

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

JT INTERNATIONAL S.A.
Petitioner,

v.

FONTEM HOLDINGS 1 B.V.
Patent Owner

U.S. Patent No. 8,365,742
Issued: February 5, 2013
Filed: April 5, 2011
Inventor: Lik Hon
Title: AEROSOL ELECTRONIC CIGARETTE

Inter Partes Review No. IPR2015-01587

PETITION FOR *INTER PARTES* REVIEW UNDER 37 C.F.R. § 42.100

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Exhibit List for *Inter Partes* Review of U.S. Patent No. 8,365,742

Exhibit Description	Exhibit
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Declaration of Jeffrey A. Schuster, Ph.D.	1002
U.S. Patent No. 6,155,268 (“Takeuchi”)	1003
U.S. Patent No. 6,234,167 (“Cox”)	1004
U.S. Patent No. 4,947,874 (“Brooks”)	1005
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EP 0 845 220 (“Susa”)	1007
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Webster’s New World Collegiate Dictionary (“detach”)	1018
Oxford American Dictionary & Thesaurus (“frame”)	1019
McGraw-Hill Dictionary of Scientific and Technical Terms (5 th ed. 1994) (“assembly”) (“component”) (“porous”)	1020

Exhibit Description	Exhibit
Academic Press Dictionary (“permeability”) (“solid”)	1021
American Heritage Dictionary (“atomize”) (“end”) (“substantial”)	1022
Merriam-Webster.com (“aerosol”) (“atomizer”) (“permeable”) (“porous”)	1023

Petitioner JT International S.A. (“Petitioner”) respectfully petitions for *inter partes* review of claims 1-3 (all claims) of U.S. Patent No. 8,365,742 (“the ‘742 patent” (Ex. 1001)) in accordance with 35 U.S.C. §§ 311-319 and 37 C.F.R. §42.100 *et seq.*

I. NOTICES AND STATEMENTS

Pursuant to 37 C.F.R. § 42.8(b)(1), Petitioner identifies JT International S.A. as the real party-in-interest. For example, no other party has funded, directed or controlled this Petition. 37 C.F.R. § 42.8(b)(1).

Pursuant to 37 C.F.R. § 42.8(b)(2), Petitioner identifies the following judicial matters involving the ‘742 patent: 12-cv-5454 and 14-cv-01645. On March 10, 2015, VMR Products LLC filed a petition for *inter partes* review of claims 1, 2, and 3 (all claims) of the ‘742 patent (Case No. 2015-00859).

Pursuant to 37 C.F.R. § 42.8(b)(3), Petitioner identifies the following counsel. Lead counsel for Petitioner is Erik G. Swenson, Norton Rose Fulbright US LLP, Reg. No. 45,147, who can be reached by email at erik.g.swenson@nortonrosefulbright.com, by ph: 612-321-2266, by fax: 612-321-2288, and at: Norton Rose Fulbright US LLP, 3100 RBC Plaza, 60 South 6th St. Minneapolis, MN 55402. Backup counsel is George W. Jordan III, who can be reached by email at george.jordan@nortonrosefulbright.com, by ph: 713-651-5423, by fax: 713-651-5246, and at: Norton Rose Fulbright US LLP, 1301

McKinney, Suite 5100, Houston, TX 77010. A power of attorney accompanies this Petition. Petitioner consents to electronic service at USNRF-JTI-Fontem-IPR-Service@nortonrosefulbright.com.

Pursuant to 37 C.F.R. § 42.104(a), Petitioner certifies that the ‘742 patent is available for *inter partes* review and that the Petitioner is not barred or estopped from requesting an *inter partes* review challenging the patent claims on the grounds identified in this Petition.

II. INTRODUCTION

The ‘742 patent is directed to an electronic cigarette comprising a shell (or housing) including an air inlet, battery assembly, and cigarette bottle assembly that fits with an atomizer assembly. The atomizer assembly provides an atomizer including a frame with a run through hole substantially aligned with heating wire wound on a porous component. A porous component contacts liquid storage.

Section III of this Petition summarizes the ‘742 patent and its prosecution history. Section IV addresses claim construction. Section V identifies the grounds for invalidity all claims. Section VI is an overview of prior art. Section VII provides the detailed explanations of grounds. These showings are accompanied by the Declaration of Jeffrey A. Schuster, Ph.D. (Ex. 1002 (“Schuster Decl.”)). Accordingly, Petitioner respectfully requests a Decision to institute *inter partes* review of the ‘742 patent.

III. THE '742 PATENT

A. Background

The '742 patent is directed to an electronic cigarette such as in FIG. 1 below.

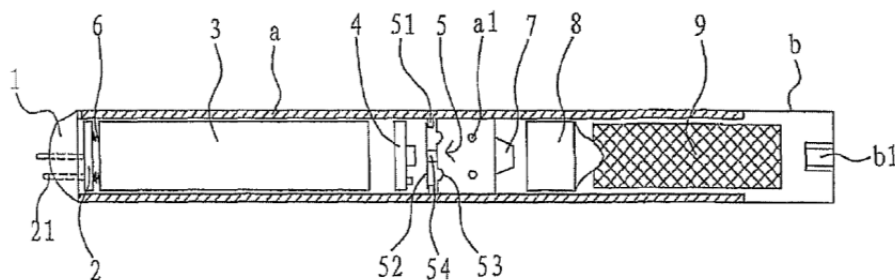


Figure 1

Hollow shell (a) contains an atomizer and battery assembly. (*Id.* at 2:30-37.)

A cigarette bottle assembly includes liquid storage 9. (*Id.* at 3:49-51.) The cigarette bottle assembly fits with the atomizer assembly. (*Id.* at 3:6-21.) A porous component of the atomizer assembly contacts the liquid storage, achieving “capillary impregnation” for the liquid supply. (*Id.* at 4:37-40.)

Figures 17-18 depicting the atomizer are reproduced below.

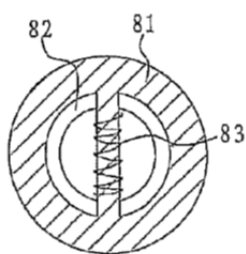


Figure 17

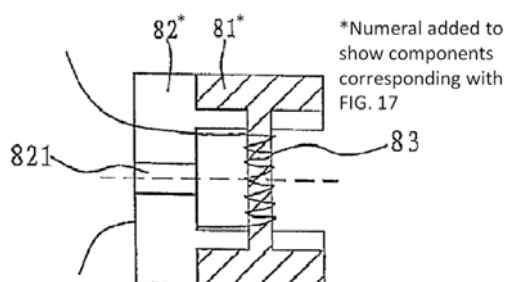


Figure 18

Porous component 81 is set on frame 82. (*Id.* at FIGS. 1, 17-18; 5:42-46.)

Heating wire 83 is wound around a portion of the porous component aligned with run-through hole 821. (*Id.* at FIGS. 17-18; 5:42-49.)

B. Prosecution History

The application which led to the ‘742 patent was filed on April 5, 2011 as U.S. App. Serial No. 13/079,937. The application was a divisional of U.S. Pat. App. No. 12/226,818, filed Oct. 29, 2008 (now U.S. Pat. No. 8,156,944), which is the national stage entry of PCT/CN2007/001575, filed on May 15, 2007, with priority to CN Pat. App. No. 2006/20090805, filed on May 16, 2006. (Ex. 1015.)

On April 5, 2011 Applicant replaced all 29 claims in a Preliminary Amendment, with one new claim, and amended the specification. (Ex. 1009 at 2-3.) On July 19, 2012, the Examiner rejected sole claim 30 under 35 U.S.C. § 112 as indefinite, (Ex. 1010 at 2.) finding it unclear which “part” and “side” the Applicant was referring to in the limitation “the said porous component is wound with heating wire in the part that is on the side in the axial direction of the run through hole” (*Id.*) The Examiner indicated that Claim 30 would be allowable if the § 112 rejection was overcome, explicitly stating that Hon ‘043 was the closest prior art and that only one limitation—“an atomizer, which includes a porous component and a heating body; the said heating body is heating wire . . . the heating wire is wound on the said porous component”—was lacking. (*Id.* at 2-3.)

On Aug. 3, 2012, Applicant responded, amending claim 30 by replacing “porous component is wound with heating wire in the on the side in the axial direction of the run-through hole” with “the heating wire is wound on a part of the

porous component that is substantially aligned with the run-through hole.” (Ex. 1011 at 2 (claim 30) and 4 (Remarks).) and also adding claims 31-32, (*id.* at 2-3.) arguing three claims were “similar to claim 30 and include the elements of claim 30, but written with more common English usage [...]new claim 32 is similar to claims 30 and 31 but describes a heating wire wound on a part of the porous component substantially aligned with the run-through hole . . . and with the porous component in contact with a liquid supply in the housing . . .” (*Id.*)

On Aug. 7, 2012 Applicant supplemented its response to the July 19, 2012 Office Action. (Ex. 1012.) The Applicant provided a substitute specification with substantive changes from the previous version. (*Id.* at 2.)

Although there were no additional rejections after the Aug. 7, 2012 response, Applicant conducted an examiner interview on Aug. 14, 2012. (Ex. 1013.) No agreement was reached during the interview. (*Id.*)

On Nov. 14, 2012, the USPTO issued a notice of allowance. (Ex. 1014.) The ‘742 patent issued on Feb. 5, 2013. Claims 30-32 issued as claims 1-3. (Ex. 1001.) On July 2, 2013, the USPTO issued a certificate of correction. (Ex. 1015.)

1. *Inter Partes* Review

Review of claims 1-3 of the ‘742 patent was requested in IPR2015-000859 under 35 U.S.C. § 103(a) as obvious based on the following: China Pat. No. CN 2719043 to Hon (“Hon ‘043”) in view of European Pat. Pub. No. EP 0 845 220 to

Susa (“Susa”); Hon ‘043 in view of PCT Pat. Pub. No. WO 03/034847 to Abhulimen (“Abhulimen”); Hon ‘043 in view of U.S. Pat. No. 2,057,353 to Whittemore (“Whittemore”); Hon ‘043 in view of U.S. Pat. No. 5,144,962 to Counts (“Counts”); Susa alone; Susa in view of Abhulimen; and Susa in view of Whittemore. (Paper 2, Mar. 10, 2015.)

IV. CLAIM CONSTRUCTION

The claims should be construed for purposes of this proceeding consistent with their broadest reasonable interpretation (“BRI”) in light of the specification. Petitioner expressly reserves the right to advance different constructions in any proceeding employing a different claim construction standard. A person of ordinary skill in the art at the time of the alleged invention of the ‘742 patent had a four-year degree in Mechanical Engineering, Electrical Engineering, Physics, or equivalent, as well as at least four years of experience in designing pulmonary drug delivery devices. (Schuster Decl. ¶20.)

The claim terms requiring analysis are discussed below. None of these claim terms were defined in the specification.

A. “Cigarette Bottle Assembly”: Claim 1 recites “cigarette bottle assembly” which the ‘742 patent describes as including a cigarette holder shell (b) and a perforated liquid storage component 9. (Ex. 1001 at 3:49-51; FIGS. 4, 11-12.) A porous component absorbs cigarette liquid from the liquid storage component 9.

(*Id.* at 3:63-67.) The cigarette bottle assembly includes air channel (b1), which serves as the inhalation port. (*Id.* at 5:18-21.) In the Summary of the Invention section, the '742 patent just refers to "bottle assembly." (*Id.* at 1:30.) The plain meaning of the term "assembly" is a "unit containing component parts of a mechanism, machine or similar device." (Ex. 1020 at 139.) Thus, the BRI of "cigarette bottle assembly" is "an enclosed unit containing component parts for cigarette material." (Schuster Decl. ¶¶ 34-40.)

B. "Cigarette Bottle Assembly is Detachably Located In One End of the Shell": Claim 1 recites the "cigarette bottle assembly is detachably located in one end of the shell." The cigarette bottle may be detached from shell (a). (Ex. 1001 at FIGS. 1-2.) The '742 patent uses the term "cigarette bottle assembly is detachably located in one end of the shell" in a manner consistent with its plain and ordinary meaning. (*e.g.*, Webster's New World Collegiate Dictionary, Ex. 1018 at 392 (defines "detach" as "to unfasten or separate and remove; disconnect; disengage"); *See, also e.g.*, American Heritage Dictionary, Ex. 1022 at 607 (defines "end" as an "outside or extreme edge or physical limit; a boundary.")).) Accordingly, the BRI of "cigarette bottle assembly is detachably located in one end of the shell" is "the cigarette bottle assembly located at a boundary or terminal surface of the shell may be separated and removed from another part of the electronic cigarette." (Schuster Decl. ¶¶ 41-46.)

C. **“Frame”**: All claims of the ‘742 patent recite the term “frame.” The ‘742 patent describes “frame” as a structure with a porous component “set on” it. (Ex. 1001 at 5:42-46.) This relationship is illustrated in FIGS. 17 and 18 below, which depict frame 82 supporting porous component 81 and heating wire 83. (*Id.* at 5:42-49.)

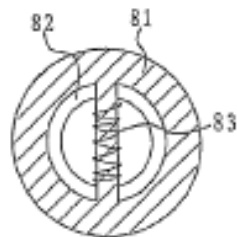


Figure 17

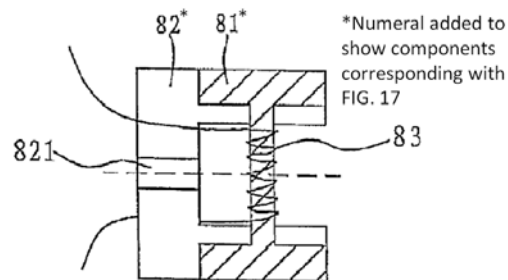


Figure 18

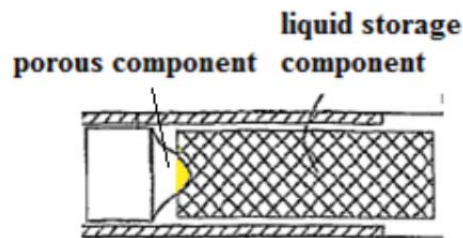
The ‘742 patent uses the term “frame” in a manner consistent with its plain and ordinary meaning. (*Id.*) (See, e.g., OXFORD AMERICAN DICTIONARY & THESAURUS, Ex. 1019 at 581 (defining “frame” as “the basic rigid supporting structure of anything”); Fontem Litigation Joint Claim Construction Chart, Ex. 1016 at Ex. B pp. 7-8 (Fontem relying on same definition of “frame”); Court’s Rulings on Claims Construction, Ex. 1017 at pp. 7 (the court held that “frame” means a “rigid structure.”).) Accordingly, the BRI of “frame” is “a rigid structure, or combination of structures, for direct or indirect support.” (Schuster Decl. ¶¶ 47-53.)

D. **“Run-through Hole”**: All claims of the ‘742 patent recite the term “run-through hole.” The ‘742 patent describes the “run-through hole” as a passageway

that connects with the atomizing chamber. (*Id.* at 3:19-21.) The run-through hole may be a passageway 821 positioned on the air inflow side of the atomizer (*id.* at 5:45-47, FIG. 18), or passageway 813 at the aerosol outflow side of the atomizer. (*Id.* at 4:29-30; FIG. 5.) The ‘742 patent uses the term “run-through hole” in a manner consistent with its plain and ordinary meaning. (Schuster Decl. at ¶¶ 54-58.) Accordingly, the BRI of “run-through hole” is “a passageway between surfaces of a body or bodies.” (*Id.*)

E. “Substantially”: The ‘742 specification does not refer to “substantially”; however, all claims recite this term. The prosecution history shows “substantially” was added by Applicant. (Ex. 1011 at 2-3.) Claim 1 was amended to recite a porous component “substantially aligned with the run-through hole”; added claim 2 recites a porous component “substantially surrounded by the liquid storage component”; added claim 3 recites a porous component “substantially aligned with the run-through hole.” (*Id.*) According to the court’s claim construction ruling, “substantially” means “largely but not completely.” (Ex. 1017 at 26.) American Heritage Dictionary defines “substantial” as “[c]onsiderable in importance, value, degree, amount, or extent[.]” (Ex. 1022 at 1791.) Regarding “largely,” the majority of the porous component need not be aligned with the run-through hole (claims 1 and 3) or surrounded by the liquid storage component (claim 2). (Schuster Decl. ¶ 63.) Indeed, there is no disclosure in which a majority of the

porous component is “surrounded” by the cigarette bottle assembly with only a minor portion (yellow) surrounded in the figures. (Schuster Decl. ¶ 64; Ex. 1001 at FIG. 1.)



The BRI of “substantially” should not exclude “completely”. The porous component exactly aligned with the run-through hole and completely surrounded by the liquid storage component are consistent with the specification of ‘742. The part of the porous component 81 that heating wire 83 is wound on is in exact alignment (*i.e.* no off-set) with the run-through hole in the drawings, even though the claims recite “substantial” alignment. (See, *e.g.*, Ex. 1001 at FIGS. 17, 18.).

Accordingly, the BRI of “substantially” consistent with the specification is “largely, whether less or more than a majority.” (Schuster Decl. ¶¶ 41-46.)

F. “Atomizer”: Claim 1 recites “atomizer.” Claims 2 and 3 do not recite “atomizer,” but do recite an “atomizer assembly.” The specification refers to “atomizer” and “atomizer assembly” interchangeably, stating an “atomizer assembly is an atomizer” (*Id.* at 3:6-8; see also 7-8; 13-18.) As explained by Dr. Schuster, the ‘742 patent strays from the classic definition of “atomizer,” using the term to broadly cover a condensation aerosol generator. (Schuster Decl. ¶¶ 74-75.)

Moreover, the American Heritage Dictionary defines “atomize” as “2. [T]o reduce to tiny particles or a fine spray.” (Ex. 1022 at 117.) “Tiny particles” refers to solid (*i.e.* non-liquid) particles as a spray is liquid. Merriam-Webster defines “aerosol” as “a suspension of fine solid or liquid particles in gas.” (Ex. 1023 (<http://www.merriam-webster.com/dictionary/aerosol>).) The meaning of “aerosol” has not changed from the time of the ‘742 patent to now. (Schuster Decl. ¶ 78.)

Accordingly, the BRI of “atomizer” consistent with the specification is a “device that converts a substance into an aerosol or vapor.” (Schuster Decl. ¶¶ 71-80.)

G. “Fits With the Atomizer Assembly Inside It”: Claim 1 recites “fits with the atomizer assembly inside it.” (Ex. 1001 at 6:12-14.) ‘742 teaches that the atomizer assembly “fits with” the cigarette bottle assembly (*id.* at 1:30-33 and 2:36-38.) via protuberance 812. (*Id.* at 3:15-23.) The phrase “inside it” is not used in the specification. In embodiments that include a “frame,” ‘742 does not disclose a protuberance. Instead, Figure 18 illustrates a frame 82 and porous component 81 with flush ends. Accordingly, the BRI of “fits with the atomizer assembly inside it” is “contacts the atomizer assembly.” (Schuster Decl. ¶¶ 81-85.)

H. “Porous Component”: All claims of the ‘742 patent recite “porous component.” (Ex. 1001.) The ‘742 patent uses “porous component” consistently with its plain meaning, using “porous” to describe foamed ceramics, foamed metal,

polymer foam, and fiber felt. (*Id.* at 3:23-27.) (*See, e.g.*, Ex. 1020 at 424 (defining “component” as a “constituent part of a system”)); (*Id.* at 1549 (defining “porous” as “[c]apable of absorbing liquids”); Ex. 1023 (<http://www.merriam-webster.com/dictionary/porous>) (defining “porous” as “having small holes to allow air or liquid to pass through.”) Therefore, the BRI of “porous component” is a “part which liquid or gas can pass through or be absorbed by.” (Schuster Decl. ¶¶ 86-91.)

I. “Electronic Cigarette” / “Aerosol Electronic Cigarette”: The term “electronic cigarette” is recited in the preamble. The preambles do not recite structural components or serve as antecedent basis for the body of the claims, and “electronic cigarette” was not relied upon to argue patentability.

The ‘742 patent does not use the term in a manner inconsistent with their plain meaning, referring to “[a] component for liquid storage of the cigarette bottle assembly (which) stores the nicotine liquid. Smokers can enjoy the feel of smoking [. . .]” (Ex. 1001 at 1:38-40). Therefore, the BRI of “electronic cigarette” is an “electronically controlled device for inhalation by a user of vaporized or aerosolized material, which device can be used as a substitute for cigarette smoking.” (Schuster Decl. ¶¶ 92-95.)

V. IDENTIFICATION OF CHALLENGE

Petitioner respectfully requests the cancellation of claims 1-3 of the '742 patent based on the grounds of invalidity in this Petition. 37 C.F.R. § 42.104(b). The grounds are based on the following: Takeuchi (Ex. 1003); Cox (Ex. 1004); Brooks (Ex. 1005); Whittemore (Ex. 1006); Susa (Ex. 1007); and Liu (Ex. 1008). The pre-AIA statutory grounds for the challenges are set forth below.

#	Prior Art Reference(s)	Basis	Claims Challenged
1	Takeuchi	103(a)	1-3
2	Takeuchi and Cox	103(a)	1-3
3	Brooks	103(a)	1 and 3
4	Brooks and Whittemore	103(a)	1-3
5	Liu and Susa	103(a)	1-3
6	Susa	102	1-3
7	Susa	103(a)	3
8	Susa and Whittemore	103(a)	1-3

Grounds 1-8 are not redundant of IPR2015-000859 at least because of the following reasons: Takeuchi, Brooks and Liu are primary references not relied upon in the pending IPR; Cox is a secondary reference not relied upon in the pending IPR; Susa is relied upon for anticipation aside from obviousness; Takeuchi is a strong primary reference especially as to frame and porous component; Brooks is a strong primary reference especially as to frame and detachable cigarette bottle assembly; Liu is a strong primary reference especially as to the heating wire and the path of air flowing through the run-through hole of the frame; Cox is a strong

secondary reference especially as to cigarette bottle assembly and heating wire; and Whittemore is a strong secondary reference especially as to the porous component.

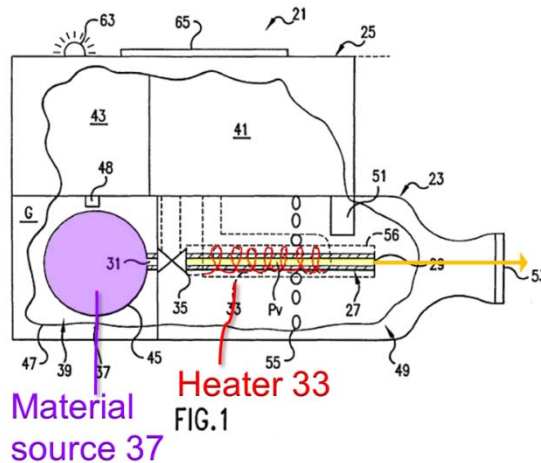
Based on their publication dates, Takeuchi (Dec. 5, 2000), Brooks (Aug. 14, 1990), Whittemore (Oct. 13, 1936), and Susa (June 3, 1998) each qualify as § 102(b) prior art. Based on its December 22, 2005 filing date, Liu qualifies as § 102(e) prior art.

VI. OVERVIEW OF PRIOR ART

A. Takeuchi

Takeuchi, entitled “Flavor-Generating Device,” describes a simulated smoking device for generating flavored inhalation aerosol. (Ex. 1003 at 1:4-9.) The device includes casing 12 (casing main body 14) partitioned by partition wall 13 into upper chamber 121, with heater 42, and lower chamber 122 with detachable battery 44 and liquid container 32. (*Id.* at 4:26-38; 6:15-29; 8:59-9:7; FIGS. 1, 8.)

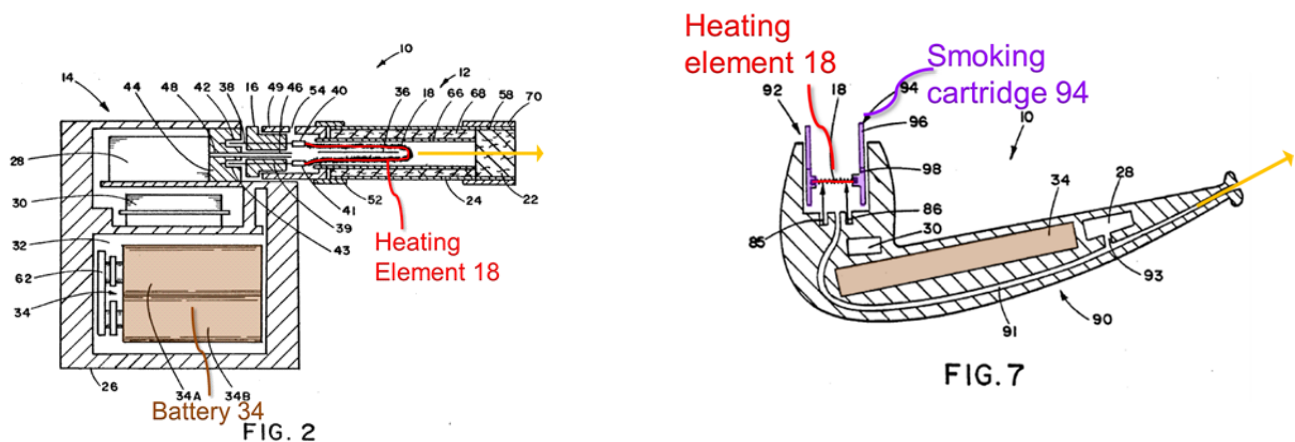
Casing 12 includes air intake port 18 and air introduction hole 26. (*Id.* at 5:4-7; 9:8-9.) Upper chamber 121 includes squeeze hole 24a to direct air from the air intake port 18 toward the outlet of capillary tube 36. (*Id.* at 4:61-67; 8:5-10.)



Within tube 27 the material is volatilized by heater 33 supplied with energy by the battery, and subsequently condenses to form an aerosol. (*Id.*) Material source 37 includes flexible container 45. (*Id.* at 4:62-65.)

C. Brooks

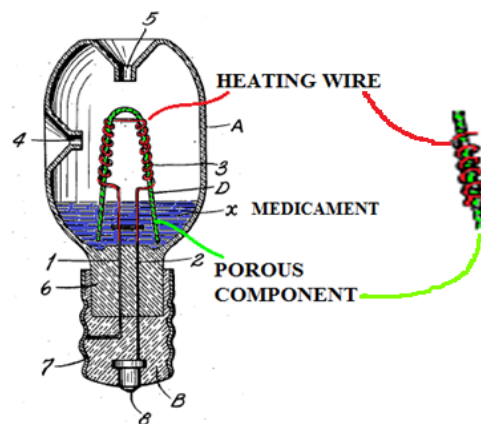
Brooks, entitled “Smoking Articles Utilizing Electrical Energy,” is directed to a smoking article in the form of a cigarette or pipe to provide a tobacco-flavored aerosol which includes a battery 34, resistance heating element 18, and disposable smoking cartridge 94. (Ex. 1005 at 3:63-4:2; 7:15-25; 12:3-15.) Battery 34 provides electrical energy to the heating element 18. (*Id.* at 5:68-6:4.)



Porous heating element 18 carries and volatilizes aerosol-forming substance. (*Id.* at 5:42-50; 7:26-30.) Plug 16 including air flow passageway 6 connects to the heating element 18. (*Id.* at 8:33-42.)

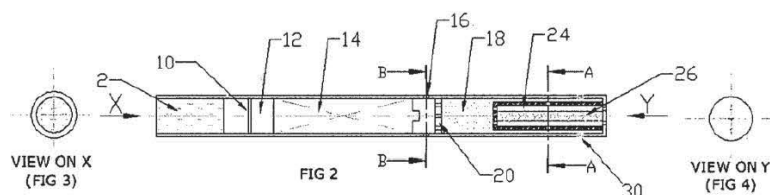
D. Whittemore

Whittemore, entitled “Vaporizing Unit for Therapeutic Apparatus,” discloses a vessel holding heating element 3 which surrounds and contacts wick D. (Ex. 1006 at 1:50-2:8; 2:38-46 (claim 1); FIG. 2.) “Medicament x is “carried by capillary action” to heater 3. (Ex. 1006 at FIG. 2; 1:50–2:8.)



E. Liu

Liu, entitled “No Tar Electronic Smoking Utensils,” is directed to a simulated cigarette having a liquid container formed of porous material.



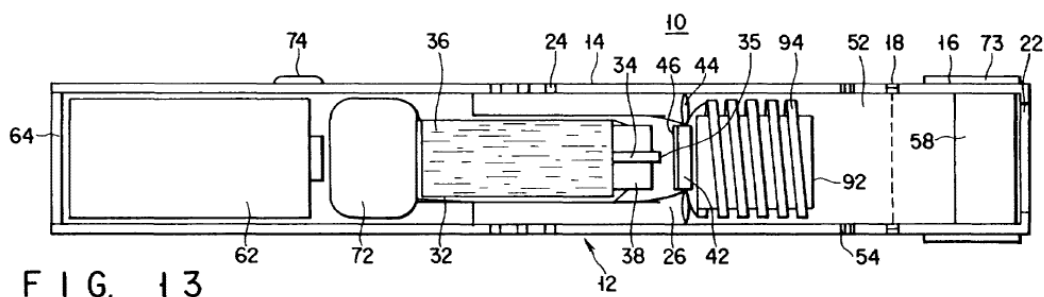
Within casing 6 is battery 14 in battery chamber 12. (Ex. 1008 at 5:30–32.) Apertures 16 permit air entry into the battery chamber 12. (*Id.* at 5:32–6:2.) Wall

20 separates liquid container 18 from battery chamber 12 and has apertures 22 to allow air flow to porous material containing liquid container 18. (*Id.* at 6:2–14.)

Heater assembly housing 24 in the mouthpiece end of liquid container 18 contains heater wire 26 wound on an insulating rod. (*Id.* at 6:16–19.) Apertures 28 allow flow of liquid and air from liquid container 18. (*Id.* at 6:20–22.)

F. Susa

Susa, entitled “Flavor Producing Article, describes a simulated smoking flavor producing article. (Ex. 1007 at 1:14-17; 2:13-21; FIG. 13.)



“Casing 12 comprises first portion 12a and second portion 12b.” (*Id.* at Abstract; 5:17-22; FIG. 1.) Air intake ports 24 receive air into casing 12 (casing main body 14). (*Id.* at FIG. 1; 5:33-36.) Material container 32 storing liquid material 36 is “detachably fixed” in first portion 12a of the casing. (*Id.* at 5:51-58.)

Coil heater 94 heats formed body 92. (*Id.* at FIG. 13, 15:37-40.) Formed body 92 contains “good air permeability” and “material to be inhaled by the user,” including menthol, or a tobacco component. (*Id.* at FIG. 13; 15:5-17.)

VII. DETAILED EXPLANATION OF GROUNDS OF INVALIDITY

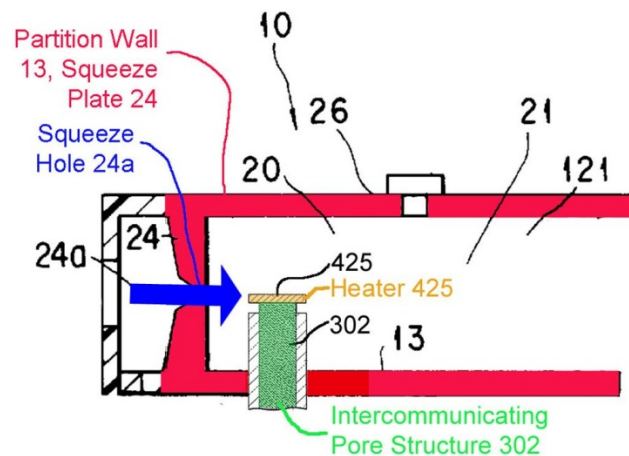
A. Ground 1: Claims 1-3 are Obvious Based on Takeuchi

Takeuchi alone renders obvious claims 1-3 of the '742 patent. As for claim 1, Takeuchi discloses an electronic cigarette comprised of a battery assembly (*see* claim chart below, claim 1, element 1[b] (source 44 in red)), a cigarette bottle assembly (*see* claim chart below, claim 1, element 1[b] (components in blue)) with an atomizer assembly (*see* claim chart below, claim 1, element 1[b] (heater 42, liquid passageway 37 in green)) fitted inside of it, surrounded by a hollow shell (casing 12). (Ex. 1003 at 4:30-38; 5:58-6:29.) The battery assembly (source 44) is electrically connected to the atomizer (specifically to heater 42). (*Id.* at 6:12-29; 6:55-62.) The cigarette bottle assembly is detachable from the battery assembly. (*Id.* at 6:12-14.)

Source 44 and heater 42 are in casing 12 and electrically connected. (*Id.* at 6:23-29; 6:55-62.) Casing 12 has through-air-inlets (air intake 18 and air introduction hole 26). (*Id.* at 8:5-10.) The cigarette bottle assembly is detachably located in one end of the shell (source 44 is removable (*id.* at 6:12-14.) and the atomizer assembly fits inside it.

Figure 15 of Takeuchi discloses liquid passageway 36 in the form of intercommunicating pore structure 302. (Schuster Decl. ¶ 120; Ex. 1003 at 10:59-63.) Takeuchi teaches “features can be combined appropriately depending on the

object of the flavor generating device.” (Ex. 1003 at 11:4-6.) Therefore, below is a portion of the embodiment of Figure 1 with the atomizer of Figure 15. (Schuster Decl. ¶ 121):

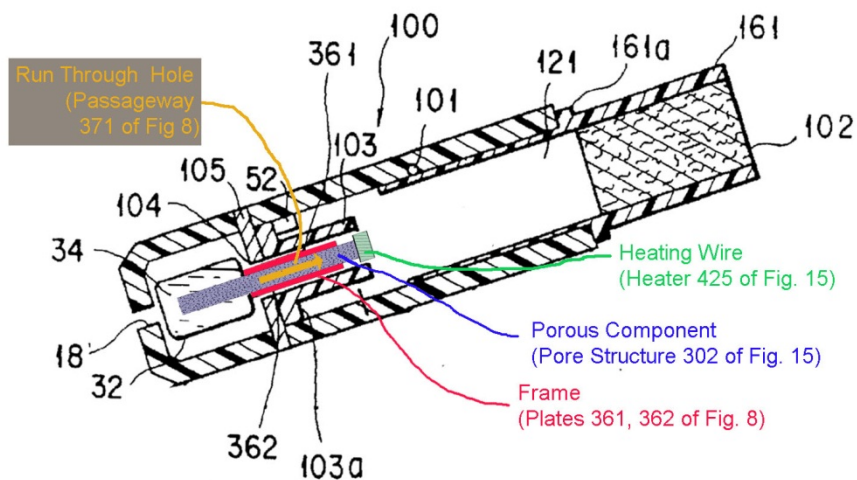


As shown above, Takeuchi discloses a frame (in red) comprised of partition wall 13, squeeze plate 24 and the top portion of the casing 12. (Schuster Decl. ¶ 122.) Alternatively, the frame can be taken to be only partition wall 13 and squeeze plate 24. (*Id.*) The porous component (intercommunicating pore structure 302) is positioned substantially within the cigarette bottle assembly and supported by the frame. The frame has a run through hole (squeeze hole 24a) that is substantially aligned with the heating body (heater 425). (Ex. 1003 at 4:63-67.)

As to claim 2, Takeuchi discloses air flowing through the run-through hole (squeeze hole 24a) and the porous component (porous element 302) substantially surrounded by the liquid storage component (liquid container 32). (*Id.* at 3:42-47; 4:61-67; 8:5-10; 10:53-59.)

As to claim 3, Takeuchi discloses the porous component 302 between the frame and outlet (inhalation port 22; mouthpiece 161 (see figures above)) (*id.* at 6:56-7:2; 9:8-34; 10:50-67; FIGS. 1, 8, 14-15) and in contact with a liquid supply (liquid flavor source 34). (*Id.* at 3:35-46; 10:50-59.)

To the extent that the frame shown above may not disclose the porous component between the frame and the outlet, the embodiment of Figure 8 does. As shown in the modified figure below (features can be combined appropriately [...])” (*id.* at 11:4-6.), the device provides a frame (plates 361 and 362) (*Id.* at 8:35-44.) and a run through hole (liquid passageway 371). (Schuster Decl. ¶ 126.)



Based on the BRI of “frame,” plates 361 and 362 are a frame for the pore structure 302. (Schuster Decl. ¶ 127-128; Ex. 1003 at FIGS. 8 and 15.)

Accordingly, Takeuchi renders claims 1-3 obvious. The claim charts below specify where each element of these claims is found. 37 C.F.R. § 42.104(b).

U.S. Patent No.	Takeuchi
8,365,742	

1[a] An aerosol electronic cigarette, comprising:	Takeuchi discloses an aerosol electronic cigarette. <i>See, e.g.</i>, 5:43-46 (“simulated smoking article”).
1[b] a battery assembly, an atomizer assembly and a cigarette bottle assembly,	Takeuchi discloses a battery assembly (“source 44”), an atomizer assembly (“capillary tube 36”; “liquid passageway 37”/“liquid passageway 371”; “heater 42”; “heater 425” “enclosure 301”; “intercommunicating pore structure 302”), and a cigarette bottle assembly (“Casing 12” without removable “source 44”). <i>See, e.g.</i>, Abstract; 5:58-6:29; 10:50-67; FIGS. 1, 14-15.
1[c] and a shell that is hollow and integrally formed;	Takeuchi discloses a shell (“casing 12”) that is hollow and integrally formed. <i>See, e.g.</i>, 4:30-38; FIG. 1.
1[d] the battery assembly electrically connected with the atomizer assembly, and both are located in the shell;	Takeuchi discloses a battery assembly (“source 44”) electrically connected with the atomizer assembly (“capillary tube 36”; “liquid passageway 37”/“liquid passageway 371”; “heater 42”; “heater 425”; “enclosure 301”; “intercommunicating pore structure 302”), and both are located in the shell (“casing 12”). <i>See, e.g.</i>, Abstract; 2:1-16; 3:35-50; 5:7-11; 6:23-29; 10:50-67; FIGS. 1, 14-15.
1[e] the cigarette bottle assembly is detachably located in one end of the shell, and fits with the atomizer assembly inside	Takeuchi discloses the cigarette bottle assembly (“Casing 12” without removable “source 44”) detachably located (can be separated from “source 44”) in one end of the shell (“casing 12”), and fits with the atomizer assembly (“capillary tube 36”;

it;	“liquid passageway 37”/“liquid passageway 371”; “heater 42”; “heater 425”; “enclosure 301”; “intercommunicating pore structure 302”) inside it. <i>See, e.g.</i> , Abstract; 5:28-39; 6:13-15; 8:33-34; FIGS. 1, 7-8, 14-15.
1[f] the shell has through-air-inlets;	Takeuchi discloses the shell (casing 12) with through-air-inlets (“air intake port 18” and “outer air introduction hole 26”). <i>See, e.g.</i> , 5:4-7; 8:5-10; FIG. 1.
1[g] the atomizer assembly is an atomizer, which includes a porous component and a heating body;	Takeuchi discloses the atomizer assembly (“capillary tube 36”; “liquid passageway 37”/“liquid passageway 371”; “heater 42”; “heater 425”; “enclosure 301”; “intercommunicating pore structure 302”) is an atomizer that includes a porous component (“liquid passageway 372” constituted by “intercommunicating pore structure 302” and “enclosure 301”) and a heating body (“heater 42”). <i>See, e.g.</i> , 2:1-16; 3:35-50; 5:7-11; 6:4-22; 10:50-67; FIGS. 1, 14-15.
1[h] the heating body is heating wire;	Takeuchi discloses a heater (“heater 425”) provided on the protruded end of the porous component (“liquid passageway 372” constituted by “intercommunicating pore structure 302” and “enclosure 301”) <i>See, e.g.</i> , 3:35-50; 6:4-7; 9:27-32; 11:7-13; 12:47-13.3; FIGS. 1, 8, 14-15.
1[i] the atomizer includes a frame;	Takeuchi discloses the atomizer includes a frame (demarcated by the top wall of “casing 12” at the top, “partition wall 13” at the bottom, the partition wall with “squeeze plate 24” at one end, and the beginning of “inhalation port 22” at another end, or consisting only of “partition wall 13” and “squeeze plate 24”; “plates 361 and 362”). <i>See, e.g.</i> , 4:30-38; 4:61-67; 6:4-7; 9:29-34; FIGS. 1, 8.
1[j] the porous component is supported by the frame;	Takeuchi discloses the porous component (“liquid passageway 372” constituted by “intercommunicating pore structure 302” and “enclosure 301”) supported by the frame (<i>e.g.</i> “capillary tube 36” protrudes into “upper chamber 121” through “partition wall 13”; “passageway 371”

	goes through “plates 361 and 362”). <i>See, e.g.</i> , 6:4-7; 9:29-34; 10:50-63; FIGS. 1, 8, 14-15.
1[k] the heating wire is wound on the porous component;	Takeuchi discloses a heater (“heater 425”) provided on the protruded end of the porous component (“liquid passageway 372” constituted by “intercommunicating pore structure 302” and “enclosure 301”) <i>See, e.g.</i> , 3:35-50; 6:4-7; 8:5-10; 9:29-34; 10:50-63; FIGS. 1, 8, 14-15.
1[l] the frame has a run-through hole;	Takeuchi discloses the frame (demarcated by the top wall of “casing 12” at the top, “partition wall 13” at the bottom, the partition wall with “squeeze plate 24” at one end, and the beginning of “inhalation port 22” at another end, or consisting only of “partition wall 13” and “squeeze plate 24”; “plates 361 and 362”) with a run-through hole (“squeeze hole 24a”; “passageway 371” goes through “plates 361 and 362”). <i>See, e.g.</i> , 6:4-7; 9:27-32; 9:29-34; FIGS. 1, 8.
1[m] a heating wire wound on a part of the porous component that is substantially aligned with the run-through hole;	Takeuchi discloses a heater (“heater 425”) provided on the protruded end of the porous component (“liquid passageway 372” constituted by “intercommunicating pore structure 302” and “enclosure 301”) that is substantially aligned with the run-through hole (“squeeze hole 24a”; “passageway 371” goes through “plates 361 and 362”). <i>See, e.g.</i> , 3:35-50; 6:56-7:2; 8:5-10; 9:29-34; 10:50-67; FIGS. 1, 8, 14-15.
1[n] and with the porous component also positioned substantially within the cigarette bottle assembly.	Takeuchi discloses the porous component (“liquid passageway 372” constituted by “intercommunicating pore structure 302” and “enclosure 301”) positioned substantially within the cigarette bottle assembly (“Casing 12” without removable “source 44”). <i>See, e.g.</i> , Abstract; 3:35-50; 8:33-34; 10:50-67; FIGS. 1, 6, 14-15.
2[a] An electronic cigarette, comprising:	Takeuchi discloses an electronic cigarette. <i>See</i> claim 1[a] above for evidence.
2[b] a battery assembly and an atomizer assembly within a housing with the battery assembly	Takeuchi discloses a battery assembly (“source 44”) and an atomizer assembly (“capillary tube 36”; “liquid passageway 37”/“liquid passageway 371”; “heater 42”; “heater 425”; “enclosure 301”;

electrically connected to the atomizer assembly;	“intercommunicating pore structure 302”) within a housing (“casing 12”) with the battery assembly electrically connected to the atomizer assembly. <i>See</i> claim 1[d] above for evidence.
2[c] a liquid storage component in the housing;	Takeuchi discloses a liquid storage component (“liquid container 32”) in the housing (“casing 12”). <i>See, e.g.</i> , Abstract; 5:28-39; 8:33-34; FIG. 1.
2[d] with the housing having one or more through-air-inlets;	Takeuchi discloses the housing (“casing 12”) having one or more through-air-inlets (“air intake port 18” and/or “outer air introduction hole 26”). <i>See</i> claim 1[f] above for evidence.
2[e] the atomizer assembly including a porous component supported by a frame having a run-through hole;	Takeuchi discloses the atomizer assembly including a porous component (“liquid passageway 372” constituted by “intercommunicating pore structure 302” and “enclosure 301”) supported by a frame (demarcated by the top wall of “casing 12” at the top, “partition wall 13” at the bottom, the partition wall with “squeeze plate 24” at one end, and the beginning of “inhalation port 22” at another end, or consisting only of “partition wall 13” and “squeeze plate 24”) having a run-through hole (“squeeze hole 24a”). <i>See, e.g.</i> , 6:4-7; 8:5-10; FIGS. 1, 14-15.
2[f] a heating wire wound on a part of the porous component in the path of air flowing through the run-through hole; and	Takeuchi discloses a heater (“heater 425”) provided on the protruded end of the porous component (“liquid passageway 372” constituted by “intercommunicating pore structure 302” and “enclosure 301”) in the path of air flowing through the run-through hole (“squeeze hole 24a”). <i>See, e.g.</i> , 3:35-50; 6:4-7; 8:5-10; 10:50-67; FIGS. 1, 14-15.
2[g] the porous component substantially surrounded by the liquid storage component.	Takeuchi discloses the porous component (“liquid passageway 372” constituted by “intercommunicating pore structure 302” and “enclosure 301”) substantially surrounded by the liquid storage component (“liquid container 32”). <i>See</i> claim 1[n] above for evidence.
3[a] An electronic cigarette, comprising:	Takeuchi discloses an electronic cigarette. <i>See</i> claim 1[a] above for evidence.
3[b] a battery assembly and an atomizer assembly	Takeuchi discloses a battery assembly (“source 44”) and an atomizer assembly (“capillary tube 36”;

within a housing with the battery assembly electrically connected to the atomizer assembly;	“liquid passageway 37”/“liquid passageway 371”; “heater 42”; “heater 425”; “enclosure 301”; “intercommunicating pore structure 302”) within a housing (“casing 12”) with the battery assembly electrically connected to the atomizer assembly. See claim 1[d] above for evidence.
3[c] with the housing having one or more through-air-inlets and an outlet;	Takeuchi discloses the housing (“casing 12”) having one or more through-air-inlets (“air intake port 18” and/or “outer air introduction hole 26”) and an outlet (“inhalation port 22”). See, e.g., 4:39-60; 8:5-10; FIG. 1.
3[d] the atomizer assembly includes a frame having a run through hole, and a porous component between the frame and the outlet;	Takeuchi discloses the atomizer assembly (“capillary tube 36”; “liquid passageway 37”/“liquid passageway 371”; “heater 42”; “heater 425”; “enclosure 301”; “intercommunicating pore structure 302”) includes a frame (“plates 361 and 362”) with a run-through hole (“liquid passageway 371” runs through the hole of “plates 361 and 362”), and a porous component (“liquid passageway 372” constituted by “intercommunicating pore structure 302” and “enclosure 301”) between the frame and the outlet (“inhalation port 22”) See, e.g., 6:4-7; 9:29-34; FIGS. 8, 14-15.
3[e] a heating wire wound on a part of the porous component which is substantially aligned with the run-through hole; and	See claim 1[m] above.
3[f] with the porous component in contact with a liquid supply in the housing.	Takeuchi discloses the porous component (“liquid passageway 372” constituted by “intercommunicating pore structure 302” and “enclosure 301”) in contact with a liquid supply (“liquid flavor source 34”) in the housing (“casing 12”). See claim 1[n] above for evidence.

B. Ground 2: Claims 1-3 are Obvious Based on Takeuchi in View of Cox

To the extent Takeuchi may not disclose a cigarette bottle assembly detachably located in one end of a shell, Cox discloses such a cigarette bottle assembly (first component 23 containing flexible container 45). (Ex. 1004 at 3:48-60; FIG. 1.)

To the extent that Takeuchi may not disclose a heating wire wound on a porous component, Cox discloses heater body 33 wound on a porous component 227. It would have been obvious to a person of ordinary skill in the art to implement a cigarette bottle assembly detachably located at one end of the shell in order to replace the cigarette bottle assembly, facilitate filling or eliminate refilling via a prefilled bottle, separately from the more expensive components, and thereby eliminate removable cap 59 (Schuster Decl. ¶ 130) or to implement such a heating wire as the heater 425 of Takeuchi because a wound heating wire is straightforward to design and manufacture. (*Id.* at ¶ 133.)

Accordingly, Takeuchi in view of Cox renders obvious claims 1-3. The claim charts below specify where each element of the claim is found in these references. 37 C.F.R. § 42.104(b).

U.S. Patent No.	Takeuchi in view of Cox
8,365,742	
1[a] An aerosol electronic cigarette, comprising:	See Ground 1, claim 1[a] above.

1[b] a battery assembly, an atomizer assembly and a cigarette bottle assembly,	Takeuchi discloses a battery assembly (“source 44”), an atomizer assembly (“capillary tube 36”; “liquid passageway 37”/“liquid passageway 371”; “heater 42”; “heater 425”; “enclosure 301”; “intercommunicating pore structure 302”), and a cigarette bottle assembly (“liquid container 32”). <i>See, e.g.</i> , Abstract; 5:58-6:29; 10:50-67; FIG. 1.
1[c] and a shell that is hollow and integrally formed;	Takeuchi discloses a shell (“casing 12”) that is hollow and integrally formed. <i>See e.g.</i> , 4:30-38; FIG. 1.
1[d] the battery assembly electrically connected with the atomizer assembly, and both are located in the shell;	Takeuchi discloses a battery assembly (“source 44”) electrically connected with the atomizer assembly (“capillary tube 36”; “liquid passageway 37”/“liquid passageway 371”; “heater 42”; “heater 425”; “enclosure 301”; “intercommunicating pore structure 302”), and both are located in the shell (“casing 12”). <i>See, e.g.</i> , Abstract; 2:1-16; 3:35-50; 5:7-11; 6:23-29; 10:50-67; FIGS. 1, 14-15.
1[e] the cigarette bottle assembly is detachably located in one end of the shell, and fits with the atomizer assembly inside it;	Takeuchi discloses the cigarette bottle assembly (“liquid container 32”) located in one end of the shell (“casing 12”), and fits with the atomizer assembly (“capillary tube 36”; “liquid passageway 37”/“liquid passageway 371”; “heater 42”; “heater 425”; “enclosure 301”; “intercommunicating pore structure 302”) inside it. <i>See e.g.</i> , Abstract; 5:28-39; 6:13-15; 8:33-34; FIGS. 1, 7-8, 14-15. Cox discloses a bottle assembly (“flexible container 45”) detachably located (material to be turned into aerosol in “first component 23” is preferably disposable) in one end of the shell. <i>See, e.g.</i> , 3:39-63; FIG. 1.
1[f]-[g]	<i>See</i> Ground 1, claim 1[f]-[g] above.
1[h] the heating body is heating wire;	Cox discloses the heating body (“heater 33”) as a heating wire. <i>See e.g.</i> , FIGS. 1, 3-5. Takeuchi discloses a heater (“heater 425”) provided on the protruded end of the porous component (“liquid passageway 372” constituted by “intercommunicating pore structure 302” and “enclosure 301”) <i>See, e.g.</i> , 3:35-50; 6:4-7; 8:50-10; 9:29-34; 10:50-63; FIGS. 1, 8, 14-15.

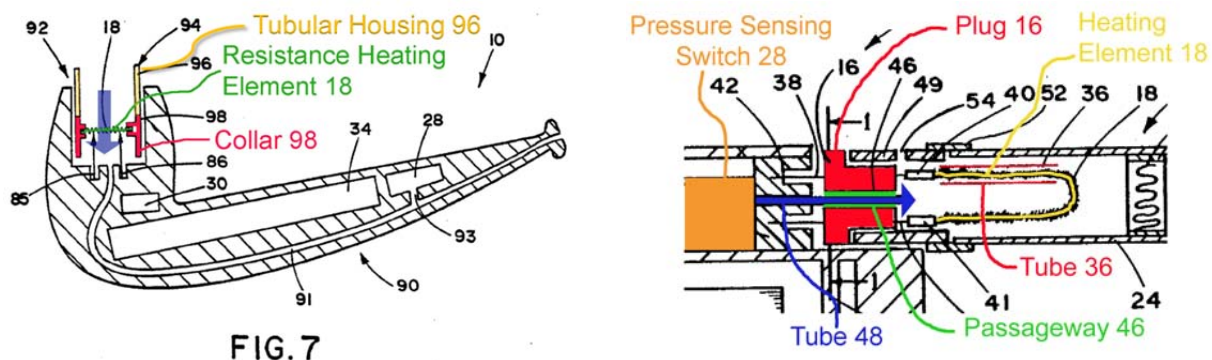
1[i]-[j]	See Ground 1, claim 1[i]-[j] above.
1[k] the heating wire is wound on the porous component;	Cox discloses the heating wire (“heater 33”) wound on tube 27. <i>See e.g.</i> , FIGS 1, 3-5. Takeuchi discloses a heater (“heater 425”) provided on the protruded end of the porous component (“liquid passageway 372” constituted by “intercommunicating pore structure 302” and “enclosure 301”) <i>See, e.g.</i> , 3:35-50; 6:4-7; 9:29-34; 10:50-67; FIGS. 1, 8, 14-15.
1[l] the frame has a run-through hole;	See Ground 1, claim 1[l] above.
1[m] a heating wire wound on a part of the porous component that is substantially aligned with the run-through hole;	Cox discloses the heating wire (“heater 33”) wound on tube 27. <i>See e.g.</i> , FIGS 1, 3-5. Takeuchi discloses a heater (“heater 425”) provided on the protruded end of the porous component (“liquid passageway 372” constituted by “intercommunicating pore structure 302” and “enclosure 301”) that is substantially aligned with the run-through hole (“squeeze hole 24a”; “passageway 371” goes through “plates 361 and 362”). <i>See, e.g.</i> , 3:35-50; 6:56-7:2; 8:5-10; 9:29-34; 10:50-67; FIGS. 1, 8, 14-15.
1[n] and with the porous component also positioned substantially within the cigarette bottle assembly.	Takeuchi discloses the porous component (“liquid passageway 372” constituted by “intercommunicating pore structure 302” and “enclosure 301”) positioned substantially within the cigarette bottle assembly (“liquid container 32”). <i>See, e.g.</i> , Abstract; 3:35-50; 8:33-34; 10:50-67; FIGS. 1, 6, 14-15.
2[a]-[e]	See Ground 1, claim 2[a]-[e] above.
2[f] a heating wire wound on a part of the porous component in the path of air flowing through the run-through hole; and	Cox discloses the heating wire (“heater 33”) wound on tube 27. <i>See e.g.</i> , FIGS 1, 3-5. Takeuchi discloses a heater (“heater 425”) provided on the protruded end of the porous component (“liquid passageway 372” constituted by “intercommunicating pore structure 302” and “enclosure 301”) in the path of air flowing through the run-through hole (“squeeze hole 24a”). <i>See, e.g.</i> , 3:35-50; 6:4-7; 8:5-10; 10:50-67; FIGS. 1, 14-15.
2[g] the porous component substantially	See Ground 1, claim 2[g] above.

surrounded by the liquid storage component.	
3[a]-[d] An electronic cigarette, comprising:	See Ground 1, claim 3[a]-[d] above.
3[e] a heating wire wound on a part of the porous component which is substantially aligned with the run-through hole; and	See claim 1[m] above.
3[f] with the porous component in contact with a liquid supply in the housing.	See Ground 1, claim 3[f] above.

C. Ground 3: Claims 1 and 3 are Obvious Based on Brooks

Brooks alone renders Claims 1 and 3 obvious. As to claim 1, Brooks discloses an electronic cigarette in the form of a cigarette or pipe to provide a tobacco-flavored smoke or aerosol. (Ex. 1005 at FIGS. 1, 7; Abstract.) Brooks provides a shell (case 26 and overwrap 24 or bowl 92 and stem 90) which contains a battery assembly (battery 34) electrically connected to an atomizer assembly (heating element 18). (*Id.* at 7:15-25.) The shell includes through-air-inlets (air inlet openings 54). (*Id.* at 8:43-57; FIG. 1.) Similarly, the smoking cartridge 94 has an air inlet end. (*Id.* at 12:28-32; FIG. 7.) The heating element 18 may include porous metal wires or carbon yarns (*id.* at 7:65-8:3.) carrying aerosol forming substance. (*Id.* at 7:26-30.) Therefore, the heating element 18 is both a heating wire and a porous component. (Schuster Decl. ¶ 136.)

The pipe embodiment has a cigarette bottle assembly (smoking cartridge 94) comprised of a frame having a run through hole aligned with the heating wire (heating element 18 supported by collar 98. *See* FIG. 7 below. (*Id.* at 12:16-19; Schuster Decl. ¶ 137.) Similarly, the cigarette embodiment has a cigarette bottle assembly (cigarette 12) with a frame with a run through hole. Heating element 18 is supported by plug 16 and tube 36 in the cigarette embodiment. (Ex. 1005 at 8:31-57.) The plug 16 (in combination with tube 36) and collar 98 each include a passageway (run-through hole). (*Id.* at 8:31-42; 9:43-46; 12:16-19.) As shown in annotated FIGS. 7 and 1 below, any of plug 16 in combination with tube 36 and collar 98 constitute a frame with a run through hole (tube 48 goes through the hole in Figure 1) aligned with the porous component. (Schuster Decl. ¶ 137.)



It would have been obvious to a person of ordinary skill in the art to replace the porous heating wire of Brooks with a separate heating wire and separate porous component as this would allow independent optimization of the ability to hold liquid and the thermal properties. (*Id.* at ¶ 138.) It would have been obvious to wind the heating wire wound around the separate porous component to improve

ease of manufacture, and also to provide more efficient and uniform heating due to greater contact between the porous component and the wire. (*Id.* at ¶ 139.)

Brooks background section cites and describes Whittemore, which discloses a heater wire wrapped around a porous component (wick). (Ex. 1005 at 1:57-61.) Brooks and Whittemore both use an electrical heating element to form an aerosol and thus provide an additional motivation for a person of ordinary skill in the art to replace the porous heating wire of Brooks with a heating wire wound on a porous component. (Schuster Decl. ¶ 142.)

Also, for claim 3, it would have been obvious to a person of ordinary skill in the art to extend the porous component of Brooks into a liquid supply, thereby using capillary action to increase the available number of puffs. (Schuster Decl. ¶ 143.) See such liquid contact as described in Whittemore for example. (Ex. 1006 at 1:50-2:8; FIG. 2.)

Accordingly, Brooks renders obvious claims 1 and 3. The claim charts below specify where each element of the claims is found. 37 C.F.R. § 42.104(b).

U.S. Patent No.	Brooks
8,365,742	
1[a] An aerosol electronic cigarette, comprising:	Brooks discloses an aerosol electronic cigarette (“smoking article 10”). <i>See, e.g.</i> , 7:15-25; 12:3-38; 20:14-29; FIGS. 1, 7-8.
1[b] a battery assembly, an atomizer assembly and a cigarette bottle assembly,	Brooks discloses a battery assembly (“battery power supply 34”; “batteries 34A and 34B”), an atomizer assembly (“heating element 18”), and a cigarette bottle assembly (“disposable smoking cartridge 94”;

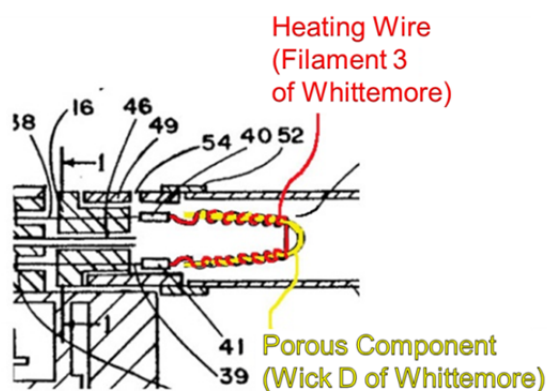
	“cigarette 12”). <i>See, e.g.</i> , 7:15-25; 12:3-38; FIGS. 7-8.
1[c] and a shell that is hollow and integrally formed;	Brooks discloses a shell (case 26 and overwrap 24 or bowl 92 and stem 90) that is hollow and integrally formed. <i>See, e.g.</i> , 7:15-25; 12:3-38; FIGS. 1, 7-8.
1[d] the battery assembly electrically connected with the atomizer assembly, and both are located in the shell;	Brooks discloses the battery assembly (“battery power supply 34”; “batteries 34A and 34B”) electrically connected with the atomizer assembly (“heating element 18”), and both are located in the shell (case 26 and overwrap 24 or bowl 92 and stem 90). <i>See, e.g.</i> , 7:15-25; 12:3-46; FIGS. 1, 7-9.
1[e] the cigarette bottle assembly is detachably located in one end of the shell, and fits with the atomizer assembly inside it;	Brooks discloses the cigarette bottle assembly (“disposable smoking cartridge 94”; “cigarette 12”) detachably located in one end of the shell (case 26 and overwrap 24 or bowl 92 and stem 90), and fits with the atomizer assembly inside it. <i>See e.g.</i> , 12:4-6; 12:16-38; FIGS. 7-8.
1[f] the shell has through-air-inlets;	Brooks discloses the shell (case 26 and overwrap 24 or bowl 92 and stem 90) with through-air-inlets (“air inlet openings 54”). <i>See, e.g.</i> , 8:43-57; FIG. 1.
1[g] the atomizer assembly is an atomizer, which includes a porous component and a heating body;	Brooks discloses the atomizer assembly as an atomizer (“heating element 18”), which includes a porous component and a heating body (“heating element 18” is both porous and a heating body). <i>See, e.g.</i> , 7:26-30; 7:48-8:3. FIGS. 1, 7-8.
1[h] the heating body is heating wire;	Brooks discloses the heating body is heating wire (“Other suitable heating elements include porous metal wires [. . .]”). <i>See e.g.</i> , 7:65-8:3; FIGS. 1, 7-8.
1[i] the atomizer includes a frame;	Brooks discloses the atomizer includes a frame (“plug 16” in combination with “tube 36”; “collar 98”). <i>See, e.g.</i> , 8:23-57; 12:16-19. FIGS. 1, 7-8.
1[j] the porous component is supported by the frame;	Brooks discloses the porous component (“heating element 18” is supported by the frame (“plug 16” in combination with “tube 36”; “collar 98”). <i>See, e.g.</i> , 8:23-57; 12:16-19. FIGS. 1, 7-8.
1[k] the heating wire is wound on the porous component;	Brooks discloses a porous heating wire (“heating element 18”). <i>See, e.g.</i> , 7:26-30; 7:48-8:3. FIGS. 1, 7-8.
1[l] the frame has a run-	Brooks discloses the frame (“plug 16” in combination

through hole;	with “tube 36”; “collar 98”) with a run-through hole (“passageway 46”; space between collar 98 for “heating element 18”). <i>See, e.g.</i> , 8:31-42; 9:43-46; 12:16-19; FIGS. 1, 7-8.
1[m] a heating wire wound on a part of the porous component that is substantially aligned with the run-through hole;	Brooks discloses a porous heating wire (“heating element 18”) that is substantially aligned with the run-through hole (“passageway 46”; space between collar 98 for “heating element 18”). <i>See, e.g.</i> , 8:31-42; 12:16-19; FIGS. 1, 7-8.
1[n] and with the porous component also positioned substantially within the cigarette bottle assembly.	Brooks discloses the porous component (“heating element 18”) positioned substantially within the cigarette bottle assembly (“disposable smoking cartridge 94”; “cigarette 12”). <i>See, e.g.</i> , 7:26-30; 7:48-8:3; 12:16-19; FIGS. 7-8.
3[a] An electronic cigarette, comprising:	Brooks discloses an electronic cigarette (“smoking article 10”). <i>See</i> claim 1[a] above for evidence.
3[b] a battery assembly and an atomizer assembly within a housing with the battery assembly electrically connected to the atomizer assembly;	Brooks discloses a battery assembly (“power supply 34”; “batteries 34A and 34B”) and an atomizer assembly (“heating element 18”) within a housing (case 26 and overwrap 24 or bowl 92 and stem 90) with the battery assembly electrically connected to the atomizer assembly. <i>See</i> claim 1[d] above for evidence.
3[c] with the housing having one or more through-air-inlets and an outlet;	Brooks discloses the housing (case 26 and overwrap 24 or bowl 92 and stem 90) having one or more through-air-inlets (“air inlet openings 54”; “air passageway 91”) and an outlet (“mouthend filter 22”). <i>See, e.g.</i> , 5:42-50; 12:4-6; FIGS. 1, 7-8.
3[d] the atomizer assembly includes a frame having a run through hole, and a porous component between the frame and the outlet;	Brooks discloses the atomizer assembly includes a frame (“plug 16” in combination with “tube 36”) having a run-through hole (“passageway 46”), and a porous component (“heating element 18”) between the frame and the outlet (“mouthend filter 22”). <i>See, e.g.</i> , 8:23-57; FIG. 1.
3[e] a heating wire wound on a part of the porous component which is substantially aligned	Brooks discloses a porous heating wire (“heating element 18”) that is substantially aligned with the run-through hole (“passageway 46”; space between collar 98 for “heating element 18”). <i>See, e.g.</i> , 8:31-

with the run-through hole; and	42; 12:16-19; FIGS. 1, 7-8.
3[f] with the porous component in contact with a liquid supply in the housing.	Brooks discloses the porous component (“heating element 18”) in contact with a liquid supply (“heating element 18” impregnated with “liquid aerosol forming substance”) in the (case 26 and overwrap 24 or bowl 92 and stem 90). <i>See, e.g.</i> , 7:26-30; 20:14-29; 22:7-20; FIG. 1.

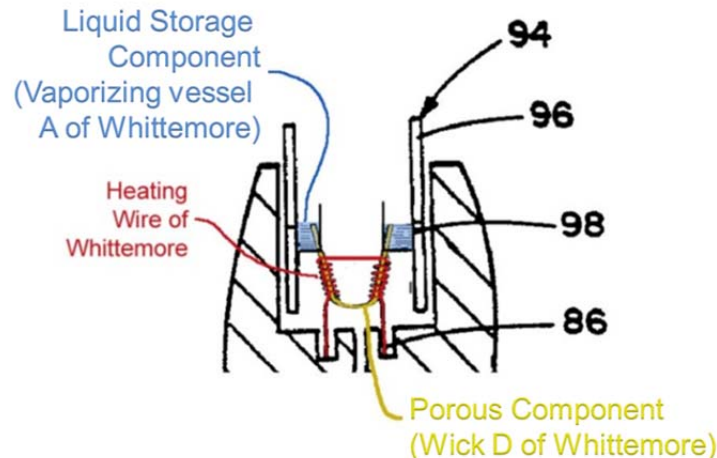
D. Ground 4: Claims 1-3 are Obvious Based on Brooks in View of Whittemore

To the extent claims 1 and 3 are not obvious based on Brooks alone, the claims are obvious based on Brooks in view of Whittemore. It would have been obvious to a person of ordinary skill in the art to replace the porous heating wire of Brooks with the heater coil wrapped porous component of Whittemore in order to independently optimize the properties of each. (See Ground 3 above; Schuster Decl. ¶ 144.) The illustration below shows the combination of the heating wire and the porous component of Whittemore with the device of Brooks.



Claim 2 is obvious based on Brooks in view of Whittemore. Brooks discloses a run-through hole (passageway 46) with air flowing through. Air must

flow to create a pressure change for detection by a sensor (“switch 28”). (Schuster Decl. ¶ 145.) Whittemore discloses a porous component (wick D) substantially surrounded by a liquid storage component (vaporizing vessel A). (Ex. 1006 at 2:8-25; FIG. 2.) It would have been obvious to a person of ordinary skill in the art to substantially surround the porous component of Brooks with the liquid supply of Whittemore, thereby increasing the number of available puffs. (Schuster Decl. ¶ 146.) It would also be obvious to replace the porous heating wire of Brooks with the heating wire wound on the porous component of Whittemore to independently optimize the properties of each. (See Ground 3; Schuster Decl. at ¶ 146.) The figure below shows the Brooks device as modified by Whittemore.



Accordingly, Brooks in view of Whittemore renders obvious claims 1-3. The claim charts below specify where each element of the claim is found in these references. 37 C.F.R. § 42.104(b).

U.S. Patent No.	Brooks in View of Whittemore
8,365,742	

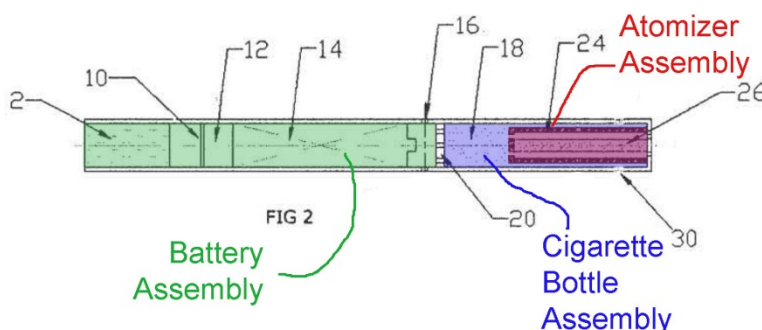
1[a]-[j] An aerosol electronic cigarette, comprising:	See Ground 3, claim 1[a]-[j] above.
1[k] the heating wire is wound on the porous component;	Whittemore discloses the heating wire (“filament 3”) wound on the porous component (“wick D”). <i>See e.g.</i> , 2:8-18; FIG. 2. Brooks discloses a porous heating wire (“heating element 18”). <i>See, e.g.</i> , 7:26-30; 7:48-8:3. FIGS. 1, 7-8.
1[l] the frame has a run-through hole;	See Ground 3, claim 1[l] above.
1[m] a heating wire wound on a part of the porous component that is substantially aligned with the run-through hole;	Whittemore discloses the heating wire (“filament 3”) wound on the porous component (“wick D”). <i>See e.g.</i> , 2:8-18; FIG. 2. Brooks discloses a porous heating wire (“heating element 18”) that is substantially aligned with the run-through hole (“passageway 46”; space between collar 98 where “heating element 18” is placed). <i>See, e.g.</i> , 8:31-42; 12:16-19; FIGS. 1, 7-8.
1[n] and with the porous component also positioned substantially within the cigarette bottle assembly.	See Ground 3, claim 1[n] above.
2[a] An electronic cigarette, comprising:	Brooks discloses an electronic cigarette (“smoking article 10”). <i>See</i> Ground 3, claim 1[a] above for evidence.
2[b] a battery assembly and an atomizer assembly within a housing with the battery assembly electrically connected to the atomizer assembly;	Brooks discloses a battery assembly (“battery power supply 34”; “batteries 34A and 34B”) and an atomizer assembly (“heating element 18”) within a housing (case 26 and overwrap 24 or bowl 92 and stem 90) with the battery assembly electrically connected to the atomizer assembly. <i>See</i> Ground 3, claim 1[d] above for evidence.
2[c] a liquid storage component in the housing;	Whittemore discloses a liquid storage component (“vaporizing vessel A”) in the housing (“vaporizing unit”) <i>See e.g.</i> , 1:19-19; 2:38-46 (claim 1); FIGS. 1-3. Brooks discloses the porous component (“heating element 18”) in contact with a liquid supply (“heating element 18” impregnated with “liquid aerosol forming substance”) in the housing (case 26 and overwrap 24

	or bowl 92 and stem 90). <i>See, e.g.</i> , 7:26-30; 20:14-29; 22:7-20; FIGS. 1, 7-8.
2[d] with the housing having one or more through-air-inlets;	Brooks discloses the housing (case 26 and overwrap 24 or bowl 92 and stem 90) having one or more through-air-inlets (“air inlet openings 54”; “air passageway 91”). <i>See</i> Ground 3, claim 1[f] above for evidence.
2[e] the atomizer assembly including a porous component supported by a frame having a run-through hole;	Brooks discloses the atomizer assembly including a porous component (“heating element 18”) supported by a frame (“plug 16” in combination with “tube 36”; “collar 98”) having a run-through hole (“passageway 46”; space between collar 98 where “heating element 18” is placed). <i>See, e.g.</i> , 7:26-30; 7:48-8:3; 8:31-57; 12:16-19; FIGS. 1, 7-8.
2[f] a heating wire wound on a part of the porous component in the path of air flowing through the run-through hole; and	Whittemore discloses a heating wire (“filament 3”) wound on a porous component (“wick D”). <i>See, e.g.</i> , 2:8-18; FIG. 2. Brooks discloses a porous heating wire (“heating element 18”) that is in the path of air flowing through the run-through hole (“passageway 46”; space between collar 98 where “heating element 18” is placed). <i>See, e.g.</i> , 8:31-42; 9:43-50; 12:3-38; FIGS. 1, 7-8.
2[g] the porous component substantially surrounded by the liquid storage component.	Whittemore discloses the porous component (“wick D”) substantially surrounded by the liquid storage component (“vaporizing vessel A”). <i>See e.g.</i> , 2:8-25; FIG. 2. Brooks discloses the porous component (“heating element 18”) in contact with a liquid supply (“heating element 18” impregnated with “liquid aerosol forming substance”) in the housing (“cigarette 12” and “hand-held controller 14” (including “case 26”); “bowl 90”; “stem 90”). <i>See, e.g.</i> , 7:26-30; 20:14-29; 22:7-20; FIGS. 1, 7-8.
3[a]-[d]	<i>See</i> Ground 3, claim 3[a]-[d] above.
3[e] a heating wire wound on a part of the porous component which is substantially aligned with the run-through hole; and	Whittemore discloses a heating wire (“filament 3”) wound on a porous component (“wick D”). <i>See e.g.</i> , 2:8-18; FIG. 2. Brooks discloses a porous heating wire (“heating element 18”) that is substantially aligned with the run-through hole (“passageway 46”; space between collar 98 where “heating element 18” is

	placed). <i>See, e.g.</i> , 8:31-42; 12:16-19; FIGS. 1, 7-8.
3[f] with the porous component in contact with a liquid supply in the housing.	Brooks discloses the porous component (“heating element 18”) in contact with a liquid supply (“heating element 18” impregnated with “liquid aerosol forming substance”) in the housing (“cigarette 12” and “hand-held controller 14” (including “case 26”)). <i>See e.g.</i> , 7:26-30; 20:14-29; 22:7-20; FIG. 1. Whittemore discloses the porous component (“wick D”) in contact with a liquid supply (“medicament”) in the housing (“vaporizing unit”). <i>See e.g.</i> , 1:50-2:8; FIGS. 1-2.

E. Ground 5: Claims 1-3 are Obvious Based on Liu in View of Susa

Many claims of the ‘944 patent – ‘742’s parent – were found unpatentable by the Board as anticipated by Liu. IPR 2013-00387, Paper 43 at 31. The same Liu art in view of Susa renders the claims of the ‘742 patent obvious. Liu is directed to a “no-tar electronic smoking utensil.” Liu’s device has a battery assembly (battery chamber 12), atomizer assembly (heater assembly housing 24 (“heater housing”)), and cigarette bottle assembly (area to the right of dividing wall 20, including liquid container 18). (Ex. 1008 at 5:8-12; 5:31-6:7.)



Battery chamber 12 and heater housing 24 are located in a shell (casing 6) with through-air-inlets (apertures 16). (*Id.* at 5:31-32; 6:1-2, 16.) Battery chamber

12 is electrically connected to a heating body (heater wire 26 wound on a ceramic rod housed in and supported by heater housing 24). (*Id.* at 6:20-22; 7:11-19.) The atomizer (heater housing 24) fits inside the cigarette bottle assembly (see fig. above). Liquid container 18 is formed of porous material for mixing air and liquid (*Id.* at 6:11-14.).

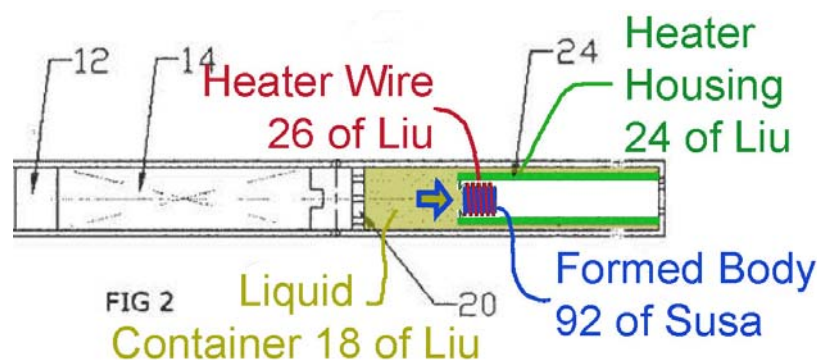
The heating wire of Liu is wound on a ceramic rod, not a porous component. It would have been obvious to a person of ordinary skill in the art to instead wind the heating wire of Liu on the air permeable (and therefore porous) “formed body 92” of Susa and contact porous “formed body 92” of Susa with the air permeable porous element (liquid container 18) of Liu. (Schuster Decl. ¶ 149.)

And while Susa discloses “formed body 92” as a solid, that alone does not mean “formed body 92” cannot be porous. Academic Press Dictionary of Science and Technology defines “solid” as having “the greatest tendency to resist forces that would alter its shape,” e.g., not a liquid or a gas. (Ex. 1021 at 2030.)

Indeed, Susa discloses “formed body 92” as a component having “good air permeability.” (Ex. 1007 at 15:13–17.) Academic Press Dictionary of Science and Technology defines “permeability” as the “capability of a porous substance or membrane to allow a liquid to filter through it.” (Ex. 1021 at 1612.) (Schuster Decl. ¶ 151.)

This combination would result in the porous component bringing the liquid into contact with the heater wire in a more controlled and reproducible way than the liquid drawn into the heater housing by the user's inhalation air as disclosed by Liu. (Schuster Decl. ¶ 152.)

It would have been obvious to a person of ordinary skill in the art to support the porous component added to Liu with a frame. (*Id.* at ¶ 153.) The ceramic rod in Liu is supported by heater housing 24. (Ex. 1008 at 6:18-19.) Similarly, a person of ordinary skill in the art would have reason to implement a frame to support the porous component, which presumably would be lighter than the Liu ceramic rod, as opposed to having the entire housing for support. (Schuster Decl. ¶ 153.) Further, the frame could be used to direct the air centrally onto the porous element, rather than outside of the heater wire as shown in Liu. (*Id.*) This combination is illustrated below.



Liu does not explicitly disclose the cigarette bottle assembly (area to the right of wall 20) detachably located at one end of the shell. Susa's cigarette bottle assembly however is detachably located in one end of the shell. (Ex. 1007 at

Abstract; 5:20-22.) It would be obvious to a person of ordinary skill in the art to detachably locate the cigarette bottle assembly of Liu in one end of the shell as in Susa to facilitate replacement or replenishment when exhausted by making it separable from more expensive and durable components of the simulated cigarette. (Schuster Decl. ¶ 154.)

As to claim 2, the run-through hole is taught as explained above for claim 1. When the ceramic rod is replaced with the porous component it becomes “substantially surrounded” by the liquid storage component, and the air drawn through the container 18 of Liu goes through the run-through hole. (*Id.* at ¶ 155.)

As to claim 3, Susa discloses a porous component (“formed body 92”) between frame (“support member 44”) and the outlet (“suction port 22”). (Ex. 1007 at 15:47-51; FIGS. 12-13.) Second, it would have been obvious to a person of ordinary skill in the art to place the air permeable porous component 92 of Susa in contact with air permeable, porous container 18 of Liu to facilitate the absorption and transport of the liquid to “formed body 92.” (Schuster Decl. ¶ 156.)

Accordingly, Liu in view of Susa renders obvious claims 1-3. The claim charts below specify where each element of the claim is found in these references. 37 C.F.R. § 42.104(b).

U.S. Patent No.	Liu in view of Susa
8,365,742	
1[a] An aerosol	Liu discloses an aerosol electronic cigarette (“no-tar

electronic cigarette, comprising:	electronic smoking utensils”). <i>See, e.g.</i> , Abstract (57); p. 1, ll. 6-7; FIG. 2.
1[b] a battery assembly, an atomizer assembly and a cigarette bottle assembly,	Liu discloses a battery assembly (“cylindrical battery chamber 12 housing a battery 14”); an atomizer assembly (“heater assembly housing 24” with “heater wire 26 spirally wound on a central ceramic insulating rod”) and a cigarette bottle assembly (area inside housing to the right of “dividing wall 20,” including “liquid container 18”) (see FIG. 2)). <i>See, e.g.</i> , p. 5, ll. 31-32; p. 6, ll. 16-22; FIG. 2.
1[c] and a shell that is hollow and integrally formed;	Liu discloses a shell (“casing 6”) that is hollow and integrally formed. <i>See, e.g.</i> , p. 5, ll. 14-15; FIGS. 1-2.
1[d] the battery assembly electrically connected with the atomizer assembly, and both are located in the shell;	Liu discloses the battery assembly (“cylindrical battery chamber 12 housing a battery 14”) electrically connected with the atomizer assembly (“heater assembly housing 24” with “heater wire 26 spirally wound on a central ceramic insulating rod”), and both are located in the shell (“casing 6”). <i>See, e.g.</i> , p. 5, ll. 8-12; p. 5, l. 31-p. 6, l. 27; FIG. 2.
1[e] the cigarette bottle assembly is detachably located in one end of the shell, and fits with the atomizer assembly inside it;	Liu discloses the cigarette bottle assembly (area inside housing to the right of “dividing wall 20,” including “liquid container 18” (see FIG. 2)) located in one end of the shell (“casing 6”), and fits with the atomizer assembly (heater housing 24 with heater wire 26 wound on insulating rod) inside it. <i>See, e.g.</i> , p. 5 l. 31-p. 6, l. 22; FIG. 2. Susa disclose the cigarette bottle assembly (“material container 32”) of the shell (“cylindrical casing 12”/“casing main body 14”), and the atomizer assembly (“formed body 92”; “coil heater 94”) inside it. <i>See, e.g.</i> , 5:15-22; 14:54-15:4; FIGS. 1, 12-13.
1[f] the shell has through-air-inlets;	Liu discloses the shell (“casing 6”) having through-air-inlets (“apertures 16”). <i>See, e.g.</i> p. 5, l. 32-p. 6, l. 2; FIG. 2.
1[g] the atomizer assembly is an atomizer, which includes a porous component and a heating	Liu discloses the atomizer assembly (“heater assembly housing 24” with “heater wire 26 spirally wound on a central ceramic insulating rod”) as an atomizer with a heating body (heater housing 24 with heater wire 26

body;	wound on insulating rod). <i>See, e.g.</i> , p. 5, ll. 8-12; p. 6, ll. 16-22; FIG. 2. Susa discloses the atomizer assembly (“formed body 92”,” coil heater 94”) is an atomizer that includes a porous component (“formed body 92”) and a heating body (“ceramic heater 42”; “coil heater 94”). <i>See, e.g.</i> , Abstract (57); 15:5-27; 15:31-36; FIGS. 12-13.
1[h] the heating body is heating wire;	Liu discloses the heating body is heating wire (“heater wire 26 spirally wound on a central ceramic insulating rod”). <i>See, e.g.</i> , p. 6, ll. 16-22; FIG. 2.
1[i] the atomizer includes a frame;	Liu discloses the atomizer includes a frame (“heater assembly housing 24”). <i>See, e.g.</i> , p. 6, ll. 16-22; FIG. 2.
1[j] the porous component is supported by the frame;	Susa discloses the porous component (“formed body 92”) supported by the frame (“support member 44”). <i>See, e.g.</i> , 13:20-23; 15:5-36; 17:4-10; FIGS. 9, 12-13, 16. Liu discloses the insulating rod supported by the frame (heater housing 24). <i>See, e.g.</i> , p. 6, ll. 16-22; FIG. 2.
1[k] the heating wire is wound on the porous component;	Susa discloses the heating wire (“coil heater 94”) is wound on the porous component (“formed body 92”). <i>See, e.g.</i> , 15:5-36; FIGS. 12-13. Liu discloses the heating wire (“heater wire 26” wound on insulating rod) <i>See, e.g.</i> , p. 6, ll. 16-22; FIG. 2.
1[l] the frame has a run-through hole;	Liu discloses the frame (“heater assembly housing 24”) with a run-through hole (“apertures 28”). <i>See, e.g.</i> , Abstract (57); p. 6, ll. 16-22; FIGS. 2, 5. Susa also discloses the frame (“support member 44”) with a run-through hole. <i>See, e.g.</i> , 13:14-23; 17:4-10; FIGS. 9, 12-13, 16.
1[m] a heating wire wound on a part of the porous component that is substantially aligned with the run-through hole;	Susa discloses heating wire (“coil heater 94”) wound on a part of the porous component (“formed body 92”) that is substantially aligned with the run-through hole. <i>See, e.g.</i> , 13:14-23; 15:5-36; 17:4-10; FIGS. 9, 12-13, 16. Liu discloses a heating wire wound on a part of the insulating rod that is substantially aligned with the run-through hole (“apertures 28”). <i>See, e.g.</i> , Abstract (57); p. 6, ll. 16-22; FIGS. 2, 5.
1[n] and with the porous	Susa discloses the porous component (“formed body

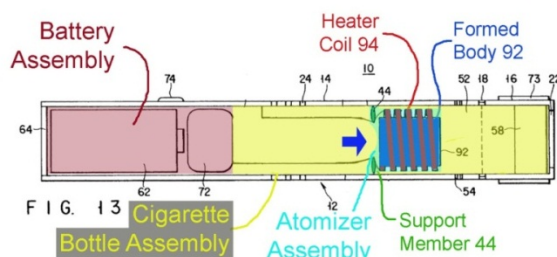
component also positioned substantially within the cigarette bottle assembly.	92”) and the cigarette bottle assembly (“material container 32”). <i>See, e.g.</i> , 5:15-22; 14:54-15:27; FIGS. 1, 12-13. Liu discloses the insulating rod positioned substantially within the cigarette bottle assembly (area inside housing right of “dividing wall 20,” including “liquid container 18” (see FIG. 2)). <i>See, e.g.</i> , p. 6, ll. 16-22; FIG. 2.
2[a] An electronic cigarette, comprising:	Liu discloses an electronic cigarette. <i>See</i> claim 1[a] above for evidence.
2[b] a battery assembly and an atomizer assembly within a housing with the battery assembly electrically connected to the atomizer assembly;	Liu discloses a battery assembly (“cylindrical battery chamber 12 housing a battery 14”) and an atomizer assembly (“heater assembly housing 24” with “heater wire 26 spirally wound on a central ceramic insulating rod”) within a housing (“casing 6”) with the battery assembly electrically connected to the atomizer assembly. <i>See</i> claim 1[d] for evidence.
2[c] a liquid storage component in the housing;	Liu discloses a liquid storage component (areas inside housing to the right of “dividing wall 20,” including “liquid container 18” (see FIG. 2)). <i>See, e.g.</i> , p. 5, l. 31-p. 6 l. 7; FIG. 2.
2[d] with the housing having one or more through-air-inlets;	Liu discloses the housing (“casing 6”) having one or more through-air-inlets (“apertures 16”). <i>See</i> claim 1[f] for evidence.
2[e] the atomizer assembly including a porous component supported by a frame having a run-through hole;	Susa discloses the porous component (“formed body 92”) supported by a frame (“support member 44”) having a run-through hole. <i>See, e.g.</i> , 13:14-23; 15:5-27; 17:4-10; FIGS. 9, 12-13, 16. Liu discloses the atomizer assembly including a “ceramic insulating rod” supported a frame (heater housing 24) having a run-through hole (“apertures 28”). <i>See, e.g.</i> , p. 6, ll. 16-22; FIG. 2.
2[f] a heating wire wound on a part of the porous component in the path of air flowing through the run-through hole; and	Susa discloses a heating wire (“coil heater 94”) wound on a part of the porous component (“formed body 92”) wound on a part of the porous component in that path of air flowing through the run-through hole. <i>See, e.g.</i> , 13:14-23; 15:5-36; 17:4-10; FIGS. 9, 12-13, 16. Liu discloses a heating wire (“heater wire 26”) wound on a part of the “central ceramic insulating rod” in the path of the air flowing through the run-through hole

	(“apertures 28”). <i>See, e.g.</i> , p. 6, ll. 16-22; FIG. 2.
2[g] the porous component substantially surrounded by the liquid storage component.	Susa discloses the porous component (“formed body 92”) and the liquid storage component (“material container 32”). <i>See, e.g.</i> , 5:15-22; 14:54-15:27; FIGS. 1, 12-13. Liu discloses the insulating rod substantially surrounded by the liquid storage component (areas inside housing to the right of “dividing wall 20,” including “liquid container 18” (<i>see</i> FIG. 2). <i>See, e.g.</i> , p. 6, ll. 16-22; FIG. 2.
3[a] An electronic cigarette, comprising:	Liu discloses an electronic cigarette. <i>See</i> claim 1[a] above for evidence.
3[b] a battery assembly and an atomizer assembly within a housing with the battery assembly electrically connected to the atomizer assembly;	Liu discloses a battery assembly (“battery chamber 12 housing a battery 14”) and an atomizer assembly (heater housing 24 with heater wire 26 wound on insulating rod) within a housing (“casing 6”) with the battery assembly electrically connected to the atomizer assembly. <i>See</i> claim 1[d] for evidence.
3[c] with the housing having one or more through-air-inlets and an outlet;	Liu discloses the housing (“casing 6”) having one or more through-air-inlets (“apertures 16”) and an outlet (“mouthpiece end 4”). <i>See, e.g.</i> , Abstract (57); p. 3, l. 31-p. 4, l. 8; p. 5, ll. 4-6; p. 5, l. 32-p. 6, l. 2; FIG. 2.
3[d] the atomizer assembly includes a frame having a run through hole, and a porous component between the frame and the outlet;	Susa discloses the atomizer assembly (“formed body 92”; “coil heater 94”) including a frame (“support member 44”) having a run through hole, and a porous component (“formed body 92”) between the frame and the outlet (“suction port 22”). <i>See, e.g.</i> , 13:14-23; 15:47-51; 17:4-10; FIGS. 9, 12-13, 16. Liu discloses the atomizer assembly (heater housing 24 with heater wire 26 wound on insulating rod) including a frame (“heater assembly housing 24”) having a run through hole (“apertures 28”). <i>See, e.g.</i> , Abstract (57); p. 6, ll. 16-22; FIGS. 2, 5.
3[e] a heating wire wound on a part of the porous component which is substantially aligned with the run-through hole; and	<i>See</i> claim 1[m] above.

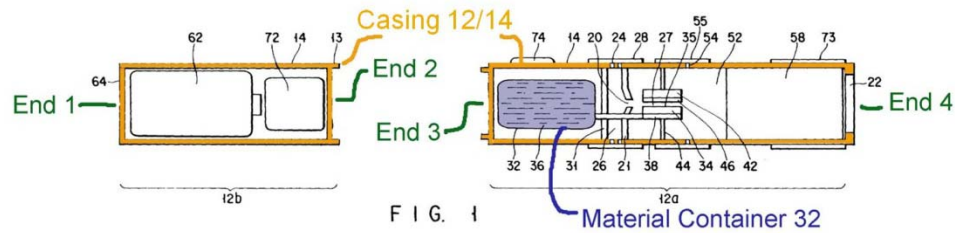
3[f] with the porous component in contact with a liquid supply in the housing.	Liu discloses the “central ceramic insulating rod” that is in contact with a liquid supply in the housing (“casing 6”). <i>See, e.g.</i> , p. 6, ll. 16-22; FIG. 2. Susa discloses the porous component (“formed body 92”). <i>See, e.g.</i> , 14:54-15:52; FIGS. 12-13.
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F. Ground 6: Claims 1-3 are Anticipated in View of Susa

Claims 1-3 of the ‘742 patent are unpatentable under 35 U.S.C. § 102 as anticipated by Susa. As shown below (with only relevant components), Susa discloses a battery assembly (“power supply 62”), electrically connected to an atomizer assembly (“formed body 92”; “heater coil 94”) and cigarette bottle assembly (the area to the right of “control circuit 72.”) (Schuster Decl. ¶ 157; Ex. 1007 at FIG. 13; 8:36-45; 14:54-15:46) all located in the shell (casing 12/casing main body 14) with through-air-inlets (air intake ports 24). (*Id.* at 5:33-36; 17:1-3).



Other embodiments disclosed in Susa also refer to “[a] flavor generation article 10 with a cylindrical casing 12” (made up of “first portion 12a” and “second portion 12b”) (*Id.* at 5:15-17; FIG. 1.) The cigarette bottle assembly therefore can consist of the area inside “first portion 12a.” (Schuster Decl. ¶ 158; Ex. 1007 at FIG. 1.)



Although the embodiment in Figure 13 does not expressly show that “casing 12”/“casing main body 14” is detachable, detachment of the casing is reasonably implied from Figure 1. (Ex. 1007 at 17:11-19.) To the extent detachment would not be implied into Figure 13 itself, it would be appropriate to combine the detachability in Figure 1 with the embodiment of Figure 13 given the object of Susa. (Schuster Decl. ¶ 160; Ex. 1007 at FIGS. 1, 12; 5:20-30; 14:54-15:4) Moreover, at least part of the cigarette bottle assembly (*i.e.* “formed body 92”) can be detached. (*Id.*)

The atomizer assembly is an atomizer including a porous component (formed body 92) and a heating body (heater coil 94). (*Id.* at FIG. 13; 15:5-36.) The atomizer includes a frame (“support member 44”) having a run-through hole. (Schuster Decl. ¶ 161; Ex. 1007 at FIG. 13; 13:20-23; 17:4-10.) While Figure 13 discloses ceramic heater 42, Susa reasonably implies that ceramic heater 42 is optionally used for the vaporization of the contents in formed body 92 only when heat capacity of formed body 92 is high. (Schuster Decl. ¶ 164; Ex. 1007 at 15:37-46.) Therefore, the electronic cigarette device of Susa can be used with “coil heater 94” as the only heating component. (*Id.*)

The frame supports the porous component (formed body 92) with which the run through hole is substantially aligned. (Schuster Decl. ¶ 162; Ex. 1007 at FIG. 13; 13:20-23;15:47-51;17:4-10.) The porous component is positioned substantially within the cigarette bottle assembly (area inside “first portion 12a” or area to the right of “control circuit 72”). (Schuster Decl. ¶ 165; Ex. 1007 at FIGS. 1, 13.)

As to claim 2, Susa discloses the run-through hole with air flowing through (Schuster Decl. ¶ 166; Ex. 1007 at FIG. 13; 13:20-23; 15:47-51; 17:4-10.) Susa further discloses the porous component (“formed body 92”) substantially surrounded by the liquid storage component (area inside “first portion 12a” or area right of “control circuit 72”). (Schuster Decl. ¶ 166; Ex. 1007 at FIGS. 1, 13.)

As to claim 3, Susa discloses the porous component (“formed body 92”) between the frame (“support member 44”) and outlet (“suction port 22”). (Ex. 1007 at FIG. 13.) Susa further discloses the porous component (“formed body 92”) in contact with a liquid supply. The “formed body 92” can contain, by way of example, “menthol, caffeine, or a tobacco component, e.g., a tobacco extracted component or a tobacco smoke condensate component[.]” (Schuster Decl. ¶ 167; Ex. 1007 at 15:5-12.) Such extracted or smoke condensate components can contain liquid (tobacco contains resin, for example.) (Schuster Decl. ¶ 167.) If “formed body 92” was not porous but somehow interpreted to be formed of solid tobacco components, the tobacco components would not be capable of diffusing to

the surface to replace the tobacco components that had been vaporized. (*Id.*)

“Formed body 92” contains and, therefore, is inherently in contact with tobacco components in a liquid state. (*Id.*)

Accordingly, Susa anticipates claims 1-3. The charts below specify where each element of these claims is found. 37 C.F.R. § 42.104(b).

U.S. Patent No.	Susa
8,365,742	
1[a] An aerosol electronic cigarette, comprising:	Susa discloses an aerosol electronic cigarette (“flavor generation article 10”). <i>See, e.g.</i> , Abstract (57); 6:7-25 (“simulated smoking article”); FIGS. 1, 13.
1[b] a battery assembly, an atomizer assembly and a cigarette bottle assembly, and a shell that is hollow and integrally formed;	Susa discloses a battery assembly (“power supply 62”), an atomizer assembly (“formed body 92”; “coil heater 94”), and a cigarette bottle assembly (area within “first portion 12a” or area right of “control circuit 72”), and a shell (“casing 12”/“casing main body 14”) that is hollow and integrally formed. <i>See, e.g.</i> , Abstract (57); 5:15-17; 5:20-29; 8:43-45; 14:54-15:46; FIGS. 1, 13.
1[c] the battery assembly electrically connected with the atomizer assembly, and both are located in the shell;	Susa discloses a battery assembly (“power supply 62”) electrically connected with the atomizer assembly (“formed body 92”; “coil heater 94”), and both are located in the shell (“casing 12”/“casing main body 14”). <i>See, e.g.</i> , Abstract (57); 8:36-40; 15:37-46; FIGS. 1, 13.
1[d] the cigarette bottle assembly is detachably located in one end of the shell, and fits with the atomizer assembly inside it;	Susa discloses the cigarette bottle assembly (area within “first portion 12a” or area right of “control circuit 72”) detachably located in one end of the shell (“casing 12”/“casing main body 14”), and fits with the atomizer assembly (“formed body 92”; “heater coil 94”) inside it. <i>See, e.g.</i> , Abstract (57); 5:51-55; 14:54-15:4; FIGS. 1, 12-13.
1[e] the shell has through-air-inlets;	Susa discloses the shell (“casing 12”/“casing main body 14”) with through-air-inlets (“air intake ports 24”). <i>See, e.g.</i> , 5:33-36; FIG. 13.

1[f] the atomizer assembly is an atomizer, which includes a porous component and a heating body;	Susa discloses the atomizer assembly (“formed body 92”; “coil heater 94”) is an atomizer that includes a porous component (“formed body 92”) and a heating body (“coil heater 94”). <i>See e.g.</i> , 14:54-15:46; FIGS. 1, 13.
1[g] the heating body is heating wire;	Susa discloses a heating wire (“coil heater 94”). <i>See, e.g.</i> , 15:31-34; FIG. 13.
1[h] the atomizer includes a frame;	Susa discloses the atomizer includes a frame (“support member 44”). <i>See, e.g.</i> , 15:47-51; 17:4-10; FIGS. 13, 16.
1[i] the porous component is supported by the frame;	Susa discloses the porous component (“formed body 92”) supported by the frame (“support member 44”). <i>See, e.g.</i> , 15:47-51; 17:4-10; FIGS. 13, 16.
1[j] the heating wire is wound on the porous component;	Susa discloses the heating wire (“coil heater 94”) is wound on the porous component (“formed body 92”) <i>See, e.g.</i> , 15:31-36; FIGS. 13.
1[k] the frame has a run-through hole;	Susa discloses the frame (“support member 44”) with a run-through hole. <i>See, e.g.</i> , 13:20-23; 15:47-51; 17:4-10; FIGS. 13, 16.
1[l] a heating wire wound on a part of the porous component that is substantially aligned with the run-through hole;	Susa discloses a heater wire (“coil heater 94”) wound on part of the porous component (“formed body 92”) that is substantially aligned with the run-through hole. <i>See, e.g.</i> , 13:20-23; 15:47-51; 17:4-10; FIG. 13.
1[m] and with the porous component also positioned substantially within the cigarette bottle assembly.	Susa discloses the porous component (“formed body 92”) positioned substantially within the cigarette bottle assembly (area within “first portion 12a” or area right of “control circuit 72.”). <i>See, e.g.</i> , FIG. 13.
2[a] An electronic cigarette, comprising:	Susa discloses an electronic cigarette. <i>See</i> claim 1[a] above for evidence.
2[b] a battery assembly and an atomizer assembly within a housing with the battery assembly electrically connected to the atomizer assembly;	Susa discloses a battery assembly (“power supply 62”) and an atomizer assembly area within “first portion 12a” or are right of “control circuit 72.”) within a housing (“casing 12”/“casing main body 14”) with the battery assembly electrically connected to the atomizer assembly. <i>See</i> claim 1[c] above for evidence.

2[c] a liquid storage component in the housing;	Susa discloses a liquid storage component (area within “first portion 12a” or area right of “control circuit 72.”) in the housing (“casing 12”/“casing main body 14”). <i>See, e.g.</i> , Abstract (57); FIGS. 1, 13.
2[d] with the housing having one or more through-air-inlets;	Susa discloses the housing (“casing 12”/“casing main body 14”) having one or more through-air-inlets (“air intake ports 24”). <i>See</i> claim 1[e] above for evidence.
2[e] the atomizer assembly including a porous component supported by a frame having a run-through hole;	Susa discloses the atomizer assembly including a porous component (“formed body 92”) supported by a frame (“support member 44”) having a run-through hole. <i>See</i> claim 1[f], [h]-[j] above for evidence.
2[f] a heating wire wound on a part of the porous component in the path of air flowing through the run-through hole; and	Susa discloses a heating wire (“coil heater 94”) wound on a part of the porous component (“formed body 92”) in the path of air flowing through the run-through hole. <i>See</i> claim 1[k]-[l] above for evidence.
2[g] the porous component substantially surrounded by the liquid storage component.	Susa discloses the porous component (“formed body 92”) substantially surrounded by the liquid storage component (area within “first portion 12a” or the area to the right of “control circuit 72.”). <i>See</i> claim 1[m] above for evidence.
3[a] An electronic cigarette, comprising:	Susa discloses an electronic cigarette. <i>See</i> claim 1[a] above for evidence.
3[b] a battery assembly and an atomizer assembly within a housing with the battery assembly electrically connected to the atomizer assembly;	Susa discloses a battery assembly (“power supply 62”) and an atomizer assembly (“formed body 92”; “coil heater 94”) within a housing (“casing 12”/“casing main body 14”) with the battery assembly electrically connected to the atomizer assembly. <i>See</i> claim 1[b]-[c] above for evidence.
3[c] with the housing having one or more through-air-inlets and an outlet;	Susa discloses the housing (“casing 12”/“casing main body 14”) having one or more through-air-inlets (“air intake ports 24”) and an outlet (“suction port 22”). <i>See e.g.</i> , 5:33-36; 13:5-8; FIG. 13.
3[d] the atomizer assembly includes a	Susa discloses the atomizer assembly (“formed body 92”; “coil heater 94”) includes a frame (“support

frame having a run through hole, and a porous component between the frame and the outlet;	member 44”) with a run-through hole, and a porous component (“formed body 92”) between the frame and the outlet (“suction port 22”) <i>See e.g.</i> , FIG. 13.
3[e] a heating wire wound on a part of the porous component which is substantially aligned with the run-through hole; and	<i>See</i> claim 1[l]above.
3[f] with the porous component in contact with a liquid supply in the housing.	Susa discloses the porous component (“formed body 92”) in contact with a liquid supply (“liquid flavor source 34”) in the housing (“casing 12”). <i>See e.g.</i> , 15:5-12; FIG. 13.

G. Ground 7: Claim 3 is Obvious Based on Susa

See Ground 6, claim 3, elements [a]-[e] above for the analysis of how Susa renders these elements obvious. To the extent that Susa does not inherently disclose the state of the supply in “formed body 92” to be a liquid (or any other state of matter), it would have been obvious to one of ordinary skill to modify Susa so that the supply is liquid, therefore meeting the limitation of “with the porous component in contact with a liquid supply in the housing” in claim 2. (Schuster Decl. ¶ 168.) “Formed body 92” is the flavor generating article to be heated in the embodiments of Figures 12-13. (*Id.* at ¶ 168; Ex. 1007 at FIGS. 12-13; 14:54-15:46.) For other embodiments, Susa is replete with examples where the flavor generating article is a “liquid material 36” that can be tobacco components which are heated into an aerosol. (Schuster Decl. ¶ 168; Ex. 1007 at FIGS. 1, 8-10;

Abstract (57); 5:51-58; 6:7-25.) If “formed body 92” is formed of solid tobacco components, they cannot diffuse to the surface to replace the tobacco components previously vaporized. Therefore, as explained in Ground 6, the obvious choice would be to have formed body 92 contain and therefore be in contact with tobacco components which are in a liquid state as disclosed in the other Susa embodiments. (Schuster Decl. ¶ 168.)

In view of the foregoing, claim 3 of the ‘742 patent is obvious in view of Susa. (Schuster Decl. ¶168.)

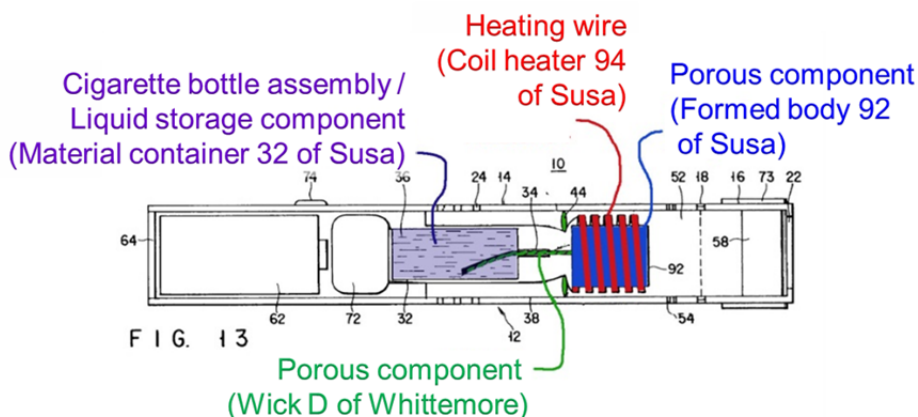
H. Ground 8: Claims 1-3 are Obvious Based on Susa in View of Whittemore

To the extent the cigarette bottle assembly (claim 1) and/or liquid storage component (claim 2) disclosed in Susa are limited to “material container 32” only and, therefore, “formed body 92” would not be in contact with the cigarette bottle assembly/liquid storage, Susa combined with Whittemore render obvious claims 1-2. (Schuster Decl. ¶ 169.)

Whittemore discloses i.) a bottle assembly vaporizing vessel A detachably located in one end of the shell (the vaporizing unit), and fits with the atomizer assembly (wick D and filament 3) inside it (claim 1); ii.) a porous component (wick D) positioned substantially within the bottle assembly (vaporizing vessel A) (claim 1); and iii.) the porous component (wick D) substantially surrounded by the

liquid storage component (vaporizing vessel A) (claim 2). (Schuster Decl. ¶ 170; Ex. 1006 at 1:19-2:18; 1:39-45; 1:50-2:18; FIGS. 1-2.)

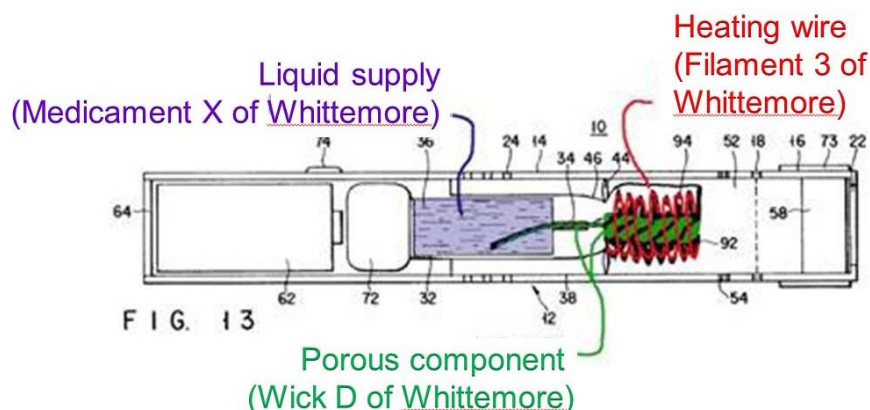
It would have been obvious to one of ordinary skill to modify Susa so that formed body 92 is attached to wick D from Whittemore so that wick D would extend into and be inside “material container 32.” The proposed combination is seen in the modified figure below (Schuster Decl. ¶ 171.):



The modification is motivated by the fact that the wick would facilitate absorption and transport of “liquid material 36” from “material container 32” to “formed body 92” for vaporization using “coil heater 94” for heating; the user would therefore be able to use the device longer before needing to replenish the liquid in or replace formed body 92. (Schuster Decl. ¶ 172.) The need in certain embodiments (including the embodiment of FIG. 13) to discharge or “splash” liquid material 36 onto ceramic heater 42 (which would inevitably lead to splashing, loss of liquid, and inconsistent vaporization) would be eliminated.

(Schuster Decl. ¶172; Ex. 1007 at 7:39-43.) Fewer parts would be required, and the heating control functions would be simplified as well. (*Id.*)

It also would have been obvious to one of the ordinary skill to modify Susa so that material container 32 of Susa contained Medicament x of Whittemore, and Whittemore's wick D and filament 3 would be used as the atomizer. The proposed combination can be seen in the modified figure below. (Schuster Decl. ¶173).



One motivation for this modification is to allow absorption and transport of Medicament x from material container 32 to filament 3 for vaporization. (Schuster Decl. ¶174.) The user would therefore be able to use the device without needing to replenish the liquid in replace formed body 92. (*Id.*) The need to discharge or “splash” medicament x onto ceramic heater 42 for heating would be eliminated with the advantages described above. (*Id.*; Ex. 1007 at 7:39-43.) Another motivation for the modification would be that Medicament x would not splash around as it might in vaporizing vessel A of Whittemore if the liquid is in material

container 32. (Schuster Decl. ¶ 175.) The modification would allow for transport and storage, for example in a user’s pocket, as well. (*Id.*)

Whittemore also discloses the porous component of the atomizer assembly (wick D) in contact with a liquid supply (medicament x) (claim 3). (Schuster Decl. ¶ 176; Ex. 1006 at FIGS. 1-2; 1:50-2:8.) Therefore, to the extent Susa alone does not anticipate or render the limitation of “the porous component in contact with a liquid supply in the housing” in claim 3 obvious, Susa in combination with Whittemore render the limitation obvious. The motivations to combine would be the same as mentioned in the preceding paragraphs in this Ground. (Schuster Decl. ¶ 176.)

Accordingly, Susa in view of Whittemore renders obvious claims 1-3. The claim charts below specify where each element of the claim is found in these references. 37 C.F.R. § 42.104(b).

U.S. Patent No.	Susa in View of Whittemore
8,365,742	
1[a] An aerosol electronic cigarette, comprising:	See Ground 7, claim 1[a] above.
1[b] a battery assembly, an atomizer assembly and a cigarette bottle assembly, and a shell that is hollow and integrally formed;	Susa discloses a battery assembly (“power supply 62”), an atomizer assembly (“formed body 92”; “coil heater 94”), and a cigarette bottle assembly (“material container 32”), and a shell (“casing 12”/“casing main body 14”) that is hollow and integrally formed. See, e.g., Abstract (57); 5:15-17; 5:20-29; 5:51-6:17; 8:43-45; 14:54-15:46; FIGS. 1, 13.
1[c] the battery assembly	See Ground 7, claim 1[c] above.

electrically connected with the atomizer assembly, and both are located in the shell;	
1[d] the cigarette bottle assembly is detachably located in one end of the shell, and fits with the atomizer assembly inside it;	Susa discloses the cigarette bottle assembly (“material container 32”) detachably located in one end of the shell (“casing 12”/“casing main body 14”), and the atomizer assembly (“formed body 92”; “heater coil 94”) inside it. <i>See, e.g.</i> , Abstract (57); 5:51-55; 14:54-15:4; FIGS. 1, 12-13. Whittemore discloses a bottle assembly in the form of “vaporizing vessel A” that is detachably located in one end of the shell (<i>i.e.</i> the “vaporizing unit”), and fits with the atomizer assembly (“wick D” and “filament 3”) inside it. <i>See, e.g.</i> , 1:19-28; 1:39-45; 1:50-2:8; FIGS. 1-2.
1[e] the shell has through-air-inlets;	<i>See</i> Ground 7, claim 1[e] above.
1[f] the atomizer assembly is an atomizer, which includes a porous component and a heating body;	Susa discloses the atomizer assembly (“formed body 92”; “coil heater 94”) is an atomizer that includes a porous component (“formed body 92”) and a heating body (“coil heater 94”). <i>See supra</i> , Ground 7, claim 1[f]. Whittemore discloses an atomizer that includes a wick (“wick D”) and a heating body (“filament 3”). <i>See, e.g.</i> , 1:50-2:18; FIGS. 1-2.
1[g] the heating body is heating wire;	Susa discloses a heating wire (“coil heater 94”). <i>See supra</i> , Ground 7, claim 1[g]. Whittemore discloses the heating body is a heating wire in the form of “filament 3.” <i>See, e.g.</i> , 1:50-2:18; FIGS. 1-2.
1[h] the atomizer includes a frame;	Susa discloses the atomizer includes a frame (“support member 44”). <i>See</i> Ground 7, claim 1[h] above. Whittemore discloses the atomizer includes a frame (“closed bottom 6”). <i>See e.g.</i> , 1:50-2:18; FIGS. 1-2.
1[i] the porous component is supported by the frame;	Susa discloses the porous component (“formed body 92”) supported by the frame (“support member 44”). <i>See</i> Ground 7, claim 1[i] above. Whittemore discloses the porous component (“formed body 92”) is supported by the frame (“closed bottom 6”). <i>See, e.g.</i> , 1:50-2:18; FIGS. 1-2.
1[j] the heating wire is	Susa discloses the heating wire (“coil heater 94”) is

wound on the porous component;	wound on the porous component (“formed body 92”) See Ground 7, claim 1[j] above. Whittemore discloses the heating wire (“filament 3”) is wound on the porous component (“wick D”). See, e.g., 1:50-2:18; FIGS. 1-2.
1[k]-[l]	See Ground 7, claim 1[k]-[l] above.
1[m] and with the porous component also positioned substantially within the cigarette bottle assembly.	Susa discloses the porous component (“formed body 92”) and the cigarette bottle assembly (“material container 32”). See, e.g., 5:51-6:25; 14:54-15:46; FIG. 13. Whittemore discloses the porous component of the atomizer assembly (“wick D”) positioned substantially within the bottle assembly (“vaporizing vessel A”). See, e.g., 1:50-2:18; FIGS. 1-2.
2[a]-[b]	See Ground 7, claim 2[a]-[b] above.
2[c] a liquid storage component in the housing;	Susa discloses a liquid storage component (“material container 13”) in the housing (“casing 12”/“casing main body 14”). See, e.g., Abstract (57); 5:51-6:17; FIGS. 1, 13.
2[d] with the housing having one or more through-air-inlets;	See Ground 7, claim 2[d] above.
2[e]-[f]	See Ground 7, claim 2[e]-[f] above.
2[g] the porous component substantially surrounded by the liquid storage component.	Susa discloses the porous component (“formed body 92”) and the liquid storage component (“material container 32”). Whittemore discloses the porous component (“wick D”) substantially surrounded by the liquid storage component (“vaporizing vessel A”). See claim 1[m] above for evidence.
3[a]-[e]	See Ground 7, claim 3[a]-[e] above.
3[f] with the porous component in contact with a liquid supply in the housing.	Susa discloses the porous component (“formed body 94”). See, e.g., 15:5-12; FIG. 13. Whittemore discloses the porous component of the atomizer assembly (“wick D”) in contact with a liquid supply (“medicament x”) in the housing (“vaporizing unit”). See claim 1[m] above for evidence.

VIII. CONCLUSION

For the reasons described above, there is a reasonable likelihood that Petitioner will prevail as to each of claims 1-3 of the '742 patent. Accordingly, *inter partes* review of claims 1-3 of the '742 patent is respectfully requested.

The USPTO is authorized to charge any required fees, including the fee as set forth in 37 C.F.R. § 42.15(a) and any excess claim fees, to Deposit Account No. 50-1212 referencing Docket No. JTII.P0013US.

Date: July 14, 2015

Respectfully submitted,
/Erik G. Swenson/
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CERTIFICATE OF SERVICE

The undersigned hereby certifies that a copy of the attached Petition for *Inter Partes* Review and all supporting documents were served on July 14, 2015, by United States Postal Service as Express Mail on the Patent Owner at the correspondence address of record for the patent at the following address:

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