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Paper 7
Entered: March 20, 2025

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

SHENZHEN KANGVAPE TECHNOLOGY CO., LTD.,
Petitioner,

v.

RAI STRATEGIC HOLDINGS, INC.,
Patent Owner.

IPR2024-01406
Patent 11,925,202 B2

Before JO-ANNE M. KOKOSKI, CHRISTOPHER M. KAISER, and BRIAN D. RANGE, *Administrative Patent Judges.*

KOKOSKI, *Administrative Patent Judge*.

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

I. INTRODUCTION

Shenzhen Kangvape Technology Co., Ltd. ("Petitioner") filed a Petition to institute an *inter partes* review of claims 1, 3, 4, 8–13, and 15 ("the challenged claims") of U.S. Patent No. 11,925,202 B2 ("the '202 patent," Ex. 1001). Paper 2 ("Pet."). RAI Strategic Holdings, Inc. ("Patent Owner") filed a Preliminary Response. Paper 6 ("Prelim. Resp.").

Institution of an *inter partes* review is authorized by statute when "the information presented in the petition . . . and any response . . . shows that there is a reasonable likelihood that the petitioner would prevail with respect to at least 1 of the claims challenged in the petition." 35 U.S.C. § 314 (2018); *see also* 37 C.F.R. § 42.4 (2023). For the reasons discussed below, we determine that Petitioner establishes a reasonable likelihood of prevailing with respect to the unpatentability of at least one claim of the '202 patent. Accordingly, we institute an *inter partes* review of claims 1, 3, 4, 8–13, and 15 of the '202 patent.

A. Real Parties in Interest

Petitioner identifies itself as the real party in interest. Pet. 81. Patent Owner identifies RAI Strategic Holdings, Inc., R.J. Reynolds Vapor Company, RAI Innovations Company, and R.J. Reynolds Tobacco Company as the real parties in interest. Paper 3 (Mandatory Notice), 1.

B. Related Matters

The parties indicate that the '202 patent is asserted in the U.S. International Trade Commission, Investigation No. 337-TA-1410, *Certain Disposable Vaporizer Devices*, filed on June 11, 2024. Pet. 81; Paper 3, 1. The '202 patent is also challenged in IPR2024-01280, in which institution was denied on March 6, 2025, and PGR2024-00049, in which institution was denied on March 10, 2025. *Ecto World, LLC and SV3, LLC v. RAI*

Strategic Holdings, Inc., IPR2024-01280, Paper 10 (PTAB March 6, 2025); *Ecto World, LLC and SV3, LLC v. RAI Strategic Holdings, Inc.*, PGR2024-00049, Paper 10 (PTAB March 10, 2025). Pet. 81–82; Paper 7, 1.

C. The '202 Patent

The '202 patent, titled "Tobacco-Containing Smoking Article," is directed to "tobacco smoking articles that produce aerosols without experiencing any necessary burning of tobacco or other component materials during periods in which the articles are used." Ex. 1001, code (54), 4:61–65. Figure 1 is reproduced below.

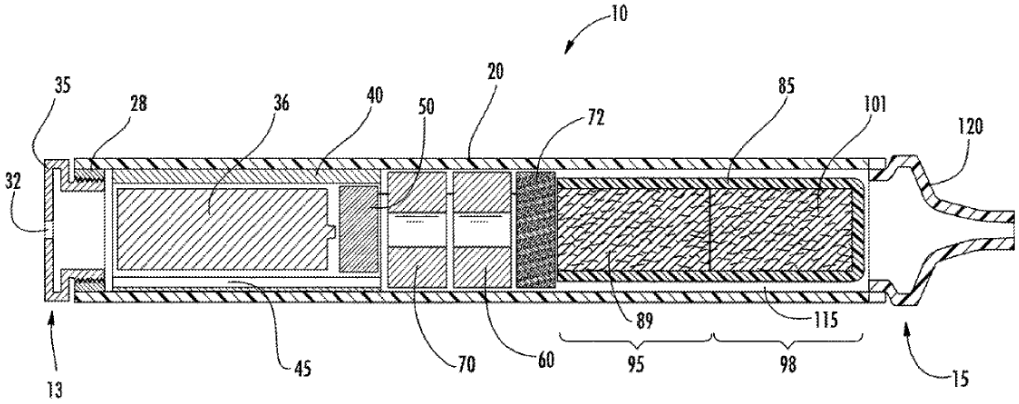

FIG. 1

Figure 1 depicts a longitudinal cross-sectional view of an embodiment of an electrically-powered, tobacco-containing smoking article described in the '202 patent. *Id.* at 8:47–49. Smoking article 10 includes outer housing 20, mouth-end 15, mouth-end piece 120, distal end 13, and end cover cap 35. *Id.* at 19:58–60, 20:5–11, 24:14–15. Mouth-end 15 comprises an opening adapted for egress of an aerosol generated within smoking article 10, and distal end 13 comprises an opening adapted for intake of air into smoking article 10. *Id.* at 20:5–9. Electric power source 36, electrically powered control components 50, sensing mechanism 60, and at least one electrical resistance heating element 70, 72 are arranged within outer

housing 20. *Id.* at 20:24–25, 20:45–46, 20:61–64, 21:28–29. Resistance heating elements 70, 72 can be powered by electric power source 36, can be controlled by electrically powered control components 50, and are configured to allow airflow therethrough. *Id.* at 21:35–40.

Cartridge 85 contains some form of tobacco 89 and aerosol-forming material. Ex. 1001, 22:14–16. Cartridge 85 can include upstream segment 95, composed of tobacco or processed tobacco filler material 89 incorporating aerosol-forming material, and downstream segment 98, composed of substrate 101 carrying flavors or aerosol-forming material. *Id.* at 22:27–32. The '202 patent teaches that "smoking article 10 is assembled such that a certain amount of aerosol-forming material and tobacco components can be wicked or otherwise transferred to heating element 72 or the region in close proximity to the heating element." *Id.* at 22:32–36. At least one air passageway 115 extends longitudinally between the inner surface of outer housing 20 and the outer surface of cartridge 85. *Id.* at 22:40–43.

During use, mouth-end 15 is placed in the smoker's lips, and air is drawn through openings 32 in cap 35 located at distal end 13 and into outer housing 20. Ex. 1001, 24:30–34. The drawn air passes through air passageway 45 that extends along the length of power source 36 and electronic control components 50, then through an air passageway area within resistance heating element 70 and sensing mechanism 60, past or through resistance heating element 72, through air passageway 115 and into mouth-end piece 120. *Id.* at 24:34–41. Resistance heating elements 70, 72 heat aerosol-forming materials and tobacco materials in the vicinity of those heating elements. *Id.* at 24:41–44. "Aerosol that is formed by the action of drawn air passing heated tobacco components and aerosol-forming material

in the region occupied by" resistance heating element 72 "is drawn through the mouth-end piece 120, and into the mouth of the smoker." *Id.* at 24:50–54.

D. Illustrative Claim

Petitioner challenges claims 1, 3, 4, 8–13, and 15 of the '202 patent. Independent claim 1 is illustrative of the claimed subject matter, and is reproduced below.

> 1. An electrically-powered, aerosol-generating smoking article comprising:
>
> an outer housing having two ends;
>
> a mouthpiece defined at one of the two ends;
>
> an electrical power source arranged within the outer housing;
>
> an electrical resistance heater positioned within the outer housing, the electrical resistance heater being configured for electrical connection with the electrical power source
>
> a storage compartment defined within the outer housing, the storage compartment being configured for storage of a liquid aerosol-forming material and being arranged such that the liquid aerosol-forming material can be wicked into contact with the electrical resistance heater to volatilize the liquid aerosol-forming material;
>
> an air passageway through at least a portion of the outer housing, the air passageway being arranged so that air drawn into the outer housing combines with volatilized liquid aerosol-forming material to produce an aerosol that can be drawn into the mouth of a user of the electrically-powered, aerosol-generating smoking article through the mouthpiece; and
>
> a controller configured to activate current flow through the electrical resistance heater in response to a draw

> on the electrically-powered, aerosol-generating smoking article.

Ex. 1001, 32:58–33:18.

E. Asserted Grounds

Petitioner asserts that claims 1, 3, 4, 8–13 and 15 would have been unpatentable on the following grounds:

Claim(s) Challenged	35 U.S.C. §	Reference(s)/Basis
1, 3, 4, 8–13	102	Morgan[1]
1, 3, 4, 8–13, 15	103	Morgan, Susa[2]
1, 4, 8, 9, 13	102	Gupta[3]
1, 3, 4, 8–13, 15	103	Gupta, Takeuchi[4]
1, 3, 8–11, 13, 15	102	Takeuchi

Pet. 1. Petitioner relies on the Declaration of Dr. Samir Nayfeh (Ex. 1003) in support of its contentions.

II. ANALYSIS

A. Level of Ordinary Skill in the Art

Petitioner contends that a person of ordinary skill in the art ("POSA" or "POSITA") would have had "a bachelor's degree in mechanical engineering, electrical engineering, or a related field, and three to four years of experience, or a master's degree in mechanical engineering, electrical engineering, or a related field, and one to two years of experience." Pet. 6 (citing Ex. 1003 ¶ 13). Petitioner further contends that "[s]uch experience would include a familiarity with thermal fluid delivery devices and/or the components and underlying technology used therein, and a higher level of

[1] US 5,249,586, issued Oct. 5, 1993 (Ex. 1004, "Morgan").
[2] EP 0 845 220 B1, published Jan. 26, 1998 (Ex. 1006, "Susa").
[3] US 2005/0205084 A1, published Sept. 22, 2005 (Ex. 1007, "Gupta").
[4] US 6,155,268, issued Dec. 5, 2000 (Ex. 1009, "Takeuchi").

education or skill might make up for less experience, and vice versa." *Id.* at 6–7 (citing Ex. 1003 ¶ 13). Patent Owner states that, for purposes of the Preliminary Response, "Patent Owner maintains that Petitioners' arguments fail even under Petitioners' POSA definition." Prelim. Resp. 13.

On this record, we preliminarily adopt Petitioner's undisputed proposed definition because it appears to be consistent with the cited prior art and the disclosure of the '202 patent. *See Okajima v. Bourdeau*, 261 F.3d 1350, 1355 (Fed. Cir. 2001) (explaining that specific findings regarding ordinary skill level are not required "where the prior art itself reflects an appropriate level and a need for testimony is not shown" (quoting *Litton Indus. Prods., Inc. v. Solid State Sys. Corp.*, 755 F.2d 158, 163 (Fed. Cir. 1985))).

B. Claim Construction

We construe each 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). Under this standard, claim terms are generally given their plain and ordinary meaning as would have been understood by a person of ordinary skill in the art at the time of the invention and in the context of the entire patent disclosure. *Phillips v. AWH Corp.*, 415 F.3d 1303, 1313 (Fed. Cir. 2005) (en banc). Only those terms in controversy need to be construed, and only to the extent necessary to resolve the controversy. *Realtime Data LLC v. Iancu*, 912 F.3d 1368, 1375 (Fed. Cir. 2019).

Petitioner argues that we should adopt the construction of the claim term "wicked into contact" that the Board adopted in a prior *inter partes* review proceeding that addressed the same term in an earlier, related patent. Pet. 7 (citing IPR2020-01602, Paper 32 at 8–15 (PTAB March 30, 2022)).

In particular, Petitioner asserts that "the Board previously construed the term '***wicked into contact***' to mean: 'wicked into contact (1) with the heater, or (2) with an area in close proximity to, and exposed [to] the heat produced by, the heater,'" and "[t]he present Petition adopts this formal construction for purposes of this IPR proceeding." *Id.* (citing IPR2020-01602, Paper 32 at 15). Patent Owner also "adopts this construction for purposes of" the Preliminary Response, and argues that "Petitioner's grounds fail even under its proposed construction of 'wicked into contact.'" Prelim. Resp. 13.

For purposes of this Decision, we adopt the Board's prior construction of "wicked into contact," namely, "wicked into contact (1) with the heater, or (2) with an area in close proximity to, and exposed to the heat produced by, the heater," which is undisputed on this record. *See Philip Morris Products, S.A. v. RAI Strategic Holdings, Inc.*, IPR2020-01602, Paper 32 at 8–15 (PTAB March 30, 2022).

C. Asserted Anticipation by Morgan

Petitioner contends that claims 1, 3, 4, and 8–13 are anticipated by Morgan. Pet. 8–30. Patent Owner disagrees. Prelim. Resp. 14–26.

1. Overview of Morgan

Morgan "relates to smoking articles in which tobacco flavor media are heated but not burned to release tobacco flavors." Ex. 1004, 1:12–15.

Morgan's Figures 1 and 2 are reproduced below.

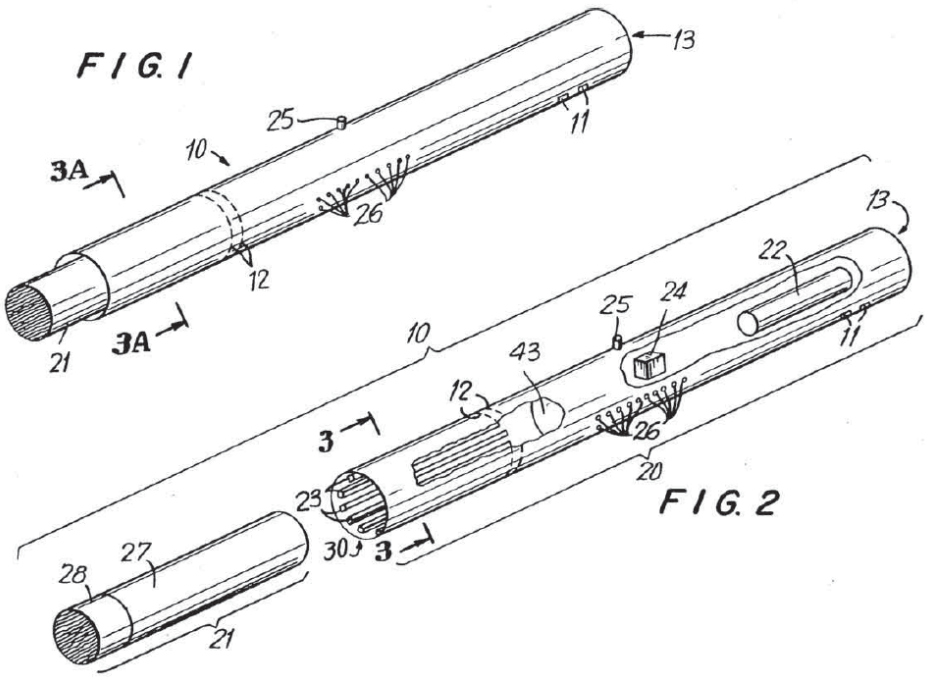

FIG. 2

Figure 1 (top) is a perspective view of an embodiment of an electrical smoking article described in Morgan, and Figure 2 (bottom) is a partially fragmentary, exploded perspective view of the electrical smoking article depicted in Figure 1. Ex. 1004, 2:42–45. Smoking article 10 includes reusable portion 20 and disposable filter/flavor portion 21, which is received in cavity 30 at the mouth end of reusable portion 20. *Id.* at 4:42–47. Disposable portion 21 includes flavor segment 27 and filter segment 28, typically a conventional cellulose acetate filter segment. *Id.* at 5:26–30. Reusable portion 20 includes power source 22 (which can be a battery, a capacitor, or both), heating elements 23, control circuit 24, and pushbutton 25. *Id.* at 4:48–59. Indicators 26 reflect the status of heaters 23. *Id.* at 4:59–61. Perforations 12 are provided in the wall of reusable portion 20 to allow outside air to be drawn in during puffing, or outside air may be drawn through all of reusable portion 20 via openings (not shown) at far end 13. *Id.* at 5:1–5.

Figures 3 and 3A are reproduced below.

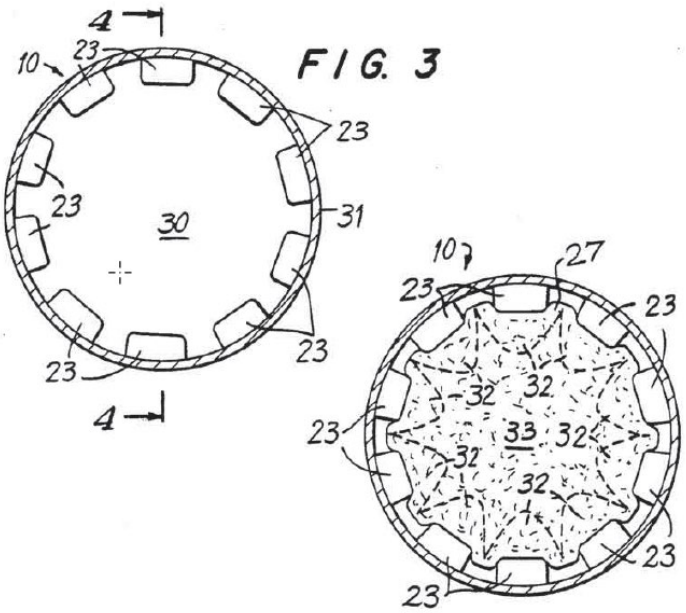

FIG. 3

FIG. 3A

Figure 3 (top) is a radial cross-section view of the electrical smoking article depicted in Figures 1 and 2, taken from line 3–3 of Figure 2, and Figure 3A is a radial cross-section view of the electrical smoking article depicted in Figures 1–3, taken from line 3A–3A of Figure 1. Ex. 1004, 2:46–51. Heating elements 23 are linear, bowed slightly away from the wall of cavity 30, distributed substantially uniformly around the circumference of cavity 30, and spaced apart sufficiently that the regions of disposable portion 21 heated by neighboring heating elements 23 do not overlap. *Id.* at 5:6–11, 5:18–23. As shown in Figure 3A, in which disposable portion 21 is inserted into cavity 30, each region 32 represents the fraction of flavor segment 27 that is heated by each respective heating element 23 to provide an individual charge of tobacco flavor substance. *Id.* at 5:58–65. Tobacco foam region 33 in the center of flavor segment 27 provides bulk and compressibility, but is not heated to deliver flavor to the smoker. *Id.* at 7:1–5.

2. Claim 1

Petitioner contends that Morgan discloses all of the elements of independent claim 1. Pet. 11–21. For example, Petitioner contends that Morgan discloses "an outer housing having two ends" (outer surface of portion 20), "an electrical power source arranged within the outer housing" (power source 22), "an electrical resistance heater positioned with the outer housing . . . being configured for electrical connection with the electrical power source" (heating elements 23, 51, and 78), and "a controller configured to activate the current flow through the electrical resistance heater in response to a draw on the electrically-powered, aerosol-generating smoking article" (control circuit 24). *Id.* at 11–12, 14–16, 20–21.

With respect to the "a storage compartment defined within the outer housing . . . being configured for storage of a liquid aerosol-forming material and being arranged such that the liquid aerosol-forming material can be wicked into contact with the electrical resistance heater to volatilize the liquid aerosol-forming material," Petitioner first contends that Morgan "discloses a storage compartment including at least the flavor segment 27 (of Morgan's disposable portion 21) within cavity 30 at the mouth end of portion 20." Pet. 16 (citing Ex. 1004, 5:26–65, 2:26–33, 3:26–64, 4:44–47, 6:46–62, Figs. 1, 2, 3A; Ex. 1003 ¶¶ 61–65). Petitioner then contends that cavity 30 can receive disposable portion 21, which includes flavor segment 27, and that "Morgan discloses that '[f]lavor segment 27 can be any material that liberates flavors when hot air passes over or through it." *Id.* (citing Ex. 1004, 4:44–47, 5:26–65). Petitioner contends that "[i]n one embodiment, the flavor segment 27 can include 'an extruded open-cell foamed tobacco product' where 'an aerosol precursor such as glycerine is added to the composition.'" *Id.* (citing Ex. 1004, 5:36–46). Petitioner

further contends that "Morgan's liquid aerosol precursor (such as glycerine) would be capable of wicking through the pores of such a foam substrate—especially as the glycerine is heated/volatilized and evacuated from those pores immediately adjacent the heating element (generating capillary action of the glycerine through the open-cell foam toward the evacuated pores)." *Id.* at 18 (citing Ex. 1004, 5:34–46, 3:58–68; Ex. 1003 ¶ 64). According to Petitioner,

> based on Morgan's teaching for such "intimate thermal contact" between the heating elements and the flavor segment 27 and the resulting "visible condensed aerosol" from the heated aerosol precursor therein, Morgan teaches that the glycerine or other liquid aerosol-forming precursor within flavor segment 27 "can be wicked into contact with" the heating elements [of] Morgan's heater.

Id. (citing Ex. 1004, 5:34–65, 3:28–68, 2:26–33; Ex. 1003 ¶¶ 64–65).

Patent Owner argues that "Morgan does not describe its smoking device as being configured to wick liquid." Prelim. Resp. 15 (citing Ex. 1004). Patent Owner also argues that Petitioner fails "to show that liquid aerosol precursor would necessarily wick through Morgan's extruded open-cell foamed tobacco structure." *Id.* at 16–17 (citing *In re Robertson*, 169 F.3d 743, 745 (Fed. Cir. 1999)). In particular, Patent Owner argues that "despite having every opportunity to do so, the Petition made no attempt to show that Morgan's *specific* extruded open-cell foamed tobacco structure would necessarily wick liquid aerosol precursor." *Id.* at 17. Patent Owner further argues that "Morgan describes heating each region 32 of the flavor segment 27 only a *single time*, which directly contradicts the concept of wicking." *Id.* at 21.

To establish anticipation, each and every element in a claim, arranged as recited in the claim, must be found in a single prior art reference. *Net*

MoneyIN, Inc. v. VeriSign, Inc., 545 F.3d 1359, 1369 (Fed. Cir. 2008); *Karsten Mfg. Corp. v. Cleveland Golf Co.*, 242 F.3d 1376, 1383 (Fed. Cir. 2001). "A reference may anticipate inherently if a claim limitation that is not expressly disclosed is 'necessarily present, or inherent, in the single anticipating reference.'" *In re Montgomery*, 677 F.3d 1375, 1379 (Fed. Cir. 2012) (quoting *Verizon Servs. Corp. v. Fibernet Va., Inc.*, 602 F.3d 1325, 1336–37 (Fed. Cir. 2010)).

Based on the current record, we are not persuaded that Petitioner sufficiently establishes that Morgan discloses "a storage compartment . . . being arranged such that the liquid aerosol-forming material can be wicked into contact with the electrical resistance heater to volatilize the liquid aerosol-forming material" as recited in claim 1.

Morgan teaches that "[f]lavor segment 27 can be any material that liberates flavors when hot air passes over or through it," and preferably "is a cylindrical portion of an extruded open-cell foamed tobacco product" with "approximately 10% of an aerosol precursor such as glycerine is added to the composition." Ex. 1004, 5:34–43. Morgan also teaches that "[t]he reusable heaters are disposed in the cavity in such a way that they make thermal contact with the disposable portion [that contains flavor segment 27] when the disposable portion is inserted into the cavity." *Id.* at 3:27–30; *id.* at 5:47–52 (explaining that heating elements 23 are bowed out from the cavity wall "so that elements 23 press into flavor segment 27 for intimate thermal contact"); 6:50–52 ("[H]eating elements 71 actually pierce and extend into disposable portion 21 to provide the desired intimate thermal contact."). Morgan further teaches "flavor segment 27 should be firm but compressible" in order to achieve intimate thermal contact between the heating elements and flavor segment 27, and "[t]he open-cell foamed structure described in"

U.S. Patent No. 4,510,950 (Ex. 1005, "the '950 patent") "is particularly well-suited for that purpose, but other compressible structures may be used." *Id.* at 5:52–57. In addition, Morgan's Figure 3A, reproduced above (*see* § II.C.1, *supra*), "shows regions 32 of flavor segment 27 adjacent heaters 23, each region 32 representing that fraction of segment 27 that is heated by each respective heater 23 to provide an individual charge of tobacco flavor substance." *Id.* at 5:61–65; *see also id.* at 2:28–33 ("When any one of the plurality of electrical heating means is activated, a respective fraction of the removable portion of tobacco flavor medium in contact with that one of the heating means is heated, delivering a predetermined quantity of tobacco flavor substance to the smoker.").

Taken together, these disclosures in Morgan indicate that the tobacco flavor material, which can contain a liquid aerosol-forming material, is heated by intimate thermal contact with the heating elements. We do not discern, and Petitioner does not direct us to, any disclosures in Morgan that indicate that liquid aerosol-forming material is wicked in any way, let alone into contact with the heater, or an area in close proximity to and exposed to the heat produced by the heater.

Petitioner's argument that "Morgan's liquid aerosol precursor (such as glycerine) would be capable of wicking through the pores of" an open-cell foamed substrate, "especially as the glycerine is heated/volatilized and evacuated from those pores immediately adjacent the heating element (generating capillary action of the glycerin through the open-cell foam toward the evacuated pores)" is unpersuasive on this record. Pet. 18 (citing Ex. 1004, 5:34–46, 3:58–68; Ex. 1003 ¶ 64). We understand Petitioner to be arguing that Morgan inherently discloses that Morgan's liquid aerosol precursor would be "wicked into contact with the electrical resistance heater

to volatilize the liquid aerosol-forming material" as recited in claim 1. That Morgan's liquid aerosol precursor "*would be capable* of wicking through the pores" of an open-cell foamed substrate is not sufficient to establish that the liquid aerosol precursor *necessarily* wicks through the open pores and into contact with the heater or an area in close proximity to, and exposed to the heat produced by, the heater. *See Therasense, Inc. v. Becton, Dickinson & Co.*, 593 F.3d 1325, 1332 (Fed. Cir. 2010) (Inherency "may not be established by probabilities or possibilities. The mere fact that a certain thing *may* result from a given set of circumstances is not sufficient." (quoting *Cont'l Can Co. USA, Inc. v. Monsanto Co.*, 948 F.2d 1264, 1269 (Fed. Cir. 1991))).

Dr. Nayfeh testifies that "ordinary capillary action of the liquid in" an open-cell foamed substrate causes the liquid to "wick through the pores," but does not adequately explain how or why the open-cell foamed substrate described in Morgan (by reference to the '950 patent) would create such wicking. *See* Ex. 1003 ¶ 64. Instead, Petitioner and Dr. Nayfeh point to a previous IPR proceeding in which Petitioner and Dr. Nayfeh contend "Patent Owner admitted that this traditional capillary action of fluid is an example of wicking." Pet. 18 (citing Ex. 1015, 29); Ex. 1003 ¶ 64 (citing Ex. 1015, 29). In particular, they point to the Patent Owner Response in *Philip Morris Products, S.A. v. RAI Strategic Holdings, Inc.*, IPR2020–01602, in which Patent Owner states that the asserted prior art (Hon) "knew how to describe when wicking action was responsible for transporting liquid, as Hon explains that its liquid solution moved from supply bottle 11 to porous body 27 'via capillary infiltration' (*i.e.*, wicking)." Ex. 1015, 29. Morgan, however, does not explain that a liquid solution is moved via capillary infiltration in the open-cell foamed structure. Morgan only states that the

open-cell foamed structure described in the '950 patent "is particularly well-suited" to forming a firm but compressible flavor segment; it is silent as to the wicking abilities of such open-cell foamed structure. Ex. 1004, 5:33–37; *see also id.* at 7:1–5 (noting that inefficient tobacco use occurs in flavor segment 27 "where the tobacco foam region 33 (FIG. 3A) in the center of segment 27 provides bulk and compressibility but is never heated to deliver flavor to the smoker.").

For these reasons, and based on the current record, we are not persuaded that Petitioner establishes a reasonable likelihood of showing that Morgan anticipates claim 1 of the '202 patent.

3. Claims 3, 4, and 8–13

Petitioner contends that claims 3, 4, and 8–13, which depend from claim 1, are also anticipated by Morgan. Pet. 21–30. Petitioner's arguments regarding the additional limitations in these dependent claims do not remedy the deficiencies discussed above with respect to claim 1. Thus, for the same reasons given above with respect to Petitioner's challenge of claim 1, we are not persuaded that Petitioner establishes a reasonable likelihood of prevailing in showing that claims 3, 4, and 8–13 are anticipated by Morgan.

D. Asserted Obviousness over Morgan and Susa

Petitioner contends that claims 1, 3, 4, 8–13, and 15 would have been obvious over the combined teachings of Morgan and Susa. Pet. 32–39. Petitioner does not rely on Susa to remedy the deficiencies identified above with respect to Petitioner's challenges based on Morgan alone. Accordingly, for the reasons set forth above regarding Petitioner's challenge based on Morgan, and based on the current record, we are not persuaded that Petitioner establishes a reasonable likelihood of showing that claims 1, 3, 4,

8–13, and 15 would have been obvious over the combined teachings of Morgan and Susa.

E. Asserted Anticipation by Gupta

Petitioner contends that claims 1, 4, 8, 9, and 13 are anticipated by Gupta. Pet. 41–52. Patent Owner disagrees. Prelim. Resp. 26–33.

1. Overview of Gupta

Gupta relates to an aerosol generating device that "can be operated to produce aerosols having a controlled particle size distribution." Ex. 1007 ¶ 38.

Gupta's Figure 1 is reproduced below.

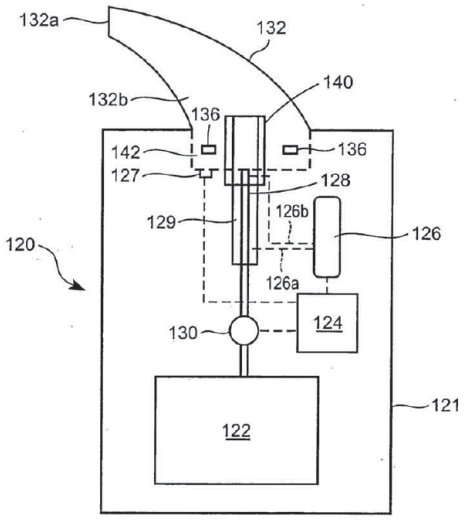

FIG. 1

Figure 1 is a depiction of an aerosol generating device described in Gupta. Ex. 1007 ¶ 11. Aerosol generating device 120 includes housing 121, liquid aerosol formulation source 122, controller 124, power source 126, sensor 127, heated flow passage 128, valve 130, and mouthpiece 132. *Id.* ¶ 39. Controller 124 is connected to power source 126, sensor 127, and valve 130 "to effect delivery of the liquid from source 122 to the flow passage 128," which "comprises a capillary sized flow passage." *Id.* ¶ 40. Heated flow passage 128 "comprises an electrically conductive material,

such as a metallic tube (e.g., stainless steel), or a non-conductive or semi-conductive tube incorporating a heater made of an electrically conductive material, such as platinum, or the like." *Id.* ¶ 41. The heating arrangement can also include "a resistance heater, such as a thin platinum layer, located along the flow passage." *Id.* ¶ 48. A portion of flow passage 128 is disposed within body 129, and rear wall 134 of body 129 "forms a seal about the outer surface of the tube defining the flow passage 128 to form a dead air space 135 between the tube defining the flow passage 128 and the body 129." *Id.* ¶ 42. Aerosol confinement sleeve 140 is provided around body 129 and flow passage 128, and "controls the aerosol particle size of aerosols delivered by the aerosol generating device 120." *Id.* ¶ 44.

Gupta teaches that, during operation, valve 130 opens to allow a desired volume of liquid material from source 122 to enter flow passage 128. *Id.* ¶ 50. "[V]alve 130 may be opened either prior to or subsequent to detection by the sensor 127 of vacuum pressure applied to the mouthpiece 132 by a user attempting to inhale aerosol from the aerosol generating device 120." *Id.* Liquid passing through flow passage 128 from source 122 is heated to a sufficient temperature to volatilize the liquid. *Id.* According to Gupta, "[l]iquid from the source 122 can be fed into the flow passage 128 at a substantially constant pressure and/or in a predetermined volume." *Id.* Volatilized liquid exits flow passage 128 through an outlet end and forms an aerosol, which can be inhaled by a user drawing upon mouthpiece 132. *Id.*

2. Claim 1

Petitioner contends that Gupta discloses all of the elements of independent claim 1. Pet. 41–50. For example, Petitioner contends that Gupta discloses "an outer housing having two ends" (housing 121 with

mouthpiece 132 at one end and a second end opposite mouthpiece 132), "a mouthpiece defined at one of the two ends" (mouthpiece 132), and "an electrical power source arranged within the outer housing" (power source 126 in housing 121). *Id.* at 41–43.

With respect to the "a storage compartment defined within the outer housing . . . being configured for storage of a liquid aerosol-forming material and being arranged such that the liquid aerosol-forming material can be wicked into contact with the electrical resistance heater to volatilize the liquid aerosol-forming material," Petitioner contends that "source 122, flow passage 128, body 129 and aerosol confinement sleeve 140 define a connected volume and collectively represent a storage compartment." Pet. 45–46 (citing Ex. 1007, Fig. 1; Ex. 1003 ¶ 139). Petitioner also contends that

> [b]ecause Gupta teaches that heated flow passage 128 "comprises a capillary sized flow passage and alternatively refers to the flow passage as a "capillary passage," the liquid aerosol formulation stored in source 122 and flow passage 128 would be capable of wicking into contact with Gupta's electrical resistance heater through heated flow passage 128.

Id. at 47 (citing Ex. 1004 ¶¶ 40, 41, 43, 45, 47, Fig. 1; Ex. 1003 ¶ 142). Petitioner further contends that "forces associated with capillary action can drive the liquid aerosol formulation to flow through Gupta's heated flow passage 128 and into contact with the electrical resistance heater." *Id.* (citing Ex. 1003 ¶ 142) (emphases omitted). Therefore, according to Petitioner, "based on Gupta's teaching that source 122 and heater flow passage 128 hold a liquid aerosol formulation and that heated flow passage 128 is a capillary passage, Gupta teaches that the liquid aerosol formulation ***can be wicked into contact with*** the ***electrical resistance***

heater." *Id.* (citing Ex. 1007 ¶¶ 39–41, 43, 45–47, 61, Fig. 1; Ex. 1003 ¶ 142).

Patent Owner responds that "Gupta describes *actively* supplying liquid aerosol precursor to heaters at a predetermined volume, pressure, and flow rate using a controller, a valve, and possibly other components (*e.g.*, a pump, a pressurization arrangement)." Prelim. Resp. 27. Patent Owner also argues that "[t]he Petition does not identify any disclosure of wicking in Gupta." *Id.* at 30 (citing Pet. 45–47).

We are not persuaded, based on the current record, that Petitioner sufficiently establishes that Gupta discloses "a storage compartment . . . being arranged such that the liquid aerosol-forming material can be wicked into contact with the electrical resistance heater to volatilize the liquid aerosol-forming material" as recited in claim 1. In particular, we are not persuaded that Gupta discloses that liquid aerosol-forming material is wicked into contact with the heater.

Petitioner relies on Gupta's teaching that flow passageway 128 preferably is a "capillary sized passage" to support its contention that "the liquid aerosol formulation stored in source 122 and flow passage 128 would be capable of wicking into contact with Gupta's electrical resistance heater through heated flow passage 128." Pet. 47 (citing Ex. 1007 ¶¶ 40, 41, 43, 45, 47, Fig. 1; Ex. 1003 ¶ 142). Based on that teaching, Petitioner contends that "forces associated with capillary action can drive the liquid aerosol formulation to flow through Gupta's heated flow passage 128 and into contact with the electrical resistance heater." *Id.* (citing Ex. 1003 ¶ 142). Petitioner, however, does not adequately explain why the size of the tube necessarily results in capillary action driving the liquid formulation through that tube. *Id.* Petitioner cites to Dr. Nayfeh's testimony, but that testimony

mirrors the statements in the Petition without providing further technical explanation or additional evidence in support thereof. Ex. 1003 ¶ 142; *see also Xerox Corp. v. Bytemark, Inc.*, IPR2022-00624, Paper 9 at 15 (PTAB Aug. 24, 2022) (precedential) (expert declaration that "merely repeats, *verbatim*, the conclusory assertion for which it is offered to support" is entitled to little weight).

Moreover, Gupta teaches that valve 130 "allow[s] a desired volume of liquid material from the source 122 to enter the flow passage 128," and "[l]iquid from the source 122 can be fed into the flow passage 128 at a substantially constant pressure and/or in a predetermined volume," which at least suggests that liquid is driven through flow passageway 128 other than by wicking. Ex. 1007 ¶ 50. Neither Petitioner nor Dr. Nayfeh, however, explain how or why capillary action would wick the liquid into contact with the heater in light of the described operation of Gupta's aerosol generating device. We also note that Petitioner contends that the liquid in Gupta "would be *capable* of wicking into contact" with Gupta's heater, which is not sufficient to establish that such liquid necessarily is wicked into contact with the heater as required by claim 1. *See Therasense,* 593 F.3d at 1332.

For these reasons, and based on the current record, we are not persuaded that Petitioner establishes a reasonable likelihood of showing that Gupta anticipates claim 1 of the '202 patent.

3. Claims 4, 8, 9, and 13

Petitioner contends that claims 4, 8, 9, and 13, which depend from claim 1, are also anticipated by Gupta. Pet. 50–52. Petitioner's arguments regarding the additional limitations in these dependent claims do not remedy the deficiencies discussed above with respect to claim 1. Thus, for the same reasons given above with respect to Petitioner's challenge of claim 1, we are

not persuaded that Petitioner establishes a reasonable likelihood of prevailing in showing that claims 4, 8, 9, and 13 are anticipated by Gupta.

F. Asserted Obviousness over Gupta and Takeuchi

Petitioner contends that independent claim 1, and claims 3, 4, 8–13, and 15 that depend therefrom, would have been obvious over the combined teachings of Gupta and Takeuchi. Pet. 54–65. Petitioner does not rely on Takeuchi to remedy the deficiencies identified above with respect to Petitioner's challenge based on Gupta alone. *Id.* Accordingly, for the reasons set forth above regarding Petitioner's challenge based on Gupta, we are not persuaded that Petitioner establishes a reasonable likelihood of showing that claims 1, 3, 4, 8–13, and 15 would have been obvious over the combined teachings of Gupta and Takeuchi.

G. Asserted Anticipation by Takeuchi

Petitioner contends that Takeuchi anticipates claims 1, 3, 8–11, 13, and 15 of the '202 patent. Pet. 65–75. Patent Owner disagrees. Prelim. Resp. 33–40.

1. Overview of Takeuchi

Takeuchi "relates to a flavor-generating device for enjoying inhalation of flavor or for enjoying simulated smoking, and more particularly, to a flavor-generating device which is to be inhaled by a user by heating a liquid[] flavor source without relying on combustion." Ex. 1009, 1:3–8.

Takeuchi's Figure 1 is reproduced below.

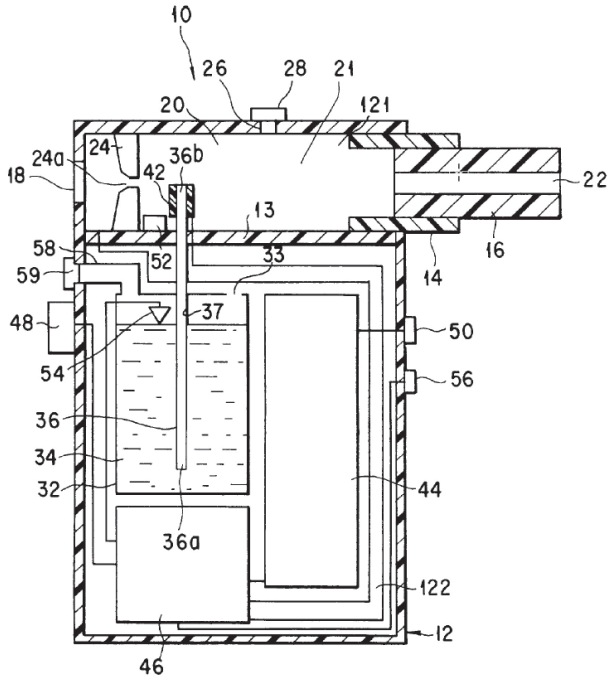

Figure 1 shows a sectional view of a flavor-generating device according to an embodiment described in Takeuchi. Ex. 1009, 2:51–52. Flavor generating device 10 includes casing 12, the inner space of which is partitioned into upper chamber 121 and lower chamber 122 by partition wall 13. *Id.* at 4:29–33. Upper chamber 121 is used as gas passageway 20, and lower chamber 122 includes liquid container 32, power source 44, and a control circuit. *Id.* at 4:33–38. Liquid container 32 houses liquid flavor source 34. *Id.* at 5:28–30. Liquid flavor source 34 contains a flavor substance and a substance that forms an aerosol when heated. *Id.* at 5:32–35. Capillary tube 36 is inserted in liquid container 32, and defines liquid passageway 37. *Id.* at 5:47–50. The upper end of capillary tube 36 is equipped with heater 42 to gasify liquid flavor source 34. *Id.* at 6:4–7. Takeuchi teaches that power source 44, which supplies power to electric heater 42, can be a DC power source such as a primary or secondary battery, or an AC power source. *Id.* at 6:12–19.

Takeuchi teaches that, when the flavor-generating device is used for inhaling a flavor, the user switches on a power switch and inhales through mouth piece 16, which causes a sensor to signal the control circuit to supply electric power from power source 44 to heater 42. Ex. 1009, 7:48–56. Liquid flavor source 34 is transferred to the outlet port of capillary tube 36 by force of capillary action, gasified by the heat generated from heater 42, and transferred into gas passageway 20. *Id.* at 7:57–63. Liquid flavor source 34 is then newly supplied from liquid container 32 into the outlet port of capillary tube 36 by the capillary force of capillary tube 36. *Id.* at 7:65–8:4. The gasified flavor source mixes with air introduced through air intake port 18 and squeeze hole 24a and transfers into inhalation port 22 for inhalation by the user. *Id.* at 8:5–10.

2. Claim 1

Petitioner contends that Takeuchi discloses all of the limitations of claim 1. Pet. 65–73. For example, Petitioner contends that Takeuchi discloses "an outer housing having two ends" (casing 12 and inhalation port holder 14), "a mouthpiece defined at one of the two ends" (mouth piece 16 detachably inserted into inhalation port holder 14), and "an electrical power source arranged within the outer housing" (power source 44). *Id.* at 66–68.

With respect to the "an electrical resistance heater positioned within the outer housing, the electrical resistance heater being configured for electrical connection with the electrical power source" limitation of claim 1, Petitioner contends that "[b]ecause Takeuchi discloses that '[a]n electric power is supplied from a power source 44 . . . to the electric heater 42,' Takeuchi discloses that the ***electrical resistance heater*** is configured for electrical connection with the ***electrical power source***." *Id.* at 69–70 (citing Ex. 1009, 6:5–22, 7:48–56; Ex. 1003 ¶ 202). Patent Owner responds that

Takeuchi discloses a general heater, but not an electrical resistance heater. Prelim. Resp. 36–40.

We are persuaded, on this record, that Petitioner sufficiently shows that Takeuchi discloses "an electrical resistance heater positioned within the outer housing, the electrical resistance heater being configured for electrical connection with the electrical power source" as recited in claim 1. Takeuchi discloses that heater 24, which "consists of a tubular body mounted to the capillary tube," is supplied with electric power by power source 44, and "[i]t is desirable to use as the power source 44 a DC power source available on the market such as a primary battery (dry battery), or a secondary battery (rechargeable battery)." Ex. 1009, 6:8–17. Dr. Nayfeh further explains that,

> based upon Takeuchi's disclosure, it is clear that each of Takeuchi's heater embodiments (e.g., heater 42, ring-shaped heater 72, rod-like heater 74, and plate-like heater 76) operate as ***resistance heaters***—especially because Takeuchi states that it is "desirable" for power source 44 to be "a DC power source." EX1009, 7:48–56, 6:4–22 ("electric power is supplied from the power source 44" to the heater). Here, a POSITA would have readily recognized that Takeuchi's use of DC power and the wired connection to the disclosed metallic heater element indicates a traditional resistance heater that generates heat through resistance to unipolar current flow (unlike, for example, a traditional dielectric heater that requires a rapid alternating bipolar electric field created by high-frequency AC power).

Ex. 1003 ¶ 202. Based on the current record, we credit Dr. Nayfeh's testimony in this regard because it is supported by some technical reasoning.

At this stage of the proceeding, Patent Owner does not address Petitioner's specific contentions with respect to the other limitations of claim 1. *See* Prelim. Resp. We reviewed Petitioner's contentions for all the elements of independent claim 1, as well as the supporting evidence. Pet. 65–73. Based on the record before us, we are persuaded that

Petitioner's discussion of the particular structures in Takeuchi establishes a reasonable likelihood that Takeuchi discloses all of the limitations of claim 1.

3. Claims 3, 4, 8–13, and 15

Petitioner also contends that Takeuchi discloses all of the limitations of claims 3, 4, 8–13, and 15, which depend from claim 1. Pet. 73–75. At this stage of the proceeding, Patent Owner does not address Petitioner's specific contentions with respect to claims 3, 4, 8–13, and 15. *See* Prelim. Resp. We reviewed Petitioner's contentions with regard to claims 3, 4, 8–13, and 15, and are persuaded that Petitioner establishes a reasonable likelihood of showing that Takeuchi discloses all of the limitations of these dependent claims as well. Pet. 73–75.

4. Conclusion

For the reasons set forth above, and based on the current record, we determine that Petitioner establishes a reasonable likelihood of showing that claims 1, 3, 4, 8–13, and 15 are anticipated by Takeuchi.

III. CONCLUSION

Based on the arguments in the Petition and the Preliminary Response, and the evidence of record, we determine Petitioner establishes a reasonable likelihood that it will prevail on its challenge to at least one claim of the '202 patent. Accordingly, we institute an *inter partes* review of all the challenged claims on all the challenged grounds.

The factual findings set forth in this Decision are preliminary and provided for the sole purposes of deciding whether the institute a review. Any final findings will be based on the full trial record, including any information presented in a timely filed response to the Petition. *See Trivascular, Inc. v. Samuels*, 812 F.3d 1056, 1068 (Fed. Cir. 2016) (noting

that "there is a significant difference between a petitioner's burden to establish a 'reasonable likelihood of success' at institution, and actually proving invalidity by a preponderance of the evidence at trial") (quoting 35 U.S.C. § 314(a); comparing *id.*, with § 316(e)).

IV. ORDER

In consideration of the foregoing, it is hereby:

ORDERED that an *inter partes* review is instituted with respect to all the grounds asserted 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 trial, which shall commence on the entry date of this Decision.

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