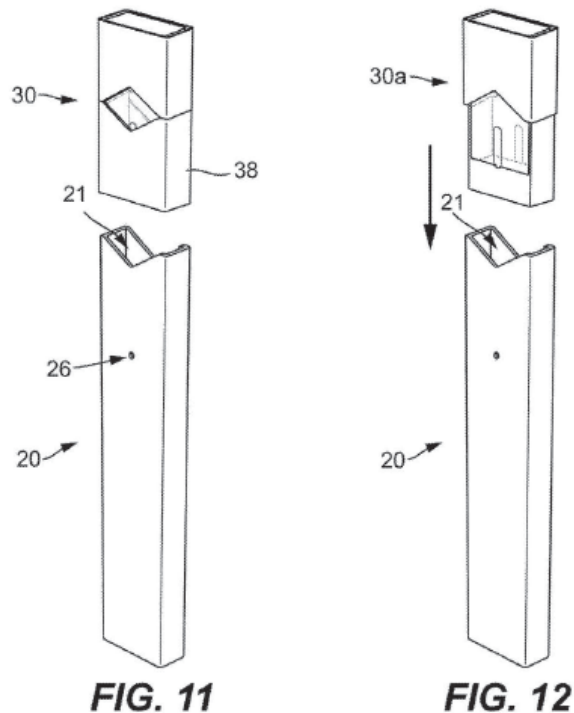
Patent Owner further identifies IPR2024-00223 (U.S. Patent No. 10,709,173), IPR2024-00267 (U.S. Patent No. 11,134,722), IPR2024-00268 (U.S. Patent No. 11,606,981), IPR2024-00536 (U.S. Patent No. 11,606,981 and IPR2024-00567 (U.S. Patent No. RE49,114) as related matters. Paper 6, 2.

C. The '123 patent

The '123 patent, titled “Vaporizer Devices with Blow Discrimination,” issued on November 20, 2018. Ex. 1001, codes (45), (54). The '123 patent describes electronic cigarettes (“e-cigarettes”) or vaping devices as “battery-powered vaporizers that simulate the feeling of smoking, but without tobacco.” *Id.* at 2:23–25. The '123 patent describes vaping devices that “can accurately differentiate between blowing and drawing (sucking) through the mouthpiece and adjust the control of the vaporizer accordingly.” *Id.* at 2:15–19. The '123 patent explains that e-cigarettes can be activated by a user pressing a button or via a pressure sensor that detects a user drawing (sucking) on the e-cigarette to determine whether a heating

element should be in use or not. *Id.* at 2:28–40. An issue with the latter arrangement is that such pressure sensors may detect a draw following a user blowing or exhaling through the device. *Id.* at 2:41–46. This causes the heating element to be activated without the user drawing on the e-cigarette, which provides a non-ideal user experience, wastes battery life and vaporizable material, and may cause overheating of vaporizable material. *Id.* at 2:58–65.

Figures 11–13 are illustrative of a vaporizer according to the '123 patent and are reproduced below.



Figures 11–13 “represent an illustrative assembly sequence for assembling the main components” of the ’123 patent’s device. *Id.* at 13:42–43. Figures 11–13 show a device body 20 having a cartridge receptacle 21 to receive a cartridge (not shown in Figure 12) or a pod 30a. *Id.* at 28:10–18.

The ’123 patent depicts further details of the device’s components in Figure 25, which is reproduced below.

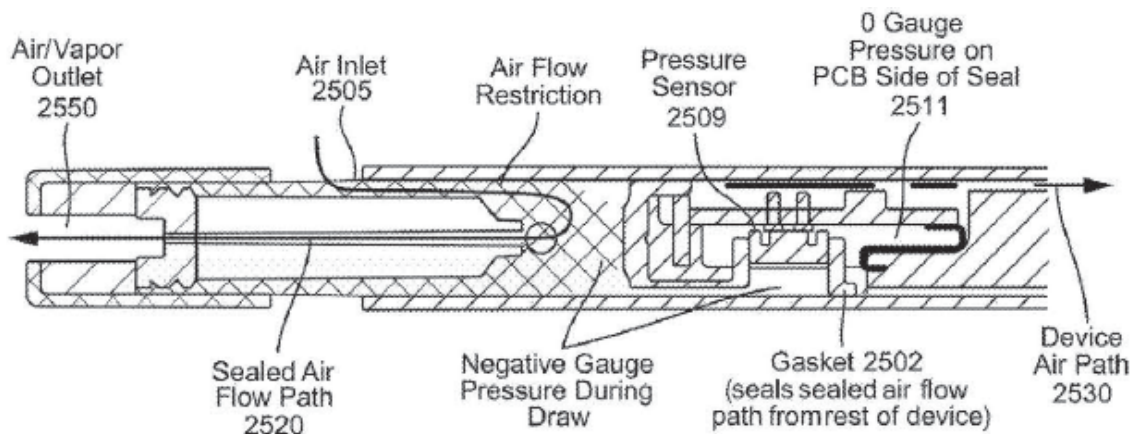


FIG. 25

Figure 25 shows a sectional view to illustrate an air path through a vaporizer device. *Id.* at 14:10–12. The ’123 patent describes the use of a pressure sensor “that can distinguish positive and negative pressure.” *Id.* at 42:8–9. The ’123 patent describes that pressure sensor 2509 can be a capacitive pressure sensor and include a diaphragm. *Id.* at 42:14–16. The ’123 patent also describes other types of pressure sensors that may be used, such as microelectromechanical systems (MEMS) pressure sensors. *Id.* at 41:56–58.

The ’123 patent further describes that pressure sensor 2509 may be included in sealed air path 2520 and that gasket 2502 may form an airtight seal so that sensor 2509 sees gauge pressures in air path 2530 when a user draws from or blows into the device. *Id.* at 42:25–32. For instance, an air

flow restriction between nominal air inlet 2505 and sensor 2509 creates a pressure that the static plate side of the sensor registers. *Id.* at 42:32–35. Conversely, PCB (printed circuit board) side 2511 of sensor 2509 remains at an external reference pressure during a draw or blow because PCB side 2511 is not part of sealed air path 2520. *Id.* at 42:35–39. As a result, a negative pressure in sealed air path 2520 due to a draw pulls the diaphragm toward the static plate, which increases the capacitance of the sensor. *Id.* at 42:39–43. A positive pressure in sealed air path 2520 due to a blow pushes the diaphragm away from the static plate, which decreases capacitance. *Id.* at 42:43–46. These capacitance values may then be read and compared to an ambient pressure. *Id.* at 42:50–52.

D. Illustrative Claim

Petitioner challenges claims 14–16, 18, 27–29, 31, and 32 of the ’123 patent. Independent claim 14 is representative of the challenged claims and is reproduced below with Petitioner’s annotations³:

[14.A] A vaporizer device body comprising:

[14.B] a cartridge receptacle configured to insertably receive a cartridge containing a vaporizable material;

[14.C] a pressure sensor configured to output sensor readings,

[14.D] wherein a first side of the pressure sensor is exposed to a sealed air flow path and a second side of the pressure sensor is exposed to a device air path open to ambient pressure,

[14.E] the sealed air flow path comprising a channel formed between an interior surface of the cartridge receptacle and an exterior surface of the cartridge,

³ For convenience, we adopt Petitioner’s annotated claim format.

[14.F] the sealed air flow path passing from an air inlet, through the channel and to a heater and an outlet of a mouthpiece within the cartridge; and

[14.G] a gasket around the pressure sensor, the gasket configured to seal the device air path from the sealed air flow path.

Ex. 1001, 48:46–60.

E. The Asserted Unpatentability Challenges

Petitioner asserts that claims 14–16, 18, 27–29, 31, and 32 would have been unpatentable based on the following grounds:

Claim(s) Challenged	35 U.S.C. §	Reference(s)/Basis
14, 27, 32	102	Worm ⁴
14, 27, 32	103	Worm, knowledge of a person of ordinary skill in the art
14, 27, 32	103	Worm, Levitz ⁵
14, 27, 32	103	Thorens, ⁶ Weigensberg, ⁷ knowledge of a person of ordinary skill in the art

⁴ Worm et al., U.S. Patent Pub. No. 2015/0245658 A1, published Sept. 3, 2015 (Ex. 1004, “Worm”).

⁵ Levitz et al., WO 2012/142293 A2, published Oct. 18, 2012 (Ex. 1010, “Levitz”).

⁶ Thorens et al., U.S. Patent Pub. No. 2014/0318559 A1, published Oct. 30, 2014 (Ex. 1016, “Thorens”).

⁷ Weigensberg et al., U.S. Patent Pub. No. 2015/0020831 A1, published Jan. 22, 2015 (Ex. 1006, “Weigensberg”).

Claim(s) Challenged	35 U.S.C. §	Reference(s)/Basis
14–16, 18, 27–29, 31, 32 ⁸	103	Worm, Lamb ⁹
14–16, 18, 27–29, 31, 32	103	Worm, knowledge of a person of ordinary skill in the art, Lamb
14–16, 18, 27–29, 31, 32	103	Worm, Levitz, Lamb
14–16, 18, 27–29, 31, 32	103	Thorens, Weigensberg, Lamb

Pet. 5–7. Petitioner also relies on declaration testimony of Joseph C. McAlexander III (Ex. 1003). Patent Owner relies on declaration testimony of John Collins, Ph.D. (Ex. 2001).

II. ANALYSIS

A. *Principles of Law*

In an *inter partes* review, “the petitioner has the burden from the onset to show with particularity why the patent it challenges is unpatentable.” *Harmonic Inc. v. Avid Tech., Inc.*, 815 F.3d 1356, 1363 (Fed. Cir. 2016) (citing 35 U.S.C. § 312(a)(3) (2012) (requiring *inter partes* review petitions to identify “with particularity . . . the evidence that supports the grounds for the challenge to each claim”)). This burden of persuasion never shifts to the patent owner. *See Dynamic Drinkware, LLC v. Nat’l Graphics, Inc.*, 800

⁸ Petitioner’s summary of grounds omits claim 32 for the final four grounds incorporating Lamb. Pet. 5. We understand this omission to be unintentional because the substantive discussion of these grounds includes claim 32. *See id.* at 87, 99.

⁹ Lamb et al., U.S. Patent Pub. No. 2016/0128389 A1, published May 12, 2016 (Ex. 1005, “Lamb”).

F.3d 1375, 1378 (Fed. Cir. 2015) (discussing the burden of proof in *inter partes* review).

To anticipate, a reference must “show all of the limitations of the claims arranged or combined in the same way as recited in the claims.” *Net MoneyIN, Inc. v. VeriSign, Inc.*, 545 F.3d 1359, 1370 (Fed. Cir. 2008); *accord In re Bond*, 910 F.2d 831, 832 (Fed. Cir. 1990).

Obviousness is a question of law based on underlying determinations of fact. *Graham v. John Deere Co.*, 383 U.S. 1, 17 (1966); *Richardson-Vicks, Inc. v. Upjohn Co.*, 122 F.3d 1476, 1479 (Fed. Cir. 1997). A claim is unpatentable as obvious, under 35 U.S.C. § 103, if the differences between the claimed subject matter and the prior art are such that the subject matter, as a whole, would have been obvious at the time of the invention to a person having ordinary skill in the art. *KSR Int’l Co. v. Teleflex Inc.*, 550 U.S. 398, 406 (2007). The question of obviousness is resolved on the basis of underlying factual determinations including (1) the scope and content of the prior art; (2) any differences between the claimed subject matter and the prior art; (3) the level of ordinary skill in the art; and (4) objective evidence of nonobviousness. *Graham*, 383 U.S. at 17–18. Consideration of the *Graham* factors “helps inform the ultimate obviousness determination.” *Apple Inc. v. Samsung Elecs. Co.*, 839 F.3d 1034, 1048 (Fed. Cir. 2016) (en banc), *cert. denied*, 138 S. Ct. 420 (2017). Subsumed within the *Graham* factors are the requirements that all claim limitations be found in the prior art references and that the skilled artisan would have had a reasonable expectation of success in combining the prior art references to achieve the claimed invention. *Pfizer, Inc. v. Apotex, Inc.*, 480 F.3d 1348, 1361 (Fed. Cir. 2007). “Obviousness does not require absolute predictability of success

. . . all that is required is a reasonable expectation of success.” *In re O’Farrell*, 853 F.2d 894, 903–04 (Fed. Cir. 1988) (citations omitted). But, a petitioner cannot satisfy its burden of proving obviousness by employing “mere conclusory statements.” *In re Magnum Oil Tools Int’l, Ltd.*, 829 F.3d 1364, 1380 (Fed. Cir. 2016).

We analyze the challenges presented in the Petition in accordance with the above-stated principles.

B. Level of Ordinary Skill in the Art

We review the grounds of unpatentability in view of the understanding of a person of ordinary skill in the art at the time of the invention. *Graham*, 383 U.S. at 17.

Petitioner contends that a person of ordinary skill in the art “would have at least a B.S. degree in Mechanical Engineering, Electrical Engineering, Industrial Design, Product Design, or similar field, with at least two years of industry experience in one of these fields” and that a person of ordinary skill in the art “would have been familiar with electrically powered vaporizing articles, their components or the underlying technologies.” Pet. 7.

Patent Owner argues that a person of ordinary skill in the art “at the time of the ’123 patent would have had a B.S. in mechanical engineering, electrical engineering, or an equivalent degree, and either at least two years of experience designing electro-mechanical consumer products or an advanced degree in mechanical engineering, electrical engineering, or an equivalent field.” Prelim. Resp. 4 (citing Ex. 2001 ¶ 19). Patent Owner also states that “Patent Owner’s arguments herein apply regardless of which

definition of a [person of ordinary skill in the art] is adopted.” *Id.* (citing Ex. 2001 ¶¶ 20–21).

In light of the record before us, and for purposes of this Decision, we adopt Petitioner’s proposal regarding the level of ordinary skill in the art. Based on our review of the ’123 patent and the prior art of record, we determine that the definition offered by Petitioner comports with the qualifications a person would have needed to understand the ’123 patent and the prior art. We will make any final determination pertaining to the level of ordinary skill in the art, however, on the full trial record.

C. Claim Construction

We construe claim terms according to the standard set forth in *Phillips v. AWH Corp.*, 415 F.3d 1303, 1312–17 (Fed. Cir. 2005) (en banc); 37 C.F.R. § 42.100(b). Under *Phillips*, we give claim terms “their ordinary and customary meaning.” *Phillips*, 415 F.3d at 1312. “[T]he ordinary and customary meaning of a claim term is the meaning that the term would have to a person of ordinary skill in the art in question at the time of the invention.” *Id.* at 1313. “Importantly, the person of ordinary skill in the art is deemed to read the claim term not only in the context of the particular claim in which the disputed term appears, but in the context of the entire patent, including the specification.” *Id.*

Petitioner contends that the parties proposed a construction for “pressure valve,” a limitation appearing in claims 18 and 31, during the ITC investigation, but Patent Owner contends that the parties agreed that the term is no longer in dispute. Pet. 7 (citing Ex. 1001, 41:58–65); Prelim. Resp. 5. Patent Owner contends that the terms of the ’123 patent should be given their plain and ordinary meaning. Prelim. Resp. 4–5.

For purposes of this Decision, we need not expressly construe any claim terms. *See Vivid Techs., Inc. v. Am. Sci. & Eng'g, Inc.*, 200 F.3d 795, 803 (Fed. Cir. 1999) (holding that “only those terms need be construed that are in controversy, and only to the extent necessary to resolve the controversy”); *see also Nidec Motor Corp. v. Zhongshan Broad Ocean Motor Co.*, 868 F.3d 1013, 1017 (Fed. Cir. 2017) (citing *Vivid Techs.* in the context of an *inter partes* review).

D. Challenge Based on Worm Alone

Petitioner alleges that claims 14, 27, and 32 of the '123 patent are anticipated by Worm. Pet. 28–49.

1. Overview of Worm (Ex. 1004)

Worm is titled “Control Body for an Electronic Smoking Article” and describes aerosol delivery devices, such as smoking articles and e-cigarettes. Ex. 1004, code (54), ¶¶ 1, 24. An example of a sectional view of Worm’s smoking article is depicted in Figure 2, reproduced below:

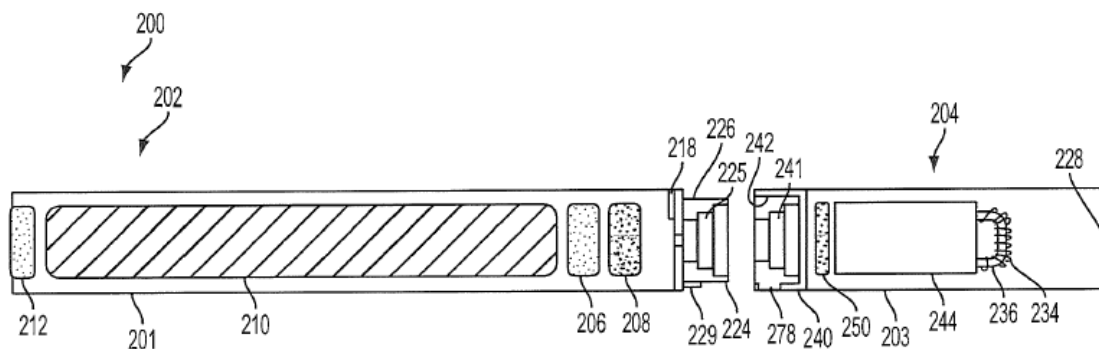


FIG. 2

Figure 2 is a sectional view of an electronic smoking article. *Id.* ¶ 14..

Figure 2 above depicts smoking article 200, which includes control body 202 having control body shell 201, control component 206, and flow

sensor 208. *Id.* ¶ 53. Smoking article 200 further includes cartridge 204 having cartridge shell 203 with opening 228. *Id.* Worm describes shell 203 as enclosing reservoir housing 244 in fluid communication with liquid transport element 236 that is “adapted to wick or otherwise transport an aerosol precursor composition” to heater 234. *Id.* Control body 202 may further include coupler 224 to engage with base 240 of cartridge 204 and facilitate fluid engagement between control body 202 and cartridge 204. *Id.* ¶ 56.

Figure 5 of Worm is reproduced below.

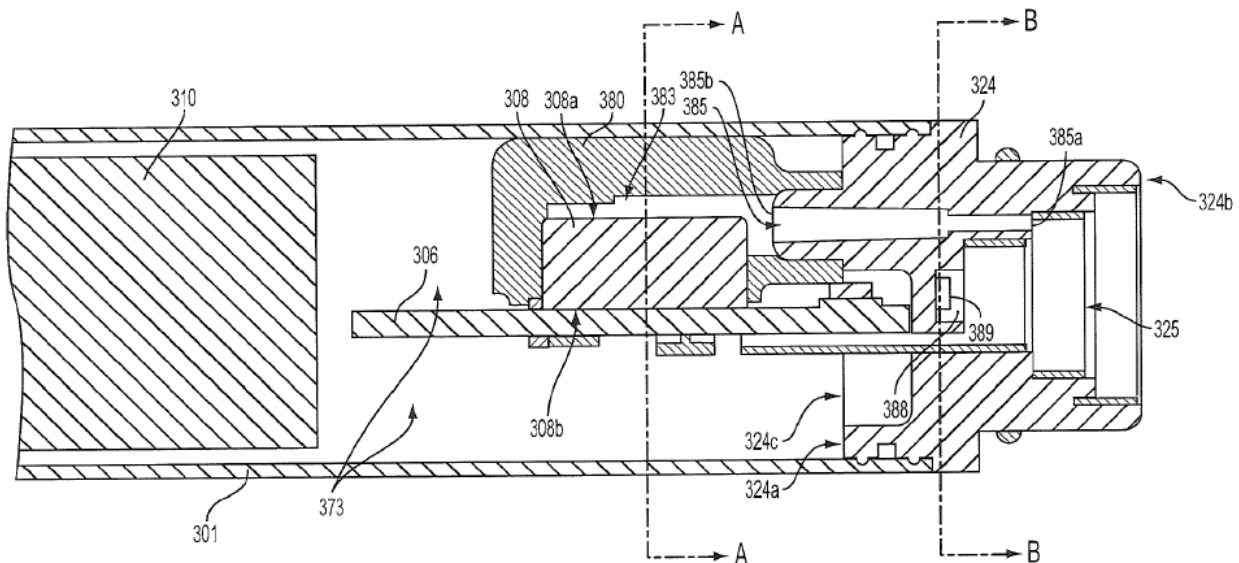


FIG. 5

Figure 5 is a sectional view of the proximal end of a control body. *Id.* ¶ 17.. Worm explains that first end 308a of pressure sensor 308 may be in fluid communication with pressure reduction space 383 and second end 308b of pressure sensor 308 may be in fluid communication with normal pressure space 373. Ex. 1004 ¶ 64. As shown in Figure 5, the device may include sealing member 380 that “can substantially surround the perimeter of the

pressure sensor 308 and be in a sealing contact therewith” so that second end 308b is positioned within normal pressure space 373. *Id.*

Worm’s Figure 7 is reproduced below.

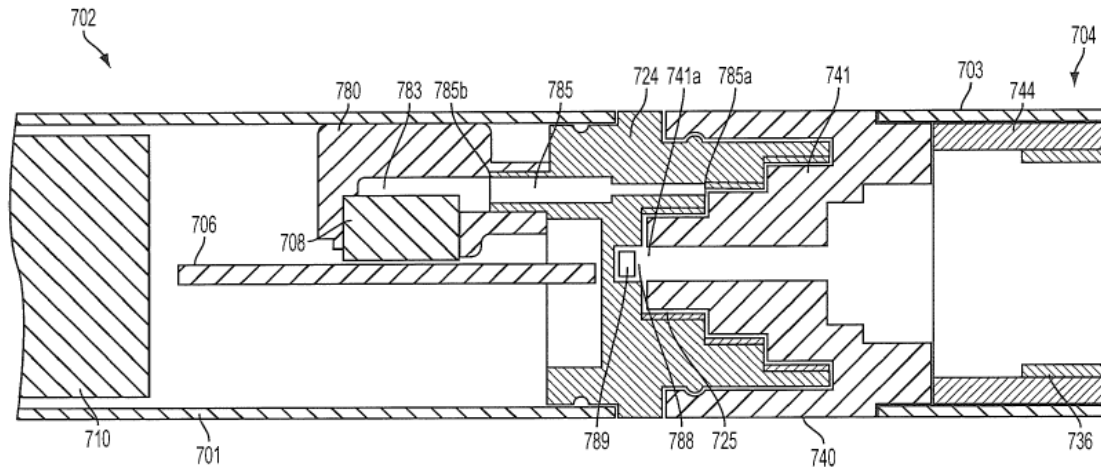


FIG. 7

Figure 7 depicts the spatial relationship of an air inlet channel and first end of a pressure channel. *Id.* ¶ 74. Worm states that control body 702 may engage with cartridge 704 via coupler 724. *Id.* ¶ 74. Coupler 724 includes cavity 725 to receive projection 741 on base 740 of cartridge 704. *Id.* Projection 741 includes air flow entry 741a that seat in cavity 725 proximate to air inlet channel 788. *Id.* Worm describes coupler 724 as further including pressure channel 785 having first end 785a that opens within cavity 725 and second end 785b opening with control body 702, particularly within pressure reduction space 783. *Id.*

Worm explains that when air is drawn on the mouthend of cartridge 704, the air enters air inlet channel 788 via one or more air inlet apertures 789, then flows into air flow entry 741a, and then passes through the interior of base 740 and into cartridge 704 toward its mouthend. Ex. 1004 ¶ 75. Worm further states that a draw on the device causing air to

enter inlet channel 788 via air inlet aperture 789 also causes a pressure drop to be communicated to the cavity 725. *Id.* ¶ 76. Worm further states that “[t]he matched configuration of the cavity 725 and the projection 741 preferably does not substantially form an air tight connection therebetween” and, thus, the pressure drop is communicated to the pressure channel 785 from the first end 785a to the second end 785b and thus to pressure reduction space 783. *Id.* In turn, the pressure drop is communicated to the pressure sensor, which experiences a pressure differential between its first end in pressure reduction space 783 and its second end in normal pressure space within the shell 701 of the control body 702. *Id.* ¶¶ 74, 77.

2. *Analysis of Claim 14*

Petitioner alleges that Worm anticipates claim 14 of the ’123 patent. Pet. 28–46. Petitioner contends that Worm’s smoking article 200 including control body 202 discloses a “vaporizer device body” as recited in claim 14. Pet. 28–29 (citing Ex. 1004, code (54), ¶¶ 5, 10, 26, 56, Fig. 2, claim 1; Ex. 1003 ¶¶ 99–102). Petitioner contends that Worm’s control body 202 having cavity 225 for receiving cartridge 204 discloses “a cartridge receptacle configured to insertably receive a cartridge containing a vaporizable material” as recited in claim 14. *Id.* at 30–31 (citing Ex. 1004 ¶¶ 53, 56, 57, 77, 104, 105, Fig. 2; Ex. 1003 ¶¶ 103–106).

Petitioner argues that Worm’s sensor 208/308 discloses “a pressure sensor configured to output sensor readings” as disclosed in claim 14. Pet. 31–34 (citing Ex. 1004 ¶¶ 8, 46, 53, 54, 60, Figs. 2, 5; Ex. 1003 ¶¶ 107–116; Ex. 1026). Petitioner contends that Worm’s sensor 308 being exposed to a normal pressure space 373 (“device air path open to ambient pressure”) and a pressure reduction space 383 (“sealed air flow path”) discloses

“wherein a first side of the pressure sensor is exposed to a sealed air flow path and a second side of the pressure sensor is exposed to a device air path open to ambient pressure” as recited in claim 14. *Id.* at 34–39 (citing Ex. 1004 ¶¶ 7, 63, 64, 69, 75–77, Figs. 5, 6B, 7; Ex. 1003 ¶¶ 117–127; Ex. 1001, 4:38–42).

Petitioner asserts that Worm’s pressure reduction space 783 extends into a channel formed by the non-airtight connection between cavity 725 (“interior surface of the cartridge receptacle”) and cartridge projection 741 (“exterior surface of the cartridge”), which discloses “the sealed air flow path comprising a channel formed between an interior surface of the cartridge receptacle and an exterior surface of the cartridge” as recited in claim 14. Pet. 40–42 (citing Ex. 1004 ¶ 76, Fig. 7; Ex. 1003 ¶¶ 128–132).

Petitioner alleges that this channel forms an air inlet that extends to the heater 234 and opening 228, which discloses “the sealed air flow path passing from an air inlet, through the channel and to a heater and an outlet of a mouthpiece within the cartridge.” Pet. 42–45 (citing Ex. 1004 ¶¶ 44, 53, Figs. 1, 2, 7; Ex. 1003 ¶¶ 133–136; Ex. 1019).

Petitioner contends that Worm’s sealing member 380 surrounding sensor 308 to seal normal pressure space 373 from pressure reduction space 383 discloses “a gasket around the pressure sensor, the gasket configured to seal the device air path from the sealed air flow path” as recited in claim 14. Pet. 45–46 (citing Ex. 1004 ¶¶ 7, 63, 64, Fig. 5; Ex. 1003 ¶¶ 137–139).

Patent Owner, at this time, does not challenge many of Petitioner’s allegations regarding the teachings of Worm. *See generally* Prelim. Resp. Instead, Patent Owner first argues that Petitioner has put forth an

anticipation ground that improperly relies on a combination of different embodiments in Worm. Prelim. Resp. 5–6; Ex. 1004 ¶ 54; *compare* Pet. 28–29 *with* Pet. 34–35. Second, Patent Owner argues that Worm does not disclose the claimed “sealed air flow path passing from an air inlet, through the channel and to a heater and an outlet of a mouthpiece” where the channel is “formed between an interior surface of the cartridge receptacle and an exterior surface of the cartridge.” *Id.* at 6–7 (citing Ex. 2001 ¶¶ 38–39). We address Patent Owner’s arguments below.

a) whether Petitioner’s allegations support a challenge based on anticipation

Patent Owner argues that “Petitioner’s Worm-based grounds fail because Petitioners rely on a combination of multiple, disparate embodiments within Worm without any assertion that such embodiments would be obvious to combine.” Prelim. Resp. 5. Specifically, Patent Owner asserts that Petitioner relies on different embodiments depicted in different figures as its basis that Worm anticipates claim 14. *Id.* at 5–6.

To anticipate a claim, a reference “must not only disclose all elements of the claim within the four corners of the document, but must also disclose those elements ‘arranged as in the claim.’” *Net MoneyIN*, 545 F.3d at 1369. The prior art reference “must clearly and unequivocally disclose the claimed [invention] or direct those skilled in the art to the [invention] without any need for picking, choosing, and combining various disclosures not directly related to each other by the teachings of the cited reference.” *Id.* at 1371 (citation omitted). “[D]ifferences between the prior art reference and the claimed invention, however slight, invoke the question of obviousness, not anticipation.” *Id.*

Although the various embodiments of Worm contain similar features, we are not persuaded that Petitioner sufficiently demonstrates that the various embodiments disclose a single vaporizer device that anticipates the challenged claims. As Patent Owner notes, “for limitations [14.A] and [14.B], Petitioners rely on the embodiment of Figure 2 (Pet. 28–29), whereas for limitation [14.C], which requires a pressure sensor, Petitioners rely on Figure 5” (*id.* at 32), and “for limitations [14.D], [14.E], and [14.F], Petitioners rely on the different embodiment of Figure 7” (*id.* at 34–45). Worm’s description of the figures suggests each of Figures 2, 5, and 7 relate to different embodiments of Worm. *See* Ex. 1004 ¶¶ 14 (“FIG. 2 is a sectional view through an electronic smoking article comprising a cartridge and a control body according to an example embodiment of the present disclosure”), 17 (“FIG. 5 is a detailed view of the proximal end of the *control body illustrated in FIG. 3* that also illustrates a sealing member” (emphasis added)), 20 (FIG. 7 is a partial sectional view of an electronic smoking article *according a further example embodiment* of the present disclosure showing a control body connected to a cartridge via the control body coupler and the cartridge base” (emphasis added)). Based on Worm’s descriptions, it appears that Figure 2 relates to one embodiment, Figures 3–5 relate to another embodiment, and Figure 7 relates to yet another embodiment. *See id.* ¶¶ 13–20, 53, 59. In addition, Petitioner does not argue that a single embodiment of Worm discloses all limitations of challenged claim 14. *See generally* Pet. Nor does Petitioner direct our attention to any disclosure in Worm that show how Figures 2, 5, and 7 interrelate as a single embodiment or present any argument that a person skilled in the art “would ‘at once envisage’ the claimed arrangement or

combination.” *Id.*; *Kennametal, Inc. v. Ingersoll Cutting Tool Co.*, 780 F.3d 1376, 1381 (Fed. Cir. 2015). Thus, Petitioner fails to show that the cited material in Worm discloses the limitations of claim 14 arranged in the same way as claimed without resorting to the need to pick and choose from disparate disclosures. *Net MoneyIN*, 545 F.3d 1371 (“[I]t is not enough that the prior art reference . . . includes multiple, distinct teachings that the prior art might somehow combine to achieve the claimed invention.”).

Therefore, because the teachings of Worm are found in different, disparate embodiments—and Petitioner does not show otherwise—we find that the ordinarily skilled artisan would not have viewed Figures 2, 5, and 7 as the same embodiment. For at least this reason, and based on the information set forth in the Petition, Petitioner fails to show a reasonable likelihood that claim 14 is anticipated by Worm.

b) whether Worm teaches an air flow path passing from an air inlet, through the channel and to a heater and an outlet of a mouthpiece

Patent Owner argues that even if Petitioner can combine the teachings of Worm, “Worm does not expressly or inherently disclose a ‘sealed air flow path passing from an air inlet, through the channel and to a heater and an outlet of a mouthpiece’ where the channel is ‘formed between an interior surface of the cartridge receptacle and an exterior surface of the cartridge.’” Prelim. Resp. 6. As noted above, Petitioner asserts Worm discloses that “the sealed air flow path includes the channel formed by the gap between cavity 725 and cartridge projection 741.” Pet. 40 (citing Ex. 1004, 76, Fig. 5; Ex. 1003 ¶¶ 129–130; *id.* at 41–42 (citing Ex. 1003 ¶¶ 131–132)). Patent Owner argues that “Worm does not disclose any such ‘air flow path’” and instead

discloses that when air is drawn from the mouthpiece, it “causes air to enter the air inlet channel 788 . . . through one or more air inlet apertures 789 and flow into the air flow entry 741a . . . from which the drawn air passes through the interior of the base 740 [which is in cartridge 704] and into the cartridge 704,” after which the airflow “proceed[s] . . . toward the mouthend of the cartridge.”

Id. at 7 (citing Ex. 1004 ¶ 75, Fig. 6B; Ex. 2001 ¶¶ 40–43).

Patent Owner illustrates the airflow path in Worm in Patent Owner’s annotated version of Figure 7 reproduced below.

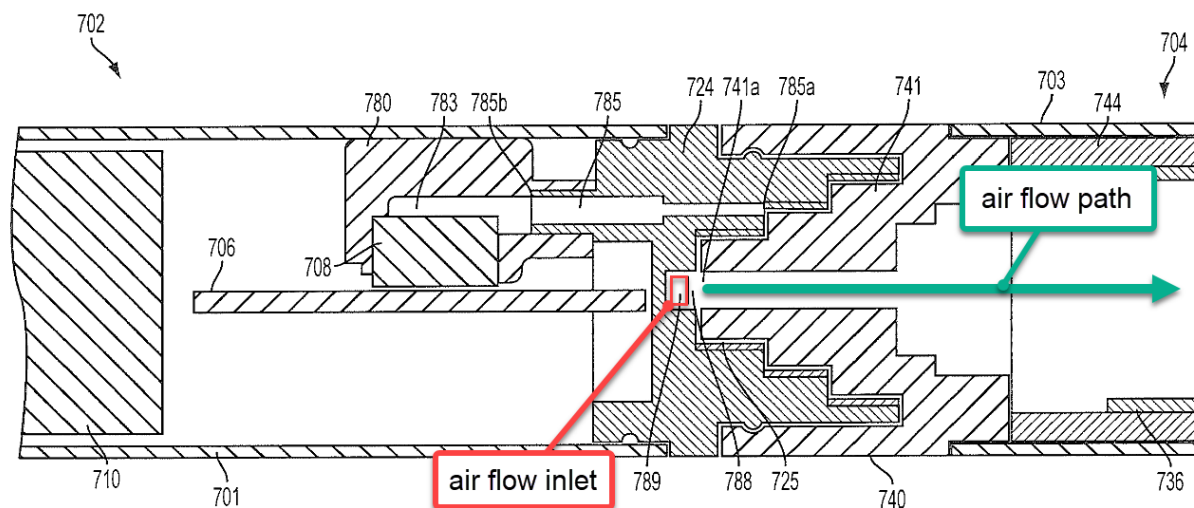


FIG. 7

Patent Owner’s Annotated Figure 7 labels air inlet aperture 789 in red and adds a teal-colored arrow through the center of cartridge 704 to illustrate the air flow path. *Id.* at 8 (citing Ex. 1004 ¶¶ 74–75, Fig. 7; Ex. 2001 ¶¶ 41–43). Patent Owner argues that there would not be a uniform gap for airflow between body 702 and cartridge 704, as asserted by Petitioner, because “this space is where the electrical contacts in the cartomizer and body must touch each other.” *Id.* at 9–10 (citing Ex. 1004 ¶ 58, Fig. 6B; Ex. 2001 ¶¶ 44–45). Patent Owner argues that no additional air inlets beyond one or more air

inlet apertures 789 are disclosed in Worm. *Id.* at 10. Patent Owner further argues that a person of ordinary skill in the art would understand that airflow travels through the inlets and passages as already described in Worm (namely, air inlet aperture 789) and would not understand the structures identified by Petitioner are for airflow. *Id.* at 13. Patent Owner's declarant, Dr. Collins, explains that

Worm does not disclose anywhere that such additional air inlets or passage exist, and the fluid mechanics of such a passageway, winding up and down along the protrusions forming the 'cavity' in Worm, would cause a reduction in airflow at every turn, such that the primary air inlet passageway, already taught in Worm, would control.

Ex. 2001 ¶ 47.

On this record, Patent Owner's arguments have merit. Patent Owner's argument that airflow through Worm's device would flow through the primary air inlet passageway and not through the channel identified by Petitioner appear persuasive on this record. As such, we have doubt that Petitioner would ultimately prevail on its assertion that Worm anticipates claim 14.

3. *Remaining Claims 27 and 32*

Petitioner also asserts that Worm anticipates claims 27 and 32. Pet. 46–49. Claim 32 depends on independent claim 27, which recites limitations substantially similar those discussed above for claim 14 (*see* Ex. 1001, 49:62–67), and Petitioner relies on the same analysis to support its contentions regarding claim 27 (*see* Pet. 46–48). Petitioner does not present any arguments or evidence with respect to claims 27 and 32 that would remedy the defects detailed above with respect to independent claim 14.

Accordingly, we similarly have doubt that Petitioner would ultimately prevail on its assertion Worm anticipates claims 27 and 32.

E. Challenge Based on Worm and Knowledge of a Person of Ordinary Skill in the Art

Petitioner alleges that claims 14, 27, and 32 of the '123 patent are rendered obvious by Worm and the knowledge of a person of ordinary skill in the art. Pet. 5, 50. Petitioner relies, generally, on the same analysis and evidence presented above in connection with its anticipation challenge based on Worm in Ground 1 to support its contentions here. *Id.* at 50. However, Petitioner alleges that even if Worm does not disclose limitations [14.E], [14.F], [27.G], and [27.H], the combination of Worm in view of the knowledge of a person of ordinary skill in the art would have rendered obvious those limitations. Pet. 50–52.

1. Analysis of Claim 14

Petitioner argues that it would have been obvious to a person of ordinary skill in the art “that the channel formed between the cartridge receptacle and cartridge of Worm permits air to enter the cavity.” Pet. 50 (citing Ex. 1003 ¶ 156). Petitioner argues that because Worm discloses that cavity 725 and projection 741 do not form an airtight connection, the ordinarily skilled artisan would have understood that the gap between cavity 725 and projection 741 would be for airflow from the air inlet at the periphery between cavity 725 and projection 741. *Id.* at 50–52 (citing Ex. 1003 ¶¶ 157–159; Ex. 1004 ¶¶ 69, 75, 76, Fig. 7). Specifically, Petitioner asserts that “[a]ir entering at the periphery would join the air evacuated from the pressure reduction space and enters [sic] into the cartridge to pass by the heater and into the smoker’s mouth.” *Id.* at 50–51

(citing Ex. 1003 ¶ 157). Petitioner notes that in some embodiments air may enter through air inlet aperture 389/789. *Id.* at 51. In that embodiment, Petitioner alleges that a person of ordinary skill in the art “would have recognized that air would still enter the device through the air inlet at the periphery . . . as negative pressure increased.” *Id.* Additionally, Petitioner asserts that “for embodiments where air inlet aperture 389/789 is not used, the only access to ambient air in Worm is the interface between the cartridge and the cartridge receptacle, as show[n]” and “[w]ithout access to ambient air from the periphery, a vacuum would be created in the device and the device would become nonfunctional.” *Id.* (citing Ex. 1003 ¶ 158).

In addition to the arguments advanced above in connection with Petitioner’s anticipation ground, Patent Owner further argues that an ordinary artisan “would not have considered it desirable for such a channel to permit airflow” and an ordinarily skilled artisan would not have understood Worm to include airflow in this channel. Prelim. Resp. 16 (citing Ex. 2001 ¶¶ 57–58). Patent Owner contends that Petitioner’s assertion that there is airflow in the gap between cavity 725 and projection 741 is incorrect because the patent figures are not intended to convey specific dimensions and that that an ordinarily skilled artisan “would understand that some contact between the surfaces is needed to conduct electricity and the depth of the cartridge into the housing would vary with use, including blockage when the cartridge is pulled toward the cavity.” *Id.* at 17 (citing Ex. 1004 ¶ 76; Ex. 2001 ¶¶ 59–60). Patent Owner, through the testimony of Dr. Collins, explains that “the airflow in an e-cigarette is the result of considerable engineering” and “[t]he size, shape, and location of air inlets and air passages affect draw resistance, which impacts among other

things, vapor production, the size of the visible vapor cloud, and nicotine delivery to a user.” *Id.* (citing Ex. 2001 ¶ 61). Because “Petitioner’s alleged air inlet and passage . . . cannot be tightly engineered or controlled to ensure an optimal user experience,” Patent Owner asserts that “in order to control the amount of airflow that results in an optimal user experience, it would be preferable and simpler to engineer the size of the air inlet 789 and air passage 788 [as] expressly described in Worm.” *Id.* at 18–19 (citing Ex. 2001 ¶¶ 63–64).

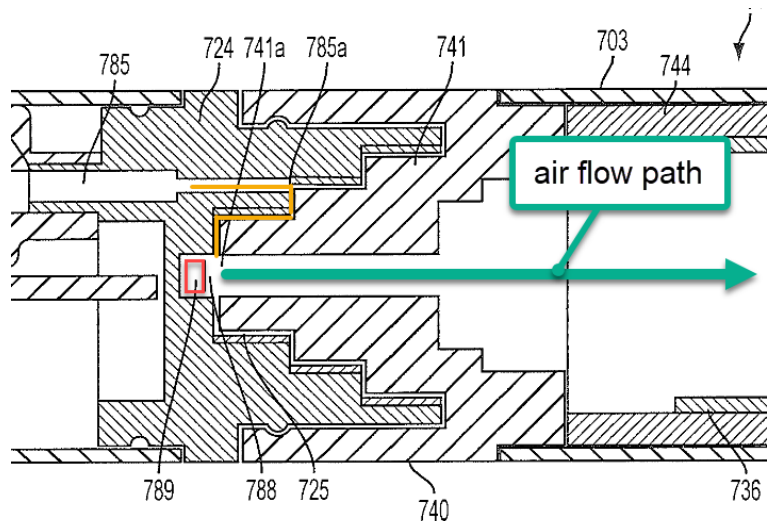
Patent Owner also argues that “nowhere does Worm describe the air inlet aperture 789 as optional—indeed, all of the embodiments Petitioners rely on (Figures 2, 5, and 7) use an air inlet aperture.” *Id.* at 19–20 (citing Ex. 2001 ¶¶ 65–66). Patent Owner also alleges that “Petitioners are incorrect that the device would be nonfunctional without airflow” because “such a device would be considered a ‘fuming’ type device.” *Id.* at 20 (citing Ex. 2001 ¶ 67).

Patent Owner’s argument that patent figures are not intended to convey specific dimensions is unpersuasive at this stage because Petitioner relies on Worm’s figures to render obvious the existence of the gap for airflow, rather than to provide any specific dimensions or sizes of the gap.

However, for the reasons discussed above, Patent Owner’s arguments that airflow in the gap between cavity 725 and projection 741 would require modifying Worm and would be undesirable, prevented by electrical contacts, or difficult to control appear to have some merit.

Patent Owner’s arguments that Petitioner’s additional air flow pathway is unnecessary may also have some merit. Patent Owner provides

an enlarged version (reproduced below) of Patent Owner’s Annotated Figure 7 to illustrate its position.



Patent Owner’s Enlarged Annotated Figure 7 illustrates pressure channel 785 (orange) from pressure reduction space 783 (not shown) to air flow entry 741a. *See supra* 22 (Patent Owner’s Annotated Figure 7); Ex. 1004 ¶ 74, Fig. 7. Worm discloses that the lack of the airtight connection between cavity 725 and projection 741 is to communicate the pressure drop to pressure channel 785. Ex. 1004 ¶¶ 74–76; Ex. 2001 ¶¶ 50–51. Thus, the record does appear to support an argument that there is at least some airflow through the channel to communicate the air pressure drop to pressure channel 785.

However, Patent Owner and Dr. Collins explain that “there is simply no disclosure or need for the airflow path to extend past the pressure chamber—indeed, Worm states that the pressure chamber is an ‘isolated segment of the device.’” Ex. 2001 ¶ 51; Prelim. Resp. 12. Further, we find potentially persuasive Patent Owner’s arguments that the skilled artisan would have understood the winding path of the gap would limit air flow because the because body 702 and cartridge 704 would be pulled together to

form a seal when a user inhales on the mouthpiece of the cartridge. Pet. 13–16 (citing Ex. 1004 ¶ 38; Ex. 2001 ¶¶ 52–56).

As such, we have concern as to whether Petitioner would ultimately prevail on its assertion that claim 14 would have been obvious over Worm because we question whether Petitioner has sufficiently shown that Worm teaches or suggests an air flow path passing from an air inlet, through the channel and to a heater and an outlet of a mouthpiece as required by claim 14

2. Remaining Claims 27 and 32

Petitioner also asserts that claims 27 and 32 would have been obvious over Worm in view of the knowledge of a person of ordinary skill in the art. Pet. 50–52. Claims 27 (and 32 by virtue of its dependence on claim 27) recites limitations substantially similar those discussed above for claim 14 (*see* Ex. 1001, 49:62–67). Petitioner relies on the same analysis to support its contentions regarding claim 27 (*see* Pet. 46–52). Petitioner does not present any arguments or evidence with respect to claims 27 and 32 that would remedy the defects detailed above with respect to independent claim 14. Thus, we have concern that Petitioner would ultimately prevail on its challenge of claims 27 and 32 for the same reasons set forth above regarding claim 14.

F. Challenge Based on Worm and Levitz

Petitioner alleges that claims 14, 27, and 32 of the '123 patent would have been rendered obvious by the combined teachings of Worm and Levitz. Pet. 5, 52. Petitioner relies on much of the same analysis and evidence presented above for Ground 1 to support its contentions here. *Id.* at 52. However, Petitioner alleges that even if Worm does not disclose or render

obvious limitations [14.E], [14.F], [27.G], and [27.H], the combination of Worm in view of Levitz would have rendered obvious those limitations. Pet. 52–62.

1. Overview of Levitz (Ex. 1010)

Levitz is titled “Battery Connector for Electronic Cigarette with Side Air Intake” and describes “a battery connector for an electronic cigarette having a side air intake for improved air in-flow and out-flow through the electronic cigarette.” Ex. 1010, code (54), ¶ 2. Levitz states that an electronic cigarette may have a “two-piece” construction in which an atomizer section is detachable from a battery section. *Id.* ¶ 6. Levitz describes an inhalation sequence in which air enters from a side of the battery and enters rear to the battery via groove. *Id.* ¶ 17. The air then enters a cartomizer via an axial opening and then reaches a smoker’s mouth. *Id.*

Levitz’s Figure 13 is reproduced below.

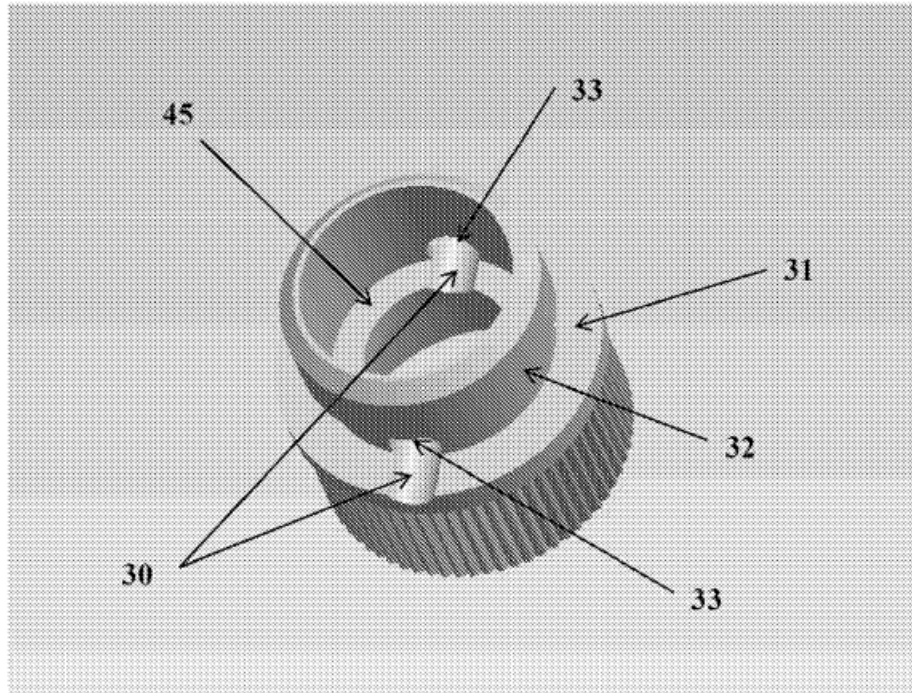


Figure 13

Figure 13 illustrates a connector. *Id.* ¶42. Figure 13 shows that the connector (without a battery post) includes perpendicular surface channels 30 that penetrate through the connector's shaft 32 so orifices 33 are formed through inner shelf 45. *Id.*

Figures 14 is reproduced below.

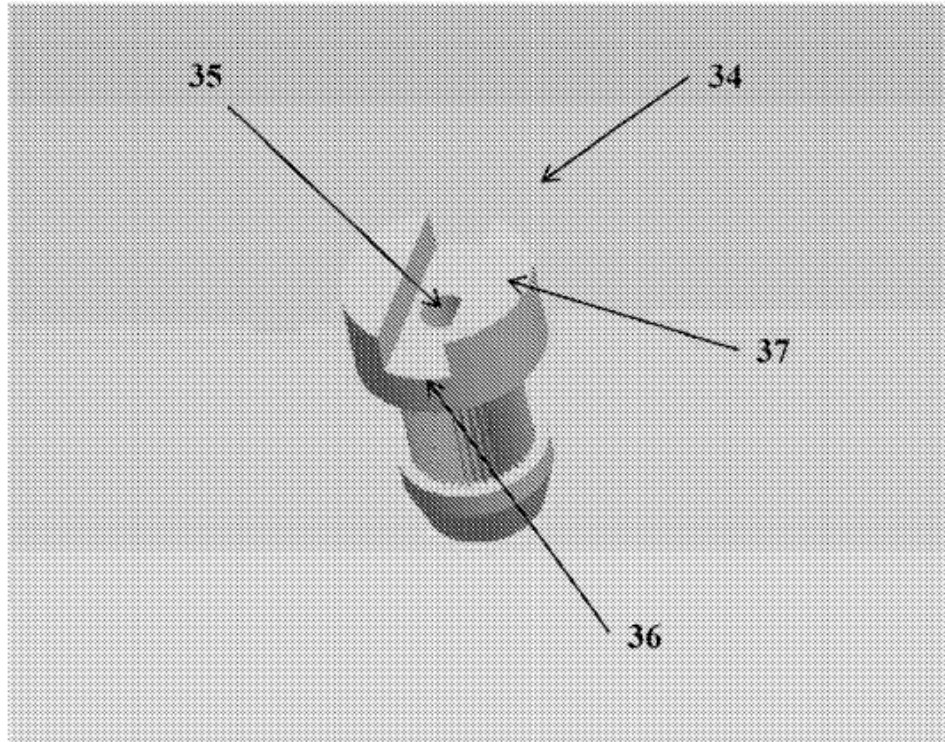


Figure 14

Figure 14 shows a battery post. *Id.* Figure 14 illustrates battery post 34 which includes longitudinal orifice 35 that extends longitudinally through post 34 to form a pressure differential channel. *Id.* ¶ 42. Battery post 34 further includes groove 36 that “assists in guiding air inhaled or exhaled through perpendicular surface channel 30 and orifice 33.” *Id.* According to Levitz, although the battery may include the male connection and the cartomizer the female connection, the reverse may be suitable, depending upon design requirements. *Id.* ¶ 48.

Levitz’s Figure 16 is reproduced below.

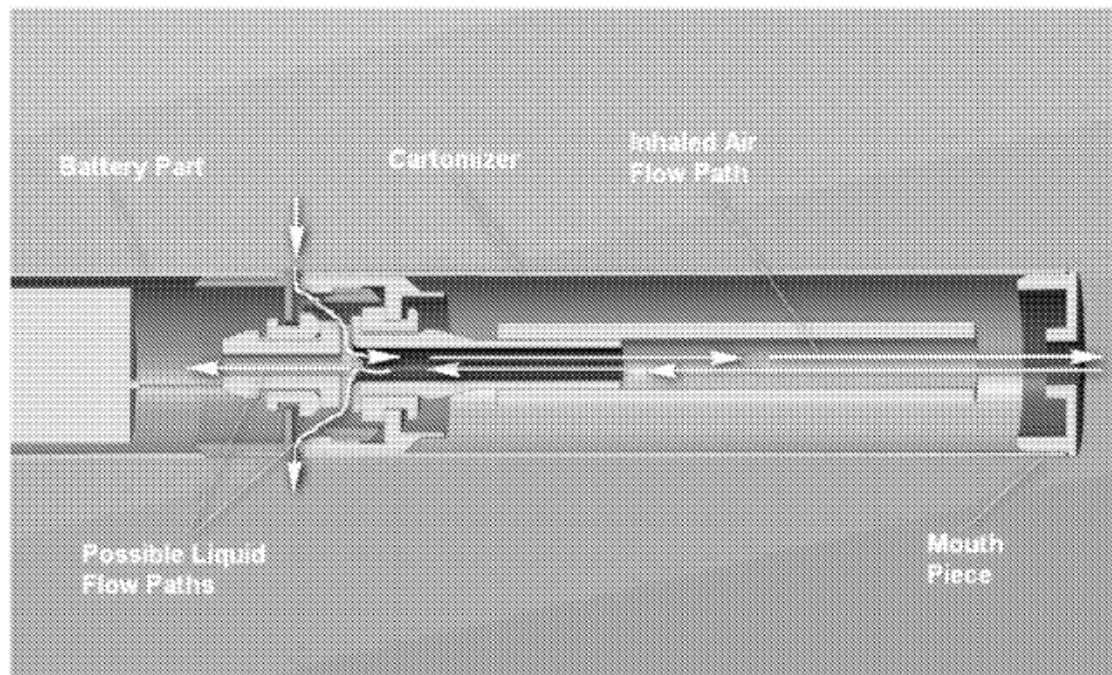


Figure 16

Figure 16 is a sectional view of an electronic cigarette. *Id.* ¶ 26. Levitz explains that Figure 16 depicts “airflow through the connector and battery post combination” and shows a bidirectional air flow path through the center of the cartomizer from the connector and battery post combination to the mouthpiece. *Id.* ¶ 44. Levitz acknowledges that “one possible draw-back of this arrangement is that upon exhalation, any excess fluid (vapor, saliva, etc.) could be blown through orifice 35, into the pressure differential channel and into the Battery.” *Id.*

2. Analysis of Claim 14

Petitioner argues that Levitz discloses a two-piece e-cigarette that includes an air inlet on its side and an airflow path in a channel between its battery and its cartomizer. Pet. 52–56 (citing Ex. 1003 ¶¶ 161–167; Ex. 1010 ¶¶ 6, 17, 42–44, 48, Figs. 15, 16). Petitioner argues that an ordinarily skilled artisan would have modified Worm in view of Levitz so

that outside air enters between the battery and cartridge connection. *Id.* at 56 (citing Ex. 1003 ¶¶ 168–169; Ex. 1007, 4:41–43). Petitioner contends that air inlets are a design choice and having the channel between the battery and the cartridge would enable the smoker to clean the channel simply by removing the cartridge. *Id.* at 57–60 (citing Ex. 1003 ¶¶ 170–173; Ex. 1004 ¶ 72; Ex. 1007, 1:64–2:1, 4:15–18, 4:41–43, Figs. 3a, 3b; Ex. 1009, 4:45–48, Fig. 3; Ex. 1011, 4:9–12, Fig. 5A; Ex. 1012 ¶ 28, Fig. 6; Ex. 1013 ¶ 97, Fig. 16). Petitioner contends that a person of ordinary skill in the art would have had a reasonable expectation of success in combining Worm and Levitz because both disclose two-piece e-cigarettes and an ordinary artisan would have understood that placing the air inlet on the periphery of the device would not disrupt its operation and the channel would be along either a male-female or female-male connection. *Id.* at 60–62 (citing Ex. 1003 ¶¶ 174–178; Ex. 1004 ¶ 76; Ex. 1010 ¶ 48).

Patent Owner argues that neither Worm nor Levitz discloses or renders obvious the air flow and air inlet claim limitations, and that combining Worm and Levitz would be redundant. Prelim. Resp. 20–22 (citing Ex. 2001 ¶¶ 68–72). In reply to Petitioner’s assertion that air inlets are a design choice and that an additional air inlet would alleviate backflow, Patent Owner argues that having additional air inlets is not a design choice because “the size, shape, and location of air inlets affect draw resistance, which impacts, among other things, vapor production, the size of the visible vapor cloud, and nicotine delivery to a user.” *Id.* at 22. Patent Owner also argues that a person of ordinary skill in the art would not be motivated to include the additional air inlet because Worm already addresses backflow

with the existing inlet 789. *Id.* at 22–24 (citing Ex. 1004 ¶ 76; Ex. 2001 ¶¶ 73–77).

Based on the information presented in the Petition, we are persuaded that Petitioner demonstrates a reasonable likelihood of prevailing at trial in showing that claims 14 and 27 of the '123 patent are unpatentable as obvious based on Worm and Levitz. Because Worm discloses a non-airtight gap and Levitz discloses airflow from the periphery of the device between the battery and the cartridge, we are persuaded, for the purposes of institution, that an ordinary artisan would have had reason to modify Worm in view of Levitz to render obvious limitations [14.E], [14.F], [27.G], and [27.H] for the reasons asserted by Petitioner. At this stage, Patent Owner's arguments to the contrary are unavailing because they are directed to Worm's airflow and backflow rather than Petitioner's proposed combination of Worm and Levitz.

Having determined that Petitioner satisfies the threshold showing under 35 U.S.C. § 314(a) for institution of trial with respect to at least one challenged claim of the '123 patent, we order that trial shall proceed on all claims and all challenged grounds. *SAS Institute Inc. v. Iancu*, 138 S. Ct. 1348, 1353 (2018) (“The agency cannot curate the claims at issue but must decide them all.”); *see Adidas AG v. Nike, Inc.*, 894 F.3d 1256, 1258 (Fed. Cir. 2018) (remanding for consideration of all challenged claims and asserted grounds set forth in the petition); *see also* USPTO, Guidance on the impact of SAS on AIA trial proceedings (Apr. 26, 2018), <https://www.uspto.gov/patents/ptab/trials/guidance-impact-sas-aia-trial> (“the PTAB will institute as to all claims or none [and] [i]f the PTAB institutes a trial, the PTAB will institute on all challenges raised in the petition.”).

3. *Remaining Claims 27 and 32*

Petitioner also asserts that claims 27 and 32 would have been obvious over Worm and Levitz. Pet. 52–62. Patent Owner does not separately address remaining claims 27 and 32 beyond what is argued for claim 14. *See generally* Prelim. Resp. Having determined that Petitioner satisfies the threshold showing under 35 U.S.C. § 314(a) for institution of trial with respect to at least one challenged claim of the ’123 patent, we order that trial shall proceed on all claims and all challenged grounds. *SAS*, 138 S. Ct. at 1353.

G. *Challenge Based on Thorens and Weigensberg*

Petitioner alleges that the combination of Thorens in view of Weigensberg would have rendered obvious claims 14, 27, and 32 of the ’123 patent. Pet. 63–87.

1. *Overview of the Prior Art*

a) *Thorens (Ex. 1016)*

Thorens is titled “Electrically Heated Smoking System Having a Liquid Storage Portion” and describes an electrically heated smoking system for receiving an aerosol-forming substrate. Ex. 1016, code (54), ¶ 2.

Figure 1 of Thorens is reproduced below.

Fig. 1

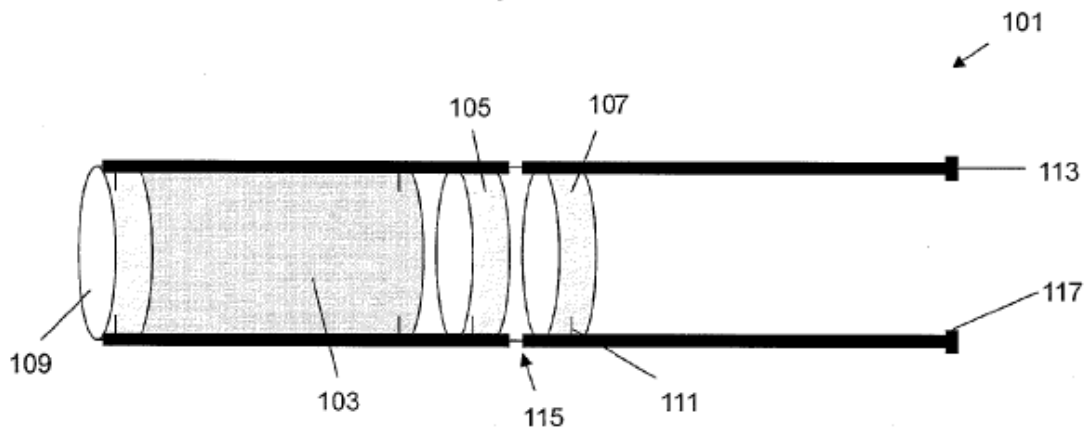


Figure 1 depicts the shell of an electrically heated smoking system. *Id.* ¶ 39. Figure 1 shows shell 101 which includes battery 103, circuitry 105, puff detection system 107, puff indicator 109, electrical connections 111, electrical contacts 113, air inlets 115, and lock mechanism 117. *Id.* ¶ 42. Shell 101 also has lock mechanism 117 to releasably engage with a mouthpiece, which is shown in Figure 2. *Id.* ¶¶ 42, 44.

Figure 2 is reproduced below.

Fig. 2

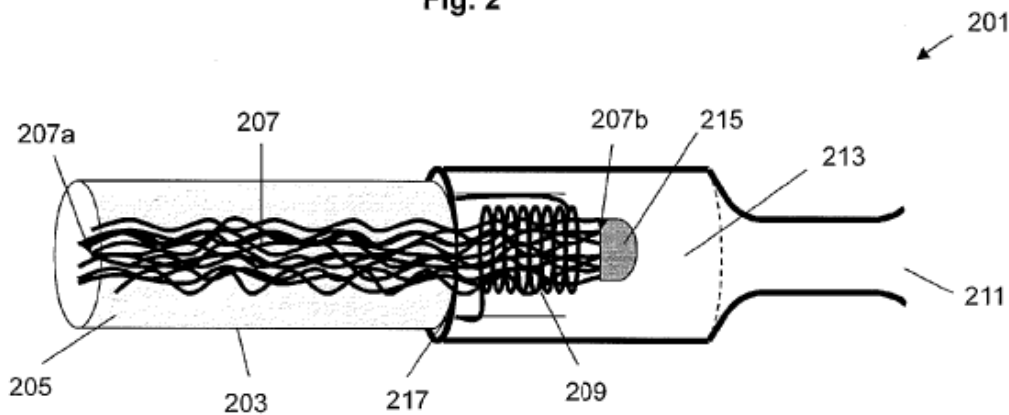


Figure 2 depicts the mouthpiece of an electrically heated smoking system. *Id.* ¶ 40. Mouthpiece 201 includes cartridge 203 containing liquid 205, capillary wick 207, heating coil 209, air outlet 211, and aerosol forming

chamber 213. *Id.* ¶43. Thorens describes first end 207a of capillary wick 207 extending into cartridge 203 and second end 207b of capillary wick 207 being surrounded by heating coil 209. *Id.*

Thorens' Figure 3 is reproduced below.

Fig. 3

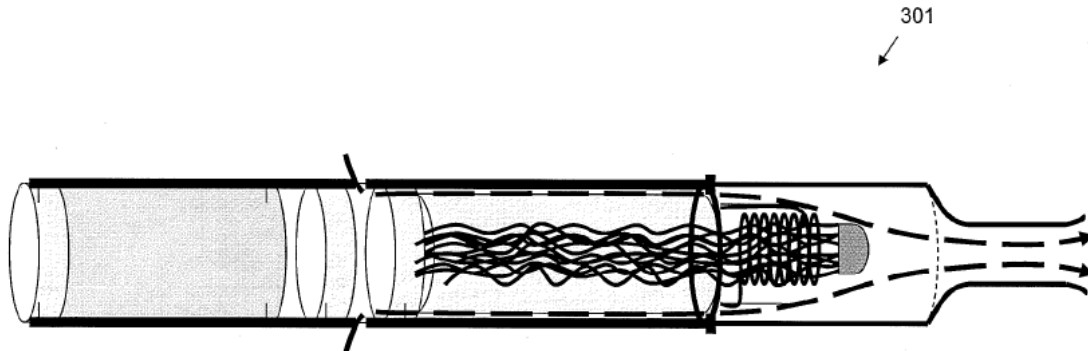


Figure 3 depicts a constructed electrically heated smoking system. *Id.* ¶41. Figure 3 shows shell 101 engaged with mouthpiece 201 to form electrically heated smoking system 301. *Id.* ¶44. Thorens explains that when a user draws on the device at air outlet 211, ambient air is drawn through air inlets 115. *Id.* ¶45. Puff detection system 107 senses this and activates heating coil 209, which heats second end 207b of wick 207. *Id.* Liquid in second end 207b is vaporized to create a supersaturated vapor that is mixed and carried in the air flow from air inlets 115 towards aerosol forming chamber 213 where the vapor condenses to form an inhalable aerosol. *Id.* The aerosol is then carried towards outlet 211 into a user's mouth. *Id.* Thorens explains that ambient air passes around cartridge 203 after being drawn through cartridge 203 and before reaching second end 207b. *Id.* ¶48. Thorens also describes an embodiment in which cartridge 203 is positioned downstream of second end 207b and heating coil 209. *Id.* As a result,

ambient air is drawn through air inlets 115 and the vapor or aerosol then passes around cartridge 203 on the way to outlet 211. *Id.*

b) Weigensberg (Ex. 1006)

Weigensberg is titled “Charging Electronic Cigarette” and describes a charger for a battery-operated electronic cigarette that limits exposure to tobacco fumes. Ex. 1006, code (54), ¶ 2. Weigensberg’s Figure 1 is reproduced below.

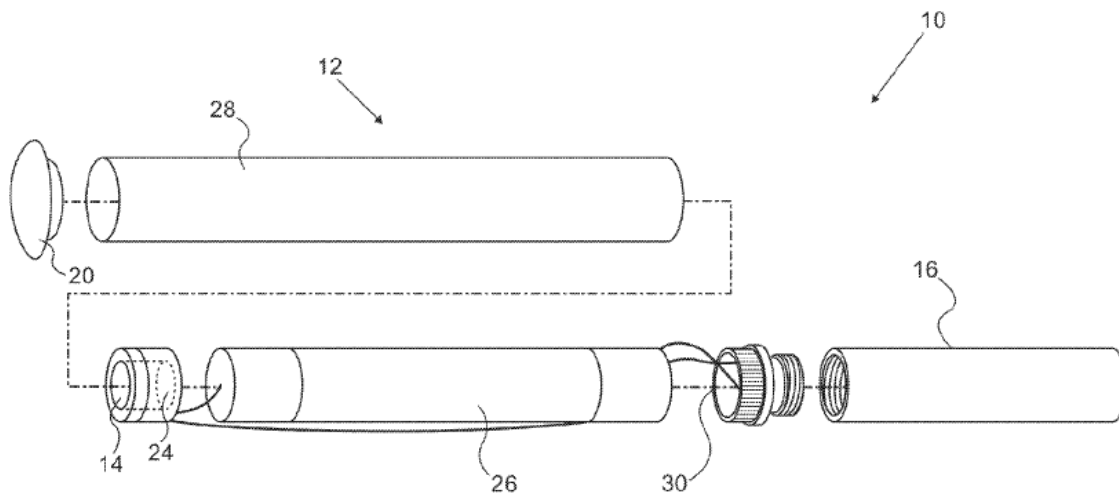


FIG. 1

Figure 1 is an exploded view of an electronic cigarette. *Id.* ¶ 33. As shown in Figure 1, smoking device 10 includes battery section 12 having power control circuitry 14 that is typically encased as a unit with vacuum sensor 24. *Id.* ¶ 58. Device 10 further includes tip 20 and cartridge section 16 having an aerosol generating device. *Id.* ¶¶ 58–59. When smoke enters device 10, an internal pressure typically constricts its flow, which creates a pressure differential that is sensed by vacuum sensor 24. *Id.* ¶ 59. Electronic power control circuitry 14 linked to sensor 24 then activates the aerosol generating device. *Id.*

Weigensberg’s Figure is reproduced below.

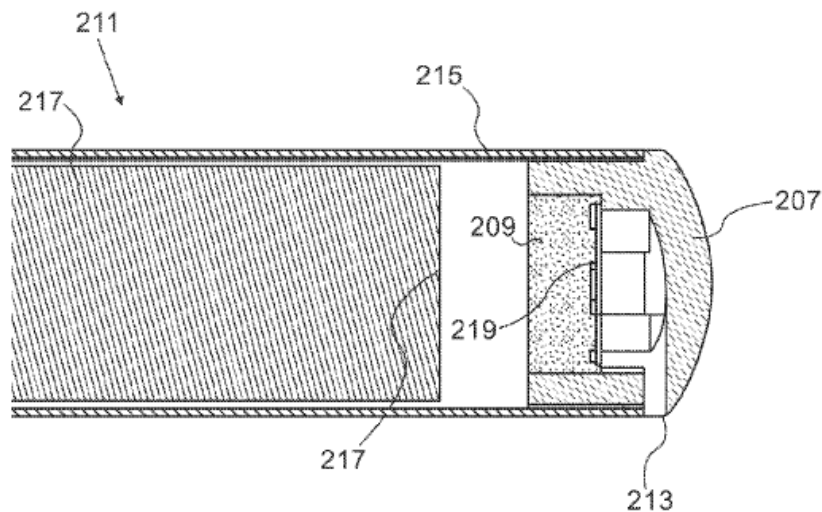


FIG. 24

Figure shows a sectional view of an electronic cigarette. *Id.* ¶ 54.

Weigensberg Figure 24 depicts barrel 215 of electronic cigarette 211 having LED cap 207. *Id.* ¶ 107. Weigensberg states that LED cap 207 “is mostly inset into the end of the barrel 215” and “may be constructed of a plastic material.” *Id.* Sensor unit 209 is located inside LED cap 207, which also has perforation 213 for communication between sensor unit 209 and the ambient atmosphere. *Id.*

2. Analysis of Claim 14

Petitioner alleges that “Thorens and Weigensberg alone or further in view of the knowledge of a [person of ordinary skill in the art] renders obvious claims 14, 27, and 32 of the ’123 patent.” Pet. 63–83.

Petitioner contends that smoking system 301 of Thorens discloses a “vaporizer device body” as recited in claim 14. *Id.* at 70–71 (citing Ex. 1003 ¶¶ 192–193; Ex. 1016 ¶ 44, Figs. 1–3). Petitioner contends that shell 101 receiving mouthpiece 201 that includes vaporizable liquid 205 discloses “a cartridge receptacle configured to insertably receive a cartridge containing a

vaporizable material” as recited in claim 14. *Id.* at 71–73 (citing Ex. 1003 ¶ 194–196; Ex. 1016 ¶¶ 42–43, Figs. 1–3).

Petitioner argues that the combined teachings of Thorens and Weigensberg suggests “a pressure sensor configured to output sensor readings,” as claimed. *Id.* at 73. Specifically, Petitioner argues that “Weigensberg discloses a sensor that outputs sensor readings corresponding to pressure values” as claimed. *Id.* at 73 (citing Ex. 1006 ¶ 87). Petitioner explains that a person of ordinary skill in the art “would have understood that an analog output can include a range of values corresponding to the pressure difference.” *Id.* (citing Ex. 1003 ¶ 98).

Petitioner further contends that Thorens in view of Weigensberg discloses “a first side of the pressure sensor is exposed to a sealed air flow path and a second side of the pressure sensor is exposed to a device air path open to ambient pressure,” as claimed. *Id.* at 75 (citing Ex. 1003 ¶¶ 200–204). According to Petitioner, “Weigensberg discloses a device air flow path open to ambient through perforation 213” and “a sealed air flow path on the opposite side of the sensor.” *Id.* (citing Ex. 1006 ¶¶ 59, 107). Petitioner proposes replacing Thorens’ tip portion with Weigensberg’s tip portion, which comprises a pressure sensor and LED. *Id.* at 76. Therefore, the combined device would have an air flow path through Weigensberg’s perforation 213 which has one side of the pressure sensor exposed to the ambient pressure. *Id.* at 76–77 (citing Ex. 1003 ¶ 202).

Petitioner asserts that Thorens’ negative pressure path, located between the interior surface of the shell 101 and the exterior surface of the cartridge 203, discloses “the sealed air flow path comprising a channel formed between an interior surface of the cartridge receptacle and an

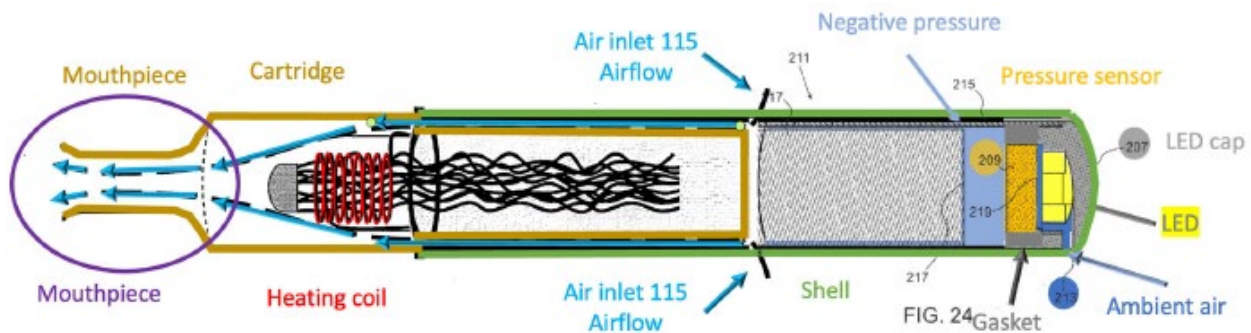
exterior surface of the cartridge” as recited in claim 14. *Id.* at 78–79 (citing Ex. 1016 ¶¶ 45, 48, Figs. 3; Ex. 1003 ¶¶ 205–208). Petitioner also argues that Thorens’ negative pressure path passing from air inlets 115 to the heating coil 209 and the outlet 211 of the mouthpiece discloses “the sealed air flow path passing from an air inlet, through the channel and to a heater and an outlet of a mouthpiece within the cartridge” as recited in claim 14. *Id.* at 80–81 (citing Ex. 1016 ¶¶ 43, 45; Ex. 1003 ¶¶ 209–211).

Petitioner contends that Weigensberg’s plastic LED cap around the pressure sensor to isolate the ambient air pressure from the negative air pressure path inside the device discloses “a gasket around the pressure sensor, where the gasket configured to seal the device air path from the sealed air flow path” as recited in claim 14. Pet. 81 (citing Ex. 1003 ¶¶ 212–213; Ex. 1006 ¶¶ 105, 107, Fig. 1). Petitioner also contends that if Weigensberg’s plastic LED cap is not a gasket, an ordinarily skilled artisan would have recognized that Weigensberg’s sensor—“consistent with common practice”—would still have a gasket to isolate the pressure sensor’s ambient side from the negative pressure side because “[i]t was well known that differential pressure sensor[s] would have included a gasket around the pressure sensor to seal the different sensed paths from each other.” *Id.* at 81–82 (citing Ex. 1003 ¶ 214; Ex. 1009, 6:6–9, Fig. 5; Ex. 1022 ¶ 101; Ex. 1023 ¶ 83). Petitioner contends that an ordinary artisan would have used Weigensberg’s sensor and LED cap or gasket to modify Thorens to disclose limitation [14.G]. *Id.* at 83 (citing Ex. 1003 ¶¶ 215–216).

Petitioner also contends that an ordinary artisan would have been motivated to combine Thorens and Weigensberg because a differential pressure sensor is a design choice, a differential pressure sensor open to

ambient air can accommodate external pressure changes, Weigensberg's sensor outputs values that can be used to add features to the device, and Thorens' puff sensor can free up space. Pet. 68–69 (citing Ex. 1003 ¶ 190; Ex. 1016 ¶ 34; Ex. 1021, 25:4–7; Ex. 1022 ¶ 101; Ex. 1023 ¶ 83). Petitioner asserts that an ordinary artisan would have had a reasonable expectation of success modifying Thorens in view of Weigensberg because both disclose similar devices on which an ordinary artisan could make minor adjustments. *Id.* at 68–69 (citing Ex. 1003 ¶ 187–188, 191; Ex. 1006 ¶ 58).

By way of example, Petitioner provides a figure depicting a modified version of Thorens in which Thorens' tip comprising an LED is replaced by Weigensberg's tip portion, comprising a pressure sensor and an LED. This modified figure is reproduced below



Modified Thorens and combines the cartridge of Thorens' Figure 3 (positioned left) with Weigensberg's tip shown in Figure 24 (positioned right). *Id.* at 80. Petitioner contends that Weigensberg's pressure sensor 209 (orange) is exposed to ambient air through perforation 213 ("device air path open to ambient pressure," dark blue) and Thorens' negative pressure path from air inlets 115 (light blue) to the smoker's mouth ("sealed air flow path") discloses a "wherein a first side of the pressure sensor is exposed to a sealed air flow path and a second side of the pressure sensor is exposed to a

device air path open to ambient pressure” as recited in claim 14. *Id.* at 75–78 (citing Ex. 1003 ¶¶ 200–204; Ex. 1006 ¶¶ 59, 107, Figs. 23, 24; Ex. 1016 ¶ 48; Ex. 1022 ¶ 101; Ex. 1023 ¶ 83). Modified Thorens further depicts the sealed air path from the air inlet through the channel and to a heater and an outlet of a mouthpiece as claimed. *Id.* at 80. “The mouthpiece 201 [(denoted by a purple circle)] comprises a liquid storage portion in the form of cartridge 203 [(brown)] containing liquid 205, a capillary wick 207, a heating element in the form of heating coil 209 [(red)], an air outlet 211 and an aerosol forming chamber 213.” *Id.* (quoting Ex. 1016 ¶ 43). And lastly, gasket (dark grey), i.e., LED cap 207, is shown surrounding pressure sensor 209 with an LED (yellow) positioned over pressure sensor 200.

Patent Owner, at this time, does not challenge many of Petitioner’s allegations regarding the teachings of Thorens and Weigensberg. *See generally* Prelim. Resp. But, Patent Owner does argue that Petitioner fails to demonstrate that the skilled artisan would have had a reason to combine Thorens and Weigensberg and that the combination does not render obvious “a gasket around the pressure sensor.” Prelim. Resp. 25–36. We focus our discussion below on Patent Owner’s arguments.

*a) whether an ordinary artisan would combine
Thorens and Weigensberg*

Patent Owner argues that an ordinarily skilled artisan would not have been motivated to combine Thorens and Weigensberg. Prelim. Resp. 26. Specifically, Patent Owner argues that combining Thorens and Weigensberg involves significantly changing the device and electrical circuitry of Thorens. *Id.* at 26–27 (citing Ex. 2001 ¶ 81). Patent Owner argues that replacing the puff detection system of Thorens with the differential pressure sensor of Weigensberg would be unnecessary because Thorens already

detects inhalation. *Id.* at 27–28, 30–31 (citing Ex. 1016 ¶¶ 15, 34, 42, 44, 46; Ex. 2001 ¶¶ 83–86, 91). Patent Owner explains that a person of ordinary skill in the art would have found Petitioner’s proposed modifications undesirable because they would result in exposed wiring and leads where the cartridge is inserted. *Id.* at 29–30 (citing Ex. 2001 ¶¶ 87–89). Patent Owner argues that Petitioner’s proposed modification would remove programmable circuitry 105 and thus would render the device inoperable. *Id.* at 30 (citing Ex. 2001 ¶ 90). Patent Owner argues that adding Weigensberg’s sensor to Thorens amounts to more than a mere design choice, Weigensberg’s sensor is not advantageous over Thorens’ sensor, Thorens’ sensor already detects airflow, and Weigensberg’s sensor would have used more space. *Id.* at 31–32 (citing Ex. 1016 ¶ 34; Ex. 2001 ¶¶ 92–96).

Patent Owner’s arguments appear to have some merit. We question whether Petitioner has provided sufficient evidence that, in view of the challenges and redundancies involved, a person of ordinary skill in the art would have had reason to replace the puff detection system of Thorens with the differential pressure sensor of Weigensberg as proposed. Stated differently, even if an ordinarily skilled artisan *could* have made the combination, we question whether Petitioner has sufficiently explained why an ordinary artisan *would have been motivated* to do so. *See, e.g., Belden Inc. v. Berk-Tek LLC*, 805 F.3d 1064, 1073 (Fed. Cir. 2015) (“[O]bviousness concerns whether a skilled artisan not only *could have made* but *would have been motivated to make* the combinations or modifications of prior art to arrive at the claimed invention.”) (citing *InTouch Techs., Inc. v. VGO Commc’ns, Inc.*, 751 F.3d 1327, 1352 (Fed. Cir. 2014)).

b) whether the combination of Thorens and Weigensberg discloses a gasket around the pressure sensor

Patent Owner argues that Weigensberg does not disclose a gasket around its pressure sensor as required by claim element [14.G] because plastic LED cap 207 is not a gasket. Prelim. Resp. 33 (citing Ex. 2001 ¶¶ 87–89). Patent Owner argues that an ordinary artisan would understand that a gasket is made of flexible material located around the sensor to provide a seal, but Weigensberg’s plastic LED cap cannot provide an airtight seal, there is no space in the device to provide a gasket, and there would be no need for Weigensberg’s device to include a gasket because the plastic LED cap provides enough of a seal for the differential pressure sensor to work. *Id.* at 33–34 (citing Ex. 2001 ¶¶ 97–99).

We are not persuaded that Weigensberg fails to disclose a gasket at this stage of the proceeding. Even Patent Owner concedes that “the plastic LED cap, while not a perfect seal, provides enough separation for the differential pressure sensor to work.” *See* Prelim. Resp. 34. Accordingly, we are persuaded that Petitioner has shown sufficiently at this stage of the proceeding that Weigensberg teaches a gasket around the pressure sensor.

However, as noted above, we have concern whether Petitioner has provided sufficient motivation to combine Thorens and Weigensberg.

3. Remaining Claims 27 and 32

Petitioner also asserts that claims 27 and 32 would have been unpatentable in view of Thorens and Weigensberg. Pet. 83–87. Claim 32 depends on independent claim 27, which recites limitations substantially similar those discussed above for claim 14 (*see* Ex. 1001, 49:62–67), and Petitioner relies on the same analysis to support its contentions regarding

claim 27 (*see* Pet. 83–87). Petitioner does not present any arguments or evidence with respect to claims 27 and 32 that would remedy the defects detailed above with respect to independent claim 14. Accordingly, we similarly have doubt that Petitioner would ultimately prevail on its assertion Worm anticipates claims 27 and 32.

H. Challenges Based on Worm and Lamb

Petitioner alleges that any of Petitioner’s first four grounds in view of Lamb would have rendered obvious claims 14–16, 18, 27–29, 31, and 32 of the ’123 patent. Pet. 87–99. Petitioner relies on the same analysis and evidence presented above for Grounds 1–4 to support its contentions here. Petitioner introduces Lamb to the combinations of Grounds 1–4 to teach or suggest “pressure sensor configured to output sensor readings” and “gasket around the pressure sensor . . . to seal the device air path from the sealed air flow path” (claims 14 and 27), a capacitive pressure sensor (claims 15 and 28), a MEMS sensor (claims 16 and 29), a pressure sensor that outputs pressure values (claims 18 and 31), and a nicotine formulation (claim 32). *Id.* at 87.

1. Overview of Lamb (Ex. 1005)

Lamb is titled “MEMS-Based Sensor for an Aerosol Delivery Device” and describes aerosol delivery devices, such as smoking articles. Ex. 1005, code (54), ¶ 1. An embodiment of an aerosol delivery device is shown in Figure 1, which is reproduced below.

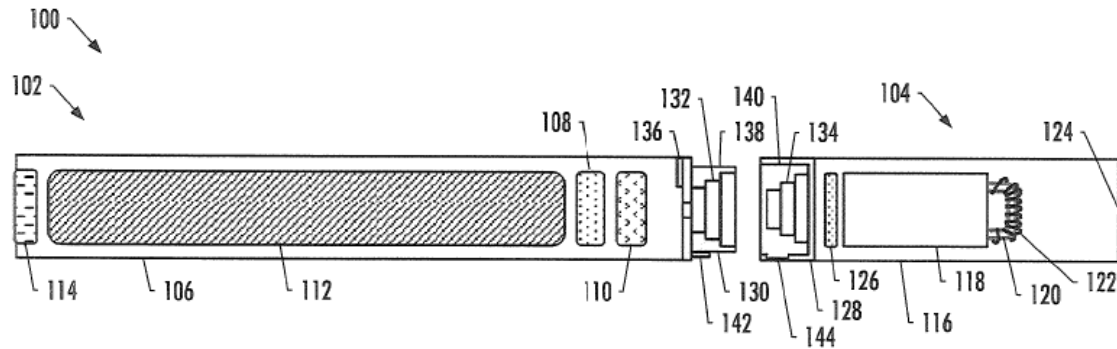


FIG. 1

Figure 1 is a cut-away view of an aerosol delivery device. *Id.* ¶ 11. Aerosol delivery device 100 includes control body 102 and cartridge 104. *Id.* ¶ 24. Control body 102 further includes control component 108, flow sensor 110, battery 112, and light-emitting diode 114. *Id.* ¶ 26. Lamb states that “flow sensor 110 may be implemented by a microelectromechanical systems-based (MEMS-based) sensor such as a MEMS microphone or MEMS pressure sensor.” *Id.* ¶ 43.

According to Lamb, “the MEMS-based sensor may be configured to convert the pressure to the electrical signal that varies with a corresponding variation in the pressure relative to an ambient pressure on the MEMS-based sensor.” *Id.* ¶ 45. Lamb further describes a MEMS microphone that includes a diaphragm that causes the capacitance of a variable capacitor to change when the diaphragm is moved due to a pressure change. *Id.* ¶ 47. The MEMS microphone then outputs a voltage or digital representation thereof as an electrical signal. *Id.*

2. Analysis of Claim 14

Petitioner argues that it would be obvious to modify Worm, Thorens, or Weigensberg (as argued in Grounds 1–4) to use Lamb’s MEMS-based pressure sensor configured to output sensor readings (claim limitation

[14.C]) and to include a gasket around the pressure sensor (claim limitation [14.G]) from Newton766¹⁰ (incorporated by reference into Lamb). Pet. 87–97 (citing Ex. 1001, 4:49–60; Ex. 1003 ¶¶ 233–260; Ex. 1004 ¶ 77, Fig. 2; Ex. 1005 ¶¶ 4, 6–8, 26, 40, 41, 43, 45–47, Figs. 1, 3; Ex. 1006 ¶¶ 59, 107; Ex. 1009, 6:6–9, Fig. 5; Ex. 1019; Ex. 1014, Abstract, ¶ 11; Ex. 1016 ¶¶ 15, 46; Ex. 1022 ¶ 102; Ex. 1015, 3:3–7; Ex. 1020; Ex. 1028 ¶ 3; Ex. 1021, Abstract, 23:25–28). Petitioner argues that a person of ordinary skill in the art would have had reason to modify Worm and Weigensberg to include Lamb’s MEMS pressure sensor as a matter of simple substation and that including “a MEMS pressure sensor . . . ha[s] certain advantages including responsiveness, small footprint, low power consumption, low cost, reliability, precision and easy integration.” *Id.* at 91–94 (citing Ex. 1003 ¶¶ 240–249; Ex. 1001, 4:49–60 (‘pressure sensors described herein may be *any differential pressure sensor, such as a MEMS. . .*’); Ex. 1022 ¶ 102; Ex. 1015, 3:3–7; Ex. 1028 ¶ 3; Ex. 1021, 23:25–28, Abstract; Ex. 1014 ¶ 11, Abstract).

Patent Owner argues that Lamb does not remedy the deficiencies in Grounds 1–4 relating to the claim limitations directed to the air flow path. Prelim. Resp. 34–35. Patent Owner also argues that Lamb does not actually disclose a gasket, but that Petitioner is relying on a sealing member in Newton766, that Lamb incorporates by reference. *Id.* at 35. Furthermore, Patent Owner argues that Lamb’s incorporation of Newton766 is actually limited to Newton766’s LED components rather than the sealing member. *Id.* Moreover, Patent Owner argues that Petitioner does not provide a

¹⁰ Newton, U.S. Patent No. 8,499,766 B1, issued Aug. 6, 2013 (Ex. 1009, “Newton766”).

motivation to combine Thorens and Weigensberg with Newton766's gasket. *Id.* at 35–36.

Patent Owner's arguments appear to have merit. Grounds 5–6 correspond to Grounds 1–2 and the addition of Lamb does not appear to remedy our concerns about the air flow limitations as discussed above. Furthermore, Petitioner does not provide a reason to modify Worm or Weigensberg to include a gasket; Petitioner's motivation to combine arguments are directed to Lamb's sensor.¹¹ Therefore, we have doubt that Petitioner ultimately will establish that an ordinary artisan would have modified Worm and Weigensberg with Lamb's sensor and Newton766's gasket.

3. *Remaining Claims (Claims 15, 16, 18, 27–29, 31, 32)*

Petitioner also asserts that claims 15, 16, 18, 27–29, 31, and 32 would have been unpatentable the asserted combinations when combined with Lamb. Pet. 97–99. Claims 27 (and claims 15, 16, 18, 28, 29, 31, and 32 by virtue of dependence from either of claim 14 or claim 27) recites limitations substantially similar those discussed above for claim 14 (*see* Ex. 1001, 49:62–67). Petitioner relies on the same analysis to support its contentions regarding claim 27 (*see* Pet. 46–52). Petitioner's arguments regarding these claims do not address our concern regarding air flow as discussed above regarding claim 14 (*supra* Sections II.D.2.b or II.E.1) or whether Petitioner has adequately shown a motivation to combine Thorens and Weigensberg

¹¹ We observe that Patent Owner appears to identify Petitioner's failure to provide a motivation to include Lamb's (or Newton766's) gasket with respect to the combination of Thorens and Weigensberg, i.e., Ground 8, alone. Prelim. Resp. 35. However, this failure is also observed in grounds involving Worm, i.e., Grounds 5–7.

(*supra* Section II.G.2.a). Thus, we have concern that Petitioner would ultimately prevail on its challenge of claims 15, 16, 18, 27–29, 31, and 32 for the same reasons set forth above regarding claim 14.

I. Objective Indicia

“A determination of whether a patent claim is invalid as obvious under § 103 requires consideration of all four *Graham* factors, and it is error to reach a conclusion of obviousness until all those factors are considered.” *Apple Inc. v. Samsung Elecs. Co.*, 839 F.3d 1034, 1048 (Fed. Cir. 2016) (en banc); *see also Transocean Offshore Deepwater Drilling, Inc. v. Maersk Drilling USA, Inc.*, 699 F.3d 1340, 1349 (Fed. Cir. 2012) (same).

Patent Owner asserts objective indicia evidence of non-obviousness. Prelim. Resp. 36 (citing Ex. 2001 ¶¶ 103–104). Patent Owner has, according to its own testimony, marketed and sold electronic cigarette devices under the JUUL brand for nearly a decade. *Id.* Such “products comprise a JUUL Device and various JUULpod (a removable cartridge) products (the ‘JUUL System’).” *Id.* Patent Owner contends:

After its introduction in 2015, the JUUL System met the long-felt need for a nicotine alternative to conventional combustion cigarettes. The JUUL System unexpectedly met this need by declining to use cigarette iconography and instead focusing on modularity and a system that would provide the best user experience. As a result, the JUUL System received significant industry praise and commercial success, raising its market share to over 70% within a few years. The success of the JUUL System also led to copying by competitors, including by Petitioners and Petitioners’ parent company and real party-in-interest, Altria Group, Inc (“Altria”) (f/k/a Philip Morris).

Id. at 37.

Patent Owner argues its claims are co-extensive with its product and, alternatively, that a nexus exists between evidence of (*see* Prelim. Resp. 37–52; Sur-reply), long-felt need (*see* Prelim. Resp. 53–57), unexpected results (*see* Prelim. Resp. 57–58), industry praise (*see* Prelim. Resp. 59–60), commercial success (*see* Prelim. Resp. 60–61), and copying (*see* Prelim. Resp. 61–65) and the claims of the ’123 patent.

Petitioner argues in reply that Patent Owner’s products are “not co-extensive with the claims because Patent Owner’s products include numerous unclaimed features that impact the product’s functionality. Reply 1–2. Petitioner also argues that a nexus does not exist between the claims and Patent Owner’s evidence of long-felt need, unexpected results, industry praise, and commercial success, and copying. *Id.* at 3–5. Lastly, Petitioner argues that the ’123 patent did not satisfy a long felt need in the industry. *Id.* at 2.

We have considered Patent Owner’s evidence of objective indicia of non-obviousness and Petitioner arguments and we determine that it would be premature to deny institution at this stage of the proceeding. We reserve final consideration of this issue until the record has been fully developed during trial. Any final decision, however, will be based on the full record developed during the trial.

III. CONCLUSION

For the foregoing reasons, we determine that Petitioner has demonstrated a reasonable likelihood that it would prevail with respect to at least one of the claims challenged in the Petition. Accordingly, we institute an *inter partes* review of the ’123 patent.

IV. ORDER

In consideration of the foregoing, it is hereby:

ORDERED that, pursuant to 35 U.S.C. § 314(a), an *inter partes* review of claims 14–16, 18, 27–29, 31, and 32 of U.S. Patent No. 10,130,123 B2 is instituted with respect to all grounds set forth in the Petition; and

FURTHER ORDERED that, pursuant to 35 U.S.C. § 314(c) and 37 C.F.R. § 42.4, notice is hereby given of the institution of a trial, which will commence on the entry date of this Decision.

IPR2024-00231
Patent 10,130,123 B2

FOR PETITIONER:

Anish R. Desai
Elizabeth S. Weiswasser
Adrian C. Percer
Anne M. Cappella
Sutton W. Ansley
Christopher M. Pepe
Matthew D. Sieger
Taylor J. Lawrence
WEIL, GOTSHAL & MANGES LLP
anish.desai@weil.com
elizabeth.weiswasser@weil.com
adrian.percer@weil.com
anne.cappella@weil.com
sutton.ansley@weil.com
christopher.pepe@weil.com
matthew.sieger@weil.com
taylor.lawrence@weil.com

FOR PATENT OWNER:

James M. Glass
John T. McKee
Quincy Lu
QUINN EMANUEL URQUHART & SULLIVAN LLP
jimglass@quinnemanuel.com
johnmckee@quinnemanuel.com
quincylu@quinnemanuel.com