

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Patent of: Robinson et al.
U.S. Patent No.: 11,925,202 Attorney Docket No.: 58579-0002IP1
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Control No.: IPR2024-01406
Title: TOBACCO-CONTAINING SMOKING ARTICLE

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**PETITION FOR *INTER PARTES* REVIEW OF UNITED STATES PATENT
NO. 11,925,202 PURSUANT TO 35 U.S.C. §§ 311–319, 37 C.F.R. § 42**

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EXHIBITS

EX1001	U.S. Patent No. 11,925,202 to Robinson et al. (“the ’202 Patent”)
EX1002	Prosecution History of the ’202 Patent (“the Prosecution History”)
EX1003	Declaration of Dr. Samir Nayfeh
EX1004	U.S. Patent No. 5,249,586 (“Morgan”)
EX1005	U.S. Patent No. 4,510,950 (“Keritsis”)
EX1006	E.P. Patent No. 0845220 (“Susa”)
EX1007	U.S. Publication No. 2005/0205084 (“Gupta”)
EX1008	U.S. Patent No. 5,743,251 (“Howell”)
EX1009	U.S. Patent No. 6,155,268 (“Takeuchi”)
EX1010	Kevin Hatch, et al., Preliminary Evaluation of a Commercially Available Electric Aerosol Inhaler from China (Sep. 14, 2006) (“September 2006 Ruyan Product Evaluation”), available at https://www.industrydocuments.ucsf.edu/tobacco/docs/#id=jqyy0228
EX1011	U.S. Patent No. 7,726,320 (“the ’320 patent”)
EX1012	Final Written Decision in IPR2020-00921, Paper 32 (PTAB June 30, 2022)
EX1013	U.S. Patent No. 5,060,671 (“Counts”)
EX1014	Declaration of Dr. Robert Sturges, <i>RJ Reynolds Vapor Company et al v. Fontem Holdings I BV et al.</i> , IPR2018-00627, EX1002

EX1015	Patent Owner Response in IPR2020-01602, Paper 16 (PTAB July 2, 2021)
EX1016	Petition in IPR2018-00627, Paper 2 (PTAB March 1, 2018)
EX1017	U.S. Publication No. US2013/0306064 (“Thorens”)
EX1018	U.S. Publication No. US2014/0000638 (“Sebastian”)

LISTING OF CLAIMS

<u>Claim Element</u>	<u>Language</u>
[1pre]	An electrically-powered, aerosol-generating smoking article comprising:
[1a]	an outer housing having two ends;
[1b]	a mouthpiece defined at one of the two ends;
[1c]	an electrical power source arranged within the outer housing;
[1d]	an electrical resistance heater positioned within the outer housing, the electrical resistance heater being configured for electrical connection with the electrical power source
[1e]	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;
[1f]	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
[1g]	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.
[3]	The electrically-powered, aerosol-generating smoking article of claim 1, wherein the storage compartment comprises a fibrous substrate.
[4]	The electrically-powered, aerosol-generating smoking article of claim 1, wherein the aerosol that is produced passes at least partially through the storage compartment before exiting through the mouthpiece.

<u>Claim Element</u>	<u>Language</u>
[8]	The electrically-powered, aerosol-generating smoking article of claim 1, wherein the storage compartment is configured as a container for holding liquid.
[9]	The electrically-powered, aerosol-generating smoking article of claim 1, wherein the electrical resistance heater is arranged in contact with the storage compartment.
[10]	The electrically-powered, aerosol-generating smoking article of claim 1, wherein the electrical resistance heater is arranged proximate to an absorbent wicking material configured for transferring the liquid aerosol-forming material to the electrical resistance heater.
[11]	The electrically-powered, aerosol-generating smoking article of claim 1, wherein at least a portion of the electrical resistance heater extends into the storage compartment.
[12]	The electrically-powered, aerosol-generating smoking article of claim 1, wherein the electrical resistance heater is configured to allow airflow therethrough.
[13]	The electrically-powered, aerosol-generating smoking article of claim 1, further comprising a sensor adapted for sensing the draw by a user on the electrically-powered, aerosol-generating smoking article.
[15]	The electrically-powered, aerosol-generating smoking article of claim 1, further comprising an end cap defined at a second of the two ends.

Shenzhen Kangvape Technology Co., Ltd. (“Petitioner” or “Kangvape”)

petitions for *Inter Partes* Review (“IPR”) of claims 1, 3, 4, 8-13, and 15 of U.S.

Patent 11,925,202 (the ’202 Patent).

I. REQUIREMENTS FOR IPR—37 C.F.R. § 42.104

A. Grounds for Standing—37 C.F.R. § 42.104(a)

Petitioner certifies that the ’202 Patent is available for IPR, and Petitioner is not barred or estopped from requesting IPR.

B. Challenge and Relief Requested—37 C.F.R. § 42.104(b)

Petitioner requests IPR on grounds 1A-3 listed below. An expert declaration from Dr. Samir Nayfeh supports each ground. *See* EX1003.

<u>Ground</u>	<u>Claims</u>	<u>Basis for Rejection</u>
1A	1, 3, 4, 8-13	§102 – Anticipated by Morgan (EX1004)
1B	1, 3, 4, 8-13, 15	§103 – Obvious based on Morgan in view of Susa (EX1006)
2A	1, 4, 8, 9, 13	§103 – Anticipated by Gupta (EX1007), which incorporates Howell (EX1008) by reference in its entirety.
2B	1, 3, 4, 8-13, 15	§103 – Obvious based on Gupta in view of Takeuchi (EX1009)
3	1, 3, 8-11, 13, 15	§102 – Anticipated by Takeuchi

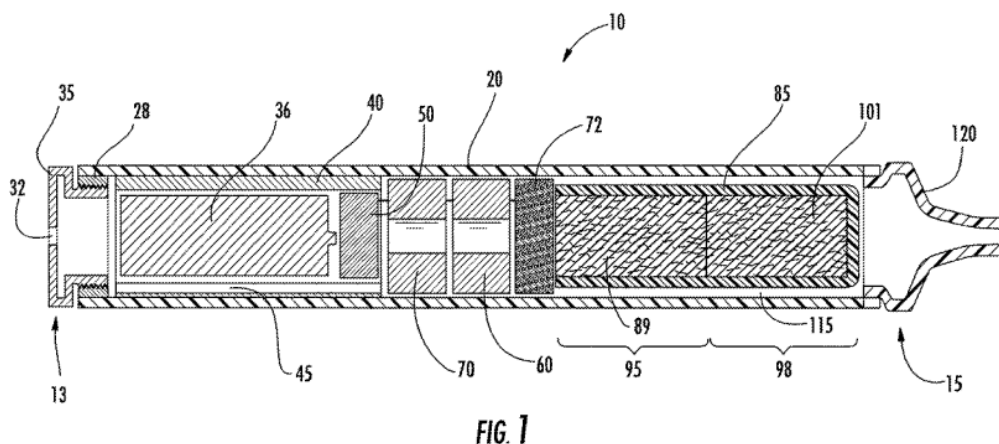
The ’202 Patent was filed on March 31, 2023, claiming priority to several prior patent applications. The earliest of these prior patent applications was filed on October 18, 2006 (an alleged pre-AIA filing date for purposes of this IPR). Here,

all prior art publications in Grounds 1A-3 were published more than a year before the critical date of October 18, 2006, thereby qualifying as prior art under pre-AIA §102(b). *See* EX1004, 1; EX1006, 1; EX1007, 1; EX1009, 1.

II. SUMMARY OF THE '202 PATENT

A. Brief Description

The '202 Patent describes a “smoking article” operating as an “electrically powered aerosol generating device” that powers a heating device with the power source “for forming a thermally generated aerosol.” EX1001, 5:41-61, Abstract, 1:28-29, 4:30-5:61, FIGS. 1-3; EX1003, ¶27. The smoking article is intended “produce aerosols without experiencing any necessary burning of tobacco or other component materials” because the smoking article uses electrically generated heat to produce aerosol instead of burning. EX1001, 4:35-67; 1:56-61. Three embodiments of the smoking article described in the '202 Patent are shown below:



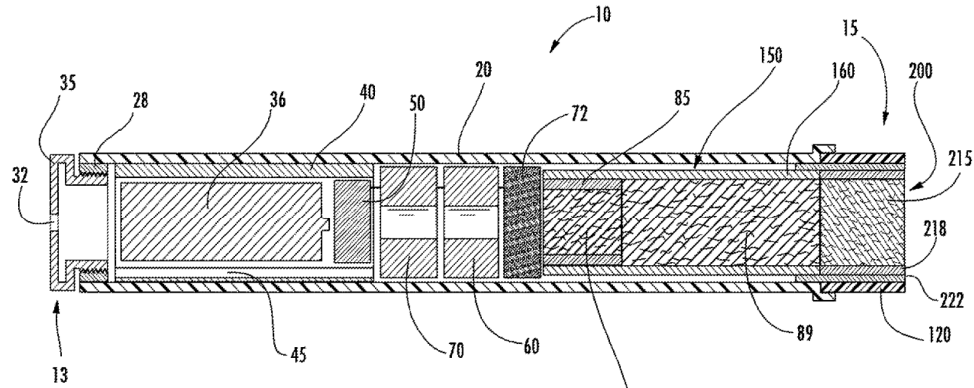


FIG. 2

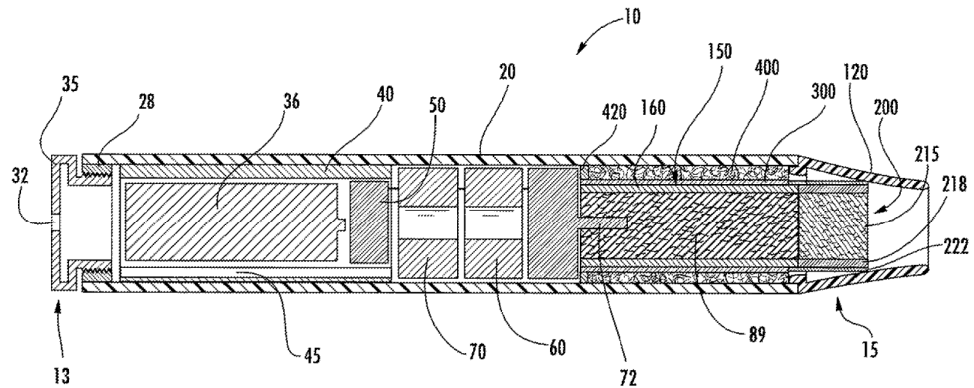


FIG. 3

EX1001, FIGS. 1-3. As depicted above, the smoking article 10 “has an overall shape that is generally rod-like or tubular in nature, generally akin to a cigarette-type or cigar-type smoking article.” EX1001, 19:53-57. The smoking article 10 described in the specification includes a set of structures that are also recited in claim 1, including the structures of:

- an “outer housing” (outer container or housing 20, col. 19: 58-20:23),
- a “mouthpiece” (mouth-end 15 including a mouth piece 120, col. 20:4-23 and 24:15-59),
- an “electrical power source” (battery source 36, col. 20:24-44),
- an “electrical resistance heater” (heating element 72, col. 21:28-22:8),

- a “storage compartment” that is “configured for” storage of a liquid-aerosol forming material (cartridge 85, col. 22:9-36),
- an “air passageway” (passageway 45/115, col. 20:28-44, 22:40-45 and 24:34-41), and
- a “controller” (controller 50, col. 20:45-21:27).

EX1003, ¶29.

Critically, the ’202 Patent plainly admits that each of these above-listed structures were essentially copied from a commercially available prior art product called the “Ruyan Atomizing Electronic Cigarette.” EX1001, 20:1-4, 20:20-24, 20:38-44, 20:55-59, 20:64-67, 21:58-61, 22:19-22, 24:20-23; EX1003, ¶30 (citing to EX1010 to corroborate the contents of the “commercially available” Ruyan device). According to the specification, the only purported point of novelty over this prior art Ruyan device was to “replace” the contents of Ruyan’s storage compartment (which contained an aerosol-forming material and “fibrous” substrate) with an aerosol-forming liquid *and a “tobacco” substrate* (tobacco cut filler, tobacco sheet, aqueous extracted tobacco cut filler pulp, or formed tobacco pieces or pellets). EX1001, 22:46-23:34.

This striking admission might have made sense in the context of the first patent filed in this family because all claims were expressly limited to air being drawn through “both *the tobacco material* and the aerosol-forming material.” EX1011, cl. 1 (emphasis added). With the ’202 Patent, Patent Owner threw off this

yolk. The claims include no such “tobacco” recitation. Claim 1 simply recites the same structures (listed above) that were admittedly known and copied from the prior art Ruyan device. EX1001, cl. 1. Simply put, the Challenged Claims ensnared a variety of prior art devices disclosed in numerous publications. *Infra*, Section V.

B. Summary of the Prosecution History of the '202 Patent

The '202 Patent issued after a terse examination. EX1002, 3. Shortly after filing the continuation application, Patent Owner filed an IDS in which the listing of references was fifty-seven pages in length—demanding the examiner should analyze *more than 11,000 pages of patent literature* plus nearly 300 non-patent documents. EX1002, 71-128.

Days later, Patent Owner canceled all of the original claims 1-30 and replaced them with new claims 31-60, thereby eliminating any remnant of the purported point of novelty expressed in the specification. EX1002, 153-159; *Supra*, Section II.A (“Patent Owner threw off this yolk”). Notably, the Examiner expressly requested further context/specificity from Patent Owner about the lengthy IDS. EX1002, 174 (“it is requested that it be specifically pointed out in response to this Office Action”). Patent Owner failed to comply.

Buried under this daunting mountain of cited publications/literature and faced with the lengthy set of new claims, the examiner apparently elected to forego any prior art rejections under §102 or §103. Instead, the examiner merely raised

concerns regarding obviousness-type double patenting. EX1002, 172-177. In response, Applicant filed a terminal disclaimer to obviate that ground. EX1002, 287-289. No substantive arguments for patentability over any particular prior art were submitted by Patent Owner.

Three weeks later, all claims were allowed in a notice of allowance on September 21, 2023. EX1002, 305-310. No reasons for allowance were provided. After yet another IDS, the examiner issued a second notice of allowance on December 13, 2023. EX1002, 391-396. Again, no reasons for allowance were provided by the Examiner.

Weeks after issuance, Patent Owner asserted the '202 Patent in the ITC against a vast array of parties, demanding that products long available to the public should now be excluded. Upon this record, the '202 Patent is ripe for review.

III. LEVEL OF ORDINARY SKILL

A person of ordinary skill in the art at the time of the alleged critical date of the '202 Patent (“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. EX1003, ¶13. Such experience would include a familiarity with thermal and fluid delivery devices

and/or the components and underlying technology used therein, and a higher level of education or skill might make up for less experience, and vice versa. *Id.*

IV. CLAIM CONSTRUCTION

All claim terms should be construed according to the *Phillips* standard.

Phillips v. AWH Corp., 415 F.3d 1303 (Fed. Cir. 2005); 37 C.F.R. §42.100. The Board has previously addressed a claim term from an earlier related patent that is also present in claim 1 of the '202 Patent. *See* IPR2020-01602, Paper 32, pp. 8-15 (PTAB March 30, 2022) (analyzing claims of related U.S. Patent No. 9,901,123). In particular, 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 by the heat produced by, the heater.” *Id.* at 15 (“We do not adopt Patent Owner’s position that ‘wicked into contact’ requires that the liquid mixture must be brought into contact with the electrical resistance heater solely by wicking”); *see also* EX1001, 21:44-61 (“in close proximity to”), 24:41-59; EX1003, ¶¶35-36. The present Petition adopts this formal construction for purposes of this IPR proceeding, and all Grounds 1A-3 provide this traditional functionality recited in claim 1.

From there, given the noticeable overlap between the components of the preferred embodiment of the '202 Patent and the prior art/predictable combinations articulated in Grounds 1A-3, Petitioner submits that no other claim terms need a

formal construction for purposes of resolving controversies in this proceeding.

Wellman, Inc. v. Eastman Chem. Co., 642 F.3d 1355, 1361 (Fed. Cir. 2011);

Google Inc. v. Intellectual Ventures II LLC, 701 Fed. Appx. 946, 956 (Fed. Cir.

2017) (“do not require construction” for purposes of “resolv[ing] the parties’

patentability arguments”).

V. DETAILED EXPLANATION OF GROUNDS

A. GROUND 1A: Morgan anticipates claims 1, 3, 4, 8-13 under pre-AIA §102(b)

1. Morgan

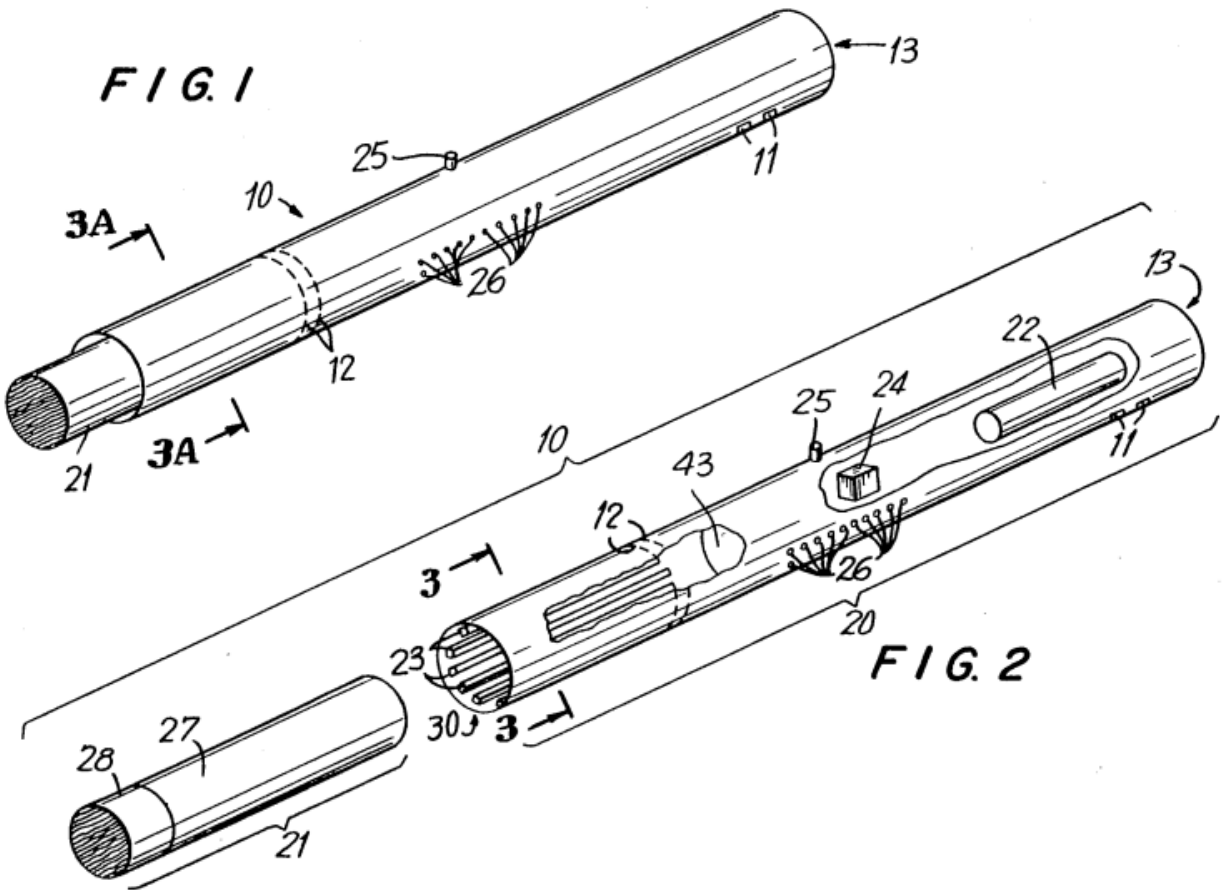
The Board previously analyzed Morgan’s teachings in comparison to claims of an earlier patent related to the ’202 Patent. *See* IPR2020-00921, Paper 32, 13-35 (PTAB June 30, 2022) (invalidating similar claims of a related U.S. Patent No. 9,814,268 based upon Morgan’s teachings). Here, many of the Board’s previous findings regarding Morgan are likewise pertinent here (refer to citations to EX1012 below).

Morgan discloses a slender aerosol-producing electrical smoking article that resembles a cigarette—much like the smoking article of the ’202 Patent. EX1004, 2:6-33, 3:9-37, FIGS. 1-2. Morgan’s electrical smoking article provides many of the benefits that are also given by the smoking article of the ’202 Patent, including electrical resistance heaters that heat (but do not burn) an aerosol precursor contained within a porous tobacco material so as to produce aerosol that mimics

the appearance of cigarette smoke. EX1004, 1:11-15, 2:6-33, 5:21-65, FIGS. 1-2.

Consequently, Morgan's electrical smoking article 10 achieves a user experience that is similar to conventional cigarette smoking but does not involve the user inhaling smoke from burning tobacco. EX1003, ¶¶37-38.

The electrical smoking article of Morgan includes a reusable portion comprising an outer housing, heating elements, a power source, control circuitry, and a disposable portion. EX1004, 3:9-37, 4:42-67; EX1003, ¶39. The disposable portion holds an aerosol precursor that produces aerosol when heated by the heating elements. EX1004, 5:34-46. The disposable portion can be inserted into the reusable portion near the heating elements of the reusable portion. EX1004, 3:9-37; EX1003, ¶39. One embodiment of Morgan's electrical smoking article is shown below in FIGS. 1-4, including an example where the disposable portion is inserted into the reusable portion (FIG. 1) and an example where the disposable portion is separated from the reusable portion (FIG. 2):



EX1004, FIGS. 1-2.

As seen above, when the disposable portion 21 is received the reusable portion 20, a flavor segment 27 is proximate the heating elements 23. EX1004, 4:42-47, 5:34-57; EX1003, ¶40. Reusable portion 20 includes power source 22 which provides power for heating elements 23. EX1004, 4:48-57. For example, control circuit 24 of reusable portion 20 causes power source 22 to supply electricity to heating elements 23. EX1004, 4:48-57. When power source 22 supplies power to heating elements 23, these heating elements 23 can heat aerosol

precursor within flavor segment 27 to produce an aerosol that is inhaled by the user. EX1004, 5:58-65.

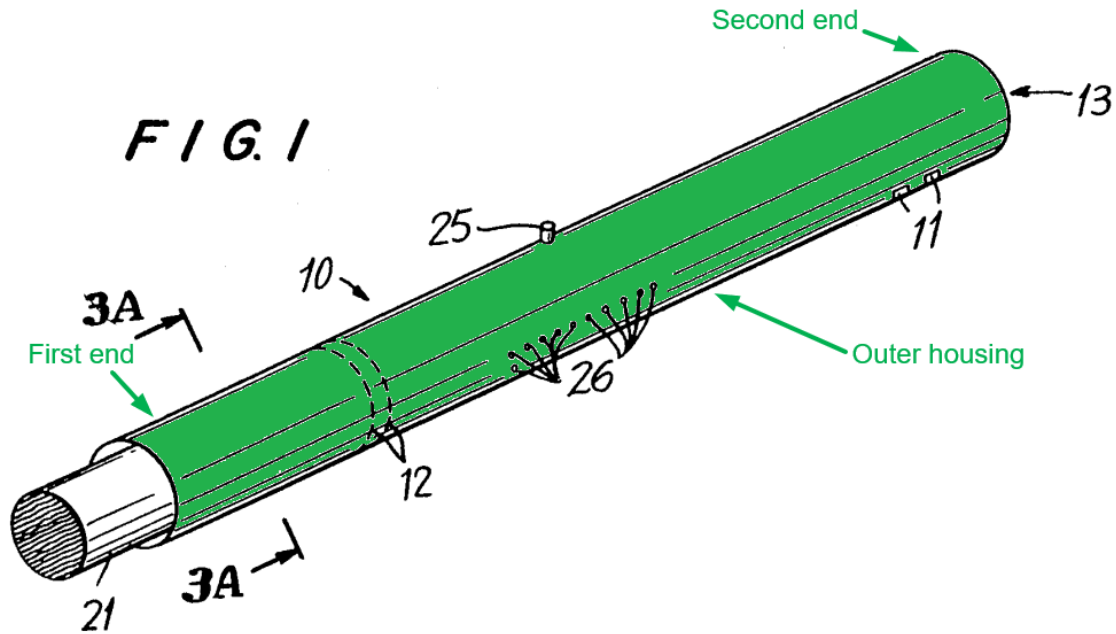
2. *Application to Challenged Claims*

Element [1pre]

As an initial matter, the '202 Patent admits that such a “smoking article” recited in the preamble was known in the prior art. EX1001, 14:29-38, 19:43-48. Morgan confirms this fact and discloses an ***electrically-powered smoking article*** in the form of electrical smoking article 10. EX1004, 4:42-67, FIGS. 1-4; EX1003, ¶49; *see also* EX1012, 16. This electrical smoking article 10 can “deliver [a] tobacco flavor substance as an aerosol,” which means that electrical smoking article 10 is ***aerosol-generating***. EX1004, 5:42-43, *see also* 2:17-33, 3:9-68, 5:34-6:2, 6:23-45, FIGS. 5-6, 6:46-62, FIGS. 7-8, 6:63-7:10, FIGS. 9-10; EX1003, ¶49.

Element [1a]

The '202 Patent admits that Element [1a] was well-known available and known in the prior art. EX1001, 20:1-4. Morgan confirms this fact and discloses Element [1a]. EX1003, ¶¶50-52. Morgan’s electrical smoking article 10 is slender and cigarette-shaped and includes an ***outer housing*** having ***two ends***. EX1004, 3:9-37, 4:42-47, 4:67-5:5, FIGS.1-2; *see also* EX1012, 16-17. Morgan’s FIG. 1 depicts this housing:



EX1004, FIG. 1 (annotated).

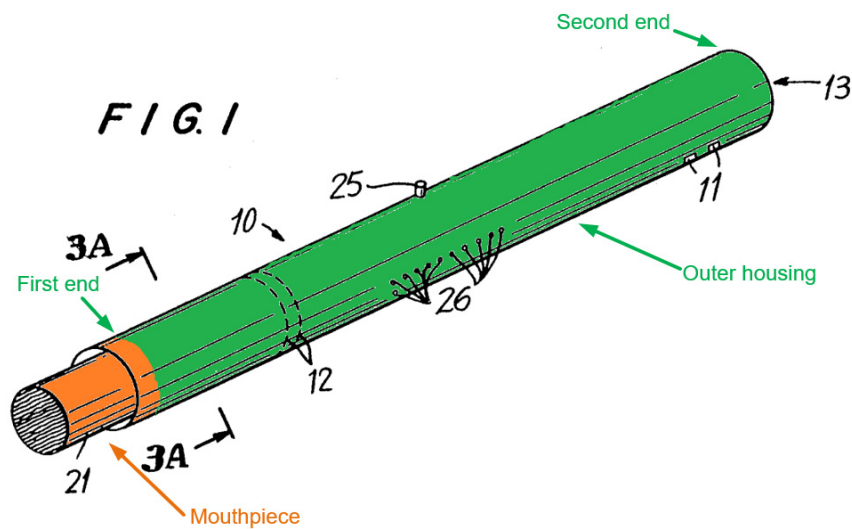
Morgan discloses that “[a]rticle 10 includes reusable or ‘permanent’ portion 20 and disposable filter/flavor portion or cartridge 21 which is received in a cavity 30 at the mouth end of portion 20.” EX1004, 4:44-47. As depicted in FIG. 1, permanent portion 20 includes an outer surface that defines an *outer housing* having *two ends* including a first end (e.g., an end near an opening where the disposable portion is inserted into reusable portion) and a second end (e.g., far end 13). EX1004, FIG. 1; EX1003, ¶¶50-52.

Element [1b]

The '202 Patent admits that Element [1b] was well-known available and known in the prior art. EX1001, 24:20-29. Morgan confirms this fact and discloses that electrical smoking article 10 can “simulate a cigarette,” describes permanent portion 20 as including a “mouth end” where a cavity 30 is formed, and discloses

that reusable portion 20 can “allow outside air to be drawn in during puffing.”

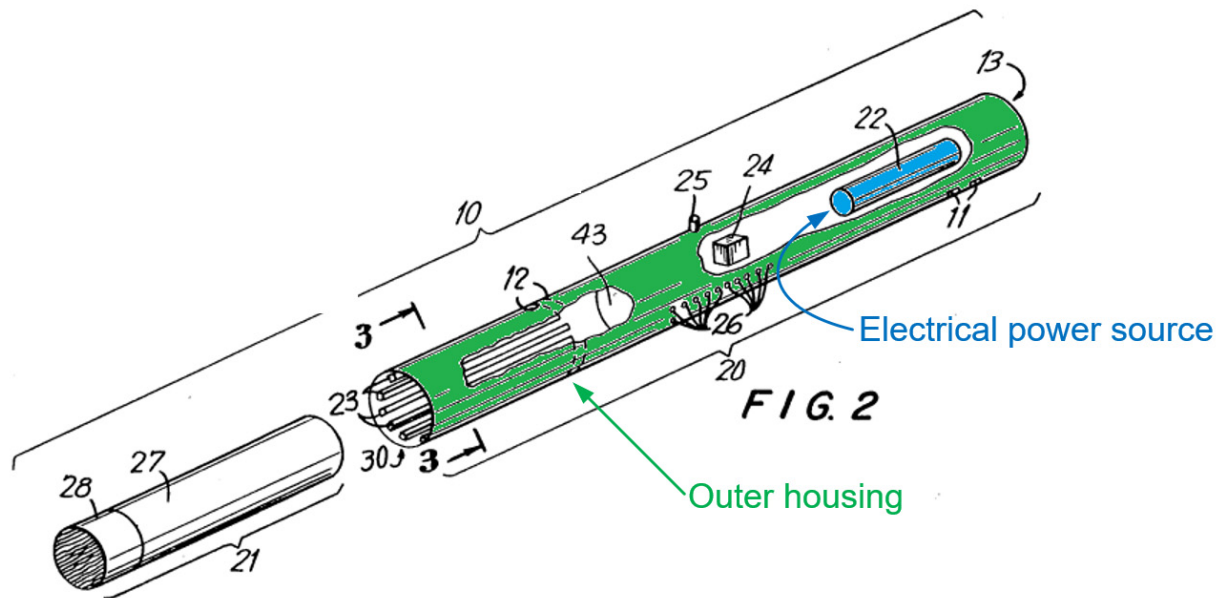
EX1004, 3:10-11, 3:26, 4:44-47, 4:67-5:5 (“cigarette wrapping paper”), 5:28-33, 5:66-6:1 (“could be inserted flush”), FIGS. 1-2; EX1003, ¶¶53; *see also* EX1012, 16-17. Based on Morgan’s teaching for the user drawing in air, the evidence here confirms that the user’s lips would apply: (i) to the rim of the “mouth end” defined by the housing portion 20 (especially for Morgan’s option in which the disposable portion 21 is fully “inserted flush,” col. 5:68-6:1), (ii) to the filter segment 28 defined at the mouth end of the housing portion 20 (provides a “mouth feel” in some uses, col. 5:28-33), or (iii) to a combination of both—thereby providing a ***mouthpiece*** defined at ***one of the two ends*** of the ***outer housing***. EX1003, ¶¶53-54; EX1004, FIG. 1; *see also* EX1012, 16-17. FIG. 1 is annotated below to illustrate option (iii) by way of example, but any one of Morgan’s options (i)-(iii) at the mouth end provides the structure of Element [1b]:



EX1004, FIG. 1 (annotated).

Element [1c]

The '202 Patent admits that Element [1c] was well-known available and known in the prior art. EX1001, 20:38-43. Morgan confirms this fact and discloses that reusable portion 20 includes an ***electrical power source*** (Morgan's power source 22) in the form of "a battery, a capacitor or both." EX1004, 4:48-67, 2:17-33; EX1003, ¶¶55-56; *see also* EX1012, 18. Further, Morgan's FIG. 2 illustrates that the power source 22 is ***arranged within the outer housing***:

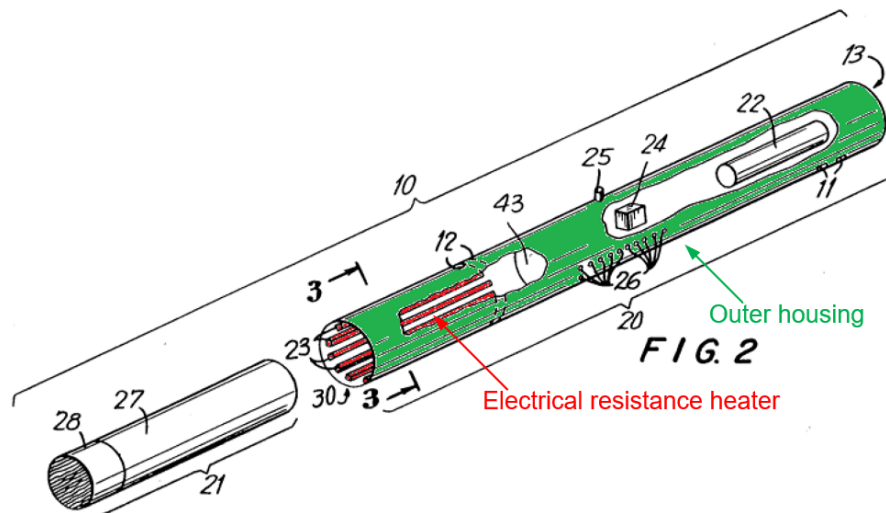


EX1004, FIG. 2 (annotated).

Element [1d]

The '202 Patent admits that Element [1d] was well-known available and known in the prior art. EX1001, 21:58-61. Morgan confirms this fact and discloses a ***heater*** including a set of controlled heating elements. EX1004, 2:17-33 ("electrical heating means"), 3:13-37 (heating elements "make thermal contact

with” the compressible tobacco segment), 3:58-4:51 (“heating elements “allow delivery” of “an aerosol containing tobacco flavors”), 4:56-59 (“[p]ower source 22 provides power for heating elements 23”), 5:6-25 (“preferably distributed substantially uniformly around the circumference of cavity 30”), 5:50-65, FIGS. 2-4; EX1003, ¶¶57-60; *see also* EX1012, 23-34. Morgan depicts three optional shapes for the set of heating elements—elongate heating elements 23 (FIGS. 1-4), elongate heating elements 51 (FIGS. 5-6), sharp-tipped heating elements 71 (FIGS. 7-8)—and each of these depicted options operates as a **resistance heater** positioned within the outer housing 20. EX1004, 4:8-9 (“a resistance of between about 0.5 ohm and 3.0 ohms”), 4:56-59, 6:23-35 (“connected to control circuitry”), 6:46-62 (“desired intimate thermal contact”); EX1003, ¶57. Morgan’s FIG. 2 depicts one example of the heating elements being positioned ***within the outer housing*** 20:



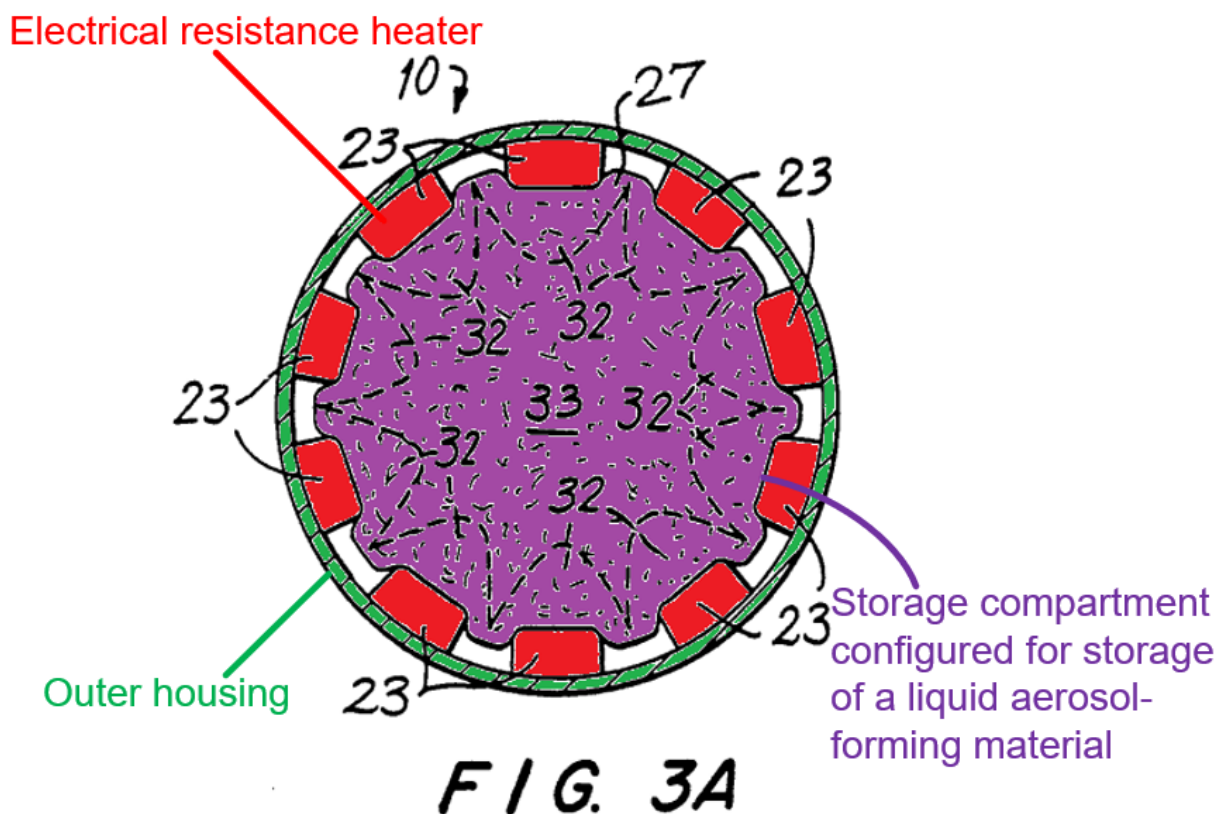
EX1004, FIG. 2 (annotated); *see also* FIGS. 3-8. Morgan also discloses that the heating elements are configured for electrical connection with an **electrical power**

source (e.g., power source 22). EX1004, 2:20-22, 4:56-67, 6:34-37, FIG. 2;
EX1003, ¶60.

Element [1e]

The '202 Patent admits that Element [1e] was well-known available and known in the prior art. EX1001, 22:19-26; *Supra*, Section II. Morgan confirms this fact and 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. EX1004, 5:26-65 ("open-cell foamed tobacco" segment wherein "an aerosol precursor such as glycerine is added"), 2:26-33 ("removable portion of tobacco flavor medium"), 3:26-64, 4:44-47, FIGS 1-2 and 3A; *see also* 6:23-45 ("lead-in for disposable portion 21"), 6:46-62 ("desired intimate thermal contact"); EX1003, ¶¶61-65; *see also* EX1012, 19-23. The cavity 30 of Morgan can receive disposable portion 21 which includes flavor segment 27. EX1004, 4:44-47, 5:26-65. Morgan discloses that "[f]lavor segment 27 can be any material that liberates flavors when hot air passes over or through it." EX1004, 5:34-35. In 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." EX1004, 5:36-46 ("desirable to add an aerosol precursor").

below in FIG. 3A at a location where the flavor segment 27 is inserted into the cavity 30 defined by the housing portion 20:



EX1004, FIG. 3A (annotated).

Morgan teaches that the flavor segment 27 includes added “glycerine” or other aerosol precursor, which are liquids that vaporize when heated so that “the visible condensed aerosol may mimic the appearance of cigarette smoke.”

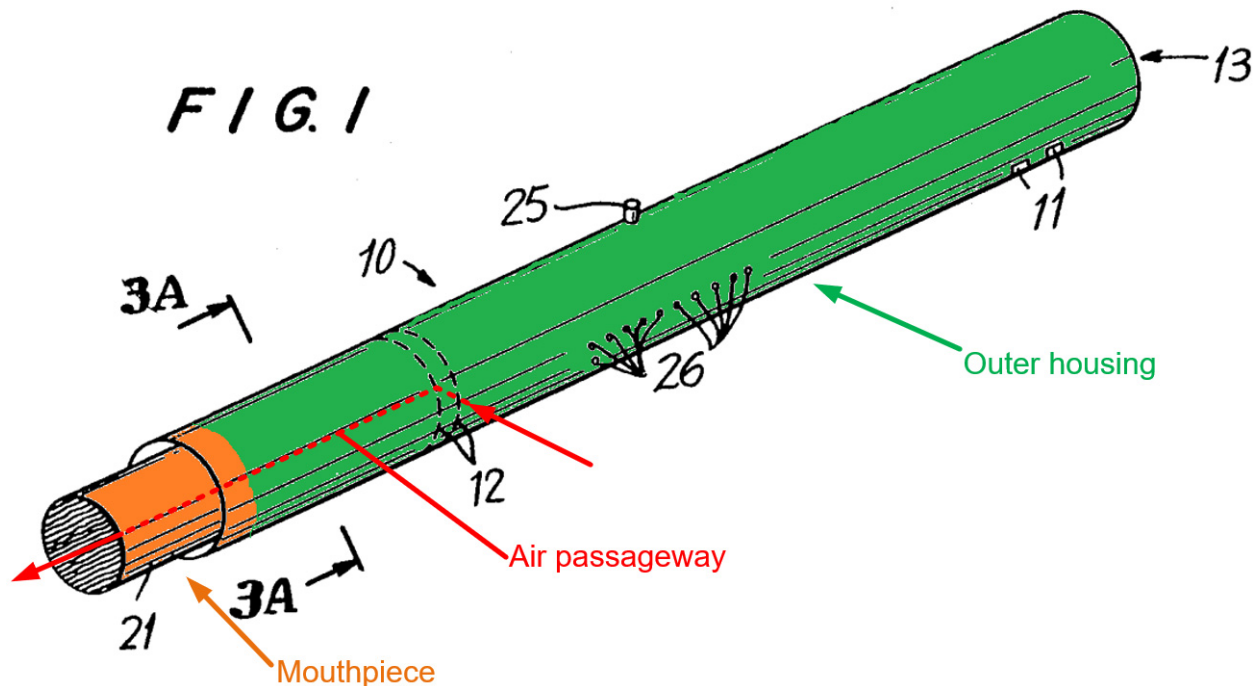
EX1004, 5:34-46, 8:45-55 (aerosol-forming material comprises liquid such as “glycerine” and “water”), 3:58-68, 2:26-33, EX1003, ¶63 (“This teaching indicates that the aerosol precursor present within flavor segment 27 is a liquid aerosol-

forming material that volatilizes to create “visible condensed aerosol” when heated by Morgan’s heating elements”).

In light of Morgan’s teaching that the flavor segment includes an “open-cell foamed” substrate, the evidence here confirms 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). EX1004, 5:34-46, 3:58-68; EX1003, ¶¶64. Note that, in previous IPR proceedings, Patent Owner admitted that this traditional capillary action of fluid is an example of wicking. EX1015, 29. Accordingly, 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 Morgan’s heater. EX1004, 5:34-65, 3:28-68; 2:26-33, EX1003, ¶¶64-65 (“fully consistent with the above-described construction” and citing to further “corroborating examples”).

Element [1f]

The '202 Patent admits that Element [1f] was well-known available and known in the prior art. EX1001, 20:1-4, 20:20-23, 20:30-44. Morgan confirms this fact and discloses that the article 10 includes at least two options for “an air passageway through at least a portion of the outer housing.” EX1004, 5:1-5; EX1003, ¶¶66-68; *see also* EX1012, 16-17. In one option, Morgan teaches “[p]erforations 12 may be provided in the wall of portion 20 to allow outside air to be drawn in during puffing.” EX1004, 5:1-3. The air passageway embodiment where air enters through perforations 12 is illustrated below in FIG. 1:



EX1004, FIG. 1 (annotated).

In another option, Morgan teaches “outside air may be drawn through all of portion 20 via openings (not shown) at its far end 13.” EX1004, 5:3-5.

Furthermore, as discussed above, disposable portion 21 includes a flavor segment 27 that is inserted into cavity 30. EX1004, 4:44-47, 5:26-29. This flavor segment 27 includes an aerosol precursor such as glycerine. EX1004, 5:34-42. Morgan also discloses that “[f]lavor segment 27 can be any material that liberates flavors when hot air passes over or through it” and “[i]t is desirable to add an aerosol precursor to deliver the tobacco flavor substance as an aerosol, so that when the consumer exhales the tobacco flavor substance, the visible condensed aerosol may mimic the appearance of cigarette smoke.” EX1004, 5:34-46. As such, Morgan teaches the air drawn into the housing portion 20 (via the air passageway cited above) combines with the volatized aerosol-forming material (e.g., the glycerine or other aerosol precursor that is heated by Morgan’s heater) to produce the “visible condensed aerosol” that can be drawn into the mouth of the user. EX1004, 5:34-65 (“liberates flavors” when the aerosol precursor is volatilized), 3:28-68; EX1003, ¶68.

Element [1g]

The ’202 Patent admits that Element [1g] was well-known available and known in the prior art. EX1001, 20:55-60. Morgan confirms this fact and discloses a ***controller*** that activates current flow to heating elements—namely, where “[p]ower source 22 provides power for heating elements 23, which are energized under the control of ***control circuit 24***, which is in turn actuated...by a puff-actuated sensor.” EX1004, 4:56-67, 2:22-33 (“control means”), 3:18-25

(describing the “control circuitry” and incorporating by reference U.S. Patent No. 5,060,671 (EX1013)), 6:34-37; EX1003, ¶¶69-70; *see also* EX1012, 18-19 (likewise acknowledging the incorporated-by-reference teaching of U.S. Patent No. 5,060,671). Morgan also discloses “control circuitry for energizing the heaters in an appropriate sequence, in response to...puff-induced actuation.” EX1004, 3:18-20. Based on Morgan’s teaching that control circuit 24 is actuated by a “puff-actuated sensor” and “puff-induced actuation” and that control circuit 24 energizes heating elements 23 based on detecting puffs by the user, the evidence here confirms that control circuit 24 is configured to activate current flow through the *electrical resistance heater* formed by heating elements 23 in response to a *draw* on electrical smoking article 10. EX1003, ¶70.

Claim [3]

As detailed above in Element [1e], the “storage compartment” includes Morgan’s flavor segment 27 within the cavity 30, which “comprises a fibrous substrate.” EX1004, 5:26-65; EX1003, ¶¶71-73. For example, Morgan discloses that “[p]referably, flavor segment 27 is a cylindrical portion of an extruded open-cell foamed tobacco product.” EX1004, 5:35-46 (incorporating by reference U.S. Patent No. 4,510,95 (EX1005)); *see also* EX1012, 22. Given that the open-cell foamed tobacco material of the flavor segment 27 can include fibrous material such as “tobacco” (plant-based material) and “fibrous cellulose” (refer to the

incorporated-by-reference EX1005, 3:24-4:23 (“about 50 to about 98 wt. %”)), Morgan teaches that the flavor segment 27 within the cavity 30 comprises a fibrous substrate. EX1003, ¶72. Additionally, Morgan’s disclosure contemplates that the flavor segment 27 can be “any material” that liberates flavors and then claims that the tobacco flavor medium “comprises tobacco” together with the aerosol-forming liquid—again, thereby teaching a plant-based fibrous substrate. EX1004 5:34-35, 8:56-59, 8, 27-28; EX1003, ¶73.

Claim [4]

Morgan discloses that the aerosol produced by the smoking article 10 “passes at least partially through the storage compartment before exiting through the mouthpiece.” EX1003, ¶¶74-76. As described above in Element [1e], Morgan discloses that air can pass “over *or through*” flavor segment 27 in a way that “liberates flavors” by volatilizing the aerosol precursor of flavor segment 27 (to generate the “visible condensed aerosol” that “mimic[s] the appearance of cigarette smoke.” EX1004, 5:34-46 (“desirable to add an aerosol precursor”); EX1003, ¶75. Accordingly, when flavor segment 27 is placed within cavity 30, at least some of the liberated flavors (e.g., aerosol) are generated within and pass through the porous regions (and certainly the external pores) of the segment 27 before being drawn into the mouth of the user through the mouthpiece. EX1004, 5:44-46; EX1003, ¶75.

Claim [8]

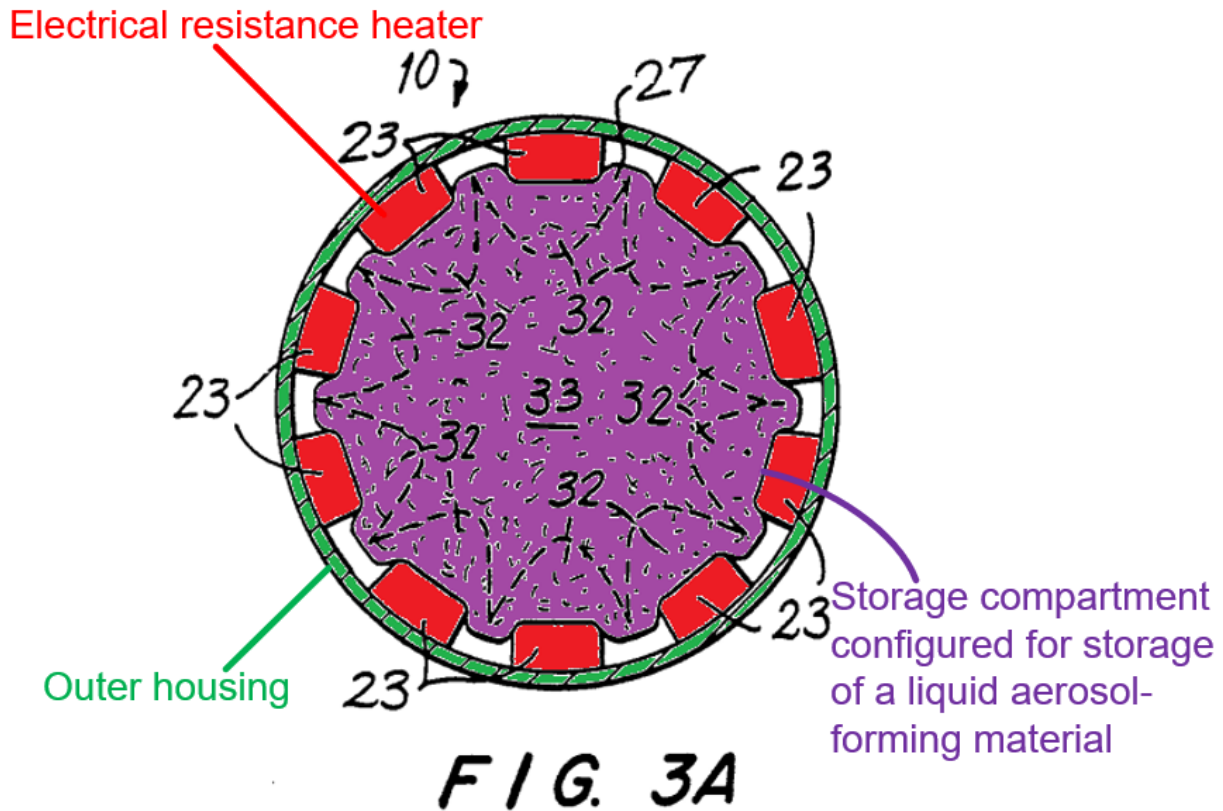
As detailed above in Elements [1e] and [3], the “storage compartment” includes Morgan’s flavor segment 27 within the cavity 30, which includes a porous substrate that contains a liquid aerosol precursor (e.g., glycerine) within its pores EX1004, 5:26-65 (“open-cell foamed tobacco” segment wherein “an aerosol precursor such as glycerine is added”), 2:26-33 (“removable portion of tobacco flavor medium”), 3:26-64, 4:44-47, FIGS 1-2 and 3A; EX1003, ¶¶77-78. Morgan teaches that the added “glycerine” or other aerosol precursor contained by the flavor segment 27 is a liquid that vaporizes when heated so to achieve “the visible condensed aerosol” that “mimic[s] the appearance of cigarette smoke.” EX1004, 5:34-46, 8:45-55 (aerosol-forming material comprises liquid such as “glycerine” and “water”); EX1003, ¶78.

Claim [9]

As detailed in Element [1d], Morgan describes a heater that includes a set of controlled heating elements that “make thermal contact with” the compressible flavor segment 27 within the cavity 30. EX1004, 3:13-37, 3:58-4:51 (“in contact with”), 5:6-65 (“press into flavor segment for intimate thermal contact”), FIG. 3A, 6:39-43, 6:50-52 (“pierce and extend into”), 6:63-7:1; EX1003, ¶¶79-80; *see also* EX1012, 23-34. For example, in FIG. 3A, because heating elements 23 have “intimate thermal contact” with flavor segment 23 and heating elements 23 are in

compressed inwardly against the flavor segment 27, the heating elements 23 are

“arranged in contact” with the storage compartment (including flavor segment 27):



EX1004, FIG. 3A (annotated); EX1003, ¶80.

Claim [10]

As detailed in Elements [1d] and [9], Morgan describes a heater that includes a set of controlled heating elements that “make thermal contact with” the compressible flavor segment 27 within the cavity 30. EX1004, 3:13-37, 3:58-4:51, 5:6-65 (“press into flavor segment for intimate thermal contact”), FIG. 3A, 6:39-43, 6:50-52, 6:63-7:1; EX1003, ¶¶81-84; *see also* EX1012, 23-34. Morgan discloses that heating elements 23 are “arranged proximate to an absorbent wicking

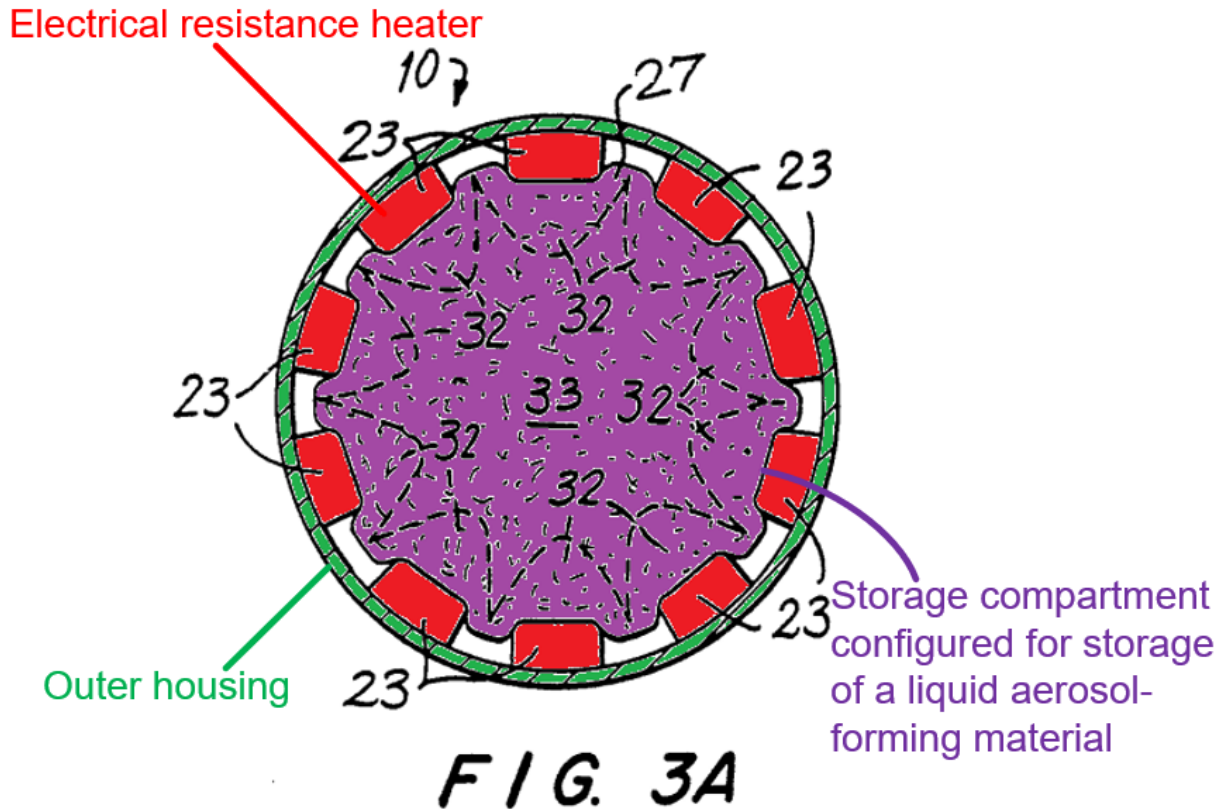
material configured for transferring the liquid aerosol-forming material to the electrical resistance heater,” as recited by claim 10. EX1003, ¶82. And as already demonstrated above in Element [1e], the flavor segment 27 can include a “open-cell foamed tobacco” substrate and an added “aerosol precursor” such as glycerine. EX1004, 5:37-42; EX1003, ¶82. Morgan teaches that such added “glycerine” or other aerosol precursor is a liquid that vaporizes when heated so that “the visible condensed aerosol may mimic the appearance of cigarette smoke.” EX1004, 5:34-65, 8:45-55 (liquid such as “glycerine” and “water”), 3:58-68. Based on Morgan’s teaching, the liquid of the added glycerine or other aerosol precursor is absorbed throughout the open cells of the foamed tobacco substrate, and thus the open-cell foamed substrate of the flavor segment 27 is an “absorbent wicking material.” EX1003, ¶83; *supra* Element [1e] (“capillary action”).

Indeed, the evidence here confirms that the open-cell foamed tobacco substrate of Morgan’s flavor segment 27 is an ***absorbent wicking material*** because the liquid aerosol precursor can wick through the open cells to areas that are exposed to the heating elements 23. *Supra*, Element [1e]. Again, as previously noted in Element [1e], in previous IPR proceedings, Patent Owner admitted that traditional capillary action of fluid is an example of wicking. *See* EX1015, 29 and 32 (citing to exhibit 2010 ¶78 in that proceeding). As was traditionally recognized, such capillary force can cause liquid to move through a lumen of a solid tube,

through pores in a substrate, or through a small gap defined between opposing walls. EX1003, ¶84. In Morgan's example, the open cells of the foamed tobacco substrate provide pores for such capillary action of a liquid (e.g., glycerine, water, or another aerosol precursor) to wick toward Morgan's heating elements and achieve "the visible condensed aerosol." EX1004, 5:34-65, 8:45-55 (liquid such as "glycerine" and "water"), 3:58-68; *supra*, Element [1e]; EX1003, ¶84.

Claim [11]

Morgan discloses at least two examples of the heater extending into the storage compartment (which includes the flavor segment within the cavity 30). EX1004, 5:6-65 ("press into flavor segment for intimate thermal contact"), FIG. 3A, 6:50-52 ("pierce and extend into"), FIGS. 7-8; EX1003, ¶¶85-87. First, Morgan teaches that the heating elements 23 of Morgan extend into the cavity 30 to thereby press into (and deform) portions of the compressible flavor segment 27. Indeed, this result is depicted in Morgan's FIG. 3A, which shows the heating elements 23 extending into the (formerly) cylindrical flavor segment 27 to thereby deform it and achieve "intimate thermal contact" with it):

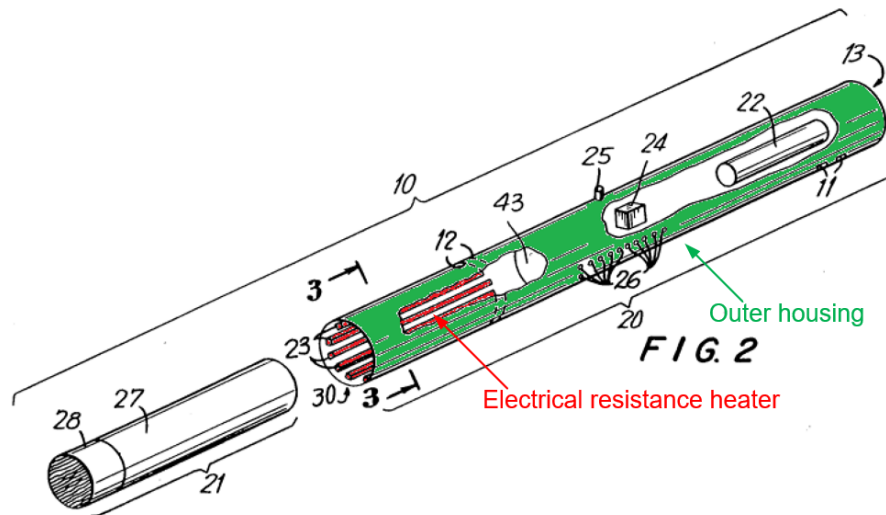


EX1004, FIG. 3A (annotated); EX1003, ¶86.

Second, Morgan teaches the option of using heating elements 71 with a different shape—“with a somewhat sharper ‘V’ tip”—to pierce into the flavor segment of the disposable portion 21. EX1004, 6:46-62, FIGS. 7-8; EX1003, ¶87. In particular, Morgan teaches that each of heating elements 71 of this optional heater configuration “actually pierce and extend into disposable portion 21 to provide the desired intimate thermal contact.” EX1004, 6:48-52. Consequently, in each of these examples, Morgan discloses that the heating elements of the *electrical resistance heater* extend into the *storage compartment*. EX1003, ¶87.

Claim [12]

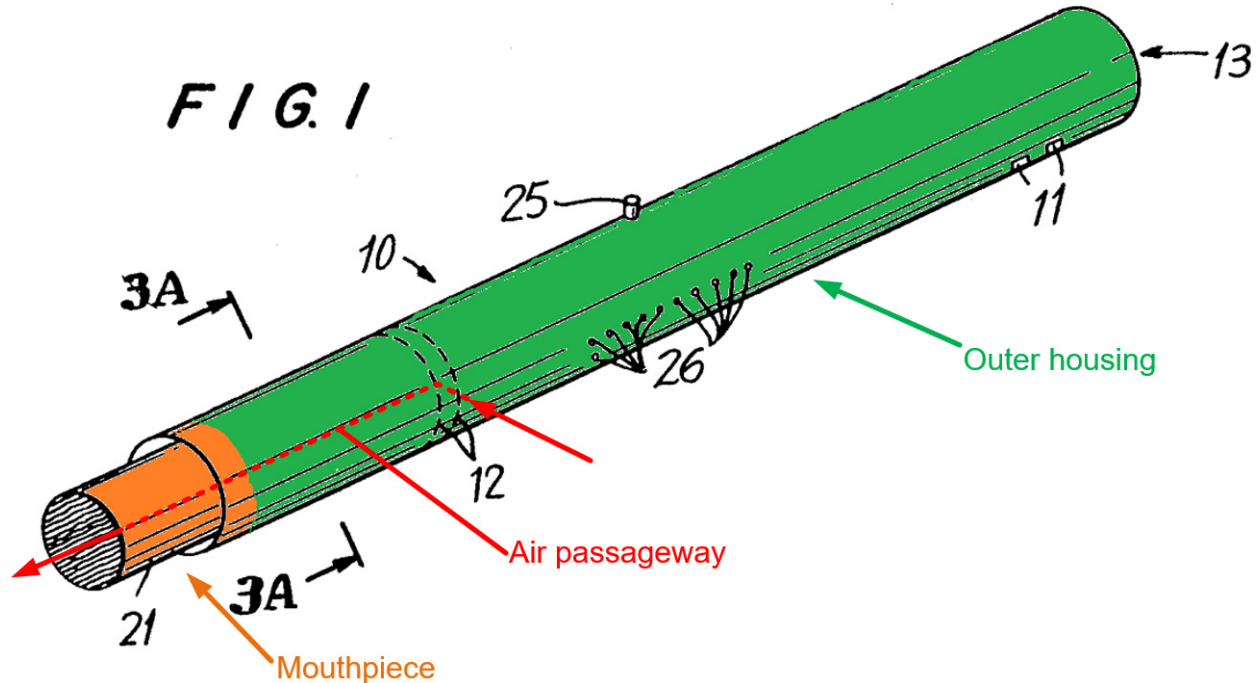
As detailed in Elements [1d] and [1f] above, Morgan discloses a heater including a set of controlled heating elements (e.g., heating elements 23, heating elements 71) that are “preferably distributed substantially uniformly around the circumference of cavity 30.” EX1004, 5:6-25, 5:47-65, 6:46-62, FIGS. 3-3A, FIGS. 7-8, 2:17-33 (“electrical heating means”), 3:13-37; EX1003, ¶¶88-91. One example is depicted in FIG. 2:



EX1004, FIG. 2 (annotated).

Morgan also discloses that the flavor segment 27 of disposable portion 21 is positioned within the center of the cavity 30 compressed between the heating elements. EX1004, 3:13-37 (“make thermal contact with”), 5:6-65 (“intimate thermal contact”), 6:46-62 (“intimate thermal contact”). Morgan discloses that air passes “over or through” the flavor segment 27 (positioned centrally between the heating elements) to “liberates flavors” during use. EX1004, 5:34-35; EX1003,

¶90. In one option, the air enters through “[p]erforations 12” of the outer housing portion 20 “to allow outside air to be drawn in during puffing.” EX1004, 5:1-3.



EX1004, FIG. 1 (annotated).

Based on Morgan’s teaching, the air passes through flavor segment 27 and thus between the heating elements of Morgan’s heater, so Morgan’s electrical resistance heater *is configured to allow airflow therethrough*. EX1003, ¶91.

Claim [13]

The ’202 Patent admits that the additional element of Claim [13] was well-known available and known in the prior art. EX1001, 21:14-21. Morgan confirms this fact and discloses that “[t]he disposable heater/flavor unit is mated to a more or less permanent unit containing a source of electrical energy such as a battery or capacitor, as well as control circuitry to actuate the heating elements in response to

a puff by a smoker on the article.” EX1004, 5:34-35; EX1003, ¶¶92-94. Morgan also expressly discloses that that electrical smoking article 10 includes a control circuit 24 which provides power to heating elements 23 based on being “actuated by...a puff-actuated sensor.” EX1004, 4:56-67, 2:22-33 (“control means”), 3:18-25 (describing the “control circuitry” and incorporating by reference U.S. Patent No. 5,060,671 (EX1013)), 6:34-37; *see also* EX1012, 18-19 (likewise acknowledging the incorporated-by-reference teaching of U.S. Patent No. 5,060,671). Based on Morgan’s teaching, the electrical smoking article 10 includes a *sensor* that is adapted for *sensing a draw by a user*. EX1003, ¶94.

B. GROUND 1B: Morgan in view of Susa would have rendered obvious claims 1, 3, 4, 8-13, 15

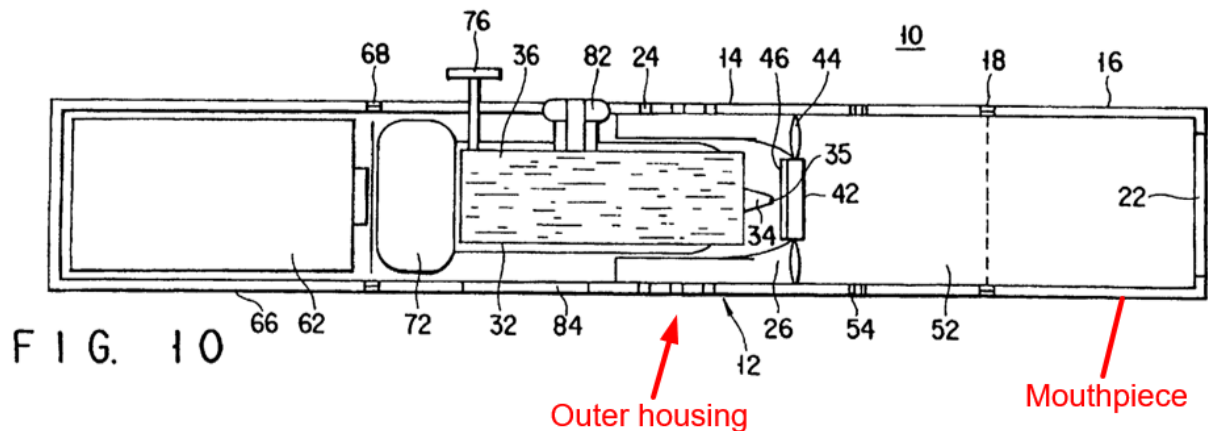
1. *Susa*

Susa is similar to Morgan in that both references describe cigarette-like electrical smoking articles that produce aerosol without burning tobacco. EX1004, 3:9-20, FIGS. 1-2; EX1006, [0001], FIG. 10; EX1003, ¶41. For example, the articles of Morgan and Susa both include an outer housing that is long and slender much like the profile of a conventional cigar or cigarette. EX1004, 4:42-5:5, FIGS. 1-2; EX1006, [0024]-[0025], FIG. 1, FIG. 10. The user inhales through one end of the outer housing in both references. EX1004, 4:42-5:5, 5:34-65, FIGS. 1-2; EX1006, [0026], [0042], FIG. 10. By the timeframe leading up to October 2006, Susa provided suggested improvements that would have predictably provided a

number of known benefits to electrical smoking articles (articulated below).

EX1003, ¶41.

For example, to the extent Patent Owner contends Morgan does not expressly disclose the claimed “mouthpiece defined at one of the two ends” of an outer housing (as recited in claim 1), such an option was conventionally implemented before 2006 in similar prior art devices, as suggested by Susa’s smoking article. EX1006, [0065]-[0068], FIG. 10; EX1003, ¶42. In particular, Susa suggests the traditional practice of using “a mouthpiece 16” that is “detachably mounted on the casing main body 14 through a connecting portion 18,” and that the mouthpiece can further include a “suction port 22” through which the user can draw the aerosol into the mouth:



EX1006, FIG. 10 (annotated), [0066], *see also* FIGS. 9 and 11-14; EX1003, ¶42.

Susa also suggests that the removable mouthpiece 16 is useful (when attached to a

main body 14) to achieve an outer housing that protects and encloses disposable materials. EX1006, [0066], [0076], FIG. 10; EX1003, ¶42.

2. *The Morgan-Susa Combination*

For the reasons articulated below, a POSITA would have been motivated to implement Morgan's article in accordance with Susa's suggested use of a detachable mouthpiece at an end of an outer housing of a smoking article. EX1003, ¶95. In the predictable combination, Morgan's electrical smoking article 10 would have predictably included a mouthpiece that removably attaches to Morgan's outer housing portion 20 to protect Morgan's disposable portion 21 (including the filter segment 28) and to mechanically retain the disposable portion 21 in Morgan's desired position within the cavity. EX1003, ¶95.

Multiple reasons would have prompted a POSITA to implement Morgan's article 10 in accordance with Susa's suggested improvement for a removable mouthpiece. EX1003, ¶95. **First**, a POSITA would have been prompted to implement Morgan's article 10 to include Susa's suggestion (removable mouthpiece that can be attached to a mating end of the outer housing of a smoking article) because the resulting article would achieve improved mechanical protection to Morgan's disposable portion 21 (including the filter 28) during use. EX1003, ¶96. Indeed, this predictable result would add mechanical support to the filter 28 of Morgan in a manner that beneficially reduces or eliminates the

application of a bending moment/torsion upon Morgan's filter 28—particularly because the user's lips would be applied to the protective mouthpiece. EX1003, ¶96. For example, the user would place her mouth on the mouthpiece of the resulting article while the filter 28 is mechanically supported within an interior of the mouthpiece, thereby advantageously allowing the mouthpiece (and the outer housing portion 20) to carry some or all of the mechanical load in the event the article is cantilevered/suspended from the user's mouth during use. EX1003, ¶96.

Second, a POSITA would have been prompted to implement Morgan's article 10 in accordance with Susa's suggested improvement for a removable mouthpiece to beneficially reduce the likelihood of inadvertent dislodgement of the filter 28/disposable portion 21 from Morgan's cavity 30 during use. EX1003, ¶97. In particular, Morgan's original filter 28 (FIGS. 1-2) may be grasped by the user's lips during use and possibly pulled away from the cavity 30 in some circumstances (e.g., when the user engages the filter 28 while outer housing 20 is freely suspended or inadvertently pulled away to overcome the retainment force from Morgan's heating elements 23), but Susa's suggested improvement would provide a removable mouthpiece that secures to the outer housing portion 20 to further secure disposable portion 21 within the cavity. EX1003, ¶97.

Third, a POSITA would have been prompted to implement Morgan's article 10 in accordance with Susa's suggested improvement for a removable mouthpiece

so that connecting the mouthpiece to the end of Morgan's outer housing portion 20 would advantageously insert the disposable portion 21 (including the flavor segment 27) to a predictable and consistent insertion distance within the cavity 30. EX1003, ¶98. In particular, to the extent the disposable portion 21 is not fully inserted by the user prior to attaching of the mouthpiece, the action of connecting the mouthpiece to the mating end of Morgan's outer housing portion 20 would induce further insertion of the disposable portion 21 to the predetermined endpoint within the cavity 30. EX1003, ¶98.

Fourth, implementing implement Morgan's article 10 in accordance with Susa's suggested improvement would beneficially allow Morgan's article 10 to have a uniform diameter, thereby more closely resembling the uniform cylindrical profile of a traditional cigarette or cigar as suggested by Susa. EX1006, [0066], FIG. 10; EX1003, ¶99.

Finally, both Morgan's article 10 and Susa's article 10 are directed to electrical smoking devices that produce aerosol without burning tobacco, and in this context, a POSITA would have possessed ample skill to successfully implement the combination as described above. EX1003, ¶100. Based upon the predictable mechanical components involved in the combination and the state of the art at the time, a POSITA would have reasonably expected success achieving

the combination before the earliest effective filing date of the '202 Patent (Oct. 18, 2006). EX1003, ¶100.

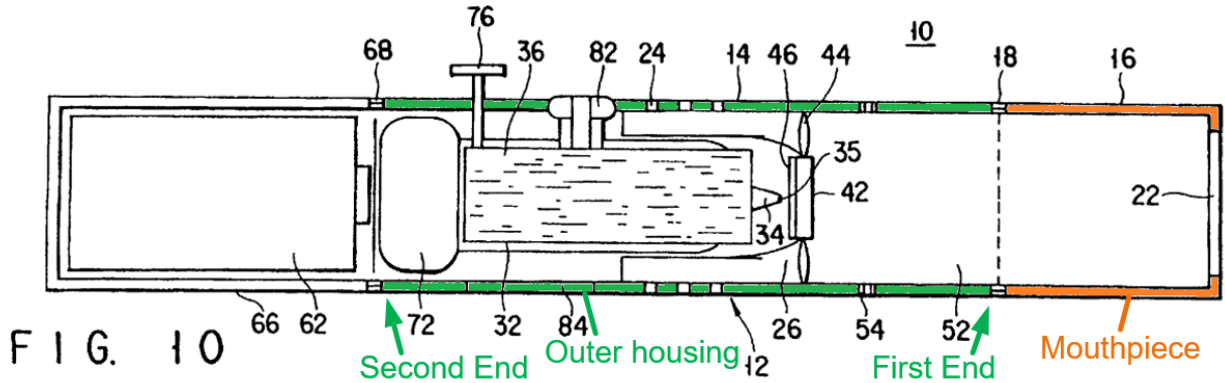
3. *Application to Challenged Claims*

Elements [1pre]-[1a], [1c]-[1e], [1g]

The Morgan-Susa combination would have provided these claim elements for at least the same reasons described above in connection with Morgan alone *See supra*, Ground 1A (§V.A.2) at Elements [1pre]-[1a], [1c]-[1e], [1g]; EX1003, ¶103.

Element [1b]

Morgan discloses that its disposable portion 21 (including the flavor segment 27 and the filter 28) is configured for insertion into Morgan's "cavity 30 at the mouth end" of the outer housing portion 20. EX1004, 4:44-47, 5:26-6:2; EX1003, ¶¶104-105. To the extent that Morgan does not expressly disclose that article 10 includes "a mouthpiece defined at one of the two ends" of the outer housing portion 20, this conventional option would have been beneficially implemented in the predictable Morgan-Susa combination. EX1003, ¶104; *supra*, §§V.B.1-V.B.2. As demonstrated above, Susa suggests that one end of an outer housing 14 of a smoking article can advantageously mate with a mouthpiece 16, which "detachably mount[s] on the casing main body 14 through a connecting portion 18." EX1006, [0066]; EX1003, ¶104.



EX1006, FIG. 10 (annotated).

As depicted in FIG. 10, Susa's removable mouthpiece 16 is defined at one of the two ends of the outer housing 14. EX1006, FIG. 10; EX1003, ¶105. For at least the four advantageous reasons expressly articulated above (*see* §V.B.2), a POSITA would have been motivated to combine Morgan and Susa such that Morgan's article 10 includes a detachable mouthpiece defined at the mouth end of Morgan's outer housing portion 20, thereby adding protection for Morgan's disposable portion 21 (including the filter segment 28) and mechanically retaining the disposable portion 21 in Morgan's desired position within the cavity 30. EX1003, ¶105.

Element [1f]

As discussed above (*see* Element [1b]), to the extent that Morgan does not disclose a "mouthpiece" as recited in claim 1, such a feature was suggested by Susa. EX1003, ¶106. Much like Morgan's article 10 is arranged so that a user can "puff" on the article to draw aerosol into her mouth, Susa's article 10 defines a

suction port 22 “through which the user inhales the flavor.” EX1004, 5:1-3; EX1006, , FIG. 10 (port 22), [0026]; EX1003, ¶106. Thus, in the predictable Morgan-Susa combination, Morgan’s heated *aerosol* would have been predictably drawn into the mouth of the user of article 10 *through the mouthpiece*. EX1006, [0065]-[0073], FIGS. 9-10; EX1003, ¶106.

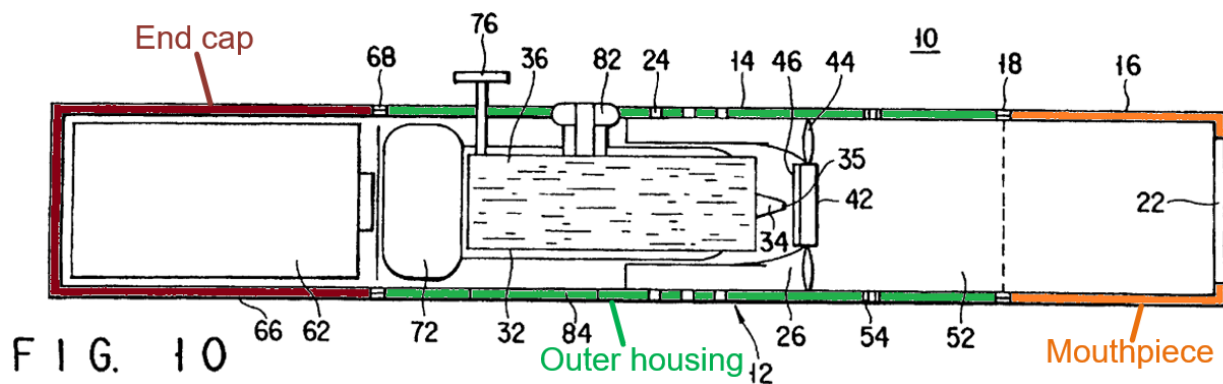
Claims [3], [4], and [8]-[13]

The Morgan-Susa combination would have rendered obvious Claims [3], [4], and [8]-[13] for at least the reasons described above in connection with Morgan alone (*see* Ground 1A, Claims [3], [4], and [8]-[13]); EX1003, ¶¶107-122.

Claim [15]

The ’202 Patent admits that Claim [15] was well-known available and known in the prior art. EX1001, 20:20-25. The predictable Morgan-Susa combination confirms this. EX1003, ¶¶123-126. For example, Morgan’s outer housing portion 20 includes a “far end 13” that is near the power source 22 and opposite from the mouth end. EX1004, 4:48-5:5, FIGS. 1-2; EX1003, ¶124. To the extent Patent Owner contends Morgan does not expressly disclose the claimed “end cap” at this far end (as recited in claim 15), such an option was conventionally implemented before 2006 in similar prior art devices, as suggested by Susa’s smoking article. EX1006, [0073], FIG. 10; EX1003, ¶124.

For example, Susa discloses an *end cap* (e.g., power supply holder 66) defined at *a second of the two ends* of an *outer housing* (e.g., casing main body 14). EX1006, [0065]-[0073], FIGS. 9-10; EX1003, ¶125. This *second of the two ends* where power supply holder 66 is defined is opposite a *first of the two ends* of Susa's *outer housing* where mouthpiece 16 is defined. EX1006, [0065]-[0073], FIGS. 9-10; EX1003, ¶125. For example, Susa's power supply 62 "is stored in a power supply holder 66 which is detachably mounted on the casing main body 14 through a connecting portion 68." EX1006, [0073], FIGS. 9-10; EX1003, ¶125. As shown, power supply holder 66 and mouthpiece 16 are defined at opposite ends of casing main body 14.



EX1006, FIG. 10 (annotated).

A POSITA would have been motivated to implement Morgan's article 10 to include an end cap (as suggested by Susa's holder 66) so that power source 22 within Morgan's reusable portion 20 was readily accessible for simplified replacement. EX1003, ¶126. Again, Morgan discloses that the power source 22 can

be a “battery,” which may be exhausted or otherwise in need of replacement.

Based on Susa’s suggestion, a POSITA would have been motivated to implement an end cap structure on the end of Morgan’s article 10 (near the battery 22) so as to provide a simple access path for battery replacement without disturbing or engaging Morgan’s other internal components (e.g., controller 24, heating elements 23, etc.). EX1003, ¶126. Further, based upon the predictable mechanical components involved in this combination and the state of the art at the time, the evidence here confirms that a POSITA would have has a reasonable expectation of success in achieving this predictable combination before the earliest effective filing date of the ’202 Patent (Oct. 18, 2006). EX1003, ¶126.

C. GROUND 2A: Gupta, which incorporates Howell by reference, anticipates claims 1, 4, 8, 9, 13

1. Gupta

Similar to the ’202 Patent, Gupta discloses an “aerosol generating device” that uses an electrical power source. EX1007, [0008], [0038]-[0040], [0045], [0049], FIG. 1. The electrical power source of Gupta’s device delivers electrical current to a heater so that the heater volatilizes liquid to produce vapor. EX1007, [0039]-[0041], [0043], [0045], FIG. 1. The vapor combines with air to create aerosol. EX1007, [0059]. The aerosol generating device includes a source of liquid aerosol formulation and a heated flow passage for transporting liquid to the heater.

EX1007, [0039]-[0041], [0042]-[0047], [0049]-[0051], [0061] FIG. 1. Gupta's

device is shown below in FIG. 1.

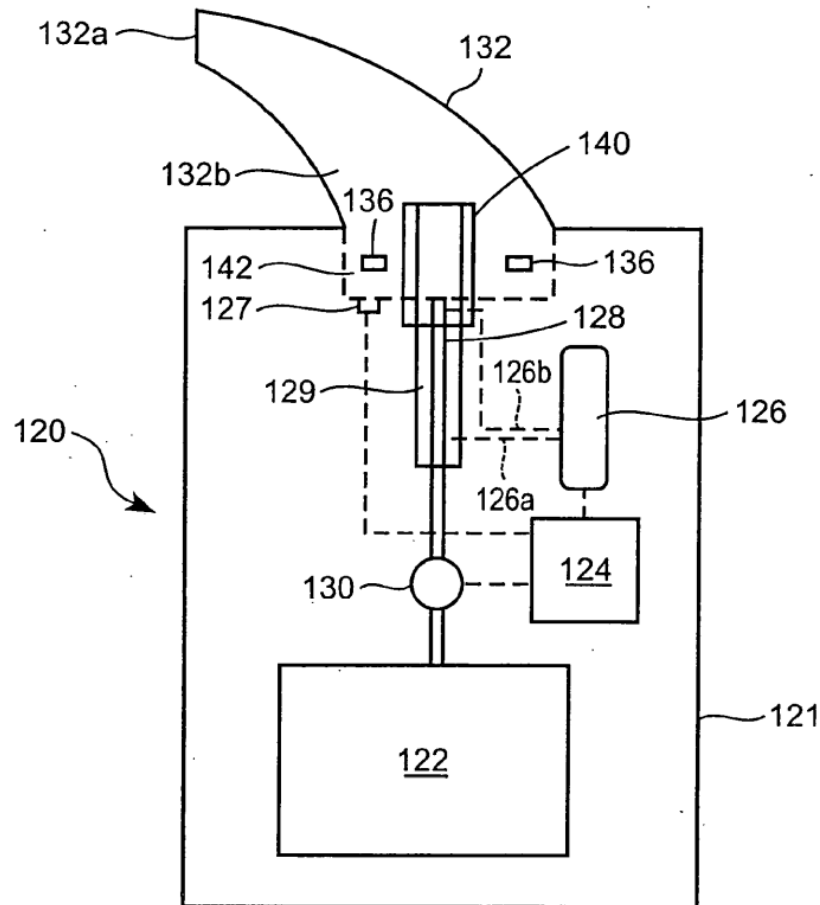


FIG. 1

EX1007, FIG. 1.

The flow passage of Gupta's aerosol generating device is "capillary sized" and is also referred to as a "capillary passage." EX1007, [0040]-[0041], FIG. 1.

This means that traditional capillary action drives liquid through the flow passage to the heater. EX1007, [0039]-[0043], FIG. 1. There are several possible embodiments of Gupta's heater including the heater being part of the flow passage

and a separate heater located along the flow passage. EX1007, [0040]-[0041], [0043], [0045], [0048], FIG. 1.

2. *Application to Challenged Claims*

Element [1pre]

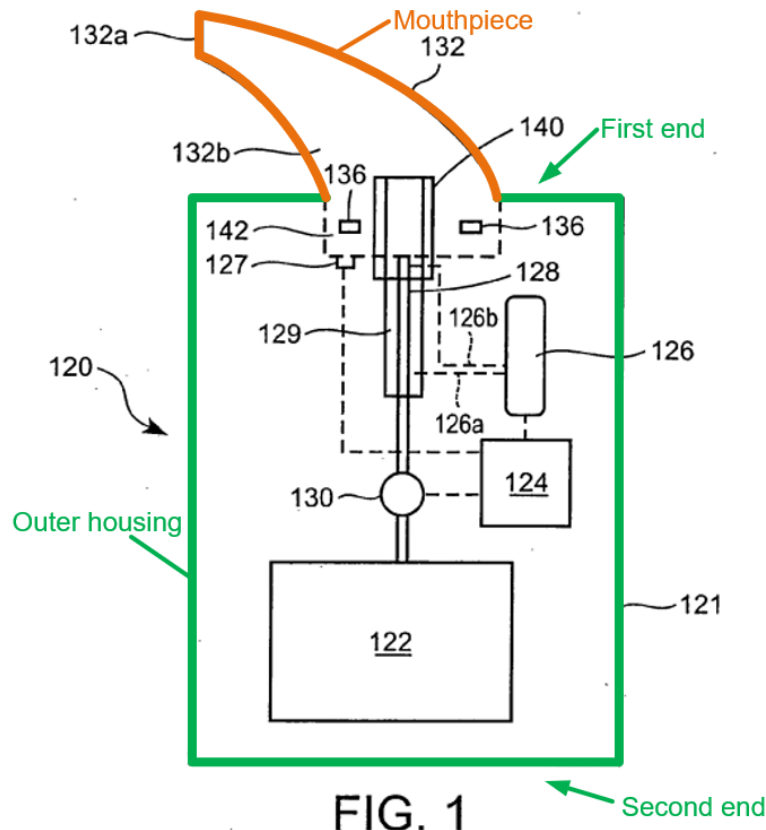
To the extent the preamble is treated as a limitation and the Board considers the recited smoking article to encompass aerosol inhaler devices that provide a smoke-like appearance during use (EX1001, 14:15-38 (“considered to be ‘smoke-like’”)), Gupta discloses such an article. EX1003, ¶129. For instance, Gupta discloses an aerosol-generating article (e.g., aerosol generating device 120). EX1007, [0038]-[0057]. This aerosol generating device 120 includes power supply that provides electricity to other components of the device, meaning that aerosol generating device 120 is electrically-powered. EX1007, [0039] (“a power source 126”), [0040], [0045], FIG. 1. Moreover, Gupta’s device 120 produces “a condensation aerosol” to be “inhaled by a user drawing on the mouthpiece” and employs the same type of aerosol-forming material (“propylene glycol”) described in the ’202 Patent as providing the “smoke-like” appearance. EX1007, [0059], [0013], [0061], [0065]; EX1003, ¶129; *see also* EX1001, 14:15-38.

Element [1a]

Gupta discloses Element [1a]. EX1003, ¶¶131-132. Gupta’s aerosol generating device 120 comprises an ***outer housing*** (e.g., housing 121) having ***two ends***—including a first end where a mouthpiece 132 is defined and a second end

opposite the first end. EX1007, [0009], [0039], [0049]-[0050]. Gupta's outer

housing 121 and mouthpiece 132 is shown below:



EX1007, FIG. 1 (annotated).

Element [1b]

Gupta discloses Element [1b]. EX1003, ¶133. Gupta's aerosol generating device 120 includes a ***mouthpiece*** (e.g., mouthpiece 132) that is ***defined at one of the two ends*** of housing 121. EX1007, [0009], [0039], [0049]-[0050]. For example, as depicted above (*see* Element [1a]), the mouthpiece 132 of Gupta is defined at a first end of the ***outer housing*** (e.g., the “top” of housing 121), the first

end opposite a second end of housing 121 (e.g., the “bottom” of housing 121).

EX1007, [0039], FIG. 1; EX1003, ¶133.

Element [1c]

Gupta discloses Element [1c]. EX1003, ¶¶134-135. For example, Gupta discloses an ***electrical power source*** (e.g., power source 126) in the form of a “battery” that is arranged within the ***outer housing*** (e.g., housing 121) of the aerosol generating device 120. EX1007, [0039]-[0040], [0043], [0045], FIG. 1. As shown below in FIG. 1, the power source 126 is ***arranged within the outer housing*** (e.g., housing 121) of aerosol generating device 120:

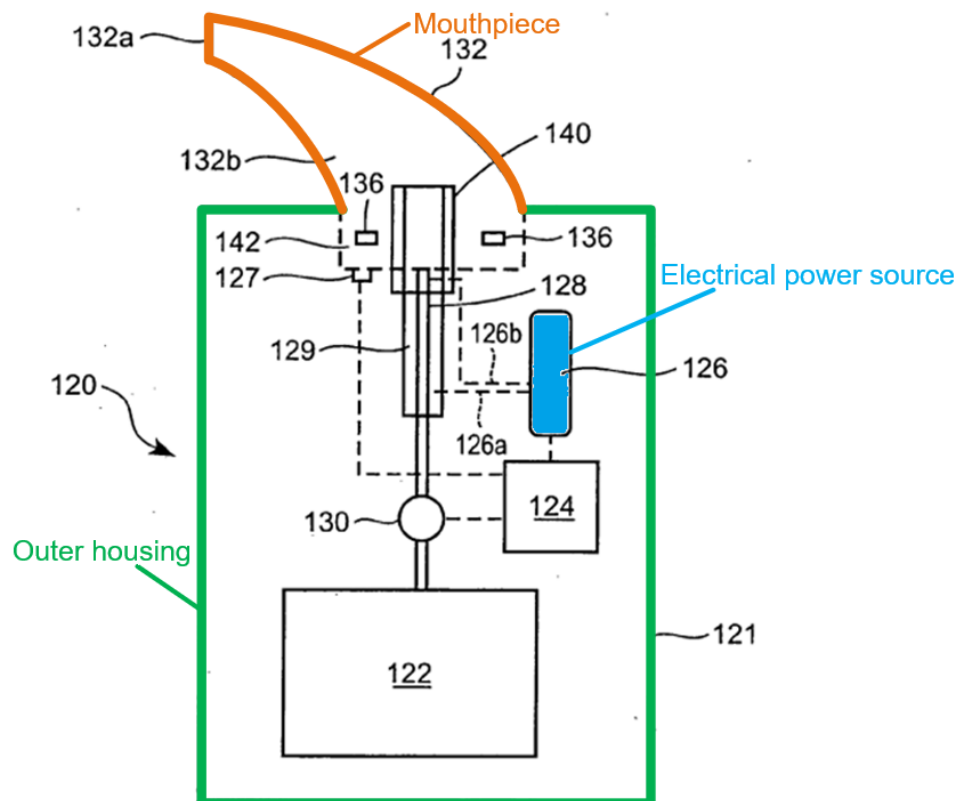


FIG. 1

EX1007, FIG. 1 (annotated).

Element [1d]

Gupta discloses Element [1d]. EX1003, ¶¶136-138. Namely, Gupta discloses a controller 124 that is “operably connected to the power source 126...to operate a **heater** arranged to heat liquid” in a “heated flow passage 128.” EX1007, [0039]-[0047], [0049]-[0051], FIG. 1. Gupta discloses several embodiments for the **heater** of aerosol generating device 120—all of these embodiments involve an **electrical resistance heater** positioned within housing 121. EX1007, [0039]-[0041], [0043] (“resistive heating material” and being located “as a section of metal tubing forming the flow passage” or as “a separate heater...located along the flow passage”), [0045], [0047]-[0049]; EX1003, ¶136. The option where Gupta’s heater is a section of metal tubing is depicted below:

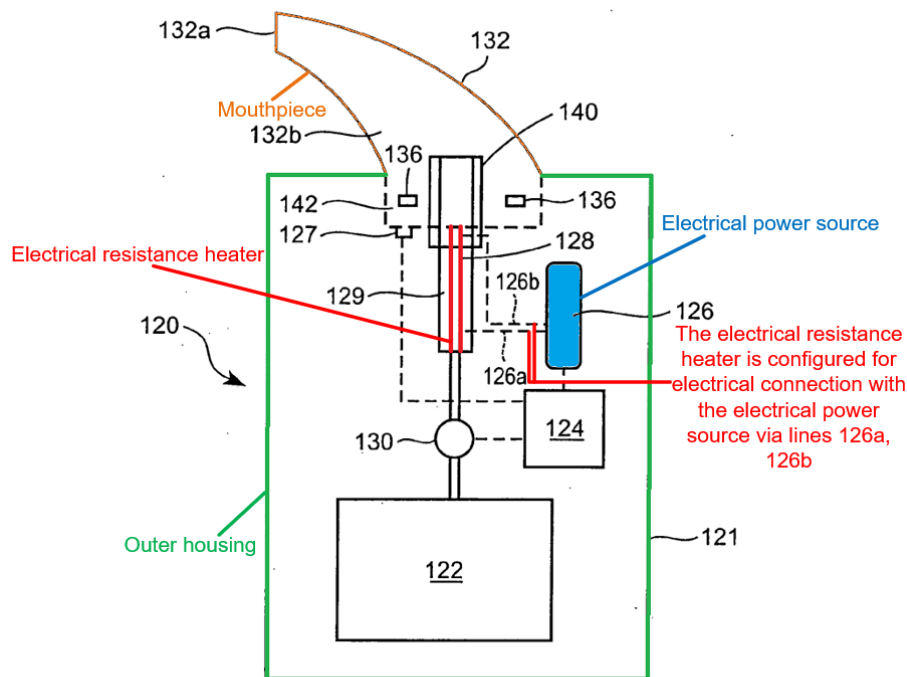


FIG. 1
EX1007, FIG. 1 (annotated).

Gupta discloses that “direct current can be passed through resistive heating material via electrical lines 126*a*, 126*b* attached to positive and negative electrodes of [a] battery,” which means that Gupta’s *electrical resistance heater* is *configured for electrical connection* with power source 126. EX1007, [0045], FIG. 1; EX1003, ¶137.

To provide an example of a “separate heater located along the flow passage” (from Gupta’s [0043]), Gupta incorporates by reference U.S. Patent No. 5,743,251 (“Howell,” EX1008). EX1007, [0048]. This incorporated-by-reference disclosure teaches that a “power supply 29 is sized to provide sufficient power for [a] heating element 27 that heats the portion of [a] tube 23.” EX1007, 5:35-55; FIG. 1 (depicting heating element 27 as a resistor). Gupta expressly teaches that such a heater can be in the form of a “thin platinum layer, located along the flow passage” of Gupta’s device. EX1007, [0048].

Element [1e]

Gupta discloses Element [1e]. EX1003, ¶¶139-142. For example, Gupta discloses that aerosol generating device 120 includes a *storage compartment* including at least the source 122, the heated flow passage 128, body 129, and an aerosol confinement sleeve 140. EX1007, [0039], [0044], FIG. 1. As depicted below in FIG. 1, the source 122, flow passage 128, body 129 and aerosol

confinement sleeve 140 define a connected volume and collectively represent a

storage compartment. EX1007, FIG. 1; EX1003, ¶139.

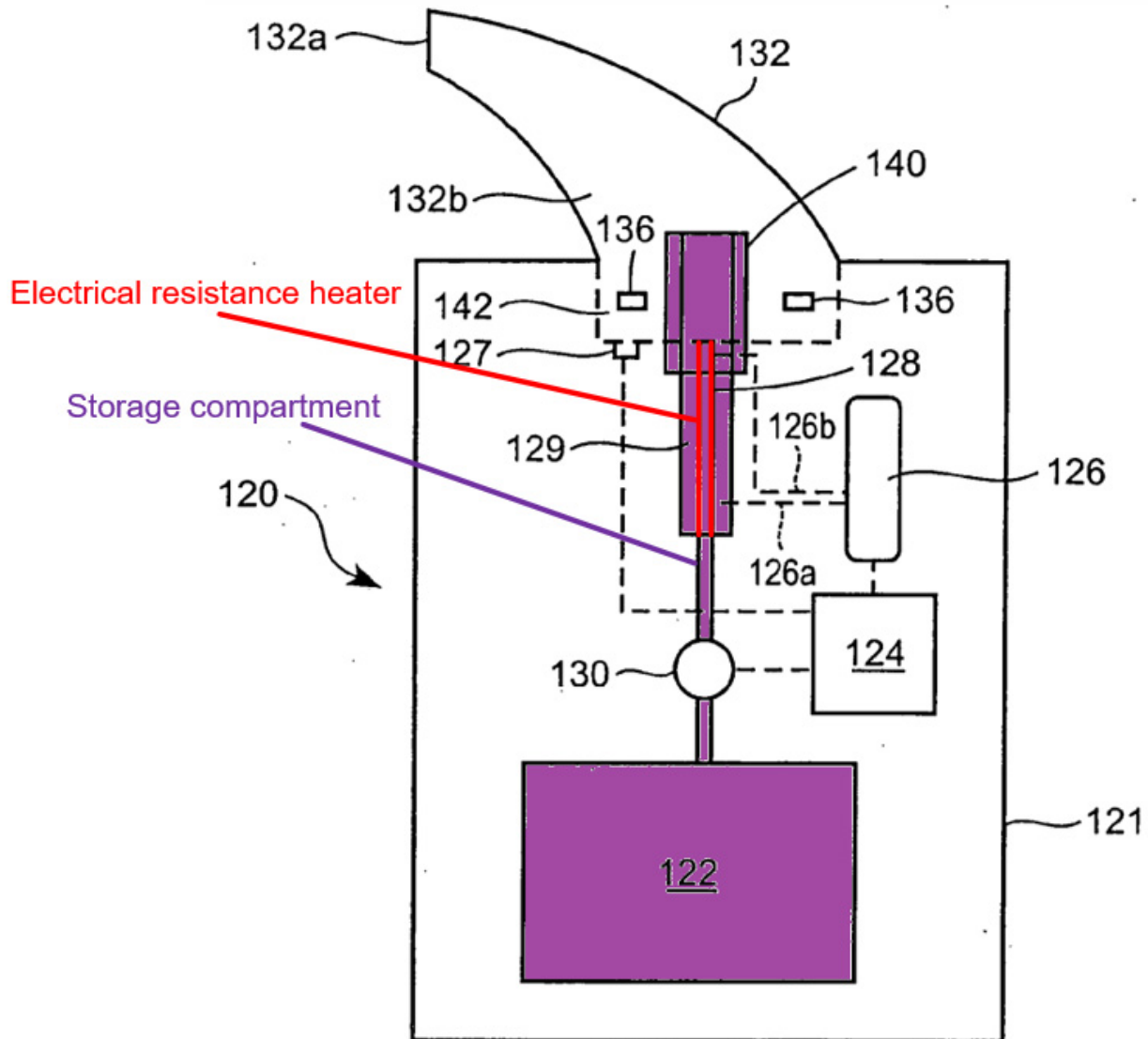


FIG. 1

EX1007, FIG. 1 (annotated).

As shown above, Gupta's *storage compartment* is defined within the *outer housing* (e.g., housing 121) of the aerosol generating device 120. EX1007, FIG. 1.

Furthermore, Gupta discloses that the *storage compartment* of source 122, flow passage 128, body 129, and aerosol confinement sleeve 140 is *configured for storage of a liquid aerosol-forming material*. EX1007, [0045] (“liquid within the flow passage 128”), [0061] (“The source 122 may contain a suitable liquid aerosol formulation”), [0040], FIG. 1; EX1003, ¶140. The liquid aerosol formulation within source 122 and heated flow passage 128 eventually *forms aerosol* when heated by the *electrical resistance heater*. EX1007, [0050]-[0062].

Because 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. EX1007, [0040]-[0041], [0043], [0045], [0047], FIG. 1; EX1003, ¶142. For example, 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*. EX1003, ¶142.

Accordingly, based on Gupta’s teaching that source 122 and heated flow passage 128 hold a liquid aerosol formulation and that heated flow passage 128 is a capillary passage, Gupta teaches that the liquid aerosol formation *can be wicked into contact with* the *electrical resistance heater*. EX1007, [0039]-[0041], [0043], [0045]-[0047], [0061], FIG. 1; EX1003, ¶142.

Element [1f]

Gupta discloses Element [1f]. EX1003, ¶¶143-145. Gupta expressly discloses that an *air passageway* exists *through at least a portion* of the *outer housing* of aerosol generating device 120. EX1007, [0049] (“air passages 136” and “passes into the interior space 132b”), FIG. 1. The air can pass into openings within the boundaries of housing 121 and subsequently flow through mouthpiece 132:

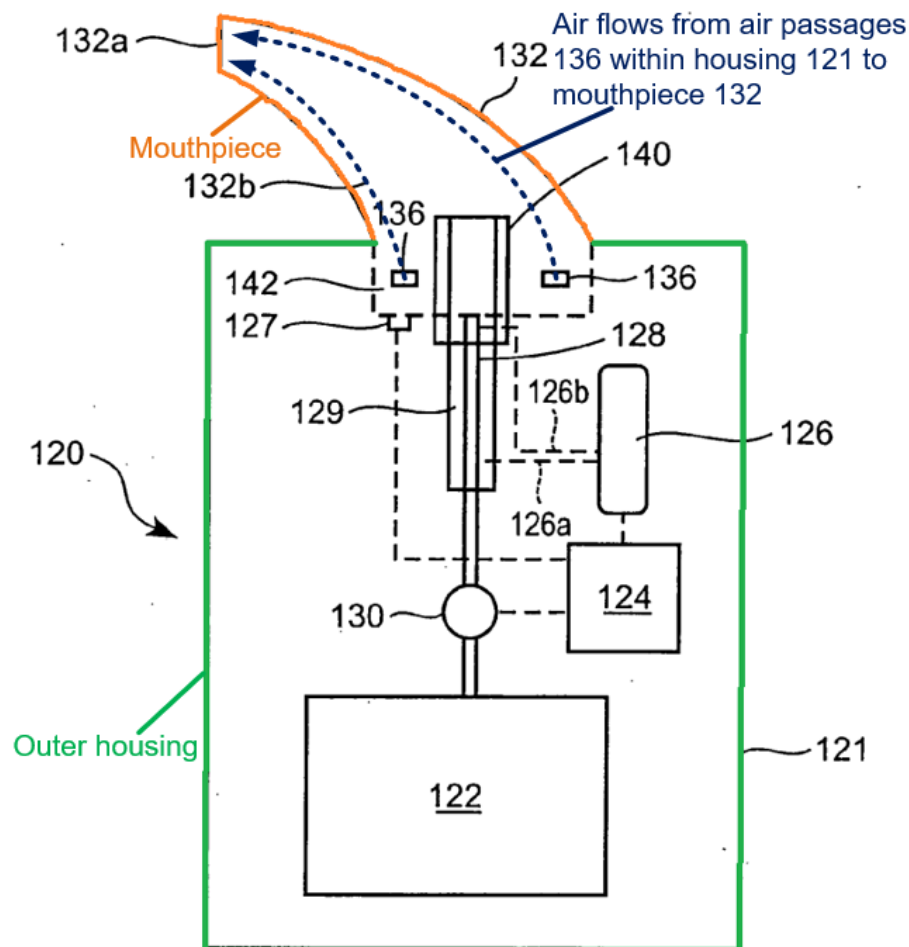


FIG. 1

EX1007, FIG. 1 (annotated).

Furthermore, Gupta expressly discloses that *air* that is *drawn into the outer housing* of device 120 through the one or more air passages 136 combines with *volatilized liquid aerosol-forming material* to produce an *aerosol*. EX1007, [0049], FIG. 1; EX1003, ¶144. The *aerosol* that is formed when air mixes with the *volatilized liquid* can be drawn into the mouth of the user through the *mouthpiece*. EX1007, [0049], FIG. 1; EX1003, ¶145.

Element [1g]

Gupta discloses Element [1g]. EX1003, ¶¶146-147. For example, Gupta discloses a *controller* (e.g., controller 124) that is “operably connected to the power source 126, the sensor 127 and valve 130 to...operate a heater arranged to heat liquid in the flow passage 128.” EX1007, [0040]; EX1003, ¶146. Because Gupta discloses that sensor 127 is a “pressure sensor” that can detect “vacuum pressure applied to the mouthpiece 132 by a user attempting to inhale aerosol from the aerosol generating device 120,” this means that sensor 127 can detect a *draw* on device 120. EX1007, [0039], [0050]; EX1003, ¶146. And Gupta’s controller 124 activates current flow through an electrical resistance heater based on detecting a draw on device 120. EX1007, [0040] (“to operate a heater”); [0050]. Moreover, Gupta expressly incorporates by reference Howell’s disclosure (EX1007, [0048]), which plainly teaches that the device should be implemented “with a puff-actuated sensor” that is used to controllably activated the “heater” to

“volatilize[]” the aerosol-forming material in the tube. EX1008, 6:10-16, FIG. 1, 3:3-59. For each of these reasons, Gupta discloses that a ***controller*** can activate current flow through an ***electrical resistance heater*** in response to a draw on device 120. EX1003, ¶147.

Claim [4]

As discussed above in Element [1e], Gupta discloses a ***storage compartment*** configured for storage of a ***liquid aerosol-forming material*** that includes source 122, heated flow passage 128, and aerosol confinement sleeve 140. EX1007, [0039]-[0046], [0049]-[0051], [0061]; EX1003, ¶¶148-150. Gupta discloses that an ***electrical resistance heater*** volatilizes liquid in the heated flow passage 128, and the volatilized liquid admixes with air in aerosol confinement sleeve 140 to create ***aerosol***. EX1007, [0045] (“to be vaporized”), [0059], FIGS. 1-2. Gupta also discloses that “[t]he aerosol exits from the outlet end of the aerosol confinement sleeve 140 and is inhaled by a user drawing on the mouthpiece 132.” EX1007, [0059], FIGS. 1-2. Because aerosol confinement sleeve 140 is part of Gupta’s storage compartment and aerosol travels from the aerosol confinement sleeve 140 out of mouthpiece 132, Gupta discloses that ***aerosol*** passes ***at least partially through the storage compartment*** before exiting ***through the mouthpiece***. EX1003, ¶150.

Claim [8]

As detailed above in Elements [1e] and [4], the “storage compartment” of Gupta’s device 120 includes source 122, heated flow passage 128, body 129, and aerosol confinement sleeve 140. EX1007, [0039]-[0046], [0049]-[0051], [0061]. In several instances, Gupta expressly discloses parts of the *storage compartment* hold *liquid*. EX1007, [0039], [0043], [0046], [0061], FIG. 1 Because Gupta discloses a storage compartment and expressly discloses that some parts of this compartment can hold liquid, Gupta’s *storage compartment* is configured as a *container* for holding *liquid*. EX1003, ¶¶151-152.

Claim [9]

As detailed above in Element [1d], Gupta discloses at least two embodiments of an *electrical resistance heater*—including a first embodiment where the electrical resistance heater is formed by part of the tubing of flow passage 128 and a second embodiment where a separate heater is located along flow passage 128. EX1007, [0039]-[0041], [0043] [0045], [0047]-[0049]. In the first embodiment, the *electrical resistance heater* is *arranged in contact with the storage compartment* because the heater portion of flow passage 128 is in direct physical contact with the liquid inside of flow passage 128, body 129, and other portions of the storage compartment. EX1003, ¶154. In the second embodiment, because the *electrical resistance heater* is “located along” the flow passage 128

and can heat liquid within flow passage 128, the *electrical resistance heater* is *arranged in contact with the storage compartment*. EX1003, ¶¶153-154.

Claim [13]

As detailed above in Element [1g], Gupta discloses that device 120 includes a sensor 127 that can detect a draw by a user. EX1007, [0039] (“The aerosol generating device 120 comprises...an optional sensor 127”), [0050] (“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”), FIG. 1. This means that aerosol generating device 120 of Gupta includes a *sensor* adapted for sensing the *draw* by a user. EX1003, ¶¶155-156.

D. GROUND 2B: Gupta in view of Takeuchi would have rendered obvious claims 1, 3, 4, 8-13, 15

1. Takeuchi

Takeuchi is similar to Gupta because both of these references disclose an electrical handheld device that produces aerosol. EX1007, [0008]-[0010], [0038]-[0039], [0049]-[0051], FIGS. 1-2; EX1009, 1:59-67, 2:1-16, FIG. 1. The devices of Gupta and Takeuchi both include an outer housing where a mouthpiece is defined at an end of the outer housing. EX1007, [0039], FIG. 1; EX1009, 4:30-47, 7:45-56, FIG. 1. Both devices include a compartment holding a liquid aerosol-forming material and a capillary tube for transporting this liquid to a heater for volatilization, the volatilized liquid mixing with air to create aerosol. EX1007,

[0039]-[0061], FIGS. 1-2; EX1009, 4:26-7:56, FIG. 1. Takeuchi provided suggested improvements that would have predictably provided known benefits to Gupta's device (articulated below). EX1003, ¶45.

For example, to the extent that Patent Owner contends that Gupta does not expressly disclose a controller “configured to activate current through the heater in response to a draw on the device” (Element [1g]), such an option was conventionally implemented in similar prior art devices, as suggested by Takeuchi. EX1009, 4:23-62, FIG. 1 (below); EX1003, ¶46. In particular, Takeuchi suggests using a “sensor 52” to detect “the inhalation action of a use[r].” EX1009, 6:23-29. Takeuchi also suggests that a “heater 42 and [a] power source 44 are driven[] under the control of [a] control circuit 46,” and that “[t]he control circuit 46 serves to start up the heater 42...in accordance with the inhaling action of the user based on the signal from the sensor 52.” EX1009, 6:23-25, 6:55-58, FIG. 1.

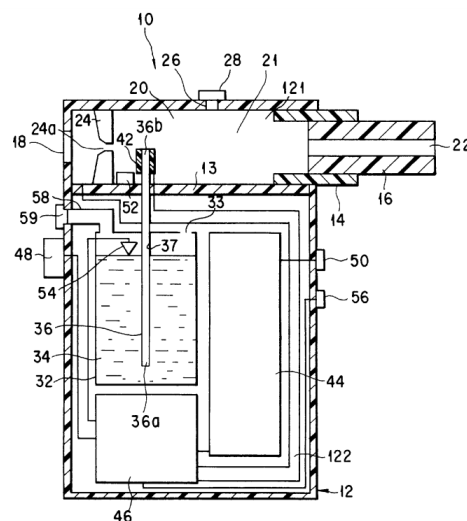


FIG. 1

Furthermore, to the extent that the Patent Owner contends that the preamble of claim 1 is limiting and Gupta does not expressly disclose a “smoking article,” Takeuchi suggests that such an aerosol-generating device can “contain tobacco components” therein for use “as a simulated smoking article.” EX1009, 5:40-46. Known benefits of such an implementation are addressed below.

2. *The Gupta-Takeuchi Combination*

In the predictable combination articulated below, the controller 124 of Gupta’s aerosol generating device 120 would have activated current flow through Gupta’s electrical resistance heater in response to the sensor 127 of Gupta detecting draw on the aerosol generating device 120, as suggested by Takeuchi. EX1003, ¶157. Furthermore, in the combination, Gupta’s aerosol generating device 120 would have been used as a smoking article in which tobacco components deliver tobacco flavor satisfaction via the aerosol, as suggested by Takeuchi. EX1003, ¶157.

Multiple reasons would have prompted a POSITA to implement Gupta’s device 10 in accordance with Takeuchi’s suggested improvements. **First**, a POSITA would have been prompted to implement Gupta’s device 120 so that controller 124 causes power source 126 to deliver power to the electrical resistance heater in response to sensor 127 detecting a user draw (as suggested by Takeuchi) because this would have limited the heater to drawing power during times when

the user is drawing on the device. EX1003, ¶158. In doing so, the resulting combination would have advantageously preserved/extended the life of power source 126 so that aerosol generating device 120 can last longer on a single charge. EX1003, ¶158. For example, the controller 124 of Gupta's device 120 would activate the heater only when the user is attempting to inhale aerosol, thereby advantageously preventing the heater from needlessly drawing power when the user is not attempting to inhale aerosol. EX1003, ¶158.

Second, a POSITA would have been prompted to implement Gupta's device 120 so that controller 124 activates the heater in response to a draw as suggested by Takeuchi to prevent the heater from producing heat when the device 120 is not in use. EX1003, ¶159. For example, if the heater of Gupta's device 120 were activated for extended periods of time when the device is not in use, this could result in the heater damaging other components of the device 120, causing discomfort to the user, exhausting a supply of aerosol-forming liquid in device 120, or any combination thereof. EX1003, ¶159. Limiting the heater to drawing power only when a user is drawing on the device 120 would have prevented these undesirable events from occurring. EX1003, ¶159.

Third, implementing the liquid aerosol formation of Gupta's device 120 in accordance with Takeuchi's suggested use of tobacco components with the aerosol-forming substances would have advantageously provided a user with

aerosol that simulates a smoking experience. EX1009, 5:40-46, EX1003, ¶160.

Some users desire to consume tobacco products or otherwise experience tobacco flavor satisfaction without inhaling combustion smoke that is produced from burning tobacco and other materials, and this combination would have resulted in aerosol-generating smoking article that can deliver such a simulated smoking experience. EX1003, ¶160.

Finally, both Gupta's device 120 and Takeuchi's device 10 are directed to electrical aerosol-producing devices, and in this context, a POSITA would have possessed ample skill to successfully implement the combination as described above. EX1003, ¶161. Based upon the predictable mechanical components involved in the combination and the state of the art at the time, a POSITA would have reasonably expected success achieving the combination before the earliest effective filing date of the '202 Patent (Oct. 18, 2006). EX1003, ¶161.

3. *Application to Challenged Claims*

Element [1pre]

As articulated above, the predictable Gupta-Takeuchi combination would have provided a modification to Gupta's device 120 in which tobacco components are used deliver tobacco flavor satisfaction via the aerosol. EX1003, ¶164; *supra*, §§V.D.1-V.D.2. Again, Takeuchi suggests that such an aerosol-generating device can be used as a "simulated smoking article" including a storage compartment that

holds a combination of an aerosol-forming liquid and “tobacco components.”

EX1009, 5:28-46, FIG. 1. For at least the advantageous reasons expressly articulated above (*see* §V.D.2), a POSITA would have been motivated to implement Gupta’s device 120 in a manner (as suggested by Takeuchi) to achieve the recited “smoking article.” EX1003, ¶164.

Elements [1a]-[1f]

The Gupta-Takeuchi combination would have provided these claim elements for at least the same reasons described above in connection with Gupta alone *See supra*, Ground 2A (§V.C.2) at Elements [1a]-[1f]; EX1003, ¶166.

Element [1g]

As detailed above (*see* Ground 2A, Element [1g]), Gupta discloses a ***controller*** (e.g., controller 124) that is “operably connected to the power source 126, the sensor 127 and valve 130 to...operate a heater arranged to heat liquid in the flow passage 128.” EX1007, [0040]; EX1003, ¶167. Sensor 127 can detect a user’s draw on device 120 because sensor 127 is a “pressure sensor” that can detect “vacuum pressure applied to the mouthpiece 132 by a user attempting to inhale aerosol from the aerosol generating device 120.” EX1007, [0039], [0050]; EX1003, ¶167. Gupta discloses that a “valve 130 may be opened either prior to or subsequent to detection...of vacuum pressure applied to the mouthpiece 132 by a user attempting to inhale aerosol” and “[l]iquid passing through the flow

passage 128 is heated to a sufficient temperature to volatilize the liquid.” EX1007, [0050].

To the extent that Gupta does not expressly disclose that controller 124 activates current flow through the heater “in response to a draw on” device 120, this conventional option would have been beneficially implemented in the predictable Gupta-Takeuchi combination. EX1003, ¶168; *supra*, §§V.D.1-V.D.2. Because Takeuchi expressly discloses that its control circuit 46 can “start up” its heater 42 based on sensor 52 detecting an inhaling action of a user, in the resulting Gupta-Takeuchi combination the controller 124 would activate Gupta’s electrical resistance heater based on sensor 127 detecting a draw on device 120. EX1009, 6:23-42, FIG. 1; EX1003, ¶168. For at least the advantageous reasons expressly articulated above (*see* §V.D.2), a POSITA would have been motivated to combine Gupta and Takeuchi such that Gupta’s controller 124 activates current flow through Gupta’s heater in response to a draw on device 120. EX1003, ¶168.

Claim [3]

The predictable Gupta-Takeuchi combination would provide this element. EX1003, ¶¶170-173. For example, as detailed above (*see* Ground 2A, Elements [1e] and [4]), the “storage compartment” of Gupta’s device 120 includes source 122, heated flow passage 128, body 129, and aerosol confinement sleeve 140. EX1007, [0039]-[0046], [0049]-[0051], [0061]. Gupta discloses that liquid can

flow through heated flow passage 128 to reach a heater that volatilizes the liquid.

EX1007, [0050], FIG. 1. Takeuchi's device 10 includes a storage compartment including a container 32 for holding liquid and a capillary tube 36 for carrying the liquid to a heater 42, much like the storage compartment Gupta's device 120 includes a source 122 for holding liquid and a heated flow passage 128 for carrying the liquid to a heater. EX1007, [0039]-[0046], [0049]-[0051], [0061], FIG. 1; EX1009, 3:35-50, 5:47-6:22, FIG. 1.

To the extent that Patent Owner contends that Gupta's storage compartment does not comprise a "fibrous substrate," such an option was conventionally implemented before 2006 in similar prior art devices, as suggested by Takeuchi's smoking article. EX1009, 3:35-50, 10:50-63, FIG. 1, FIG. 14; EX1003, ¶171. For instance, Takeuchi discloses that "the liquid passageway through which [a] liquid flavor source is transported by [] capillary force can be constituted by...an intercommunicating void or pore structure filled in an enclosure," and that "[r]epresentative examples of the structure include open-cell foamed structure, and bundled fibers." EX1009, 3:35-50. Given that Takeuchi's capillary tube 36 can include "bundled fibers," Takeuchi teaches that capillary tube 36—which is part of Takeuchi's storage compartment—comprises a "fibrous substrate." EX1009, 3:35-50; EX1003, ¶171.

A POSITA would have been motivated to implement Gupta's aerosol generating device 120 to include bundled fibers within heated flow passage 128, as suggested by Takeuchi, so that an ability of liquid to flow through heated flow passage 128 by capillary action is improved. EX1003, ¶172. For example, Takeuchi discloses that the extent to which capillary force can elevate a liquid within a capillary tube can depend upon the width of the capillary tube or a diameter of voids or pores in the fibrous substrate that fills the capillary tube. EX1009, 3:51-4:8; EX1003, ¶172. In general, narrower passageways and pores allow for greater elevation of liquids through capillary action. EX1009, 3:51-4:8; EX1003, ¶172 ("this means that narrower pores result in greater liquid elevation"). Consequently, a POSITA would have been motivated to implement Gupta's heated flow passage 128 with a fibrous substrate as suggested by Takeuchi because gaps and pores between the fibers are narrower than the width of flow passage 128, thus improving capillary flow of liquid from source 122 to the heater. EX1003, ¶173.

Claims [4], [8], [9], and [13]

The Gupta-Takeuchi combination would have rendered obvious Claims [4], [8], [9], and [13] for at least the reasons described above in connection with Gupta alone (*see* Ground 2A, Claims [3], [4], [9], and [13]); EX1003, ¶¶174-179, 187-188.

Claim [10]

The predictable Gupta-Takeuchi combination would provide this element.

EX1003, ¶¶181-182. For example, as detailed above, (*see* Claim [3]), a POSITA would have been motivated to modify the heated flow passage 128 of Gupta to include a pore structure including open cells and bundled fibers. EX1009, 3:31-50; EX1003, ¶181. A POSITA would have understood that this pore structure within heated flow passage 128 represents an ***absorbent wicking material*** configured for transferring liquid aerosol-forming material to an ***electrical resistance heater***. EX1003, ¶181. Indeed, in prior IPRs, Patent Owner admitted that capillary action through porous materials is an example of wicking. *See* EX1015, 29.

As detailed above (*see* Ground 2A, Elements [1d] and [9]), Gupta discloses an ***electrical resistance heater*** positioned within housing 121, and this electrical resistance heater is ***arranged in contact*** with a ***storage compartment*** including heated flow passage 128. EX1007, [0039]-[0041], [0043], [0045], [0047]-[0049]; EX1003, ¶182. Because the Gupta-Takeuchi combination involves heated flow passage 128 being filled with an ***absorbent wicking material***, Gupta's ***electrical resistance heater*** is arranged proximate to this ***absorbent wicking material*** within heated flow passage 128. EX1003, ¶182.

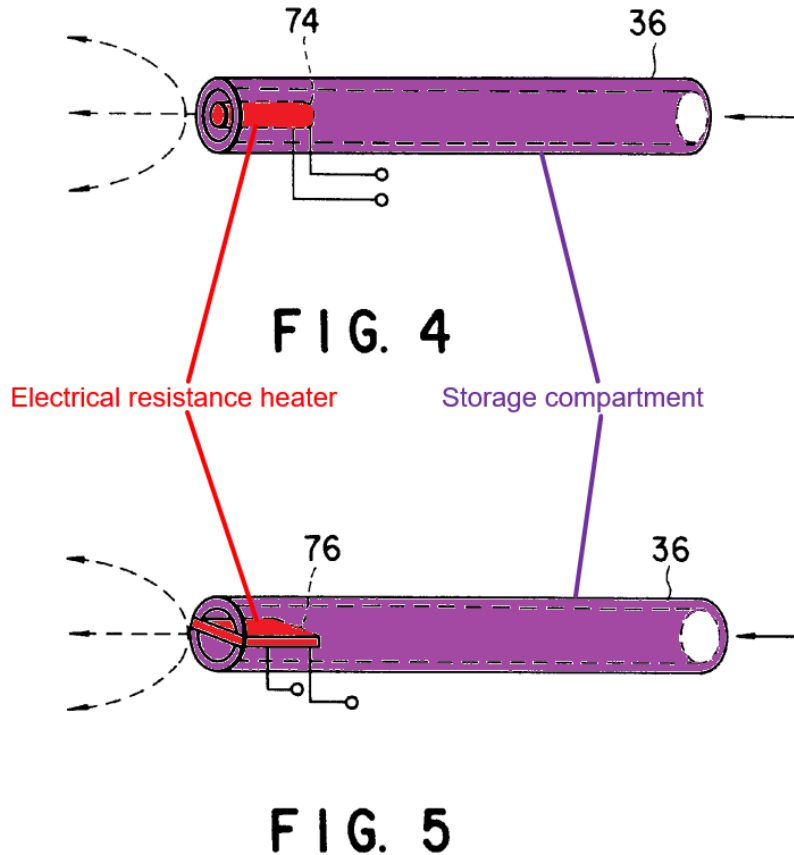
Claim [11]

The predictable Gupta-Takeuchi combination would provide this element.

EX1003, ¶¶184-186. For example, as detailed above (*see* Ground 2A, Elements

[1d]-[1e]), Gupta discloses at least two embodiments for an *electrical resistance heater* positioned within housing 121, and Gupta discloses that a storage compartment includes heated flow passage 128. EX1007, [0039]-[0041], [0043] (“tubing forming the flow passage” or a separate heater “along the flow passage”), [0047]-[0050]; EX1003, ¶184. To the extent that Patent Owner argues that Gupta does not disclose an electrical resistance heater that *extends into* Gupta’s *storage compartment*, Takeuchi suggests using this beneficial option. EX1003, ¶184.

In particular, Takeuchi discloses at least two embodiments where an *electrical resistance heater* extends into capillary tube 36. EX1003, ¶185. These include (1) a first embodiment where “a rod-like heater 74 is inserted into the outlet port 36a of the capillary tube 36” and (2) a second embodiment where “a plate-like heater 76 is inserted into the outlet port 36a of the capillary tube 36.” EX1009, 6:22-26, FIGS. 4-5. Takeuchi’s heater embodiments are depicted below in FIGS. 4 and 5:



EX1009, FIGS. 4-5 (annotated).

A POSITA would have been motivated to implement Gupta's aerosol generating device 120 to include an electrical resistance heater that extends into heated flow passage 128, as suggested by Takeuchi, so that heat radiates from the electrical resistance heater outward into liquid within heated flow passage 128. EX1003, ¶186. For example, when the heater forms part of heated flow passage 128 or is outside of heated flow passage 128, at least some of the heat radiating from the heater does not reach the liquid within heated flow passage 128. However, when the heater extends into the heated flow passage 128 as suggested by Takeuchi, all the radiated heat reaches the liquid. EX1003, ¶186.

Claim [15]

The predictable Gupta-Takeuchi combination provides this element.

EX1003, ¶¶190-192. For example, Gupta and Takeuchi both disclose a device including a storage compartment for holding a liquid aerosol-forming material.

EX1007, [0039], FIG. 1; EX1009, 5:28-30, FIG. 1. Takeuchi discloses that “[a] pouring port 58 for replenishing the liquid flavor Source 34 is connected to the liquid container 32” and that “a removable cap 59 is provided in the exposed end portion of the pouring port 58.” EX1009, 7:18-30, FIG. 1. This removable cap 59 represents an *end cap*—one that Takeuchi suggests should be positioned at the end of the outer housing opposite from the mouth piece 16:

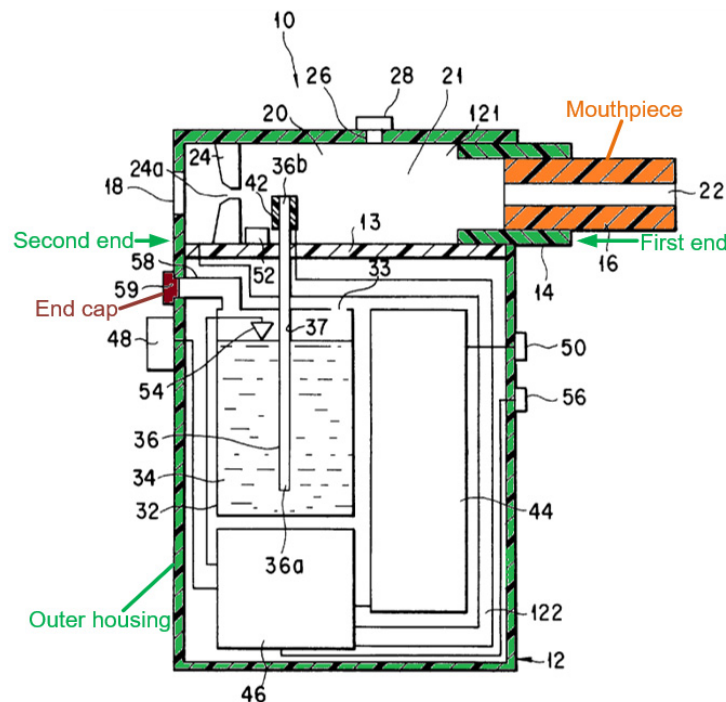


FIG. 1

EX1009, FIG. 1 (annotated); EX1003, ¶190.

A POSITA would have been motivated to implement Gupta’s device 120 to include an *end cap* (as suggested by Takeuchi) so that liquid within source 122 can be refilled when the liquid is depleted. EX1003, ¶191. Again, Gupta discloses that source 122 includes a “liquid aerosol formulation” which depletes as the liquid is vaporized to produce aerosol. EX1007, [0039]-[0040], [0045]-[0046], FIG. 1.

Based on Takeuchi’s suggestion, a POSITA would have been motivated to implement an end cap structure on the end of Gupta’s device 120 (near source 122) so as to provide a simple access path for fluid replacement without disturbing or engaging Gupta’s other components (e.g., controller 124, battery 126, valve 130).

E. GROUND 3: Takeuchi anticipates claims 1, 3, 8-11, 13, 15

1. *Takeuchi*

Takeuchi was introduced above. *Supra*, Ground 2B (§§V.D.1-V.D.3). IN Ground 3, the Petition demonstrates why Takeuchi alone anticipates claims 1, 3, 8-11, 13, and 15 under §102(b).

2. *Application to Challenged Claims*

Element [1pre]

Even if the preamble is treated as a limitation, Takeuchi discloses the recited “electrically-powered, aerosol-generating smoking article.” EX1003, ¶¶193-196. In a prior IPR, Patent Owner’s expert admitted that “Electronic Cigarettes (‘e-cigarettes’) were well-known ... since at least the mid-1990s, as demonstrated by, for example, the ... Takeuchi reference[.]” EX1014, 16. Takeuchi confirms this

fact and discloses a “flavor-generating device 10” that is *electrically-powered*.

EX1009, 4:26-38, 6:12-22, FIG. 1; EX1003, ¶195. Takeuchi’s device 10 is also *aerosol-generating* smoking article. EX1009, 5:28-39, 10:5-13, 1:4-9 (“for enjoying simulated smoking”), 5:40-46, FIG 1; EX1003, ¶196.

Element [1a]

Takeuchi’s device 10 includes an *outer housing* having *two ends*, and the *outer housing* includes casing 12 and the inhalation port holder 14. EX1009, 4:25-38, FIG. 1; EX1003, ¶¶197-198; *see also* EX1016, 27 (patent owner admission regarding Takeuchi’s housing). The *outer housing* of device 10 is depicted below in FIG. 1:

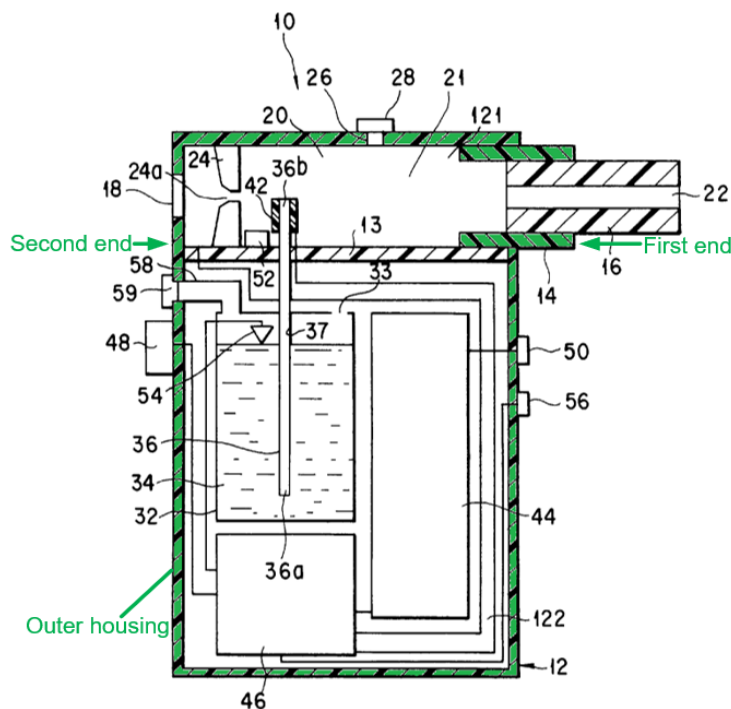


FIG. 1
EX1009, FIG. 1 (annotated).

Element [1b]

Takeuchi describes a ***mouthpiece*** defined at ***one of the two ends*** of the ***outer housing*** of device 10. EX1009, 4:39-47 (“A mouth piece 16...is detachably inserted into the holder 14”), 7:48-56; *see also* EX1016, 28 (patent owner admission regarding Takeuchi’s mouth piece). The ***mouthpiece*** of device 10 is depicted below in FIG. 1, defined at a first end of the ***outer housing***.

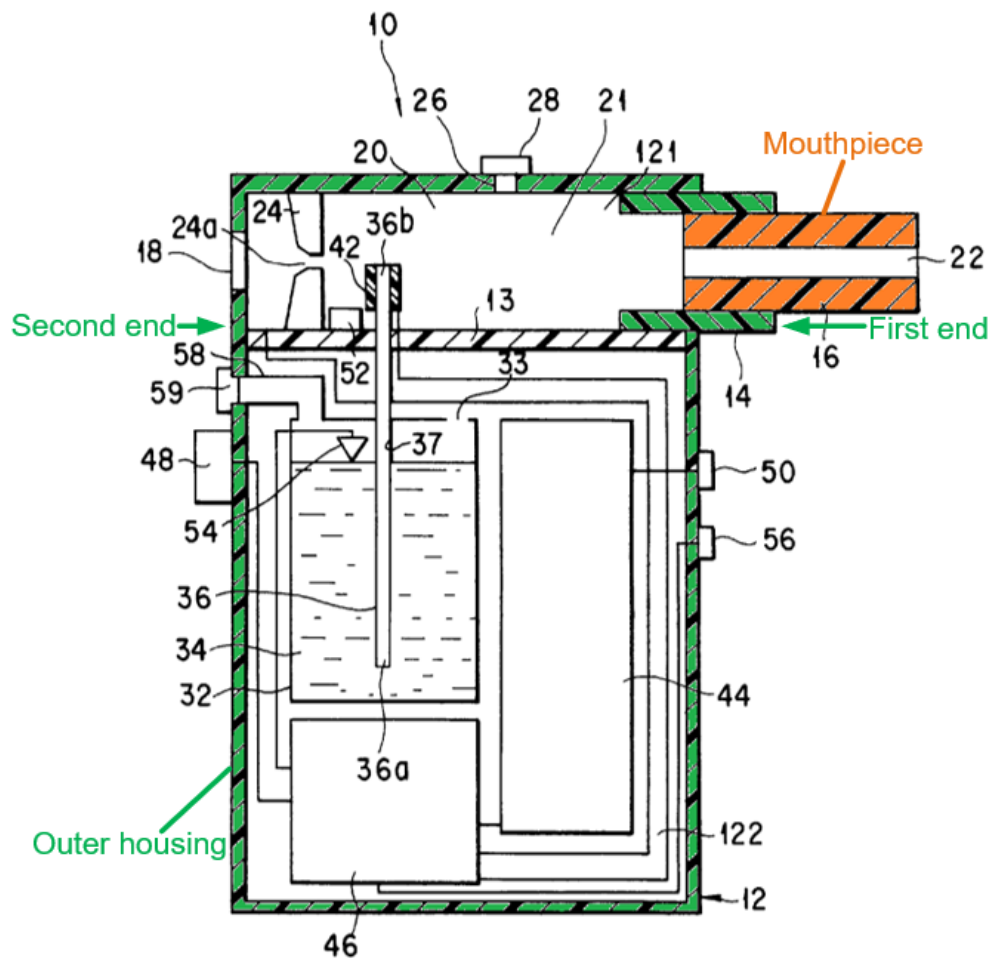


FIG. 1

EX1009, FIG. 1 (annotated).

Element [1c]

Takeuchi's power source 44 provides an ***electrical power source*** arranged within the ***outer housing*** of device 10, as recited by Element [1c]. for example, Takeuchi discloses that "casing 12 is partitioned into an upper chamber 121 and a lower chamber 122" and that "the lower chamber 122 is used as a housing for...a power source 44." EX1009, 4:30-38, 6:4-22 ("DC power source" such as a "battery"), FIG. 1; EX1003, ¶200; *see also* EX1016, 33 (patent owner admission regarding Takeuchi's battery).

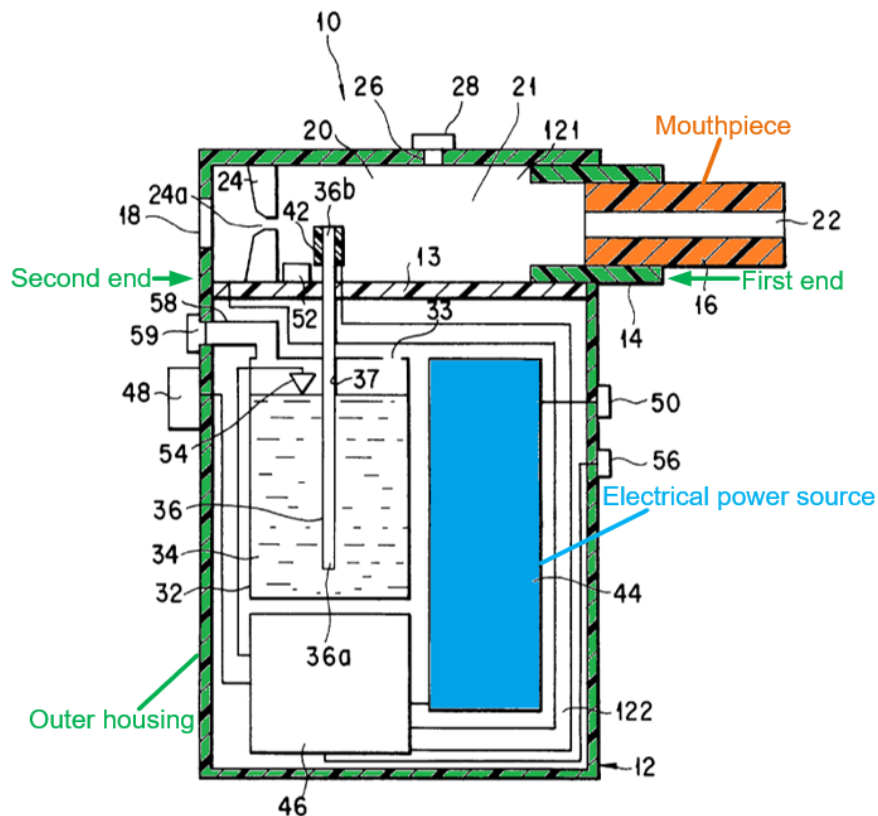


FIG. 1

EX1009, FIG. 1 (annotated).

Element [1d]

Takeuchi discloses several embodiments of an ***electrical resistance heater*** positioned within the outer housing of device 10. EX1009, 6:4-22, 8:19-21, 8:22-23, 8:24-25, FIG. 1, FIGS. 3-5; EX1003, ¶¶201-202. An embodiment where “the outlet port 36a of the liquid passageway 36 is formed by the heater 42” is depicted below in FIG. 1. EX1009, 6:4-22, FIG. 1.

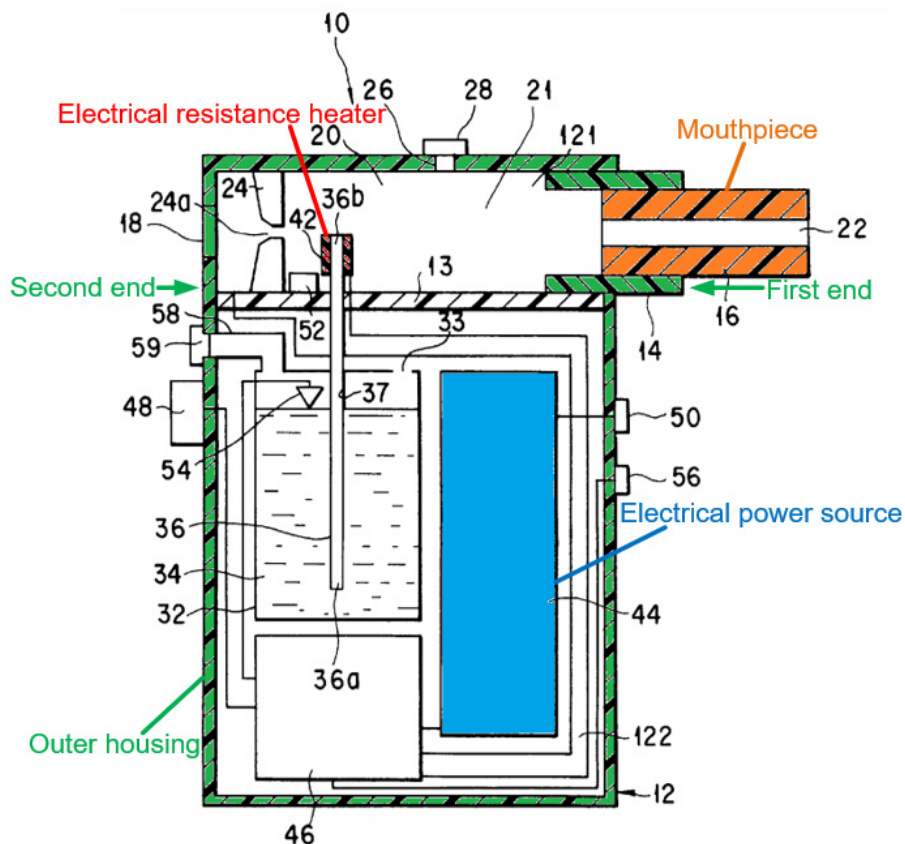


FIG. 1
EX1009, FIG. 1 (annotated).

Because 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*. EX1009, 6:5-22, 7:48-56; EX1003, ¶202.

Element [1e]

Takeuchi discloses a *storage compartment* defined within the *outer housing* of device 10, the storage compartment including liquid container 32 and liquid passageway 37. EX1009, 5:28-39 (“housing a liquid flavor source 34”), 5:47-52 (“capillary tube”), 6:4-22 (“is formed by the heater 42 itself”); FIG. 1; EX1003, ¶¶203-204. Takeuchi’s *storage compartment* is depicted below in FIG. 1.

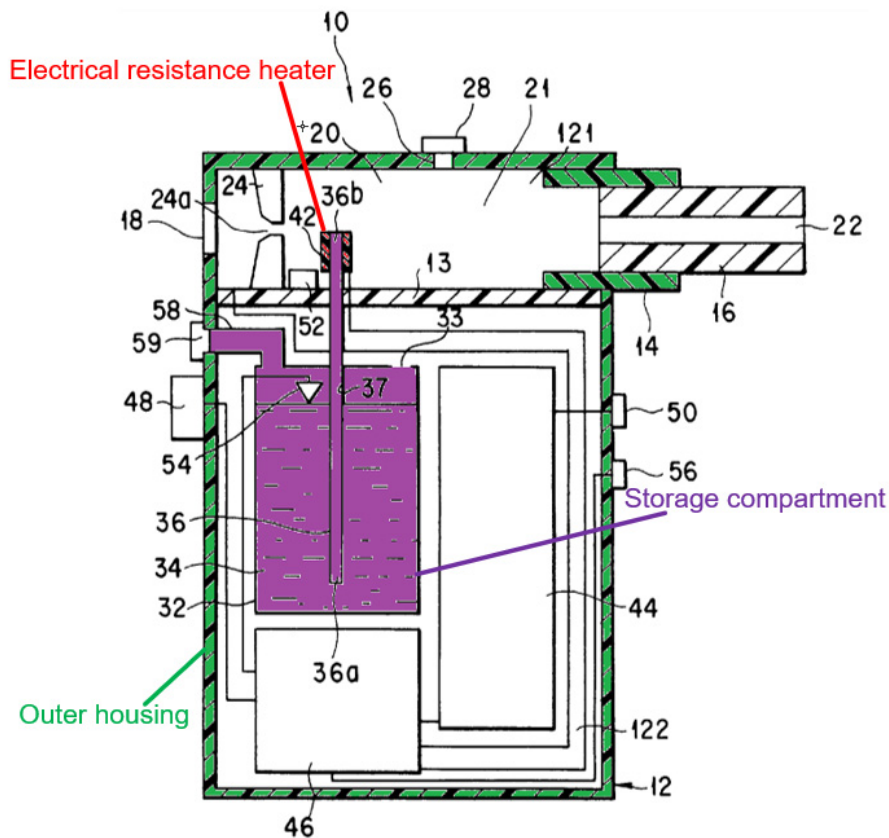


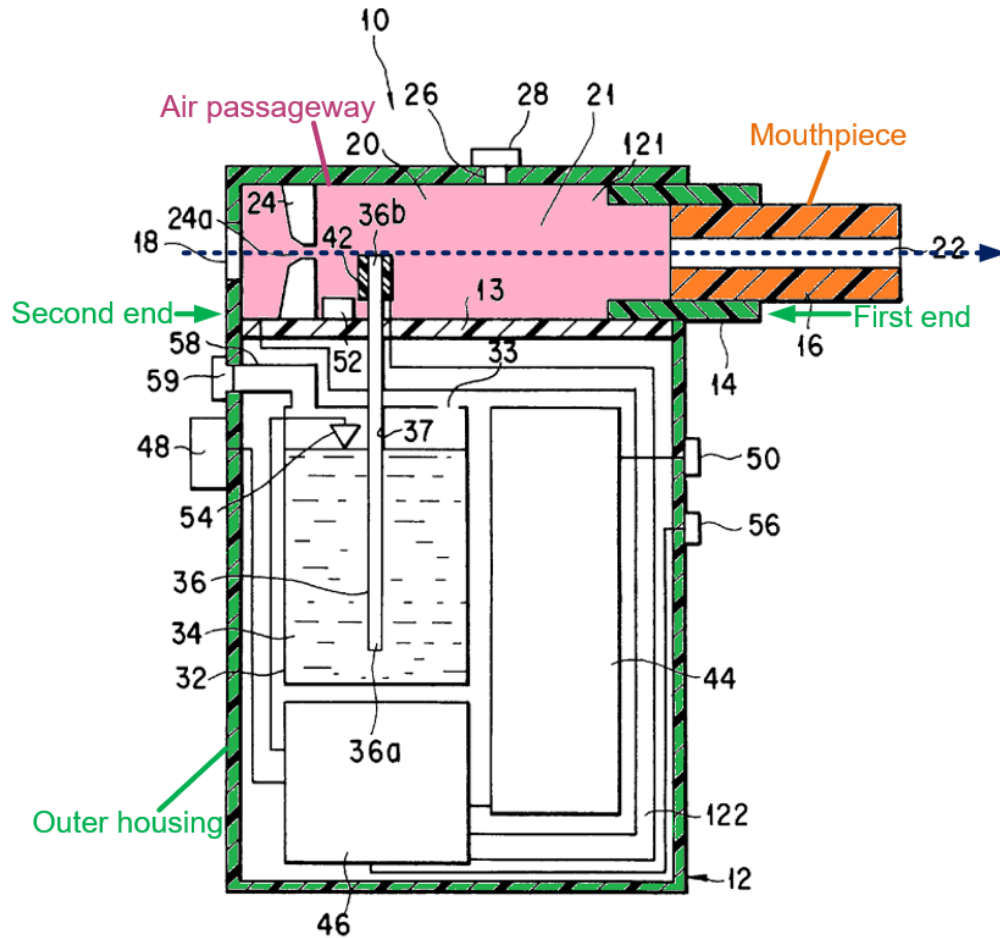
FIG. 1

EX1009, FIG. 1 (annotated).

Based on Takeuchi's teaching that "it is possible for the liquid flavor source 34 to contain a substance forming aerosol when heated," the *liquid* that is stored within Takeuchi's storage compartment includes an *aerosol-forming material*. EX1009, 5:28-39; EX1003, ¶204. Furthermore, Takeuchi discloses that the *storage compartment* is arranged such that the *liquid aerosol-forming material* can be *wicked into contact* with an *electrical resistance heater* to volatilize the *liquid aerosol-forming material*. EX1003, ¶204. For example, capillary tube 36 transports the liquid flavor source by traditional "capillary force," which Patent Owner admitted is an example of wicking. EX1015, 29. Capillary tube 36 transports the liquid to heater 42 so that the heater *volatilizes* the *liquid aerosol-forming material* EX1009, 6:4-22 ("heater 42 serving to gasify the liquid flavor source"); 6:55-62, 8:1-4.

Element [1f]

Takeuchi discloses Element [1f]. EX1003, ¶¶205-206. Takeuchi expressly discloses that an *air passageway* exists through at least a portion of the *outer housing*. EX1009, 4:30-38; 4:48-67; 7:57-8:15. For instance, Takeuchi discloses that a "gas passageway 20 is defined within the upper chamber 121 of the casing 12, between the air intake port 18 and the inhalation port 22." EX1009, 4:50-52. The *air passageway* of Takeuchi is illustrated below:



EX1009, FIG. 1 (annotated).

The air passageway 20 of Takeuchi is a place where *air* drawn into the *outer housing* combines with the *volatilized liquid* produced by heater 42 to create *aerosol*. EX1009, 6:4-7; 6:55-62; 7:57-8:15; EX1003, ¶206. As detailed above in Element [1e], because Takeuchi discloses that heater 42 “serves to gasify the liquid flavor source,” heater 42 produces *volatilized liquid*. EX1009, 6:4-22; 6:55-62, 8:1-4, FIG. 1; EX1003, ¶206. This *volatilized liquid* is inhaled through inhalation port 22, which means that *aerosol* can be *drawn into the mouth* of the *user*

through the mouthpiece. EX1009, 8:5-15 (“transferred into the inhalation port 22”), 6:39-47; 7:48-56, FIG. 2; EX1003, ¶206.

Element [1g]

Takeuchi discloses Element [1g]. EX1003, ¶207. Takeuchi discloses a ***controller***—control circuit 46—that is able to control components within the outer housing of device 10. EX1009, 6:23-42, 6:55-62, 7:48-56, FIG. 1. For instance, control circuit 46 is configured to “start up” heater 42 in response to detecting an inhaling action by the user. EX1009, 6:55-62, 7:48-56. As such, Takeuchi’s ***controller*** is configured to ***activate current flow*** through heater 42 in response to a ***draw***. EX1003, ¶207.

Claim [3]

Takeuchi discloses Claim [3] for the same reasons described above in connection with Takeuchi’s cited disclosure in Ground 2B (claim 3). EX1009, 3:35-50, 5:47-6:22, FIG. 1; EX1003, ¶¶208-209.

Claim [8]

As described above in Element [1e], Takeuchi discloses a ***storage compartment*** including liquid container 32 and liquid passageway 37 that is configured for storage of a ***liquid aerosol-forming material***. EX1009, 5:28-39, 5:47-52, 6:4-22; FIG. 1; EX1003, ¶¶210-211. Namely, Takeuchi discloses that liquid container 32 is a ***container*** that can house a liquid flavor source 34. EX1009, 5:28-39, 5:58-6:3, FIG. 1. Takeuchi also discloses that liquid passageway

37 can hold the liquid flavor source. EX1009, 5:47-52, 6:4-22, FIG. 1. Takeuchi's *storage compartment* configured as a container for holding *liquid* is shown below in FIG. 1, which depicts liquid flavor source 34 as a liquid volume that is held within liquid container 32 and liquid passageway 37.

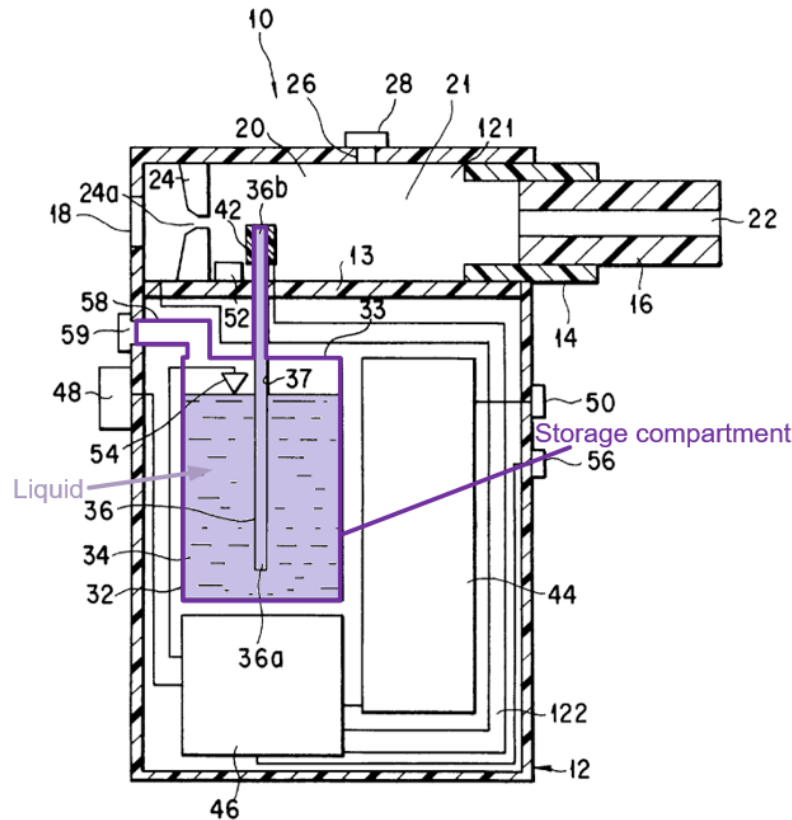


FIG. 1

EX1009, FIG. 1 (annotated).

Claim [9]

As described above in Elements [1e] and [8], Takeuchi discloses a *storage compartment* including a liquid passageway. EX1009, 4:35-28, 5:47-52, 6:4-22; FIG. 1. Furthermore, as detailed above in Element [1c], Takeuchi discloses several

embodiments of an *electrical resistance heater*—and all of these embodiments involve the heater being *arranged in contact* with Takeuchi’s liquid passageway.

EX1009, 6:4-22, 8:22-23, 8:24-25, FIG. 1, FIGS. 3-5; EX1003, ¶¶213-214.

Claim [10]

Takeuchi discloses Claim [10] for the same reasons described above in connection with Takeuchi’s cited disclosure in Ground 2B (claim 10). EX1009, 3:31-50; EX1003, ¶¶215-216.

Claim [11]

Takeuchi discloses Claim [11] for the same reasons described above in connection with Takeuchi’s cited disclosure in Ground 2B (claim 11). EX1009, 6:22-26, FIGS. 4-5; EX1003, ¶¶217-218.

Claim [13]

Takeuchi expressly discloses that sensor 52 can detect the “inhaling action” of a user. EX1009, 6:23-42, 6:46-54; EX1003, ¶¶219-220.

Claim [15]

Takeuchi discloses Claim [15] for the same reasons described above in connection with Takeuchi’s cited teaching in Ground 2B above. EX1009, 7:18-30, FIG. 1; EX1003, ¶¶221-222.

VI. DISCRETIONARY DENIAL IS NOT WARRANTED

A. The Petition’s New Prior Art and Errors Made During Prosecution Warrant Institution—35 U.S.C. § 325(d)

This Petition does not present a situation where “the same or substantially the same prior art or arguments” were previously presented. 35 U.S.C. § 325(d); *Advanced Bionics, LLC v. MED-EL Elektromedizinische Geräte GmbH*, IPR2019-01469, Paper 6, 8-9 (Feb. 13, 2020 (Precedential)). More specifically, regarding Part 1 of the *Advanced Bionics* framework, Grounds 2A-B rely upon the Gupta reference (EX1007), which was entirely absent from the record during prosecution of the ’202 Patent. For this reason alone, such “new, noncumulative prior art asserted in the Petition” weighs against discretionary denial. *Oticon Medical AB v. Cochlear Ltd.*, IPR2019-00975, Paper 15 at 20 (Oct. 16, 2019 (§§II.B and II.C precedential)). And regarding Grounds 1A-B and 3, Morgan (EX1004), Susa (EX1006), and Takeuchi (EX1009) were buried within the mammoth IDS filed by the Patent Owner. *Supra*, Section II.B. As such, those references were never addressed in any claim rejection or office action. *Amazon.com, Inc. v. M2M Sols. LLC*, IPR2019-01205, Paper 14, 15 (Jan. 27, 2020) (“a reference that ‘was neither applied against the claims nor discussed by the Examiner’”).¹

¹ Note that Grounds 1A-3 here are also distinct from a first IPR petition recently filed against the ’202 Patent, which raised no §102 grounds at all and never even cited Morgan or Gupta. *Infra*, Section VI.C.

The Board need not reach Part 2 of the *Advanced Bionics* framework because Part 1 is not satisfied. But even if the Board evaluates Part 2, this Petition specifically identifies material errors during prosecution because the Examiner was led to the erroneous conclusion that the prior art did not disclose the known structures admittedly available in prior art devices. *Supra*, Section II.A-B. Grounds 1A-3 of this Petition specifically identify relevant pin cites to some of the most critical-but-overlooked references and presents these pertinent teachings in unexamined manners never contemplated in any office action or response. *Advanced Bionics*, IPR2019-01469, Paper 6 at 8 n.9 (“a material error may include misapprehending or overlooking specific teachings”).

B. The *Fintiv* Precedent is not applicable here—35 U.S.C. § 314(a)

The '202 Patent was never asserted in any Article III court. It is currently asserted in an ITC investigation (Inv. No. 337-TA-1410), but this is not enough to invoke the *Fintiv* precedent for purposes of a discretionary denial. *See* USPTO Director Vidal, *Interim Procedure for Discretionary Denials in AIA Post Grant Proceedings with Parallel District Court Litigation* (June 21, 2022), 6-7 (“For the foregoing reasons, the PTAB will not discretionarily deny petitions based on applying *Fintiv* to a parallel ITC proceeding.”). For at least this reason, discretionarily denial is unwarranted and would be unjust.

C. The *General Plastic* Precedent does not justify discretionary denial—35 U.S.C. § 314(a)

The present Petition was diligently filed only a few weeks after a first petition against the '202 Patent (IPR2024-01280 and its proposed consolidated PGR2024-00049)—long before any preliminary response from Patent Owner or institution decision from the Board. And consistent with Director's recent decisions, the present Petition was controlled and filed by an individual petitioner (Kangvape) having no "significant relationship" to the first petitioners (Ecto World, LLC and SV3, LLC), and it raises grounds that are substantively and/or statutorily distinct from the earlier petition. *Ford Motor Co. v. Neo Wireless LLC*, IPR2023-00763, Paper 28, 9-12 (Director Vidal Mar. 22, 2024); *Videndum Prod. Sols., Inc v. Rotolight Ltd.*, IPR2023-01218, Paper 12, 5-7 (Director Vidal Apr. 19, 2024). This cumulative guidance in *Ford* and *Videndum* demonstrates why the Board does "not discretionarily deny a later petition in view of an earlier petition where the earlier and later petitioners are neither the same party nor have a significant relationship." *Jeisys Medical Inc. v. Serendia, LLC*, IPR2024-00463, Paper 20, 6-10 (August 20, 2024) (rejecting patent owner's arguments for discretionary denial based on *General Plastic* where the second petitioner was "a "co-respondent with [the first petitioner] in the related ITC proceeding").

Here, Petitioner seeks a full review of Grounds 1A-3 on the merits. Patent Owner should not be permitted to hide from those merits.

General Plastic Factor 1

The Petitioner here, Kangvape, is not the same petitioner that previously filed the earlier petition (IPR2024-01280 and its proposed consolidated PGR2024-00049). Kangvape and the first petitioners are merely co-respondents in the related ITC proceeding; Kangvape has no significant relationship with the first petitioners. *Jeisys*, IPR2024-00463, Paper 20 at 6-10. Kangvape does not make Ecto World's accused product, nor does Ecto World make Kangvape's accused product. They are competitors with different product designs. And SV3 does not make any accused product at all, but instead is believed to be a distributor having a contractual relationship with Ecto World. Kangvape does not exercise any control over the first petitioners, nor do the first petitioners exercise any control over Kangvape. Kangvape never reviewed or provided input into the earlier petition filed in IPR2024-01280 (and the same is true for the first petitioners' proposed consolidated PGR2024-00049). Here, Kangvape filed the present Petition on its own behalf—fully funded and controlled by Kangvape alone based on distinct grounds (the first petition raises no §102 grounds at all and never even mentions Morgan or Gupta). Accordingly, “*General Plastic* factor one necessarily outweighs the other *General Plastic* factors.” *Videndum*, IPR2023-01218, Paper 12 at 5-6.

General Plastic Factors 2, 4, and 5

Kangvape has not filed more than one petition against the '202 Patent and,

as noted above, there is not a significant relationship between Kangvape and the first petitioners so as to attribute the earlier petition to Kangvape. Further, Kangvape “diligently filed its Petition ... only one month after the petition” of the first petitioners, and the Board has already explained why “[s]uch diligent action counsels against denial under *General Plastic* factors 2, 4, and 5.” *Intel Corp. v. Besang Inc.*, IPR2023-00991, Paper 12, 16 (December 13, 2023).

General Plastic Factor 3

Again, there are no “roadmapping concerns” here. *Peloton Interactive, Inc. v. NEC, Corp.*, IPR2023-01241, Paper 17, 16-17 (Feb. 7, 2024) (“These circumstances do not implicate the roadmapping concerns that *General Plastic* seeks to alleviate.”). Thus, given that the present Petition “was filed before the preliminary response in the [first petitioners’] case, and well before any decision on whether to institute review, *General Plastic* factor 3 weighs against discretionary denial.” *Intel*, IPR2023-00991, Paper 12 at 15.

General Plastic Factors 6 and 7

Under similar circumstances and timing, the Board has recently held that “the finite resources of the Board are not implicated” where the present Petitioner and first petitioners do not have a sufficiently close relationship with respect to the products accused of infringement.” *Intel*, IPR2023-00991, Paper 12 at 16; *Jeisys*, IPR2024-00463, Paper 20 at 6-10. And regarding Factor 7, due to the relatively

short timeframe between the petitions, the Board recently held that “the requirement to issue a final written decision within one year of the institution decision is not implicated in this case, nor is the general concern for potential abuse caused by multiple, staggered petitions discussed in *General Plastic*.” *Intel*, IPR2023-00991, Paper 12 at 16 (“only one month”).

In sum, discretionary denial under §314(a) or §325(d) is not warranted.

VII. PAYMENT OF FEES – 37 C.F.R. § 42.103

Kangvape authorizes the Patent and Trademark Office to charge Deposit Account No. 06-1050.

VIII. MANDATORY NOTICES UNDER 37 C.F.R § 42.8(a)(1)

A. Real Party-In-Interest Under 37 C.F.R. § 42.8(b)(1)

Shenzhen Kangvape Technology Co., Ltd. (“Kangvape”) is the Petitioner and real party-in-interest. No other party had access or control over this Petition, and no other party provided funding for this Petition.

B. Related Matters Under 37 C.F.R. § 42.8(b)(2)

The ’202 Patent is asserted in an ITC investigation in which the public complaint was submitted on June 11, 2024 and listed dozens of proposed respondents. *See Certain Disposable Vaporizer Devices*, ITC Inv. No. 337-TA-1410. Petitioner here, Kangvape, was one of the respondents.

The ’202 Patent is subject of an earlier IPR petition (case no. IPR2024-01280) and a corresponding PGR petition (case no. PGR2024-00049), which are

proposed to be consolidated. Kangvape is unrelated to the first petitioners (Ecto World, LLC and SV3, LLC). These parties are among the co-respondents in the aforementioned ITC investigation.

C. Lead And Back-Up Counsel Under 37 C.F.R. § 42.8(b)(3)

Petitioner provides the following designation of counsel.

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D. Service Information

Please address all correspondence and service to the address listed above.

Petitioner consents to electronic service by email at IPR58579-0002IP1@fr.com

(referencing No. 58579-0002IP1).

Respectfully submitted,

Dated September 6, 2024

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CERTIFICATION UNDER 37 CFR § 42.24

Under the provisions of 37 CFR § 42.24(d), the undersigned hereby certifies that the word count for the foregoing Petition for *Inter partes* Review totals 13,885 words, which is less than the 14,000 allowed under 37 CFR § 42.24.

Dated September 6, 2024

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CERTIFICATE OF SERVICE

Pursuant to 37 CFR §§ 42.6(e)(4)(i) *et seq.* and 42.105(b), the undersigned certifies that on September 6, 2024, a complete and entire copy of this Petition for *Inter partes* Review, Power of Attorney, and all supporting exhibits were provided via Express Mail, to the Patent Owner by serving the correspondence address of record as follows:

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