

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

R.J. REYNOLDS VAPOR COMPANY,

Petitioner

v.

FONTEM HOLDINGS 1 B.V.,

Patent Owner

U.S. Patent 8,893,726
Issue Date: Nov. 25, 2014
Title: Electronic Cigarette

Inter Partes Review No. 2016-01270

**PETITION FOR INTER PARTES REVIEW OF
U.S. PATENT NO. 8,893,726 PURSUANT TO
35 U.S.C. §§ 311-319 AND 37 C.F.R. § 42**

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35 U.S.C. §§ 102-103	6, 7, 10, 18
35 U.S.C. §§ 311-319	1, 2, 3, 7

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REGULATIONS

37 C.F.R. § 42	1, 2, 6
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LIST OF EXHIBITS

Exhibit No.	Exhibit	Referred To In The Petition As
Exhibit 1001:	U.S. Patent No. 8,893,726	“’726 Patent”
Exhibit 1002:	’726 Patent File History, Non-Final Rejection (August 16, 2013)	“Non-Final Rejection”
Exhibit 1003:	’726 Patent File History, Amendment (October 8, 2013)	“Amendment”
Exhibit 1004:	’726 Patent File History, Notice of Allowance (August 18, 2014)	“Notice of Allowance”
Exhibit 1005:	<i>NJOY, Inc. v. Fontem Holdings I B.V.</i> , IPR2015-01302 (PTAB, filed May 29, 2015), Paper No. 15	“Prior Decision”
Exhibit 1006:	U.S. Patent No. 4,947,874	“Brooks”
Exhibit 1007:	U.S. Patent No. 5,944,025	“Cook”
Exhibit 1008:	U.S. Patent No. 6,155,268	“Takeuchi”
Exhibit 1009:	Declaration of Robert Sturges, Ph.D.	“Sturges Decl.”
Exhibit 1010:	<i>NJOY, Inc. v. Fontem Holdings I B.V.</i> , IPR2015-01302 (PTAB, filed May 29, 2015), Paper No.2	“NJOY Petition”
Exhibit 1011:	<i>NJOY, Inc. v. Fontem Holdings I B.V.</i> , IPR2015-01302 (PTAB, filed May 29, 2015), Paper No. 6	“Patent Owner Preliminary Response”
Exhibit 1012:	U.S. Patent No. 5,703,633	“Gehrer”

I. INTRODUCTION

Pursuant to 35 U.S.C. §§ 311-319 and 37 C.F.R. § 42, R.J. Reynolds Vapor Company (“Reynolds” or “Petitioner”) respectfully requests *Inter Partes* Review (“IPR”) of claims 15 and 16 of U.S. Patent No. 8,893,726 to Hon, titled “Electronic Cigarette” (“the ’726 Patent,” Ex. 1001), which is currently assigned to Fontem Holdings 1 B.V. (“Fontem” or “Patent Owner”). The Petitioner authorizes the Patent and Trademark Office to charge Deposition Account No. 23-1925 for the fees set forth in 37 C.F.R. § 42.15(a) for this Petition for IPR, and further authorizes payment of any additional fees to be charged to this Deposit Account.

This Petition demonstrates a reasonable likelihood that claims 15 and 16 of the ’726 patent are unpatentable. As discussed herein, U.S. Patent Nos. 4,947,874 (Brooks) discloses every limitation of claims 15 and 16 of the ’726 patent. In addition, to the extent there is any question whether Brooks expressly discloses a liquid storage body “including fiber material” (and it does) in the particular embodiments of Brooks relied upon here, it was nonetheless well-known in the art to include fiber material in a liquid storage body. *See* Brooks (general teachings), Cook (U.S. Patent No. 5,944,025) and Takeuchi (U.S. Patent No. 6,155,268). Thus, it would have been a simpler matter of routine design choice to include fiber material, as taught by Brooks, Cook and/or Takeuchi, in the liquid storage body of Brooks.

II. MANDATORY NOTICES UNDER 37 C.F.R. § 42.8(A)(1)

A. Real Party-in-Interest

For purposes of 35 U.S.C. § 312(a)(2) and 37 C.F.R. § 42.8(b)(1) only, Petitioner, R.J. Reynolds Vapor Company (“Petitioner”) identifies the real-parties-in-interest as R.J. Reynolds Vapor Company and Reynolds American Incorporated. R.J. Reynolds Vapor Company further discloses that it is an indirect wholly owned subsidiary of Reynolds American, Inc., and states that under the governing standard Reynolds American Incorporated is not a real-party-in-interest. See Patent Trial Practice Guide 77 Fed. Reg., Vol. 77, No. 157 (2012) at 48759-60. Reynolds American Inc. nevertheless agrees to be bound to the same extent as a real party in interest.

B. Related Matters

1. Related Litigations

Petitioner is not aware of any reexamination certificates or pending prosecution concerning the ’726 patent. Petitioner is a defendant in the following litigation involving the ’726 patent: *Fontem Ventures B.V. et al. v. R.J. Reynolds Vapor Company*, No. 2:16-cv-02286 (C.D. Cal., filed April 4, 2016). Fontem has alleged that Reynolds infringes claims 15 and 16 of the ’726 patent, the two claims for which Reynolds seeks *inter partes* review. In addition to the ’726 patent,

Fontem has also asserted U.S. Patent Nos. 8,365,742; 8,490,628; and 8,899,239 against Reynolds in the above-referenced district court action.

Reynolds was served with the complaint in the above-referenced action on April 6, 2016. Thus, Reynolds' petition is timely under 35 U.S.C. § 315(b).

The Patent Owner has also asserted the '726 patent in the following additional district court proceedings in which Reynolds was not and is not a party: *Fontem Ventures B.V. et al. v. Nu Mark LLC*, No. 2-16-cv-02291 (C.D. Cal., filed April 4, 2016); *Fontem Ventures BV et al v. NJOY, Inc.*, No. 2-14-cv-08144 (C.D. Cal., filed October 21, 2014) (terminated); *Fontem Ventures B.V. et al v. LOEC, Inc. et al.*, No. 2-14-cv-08149, (C.D. Cal., filed October 21, 2014) (terminated); *Fontem Ventures BV et al v. CB Distributors, Inc. et al.*, No. 2-14-cv-08154 (C.D. Cal., filed October 21, 2014) (terminated); *Fontem Ventures BV et al v. Vapor Corp.*, No. 2-14-cv-08155 (C.D. Cal., filed October 21, 2014) (terminated); *Fontem Ventures BV et al v. FIN Branding Group, LLC et al.*, No. 2-14-cv-08156 (C.D. Cal., filed October 21, 2014) (terminated); *Fontem Ventures BV et al v. Ballantyne Brands, LLC*, No. 2-14-cv-08157 (C.D. Cal., filed October 21, 2014) (terminated); *Fontem Ventures BV et al v. Spark Industries, LLC*, No. 2-14-cv-08158 (C.D. Cal., filed October 21, 2014) (terminated); *Fontem Ventures BV et al v. Logic Technology Development, LLC*, No. 2-14-cv-08160 (C.D. Cal., filed October 21, 2014) (terminated); *Fontem Ventures BV et al v. VMR Products, LLC*

d/b/a V2CIGS, No. 2-14-cv-08161 (C.D. Cal., filed October 21, 2014)

(terminated).

2. Related Proceedings Before the Board

The '726 patent was also the subject of the following petitions for IPR:

- *NJOY, Inc. v. Fontem Holdings I B.V.*, IPR2015-01302 (PTAB, filed May 29, 2015). On December 9, 2015, the Board denied institution of NJOY's petition in IPR2015-01302 because NJOY did not establish a reasonable likelihood of prevailing in showing the unpatentability of the challenged claims 1-4, 8-10, and 12-17. NJOY's petition relied on the combination of Takeuchi (Ex. 1008) with U.S. Pat. No. 5,144,962 (Counts) and/or U.S. Pat. No. 6,322,268 (Kaufman). Ex. 1010 at 17. Reynolds' petition relies on a different combination, and advances different arguments, and thus is not redundant to NJOY's petition.
- *Nu Mark LLC v. Fontem Holdings I B.V.*, IPR2016-01288 (PTAB, filed June 28, 2016). Nu Mark's petition in IPR2016-01288 relies on the combination of Takeuchi (Ex. 1008) with U.S. Pat. No. 1,514,682 (Wilson) and/or U.S. Pat. No. 6,598,607 (Adiga) and/or U.S. Pat. No. 6,322,268 (Kaufman), and also on the combination of U.S. Patent No. 2,057,353 ("Whittemore") in view of Wilson and Whittemore in view of Wilson and Adiga. Reynolds' petition relies on a different combination,

and advances different arguments, and thus is not redundant to Nu Mark's petition.

- *Nu Mark LLC v. Fontem Holdings 1 B.V.*, IPR2016-01297 (PTAB, filed June 28, 2016). Nu Mark's petition in IPR2016-01297 relies on U.S. 2007/0267031. Reynolds' petition relies on a different combination, and advances different arguments, and thus is not redundant to Nu Mark's petition.

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D. Service Information

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III. GROUNDS FOR STANDING

As required by 37 C.F.R. § 42.104(a), Petitioner certifies that the '726 patent is available for IPR and that Petitioner is not barred or estopped from requesting IPR on the grounds identified herein.

IV. IDENTIFICATION OF CHALLENGE AND STATEMENT OF THE PRECISE RELIEF REQUESTED

Petitioner requests *inter partes* review and cancellation of claims 15 and 16 of the '726 patent pursuant to 35 U.S.C. §§ 102 and/or 103 as set forth herein. The '726 patent is to be reviewed under pre-AIA §§ 102 and 103. Petitioner's detailed statement of the reasons for relief requested is set forth below in the section titled "Statement of Reasons for the Relief Requested." In accordance with 37 C.F.R. § 42.6(c), copies of the exhibits are filed herewith. In addition, the Petition is accompanied by the declaration of Dr. Robert Sturges. Ex. 1009.

Claims 15 and 16 are unpatentable based upon the following grounds:

Ground 1: Claims 15 and 16 are anticipated by Brooks.

Ground 2: Claims 15 and 16 are obvious over Brooks alone or Brooks in combination with Cook and/or Takeuchi.

There is no redundancy in Grounds 1 and 2. Ground 1 relies on Brooks as an anticipatory reference. Ground 2 relies on Brooks, alone or in combination with Cook and/or Takeuchi, in demonstrating that claims 15 and 16 are obvious under 35 U.S.C. § 103.

V. THRESHOLD REQUIREMENT FOR *INTER PARTES* REVIEW

This petition meets the threshold requirements for *inter partes* review because it establishes “a reasonable likelihood that the petitioner would prevail with respect to at least 1 of the claims challenged in the petition.” 35 U.S.C. § 314(a). As explained below, for the ground of unpatentability proposed below, there is a reasonable likelihood that Petitioner will prevail with respect to at least one of the challenged claims.

VI. STATEMENT OF REASONS FOR THE RELIEF REQUESTED

A. Summary of the Argument

Claims 15 and 16 of the ’726 patent are invalid under 35 U.S.C. §§ 102 and/or 103. Specifically, Brooks anticipates claims 15 and 16, or, in the alternative, claims 15 and 16 are obvious based upon Brooks alone or in combination with Cook and/or Takeuchi.

Claim 15, which is written in independent form, requires (a) a housing having an inlet and an outlet; (b) an electronic circuit board and an atomizer having a heating element, within the housing; (c) a battery electrically connected to the

electronic circuit board; (d) a stream passage within the housing leading from the inlet to the atomizer; (e) a liquid storage body including fiber material in a cylindrical section of the housing, with the liquid storage body in physical contact with the atomizer; and (f) an aerosol passage from the atomizer to the outlet. Ex. 1001 at 6:17-28. Claim 16, which depends from claim 15, additionally requires a sensor in the stream passage, with the sensor electrically linked to the electronic circuit board. *Id.* at 6:29-31.

Brooks discloses an electronic cigarette having each of the elements recited in claims 15 and 16. Alternatively, and to the extent Brooks does not expressly disclose the claimed “liquid storage body including fiber material,” it would have nonetheless been obvious to include fiber material in the porous liquid storage substrate of Brooks as taught by Brooks, Cook and/or Takeuchi. Specifically, Brooks discloses that heating element 18 “preferably is a *fibrous material* . . . in order to carry a suitable amount of aerosol forming substance,” the aerosol forming substance comprising a liquid. Ex. 1006 at 7:26-30, 8:8-15 (emphasis added). Cook discloses “an absorbent fuel reservoir [22] consists of synthetic *fiber* transfer wick material.” Ex. 1007 at 2:18-22; Fig. 1 (emphasis added). Takeuchi discloses a porous liquid storage body constructed from “*bundled fibers*.” Ex. 1008 at 3:35-49; 10:50-55; Fig. 14 (emphasis added). Thus, it would have been a matter of

routine design choice to include fiber material in the liquid storage body of Brooks.

Declaration Robert Sturges, Ph.D. (“Sturges Decl.”) (Ex. 1009) at ¶¶ 82-88.

B. Background of the ’726 Patent

1. The ’726 Patent

As illustrated in FIG. 1 reproduced below, the ’726 patent describes a structure having a shell 14 and a battery 2, an electronic circuit board 3, a sensor 6, an atomizer 9, and a liquid-supplying bottle 11 within the shell 14. Ex. 1001 at 2:37-40. An air inlet 4 is also provided on the external wall of the shell 14 and a mouthpiece 15 is provided at one end of the shell. *Id.* at 2:36-37.

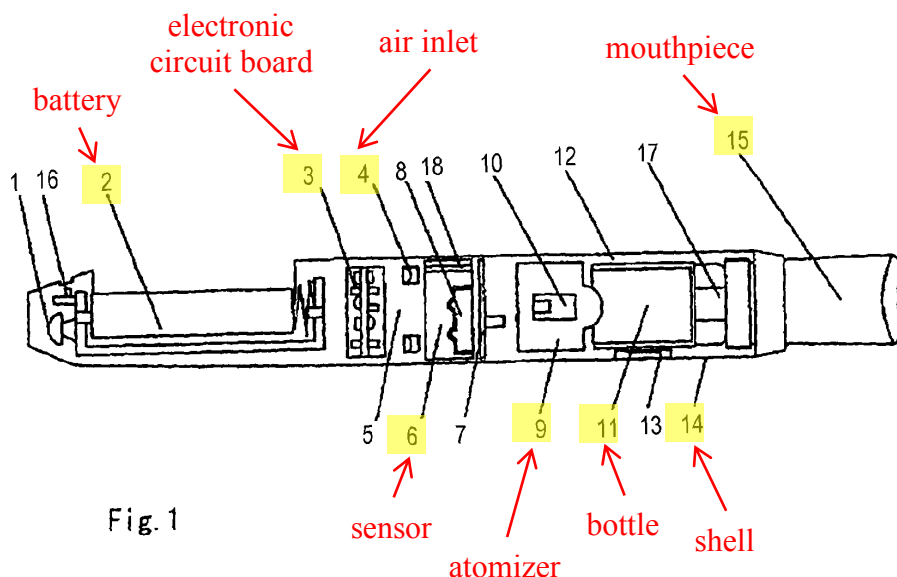


Fig. 1

The ’726 patent also describes that “a solution storage porous body 28 is provided in the liquid-supplying bottle [11], and can be filled with polypropylene fiber, terylene fiber or nylon fiber.” *Id.* at 3:11-15; Fig. 11.

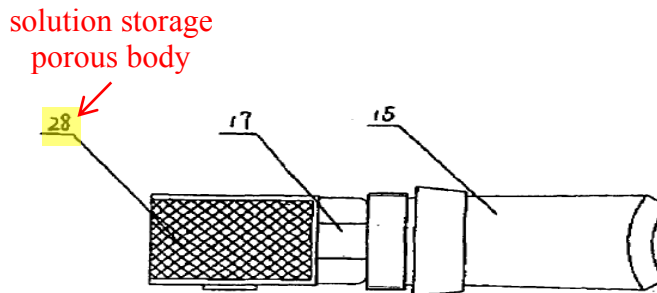


Fig. 11

The solution storage porous body 28 is in contact with the atomizer 9 to supply liquid nicotine solution to the atomizer. *Id.* at 3:64-67.

When a user inhales, air enters through the air inlet 4, passes through an air passage 18 of the sensor and flows into an atomization cavity 10 of the atomizer 9. *Id.* at 3:49-52. This drives a nicotine solution from a porous body that surrounds the atomization cavity into the atomization cavity. *Id.* at 3:52-59. It also causes the sensor 6 to output a signal to the electronic circuit board 3, which actuates a heating element 26 of the atomizer 9 to atomize the nicotine solution. *Id.* at 3:27-43. After the atomization, small droplets of the nicotine solution form aerosols, which are sucked out via an aerosol passage 12, gas vent 17 and mouthpiece 15. *Id.* at 3:59-64.

2. The Prosecution History of the '726 Patent

The '726 patent issued from application serial no. 13/777,927 filed on February 26, 2013, and claims priority to Chinese application CN 2004 0031182 filed on April 14, 2004. In the first Office Action dated August 16, 2013, the Examiner rejected application claims 16-18, which correspond to issued claims 15-17, under 35 U.S.C. § 102(b) as anticipated by Brooks. Ex. 1002 at p. 2-5.

However, the Examiner indicated that application claim 19, which depended from application claim 16, contained allowable subject matter, namely, “a liquid supply comprising fibers.” *Id.* at p. 5.

In a Response dated October 8, 2013, the Applicant argued that Brooks failed to disclose a liquid supply that is a “separately identifiable element” from heating element 18. Ex. 1003 at p. 6. However, that argument was incorrect. As Brooks expressly notes, the heating element 18 may consist of “porous substrates [i.e., a liquid supply] in intimate contact with resistance heating components.” Ex. 1006 at 8:1-2. Of course, something cannot be in intimate contact with itself, and thus Brooks expressly taught that the porous substrates could be separate from the resistance heating components, provided the substrates and the heating component are in intimate contact.

Applicant also amended application claim 16 to include, *inter alia*, subject matter from application claim 19:

16. (Currently Amended) An electronic cigarette comprising;
a housing having an inlet and an outlet;
an electronic circuit board and an atomizer having a heating element,
within the housing;
a battery electrically connected to the electronic circuit board;
a stream passage within the housing leading from the inlet to the atomizer;
a liquid supply comprising fibers in a cylindrical section of the housing,
with the liquid supply in physical contact with the atomizer; and
an aerosol passage from the atomizer to the outlet.

Ex. 1003.

The Examiner subsequently issued a Notice of Allowance on August 18, 2014. Ex. 1004. The Notice of Allowance included an examiner's amendment to the “liquid supply” element of application claim 16 as follows: “a liquid storage body including fiber material ~~supply comprising fibers~~ in a cylindrical section of the housing, with the liquid storage body ~~supply~~ in physical contact with the atomizer.” *Id.* at p. 2. The Examiner’s amendment also canceled claims 20-23. *Id.* The Examiner also provided reasons for allowance, stating “[t]he closest prior art of record fails to teach or reasonably suggest an electronic cigarette having the claimed structure, specifically that which comprises a heating wire in the atomizer surrounded by a porous body/atomizer in contact with a liquid storage body, or that which comprises a liquid storage body including fiber material.” *Id.* However, the

Examiner was incorrect about the closest prior art and what it purportedly failed to disclose. As discussed below, Brooks, either alone or in combination with Cook and/or Takeuchi, disclose an atomizer in contact with a liquid storage body including fiber material, as well as the other elements of claims 15 and 16.

C. Person of Ordinary Skill in the Art (“PHOSITA”)

A PHOSITA is a hypothetical person who is presumed to know the relevant prior art. A PHOSITA for the ’726 patent would have had at least the equivalent of a Bachelor’s degree in electrical engineering, mechanical engineering, or biomedical engineering or related fields, along with at least 5 years of experience designing electromechanical devices, including those involving circuits, fluid mechanics and heat transfer. Ex. 1009 at ¶¶ 28-29.

D. Claim Construction

Pursuant to 37 C.F.R. § 42.100(b), a claim in an unexpired patent is given its broadest reasonable construction in light of the specification in which it appears. *In re Cuozzo Speed Techs., LLC*, 793 F.3d 1268, 1278-79 (Fed. Cir. 2015), *aff’d Cuozzo Speed Techs. v. Lee*, 579 U. S. ____ (2016). Petitioner submits that the limitations below require construction, and for the purpose of this *inter partes* review only, that the remaining claim terms take on their ordinary and customary meaning that the terms would have to a PHOSITA in view of the ’726 patent specification. Petitioner’s construction of claim terms is not binding upon

Petitioner in any other proceeding related to the '726 patent, and Petitioner reserves the right to offer additional or alternative construction under the *Phillips* standard applicable in the co-pending district court litigation.

In the prior decision denying institution of *inter partes* review of the '726 patent, the prior panel construed two terms that appear in claims 15 and 16. Ex. 1005 at 8-10. These terms are shown below.

1. “electronic cigarette”

The term “electronic cigarette” is only found in the preamble of claim 15 (and claim 16 by virtue of its dependency from claim 15). In the prior IPR proceedings involving the '726 patent, the parties did not dispute whether the preamble of claim 15 is a claim limitation, and instead submitted competing constructions for the “electronic cigarette.” The Board largely adopted the Patent Owner’s proposed construction, interpreting “electronic cigarette” as “a device for generating liquid droplets for inhalation by a user, where the device functions as a substitute for smoking, e.g., by providing nicotine without tar.” Ex. 1005 at 8-9. For the reasons discussed below, Petitioner does not agree that “electronic cigarette” is a claim limitation that requires construction.

In general, a preamble limits the invention if it recites essential structure or steps, or if it is “necessary to give life, meaning, and vitality” to the claim.

Catalina Mktg. Int'l, Inc. v. Coolsavings.com, Inc., 289 F.3d 801, 808

(Fed.Cir.2002). Conversely, a preamble is not limiting “where a patentee defines a structurally complete invention in the claim body and uses the preamble only to state a purpose or intended use for the invention.” *Id.* While there is no litmus test for determining when a preamble operates as a limitation, courts have provided certain “guideposts” or examples of circumstances in which a preamble may establish a claim limitation. These circumstances include when: (1) the “Jepson” form is used for a claim; (2) the preamble is “essential to understand the limitations or terms in the claim body” (e.g. when a preamble phrase provides the antecedent basis for other terms in the claim body); (3) the preamble recites “additional structure or steps underscored as important by the specification”; and (4) a patentee clearly relies on the preamble during prosecution to distinguish the claimed invention from the prior art. *Id.* None of those circumstances are applicable here.

First, none of the challenged claims are in Jepson format. Second, the preamble language for an electronic cigarette is not essential to understand the claim. The language is not used in the body of the claim, and the alleged invention is fully defined by the claim limitations that follow the preamble. Ex. 1009 at ¶¶ 33; *see also Google Inc. v. Visual Real Estate, Inc.* IPR2014-01339, Final Written Decision, Paper 39, pp. 9-11 (P.T.A.B. Jan. 25, 2016) (preamble language “a system including a video and data server farm” was not a limitation); *Cisco Sys. et al v. Capella Photonics, Inc.*, IPR2014-01276, Final Written Decision, Paper 40, p.

18 (P.T.A.B. Feb. 17, 2016) (“servo-based” used in the preamble was not a limitation); *RF Controls, LLC. v. AI Packaging Solutions, Inc.* IPR2014-01536, Final Written Decision, Paper 20, p. 11 (P.T.A.B. March 28, 2016) (preamble language reciting “an inventory tracking system for use in . . . an inventory tracking region” was not a limitation).

Nonetheless, even if the Board’s prior construction of “electronic cigarette” is adopted (and it should not be), Petitioner contends that claims 15 and 16 are invalid for the reasons set forth herein.

2. “atomizer”

The parties in the prior IPR proceedings involving the ‘726 patent submitted competing constructions for the term “atomizer.” The Board sided with petitioner NJOY and construed “atomizer” as “a part of the electronic cigarette that includes components that participate in facilitating atomization.” Ex. 1005 at 9-10. Petitioner notes that the Patent Owner previously acknowledged in the prior proceeding involving the ‘726 patent, that “atomization” means “converting liquid into aerosol or vapor.” Ex. 1011 at 13. Using the Patent Owner’s definition of “atomization,” Petitioner adopts the Board’s prior construction of “atomizer” for purposes of this Petition, with one important exception. The non-existent “electronic cigarette” limitation should not be back-doored into the claim through the construction of “atomizer.” Petitioner respectfully submits that the Board’s

prior construction should be modified to exclude the reference to “electronic cigarette,” and to instead read “structure for facilitating atomization.” *See* Ex. 1001 at 2:52-3:10, 3:49-67, 4:11-24; Figs. 6-8; Ex. 1009 at ¶ 35.

3. “liquid storage body including fiber material”

In the previous IPR proceeding involving the ‘726 patent, and at Fontem’s urging, the Board declined to construe the term “liquid storage body” concluding that no construction was necessary. *See* Ex. 1011 at 11-12; Ex. 1005 at 11. For purposes of this Petition only, and pursuant to the BRI standard applicable, this limitation should be construed as written. Ex. 1009 at ¶ 36. No further construction is necessary for purposes of this Petition. Reynolds reserves the right to offer a different construction under the *Phillips* standard applicable in the co-pending district court litigation.

4. “physical contact”

In the previous IPR proceeding involving the ‘726 patent, the Board construed this term to mean direct contact. Ex. 1005 at 10-11. Petitioner applies this construction for purposes of this Petition.

E. Patents and Publications Relied on in this Petition

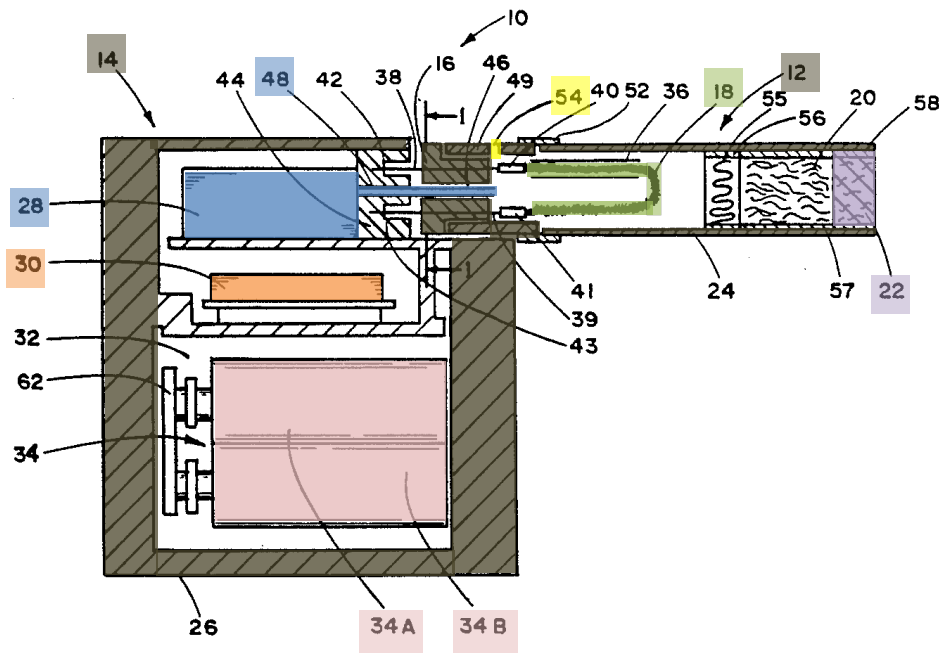
Claims 15 and 16 are unpatentable as anticipated under 35 U.S.C. § 102(b) as anticipated by Brooks (Ex. 1006), or, in the alternative, as obvious under 35

U.S.C. § 103(a) over Brooks (Ex. 1006) in combination with Cook (Ex. 1007) and/or Takeuchi (Ex. 1008).

1. Brooks (Ex. 1006) Discloses An Electronic Cigarette That Has The Claimed Features

Brooks is titled “Smoking Articles Utilizing Electrical Energy.” As discussed in the “Background of the Invention,” many smoking articles and tobacco substitute smoking materials had been proposed in the past as alternatives to smoking products that burn tobacco, including alternatives that generate flavored vapor and/or visible aerosols. Ex. 1006 at 1:19-34. These alternatives included smoking products, flavor generators and medicinal inhalers that utilized electrical energy to vaporize or heat a volatile material, or which otherwise attempted to provide the sensation of cigarette or pipe smoking without burning tobacco. *Id.* at 1:50-56. According to Brooks, “[p]referred smoking articles of the invention are capable of providing the user with the sensations of smoking (e.g., smoking, taste, feel, satisfaction, pleasure, and the like) by heating but not burning tobacco” *Id.* at 1:11-15; *see also* 3:63-4:2.

Brooks discloses a smoking article 10 that includes a hand-held controller 14 and cigarette (e.g., a disposable portion) 12 (*see id.* at 4:7-12; 7:15-16) as shown in Fig. 1:



Id. at 7:15-16; Fig. 1. “The cigarette 12 includes electrical connection plug 16, resistance heating element 18 carrying an aerosol forming substance, a roll of tobacco 20, mouth end filter 22, and a resilient overwrap 24.” *Id.* at 7:17-20. The aerosol forming substance can be, for example, “a polyhydric alcohol, such as glycerin, propylene glycol, or a mixture thereof, water; a tobacco material such as tobacco aroma oil, a tobacco essence, a spray dried tobacco extract, a freeze dried tobacco extract, tobacco dust, or the like, in order to provide tobacco flavor; or a combination thereof. *Id.* at 8:8-14.

The smoking article also “includes one or more peripheral air inlet openings 54 which provide a flow of ambient air through the cigarette during draw. *Id.* at 8:43-52. “Alternatively, the air inlet can be positioned through the extreme inlet end of the cigarette or elsewhere through the periphery of the cigarette, such that

drawn ambient air passing through the cigarette to the mouth of the user passes the resistance element.” *Id.* at 8:53-57.

The heating element 18 “is impregnated with or otherwise carries the aerosol forming substance in order that the aerosol forming substance is in a heat exchange relationship with the electrical heating element.” *Id.* at 8:4-8. The heating element 18 “preferably is *fibrous* material having a high surface area and an adsorbant, porous, wettable character, in order to carry a suitable amount of aerosol forming substance.” *Id.* at 7:26-30 (emphasis added). Notably, Brooks discloses that the heating element 18 may comprise a porous substrate that is separate, but in intimate contact with, resistance heating components. *Id.* at 7:65-8:2. (“porous substrates in intimate contact with resistance heating components”). The PHOSITA would have understood from the disclosure of Brooks that in this particular configuration the porous substrate stores the aerosol forming substance while the resistance heating components are an atomizer for heating and ultimately transforming the aerosol forming substance into an aerosol. Ex. 1009 at ¶¶ 43-44.

Moreover, because the aerosol forming substance may be a liquid (*see* Ex. 1006 at 8:5-15), the PHOSITA would have understood that the porous substrate disclosed by Brooks is a liquid storage body. Ex. 1009 at ¶ 44. The PHOSITA would have also understood from Brooks that the porous substrate (i.e., liquid storage body) can be made from a fibrous material. Ex. 1009 at ¶ 45. As

explained by Brooks, heating element 18 is preferably a “*fibrous material* having a high surface area and an adsorbant, porous, wettable character, in order to carry (i.e., store) a suitable amount of aerosol forming substance for effective aerosol formation.” Ex. 1006 at 7:26-30. Because it stores the aerosol forming substrate, the PHOSITA would have understood from this disclosure that the porous substrate is preferably made from a fibrous material having the properties identified by Brooks for storing a “suitable amount of aerosol forming substance.” Ex. 1009 at ¶ 45. Accordingly, Brooks discloses a “liquid storage body including fiber material” that is “in physical contact with the atomizer.” *Id.*

The hand-held controller 14 includes “a case 26, a puff actuated current actuation mechanism 28 having the form of a pressure sensitive switch, a time-based current control circuit 30, and a chamber 32 into which battery power supply 34 (shown as batteries 34A and 34B) is inserted.” Ex. 1006 at 7:20-25. The case 26 provides “a convenient and aesthetic holder for the user. The outer housing 26 can have a variety of shapes and can be manufactured from plastic, metal, or the like.” *Id.* at 9:37-41. In addition, the controller 14 has a receptacle 44 that “includes tube 48 which is inserted into passageway 46 of plug 16 to be in airflow communication with the internal region of the cigarette. The other end of tube 48 is in airflow communication with pressure sensing switch 28, so that changes in air pressure which occur within the cigarette during draw can be sensed by the

switch.” *Id.* at 9:41-50. The control circuit 30 is connected to the puff actuated, differential pressure sensitive switch 28 as well as to batteries 34A and 34B. *Id.* at 9:51-55.

Thus, “[w]hen the user puffs on the mouthend of the cigarette, ambient air enters the cigarette through air inlet 54. The pressure actuated switch 28 responds to a sensed change in air pressure within the cigarette during draw and permits current flow through the heating element 18. As a result, the heating element experiences an increase in temperature which in turn heats and volatilizes the aerosol forming substance. The volatilized aerosol forming substance mixes with the drawn air and forms an aerosol. The volatilized aerosol forming substance (in aerosol or vapor form) passes through the tobacco roll 20 where it elutes tobacco flavor from the tobacco, and exits the mouthend filter 22 into the mouth of the user.” *Id.* at 10:34-53.

2. Cook (Ex. 1007) and Takeuchi (Ex. 1008) Disclose A Porous Liquid Storage Body Including Fiber Material

U.S. Patent No. 5,944,025 to Cook discloses a cigarette or smoking article 10 including filter mouthpiece section 11, flavorant section 12, aerosol section 13, a fuel storage and air mixing section 16 and a catalytic combustion section 17. Ex. 1007 at 1:57-60. Figure 1 illustrates the cigarette 10 of Cook:

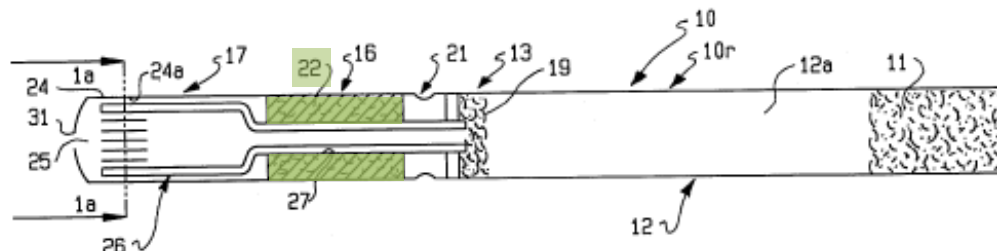


FIG 1

Ex.1007, Cook at Fig. 1 (annotated)

The fuel storage and air mixing section 16 of Cook “includes fuel absorbent reservoir 22 including a wick material for storing liquid fuel in amounts ranging from about 300-500 microliters (μl). The absorbent fuel reservoir consists of a synthetic fiber liquid transfer wick material which utilizes capillary action.” *Id.* at 2:18-22. Thus, reservoir 22 is a “liquid storage body including fiber material.”

U.S. Patent No. 6,155,268 to Takeuchi discloses a flavor generating device for enjoying simulated smoking that includes “a chamber having an air inlet port for introducing the air thereinto and an inhalation port through which a user inhales a flavor.” Ex. 1008 at 2:1-4.

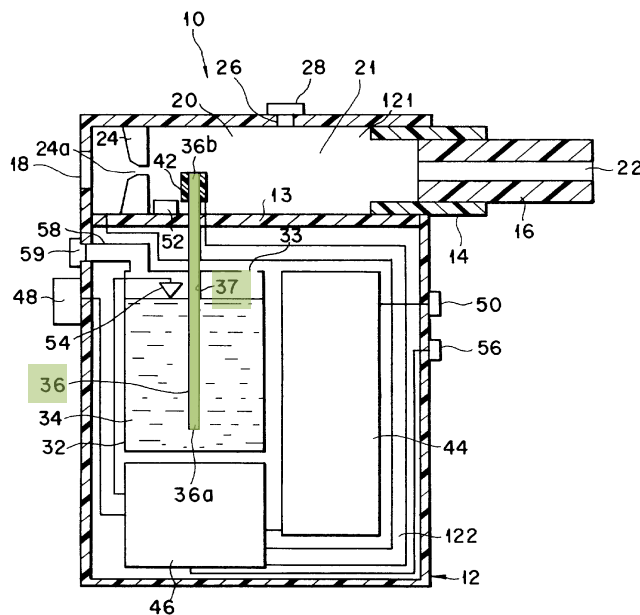


FIG. 1

Ex.1008, Takeuchi at Fig. 1 (annotated)

With reference to Figure 1 of Takeuchi, a capillary tube 36 that defines a liquid passageway 37 transports a liquid containing a flavor substance by capillary force from a liquid container 32 to a gas passageway 20 that is between the air inlet port 18 and the inhalation port 22. *Id.* at 2:4-13; 4:50-52; 5:28-30; 5:47-52; 6:4-7.

In Figure 14, Takeuchi discloses additional details about the construction of liquid passageway 37, according to one aspect of the invention.

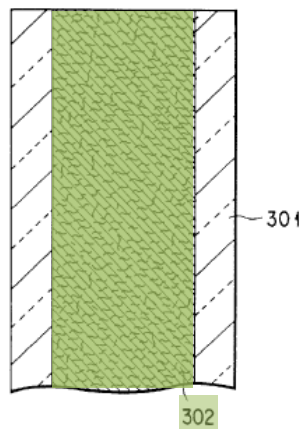


FIG. 14

Ex.1008, Takeuchi at Fig. 14 (annotated)

With reference to Figure 14, Takeuchi discloses that the liquid passageway may include an “intercommunicating pore structure 302.” *Id.* at 10:50-55. According to Takeuchi, the intercommunicating pore structure may comprise “bundled fibers.” *Id.* at 3:36-49. Thus, pore structure 302 is “a liquid storage body including fiber material.” Ex. 1009 at ¶ 58.

In addition, Takeuchi discloses that a heater 42 is mounted at an upper end portion of the capillary tube 36, which is in a fluid communication with the gas passageway 20, for heating and gasifying or evaporating the liquid transported from the liquid container 32. Ex. 1008 at 2:13-16; 6:4-12; 7:57-8:4. Figures 2A and 15 provide additional details about the arrangement of the heater of Takeuchi.

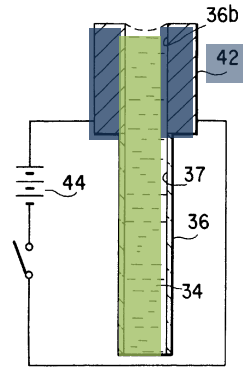


FIG. 2A

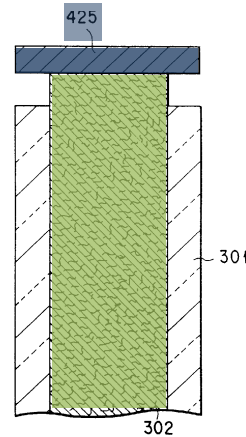


FIG. 15

In Figure 2A, the heater 42 may consists of “a tubular body mounted to the capillary tube 36 and having an inner diameter equal to that of the capillary tube 36,” according to one aspect of the invention. *Id.* at 6:7-10; Fig. 2A. In another aspect of the invention illustrated in Fig. 15, the heater 425 can be provided on a protruded end of the intercommunicating pore structure 302. *Id.* at 10:59-67; Fig. 15. Thus, the pore structure 302, which is “a liquid storage body including fiber material,” is in physical contact with the heater of Takeuchi. Ex. 1009 at ¶ 59.

F. The Challenged Claims Are Anticipated by Brooks

As discussed herein, each limitation of claims 15 and 16 of the ’726 patent is disclosed in Brooks.

1. Claim 15

a. “an electronic cigarette”

Petitioner contends that the preamble is not a limitation. But even if the preamble were a limitation, Brooks discloses an “electronic cigarette.”

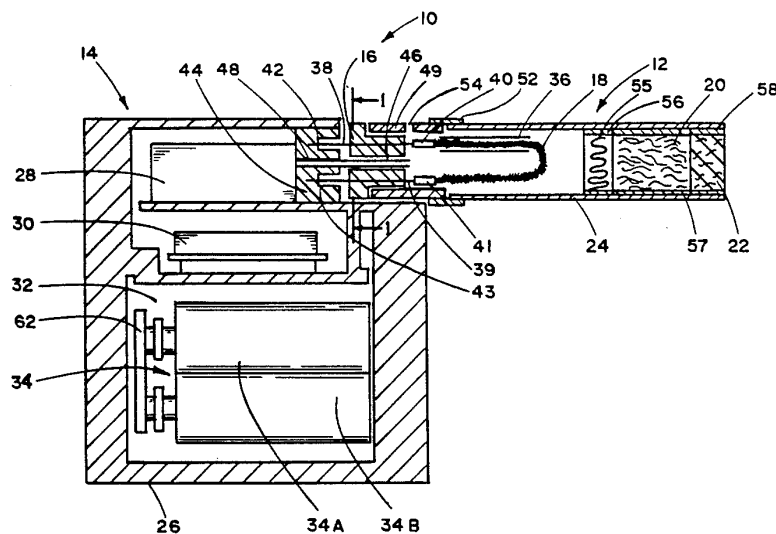
In particular, Brooks discloses a device which functions as a substitute for smoking. Ex. 1009 at ¶ 62. As noted in the “summary of the invention,” the device of Brooks provides “a tobacco-flavored smoke or aerosol and other sensations of smoking, without burning tobacco or other substances, without producing any combustion or pyrolysis products including carbon monoxide or any sidestream smoke or odor.” Ex. 1006 at 3:64-4:2.

Further, the device of Brooks generates liquid droplets for inhalation by a user. Ex. 1009 at ¶ 63. Specifically, the Brooks device includes “a cigarette or a disposable portion” 12 and “a reusable, hand-held controller 14.” Ex. 1006 at 4:7-12; 7:15-18. The cigarette 12 utilizes an air permeable high surface area electric resistance heating element [18] that normally carries aerosol forming and/or tobacco flavor substances prior to use” *Id.* at 4:7-12. The aerosol forming and/or tobacco flavor substances carried by the heating 18 element may include, for example, “a tobacco material such as a tobacco aroma oil, a tobacco essence, a spray dried tobacco extract, a freeze dried tobacco extract, tobacco dust, or the like, in order to provide tobacco flavor.” *Id.* at 8:4-14. The aerosol forming substance is volatilized by the heating element 18 to form an aerosol that is inhaled by a user. *Id.* at 8:4-14; 10:40-58.

15. An electronic cigarette	Not a claim limitation.
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comprising:

However, Brooks nonetheless discloses an “electronic cigarette.”



“The present invention relates to cigarettes and other smoking articles which employ an electrical resistance heating element and an electrical power source to provide a tobacco-flavored smoke or aerosol and other sensations of smoking without burning tobacco or other substances” Ex. 1006 at 3:63-4:2.

“In one aspect of the invention, the smoking article includes a cigarette or a disposable portion (eg, a cartridge) which utilizes an air permeable high surface area electrical resistance heating element that normally carries aerosol forming and/or tobacco flavor substances prior to use.” Ex. 1006 at 4:7-12.

“Referring to FIG. 1, smoking article 10 includes a cigarette 12 and a reusable, hand-held controller 14.” Ex. 1006 at 7:15-16.

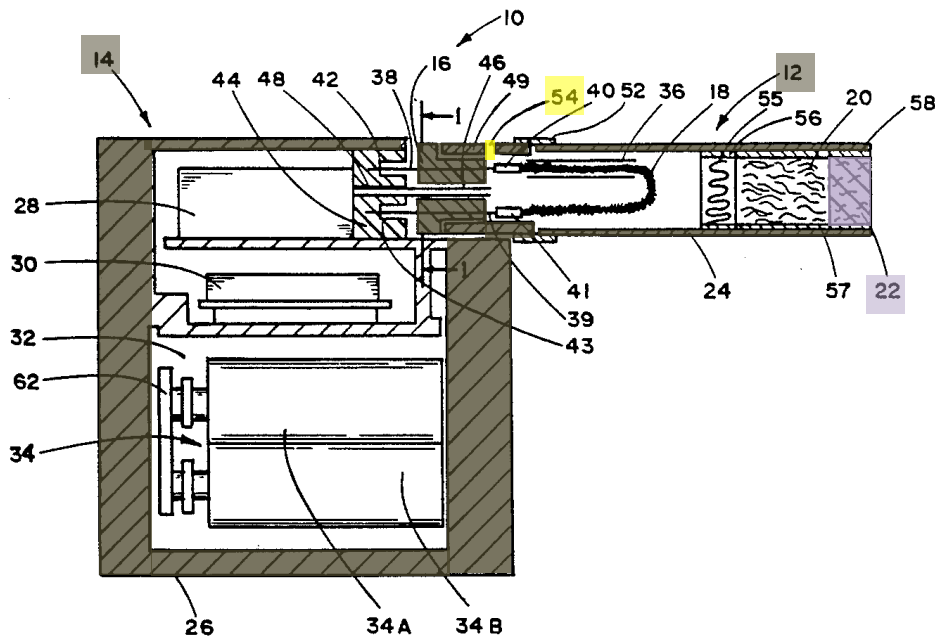
“Preferably, the heating element 18 is impregnated with or otherwise carries the aerosol forming substance in order that the aerosol forming substance is in a heat exchange relationship with the electrical heating element. The aerosol forming substance can be, for example, a polyhydric alcohol, such as glycerin, propylene glycol, or a mixture thereof; water; a tobacco material such as tobacco aroma oil, a tobacco

essence, a spray dried tobacco extract, a freeze dried tobacco extract, tobacco dust, or the like, in order to provide tobacco flavor; or a combination thereof.” Ex. 1006 at 8:4-14.

“When the user puffs on the mouthend of the cigarette . . . the heating element experiences an increase in temperature which in turn heats and volatilizes the aerosol forming substance. The volatilized aerosol forming substance mixes with the drawn air and forms an aerosol. The volatilized aerosol forming substance (in aerosol or vapor form) passes through the tobacco roll 20 where it elutes tobacco flavor from the tobacco, and exits the mouthend filter 22 into the mouth of the user. During the puff, the preferred current control circuit . . . regulates the flow of current to control the temperature experienced by the heating element and the amount of aerosol forming substance which is volatilized.” Ex. 1006 at 10:53-58.

b. “a housing having an inlet and an outlet”

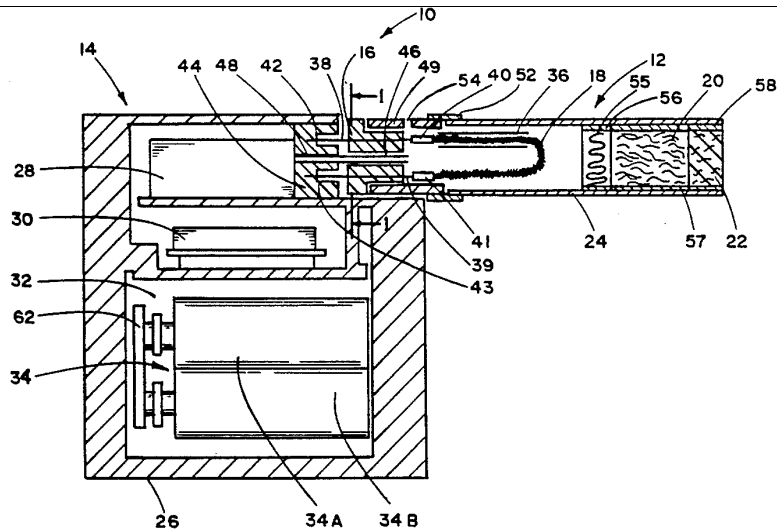
Claim 15 recites “a housing having an inlet and an outlet.”



Ex.1006, Brooks at Fig. 1 (annotated)

As illustrated in the annotated figure above and the claim chart below, Brooks describes a smoking article 10 that includes a housing, which consists of cigarette 12 and controller 14. Ex. 1006 at 7:15-20; 9:37-41. The housing has an air inlet 54 and an air outlet at the mouth end filter 22. *Id.* at 8:43-57; 10:40-53; Fig. 1; Ex. 1009 at ¶ 65.

a housing having an inlet and an outlet;



Ex. 1006 at Fig. 1.

“The cigarette 12 includes electrical connection plug 16, resistance heating element 18 carrying an aerosol forming substance, a roll of tobacco 20, mouth end filter 22, and a resilient overwrap 24.” Ex. 1006 at 7:17-20.

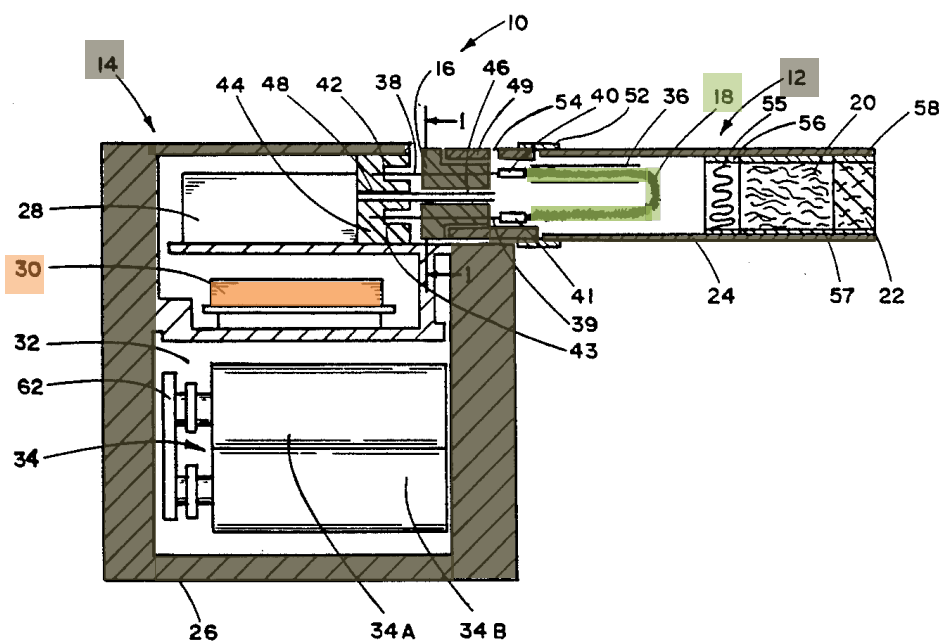
“The reusable controller 14 includes a case 26 or outer housing which provides a convenient and aesthetic holder for the user. The outer housing 26 can have a variety of shapes and can be manufactured from plastic, metal, or the like.” Ex. 1006 at 9:37-41.

“Preferably, the collar 49 includes one or more peripheral air inlet openings 54 which provide a flow of ambient air through the cigarette during draw. Alternatively, the air inlet can be positioned through the extreme inlet end of the cigarette or

	elsewhere through the periphery of the cigarette” Ex. 1006 at 8:50-57. “When the user puffs on the mouthend of the cigarette, ambient air enters the cigarette through air inlet 54. . . . The volatilized aerosol forming substance mixes with the drawn air and forms an aerosol. The volatilized aerosol forming substance (in aerosol or vapor form) . . . exits the mouthend filter 22 into the mouth of the user.” Ex. 1006 at 10:40-53.
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c. “an electronic circuit board and an atomizer having a heating element, within the housing”

Claim 15 recites “an electronic circuit board and an atomizer having a heating element, within the housing.”

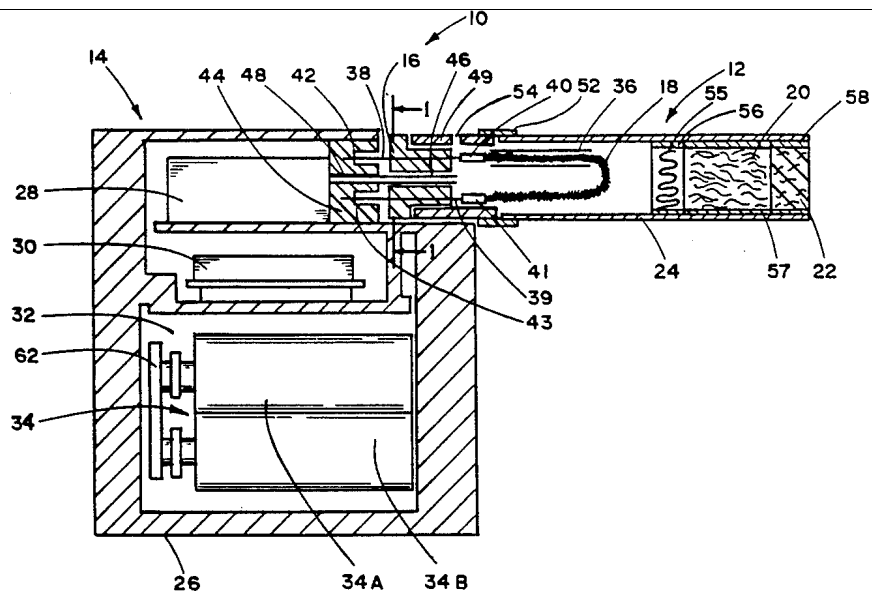


Ex.1006, Brooks at Fig. 1 (annotated)

As illustrated in the annotated figure above and the claim chart below, Brooks discloses a control circuit 30 which is an electronic circuit board. Ex. 1006

at 7:20-25; 15:39-62; Fig. 10; Ex. 1009 at ¶ 66. Further, the resistance heating components of heating element 18 of Brooks are an “atomizer having a heating element.” Specifically, the resistance heating components facilitate atomization of the aerosol forming substances, e.g., they volatilize the aerosol forming substance. Ex. 1006 at 10:40-49; Ex. 1009 at ¶ 67. This is consistent with the Patent Owner’s own admission in the prior proceeding that atomization refers to converting liquid into aerosol or vapor. Ex. 1011 at 13. The control circuit 30 and the heating element 18, including the resistance heating components, are located within the housing, which consists of cigarette 12 and hand-held controller 14. Ex. 1009 at ¶ 66.

an electronic circuit board and an atomizer having a heating element, within the housing;



Ex. 1006 at Fig. 1.

“The preferred controller 14 includes . . . a time-based current control circuit 30” Ex. 1006 at 7:20-25.

“The resistance heating element 18 employed in cigarette 12 preferably is a fibrous material having a high surface area and an adsorbant, porous, wettable character, in order to carry a suitable amount of aerosol forming substance for effective aerosol formation.” Ex. 1006 at 7:26-30.

“Other suitable heating elements include . . . porous substrates in intimate contact with resistance heating components; and the like.” Ex. 1006 at 7:65-8:3.

“[T]he heating element 18 is impregnated with or otherwise carries the aerosol forming substance in order that the aerosol forming substance is in a heat exchange relationship with the electrical heating element.” Ex. 1006 at 8:4-8.

“. . . the heating element experiences an increase in temperature which in turn heats and volatilizes the aerosol forming substance. The volatilized aerosol forming substance mixes with the drawn air and forms an aerosol.” Ex. 1006 at 10:45-49.

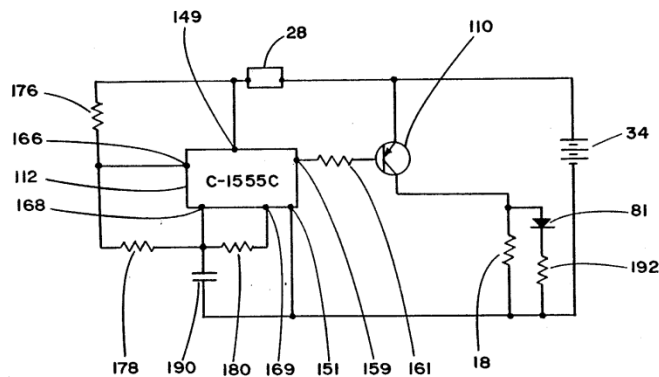


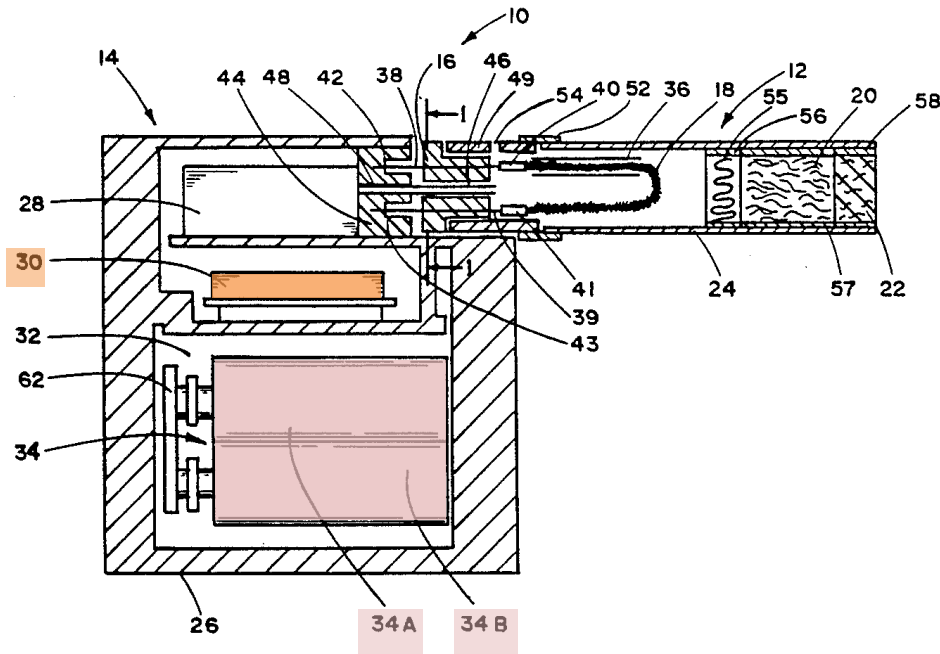
FIG. 10

Ex. 1006 at Fig. 10.

“The current regulating circuit shown in FIG. 10 is time based. This circuit includes timer 112, resistors 161, 176, 178 and 180, capacitor 190, and transistor 110.” Ex. 1006 at 15:39-62.

d. “a battery electrically connected to the electronic circuit board”

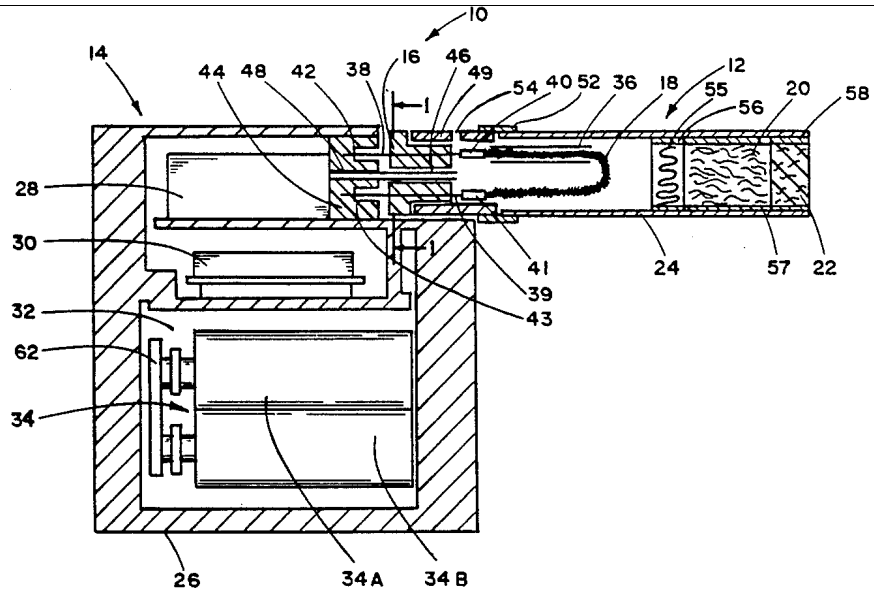
Claim 15 recites “a battery electrically connected to the electronic circuit board.”



Ex.1006, Brooks at Fig. 1 (annotated)

As illustrated in the annotated figure above and the claim chart below, Brooks discloses batteries 34A and 34B electrically connected to the electronic circuit board, namely, current control circuit 30. Ex. 1006 at 7:20-25; 9:51-55; Ex. 1009 at ¶ 68.

a battery electrically connected to the electronic circuit board;



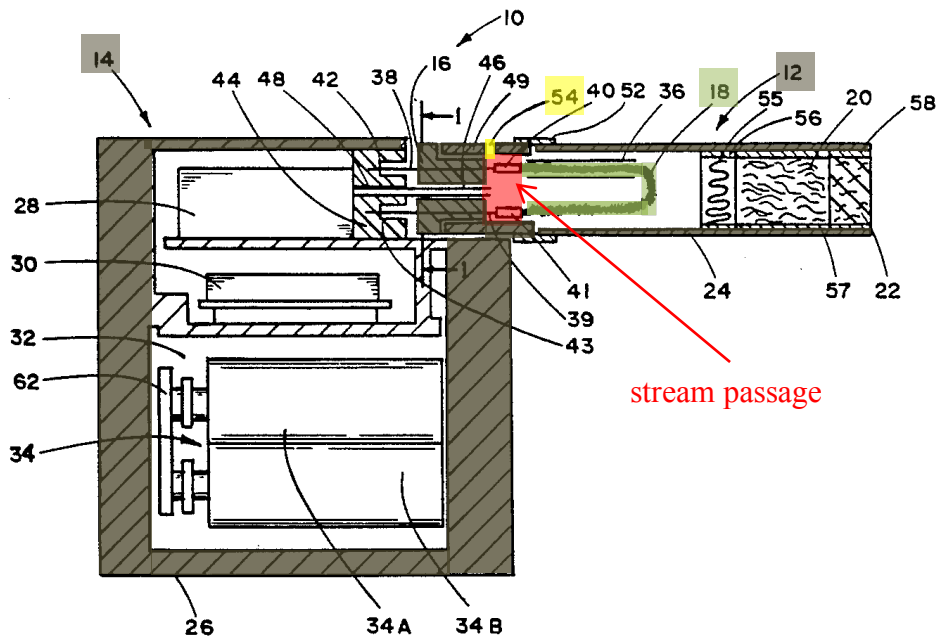
Ex. 1006 at Fig. 1.

“The preferred controller 14 includes . . . a chamber 32 into which battery power supply 34 (shown as batteries 34A and 34B) is inserted.” Ex. 1006 at 7:20-25.

“Controller 14 also preferably includes a control circuit 30, which is connected to . . . batteries 34A and 34B via battery terminal 62.” Ex. 1006 at 9:51-55.

e. “a stream passage within the housing leading from the inlet to the atomizer”

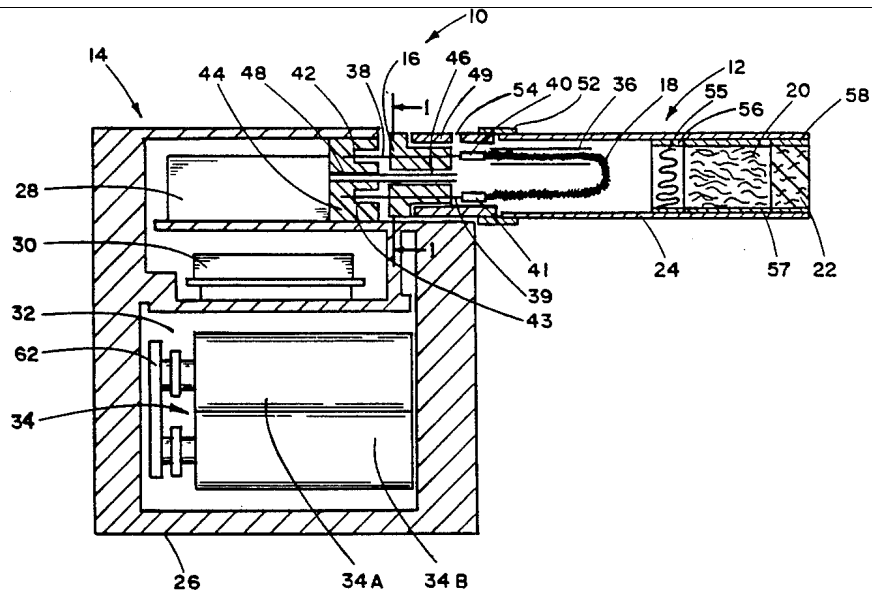
Claim 15 recites “a stream passage within the housing leading from the inlet to the atomizer.”



Ex.1006, Brooks at Fig. 1 (annotated)

As illustrated in the annotated figure above and the claim chart below, Brooks discloses a stream passage (shown in red) within the housing leading from air inlet 54 to the atomizer, i.e., the resistance heating components of heating element 18. Ex. 1006 at 8:50-57; 10:40-49; Figure 1; Ex. 1009 at ¶¶ 69-70.

a stream passage within the housing leading from the inlet to the atomizer;



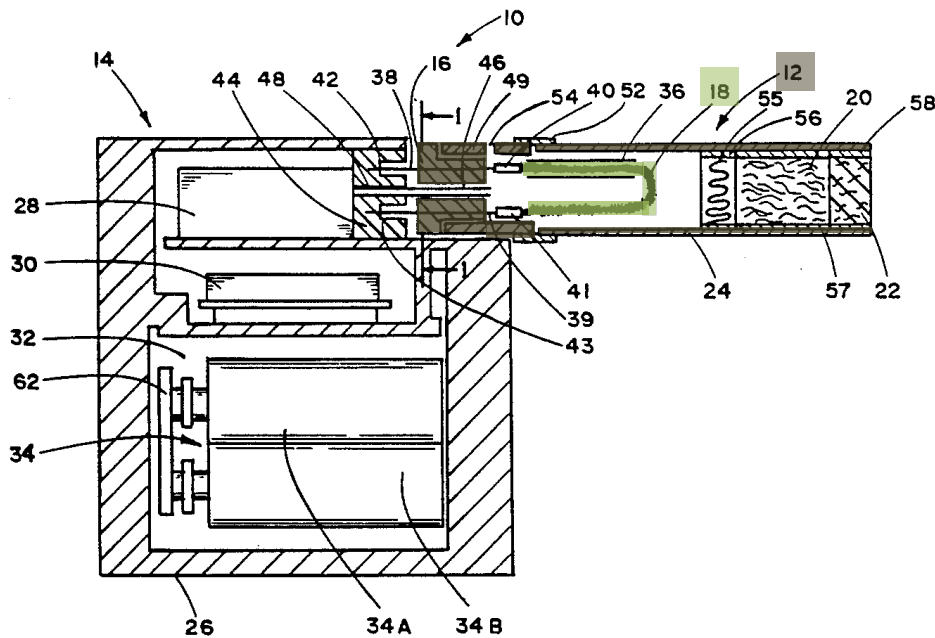
Ex. 1006 at Fig. 1.

“... drawn ambient air passing through the cigarette to the mouth of the user passes the resistance element.” Ex. 1006 at 8:55-57

“When the user puffs on the mouthend of the cigarette, ambient air enters the cigarette through air inlet 54. . . . As a result, the heating element experiences an increase in temperature which in turn heats and volatilizes the aerosol forming substance. The volatilized aerosol forming substance mixes with the drawn air and forms an aerosol.” Ex. 1006 at 10:40-49.

- f. **“a liquid storage body including fiber material in a cylindrical section of the housing, with the liquid storage body in physical contact with the atomizer”**

Claim 15 recites “a liquid storage body including fiber material in a cylindrical section of the housing, with the liquid storage body in physical contact with the atomizer.”



Ex.1006, Brooks at Fig. 1 (annotated)

As illustrated in the annotated figure above and the claim chart below, Brooks discloses a liquid storage body, i.e., porous substrates of heating element 18, in physical contact with the atomizer, i.e., the resistance heating components of heating element 18. Brooks discloses that the heating element 18 can comprise “porous substrates in intimate contact with resistance heating components.” Ex. 1006 at 7:65-8:3. The PHOSITA would have understood that, in this arrangement, the porous substrate functions to store the aerosol forming substance and is in physical contact with the resistance heating components, which comprise the “atomizer.” Ex. 1009 at ¶¶ 44-45 and 71. The aerosol forming substances stored by the porous substrate of Brooks can include liquids such as water, polyhydric alcohol, such as glycerin, or propylene glycol in combination with tobacco aroma

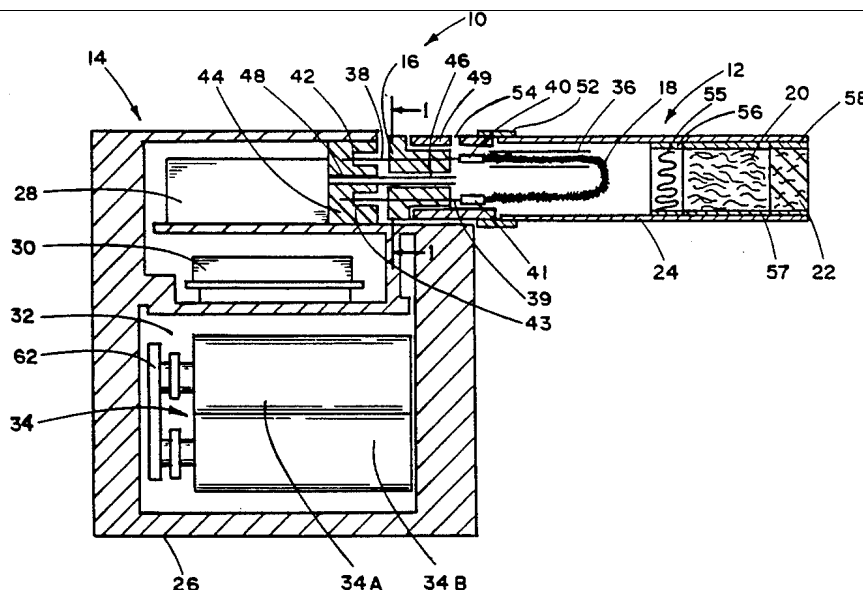
oil, tobacco essence, and/or other tobacco derivatives. Ex. 1006 at 8:4-22. The porous substrate of Brooks is thus a “liquid storage body.” Ex. 1009 at ¶¶ 44 and 71. Accordingly, Brooks discloses a heating element 18 that comprises a porous substrate (i.e., liquid storage body) that is separate from but in intimate (i.e., physical) contact with resistance heating components (i.e., the atomizer). Ex. 1009 at ¶ 71.

Brooks further explains that “heating element 18 employed in cigarette 12 preferably is fibrous material having . . . an adsorbant, porous, wettable character, in order to carry a suitable amount of aerosol forming substance.” Ex. 1006 at 7:26-30. Whether the heating element 18 is configured as a separate porous substrate in intimate contact with resistive heating components (*see id.* at 8:1-2) or heating element 18 is a unitary piece, Brooks nonetheless teaches that, in either configuration, the porous substrate (i.e., liquid storage body) is preferably made from a fibrous material having the characteristics necessary to “carry a suitable amount of aerosol forming substance.” *Id.* at 7:26-30; Ex. 1009 at ¶¶ 45 and 72.

Brooks also discloses the heating element 18 (and thus porous substrate in intimate contact with resistant heating components) may be located in a cylindrical section of the housing. As Figure 3 illustrates, the cigarette 12 section of the housing of Figure 1 may have a cylindrical shape. *See also* Ex. 1006 at 11:6-7 and 11:20-21 (noting that the embodiment illustrated in Figure 3 is “generally similar”

to the embodiment illustrated in Figure 2, which in turn is “generally similar” to the embodiment illustrated in Figure 1); Ex. 1009 at ¶ 72.

a liquid storage body including fiber material in a cylindrical section of the housing, with the liquid storage body in physical contact with the atomizer; and



Ex. 1006 at Fig. 1.

“Referring to FIG. 1, smoking article 10 includes cigarette 12 and reusable, hand-held controller 14. The cigarette 12 includes . . . heating element 18 carrying an aerosol forming substance” Ex. 1006 at 7:15-20.

“The resistance heating element 18 employed in cigarette 12 preferably is fibrous material having a high surface area and an adsorbant, porous, wettable character, in order to carry a suitable amount of aerosol forming substance for effective aerosol formation.” Ex. 1006 at 7:26-30.

“[T]he heating element 18 is impregnated with or otherwise carries the aerosol forming substance in order that the aerosol forming substance is in a heat exchange relationship with the electrical heating element. The aerosol forming substance can be, for example, a polyhydric alcohol, such as glycerin, propylene glycol, or mixtures thereof; water; a tobacco material such as tobacco aroma oil, a tobacco essence, a spray dried tobacco extract, a freeze dried tobacco extract, tobacco

dust, or the like, in order to provide tobacco flavor; or a combination thereof. Other suitable aerosol forming substances are well known in the art. See, for example, U.S. Pat. Nos. 4,714,092 and 4,756,318. While the loading of the aerosol forming substance can vary from substance to substance and from heating element to heating element, the amount of liquid aerosol forming substance used typically will be greater than about 15 mg and preferably ranges from about 25 mg to about 50 mg.” Ex. 1006 at 8:4-22.

“... the heating element experiences an increase in temperature which in turn heats and volatilizes the aerosol forming substance. The volatilized aerosol forming substance mixes with the drawn air and forms an aerosol.” Ex. 1006 at 10:45-49. 15:39-62

“Other suitable heating elements include porous metal wires or films; carbon yarns, cloths, fibers, discs or strips; graphite cylinders, fabrics or paints; microporous high temperature polymers having moderate resistivities; *porous substrates in intimate contact with resistance heating components*; and the like.” Ex. 1006 at 7:65-8:3 (emphasis added).

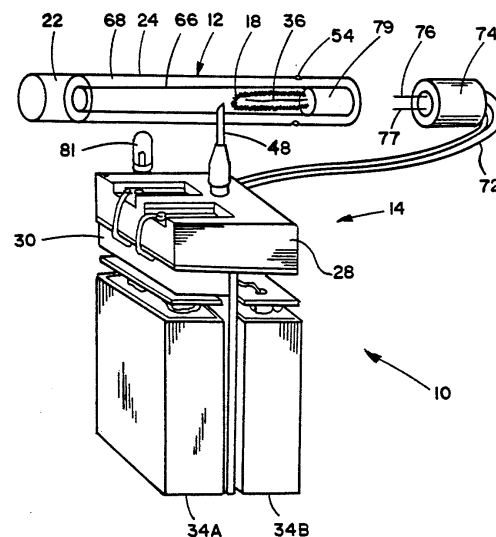


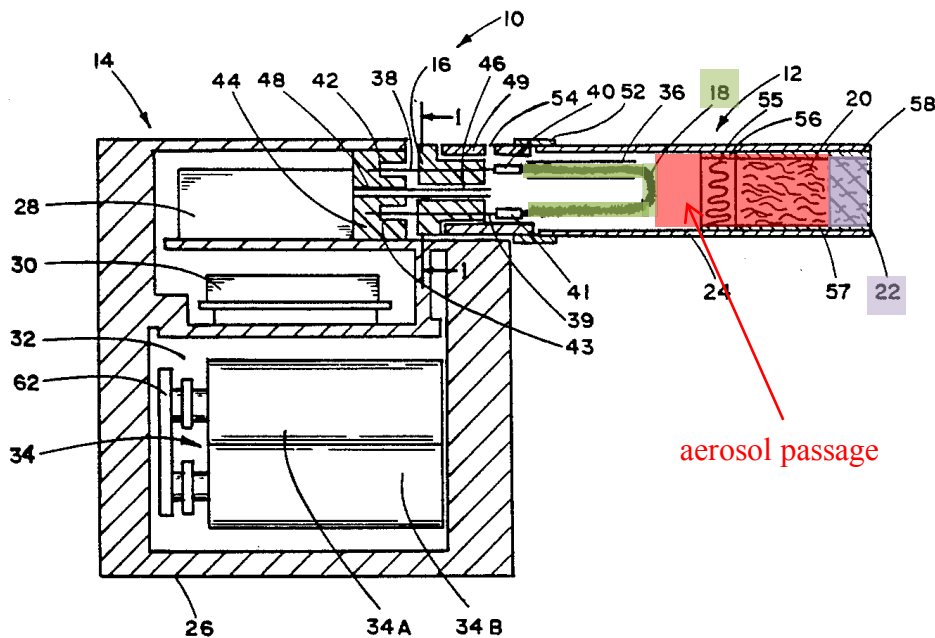
FIG. 3

Ex. 1006 at Fig. 3.

“Referring to FIG. 3, the illustrated embodiment is generally similar to the embodiment of FIG. 2 [which is generally similar to the embodiment of FIG. 1].” Ex. 1006 at 11:6-7, 11:20-21.

g. “an aerosol passage from the atomizer to the outlet”

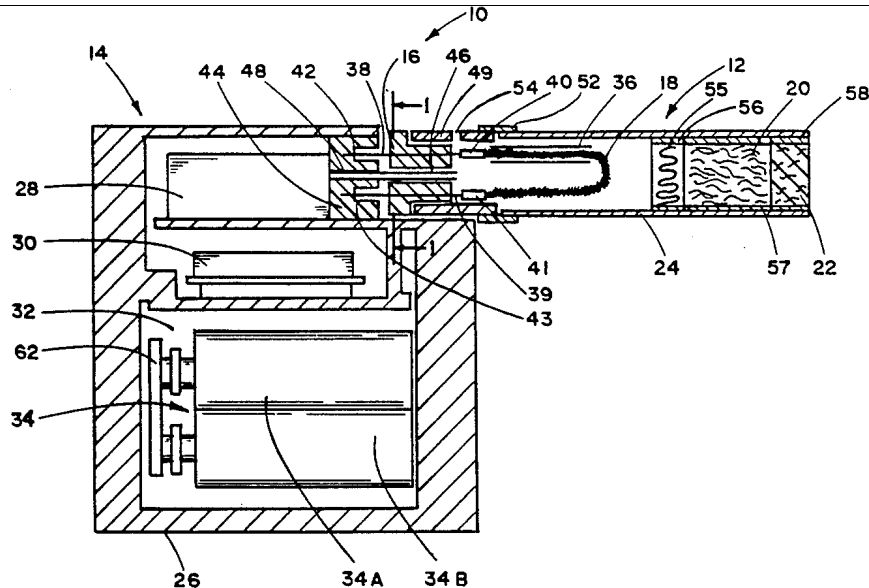
Claim 15 recites “an aerosol passage from the atomizer to the outlet.”



Ex.1006, Brooks at Fig. 1 (annotated)

As illustrated in the annotated figure above and the claim chart below, Brooks discloses an aerosol passage (shown in red) from the atomizer (resistance heating components of heating element 18) to the outlet at mouthend filter 22. Ex. 1006 at 10:45-53; 8:58-61; Ex. 1009 at ¶ 73.

an aerosol passage from the atomizer to the outlet.



Ex. 1006 at Fig. 1.

“[T]he cigarette 12 includes . . . resistance heating element 18 carrying an aerosol forming substance . . .” Ex. 1006 at 7:15-19.

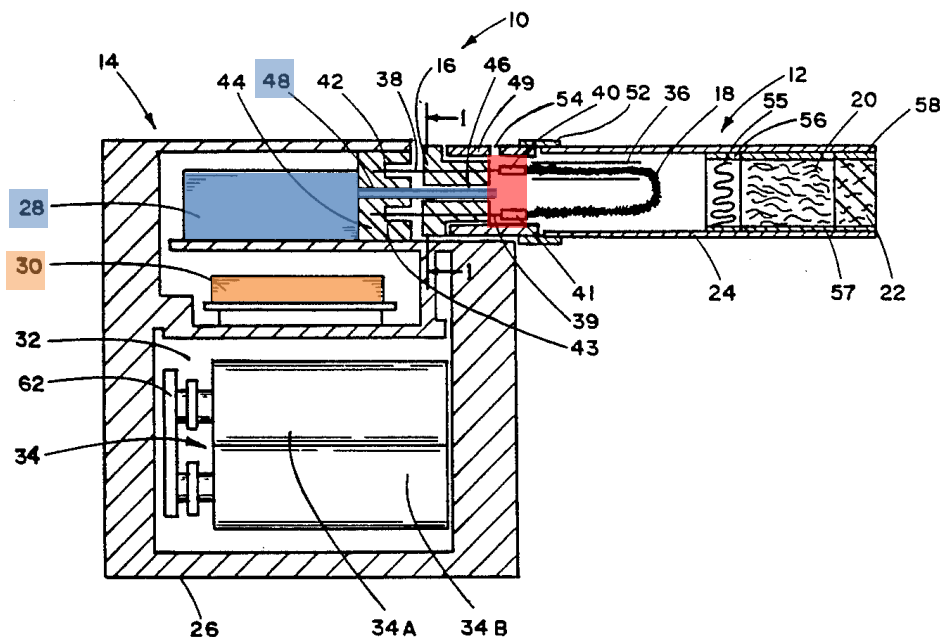
“Other suitable heating elements include . . . a porous substrate in intimate contact with resistance heating components . . .” Ex. 1006 a 7:65-8:3.

“The cigarette can include a plug spacer member 55 positioned between the heating element 18 and the roll or charge of tobacco 20. The plug spacer member 55 conveniently permits passage of aerosol therethrough . . .” Ex. 1006 at 8:58-61.

“...the heating element experiences an increase in temperature which in turn heats and volatilizes the aerosol forming substance. The volatilized aerosol forming substance mixes with the drawn air and forms an aerosol. The volatilized aerosol forming substance (in aerosol or vapor form) passes through the tobacco roll 20 where it elutes tobacco flavor from the tobacco, and exits the mouthend filter 22 into the mouth of the user.” Ex. 1006 at 10:45-53.

2. Claim 16

Claim 16 depends from claim 15, and further requires “a sensor in the stream passage, with the sensor electrically linked to the electronic circuit board.”

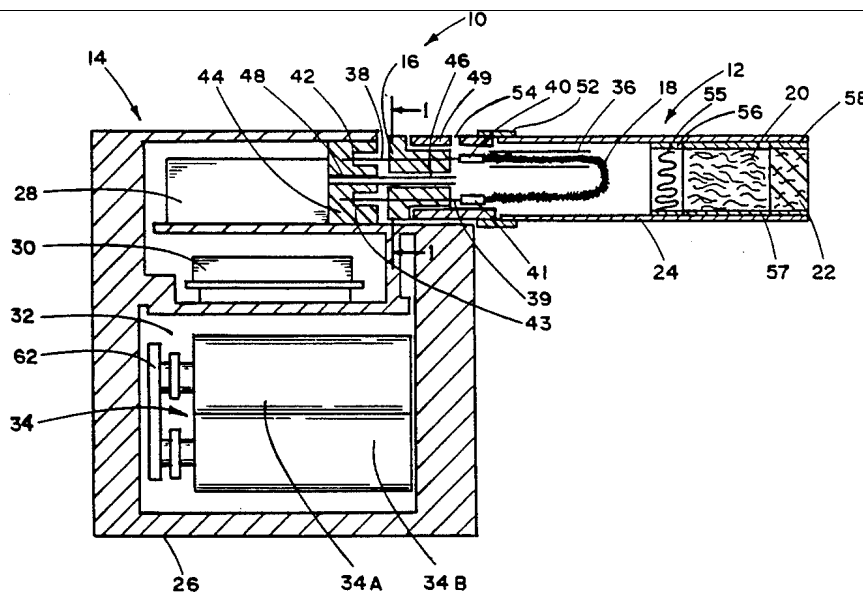


Ex.1006, Brooks at Fig. 1 (annotated)

As illustrated in the annotated figure above and the claim chart below, Brooks discloses pressure sensing switch 28 and tube 48 (i.e., “a sensor”) where tube 48 is in airflow communication with the internal region of the cigarette 12 between air inlet 54 and heating element 18 for sensing changes in air pressure within the cigarette. Ex. 1006 at 9:41-50; Ex. 1009 at ¶¶ 75-76. In particular, Figure 1 of Brooks shows one end of tube 48 disposed in the internal region of the cigarette 12 between air inlet 54 and heating element 18 (i.e., in the “stream passage”) for sensing changes in air pressure within the cigarette. Ex. 1006 at Fig.

1; *see also* Fig. 5 and 11:54-65 (noting that the embodiment illustrated in Figure 5 is “generally similar” to the embodiment illustrated in Figure 1). Brooks also discloses that pressure sensing switch 28 portion of the sensor is electronically linked to the control circuit 30 (i.e., “electronic circuit board”). *Id.* at 9:51-55; Ex. 1009 at ¶ 77.

16. The electronic cigarette of claim 15 further including a sensor in the stream passage, with the sensor electrically linked to the electronic circuit board.



Ex. 1006 at Fig. 1.

“Controller 14 includes an insulative receptacle 44 which includes plug-in connectors 42, 43 for engagement with prongs 38, 39 of plug 16. Receptacle 44 also includes *tube 48 which is inserted into passageway 46 of plug 16 to be in airflow communication with the internal region of the cigarette.* The other end of tube 48 is in airflow communication with pressure sensing switch 28, so that changes in air pressure which occur within the cigarette during draw can be sensed by the switch.” Ex. 1006 at 9:41-50 (emphasis added).

“Preferably, the collar 49 includes one or more peripheral air inlet openings 54 which provide a flow of ambient air through the cigarette during draw. Alternatively, the air inlet can be

	positioned through the extreme inlet end of the cigarette or elsewhere through the periphery of the cigarette” Ex. 1006 at 8:50-57. “Controller 14 also preferably includes <i>a control circuit 30, which is connected to a puff actuated, differential pressure sensitive switch 28 by electrically conductive wires (not shown)</i>, as well as to batteries 34A and 34B via battery terminal 62.” Ex. 1006 at 9:51-55 (emphasis added).
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G. The Challenged Claims Are Unpatentable as Obvious over Brooks (Ex. 1006) Combined With Cook (Ex. 1007) and/or Takeuchi (Ex. 1008)

Even if the Board were to determine that there is a question about whether Brooks discloses a preference that the porous substrate of heating element 18 “preferably is a fibrous material” when the porous substrate and resistance heating components are separate but “in intimate contact” (*see* Ex. 1006 at 8:2-3), it would have nonetheless been obvious to substitute fibrous material for the porous substrate as taught by Brooks, as well as by Cook and/or Takeuchi.

As explained above, Brooks discloses that heating element 18 may be “porous substrates in intimate contact with resistance heating components.” *Id.* As the PHOSITA would have understood, in this configuration, the “porous substrates” function to store the aerosol forming substance, which may comprise a liquid material. *Id.* at 8:4-22 (“... the amount of liquid aerosol forming substance. . . .”). Thus, the PHOSITA would have understood that the “porous substrates”

referenced in Brooks qualify as a “liquid storage body.” Ex. 1009 at ¶¶ 44 and 71; *see also, infra*, Section F.1.f.

As Brooks explains, the porous substrate of heating element 18 “preferably is a fibrous material . . . in order to carry a suitable amount of aerosol forming substance.” Ex. 1006 at 7:26-30. Similarly, Cook discloses a fuel absorbent reservoir 22 for storing liquid fuel that consists of a synthetic fiber liquid transfer wick material. Ex. 1007 at 2:18-22. Takeuchi discloses a liquid passageway containing intercommunicating pore structure 302 that may be made from “bundled fibers.” Ex. 1008 at Fig. 14; 10:50-55; 3:35-49. Thus, as taught by Brooks, Cook and Takeuchi, it would have been a matter of routine design choice for the PHOSITA to have included fiber material in Brooks’ “porous substrates” when the heating element 18 is configured as a “porous substrate[]” that is separate from but in intimate contact from the resistive heating components. *See* Ex. 1009 at ¶¶ 80-88.

Accordingly, claims 15 and 16 are obvious based upon Brooks alone, or in combination with Takeuchi and/or Cook.

1. Claim 15

a. “an electronic cigarette”

Petitioner contends that the preamble is not a limitation. But even if the preamble were a limitation, for the reasons discussed above in Section F.1.a with respect to anticipation, Brooks discloses an “electronic cigarette.”

b. “a housing having an inlet and an outlet”

Claim 15 recites “a housing having an inlet and an outlet.” For the reasons discussed above in Section F.1.b with respect to anticipation, Brooks discloses this limitation.

c. “an electronic circuit board and an atomizer having a heating element, within the housing”

Claim 15 recites “an electronic circuit board and an atomizer having a heating element, within the housing.” For the reasons discussed above in Section F.1.c with respect to anticipation, Brooks discloses this limitation.

d. “a battery electrically connected to the electronic circuit board”

Claim 15 recites “a battery electrically connected to the electronic circuit board.” For the reasons discussed above in Section F.1.d with respect to anticipation, Brooks discloses this limitation.

e. “a stream passage within the housing leading from the inlet to the atomizer”

Claim 15 recites “a stream passage within the housing leading from the inlet to the atomizer.” For the reasons discussed above in Section F.1.e with respect to anticipation, Brooks discloses this limitation.

f. “a liquid storage body including fiber material in a cylindrical section of the housing, with the liquid storage body in physical contact with the atomizer”

Claim 15 recites “a liquid storage body including fiber material in a cylindrical section of the housing, with the liquid storage body in physical contact with the atomizer.” As explained above in Section F.1.f., Brooks discloses that the heating element 18 can comprise “porous substrates in intimate contact with resistance heating components.” Ex. 1006 at 7:65-8:3. As the PHOSITA would have understood, Brook’s porous substrate when heating element 18 is configured in this manner stores the aerosol forming substance. Ex. 1009 at ¶¶ 44 and 71. Because Brooks also discloses that heating element 18 is preferably a fibrous material “in order to carry a suitable amount of aerosol forming substances for effective aerosol formation” (Ex. 1006 at 7:26-30), Brooks provides the motivation for including fibrous material in the porous substrates so that they too “carry a suitable amount of aerosol forming substances” when heating element 18 is configured as a porous substrate in contact with resistive heating components. Ex. 1009 at ¶¶ 82-83.

Similarly, Cook discloses a porous liquid storage body (fuel absorbent reservoir 22) made from “synthetic fiber.” Ex. 1007 at 2:18-22. Takeuchi also discloses a porous liquid storage body (intercommunicating pore structure of 302) made from “bundled fibers.” Ex. 1008 at 3:36-49; Fig. 1; 10:50-55; Fig. 14; Ex. 1009 at ¶ 84. It would have been obvious to use fiber-containing material for the porous substrates of Brooks in view of Cook or Takeuchi’s fiber teachings. Each of the porous substrates of Brooks and the fiber-containing materials of Cook and Takeuchi is disclosed for storing liquid and uses capillary action to move stored liquid for volatilization. Ex. 1009 at ¶ 85. Substituting fiber-containing material for the porous substrates of Brooks, is really nothing more than the substitution of a known element for another to achieve a predictable result, holding a liquid (e.g., aerosol forming liquids in Brooks and Takeuchi) or (liquid fuel in Cook). Ex. 1009 at ¶¶ 84-88.

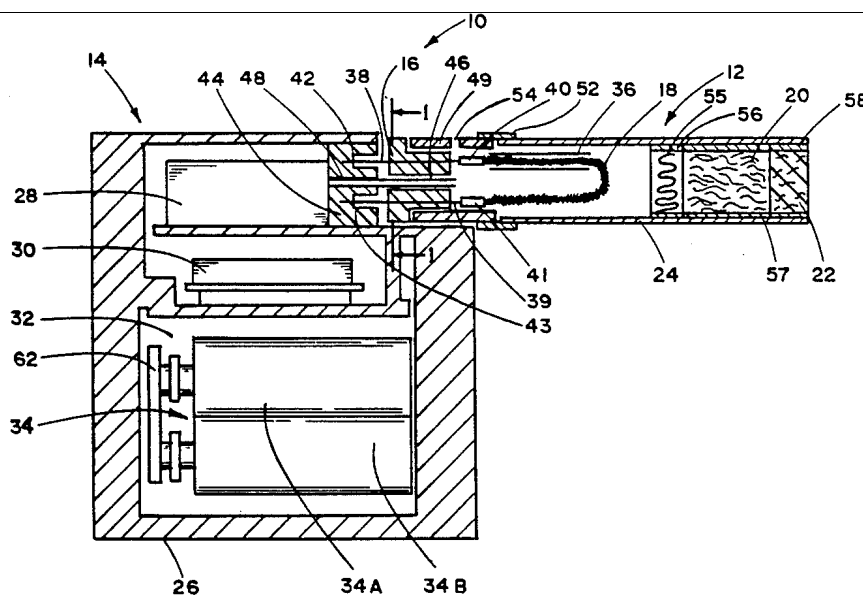
In addition, the PHOSITA would have been motivated to substitute the fiber-containing materials of Cook and Takeuchi because the PHOSITA would have recognized that fiber-containing materials are preferred for preventing undesired and unintended leaking of the aerosol forming liquid from the “porous substrate” of Brooks. Ex. 1009 at ¶ 87. Moreover, the PHOSITA would have been motivated to use Takeuchi’s fiber teachings because both the porous liquid storage body of Takeuchi and the “porous substrate” of Brooks perform the same function,

namely holding a liquid aerosol forming substance in an intimate, heat exchange relationship with a heating component for atomization. Ex. 1009 at ¶ 86.

Also, for the reasons explained above in Section F.1.e, Brooks discloses the heating element 18 (which Brooks explains may consist of a separate porous substrate in intimate contact with resistant heating components) in a cylindrical section of the housing.

The claim chart below identifies where this limitation is shown in the prior art.

a liquid storage body including fiber material in a cylindrical section of the housing, with the liquid storage body in physical contact with the atomizer; and



Ex. 1006 at Fig. 1.

“Referring to FIG. 1, smoking article 10 includes cigarette 12 and reusable, hand-held controller 14. The cigarette 12 includes . . . heating element 18 carrying an aerosol forming substance” Ex. 1006 at 15-20.

"The resistance heating element 18 employed in cigarette 12 preferably is fibrous material having a high surface area and an

	adsorbant, porous, wettable character, in order to carry a suitable amount of aerosol forming substance for effective aerosol formation.” Ex. 1006 at 7:26-30. “[T]he heating element 18 is impregnated with or otherwise carries the aerosol forming substance in order that the aerosol forming substance is in a heat exchange relationship with the electrical heating element. The aerosol forming substance can be, for example, a polyhydric alcohol, such as glycerin, propylene glycol, or mixtures thereof; water; a tobacco material such as tobacco aroma oil, a tobacco essence, a spray dried tobacco extract, a freeze dried tobacco extract, tobacco dust, or the like, in order to provide tobacco flavor; or a combination thereof. Other suitable aerosol forming substances are well known in the art. See, for example, U.S. Pat. Nos. 4,714,092 and 4,756,318. While the loading of the aerosol forming substance can vary from substance to substance and from heating element to heating element, the amount of liquid aerosol forming substance used typically will be greater than about 15 mg and preferably ranges from about 25 mg to about 50 mg.” Ex. 1006 at 8:4-22. “Other suitable heating elements include porous metal wires or films; carbon yarns, cloths, fibers, discs or strips; graphite cylinders, fabrics or paints; microporous high temperature polymers having moderate resistivities; <i>porous substrates in intimate contact with resistance heating components</i>; and the like.” Ex. 1006 at 7:65-8:3 (emphasis added).
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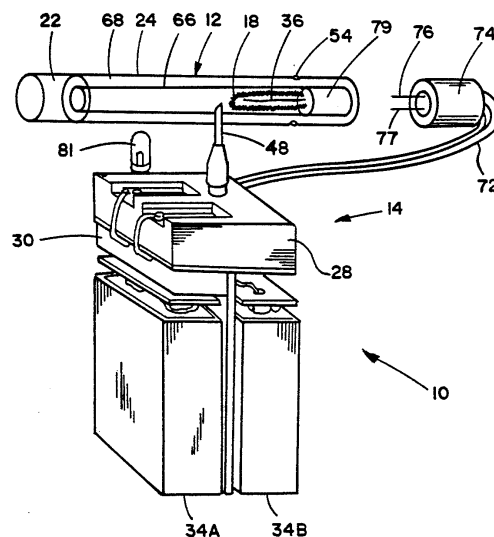
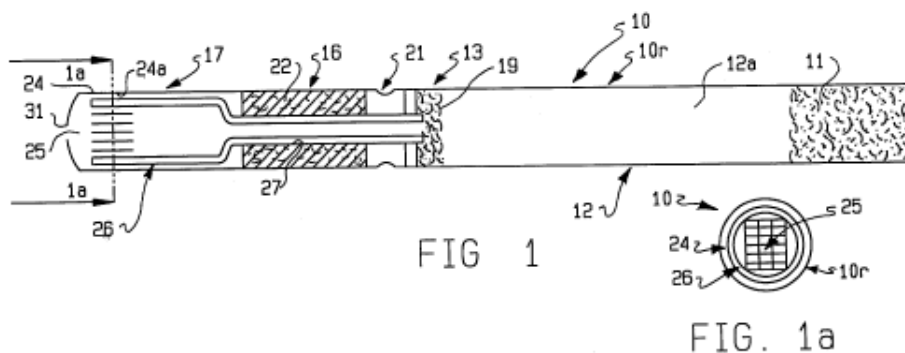


FIG. 3

Ex. 1006 at Fig. 3.

“Referring to FIG. 3, the illustrated embodiment is generally similar to the embodiment of FIG. 2 [which is generally similar to the embodiment of FIG. 1].” Ex. 1006 at 11:6-7, 11:20-21.



Ex. 1007, Figs. 1 and 1a.

“[Fuel storage and air mixing] section 16 includes fuel absorbent reservoir 22 including a wick material *for storing liquid fuel* in amounts ranging from about 300-500 microliters (μl). The absorbent fuel reservoir consists of *a synthetic fiber*

liquid transfer wick material which utilizes capillary action.”
Ex. 1007 at 2:18-22 (emphasis added).

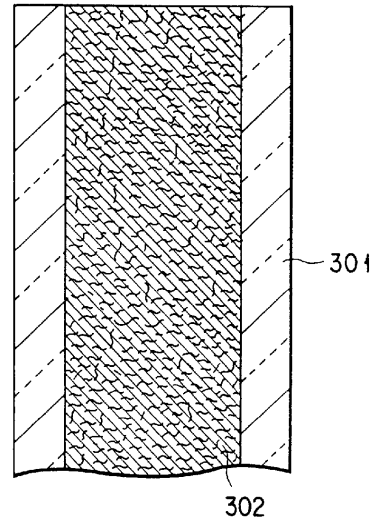


FIG. 14

Ex. 1008 at Fig. 14.

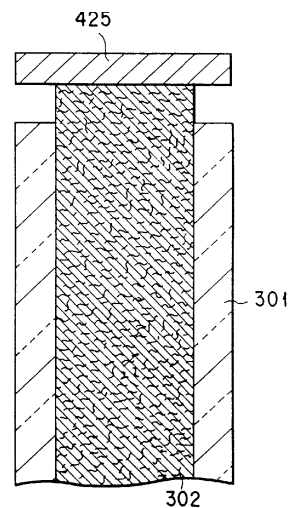


FIG. 15

Ex. 1008 at Fig. 15.

“Fig. 14 is a cross-sectional review showing another embodiment of the liquid passageway for a liquid flavor source used in a flavor-generating device according to the

	invention. In this case, a liquid passageway 372 is constituted by the intercommunicating <i>pore structure</i> 302 filled in an enclosure 301, as mentioned earlier. The enclosure 301 may be provided by a tube, or two plates arranged spaced apart from each other wherein both sides are sealed. In this embodiment, a heater or heaters (not shown) may be arranged as in FIG. 1, 10 or 11. Further, as shown in FIG. 15, the intercommunicating pore structure 302 may protrude from the enclosure 301. In such a case, a heater 425 can be provided on the protruded end of the intercommunicating pore structure 302. FIG. 15 is a cross-sectional view showing still another embodiment of the liquid passageway for a liquid flavor source used in a flavor-generating device according to the invention.” Ex. 1008, 10:50-67 (emphasis added). “In the present invention, the liquid passageway through which the liquid flavor source is transported by the capillary force can be constituted by . . . an inter-communicating void or pore structure filled in an enclosure. The intercommunicating pore structure refers to a structure having intercommunicating voids or pores through which the liquid may be elevated from the inlet of the passageway which is in fluid communication with the liquid flavor source contained in the liquid container to the outlet of the passageway by the capillary force. Representative examples of the structure include open-cell foamed structure, and <i>bundled fibers</i>, but should not be limited thereto.” Ex. 1008 at 3:35-49 (emphasis added).
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g. “an aerosol passage from the atomizer to the outlet”

Claim 15 recites “an aerosol passage from the atomizer to the outlet.” For the reasons discussed above in Section F.1.g with respect to anticipation, Brooks discloses this limitation.

2. Claim 16

Claim 16 depends from claim 15, and further requires “a sensor in the stream passage, with the sensor electrically linked to the electronic circuit board.” For the reasons discussed above in Section F.2 with respect to anticipation, Brooks discloses this limitation.

VII. CONCLUSION

Petitioner has demonstrated a reasonable likelihood that claims 15 and 16 of the '726 patent are unpatentable for the reasons explained herein. Petitioner therefore requests that the Board institute *inter partes* review for both claims.

Dated: July 2, 2016

Respectfully submitted,

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CERTIFICATE OF COMPLIANCE

The undersigned certifies that this brief complies with the type-volume limitations of 37 CFR § 42.24(a)(1)(i). This brief contains 8,997 words as calculated by the “Word Count” feature of Microsoft Word 2010, the word processing program used to create it.

The undersigned further certifies that this brief complies with the typeface requirements of 37 CFR § 42.6(a)(2)(ii) and typestyle requirements of 37 CFR § 42.6(a)(2)(iii). This brief has been prepared in a proportionally spaced typeface using Microsoft Word 2010 in Times New Roman 14 point font.

DATED: July 2, 2016

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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 July 2, 2016, a complete and entire copy of this Petition for *Inter Partes* Review, and all supporting exhibits, were served EXPRESS MAIL® to the Patent Owner by serving the correspondent of record, as indicated below:

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