

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

LOGIC TECHNOLOGY DEVELOPMENT, LLC

Petitioner

v.

FONTEM HOLDINGS 1 B.V.

Patent Owner

Patent No. 8,375,957

Issue Date: February 19, 2013

Title: ELECTRONIC CIGARETTE

Inter Partes Review No. Unassigned

**PETITION FOR INTER PARTES REVIEW
UNDER 35 U.S.C. §§ 311-319 AND 37 C.F.R. § 42.100 *et seq.***

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Exhibit List for *Inter Partes* Review of U.S. Patent No. 8,375,957

Exhibit #	Exhibit Description
1001	U.S. Patent No. 8,375,957 - PCT filed May 15, 2007
1002	Declaration of Gregory Buckner, Ph.D.
1003	China Patent CN 2719043 – issue date August 24, 2005
1004	Certified English translation of CN 2719043 pursuant to 37 C.F.R. 42.63(b)
1005	U.S. publication 2007/0267031 (“Hon ‘031”), which is the U.S. equivalent of CN 2719043
1006	CA 2562581, which is the Canadian equivalent of CN 2719043
1007	U.S. Patent No. 3,200,819 (“Gilbert”) – issue date August 17, 1965
1008	U.S. Patent No. 2,057,353 (“Whittemore”) – issue date October 13, 1936
1009	U.S. Patent No. 5,894,841 (“Voges”) – issue date April 20, 1999
1010	U.S. Pat. App. Pub. 2008/0257367 (“Paterno”) – filed April 23, 2007
1011	EP 0533599A1 (“Connors”) – publication date March 24, 1993
1012	Non-patent publication "What is a MOSFET, what does it look like, and how does it work?" dated 5/24/2004, printed from the Internet Archive, i.e., the Wayback machine, which was archived on March 5, 2010 (“TechPowerUp”)
1013	Non-patent publication "What is a MOSFET, what does it look like, and how does it work?" dated 5/24/2004, printed from the Internet Archive, i.e., the Wayback machine, which was archived on July 20, 2011 (“TechPowerUp”)
1014	PCT application No. PCT/CN2007/ 001576, filed on May 15, 2007, and January 15, 2009 Chinese Declaration re CN Patent

	Application No. 200620090805 (“Hon ‘805”)
1015	‘957 patent file history, October 29, 2008 Preliminary Amendment
1016	‘957 patent file history, October 5, 2010, Office Action
1017	‘957 patent file history, March 7, 2011, Response to Office Action
1018	‘957 patent file history, March 29, 2011, Applicant’s “Marked-Up Specification”
1019	‘957 patent file history, June 8, 2011, Office Action
1020	‘957 patent file history, December 8, 2011, Request for Continued Examination
1021	‘957 patent file history, January 9, 2012, Office Action
1022	‘957 patent file history, May 9, 2012, Amendment
1023	‘957 patent file history, August 7, 2012, Office Action
1024	‘957 patent file history, August 29, 2012, Amendment
1025	‘957 patent file history, December 17, 2012, Notice of Allowance. Ex. 1025.
1026	‘957 patent file history, July 2, 2013, Certificate of Correction
1027	U.S. Patent No. 8,156,944 (Hon; Aerosol Electronic Cigarette)
1028	DECISION - Institution of <i>Inter Partes</i> Review in IPR2013-00387, Paper 7
1029	Curriculum Vitae of Gregory Buckner, Ph.D.

Petitioner Logic Technology Development, LLC (“Petitioner”) respectfully requests the Board initiate an *inter partes* review and cancel claims 1-4, 6-18, and 21-24 of U.S. Patent No. 8,375,957 (“’957 patent,” Ex. 1001) as unpatentable pursuant to 35 U.S.C. § 311(b) based on the grounds of unpatentability that are discussed in detail herein. The showing below establishes a reasonable likelihood of prevailing on each ground of unpatentability regarding the challenged claims.

I. NOTICES AND STATEMENTS

Pursuant to 37 C.F.R. § 42.8(b)(1), Petitioner identifies Logic Technology Development, LLC as the real-party-in-interest.

Pursuant to 37 C.F.R. § 42.8(b)(2), Petitioner identifies the following related litigation involving the ‘957 patent: On March 5, 2014, Fontem Ventures BV and Fontem Holdings 1 B.V. (“Fontem”) filed nine lawsuits in the Central District of California asserting infringement of U.S. Patent No. 8,365,742, U.S. Patent No. 8,375,957, U.S. Patent No. 8,393,331, and U.S. Patent No. 8,490,628: (i) *Fontem Ventures BV and Fontem Holdings 1 B.V. v. NJOY, Inc.*, No. CV14-1645; (ii) *Fontem Ventures BV and Fontem Holdings 1 B.V. v. LOEC, Inc.*, No. CV14-1648; (iii) *Fontem Ventures BV and Fontem Holdings 1 B.V. v. CB Distributors, Inc. and DR Distributors, LLC*, No. CV14-1649; (iv) *Fontem Ventures BV and Fontem Holdings 1 B.V. v. Vapor Corp.*, No. CV14-1650; (v) *Fontem Ventures BV and Fontem Holdings 1 B.V. v. Fin Branding Group, LLC, and Victory Electronic*

Cigarettes Corp, No. CV14-1651; (vi) *Fontem Ventures BV and Fontem Holdings 1 B.V. v. BallantyneBrands, LLC.*, No. CV14-1652; (vii) *Fontem Ventures BV and Fontem Holdings 1 B.V. v. Spark Industries, LLC*, No. CV14-1653; (viii) *Fontem Ventures BV and Fontem Holdings 1 B.V. v. Logic Technology Development LLC*, No. CV14-1654; and (ix) *Fontem Ventures BV and Fontem Holdings 1 B.V. v. VMR Products LLC, dba V2CIGS*, No. CV14-1655. On April 8, 2014, Fontem also filed amended complaints in the above listed actions asserting infringement of U.S. Patent No. 8,689,805.

On December 30, 2013, the Board instituted review of U.S. Patent No. 8,156,944 to Hon (IPR2013-00387).

Pursuant to 37 C.F.R. § 42.8(b)(3) & (4) lead counsel, backup counsel, and service information for is set forth below:

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A power of attorney accompanies this petition.

Pursuant to 37 C.F.R. § 42.104(a), Petitioner certifies that the '957 patent is available for *inter partes* review and that Petitioner is not barred or estopped from requesting an *inter partes* review challenging the patent claims on the grounds identified in this Petition. Petitioner was served with a complaint asserting infringement of the '331 patent on or about March 5, 2014. No Petitioner, real party-in-interest, or privy of a Petitioner was served with such a complaint before that date; nor have they initiated a civil action challenging validity of the '957 patent.

Pursuant to 37 C.F.R. § 42.22 and §§ 42.104(b), Petitioner requests *inter partes* review of and cancellation of '957 patent claims 1-4, 6-18, and 21-24. The grounds are based upon one primary reference, CN 2719043 (Ex. 1003, and English translation pursuant to 37 C.F.R. 42.63(b), Ex. 1004) and its U.S. equivalent publication 2007/0267031 ("Hon '031," Ex. 1005) and Canadian equivalent CA 2562581, Ex.1006), and several secondary references: Gilbert (Ex. 1007), Paterno (Ex. 1010), Voges (Ex. 1009), Whittemore (Ex. 1008), Connors (Ex. 1011), and the "TechPowerUp" article (Exs. 1012, 1013).¹ The

¹ The TechPowerUp article was not available in the file history of the '957 patent. Exhibits 1012 and 1013 are the versions of the article available on

statutory grounds for the challenges are set forth below. All statutory citations are pre-AIA.

- Ground 1: Independent claims 1 and 23, and dependent claims 2, 3, 4, 6, 7, 8, 9, 16, and 24 would have been rendered obvious under 35 U.S.C. § 103(a) by China Patent CN 2719043 (and English translation, and its U.S. equivalent publication 2007/0267031 (“Hon ‘031”) and Canadian equivalent CA 2562581) in view of Gilbert, Voges, and Whittemore.

- Ground 2: Independent claim 10, and dependent claims 11, 12, 14, 15, 17, 18, and 22 would have been rendered obvious under 35 U.S.C. § 103(a) by China Patent CN 2719043 (and English translation and its U.S. equivalent publication 2007/0267031 (“Hon ‘031”), and Canadian equivalent CA 2562581) in view of Gilbert and Whittemore.

- Ground 3: Claim 13 would have been rendered obvious under 35 U.S.C. § 103(a) by the same references that render claim 10 obvious, in further view of the “TechPowerUp” article.

- Ground 4: Claim 21 would have been rendered obvious under 35 U.S.C. § 103(a) by the same references that render claim 10 obvious, in further

archive.org that are the closest in time before and after the print date identified in the file history. *See* Ex. 1002 at ¶ 167.

view of Connors.

II. INTRODUCTION

The ‘957 patent is directed to “an electronic cigarette containing nicotine” and purports to provide “an electronic cigarette that substitutes for real cigarettes and helps smokers to quit smoking.” Ex. 1001, ‘975 patent 1:5-6; 1:42-45. The ‘957 patent is a combination of components that were all well known in the art and that combination is simpler than the combination of components found in the six patents that came together “like pieces of a puzzle” which were found obvious in *KSR Int’l, Co. v. Teleflex, Inc.*, 550 U.S. 398, 420 (2007).

The combination of components in the ‘957 patent includes “a battery assembly, an atomizer assembly and a cigarette bottle assembly. The battery assembly connects with one end of the atomizer assembly, and the cigarette bottle assembly is inserted into the other end of the atomizer assembly, thus forming one cigarette type or cigar type body.” ‘957 patent at 1:46-51. “The said cigarette bottle assembly includes the cigarette liquid bottle, fiber and suction nozzle.” *Id.* at 1:66-67. Components making up the battery assembly include a: battery, circuit board, sensor, and a membrane. Components making up the atomizer assembly include an atomizer and a solution storage area. Additionally, some claims require a suction nozzle. An annotated version of Fig. 5A illustrates these components:

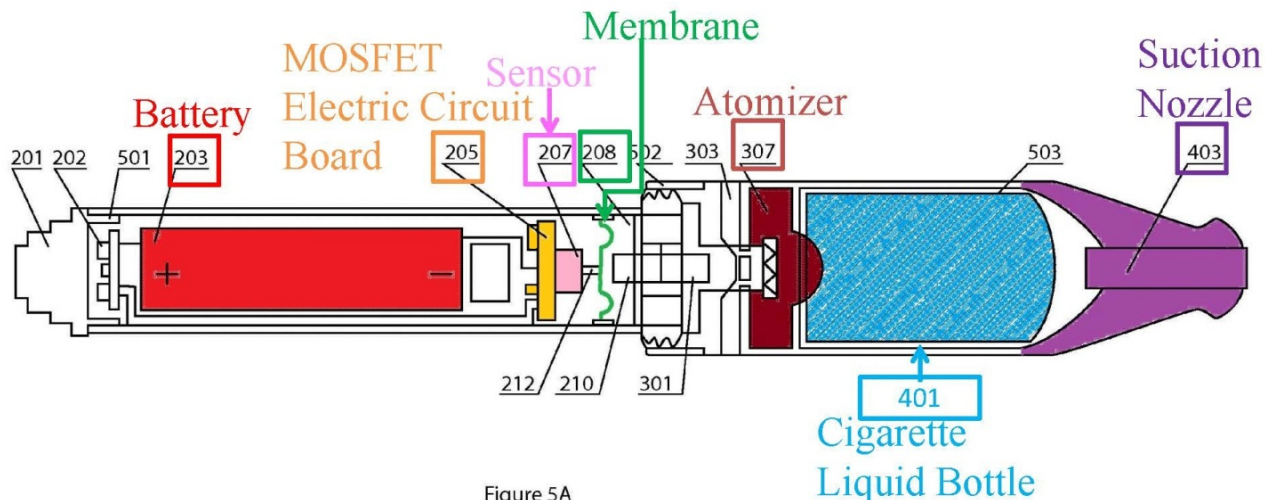


Figure 5A

This combination of components was, in large part, already disclosed by the named inventor of the '957 patent himself, Lik Hon, in an earlier patent, CN 2719043, and equivalent publications. An annotated version of CN 2719043 Fig. 1 illustrates components corresponding to those claimed in the '957 patent:

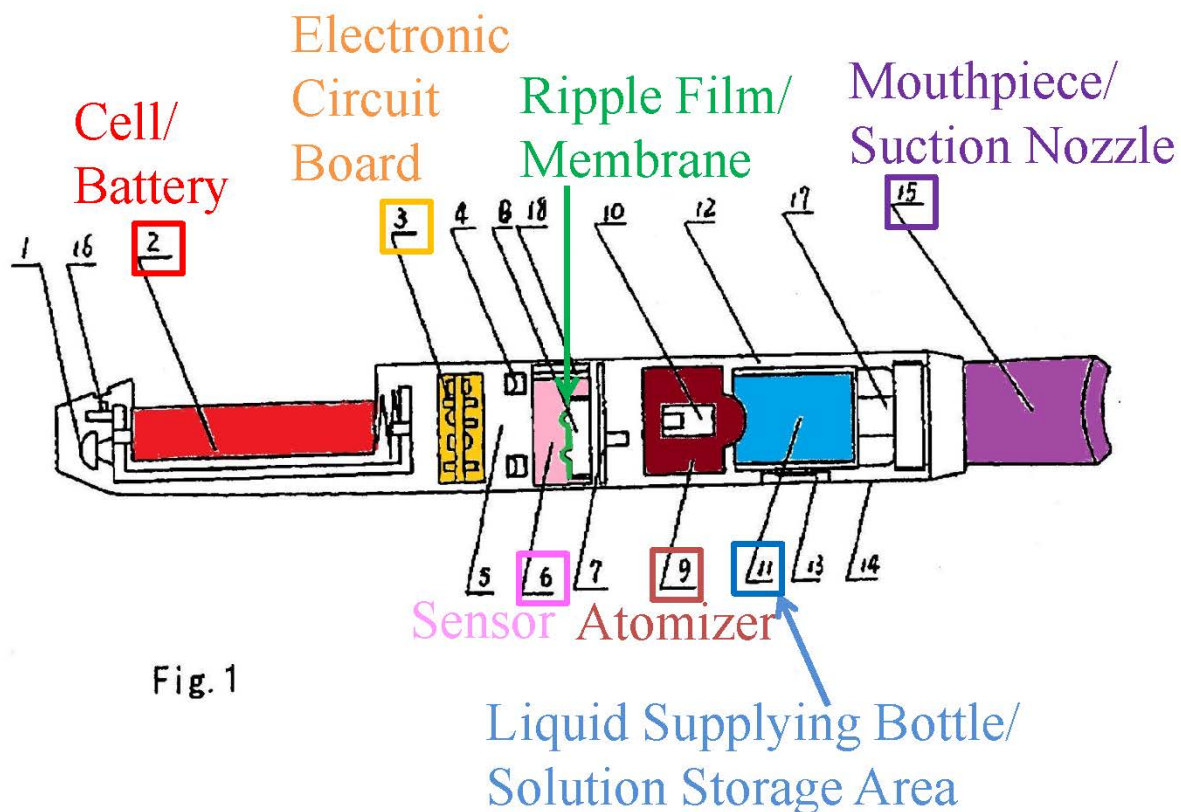


Fig. 1

During prosecution of the application leading to the ‘957 patent, the USPTO repeatedly rejected the challenged claims over CN 2719043, and only allowed them once Applicant added a limitation not disclosed in CN 2719043, i.e., “with the atomizer including a heater coil wound around a porous component.” This limitation, however, was long known in the prior art. The few pieces of the prior art “puzzle” not disclosed in CN 2719043 are disclosed in other patents and publications that were well known, and the combinations would have been obvious to one of ordinary skill in the art.

Section III of this Petition summarizes the ‘957 patent and its prosecution history. Section IV discusses claim construction. Section V provides a detailed explanation of the grounds of unpatentability.

III. THE ‘957 PATENT

A. Background

The claims of the ‘957 patent generally require some or all of the following: a battery assembly, an atomizer assembly, and a “solution assembly.” The battery assembly has a battery, a micro-controller unit, a sensor, and a primary screwthread electrode. The atomizer assembly has an atomizer, a solution storage area, a secondary screwthread electrode on the atomizer assembly, and a heater coil wound around a porous component. The elements of the battery assembly are illustrated in Figure 2A of the ‘957 patent, (*see* ‘957 patent 2:27-28), in which

element 203 is the battery, 205 is a MOSFET electric circuit board, 207 is the sensor, and 209 is the primary screwthread electrode at the end of the battery assembly. *Id.* at 3:4-20.

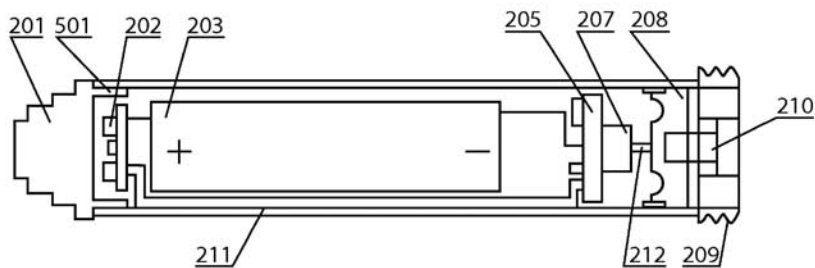


Figure 2A

Figure 3 depicts the atomizer assembly and Figure 4 depicts the “cigarette bottle assembly,” (*id.* at 2:31-34), in which element 307 is the atomizer (*id.* at 3:32-34), 305 is the heating body (*id.* at 4:2-3), and 302 is a secondary screwthread electrode that mates with the primary screwthread electrode 209 of the battery assembly (*id.* at 4:4-5). In Figure 4, element 401 is the cigarette liquid bottle, 402 is fiber containing cigarette liquid, and 403 is the suction nozzle. *Id.* at 3:48-56.

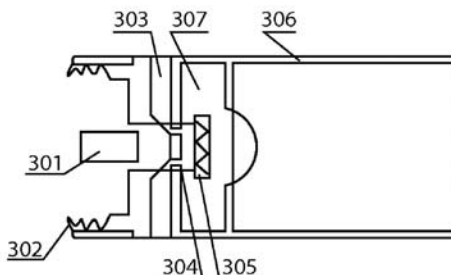


Figure 3

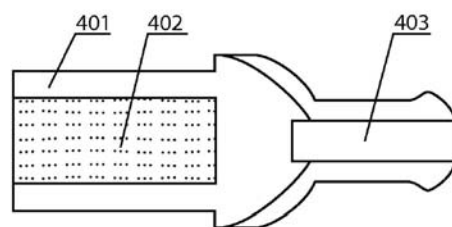


Figure 4

B. Prosecution History

1. Preliminary Amendments

The application which ultimately issued as the ‘957 patent entered the national phase on January 15, 2009, from PCT application No. PCT/CN2007/001576, filed on May 15, 2007, which claimed priority to CN Patent Application No. 200620090805 (“Hon ‘805”). Ex. 1014. The May 15, 2007 date is the “date of application for patent in the United States” for purposes of 35 U.S.C. § 102(b). The application was filed with 23 original claims, and in an October 29, 2008 Preliminary Amendment, the application amended one claim and added nine new claims. *See* October 29, 2008 Preliminary Amendment. Ex. 1015.

2. First Office Action Rejects Claims In View Of CN 2719043

On October 5, 2010, the Examiner rejected all 32 claims. Ex. 1016. Claim 1 was rejected as being anticipated by CN 2719043 (as disclosed in equivalent publication CA 2 562 581). Ex. 1016 at 5². Claims 2-32 were rejected under 35 U.S.C. 103(a) as being unpatentable over CN 2719043. *Id.* at 6-7. The Examiner found that CN 2719043 disclosed nearly all the limitations, including a pressure cavity (5), a sensor (6), a ripple film (22), a heating element provided within a

² All file history citations to Office Actions or responses are to the numbered page on the original Office Action or Response.

housing shell (14), and a detachable mouthpiece (15) attached thereto. *Id.* The Examiner also stated that “[a]ll of the other remaining claimed features are either disclosed or obvious in light of the disclosure of CN 2719043 (see entire document and Figures of CA 2 562 581).” *Id.* The Examiner also explained that it was “known in many arts to provide devices in several pieces wherein each piece is connected by mating threads. Therefore, the fact that the claimed device is in more than two pieces, and the said pieces are connected by threads does not impart patentability to the claims.” *Id.* at 7.

In response, on March 7, 2011 Applicant made amendments to the drawings and the claims. Applicant canceled claims 1-32 and added new claims 33-62. Ex. 1017 at 3-10. Applicant also attempted to distinguish CN 2719043 (which Applicant referred to as “Hon”), arguing that:

Hon does not disclose "a battery assembly including a battery, a Metallic [sic] Oxide Semiconductor Field Effect Tube [sic] (MOSTET) [sic] electric circuit board, a sensor located on the MOSFET electric circuit board, a primary screwthread electrode, a primary negative pressure cavity, and a primary shell with an external thread electrode on a first end and the battery and MOSFET electric circuit board connected successively on a second end," as disclosed by the present invention. Nowhere does Hon disclose the battery assembly of the present invention, in particular the unique components of the MOSFET electric circuit board and primary screwthreads.

Id. at 13-14.

3. Second Office Action Again Rejects Claims In View Of CN 2719043

On March 29, 2011, Applicant had an interview with the Examiner and subsequently submitted a “Marked-Up Specification.” Ex. 1018. On June 8, 2011, the Examiner made a final rejection of claims 33-62, again basing the rejections on CN 2719043, this time in view of the “TechPowerUp” Internet Webpage and Paterno (U.S. Pat. App. Pub. 2008/0257367) to reject claims 33-34, 38, and 40 under 35 U.S.C. § 103(a) as being unpatentable. Ex. 1019. Again, the Examiner found that CN 2719043 disclosed “nearly all that is recited in the claims.” *Id.* at 6.

Regarding the MOSFET electronic circuit board, the Examiner stated that “it is well known in the electronic arts, and as evidenced by the ‘TechPowerUp’ Internet webpage, MOSFETs are popular devices used in converting voltage in electronic devices” and it would have been obvious to incorporate a MOSFET circuit board. *Id.* at 6-7. The Examiner also did not find the use of internal/external electrodes to render the claims patentable, stating:

[T]he Paterno et al reference would have given one having ordinary skill in the art motivation to have provided these external/internal electrodes on the electronic cigarette of CN 2719043 in order to render the device separable at this battery/atomizer junction that would enable the “battery assembly” - which includes the circuit board (microprocessor) - to be removed from the

atomizer/liquid-carrying bottle assembly so that just the necessary electronic circuitry could be recharged at a remote docking station while being monitored by the microprocessor (see para. [0017]).

Id. at 7.

On December 8, 2011, Applicant filed a Request for Continued Examination and submitted amendments to the specification and claim 33. Ex. 1020. Applicant canceled claims 34-62 and added claims 63-133. *Id.* at 5-15. Applicant replaced the words “external thread electrode” with “primary screwthread electrode.” *Id.* at 17-18. Applicant also amended claim 33 to, among other things, substitute the phrase “solution assembly” for “bottle assembly” in claim 33. *Id.* at 6. The phrase “solution assembly” is not used in the specification of the ‘957 patent.

Applicant again attempted to overcome CN 2719043, arguing that it was not prior art, contending the application was entitled to the earlier May 16, 2006 filing date of its foreign priority document, Chinese Application No. 200620090805.0 (“Hon ’805”). *See* Ex. 1020 at 18. This argument was incorrect, because CN 2719043 is prior art under 35 U.S.C. § 102(b), as it issued on August 24, 2005, more than one year prior to the May 15, 2007 filing date of the ‘957 patent’s PCT Application, which is the “date of application for patent in the United States” for purposes of § 102(b).

Applicant also argued that the art cited by the Examiner did not anticipate or render obvious amended claim 33, which claim recited "a battery assembly which

comprises ... a primary screwthread electrode located on [a] first end of the battery assembly ... an atomizer assembly comprising ... a secondary screwthread electrode [] located on [a] second end of the atomizer assembly; and a cigarette solution assembly ... wherein [a] first end of the cigarette solution assembly is inserted into the first end of the atomizer assembly, thus forming a cigarette or cigar body." *Id.* at 18-19.

4. Third Office Action Rejects Claims

On January 9, 2012, the Examiner made a non-final rejection, rejecting all of the pending claims 33, and 63-133. Ex. 1021. The Examiner stated that independent claims 33, 86, and 107 "include recitation which is not structurally associated to other recitation in the claims and, hence, makes total understanding of the claimed invention unclear." *Id.* at 2-3.

On May 9, 2012, Applicant amended the specification, amended claims 33, 63-68, 71-73, 76-77, 81, 86-89, 93-94, 98, 103, 107-108, 112-114, 116, 125-126, 130, canceled claims 69-70, 74-75, 78-80, 82-85, 90-92, 95-97, 99-102, 104-106, 109-111, 115, 117-124, 127-129, and added new claim 134. Ex. 1022 at 7-17.

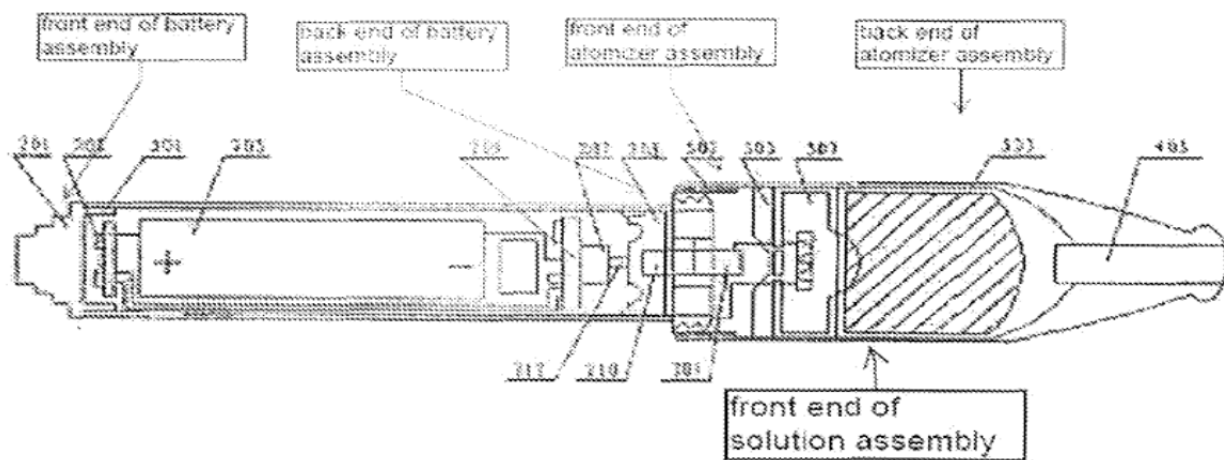
5. Fourth Office Action Again Rejects Claims In View Of CN 2719043

Despite Applicant's arguments that CN 2719043 was "not prior art" and that various limitations known in the art, such as screwthread electrodes and cigarette solution assemblies, rendered the claims patentable, on August 7, 2012, the

Examiner again rejected claims 33, 63-64, 67-68, 71-73, 76-77, 86-88, 93-94, 98, 107-108, 112-113, 116, 125-126 and 133-134 under 35 U.S.C. 103(a) as being unpatentable over CN 2719043 in view of the "TechPowerUp" Internet Webpage and Paterno. Ex. 1023 at 2-3. As in previous Office Actions, the Examiner stated that CN 2719043 disclosed nearly all of the limitations of the claims (*id.* at 5), that MOSFETs were "well known in the electronic arts," and use of MOSFETs would have been obvious. *Id.* at 5-6. Also, as in the Second Office Action, the Examiner explained that the use of screwthread electrodes did not render the claims patentable, and "the Paterno et al reference would have given one having ordinary skill in the art motivation to have provided these external/internal electrodes on the electronic cigarette of CN 2719043." *Id.* at 6. The Examiner further explained that other limitations, such as use of a micro-controller unit, were conventional. *Id.* at 6-7. Additionally, neither having a "hole through the center" (*id.* at 7), including a "hole" at the surface of a screwthread electrode (*id.* at 7), nor enabling the primary screwthread to be connected to a charger, rendered the claims patentable. *Id.* at 8.

In response, on August 29, 2012, Applicant did not dispute the positions taken by the Examiner in the August 7, 2012 Office Action regarding the presence of claim limitations in CN 2719043. Ex. 1024. Instead, Applicant amended claims 86 [issued claim 1] and 107 [issued claim 10] to add the limitation: "with the atomizer including a heater coil wound around a porous component." *Id.* at 2, 4.

Applicant also added new independent claim 138 [issued claim 23] and its dependent claim 139 [issued claim 24]. *Id.* at 5-6. Claim 138 had the “with the atomizer including a heater coil wound around a porous component” limitation that was added to claims 86 and 107. As the Applicant noted “New claims 138-139 designate the front and back ends as shown in marked up Fig. 5A below.” *Id.* at 7.



6. Notice Of Allowance

On December 17, 2012, the USPTO issued a notice of allowance. Ex. 1025.

On July 2, 2013, the USPTO issued a certificate of correction. Ex. 1026.

IV. CLAIM CONSTRUCTION

Pursuant to 37 C.F.R. § 42.104(b)(3), Petitioner sets forth how the challenged claims are to be construed. The Board construes claims in an unexpired patent by applying the broadest reasonable interpretation in light of the specification. 37 C.F.R. § 42.100(b); *see also* Office Patent Trial Practice Guide, 77 Fed. Reg. 48,756, 48,766 (Aug. 14, 2012). Claim terms are given their ordinary

and customary meaning as would be understood by one of ordinary skill in the art in the context of the entire disclosure. *In re Translogic Tech., Inc.*, 504 F.3d 1249, 1257 (Fed. Cir. 2007). Accordingly, solely for purposes of this review, Petitioner construes the claim language such that terms are given their broadest reasonable interpretation in light of the specification and file history. Terms not specifically listed and construed below should be given their plain and ordinary meaning under the broadest reasonable interpretation. See 37 C.F.R. § 42.100(b). Petitioner expressly reserves the right to argue in a different forum a different claim construction for any term in the ‘957 patent as appropriate in that proceeding.

A. Level Of Ordinary Skill In The Art

“A person of ordinary skill in the art is a person of ordinary creativity, not an automaton.” *KSR Int’l Co. v. Teleflex, Inc.*, 550 U.S. 398, 421 (2007). As confirmed by Dr. Gregory Buckner, the level of ordinary skill in the art of the ‘957 patent is at least a Bachelor’s degree in electrical engineering, mechanical engineering or biomedical engineering, along with at least five years’ experience designing eletromechanical medical devices. Ex. 1002, Buckner Dec. at ¶ 14.

B. Terms Construed

1. “Porous Component”

All of the independent claims of the ‘957 patent recite a “porous component.” As noted above, a Request for Trial was granted in connection with

IPR2013-00387 regarding U.S. Patent No. 8,156,944 (“’944 patent”), (Ex. 1027), in the Decision, paper 7. Ex. 1028. The ‘944 patent claims priority to CN Patent Application No. 200620090805 (“Hon ‘805”), just as the ‘957 patent does. The ‘944 patent is entitled “Aerosol Electronic Cigarette.” In the Decision, “porous component” was interpreted “to be a component of the atomizer assembly in the electronic cigarette that includes pores and is permeable to liquid, such as cigarette solution from the cigarette solution storage area.” Ex. 1028 at 11. The “porous component” of the ‘957 patent also has pores and is permeable to liquid such as cigarette solution, (‘957 patent at 4:6-9) and that definition is appropriate for the purposes of these proceedings for the term “porous component” as it is used in the ‘957 patent. Ex. 1002 at ¶ 57.

2. “Solution Storage Area”

All of the independent claims of the ‘957 patent recite a “solution storage area.” Claims 1 and 23 require “a solution storage area in the atomizer assembly housing,” but claim 10 requires that the “solution storage area” be part of the “solution assembly.” The specification does not use the term “solution storage area” or “solution assembly” outside of the claims. The specification does, however, reference a “cigarette bottle assembly” that “includes the **cigarette liquid**

bottle,³ fiber and suction nozzle.” ‘957 patent at 1:66-67. The specification goes on to state: “The fiber containing **cigarette liquid** is located on one end of the **cigarette liquid bottle**, and this end is inserted into the secondary shell and lies against the atomizer. The suction nozzle is located on the other end of the **cigarette liquid bottle**.” *Id.* at 2:1-3. In reference to Fig. 4, the specification states:

the cigarette bottle assembly includes the **cigarette liquid bottle** (401), fiber (402) and suction nozzle (403). The fiber (402) containing cigarette liquid is located on one end of the **cigarette liquid bottle** (401), and this end is inserted into the secondary shell (306) and lies against the atomizer (307). The suction nozzle (403) is located on the other end of the **cigarette liquid bottle** (401). Between the fiber (402) and interior wall of the **cigarette liquid bottle** (401) is an air intake hole (503).

Id. at 3:48-56. *See also* 4:7-8, 4:39, 5:21-22, all of which refer to the cigarette liquid bottle as the structure which holds the cigarette liquid.

Irrespective of which assembly the “solution storage area” is a part, consistent with the claims and the specification, and giving the term its

³ Unless otherwise indicated, all emphasis in bold or italics in this Petition has been added to the original.

broadest reasonable construction as it would be understood by one of ordinary skill in the art, the “solution storage area” is “a contained volume such as a cigarette liquid bottle or container.” *See* Ex. 1002 at ¶ 62.

V. DETAILED EXPLANATION OF UNPATENTABILITY GROUNDS

Pursuant to 37 C.F.R. § 42.104(b)(4), Petitioner sets forth how each element of the challenged claims is found in the prior art patents or printed publications.

A. Summary of CN 2719043

CN 2719043 (Ex. 1003⁴) issued on August 24, 2005, and names as its inventor the same individual, Lik Hon, who is the inventor of the ‘957 patent. CN 2719043 describes an electronic atomizing cigarette. *See* Abstract. Most of the components claimed in the ‘957 patent are also disclosed in the CN 2719043, including a cell 2 / rechargeable battery 2 (CN2719043 / U.S. equivalent publication 2007/0267031 (“Hon ‘031”, Ex. 1005) at ¶¶ 26, 28; English Translation Ex. 1004 at 10); electronic circuit board 3 (*id.* at ¶ 26; Ex. 1004 at 9); a

⁴The English translation of Ex. 1003 is Ex. 1004, but the translation does not have paragraph numbers or line numbers. For ease of reference, citations will be made to page numbers of Ex. 1004, in addition to paragraph numbers found in Hon ‘031 (Ex. 1005), which is the equivalent U.S. publication 2007/0267031, and which publication was relied upon by the Examiner.

sensor 6 (*id.*); a through hole (*id.*); an atomizer 9 (*id.*); a liquid supplying bottle 11, corresponding to the “solution storage area” (*id.*); a porous body 27, corresponding to the “porous component” (*id.*); a heating element 26, corresponding to the “heater coil” (*id.* at ¶ 28; Ex. 1004 at 11); a ripple film 22, corresponding to the “membrane” (*id.*; Ex. 1004 at 10), fiber material (*id.*); and a mouthpiece 15, corresponding to the “suction nozzle” (*id.*).

While the claims of the ‘957 patent include some additional limitations, all of those additional limitations were well known in the prior art, and a person of ordinary skill in the art would have been aware of the relevant prior art, the teachings of the prior art, and the combinations of the prior discussed in this Petition. Ex. 1002 at ¶ 65. For example, screwthread electrodes had long been known as taught in the Paterno reference (Ex. 1019) cited by the Examiner as well as in the Gilbert reference (Ex. 1007) . As noted by the Examiner, MOSFETs were well known in the art and the most common type of field effect transistor used in commercial applications. Ex. 1019 at 6-7. Micro-controller units (MCUs) were also well known, and disclosed in the Voges reference. Ex. 1009. Rechargeable batteries that use a screwthread to connect to a charger were well known, and disclosed in Connors. Ex. 1011. Additionally, concerning the limitation the Applicant added to finally overcome repeated rejections by the Examiner, the 1935 Whittemore had long taught to use a heater coil wound around a porous

component. Ex. 1008. Persons of ordinary skill would have been motivated to combine the references for the reasons discussed below, and the subject matter as a whole of each challenged claim would have been obvious. Accordingly, as shown below, a person of ordinary skill in the art would have found all of the challenged claims to be obvious.

B. The Challenged Claims Are Unpatentable

1. Independent Claims 1, 10, and 23

(a) Preamble And Battery Assembly Limitations

i. Preamble

The preamble of all independent claims are directed to an *electronic cigarette* (or cigar). CN 2719043 “relates to an electronic atomization cigarette.” Hon ‘031 at Abstract & ¶ 1; Ex. 1004 at 1, 5; Ex. 1002 at ¶ 69.

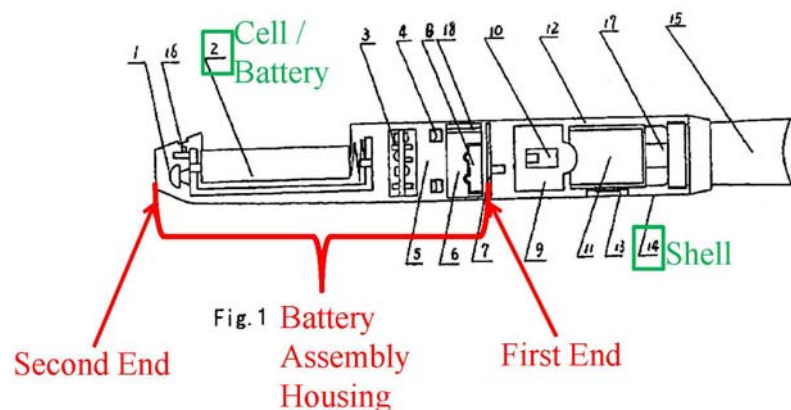
ii. Battery Assembly

All of the independent claims require “*a battery assembly comprising* [or “including” in claim 23] *a battery assembly housing having a first end and a second end*” [or “*front end and back end*” in Claim 23] . See Claim Limitations [1.1a],⁵ [10.1], [23.1a], Ex. 1002, at ¶¶ 70, 80, 185. As the Examiner noted in the

⁵Many of the claim limitations in the independent claims are similar. To limit repetition, a shorthand numbering scheme will be used herein to identify claim

Office Action dated October 5, 2010, p. 7, (Ex. 1016), and confirmed by Dr. Buckner, CN 2719043, does not explicitly disclose separate housings for the battery and atomizer, but “it is known in many arts to provide devices in several pieces wherein each piece is connected by mating threads. Therefore, the fact that the claimed device is in more than two pieces, and the said pieces are connected by threads does not impart patentability to the claims.” *Id.*; Ex. 1002 at ¶¶ 71-73.

CN 2719043 essentially discloses a battery assembly housing with a first end and a second end [or back end and front end], with the parts of the battery assembly provided within the **shell 14**, as shown in the annotated drawings below Ex. 1002 at ¶ 72:



While CN 2719043 does not disclose a housing for the battery separate from other components, it would have been obvious to one of ordinary skill in the art to

limitations. A correlation of the numbering to the words of the claims is provided in the Buckner declaration, Ex. 1002 at ¶ 24.

provide a separate housing for the battery assembly so as to allow the battery assembly to be disconnected from the rest of the device to allow recharging of a rechargeable battery in the battery assembly housing. Ex. 1002 at ¶ 73.

iii. Battery

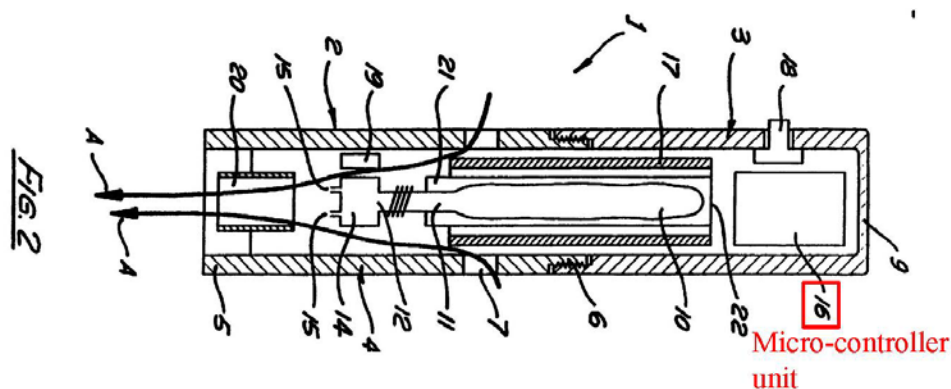
All of the ‘957 patent independent claims require a “***battery***.” See Claim Limitations [1.1b], [10.2], [23.1b], Ex. 1002, at ¶ 74, 153, 183. CN 2719043, and Hon ‘031, disclose a battery, i.e., “the **rechargeable battery 2**.” Hon ‘031 at ¶ 28; Ex. 1004 at 10.

iv. Micro-controller Unit

Independent claims 1 and 23 require a “***micro-controller unit***” (“MCU”) (see Claim Limitations [1.1c], [23.1c], Ex. 1002 at ¶¶ 75, 183), and claim 10 requires a “***circuit board connected to the battery***.” See Claim Limitation [10.2], Ex. 1002 at ¶ 153. As the Examiner noted in the Office Action dated August 7, 2012, pp. 6-7, (Ex. 1023) regarding claims 86 (issued claim 1) and 116 (issued claim 16), in connection with the MCU limitation, “one with ordinary skill in the art would have included a micro controller unit (MCU) to electrically communicate with the MOSFET electric circuit board as this set-up is conventional in many electronically controlled devices.” Ex. 1002 at ¶ 75. MCUs have been included in many electronically controlled devices prior to the priority date of the ‘957 patent. *Id.*

v. Reasons To Combine Voges

Micro-controller units were well known in the art and Voges specifically discloses a micro-controller unit in the form of a microelectronic circuit or microprocessor means: “Device 14 is controlled by **control means 16**, for example a **microelectronic circuit or microprocessor means**.” (Ex. 1009, 5:64-65; Ex. 1002 at ¶ 76.)



It would have been obvious to combine the micro-controller unit of Voges with the electronic circuit board 3 of CN 2719043 because such a combination uses a known technique of using a micro-controller unit to improve a device and make it more flexible in that the micro-controller unit could be programmed to make it more adaptable than a non-programmable electronic circuit, and the results are predictable. Ex. 1002 at ¶ 77.

vi. Battery Connected To A Circuit Board

With respect to the “*a battery connected to a circuit board*,” required by Claim 10 [10.2] , CN 2719043 discloses a battery connected to a circuit board

within the battery assembly housing: “As shown in FIG. 1, the present invention can form an integrity like a cigarette holder, a cigar or a pipe. An air inlet 4 is provided on the external wall of the shell 14. A LED 1, **a cell 2, an electronic circuit board 3**, a normal pressure cavity 5, a sensor 6, a vapor-liquid separator 7, an atomizer 9, a liquid-supplying bottle 11 and a mouthpiece 15 are sequentially provided within the shell 14.” Ex. 1005, Hon ‘031 at ¶ 26; Ex. 1004 at 9. As shown in Fig. 12, the battery is connected to the circuit board. Hon ‘031 at ¶ 24; Ex. 1004 at 8; Ex. 1002 at ¶¶ 78, 153.

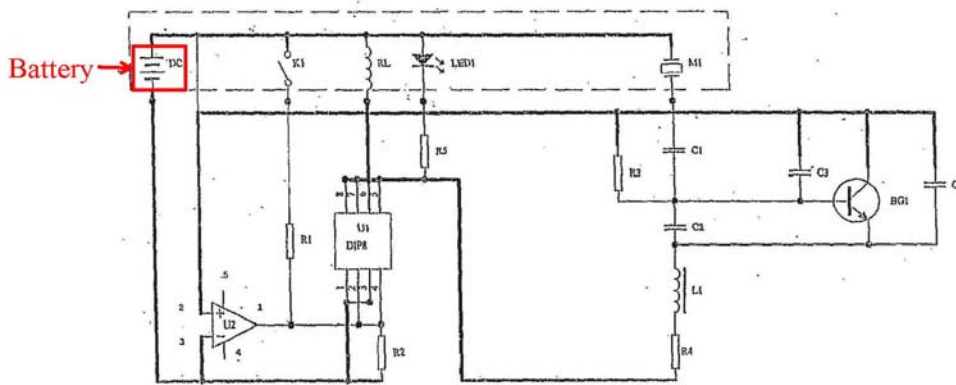


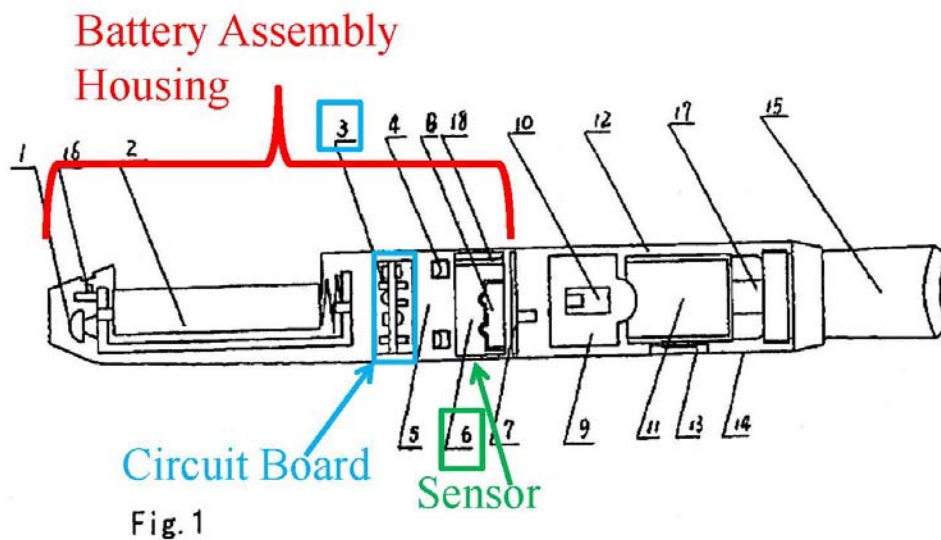
图 12

As the cell / rechargeable battery 2 is the only disclosed source of electrical power to the electronic circuit board 3, the battery is connected to the circuit board. Ex. 1002 at ¶¶ 79, 156.

vii. Sensor Connected To Circuit Board

CN 2719043 discloses “*a sensor electrically connected to a circuit board within the battery assembly housing*” (see Claim Limitations [1.1d], [23.1d]): “As

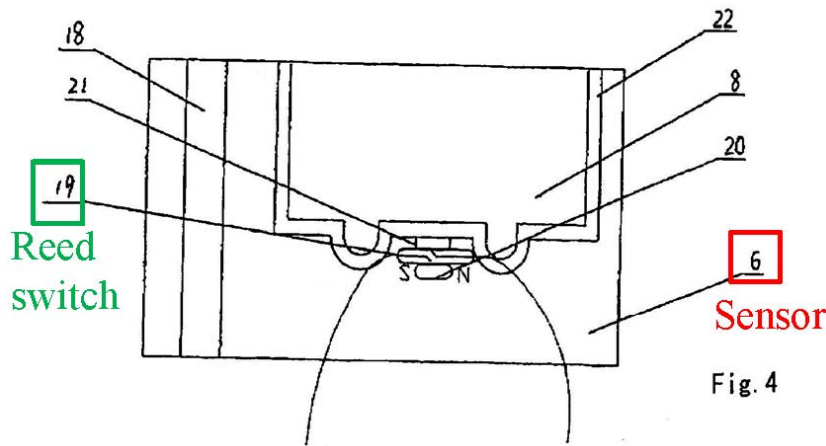
shown in FIG. 1, the present invention can form an integrity like a cigarette holder, a cigar or a pipe. An air inlet 4 is provided on the external wall of the shell 14. A LED 1, a cell 2, **an electronic circuit board 3**, a normal pressure cavity 5, a **sensor 6**, a vapor-liquid separator 7, an atomizer 9, a liquid-supplying bottle 11 and a mouthpiece 15 are sequentially provided within the shell 14.” Hon ‘031 at ¶ 26; Ex. 1004 at 9; Ex. 1002 at ¶¶ 80-81. The claim limitations are shown in the annotated drawing below:



Additionally, the sensor is electrically connected to the circuit board:

“When a smoker smokes, the mouthpiece 15 is under negative pressure, the air pressure difference or high speed stream between the normal pressure cavity 5 and the negative pressure cavity 8 will cause the **sensor 6** to output an actuating signal, **the electronic circuit board 3 connected therewith** goes into operation.” Hon ‘031 at ¶ 28; Ex. 1004 at 10; Ex. 1002 at ¶¶ 82-84.

Additional support for the fact that the sensor is electrically connected to the circuit board comes from Fig. 4, which shows that the sensor 6 is made up of a number of components, including Reed switch 19: “A first magnetic steel 20, a second magnetic steel 21 and a Reed switch 19 arranged between them is also provided within the sensor 6.” Hon ‘031 at ¶ 26; Ex. 1004 at 9; Ex. 1002 at ¶¶ 83-84.



viii. Primary Screwthread Electrode

Independent claims 1 and 10 require “*a primary screwthread electrode located on the first end of the battery assembly housing.*” (See Claim Limitations [1.2a], [10.3]; Independent claim [23.2] has a similar limitation, but substitutes the word “first” for “primary” and “back” for “first.”)

As stated by the Examiner in the Office Actions dated June 8, 2011, p. 7, (Ex. 1019), and August 7, 2012, p. 6, (Ex. 1023), Paterno “would have given one having ordinary skill in the art motivation to have provided these external/internal

electrodes on the electronic cigarette of CN 2719043 in order to render the device separable at this battery/atomizer junction that would enable the ‘battery assembly’ - which includes the circuit board (microprocessor) – to be removed from the atomizer/liquid-carrying bottle assembly so that just the necessary electronic circuitry could be recharged at a remote docking station while being monitored by the microprocessor (see para. [0017]).” Ex. 1002 at ¶ 86.

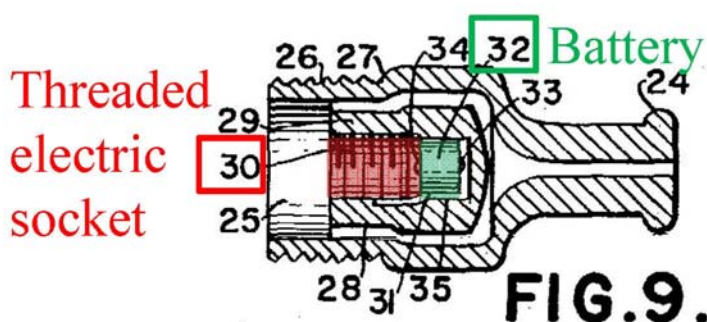
Paterno states: “Power source 5 may be a replaceable or rechargeable battery, inserted against battery spring 6. Where rechargeable, the battery may be removed for recharging or, optionally, be recharged while remaining in the device by placement of the device in contact or proximity to a docking device (not shown).” Ex. 1010, Paterno, ¶ [0017]); Ex. 1002 at ¶ 87.

ix. Reasons To Combine Paterno

The rationale supporting the combination of CN 2719043 and Paterno is that the combination uses a known technique of having a device separable at the battery/atomizer junction to improve a device and the results are predictable. Using separable battery and atomizer assemblies to allow a battery to be recharged would enhance commercial opportunities and make the product more desirable by reducing the need to replace the entire device when the battery is depleted. Hence, the electronic cigarette of CN 2719043 modified by Paterno meets the limitations of the claims. Ex. 1002 at ¶ 88.

x. Reasons To Combine Gilbert

Further, the use of threaded electric sockets was well known in the art, as shown in Gilbert, (Ex. 1007) – “Within the inner ring 29 is a threaded electric socket 30 and forwardly thereof a battery cavity 31 for detachably receiving a battery 32 having an inner contact 33 and an outer contact 34 with a contact strip 35 between the inner contact 33 and the socket 30.” (2:41-45). Ex. 1002 at ¶ 89.



Gilbert discloses a primary screwthread electrode in the form of the threaded electric socket 30, which is on the first end of the battery housing. It would have been obvious to combine Gilbert with CN 2719043 for similar reasons as to why it would have been obvious to combine Paterno with CN 2719043. That is, the combination uses a known technique of having a device separable at the battery/atomizer junction to improve a device and the results are predictable. Using separable battery and atomizer assemblies to allow a battery to be recharged would enhance commercial opportunities and make the product more desirable by reducing the need to replace the entire device when the battery is depleted. The structure disclosed in Gilbert allows two separate housings to be electrically

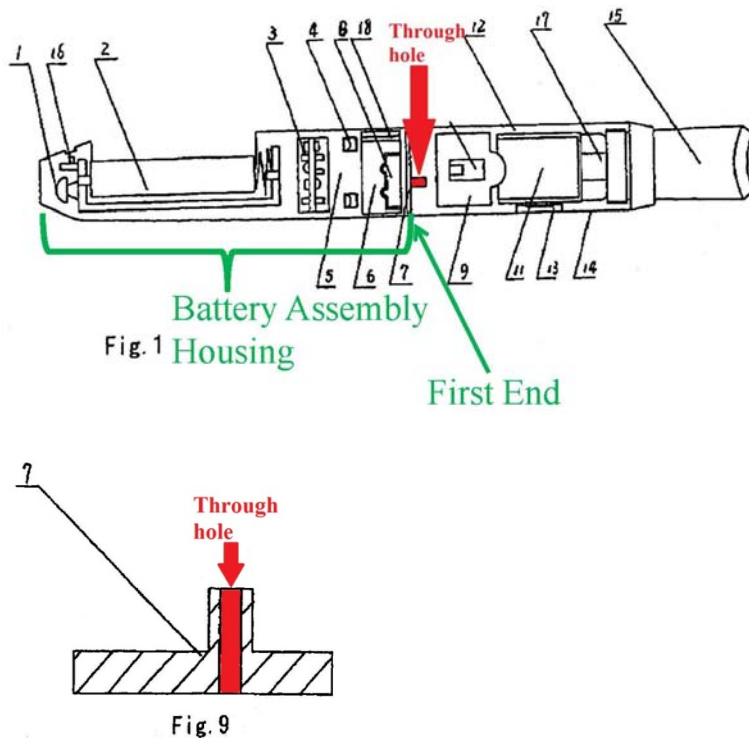
connected via screwthread electrodes without using any wires that could be twisted when the two housings are screwed together. Using separable battery and atomizer assemblies to allow a battery to be recharged would enhance commercial opportunities and make the product more desirable by reducing the need to replace the entire device when the battery is depleted. Ex. 1002 at ¶ 90.

xi. Having A Hole Through Its Center

Independent claim 1 limitation [1.2b] and dependent claim 22 require a battery assembly “*having a hole through its center.*” CN 2719043 discloses the battery assembly “having a hole through its center.” As shown in Figs. 1 and 9, “a through hole is provided on the vapor-liquid separator 7.” Hon ‘031 at ¶ 26; Ex. 1004 at 9. This through hole goes approximately through the center of the battery assembly housing into the atomizer assembly housing, or if not exactly through the center, it would have been obvious to center the through hole on the vapor-liquid separator. The choice of whether to make the through hole centered or not-centered would have been an obvious design choice. Ex. 1002 at ¶ 91.

CN 2719043 discloses that air flows through the hole in the battery assembly to the atomizer assembly: “The air enters the normal pressure cavity 5 through the air inlet 4, passes through the air passage 18 of the sensor and **then the through hole in the vapor-liquid separator 7, and flows into the atomization cavity 10** in the atomizer 9.” Hon ‘031 at ¶ 28; Ex. 1004 at 10. Ex. 1002 at ¶ 92. The claim

limitations are shown in the annotated drawings below:



(b) Atomizer Assembly Limitations

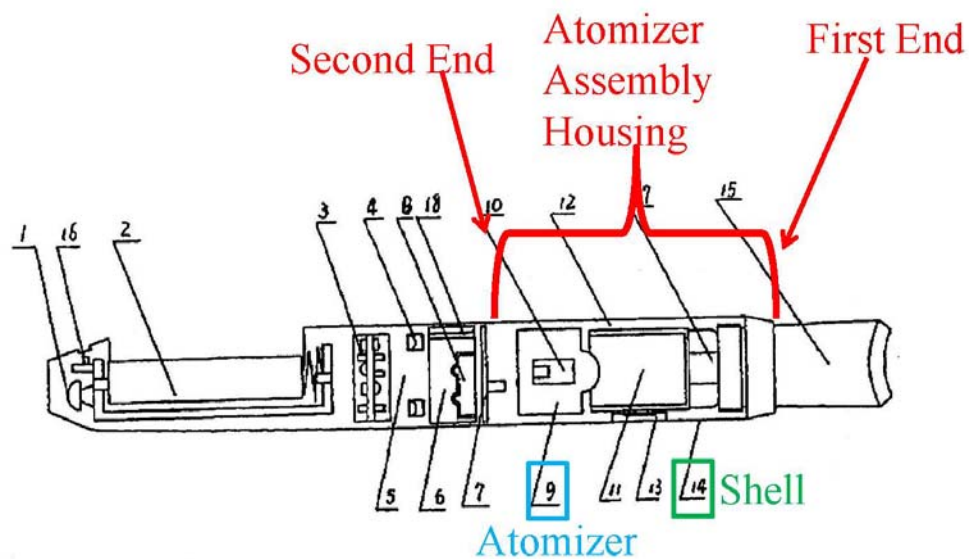
i. Atomizer Assembly

All independent claims require “*an atomizer assembly*” with “*an atomizer assembly housing having a first end and a second end.*” See Claim Limitations [1.3], [1.4], [10.4], [10.5], [23.3] (or “front end” and “back end” in Claim [23.4]).

As the Examiner stated in the Office Action dated October 5, 2010, p. 7, (Ex. 1016), regarding pending claims 2-32, the electronic cigarette of CN 2719043 does not teach an electronic cigarette with “more than two parts wherein external threads are provided on the housing where the battery is located, and internal threads are provided at an end of the housing section where the atomizer is located.

But, it is known in many arts to provide devices in several pieces wherein each piece is connected by mating threads. Therefore, the fact that the claimed device is in more than two pieces, and the said pieces are connected by threads does not impart patentability to the claims.” Ex. 1002 at ¶ 96.

CN 2719043 essentially discloses an atomizer assembly housing with a first end and a second end: “The present invention also discloses an electronic atomization cigarette with another structure, wherein the **atomizer** is postposed **within the shell**, the liquid-supplying bottle is arranged between the vapor-liquid separator and the atomizer, and a spring piece for pressing the liquid-supplying bottle on the atomizer is arranged at one end of the liquid-supplying bottle.” Hon ‘031 at ¶ 10; Ex. 1004 at 7; Ex. 1002 at ¶ 97. The claim limitations are shown in the annotated drawing below:



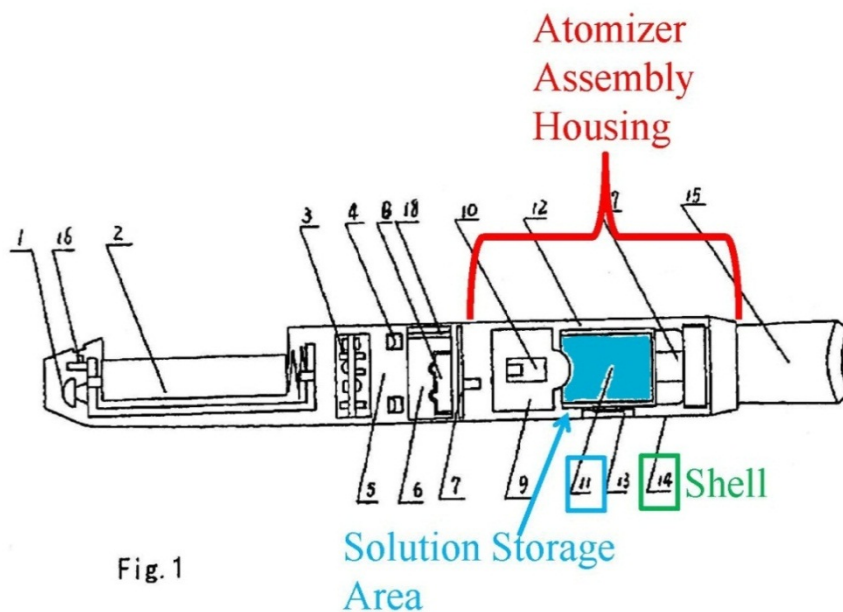
ii. Atomizer

All independent claims require an “*atomizer*.” See Claim Limitations [1.5a], [10.7a], [23.5a]. CN 2719043 discloses “an **atomizer 9**.” Hon ‘031 at ¶ 26; Ex. 1004 at 9.

iii. Solution Storage Area

Claims 1 and 23 require “*a solution storage area in the atomizer assembly housing*.” See Claim Limitations [1.5b], [23.5b]; Ex. 1002 at ¶ 101. The following analysis assumes that the definition of “solution storage area” is “a contained volume such as a cigarette liquid bottle or container.” See Section IV.B.2; Ex. 1002 at ¶¶ 58-62. CN 2719043 discloses a solution storage area in the atomizer assembly housing, in the form of a liquid-supplying bottle in the atomizer assembly housing: “As shown in FIG. 1, the present invention can form an integrity like a cigarette holder, a cigar or a pipe. An air inlet 4 is provided on the external wall of the shell 14. A LED 1, a cell 2, an electronic circuit board 3, a normal pressure cavity 5, a sensor 6, a vapor-liquid separator 7, an atomizer 9, a **liquid-supplying bottle 11** and a mouthpiece 15 are sequentially provided within the shell 14.” Hon ‘031 at ¶ 26; Ex. 1004 at 9. The liquid supplying bottle contains the “nicotine solution.” Hon ‘031 at ¶ 29.; Ex. 1004 at 11. As CN 2719043 further states: “The active ingredient in a cigarette is nicotine.” Hon ‘031 at ¶ 3; Ex. 1004 at 5. Ex. 1002 at ¶¶ 101, 102. The claim limitations are shown in the annotated

drawing below:

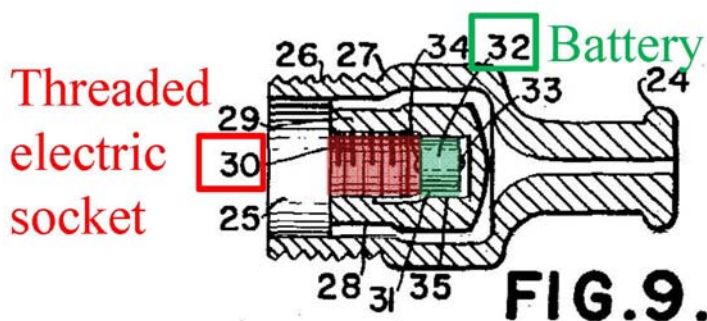


iv. Secondary Screwthread Electrode

Claim 1 requires: “a secondary screwthread electrode located on the second end of the atomizer assembly housing and having a hole through its center, the battery assembly and the atomizer assembly connected through the primary and secondary screwthread electrodes.” Claim 10 has the same requirement except that claim 10 does not include the words “and having a hole through its center.” Claim 23 has a similar limitation, with the only significant difference in connection with this limitation between claims 10 and 23 being that claim 23 uses the words “second screwthread” instead of “secondary screwthread”; “front” instead of “second”; and “first and second” instead of “primary and secondary.” See Claim Limitations [1.6], [10.6], [23.6]. For the same reasons discussed in connection

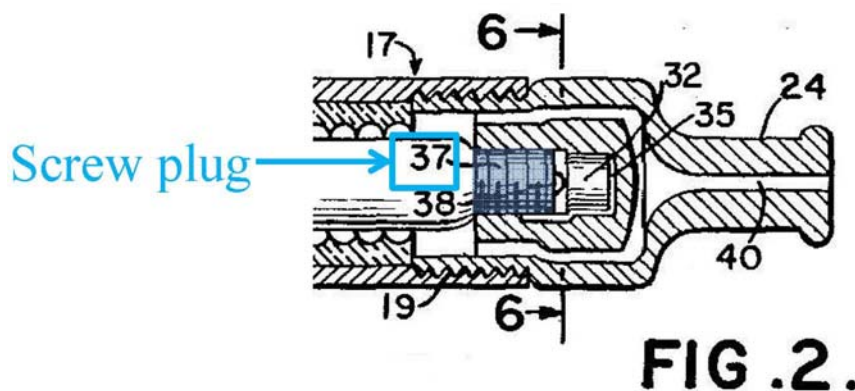
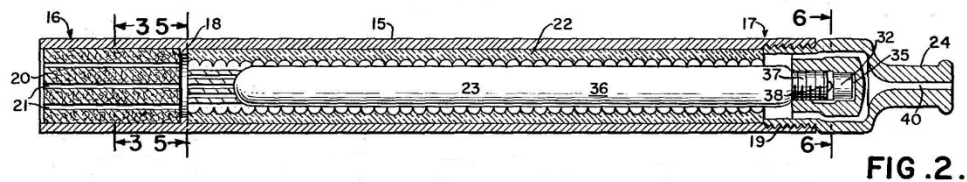
with the “primary screwthread electrode” limitation (section V.B.1.(a).viii; Ex. 1002 at ¶¶ 85-90), it would have been obvious to use primary and secondary screwthread electrodes to connect a battery assembly and atomizer assembly. Ex. 1002 at ¶¶ 103-109.

Primary Screwthread Electrode. Gilbert discloses a primary screwthread electrode used for connecting the battery assembly: “a **threaded electric socket 30** and forwardly thereof a battery cavity 31 for detachably receiving a battery 32.” Ex. 1007 at 2:41-43. This threaded electric socket for the battery assembly is the primary screwthread electrode. Ex. 1002 at ¶ 109. The rationale for combining CN 2719043 and Gilbert is discussed above in connection with the earlier discussion of the primary screwthread electrode. *See* Section V.B.1.(a).x; Ex. 1002 at ¶ 88.



Secondary Screwthread Electrode. Gilbert discloses a secondary screwthread electrode used for connecting the atomizer assembly: “**heating element** is preferably a vacuum tube or bulb having a **screw plug 37** for detachable engagement with the **socket 30.**” Ex. 1007 at 2:45-48. The screw plug

37 of the threaded heating element for the atomizer assembly of Gilbert is the secondary screwthread electrode. Ex. 1002 at ¶ 106.

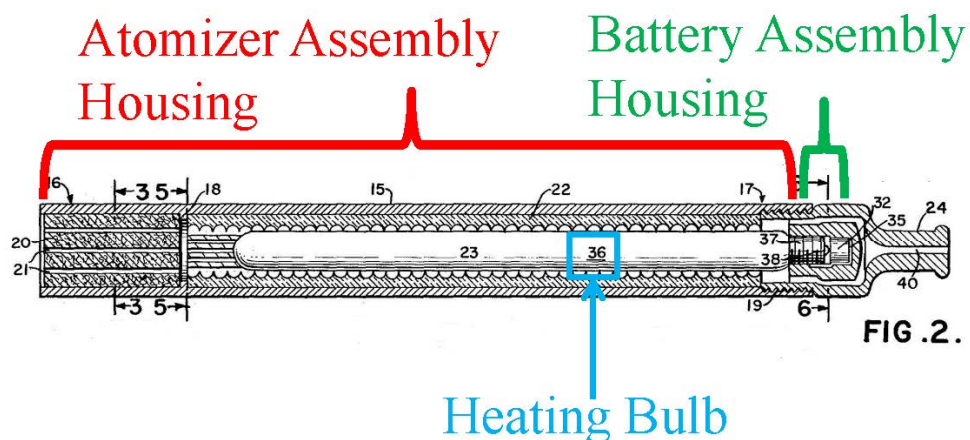


Secondary Screwthread Electrode On The End Of The Atomizer Assembly

Housing. Gilbert discloses that the secondary screwthread electrode connects to the end of the atomizer assembly housing: “The insert 22 is preferably of a ceramic material. By the act of inhalation through the mouthpiece 24, air from the ambient atmosphere is drawn in through the passages 21 of the cartridge 20 which has been impregnated with suitable flavoring material which is picked up by the inhaled air and such air then passes into the heating chamber and is caused to flow around the **heating bulb 36**, the heated and flavored air finally passing through the mouthpiece 24 into the mouth and also, if desired, **into the lungs.**” Ex. 1007 at 3:8-18; Ex. 1002 at ¶¶ 107. Just as discussed above, (section V.B.1.(a).xi) in

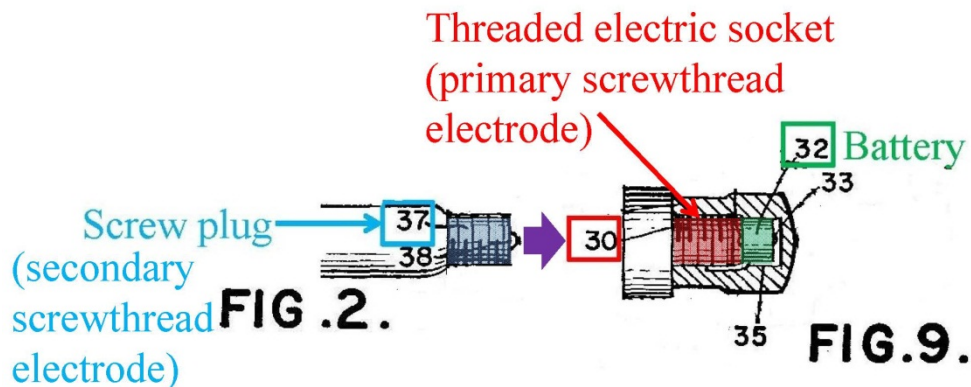
connection with the primary screwthread electrode claim limitation [1.2b], the hole through the center of the battery assembly would extend into the atomizer assembly.

Because the heating bulb heats the flavoring material sufficiently to allow the flavoring material to pass into the lungs, that means that the heating bulb and associated components are the atomizer. Screw plug 37, which is the secondary screwthread electrode is on the end of Gilbert's atomizer assembly housing. Ex. 1002 at ¶¶ 108.



Battery Assembly And The Atomizer Assembly Connected Through The Primary And Secondary Screwthread Electrodes. Simplified versions of Gilbert Figs. 2 and 9 illustrate how the end of screw plug 37 on the atomizer assembly, which is the secondary screwthread electrode, screws into the threaded electric socket 30 of the battery assembly, which is the primary screwthread electrode: “When the bulb 36 [of the atomizer assembly housing] is assembled to the socket

30 [of the battery assembly housing] its tip end 38 will engage the inner battery contact 33 and complete the circuit through the filament of the bulb 36 by the contact strip 35.” Ex. 1007 at 2:70-3:2; Ex. 1002 at ¶ 1009.



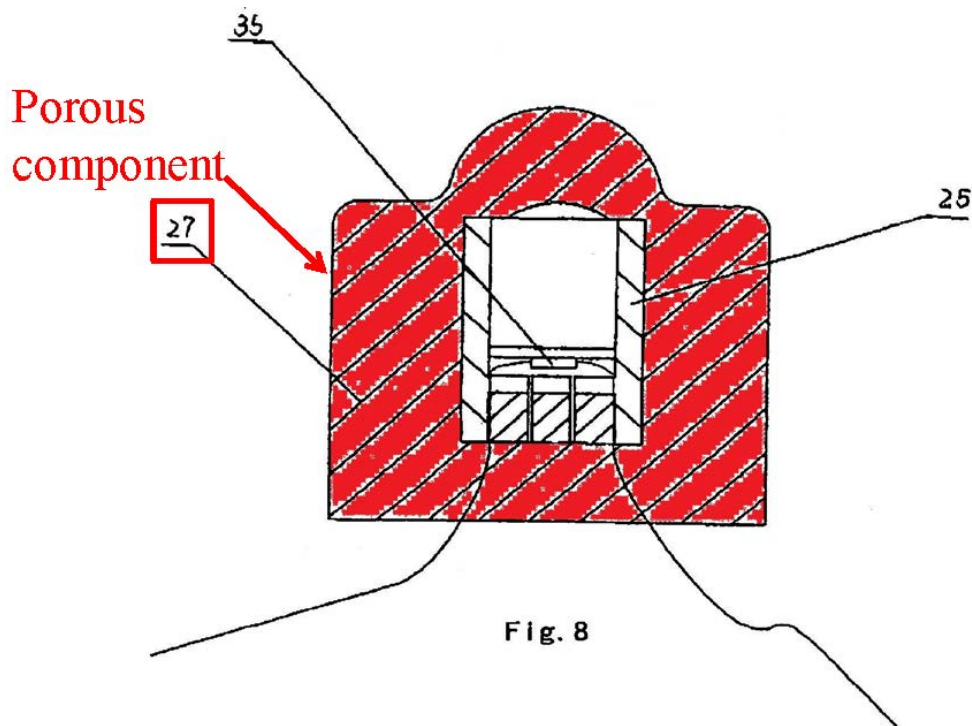
v. **Heater Coil Wound Around A Porous Component**

The final limitation of Claim 1, which is included in all of the independent claims, is the one Applicant added to get the independent claims allowed: “*and with the atomizer including a heater coil wound around a porous component.*”

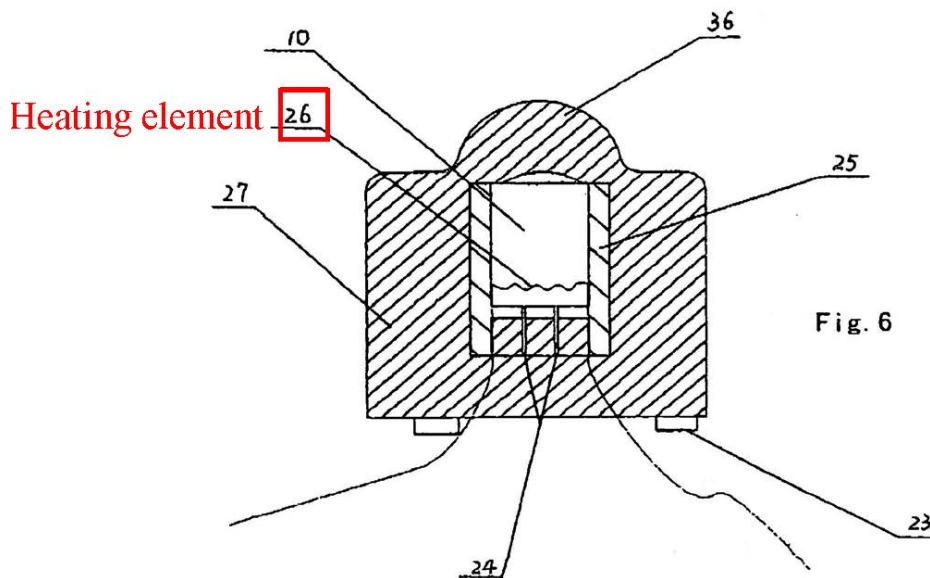
See Claim Limitations [1.7], [10.7c], [23.7]; Ex. 1002 at ¶¶ 110, 151, 183.

Porous Component. CN 2719043 discloses a porous component in the atomizer assembly: A “**porous body** in the atomizer can be made of foam nickel, **stainless steel fiber felt . . .**” Hon ‘031 at ¶ 9; Ex. 1004 at 7. “The atomization cavity wall 25 is surrounded with the **porous body 27**, which can be made of foam nickel, **stainless steel fiber felt**, high molecule polymer foam and foam ceramic.” Hon ‘031 at ¶ 26; Ex. 1004 at 9. It was well known to those of ordinary skill in the art at the time of the filing of the ‘957 patent application that materials made of

fiber included pores and were permeable to liquid. Ex. 1002 at ¶ 111. The porous component is shown in the annotated drawing below:



Heater Coil. CN 2719043 discloses the use of a heating element in the atomizer to atomize a nicotine solution: “The high speed stream passing through the ejection hole drives the nicotine solution in the porous body 27 to eject into the atomization cavity 10 in the form of droplet, where the nicotine solution is subjected to the ultrasonic atomization by the first piezoelectric element 23 and is further atomized by the **heating element 26.**” Hon ‘031 at ¶ 28; Ex. 1004 at 10-11; Ex. 1002 at ¶ 112. This heating element satisfies the heater coil limitation of the ‘957 claims.

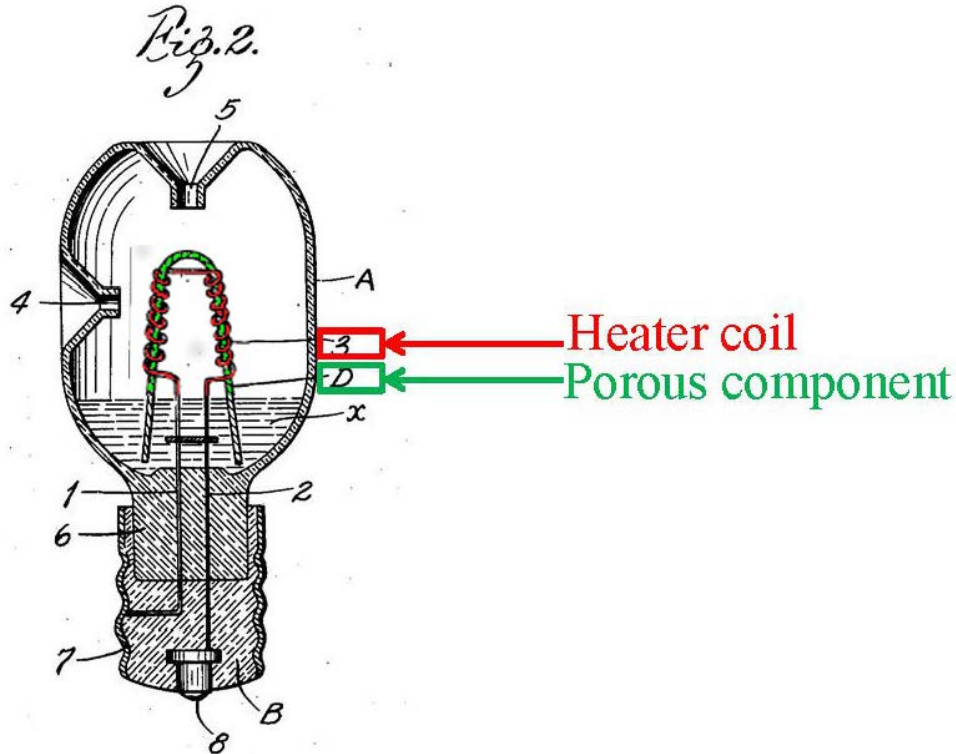


Heater Coil Wound Around A Porous Component. Whittemore discloses the well-known structure of a heater coil “wound around” a porous component:

In order that the unit will function properly, even though the heating element or filament 3 is spaced a considerable distance above or away from the medicament x, the unit is equipped with **a wick D** made of any suitable material and **combined with the heating element or filament 3** in such a way that a portion of said **wick is always in contact or approximate contact with the heating element or filament 3**, and a portion of said wick is always in contact with the medicament in the vaporizing vessel, whereby said medicament will be carried by capillary action to a point where it will be vaporized by the heat from the filament 3. In the form of my invention shown in Figure 2, the **wick consists of a thread, string or strand of some suitable wick material.**

Ex. 1008 at 1:50-2:11; Ex. 1002 at ¶ 114.

Annotated Fig. 2 of Whittemore shows a heater coil would around the porous component of the filament made of a fiber material.



One of ordinary skill in the art would have known that thread or string is made up of fiber and is porous because it has pores and is liquid permeable. Ex. 1002 at ¶ 116. Accordingly, Whittemore’s “wick D” is a porous component. *Id.*

Whittemore further discloses: “A vaporizing unit of the kind described in claim 1, in which the **heating filament is coiled around** a portion of said wick.” Ex. 1008 at Claim 4. Accordingly, Whittemore discloses a heating coil wound around a porous component. Ex. 1002 at ¶ 118.

vi. Reasons To Combine Whittemore

The rationale supporting a combination of Whittemore and CN 2719043 is that the combination uses a known technique of winding a heating coil around a porous wicking component to improve an atomizing device and the results are predictable. The winding of the heating coil around the porous wicking component increases the contact area between the wick and heating coil. Heat transfer to the wick is thus improved. Such an improvement would enhance commercial opportunities and make the product more desirable by increasing the efficiency of atomization. Ex. 1002 at ¶ 119.

(c) Other Claim 10 Limitations

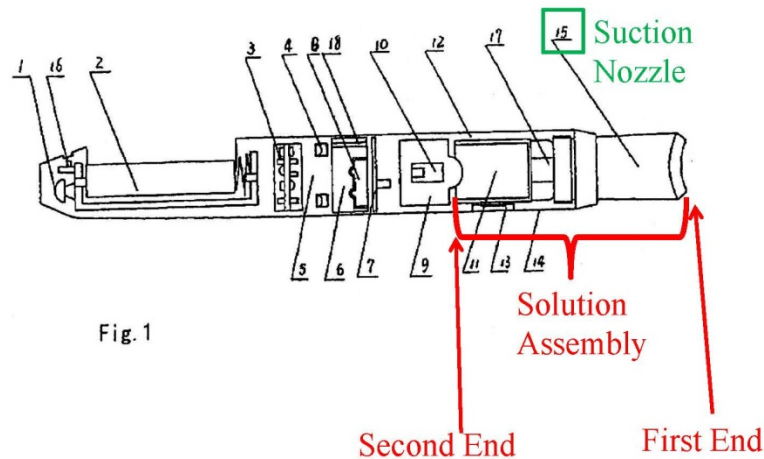
i. Solution Assembly

The only other limitations of Claim 10 that have not already been discussed above in connection with Claim 1 are the solution assembly limitations. Claim 10 requires a “*solution assembly which comprises a suction nozzle at a first end of the solution assembly.*” See Claim Limitations [10.8a], [10.8b]; Ex. 1002 at ¶¶ 151, 157. The “solution assembly” limitation is also found in claim 2. As the Examiner noted in the Office Action dated June 8, 2011, p. 6, (Ex. 1019) regarding claim 33, CN 2719043 “contains a **liquid-supplying bottle (11)** corresponding to the claimed ‘a cigarette bottle assembly including a cigarette liquid bottle, wherein the cigarette bottle assembly is inserted into one end of the atomizer assembly.’” Ex. 1002 at ¶ 123. Additionally, the Examiner stated in the Office Action dated

August 7, 2012, p. 5, (Ex. 1023), regarding claim 87 (issued claim 2) that CN 2719043 discloses a “cigarette bottle assembly comprising a first end and a second end, and a cigarette solution storage area, wherein an end of the cigarette solution assembly is inserted into the first end of the atomizer assembly housing, thus forming a cigarette or cigar body.” (citing Hon ‘031 at ¶¶ 9, 26-27, abstract, and Fig. 1); See Ex. 1004 at 6, 9-10; Ex. 1002 at ¶¶ 123-124. The cigarette bottle assembly of CN 2719043 discloses the “solution assembly” of the ‘957 patent.

ii. Suction Nozzle

Claim 10 also requires “*a suction nozzle at a first end of the solution assembly.*” See Claim Limitation [10.8b], Ex. 1002 at ¶ 157. CN 2719043 discloses a suction nozzle, in the form of a mouthpiece, at a first end of the solution assembly: “When a smoker smokes, the **mouthpiece 15** is under negative pressure, the air pressure difference or high speed stream between the normal pressure cavity 5 and the negative pressure cavity 8 will cause the sensor 6 to output an actuating signal, the electronic circuit board 3 connected therewith goes into operation.” Hon ‘031 at ¶ 28; Ex. 1004 at 10; Ex. 1002 at ¶ 157. The claim limitations are shown in the annotated drawing below:



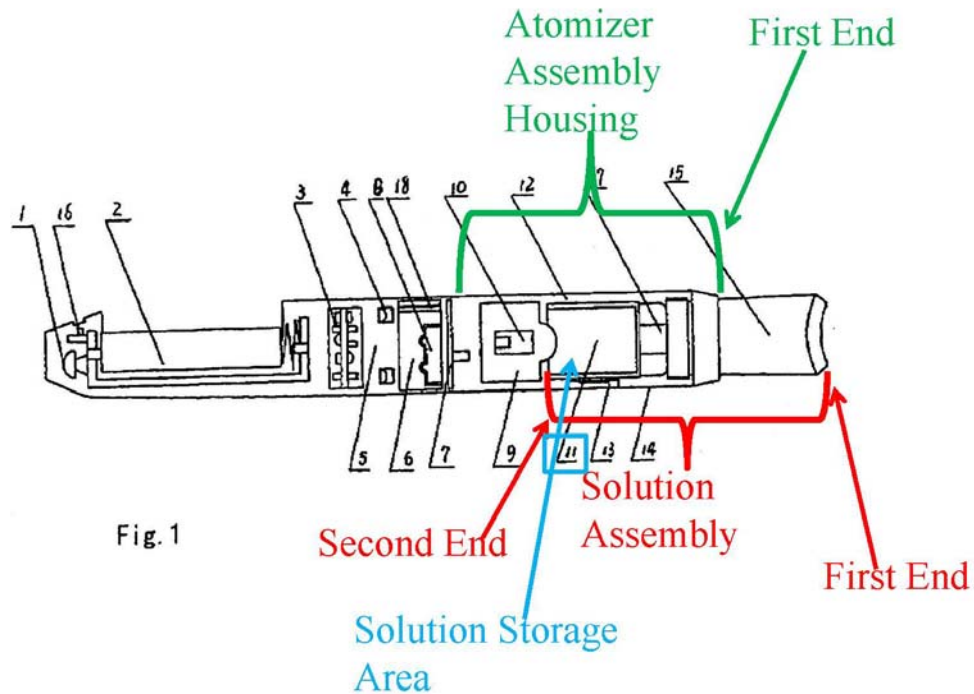
iii. Solution Storage Area

The last limitation of Claim 10 is “*a solution storage area with a liquid containing fiber material in the solution storage area.*” See Claim Limitation [10.8c], Ex. 1002 at ¶ 158. CN 2719043 discloses a solution storage area with a liquid containing fiber material in the solution storage area: “The **solution storage porous body 28 is provided in the liquid-supplying bottle, and can be filled with polypropylene fiber, terylene fiber or nylon fiber**, or be filled with plastic that are shaped by foaming, such as polyamine resin foam column or polypropylene foam column.” Hon ‘031 at ¶ 26; Ex. 1004 at 9-10; Ex. 1002 at ¶ 158. Thus, all of the limitations of Claim 10 are disclosed.

2. Claims 2, 12, and 24

Claim 2 requires: “the solution storage area in the solution assembly having a first end and a second end, and the second end of the solution assembly is inserted into the first end of the atomizer assembly housing.” Claim 12 also

requires: “the second end of the solution assembly is inserted into the first end of the atomizer assembly, thus forming a cigarette or cigar body.” Claim 24 is similar to claim 2, but uses the words: “within” instead of “in”; “front” instead of “second”; and “back” instead of “first.” CN 2719043 discloses the limitations of claims 2, 12, and 24. As the Examiner stated in the Office Action dated June 8, 2011, p. 6, (Ex. 1019) regarding claim 33, CN 2719043 “contains a liquid-supplying bottle (11) corresponding to the claimed ‘a cigarette bottle assembly including a cigarette liquid bottle, wherein the cigarette bottle assembly is inserted into one end of the atomizer assembly.’” Ex. 1002 at ¶ 123; Ex. 1004 at 9-10. Additionally, the Examiner stated in the Office Action dated August 7, 2012, p. 5, (Ex. 1023), regarding claim 87 (issued claim 2) that the electronic cigarette of CN 2719043 discloses a “cigarette bottle assembly comprising a first end and a second end, and a cigarette solution storage area, wherein an end of the cigarette solution assembly is inserted into the first end of the atomizer assembly housing, thus forming a cigarette or cigar body.” (citing Hon ‘031 at ¶¶ 9, 26-27, abstract, and Fig. 1) ; see Ex. 1004 at 6, 9-10. Ex. 1002 at ¶¶ 123, 162. CN 2719043’s cigarette bottle assembly discloses the claimed solution assembly, and the liquid supplying bottle 11 discloses the solution storage area. Ex. 1002 at ¶¶ 123-124, 163. The limitations of claim 2 are shown in the annotated drawing below:

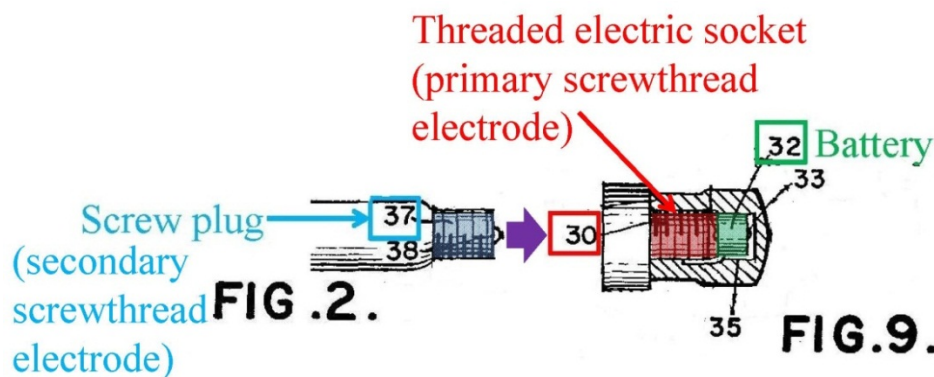


Claim 24 merely substitutes some words for those used in Claim 2, and CN 2719043 discloses all the limitations of Claim 24. Ex. 1002 at ¶¶ 191-192. Annotated Fig. 1, above, also shows that CN 2719043 forms “a cigarette or cigar body,” and the limitations of claim 12 are also disclosed in CN 2719043.

3. Claims 3 and 14

Claim 3 requires: “the primary screwthread electrode is an external screwthread electrode and the secondary screwthread electrode is an internal screwthread electrode.” Claim 14 has essentially the same limitations. As discussed above in connection with Claim 1, CN 2719043 combined with Gilbert discloses the primary and secondary screwthread electrodes, and the reasons why it would be appropriate to combine CN 2719043 and Gilbert. Ex. 1002 at ¶¶ 105,

106, 90. Simplified versions of Gilbert Figs. 2 and 9 illustrate how the screw plug 37 screws into the threaded electric socket 30: “When the bulb 36 is assembled to the socket 30 its tip end 38 will engage the inner battery contact 33 and complete the circuit through the filament of the bulb 36 by the contact strip 35.” Gilbert at 2:70-3:2; Ex. 1002 at ¶ 129.



In the phrase “black car seat,” the noun “seat” is modified by the adjectives “black” and “car”; this phrase indicates that the seat is black, not the car. Similarly, claims 3 and 14, the noun “electrode” is modified by the adjectives “external” and “screwthread”; the phrase “external screwthread electrode” indicates that the electrode is external, not the screwthread. Similar reasoning applies to “internal screwthread electrode”; “primary screwthread electrode” and “secondary screwthread electrode.” Ex. 1002 at ¶ 130. Gilbert’s “external” screwthread electrode is the threaded electric socket 30, which is external to the screw plug 37; it is the primary screwthread electrode. Gilbert’s “internal” screwthread electrode is the screw plug 37, which is internal to the threaded

electric socket 30; it is the secondary screwthread electrode. Ex. 1002 at ¶ 130.

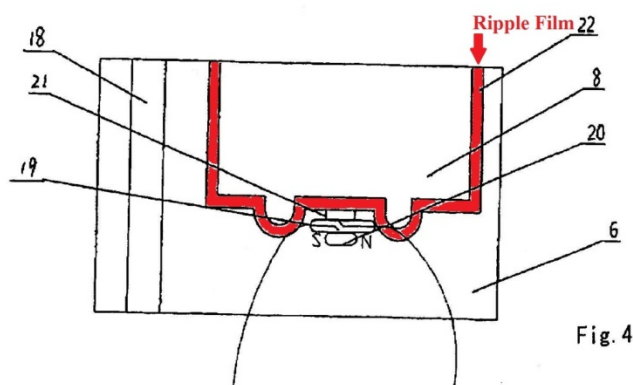
Alternatively, screw plugs commonly have bolt-like threads for insertion into a socket with nut-like threads. The bolt-like threads are sometimes considered “external” and the nut-like threads are considered “internal.” The decision whether to make the screw threads for the screw plug “internal” or “external,” however, is a design choice and it would have been obvious to make the battery assembly have external screwthreads so as to allow the battery assembly to be removed from the electronic cigarette and screwed into a battery recharger assembly having internal threads adapted to receive the battery assembly. Ex. 1002 at ¶ 131. CN 2719043 combined with Gilbert discloses the limitations of Claims 3 and 14.

4. Claims 4 and 15

Claim 4 requires: “*the battery assembly further comprises a membrane located between the primary screwthread electrode and the sensor.*” Claim 15 has the same limitations. CN 2719043 discloses a battery assembly further comprising a membrane located between the primary screwthread electrode and the sensor. Ex. 1002 at ¶ 133. As noted by the Examiner in the Office Action dated August 7, 2012, p. 6, (ex. 1023), CN 2719043 discloses “a ripple film (22) (corresponding to the claimed ‘silica gel corrugated membrane.’) . . . The ripple film (22) has a negative pressure cavity (8), and the sensor (6) connects with the ripple film (22) through a reed switch (19) (corresponding to the claimed ‘silica gel

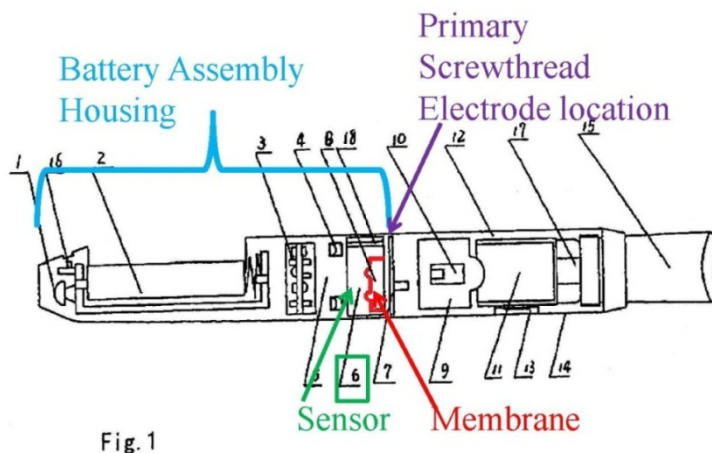
corrugated membrane on which there is the primary negative pressure cavity, the sensor being connected with the silica gel corrugated membrane through the switch spring’).” *See* Ex. 1004 at 10-11.

As specifically disclosed in CN 2719043: “When a smoker smokes, the mouthpiece 15 is under negative pressure, the air pressure difference or high speed stream between the normal pressure cavity 5 and the negative pressure cavity 8 will cause the sensor 6 to output an actuating signal, the electronic circuit board 3 connected therewith goes into operation. Now the **ripple film 22** in the sensor is deformed to take the second magnetic steel 21 away from the Reed switch 19, and the Reed switch 19 is then closed (i.e., K1 is closed) under the effect of the excessive magnetic line of force from the first magnetic steel 20, starting the field effect power transistor electronic switch (i.e., U1 is opened).” Hon ‘031 at ¶ 28; Ex. 1004 at 10. The words “membrane” and “film” refer to the same sensor components in the context of the ‘957 patent. Ex. 1002 at ¶ 134. The ripple film membrane is shown in the annotated drawing below:



It would have been an obvious design choice to place the membrane between the primary screwthread electrode and the sensor in the battery assembly. It would be unreasonable to place the primary screwthread electrode between the membrane and the sensor because the sensor would have to be broken up into components on either side of the screwthread electrode. It would also be unreasonable to put the sensor between the primary screwthread electrode and the membrane because then the screwthread electrode would have to transfer both battery power and sensor signals, complicating the design of the primary screwthread electrode. Accordingly, the obvious choice would have been to place the membrane between the primary screwthread electrode and the sensor. Had CN 2719043 incorporated the primary screwthread electrode of Gilbert, the ripple film membrane would be between the primary screwthread electrode and the sensor. Ex. 1002 at ¶¶ 135-136.

The claim limitations are shown in the annotated drawing below:



5. Claim 6

Claim 6 requires: “the sensor comprises a switch sensor, a Hall element, a semiconductor force-sensitive chip, a semiconductor matrix thermo electric bridge chip, a capacitance sensor or an inductance sensor.” CN 2719043 discloses a switch sensor in the form of a semiconductor force-sensitive chip: “The Reed switch 19, the first magnetic steel 20, the second magnetic steel 21, the ripple film 22 can be replaced by a semiconductor strain gauge with sealed film, which is mounted in the place of the sensor ripple film.” Hon ‘031 at ¶ 30; Ex. 1004 at 11. One of ordinary skill in the art would have known that a semiconductor strain gauge is the same thing as a semiconductor force-sensitive chip. Ex. 1002 at ¶ 138.

6. Claims 7, 17, and 18

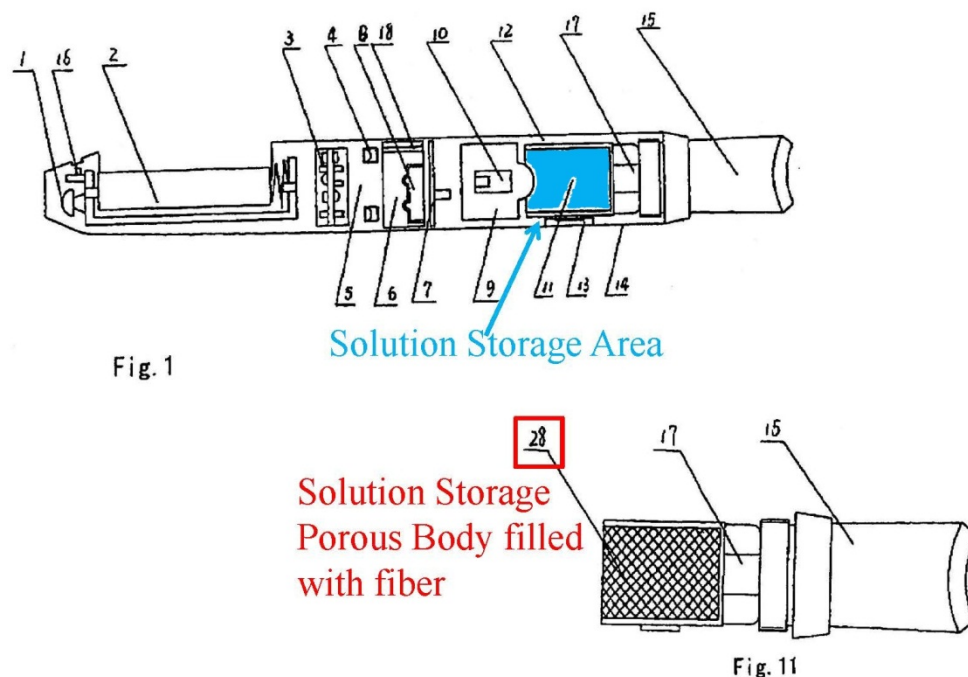
Claim 7 requires: “the atomizer assembly has an air intake hole at the secondary screwthread electrode.” Claim 17 requires: “the atomizer assembly has an air intake hole.” Claim 18 requires: “the air intake hole is at the secondary screwthread.”

As stated by the Examiner in the Office Action dated August 7, 2012, p. 7, (Ex. 1023), regarding claim 98 (issued claim 7), “it would have been obvious to one having ordinary skill in the art at the time of the invention to have included a ‘hole’ along the exterior surface/or screwthread electrode of the atomizer to enable ambient/dilution air to enter into the atomizer assembly during use, as is

conventionally provided in a myriad of smoking devices.” Dr. Buckner agrees, and it would have been obvious to one of ordinary skill in the art to have included an air intake hole at the secondary screwthread electrode. Ex. 1002 at ¶ 140.

7. Claim 8

Claim 8 requires: “*a fiber material within the solution storage area.*” CN 2719043 discloses fiber material within the solution storage area: “solution storage porous body 28 is provided in the liquid-supplying bottle, and **can be filled with polypropylene fiber, terylene fiber or nylon fiber.**” Hon ‘031 at ¶ 26, Fig. 11; Ex. 1004 at 9-10; Ex. 1002 at ¶ 142. The claim limitations are shown in the annotated drawing below:



8. Claims 9 and 11

Claim 9 requires: “*the porous component that the heater coil is wound*

around comprising a fiber material.” Claim 11 has essentially the same requirements as claim 9. In connection with the “atomizer including a heater coil wound around a porous component” limitation of independent Claims 1, 10, and 23, the discussion above (section V.B.1.(b).iv), explains how the combination of CN 2719043 and Whittemore disclose a heater coil would around the porous component of the filament made of a fiber material, such as “a thread, string or strand of some suitable wick material.” Ex. 1008, Whittemore at 1:50-2:11; Ex. 1002 at ¶¶ 144-150. Accordingly, these claims would have been rendered obvious in view of CN 2719043 and Whittemore. Ex. 1002 at ¶ 150.

9. Claim 13

Claim 13 requires: “*the circuit board is a Metallic Oxide Semiconductor Field Effect Transistor (MOSFET) circuit board.*” One of ordinary skill in the art would have found it obvious to make the control circuit using a MOSFET circuit board. Ex. 1002 at ¶ 165. As stated by the Examiner in the June 8, 2011 Office Action, pp. 6-7, (Ex. 1019) and August 7, 2012 Office Action, pp. 5-6, (Ex. 1023): “CN 2719043 may not specifically state that its electronic circuit board is of the MOSFET type; however, as it is well known in the electronic arts, and as evidenced by the ‘TechPowerUp’ Internet webpage, MOSFETs are popular devices used in converting voltage in electronic devices. Therefore, it would have been obvious to one having ordinary skill in the art at the time of the invention to

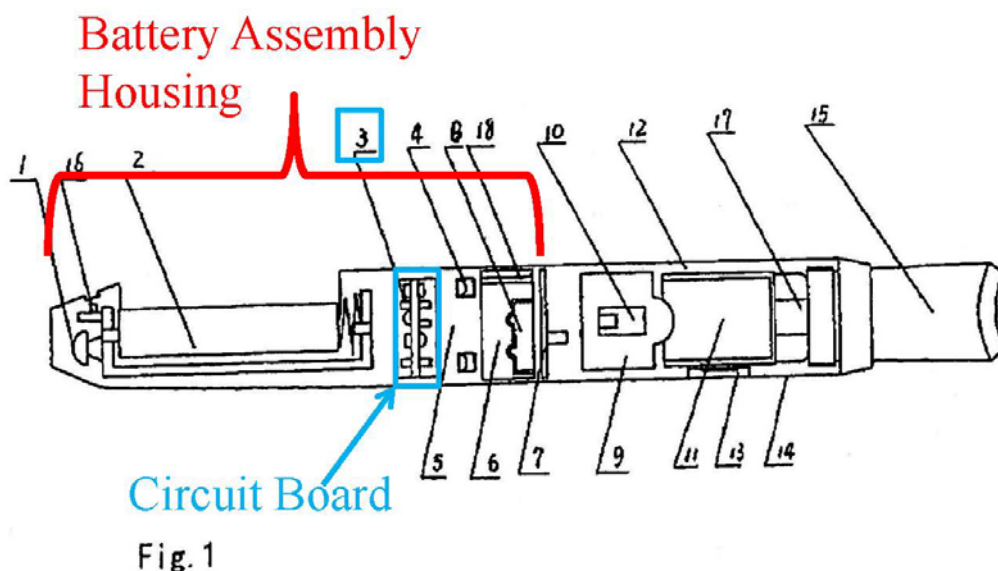
have incorporated a MOSFET-driven circuit board to control the voltage of the electronic cigarette of CN 2719043 since the use of such is already well-known.” Ex. 1002 at ¶ 165; see Exs. 1012, 1013.

CN 2719043 discloses a “field effect power transistor”: “The operating principle of the circuit is as follows: When K1 is closed, U1, i.e., the field effect power transistor is turned on, RL starts, and the Colpitts oscillator starts oscillating, M1 will provide the high frequency mechanical oscillatory wave to the atomizer 9 to achieve the result of atomization.” Hon ‘031 at ¶ 27; Ex. 1004 at 10. One of ordinary skill in the art would have known that a MOSFET is a very common type of field effect transistor (FET) used in commercial applications and one of ordinary skill in the art would have known to use a MOSFET as the field effect transistor disclosed in CN 2719043. Ex. 1002 at ¶ 166.

10. Claim 16

Claim 16 requires: “The electronic cigarette or cigar of claim 10, wherein the battery assembly further comprises a micro controller unit (MCU) electrically connected to the circuit board.” Claim limitation [1.1c] discloses where a micro-controller unit (MCU) is found. See Section V.B.1.(a).iv above and Ex. 1002 at ¶¶ 75, 79, 170. CN 2719043 further discloses that the circuit board is in what would be considered the battery assembly housing, and thus the circuit board corresponding to the MCU would be in the battery assembly, as shown in the

annotated version of Fig. 1 below:



CN 2719043 discloses that the electronic circuit is in the battery assembly (Fig. 1), and Fig. 12 discloses the “functional diagram of the circuit.” Hon ‘031 at ¶ 27; Ex. 1004 at 10. See the discussion of claim limitation [10.2] at Section V.B.1.(a).iii and Ex. 1002 at ¶¶ 153-156. One of ordinary skill in the art would have found it obvious to put an MCU on, and electrically connect it to, the circuit board, in order to consolidate electronics in a single location and to simplify manufacturing of the item. Ex. 1002 at ¶ 172. Accordingly, the limitations of this claim would have been obvious.

11. Claim 21

Claim 21 requires: “*The electronic cigarette or cigar of claim 10, wherein the primary screwthread electrode connects to a charger.*” CN 2719043 discloses that a “rechargeable cell 2” may be used as the battery. See [1.1b], Section

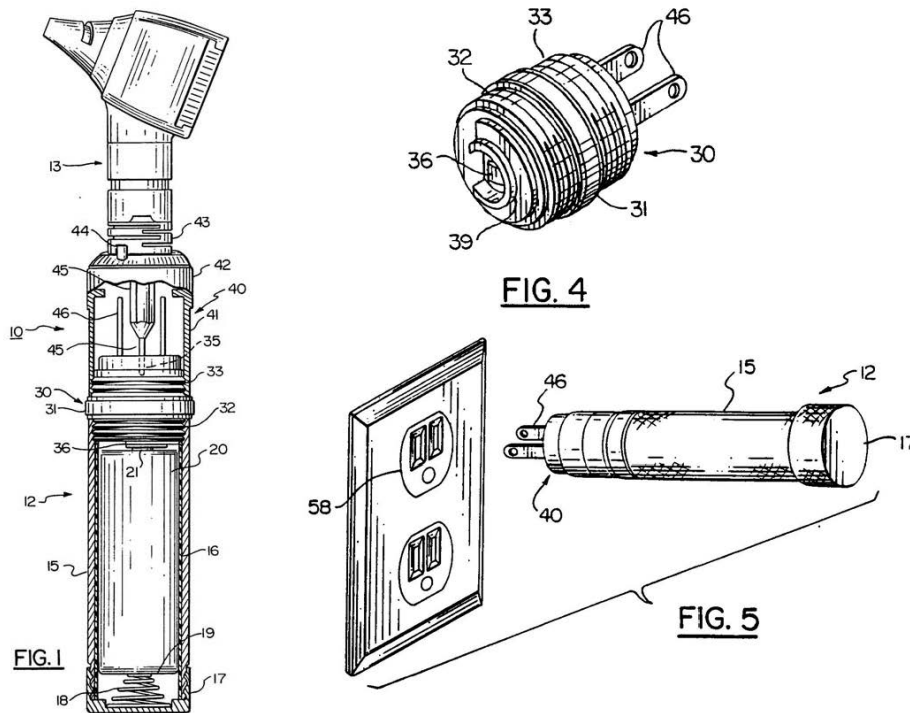
V.B.1.(a).iii; Ex. 1002 at ¶ 74. As the Examiner stated in the Office Action dated August 7, 2012, p. 8, (Ex. 1023), regarding claim 133 (issued claim 21), “it would have been obvious to one having ordinary skill in the art at the time of the invention to have chosen to enable the primary screwthread electrode to be connected to a charger, as virtually all portable electronic devices are configured in such manner to do so.” Ex. 1002 at ¶ 176.

Accordingly, it would have been obvious to one of ordinary skill in the art to adapt the battery assembly, which has the primary screwthread electrode, so that it could connect to a charger. Ex. 1002 at ¶ 177. Such an adaptation would avoid having to remove the battery from the battery assembly after the battery’s initial charge had been depleted. The rationale supporting such a combination is that it simply uses a known technique of adapting a structure holding a rechargeable battery to improve a device (the electronic cigarette of CN 2719043), and the results are predictable. Using a structure adapted to connect to a charger for a rechargeable battery, and providing ability for the rechargeable battery to be recharged, would enhance commercial opportunities and make the product more desirable by reducing the need to replace the entire device when the battery is depleted. Ex. 1002 at ¶ 177.

Further, it has long been known that devices with rechargeable battery assemblies could be made that have a primary screwthread electrode that connects

to a charger. An example of such construction is shown in EP 0533599A1 (“Connors”, Ex. 1011). Connors is entitled “Instrument handle for use with interchangeable batteries.” Connors discloses a battery casing 15 made of a conductive metal that serves as an electrical ground in the battery powered circuit. Connors at 3:55-57 & Fig. 1. An adaptor 30 is threaded onto the top of the battery casing 15 via a proximal threaded section 32 of adaptor 30. *Id.* at 4:31-35 & Figs. 1 & 4. To recharge the battery, the adaptor connector housing 40 is unscrewed from the adaptor 30 to expose the electrical prongs 46-46. *Id.* at 5:27-32 & Figs. 4 & 5. The prongs are then inserted into to a conventional 120 Volt outlet, allowing the battery to be recharged. *Id.* The charger circuitry is shown in Fig. 7 and the charger is a self-contained AC to DC converter comprising a transformer contained in the adaptor 30. *Id.* at 5:1-14. One side of the transformer has a center tap 51 that is grounded directly to the battery handle casing through ground lead 55. *Id.* at 5:5-7. The only disclosure of a connection between adaptor 30 and the battery casing 15 is the threads 32 of adaptor 30 which mate with and connect to the battery casing 15. *Id.* at 4:32-35 & Fig. 1. Accordingly, one of ordinary skill in the art would have understood that Connors discloses that the threads of battery casing 15 are a primary screwthread electrode that connects to a charger contained in adaptor 30. Ex. 1002 at ¶ 178. The reasons why it would have been obvious to combine Connors with CN 2719043 are the same as the reasons discussed in the

paragraph preceding this one.



12. Claim 22

Claim 22 requires: “The electronic cigarette or cigar of claim 10 with at least one of the primary and the secondary screwthread electrodes having a hole through its center.” Limitations [1.2a], Section V.B.1(a).viii; Ex. 1002 at ¶¶ 85-90 and [1.2b], Section V.B.1(a).xi; Ex. 1002 at ¶¶ 91-94, discuss a primary screwthread electrode having a hole through its center. Limitation [1.2b], Section V.B.1.(b).iv; Ex. 1002 at ¶¶ 103-109, discusses a secondary screwthread electrode having a hole through its center. Ex. 1002 at ¶ 107. Accordingly, claim 22 would have been obvious to one of ordinary skill in the art.

VI. CONCLUSION

For the foregoing reasons, a reasonable likelihood exists that Petitioner will prevail as to each of the claims 1-4, 6-18, and 21-24. Accordingly, *inter partes* review and cancellation of claims 1-4, 6-18, and 21-24 of the '957 patent is respectfully requested.

Respectfully submitted,

October 21, 2014

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CERTIFICATE OF SERVICE

The undersigned hereby certifies that a copy of the foregoing
PETITION FOR INTER PARTES REVIEW UNDER 35 U.S.C. §§ 311-319 AND
37 C.F.R. § 42.100 et seq. of U.S. Patent No. 8,375,957 along with exhibits 1001-
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