

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

DECLARATION OF GREGORY BUCKNER, Ph.D.

TABLE OF CONTENTS

I.	INTRODUCTION	1
A.	Engagement	1
B.	Background and Qualifications	1
C.	Information Considered.....	3
II.	LEGAL STANDARDS FOR PATENTABILITY	4
A.	Obviousness.....	4
B.	The Person of Ordinary Skill in the Art	5
III.	THE ‘957 PATENT	7
A.	Technical Overview of the ‘957 Patent.....	7
1.	Significant Claim Limitations.....	7
2.	Illustrative Claims	9
B.	Prosecution History of the ‘957 Patent	18
1.	Initial Filing.....	18
2.	First Office Action	18
(a)	Examiner Reliance on CN 2719043	19
(b)	More Than Two Parts	20
3.	Response to First Office Action.....	20
(a)	Amendments and Canceled Claims	20
(b)	Applicant’s Attempt to Distinguish CN 2719043	21
4.	Examiner Interview	22
5.	Second Office Action.....	22
(a)	Examiner Reliance on CN 2719043	22

(b)	MOSFET Circuit Board.....	24
(c)	Screwthread Electrodes	24
6.	Response to Second Office Action	26
(a)	Amendments and Canceled Claims	26
(b)	Applicant’s Attempt to Distinguish CN 2719043	26
7.	Third Office Action.....	27
8.	Response to Third Office Action	28
9.	Fourth Office Action.....	28
(a)	Examiner Reliance on CN 2719043	28
(b)	MOSFET Circuit Board.....	30
(c)	Screwthread Electrodes	31
(d)	Micro-Controller Unit - MCU	32
(e)	Hole Through the Center	32
(f)	Hole at Surface or Screwthread Electrode.....	33
(g)	Primary Screwthread Connected to Charger	33
10.	Response to Fourth Office Action	33
11.	Notice of Allowance	34
12.	Certificate of Correction	35
(a)	Porous Component	35
(b)	Solution Storage Area.....	36
IV.	PATENTABILITY ANALYSIS OF THE ‘957 PATENT	38
A.	CN 2719043	39

1.	‘957 Patent Claim 1 Limitations Are Found in CN 2719043 and Other Art	41
(a)	Preamble - Electronic Cigarette.....	41
(b)	[1.1a] - A Battery Assembly Comprising a Battery Assembly Housing Having a First End and a Second End	41
(c)	[1.1b] - With a Battery	43
(d)	[1.1c] - Micro-Controller Unit (MCU) or Circuit Board.....	44
(e)	[1.1d] - And a Sensor Electrically Connected to a Circuit Board Within the Battery Assembly Housing.....	46
(f)	[1.2a] - A Primary Screwthread Electrode Located on the First End of the Battery Assembly Housing	49
(g)	[1.2b] - And Having a Hole Through its Center.....	52
(h)	[1.3] - An Atomizer Assembly Comprising	53
(i)	[1.4] - An Atomizer Assembly Housing Having A First End And A Second End	55
(j)	[1.5a] - An Atomizer	56
(k)	[1.5b] - And a Solution Storage Area in the Atomizer Assembly Housing.....	56
(l)	[1.6] - Secondary Screwthread Electrode Located on the Second End of the Atomizer Assembly Housing and Having a Hole Through its Center	58
(m)	[1.7] - And with the Atomizer Including a Heater Coil Wound Around a Porous Component.....	62
2.	Claim 2 (and 12 and 24).....	67
3.	Claim 3 (and 14)	70

4.	Claim 4 (and 15)	71
5.	Claim 6.....	74
6.	Claim 7 (and 17, and 18).....	75
7.	Claim 8.....	75
8.	Claim 9 (and 11)	76
9.	Claim 10.....	79
	(a) [10.2] a battery connected to a circuit board within the battery assembly housing;.....	81
	(b) [10.8b] a suction nozzle at a first end of the solution assembly,	83
	(c) [10.8c] and a solution storage area with a liquid containing fiber material in the solution storage area.....	84
10.	Claim 11.....	85
11.	Claim 12.....	85
12.	Claim 13.....	86
13.	Claim 14.....	88
14.	Claim 15.....	88
15.	Claim 16.....	89
16.	Claim 17.....	90
17.	Claim 18.....	90
18.	Claim 21	90
19.	Claim 22.....	93
20.	Claim 23.....	94

(a)	[23.1a] A Battery Assembly Including a Battery Assembly Housing Having a Front End and a Back End	96
(b)	[23.4] an atomizer assembly housing having a front end and a back end	96
21.	Claim 24	97
V.	CONCLUSION	99

I, Gregory Buckner, declare:

I. INTRODUCTION

A. Engagement

1. I have been retained by Logic Technology Development, LLC as an expert witness in the above-captioned proceeding. I have been asked to render an opinion regarding the patentability of claims 1-4, 6-18, and 21-24 of U.S. Patent No. 8,375,957 (the “957 patent”), which is submitted herewith as Exhibit 1001. The following is my written report.

B. Background and Qualifications

2. I am a Professor of Mechanical and Aerospace Engineering, and Affiliate Faculty of Biomedical Engineering, at North Carolina State University (NCSU) in Raleigh, NC. I am Director of NCSU’s Electromechanics Research Laboratory and CEO of emTECH LLC, and have been involved with electromechanics research and development for more than 20 years. My research focuses on biomedical applications, primarily actuated technologies to facilitate minimally-invasive clinical procedures. Current projects focus on the development of actuated catheters to enhance the delivery of radioactive microspheres and improve the targeting and treatment of tumors in liver cancer patients.

3. I received a Ph.D. (1996) in mechanical engineering from the University of Texas at Austin, a M.S. (1987) in mechanical engineering from

Virginia Tech, and a B.S. (1986) in mechanical engineering from Louisiana State University. At the University of Texas at Austin, I specialized in electromechanics research and development, working as a post-doctoral research engineer at the University of Texas Center for Electromechanics.

4. I have over 20 years of product design, development and consulting expertise covering a wide range of industries and products. Over that time, I have maintained a consistent focus on medical devices and technologies, which includes my particular expertise in electromechanical design and real-time control systems. I have directed more than \$5M of federally and industrially sponsored research, including multiple projects funded by the National Institutes of Health (NIH) focused on the development of actuated devices to facilitate minimally-invasive clinical procedures. These projects have resulted in multiple patents and license agreements to facilitate technology transfer to clinical practice. My Curriculum Vitae is submitted herewith as Exhibit 1029.

A. Compensation and Prior Testimony

5. I am being compensated at a rate of \$250 per hour for my study and testimony in this matter. I am also being reimbursed for reasonable and customary expenses associated with my work and testimony in this investigation. My compensation is not contingent on the outcome of this matter or the specifics of my testimony.

C. Information Considered

6. My opinions are based on my years of education, research and experience, as well as my investigation and study of relevant materials. In forming my opinions, I have considered the following:

- The '957 patent (Ex. 1001) and its file history (including Exs. 1015-1026);
- China Patent CN 2719043 (Ex. 1003), its certified English translation (ex. 1004), its U.S. equivalent publication 2007/0267031 ("Hon '031", Ex. 1005) and Canadian equivalent CA 2562581 (Ex.1006);
- U.S. Patent No. 3,200,819 ("Gilbert") (Ex. 1007);
- U.S. Patent No. 2,057,353 ("Whittemore") (Ex. 1008);
- U.S. Patent No. 5,894,841 ("Voges") (Ex. 1009);
- U.S. Pat. App. Pub. 2008/0257367 ("Paterno") (Ex. 1010);
- EP 0533599A1 ("Connors") (Ex. 1011);
- 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 (Ex. 1012) and July 20, 2011 (Ex. 1013);
- U.S. Patent No. 8,156,944 (Ex. 1027);
- DECISION - Institution of *Inter Partes* Review in IPR2013-00387, Paper 7 (Ex. 1028); and

- The Petition for *Inter Partes* Review of U.S. Patent No. 8,375,957.

7. I may rely upon these materials and/or additional materials to rebut arguments raised by the patentee. Further, I may also consider additional documents and information in forming any necessary opinions, including documents that may not yet have been provided to me.

8. My analysis of the materials produced in this investigation is ongoing and I will continue to review any new material as it is provided. This report represents only those opinions I have formed to date. I reserve the right to revise, supplement, and/or amend my opinions stated herein based on new information and on my continuing analysis of the materials already provided.

II. LEGAL STANDARDS FOR PATENTABILITY

9. In expressing my opinions and considering the subject matter of the claims of the '957 patent, I am relying upon certain basic legal principles that counsel has explained to me.

A. Obviousness

10. I have been asked to provide my opinions regarding whether claims 1-4, 6-18, and 21-24 of the '957 patent would have been obvious to one of ordinary skill in art at the time of the alleged invention. It is my understanding that a patent claim is unpatentable under 35 U.S.C. § 103 if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a

whole would have been obvious at the time the alleged invention was made to a person having ordinary skill in the art to which said subject matter pertains. I further understand that an obviousness analysis takes into consideration factual inquiries such as the level of ordinary skill in the art, the scope and content of the prior art, and the differences between the prior art and the patent claim.

11. Counsel has explained to me that the U.S. Supreme Court has recognized several rationales for combining references and for modifying a reference as part of an obviousness analysis. These rationales include combining prior art elements according to known methods to yield predictable results, simple substitution of a known element for another to obtain predictable results, a predictable use of prior art elements in accordance with their established functions, applying a known technique to improve a known device or process and yield predictable results, and choosing from a finite number of known predictable solutions with a reasonable expectation of success. It is further my understanding that an obviousness analysis takes into consideration whether the prior art provides a teaching, suggestion, or motivation to combine teachings of multiple prior art references to arrive at the patent claim.

B. The Person of Ordinary Skill in the Art

12. In rendering the opinions set forth in this declaration, I was asked to consider the patent claims through the eyes of “one of ordinary skill in the art.” I

was told by counsel to consider factors such as the educational level and years of experience of those working in the pertinent art; the types of problems encountered in the art; the teachings of the prior art; patents and publications of other persons or companies; and the sophistication of the technology. I understand that the person of ordinary skill in the art is not a specific real individual, but rather a hypothetical individual having the qualities reflected by the factors discussed above.

13. I am informed that in opposition to a petition for inter partes review of U.S. Patent No. 8,156,944 (Case No. IPR2013-00387), Patent Owner Fontem Holdings 1 B.V., stated that its declarant, “Mr. Sheehan states that one of ordinary skill in the art of the ‘944 Patent ‘would be a person with a mechanical or electrical engineering degree, industrial design degree, or similar technical degree, or equivalent work experience, and 5-10 years of working in the area of electromechanical devices, including medical devices.’” Ex. 1028 at 5.

14. In my opinion, based on my experience in research and product development of electromechanical medical devices and my understanding of the skills and background that graduates of engineering programs should possess, a person of ordinary skill in the art of electromechanical medical devices similar to the one disclosed in the ‘957 patent at the time of filing of the ‘957 patent is generally at least one who has a Bachelor’s degree in electrical engineering, mechanical engineering or biomedical engineering, along with at least five years’

experience designing eletromechanical medical devices.

III. THE '957 PATENT

A. Technical Overview of the '957 Patent

15. The '957 patent is directed to “an electronic cigarette containing nicotine but not tar.” ‘975 patent 1:5-6. The '957 patent purports to provide “an electronic cigarette that substitutes for real cigarettes and helps smokers to quit smoking. For this invention, the aerosol may be regarded as liquid drops suspended in the air.” *Id.* at 1:42-45.

16. As explained in the '957 patent, the “present invention 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.” *Id.* at 1:46-51. “The said cigarette bottle assembly includes the cigarette liquid bottle, fiber and suction nozzle.” *Id.* at 1:66-67.

1. Significant Claim Limitations

17. 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.

18. 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. '957 patent 3:4-20.

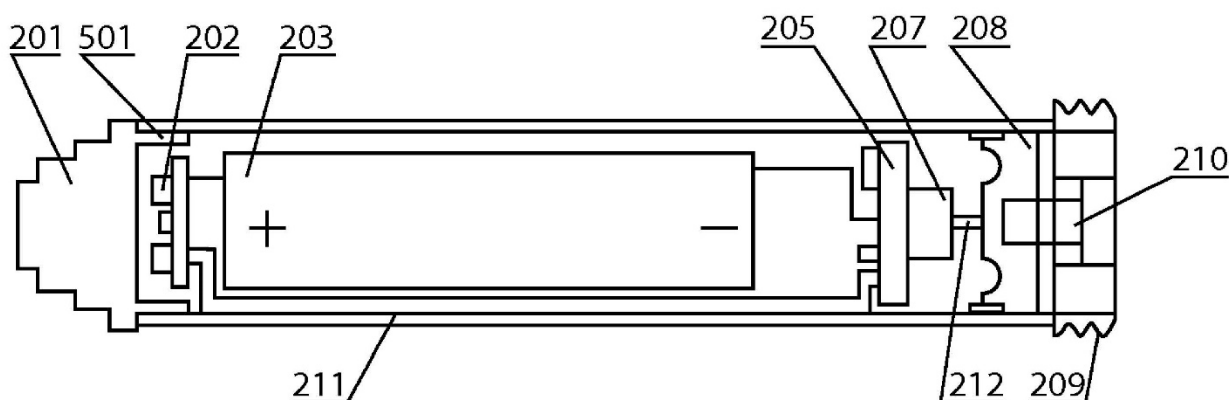


Figure 2A

19. Figure 3 depicts the atomizer assembly and Figure 4 depicts the “cigarette bottle assembly,” (see '957 patent 2:31-34), in which element 307 is the atomizer (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).

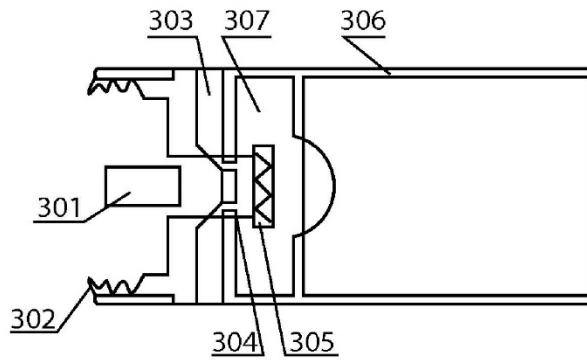


Figure 3

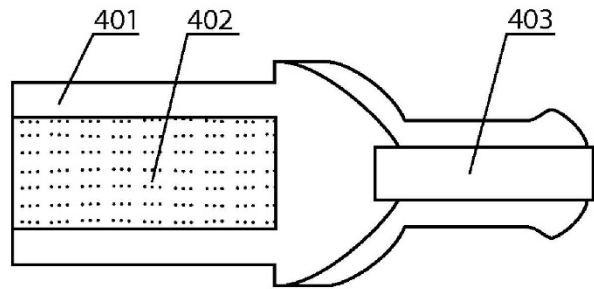


Figure 4

20. 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.

21. Figure 5A shows the battery assembly, atomizer assembly, and cigarette bottle assembly connected together:

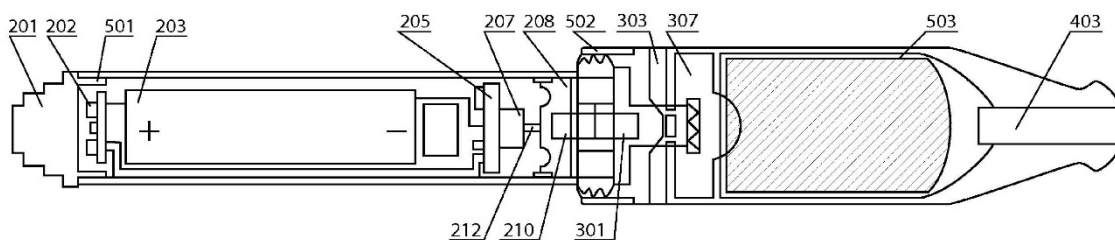


Figure 5A

2. Illustrative Claims

22. The '957 patent includes 3 independent claims and 24 claims total. Claim 1 of the '957 patent requires:

1. An electronic cigarette or cigar comprising:

a battery assembly comprising a battery assembly housing having a first end and a second end, with a battery, a micro-controller unit (MCU) and a sensor electrically connected to a circuit board within the battery assembly housing;

a primary screwthread electrode located on the first end of the battery assembly housing and having a hole through its center;

an atomizer assembly comprising:

an atomizer assembly housing having a first end and a second end;

an atomizer, and a solution storage area in the atomizer assembly housing;

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; and

with the atomizer including a heater coil wound around a porous component.

Ex. 1001 at 5:53-2:5. Claims 2-9 are dependent on Claim 1.

23. Independent Claim 10 of the '957 has some limitations to Claim 1, but also includes a "solution assembly" limitation.

10. An electronic cigarette or cigar comprising:

- a battery assembly housing having a first end and a second end;
- a battery connected to a circuit board within the battery assembly housing;
- a primary screwthread electrode located on the first end of the battery assembly housing;
- an atomizer assembly comprising:
 - an atomizer assembly housing having a first end and a second end;
 - a secondary screwthread electrode located on the second end of the atomizer assembly housing with the battery assembly and the atomizer assembly connected through the primary and secondary screwthread electrodes;
- an atomizer in the atomizer assembly housing, with atomizer including a heater coil wound around a porous component; and
- a solution assembly, which comprises, a suction nozzle at a first end of the solution assembly, and a solution storage area with a liquid containing fiber material in the solution storage area.

Ex. 1001 at 6:36-57. Claims 11-22 are dependent on Claim 10.

24. Independent Claim 23 is very similar to claim 1, with some word substitutions, such as “front end and a back end” instead of “first end and a second end.” Claim 24 is dependent on Claim 23. For ease of reference, in the discussion below, I will sometimes refer to Limitation Identifiers that are correlated with

claim language as shown in the table below. The table below also correlates claim limitations to the paragraphs of this declaration where the limitations are discussed.

Limitation Identifier	Claim Language	Declaration Paragraphs
	Claim 1	
1. [Preamble]	1. An electronic cigarette or cigar comprising:	69
[1.1a]	a battery assembly comprising a battery assembly housing having a first end and a second end,	70-73
[1.1b]	with a battery,	74
[1.1c]	a micro-controller unit (MCU)	75-79
[1.1d]	and a sensor electrically connected to a circuit board within the battery assembly housing;	80-84
[1.2a]	a primary screwthread electrode located on the first end of the battery assembly housing	85-90
[1.2b]	and having a hole through its center;	91-94
[1.3]	an atomizer assembly comprising:	95-98
[1.4]	an atomizer assembly housing having a first end and a second end;	99
[1.5a]	an atomizer,	100
[1.5b]	and a solution storage area in the atomizer assembly housing;	101-102
[1.6]	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;	103-109
[1.7]	and with the atomizer including a heater coil wound around a porous component.	110-119
	Claim 2	
2.	2. The electronic cigarette or cigar of claim 1, with 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.	120, 123-124
	Claim 3	

Limitation Identifier	Claim Language	Declaration Paragraphs
3.	3. The electronic cigarette or cigar of claim 1, wherein the primary screwthread electrode is an external screwthread electrode and the secondary screwthread electrode is an internal screwthread electrode.	90, 127-131
	Claim 4	
4.	4. The electronic cigarette or cigar of claim 1, wherein the battery assembly further comprises a membrane located between the primary screwthread electrode and the sensor.	132-136
	Claim 6	
6.	6. The electronic cigarette or cigar of claim 1, wherein 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.	137-138
	Claim 7	
7.	7. The electronic cigarette or cigar of claim 1, wherein the atomizer assembly has an air intake hole at the secondary screwthread electrode.	139-140
	Claim 8	
8.	8. The electronic cigarette or cigar of claim 1 further comprising a fiber material within the solution storage area.	141-142
	Claim 9	
9.	9. The electronic cigarette or cigar of claim 1 with the porous component that the heater coil is wound around comprising a fiber material.	143-150
	Claim 10	
10. [Preamble]	10. An electronic cigarette or cigar comprising:	151, 69
[10.1]	a battery assembly housing having a first end and a second end;	151, 70-73
[10.2]	a battery connected to a circuit board within the battery assembly housing;	78-84, 153-156

Limitation Identifier	Claim Language	Declaration Paragraphs
[10.3]	a primary screwthread electrode located on the first end of the battery assembly housing;	151, 85-90
[10.4]	an atomizer assembly comprising:	151, 95-98
[10.5]	an atomizer assembly housing having a first end and a second end;	151, 99
[10.6]	a secondary screwthread electrode located on the second end of the atomizer assembly housing with the battery assembly and the atomizer assembly connected through the primary and secondary screwthread electrodes;	151, 103-109
[10.7a]	an atomizer	151, 100
[10.7b]	in the atomizer assembly housing,	151, 99-100
[10.7c]	with atomizer including a heater coil wound around a porous component;	151, 110-119
[10.8a]	and a solution assembly, which comprises,	151, 120-126
[10.8b]	a suction nozzle at a first end of the solution assembly,	157
[10.8c]	and a solution storage area with a liquid containing fiber material in the solution storage area.	158
	Claim 11	
11.	11. The electronic cigarette or cigar of claim 10 , with the porous component that the heater coil is wound around comprising a fiber material.	144-150, 159-160
	Claim 12	
12.	12. The electronic cigarette or cigar of claim 10 , wherein the second end of the solution assembly is inserted into the first end of the atomizer assembly, thus forming a cigarette or cigar body.	120-126
	Claim 13	
13.	13. The electronic cigarette or cigar of claim 10 , wherein the circuit board is a Metallic Oxide Semiconductor Field Effect Transistor (MOSFET) circuit board.	164-167
	Claim 14	
14.	14. The electronic cigarette or cigar of claim 10 ,	127-131,

Limitation Identifier	Claim Language	Declaration Paragraphs
	wherein the primary screwthread electrode is an external screwthread electrode and the secondary screwthread electrode is an internal screwthread electrode.	168
	Claim 15	
15.	15. The electronic cigarette or cigar of claim 10 , wherein the battery assembly further comprises a membrane located between the primary screwthread electrode and the sensor.	132-136, 169
	Claim 16	
16.	16. 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.	75-79, 170-172
	Claim 17	
17.	17. The electronic cigarette or cigar of claim 10 , wherein the atomizer assembly has an air intake hole.	139-140, 173
	Claim 18	
18.	18. The electronic cigarette or cigar of claim 17 , wherein the air intake hole is at the secondary screwthread.	139-140, 174
	Claim 21	
21.	21. The electronic cigarette or cigar of claim 10 , wherein the primary screwthread electrode connects to a charger.	175-178
	Claim 22	
22.	22. 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.	85-94, 103-109, 179-182
	Claim 23	
23. [Preamble]	23. An electronic cigarette comprising:	183, 69
[23.1a]	a battery assembly including a battery assembly housing having a front end and a back end,	185, 70-73
[23.1b]	with a battery,	183, 74

Limitation Identifier	Claim Language	Declaration Paragraphs
[23.1c]	a micro-controller unit (MCU)	183, 75-79
[23.1d]	and a sensor electrically connected to a circuit board within the battery assembly housing;	183, 80-84
[23.2]	a first screwthread electrode located on the back end of the battery assembly housing;	183, 85-90
[23.3]	an atomizer assembly comprising:	183, 85-90
[23.4]	an atomizer assembly housing having a front end and a back end;	186-188, 99
[23.5a]	an atomizer,	183, 100
[23.5b]	and a solution storage area in the atomizer assembly housing;	183, 101-102
[23.6]	a second screwthread electrode located on the front end of the atomizer assembly housing, the battery assembly and the atomizer assembly connected through the first and second screwthread electrodes;	183, 103-109, 151
[23.7]	and with the atomizer including a heater coil wound around a porous component.	183, 110-119
	Claim 24	
24.	24. The electronic cigarette of claim 23 with the solution storage area within a solution assembly, and with a front end of the solution assembly inserted into the back end of the atomizer assembly.	189-192

Many of the claims have similar limitations and the table below summarizes generally the similarities in the claims, with claims in the same row having similar limitations.

Claim Language	Claims		
Most limitations	1 [Independent]	10 [Independent] – Similar to 1 but does not have “hole through its center;” adds “suction nozzle” and “solution storage area”	23 [Independent] – Similar to 1 but makes word substitutions, e.g., “front” instead of “second”
solution storage area has ends and is inserted into atomizer assembly	2 [Depends on 1]	12 [Depends on 10]	24 [Depends on 23]
primary screwthread electrode is an external screwthread electrode and the secondary screwthread electrode is an internal screwthread electrode	3 [Depends on 1]	14 [Depends on 10]	
membrane located between the primary screwthread electrode and the sensor	4 [Depends on 1]	15 [Depends on 10]	
sensor comprises a switch sensor, a Hall element, a semiconductor force- sensitive chip . . .	6 [Depends on 1]		
atomizer assembly has an air intake hole at the secondary screwthread electrode	7 [Depends on 1]	17 [Depends on 10] air intake hole	
		18 [Depends on 17] air intake hole at secondary screwthread	

fiber material within the solution storage area	8 [Depends on 1]		
porous component that the heater coil is wound around comprising a fiber material	9 [Depends on 1]	11 [Depends on 10]	

B. Prosecution History of the ‘957 Patent

1. Initial Filing

25. 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”). *See* January 15, 2009 Chinese Declaration in Ex. 1014. 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

26. In the first Office Action, on October 5, 2010, all 32 claims were rejected. Various claim terms, including “MCU” were objected to as failing to comply with 35 U.S.C. 112, first paragraph. Ex 1016 at 3-4. Applicant was “requested to review ALL the claims to ensure proper antecedent bases for each limitation, as a review of the claims indicates that they are ‘replete’ with these insufficiencies.” Ex. 1016 at 4.

(a) Examiner Reliance on CN 2719043

27. Claim 1 was rejected as being anticipated by CN 2719043 (as disclosed in equivalent publication CA 2 562 581), Ex. 1016 at 5. Claims 2-32 were rejected under 35 U.S.C. 103(a) as being unpatentable over CN 2719043. *Id.* at 6-7. Specifically, in a rejection that would be similar to others during prosecution of the application leading to the '957 patent, the Examiner noted:

The electronic cigarette of CN 2719043 either discloses or suggests nearly all of the claimed limitations, and includes pressure cavity (5), a sensor (6), a vapor-liquid separator (7) (corresponding to the claimed “air-liquid separator”), a ripple film (22) (corresponding to the claimed “silica gel corrugated membrane”), a heating element (corresponding to the claimed “heating body”) all provided within a housing shell (14), and a detachable mouthpiece (15) attached thereto. 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”). The liquid-supplying bottle (11) contains 0.4-3.5% nicotine, 0.05-2% cigarette essence, 0.1-3.1 % organic acid, 0.1-0.5% anti-

oxidation agent, and 1,2 propylene glycol (corresponding to the claimed “cigarette liquid”). All 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.

(b) More Than Two Parts

28. The Examiner explained that breaking the device into more than two parts did not render the claims patentable:

However, CN 2719043 does fail to teach or suggest that its electronic cigarette is provided in 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.

Id. at 7.

3. Response to First Office Action

(a) Amendments and Canceled Claims

29. In response to the first Office Action, 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.

(b) Applicant's Attempt to Distinguish CN 2719043

30. Applicant also attempted to distinguish CN 2719043 (which Applicant referred to as "Hon"), stating that the new claims were patentable over Hon because "Hon fails to teach, suggest or disclose each and every limitation of independent claim 33." *Id.* at 14. Specifically, Applicant stated 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.

31. Applicant also stated that because claim 33 is patentable over Hon, and dependent claims 34-62 depend on claim 33, the dependent claims were also patentable over Hon. *Id.* at 14.

4. Examiner Interview

32. On March 29, 2011, Applicant had an interview with the Examiner. On March 30, 2011, Applicant submitted a Supplemental Amendment which included a “Marked-Up Specification” and asserted that the contents of the “Substitute Specification” were discussed and agreed upon in the March 29, 2011 interview. Ex. 1018, p. 1.

5. Second Office Action

33. In a second Office Action, on June 8, 2011, the Examiner made a final rejection of claims 33-62. Claim 33 and its dependent claims were rejected under 35 U.S.C. § 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which Applicant regards as the invention. Ex. 1019.

(a) Examiner Reliance on CN 2719043

34. The Examiner also again relied on CN 2719043 (*see* Ex. 1003 and English Translation Ex. 1004) (U.S. English equivalent of which is 2007/0267031 (“Hon ‘031” ex. 1005), this time in view of the “TechPowerUp” Internet Webpage and Paterno (US. Pat. App. Pub. 2008/0257367, Ex. 1010) to reject claims 33-34,

38, and 40 under 35 U.S.C. § 103(a) as being unpatentable. Regarding most of the limitations in claim 33 and the MOSFET circuit board, the Examiner stated:

Regarding claim 33, CN 2719043 discloses nearly all that is recited in the claims since it teaches an electronic atomization cigarette which includes a shell and a mouthpiece which is detachable. Within its shell, the electronic cigarette includes a rechargeable Lithium ion battery cell (2), an electronic switching circuit/circuit board (3), a negative pressure cavity (8), a Reed switch-activated (Hall device) sensor (6) (corresponding to the claimed “a battery assembly including a battery, a ... electric circuit board, a sensor located on the ... electric circuit board, ... a primary negative pressure cavity ... and the battery and ... electronic circuit board connected successively on a second end”; the “wherein the sensor is a switch sensor made of at least one of ... Hall element” recitation of claim 38; and the “battery is at least one of ... a rechargeable lithium ion battery” recitation of claim 40). Additionally, the electronic cigarette includes an atomizer (9) (corresponding to the claimed “an atomizer assembly including an atomizer”) which is connected to the mouthpiece which 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, thus forming a cigarette or cigar body”) (see English equivalent 2007/0267031, paras. [0009], [0026]-[0027], abstract and Fig. 1).

Id. at 6.

(b) MOSFET Circuit Board

35. The Examiner also addressed Applicant’s arguments concerning use of a MOSFET circuit board:

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.

Id. at 6-7.

(c) Screwthread Electrodes

36. In reference to the screwthread electrode limitations, the Examiner

stated:

The electronic cigarette of CN 2719043 differs from claim 33 in that it may not teach of an external thread electrode (primary screwthread electrode) on a first end of the battery portion of its electronic cigarette, and/or an internal thread electrode on a respective end of the atomizer/liquid-supplying bottle assembly, wherein the battery assembly and the atomizer/cigarette bottle assembly are connected through the electrodes (per claim 34). However, 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 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]). Hence, the electronic cigarette of CN 2719043 modified by Paterno et al meets the limitations of the claims.

Id. at 7.

6. Response to Second Office Action

(a) Amendments and Canceled Claims

37. In response to the second Office Action, on December 8, 2011, Applicant filed a Request for Continued Examination and submitted an amendment to the specification and claim 33. Ex. 1020. Applicant canceled claims 34-62 and added new claims 63-133. *Id.* at 5-15. Claim 33 was amended to overcome the 112, ¶ 2 rejection by replacing “external thread electrode” with “primary screwthread electrode.” *Id.* at 17-18.

38. In the December 8, 2011 Amendment, Applicant 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 and Applicant did not explain its meaning.

(b) Applicant’s Attempt to Distinguish CN 2719043

39. Applicant also asserted that it submitted “a certified translation of a certified copy of the priority document for ... Chinese Application No. 200620090805.0, filed May 16, 2006, and submitted to the International bureau on July 19, 2007. As shown by the translation, the priority document filed May 16, 2006 is substantially the same as the current specification and figures, such that the current claims are entitled to a priority date of May 16, 2006. Because Hon '043 issued August 24, 2005 - less than one year prior to the priority date of the present

application - Hon '043 is not prior art to the present claims.” *Id.* at 18.

40. Applicant also made the following argument concerning the allowability of amended claim 33:

Claim 33, has been amended to recite, among other things, “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.” Neither the NPL webpage [i.e., the “TechPowerUp” Internet Webpage] reference nor the Paterno reference, on their own or in combination, anticipate or render obvious such elements. Therefore, amended claim 33 is patentable over the NPL reference and the Paterno reference.

Id. at 18-19.

41. Applicant also asserted that “neither the NPL reference nor the Paterno reference, on their own or in combination, anticipate or render obvious new claims 86-133.” *Id.* at 19.

7. Third Office Action

42. In a third Office Action, 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.

8. Response to Third Office Action

43. In response to the third Office Action, 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.

9. Fourth Office Action

44. In a fourth Office Action, on August 7, 2012 (Ex. 1023), the Examiner issued a non-final rejection, rejecting 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. Claims 33, 63-68, 71-73, 76-77, 81, 86-89, 93-94, 98 and 103 were also rejected under 35 U.S.C. 112, first and second paragraphs. *Id.* at 2-3.

(a) Examiner Reliance on CN 2719043

45. The Examiner again relied on CN 2719043 to reject the claims, stating:

Regarding independent claims 33 and 107 [issued independent claim 10], and claim 112 [issued dependent claim 13], CN 2719043 discloses nearly all that is recited in the claims since it teaches an electronic atomization cigarette which includes a shell and a mouthpiece which is detachable. Within its shell, the electronic cigarette includes a rechargeable Lithium ion battery cell (2), an electronic switching circuit/circuit board (3), a negative pressure cavity (8), a Reed switch activated (Hall device) sensor (6) (corresponding to the claimed “a battery assembly comprising: a battery assembly housing having a first end and a second end; a battery, and a[n] electric circuit board within the battery assembly housing, and a sensor”; the “wherein the sensor is a switch sensor made of at least one of ... Hall element” recitation of claims 72 and 94; and the “battery is rechargeable” recitation of claim 76). Additionally, the electronic cigarette includes an atomizer (9) (corresponding to the claimed “an atomizer assembly ... comprising: an atomizer assembly housing having a first end and a second end”) which is connected to the mouthpiece which contains a liquid-

supplying bottle (11) (corresponding to the claimed “a cigarette bottle assembly comprising a first end and a second end, and a cigarette solution storage area, wherein the first end of the cigarette solution assembly is inserted into the first end of the atomizer assembly housing, thus forming a cigarette or cigar body” and recitation of claims 87 and 108)(see English equivalent 2007/0267031, paras. [0009], [0026]-[0027], abstract and Fig. 1).

Id. at 5.

(b) MOSFET Circuit Board

46. In language similar to that used in the Second Office Action, the Examiner again explained why use of a MOSFET Circuit Board did not render the claims patentable:

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.

Id. at 5-6.

(c) Screwthread Electrodes

47. In language similar to that used in the June 8, 2011 Second Office Action (Ex. 1019 at 7), the Examiner again explained why the screwthread electrode limitations did not render the claims patentable:

Further, the electronic cigarette of CN 2719043 modified by the “TechPowerUp” Internet webpage, differs from claim 33 in that it does not teach a first/external thread electrode (primary screwthread electrode) on a first end of the battery portion of its electronic cigarette, and/or a second/internal screwthread electrode (secondary screwthread electrode) on a respective end of the atomizer/liquid-supplying bottle assembly, wherein the battery assembly and the atomizer/cigarette bottle assembly are connected through the electrodes (per claims 63, 64, 88 [issued claim 3] and 113 [issued claim 14]). However, 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 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]). Hence, the electronic cigarette of CN 2719043 modified by the “TechPowerUp” Internet webpage and Paterno et al meets the limitations of the claims.

Ex. 1023 at 6.

(d) Micro-Controller Unit - MCU

48. The Examiner explained that the use of a micro controller unit did not render the claims patentable: “Regarding claims 67, 86 [issued claim 1] and 116 [issued claim 16], it follows that 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.” *Id.* at 6-7.

(e) Hole Through the Center

49. The Examiner explained that: “Regarding claims 73, 86 [issued claim 1] and 134 [issued claim 22], since the screwthread electrodes of the modified electronic cigarette are structured to connect the parts of the cigarette together, and are provided at the ‘ends’ of the respective cigarette housing, it follows that such electrodes must necessarily have ‘a hole through the center’ because each housing section, on which the electrodes are attached, also has a bore therethrough to accommodate the electronic structure located within.” *Id.* at 7.

(f) Hole at Surface or Screwthread Electrode

50. The Examiner explained that the “hole” at the surface or screwthread electrode did not render the claims patentable: “Regarding claims 77, 98 [issued claim 7] and 125-126 [issued claims 17-18], 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.” *Id.* at 7.

(g) Primary Screwthread Connected to Charger

51. The Examiner explained that enabling the primary screwthread to be connected to a charger did not render the claims patentable: “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.” *Id.* at 8.

10. Response to Fourth Office Action

52. In response to the fourth Office Action, 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

1025.

12. Certificate of Correction

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

1026.

C. Claim Construction

56. I have been advised that, in construing a claim term, one looks primarily to the “intrinsic” patent evidence, which includes the words of the claims themselves, the remainder of the patent specification, and the prosecution history. I have also been advised by counsel that “extrinsic” evidence, which is evidence external to the patent and the prosecution history, may also be useful in interpreting patent claims. Extrinsic evidence can include dictionaries, treatises, textbooks, and the like.

(a) Porous Component

57. I have also been informed that a Request for Trial was granted in connection with Inter Partes Review IPR2013-00387 regarding U.S. Patent No. 8,156,944 (“’944 patent”, Ex. 1027), in the Decision, paper 7. Ex. 1028. I understand that 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.” *Id.* 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). Accordingly, I agree with that definition and find it appropriate for the purposes of these proceedings for “porous component” as it is used in the ‘957 patent.

(b) Solution Storage Area

58. In the Decision, the Board stated that, with respect to the “cigarette solution storage area” limitation, the ‘944 patent:

described in the Specification porous component 81 of atomizer 8 (part of the atomizer assembly) “has a **protuberance** on one end,” i.e., **protuberance** 812, that fits inside perforated component for liquid storage 9. *Id.* at 2:46-50; 4:44-45; 6:23-30; *see* Figure 1 (depicting a **protuberance** on atomizer 8 fitting inside perforated component for liquid storage 9).

Id. at 10.¹

59. Accordingly, the Decision states: “a ‘cigarette solution storage area’ that ‘fits with at least a portion of the said atomizer assembly inside it’ means that at least a part of an atomizer, such as a **protuberance** on a component of an

¹ In this declaration, unless otherwise indicated, bold emphasis has been added.

atomizer, is located inside the cigarette solution storage area, which is capable of storing a cigarette solution, such as one comprising nicotine.” *Id.*

60. In the ‘957 patent, 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.

61. The specification does, however, reference a “cigarette bottle assembly” that “includes the **cigarette liquid bottle**, fiber and suction nozzle.” Ex. 1001, ‘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.

62. Irrespective of which assembly the “solution storage area” is a part, consistent with the claims, the specification, the reasoning in the Board’s Decision in IPR2013-00387, and giving the term its broadest reasonable construction as it would be understood by one of ordinary skill in the art, the “solution storage area” is, unlike the dictionary definition of “area”, not a measure of a planar region, but rather “a contained volume such as a cigarette liquid bottle or container.”

IV. PATENTABILITY ANALYSIS OF THE ‘957 PATENT

63. The background section of the ‘957 patent identifies a number of problems with cigarette substitutes that existed. *See* 1:20-27. The ‘957 patent states that cigarette patches and nicotine chewing gum do not contain tar, “but they are absorbed very slowly. As a result, the peak concentration of nicotine cannot be effectively established in blood, and the smokers are not satisfied in full. In addition, the substitutes do not satisfy the smokers ‘smoking’ habit of repetitively inhaling and exhaling.” *Id.*

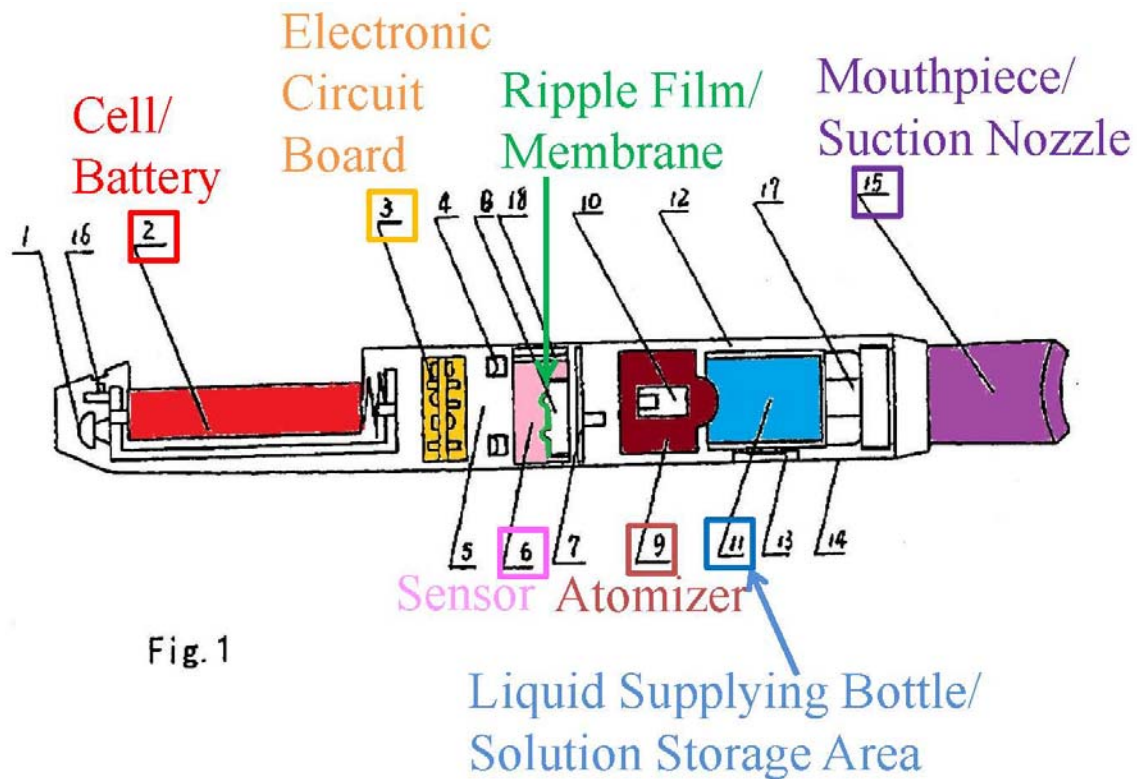
64. The ‘957 patent does not acknowledge or discuss prior art electronic cigarettes and does not attempt to distinguish the purported invention of the ‘957 patent from prior art electronic cigarettes.

65. My review of the prior art, based on my education, training, experience, and knowledge leads me to conclude that all of the limitations of the challenged claims of the '957 patent were found in the prior art, or would have been obvious to one of ordinary skill in the art.

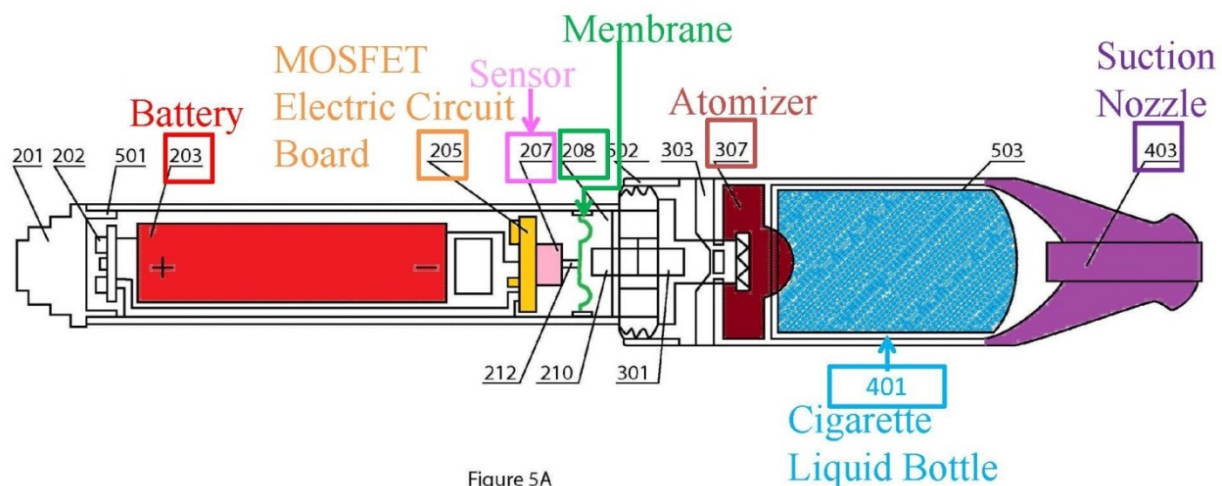
66. Relevant prior art references showing all of the claim features of the '957 patent are discussed below.

A. CN 2719043

67. CN 2719043 names as its inventor the same Lik Hon, who is the inventor of the '957 patent. CN 2719043 describes an electronic atomizing cigarette. An annotated version of Fig. 1 of CN 2719043 is shown below.



68. A drawing of the components of the '957 patent colored in the same fashion as Fig. 1 from CN 2719043 shows the similarity of the two electronic cigarettes.



**1. ‘957 Patent Claim 1 Limitations Are Found in CN 2719043
and Other Art**

(a) Preamble - Electronic Cigarette

69. The preamble of claim 1 (and the other independent claims 10, 23) are directed to an electronic cigarette (or cigar). CN 2719043 (Ex. 1003²) “relates to an electronic atomization cigarette.” Hon ‘031 at Abstract & ¶ 1; Ex. 1004 at 1, 5.

**(b) [1.1a] - A Battery Assembly Comprising a Battery
Assembly Housing Having a First End and a Second
End**

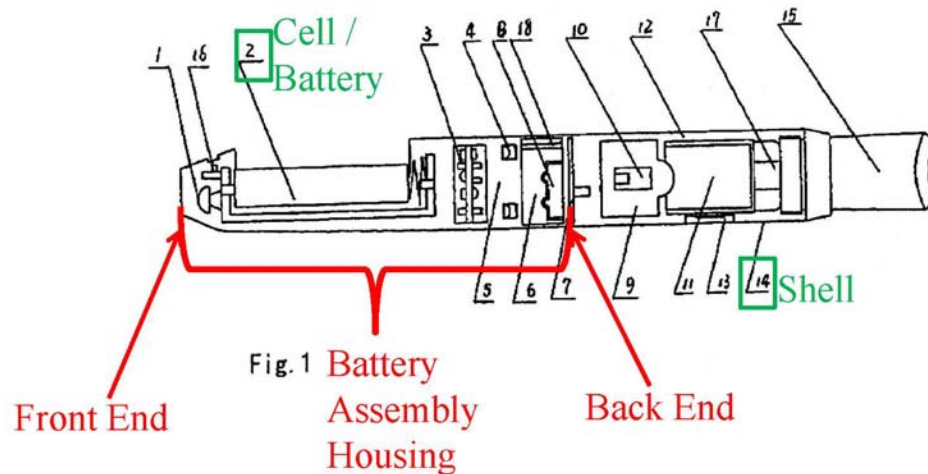
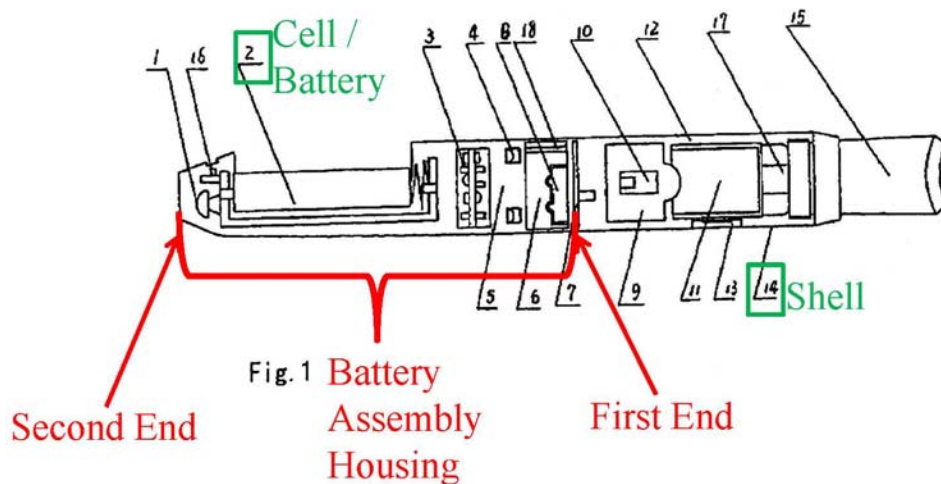
70. All of the independent claims require a battery assembly with a battery assembly housing having a first end and a second end (or front end and back end in Claim 23).

71. I agree with the Examiner’s statement in the Office Action dated October 5, 2010 (Ex. 1016 at 7), regarding pending claims 2-32, the electronic cigarette of CN 2719043 (as disclosed in Hon ‘031, ex. 1005):

²The 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.

CN 2719043 does fail to teach or suggest that its electronic cigarette is provided in 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.”

72. CN 2719043 essentially discloses a battery assembly housing with a first end and a second end: “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. The claim limitations are shown in the annotated drawings below:



73. Accordingly, 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 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.

(c) [1.1b] - With a Battery

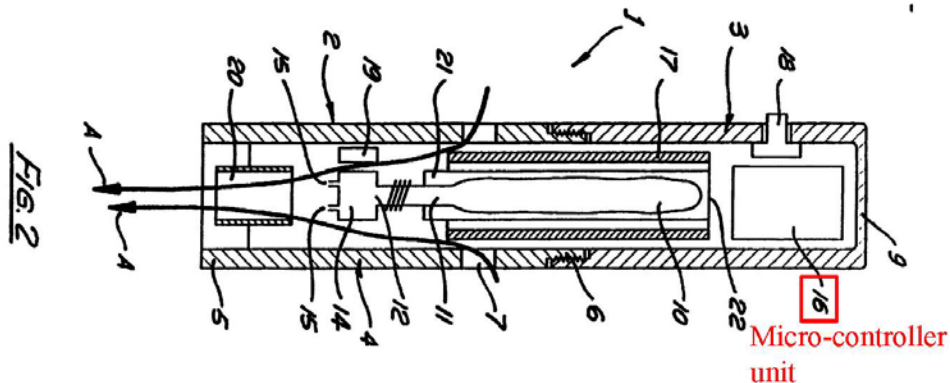
74. All of the '957 independent claims require a battery. CN 2719043

discloses a battery 2, i.e., “the **rechargeable battery 2.**” Hon ‘031 at ¶ 28; Ex. 1004 at 10.

(d) [1.1c] - Micro-Controller Unit (MCU) or Circuit Board

75. Independent claims 1 and 23 require a micro-controller unit (“MCU”), and claim 10 requires a circuit board connected to the battery. I agree with the Examiner’s statements in the Office Action dated August 7, 2012, (Ex. 1023 at 6-7), regarding claims 86 (issued claim 1) and 116 (issued claim 16), in connection with the MCU limitation, that “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.” It is true that MCUs have been included in many electronically controlled devices prior to the priority date of the ‘957 patent.

76. Consistent with the Examiner’s statement in the August 7, 2012 Office Action, 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, Voges at 5:64-65.



77. It would have been obvious to combine the micro-controller unit of Voges with the electronic circuit board 3 of CN 2719043. 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.

78. With respect to Claim 10, which requires “a battery connected to a circuit board,” 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.” Hon ‘031 at ¶ 26; Ex. 1004 at 9. Additionally, as shown in Fig. 12, the battery is connected to the circuit board. “Fig. 12 is a functional diagram of a

circuit according to the present invention.” Hon ‘031 at ¶ 24; Ex. 1004 at 8. The drawings in the original Chinese patent CN2719043 clearly show a battery symbol with the indication “DC” for “Direct Current” next to it.

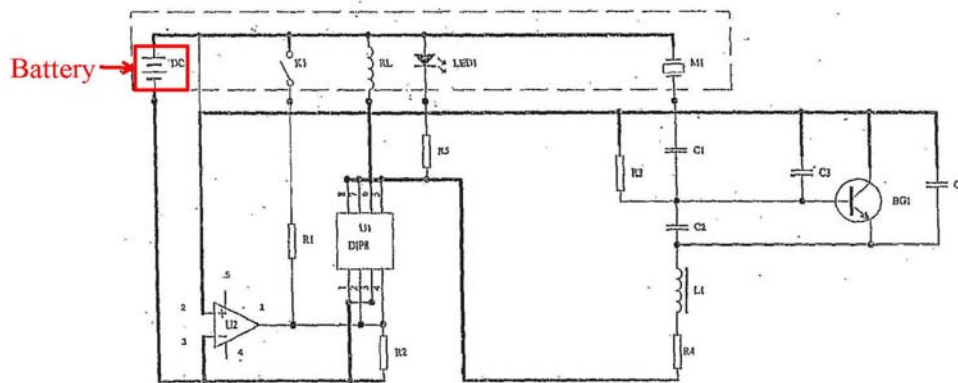
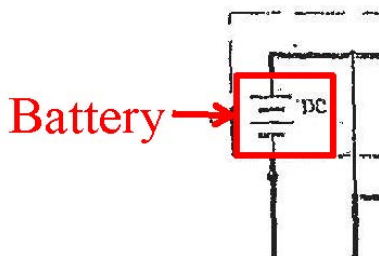


图 12

As shown close up:



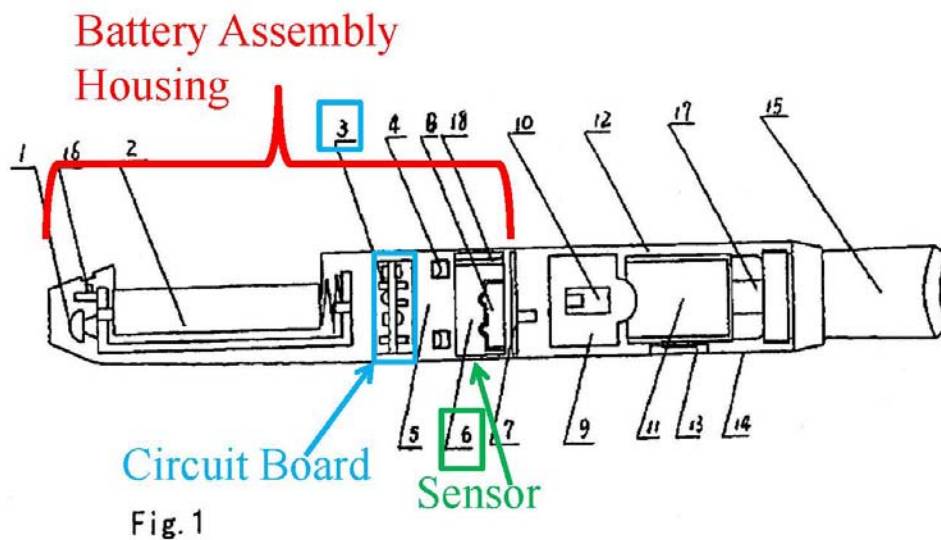
79. As the cell / rechargeable battery 2 is the only disclosed source of electrical power to the electronic circuit board 3, the battery is connected to the circuit board.

**(e) [1.1d] - And a Sensor Electrically Connected to a
Circuit Board Within the Battery Assembly Housing**

80. CN 2719043 discloses a sensor electrically 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.” Hon ‘031 at ¶ 26; Ex. 1004 at 9. Accordingly, the sensor is within the battery assembly housing

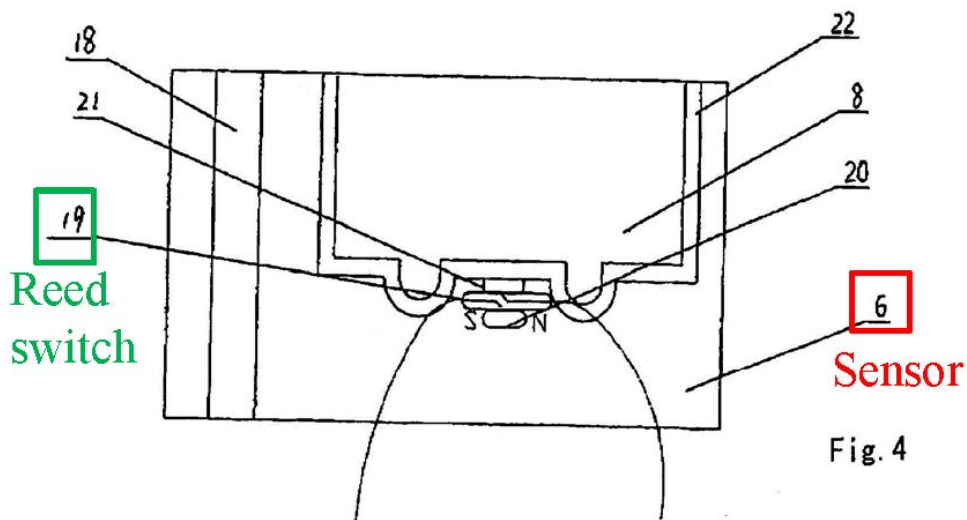
81. The claim limitations are shown in the annotated drawing below:



82. 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. Now the

ripple film 22 in the sensor 6 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.

83. 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.



84. As further disclosed in CN 2719043, the Reed switch, and therefore the sensor, is electrically connected to the circuit board: “As shown in the functional diagram of the circuit in FIG. 12, K1 refers to the Reed switch 19, RL

refers to the heating element 26, LED1 refers to the Light Emitting Diode 1, U2 refers to the low voltage detecting element used for the over-discharging protection of the lithium cell, M1 refers to the first piezoelectric element 23, and C1, C2, R3, L1, C3, BG, M1 collectively constitute a Colpitts oscillator. 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.

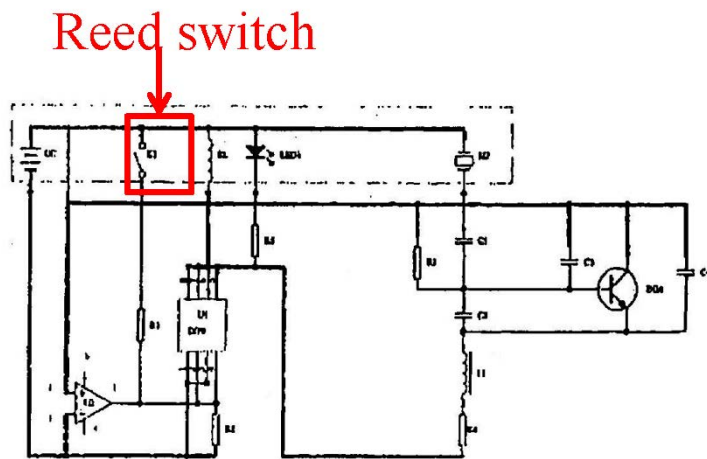


Fig. 12

(f) [1.2a] - A Primary Screwthread Electrode Located on the First End of the Battery Assembly Housing

85. Independent claims 1 and 10 require a primary screwthread electrode located on the first end of the battery assembly housing. Independent claim 23 has a similar limitation, but substitutes the word “first” for “primary” and “back” for

“first.”

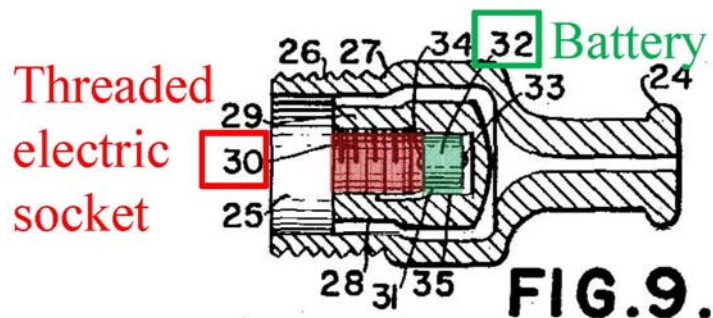
86. I agree with the Examiner’s statements in the Office Actions dated June 8, 2011 Office Action (Ex. 1019 at 7) and August 7, 2012 Office Action, (Ex. 1023 at 6), U.S. Pat. App. Pub. 2008/0257367 (“Paterno,” ex. 1010) “would have given one having ordinary skill in the art motivation to have provided 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]).”

87. As 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, at ¶ [0017].

88. The rationale supporting a combination of CN 2719043 and Paterno is that it 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.

89. Further, the use of threaded electric sockets was well known in the art, as shown in U.S. Patent No. 3,200,819 (Gilbert): – “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.” Ex. 1007, Gilbert at 2:41-45.



90. 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. The structure disclosed in Gilbert uses known techniques to allow two separate housings to be electrically connected via screwthread electrodes without using any

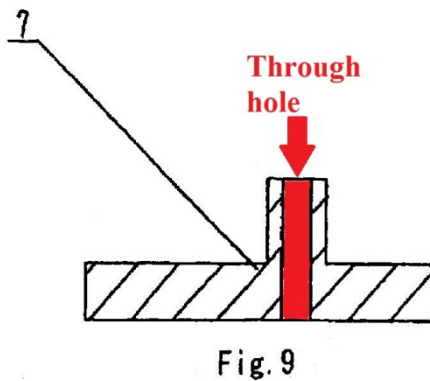
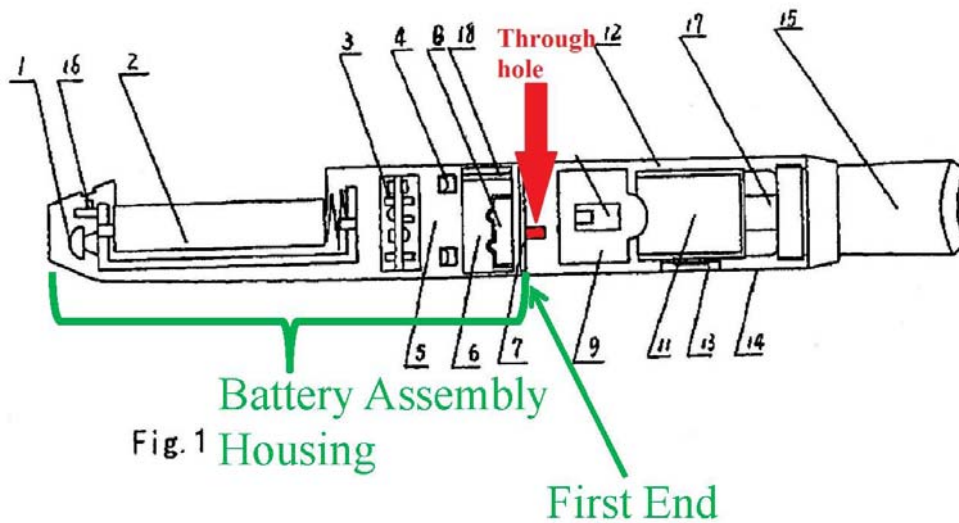
wires that could be twisted when the two housings are screwed together. Using separable battery and atomizer assemblies to allow a battery to be recharged would enhance commercial opportunities and make the product more desirable by reducing the need to replace the entire device when the battery is depleted.

(g) [1.2b] - And Having a Hole Through its Center

91. 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.

92. 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.

93. The claim limitations are shown in the annotated drawings below:



94. Accordingly, CN 2719043 discloses a primary screwthread electrode located on the first end of the battery assembly housing and having a hole through its center.

(h) [1.3] - An Atomizer Assembly Comprising

95. Just as all of the independent claims require a battery assembly, all of the independent claims require an atomizer assembly housing having a first end and a second end (or front end and back end in Claim 23).

96. I agree with the Examiner's statement in the Office Action dated October 5, 2010 (Ex. 1016 at 7), regarding pending claims 2-32, the electronic cigarette of: "CN 2719043 does fail to teach or suggest that its electronic cigarette is provided in 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."

97. 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. CN 2719043 goes on to state: "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 7.

98. The claim limitations are shown in the annotated drawing below:

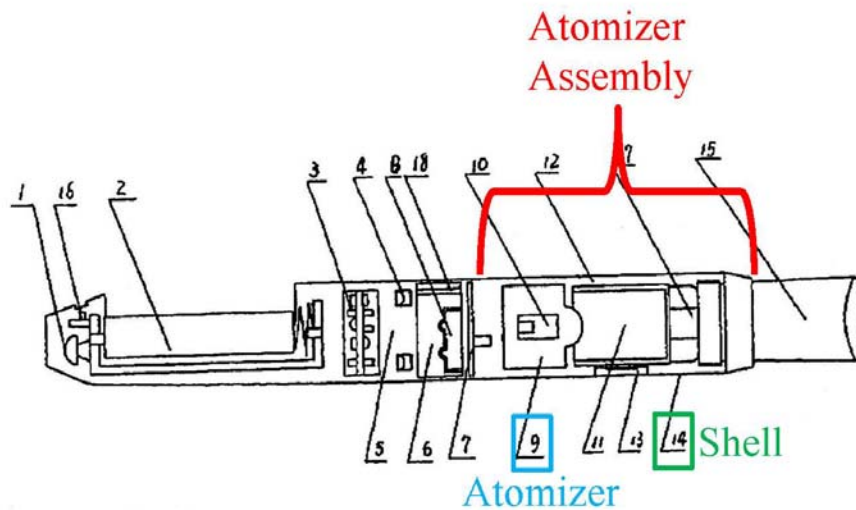


Fig. 1

(i) [1.4] - An Atomizer Assembly Housing Having A First End And A Second End

99. CN 2719043 discloses an atomizer assembly housing for the reasons disclosed in [1.3], and that assembly has a first end and a second end. The claim limitations are shown in the annotated drawing below:

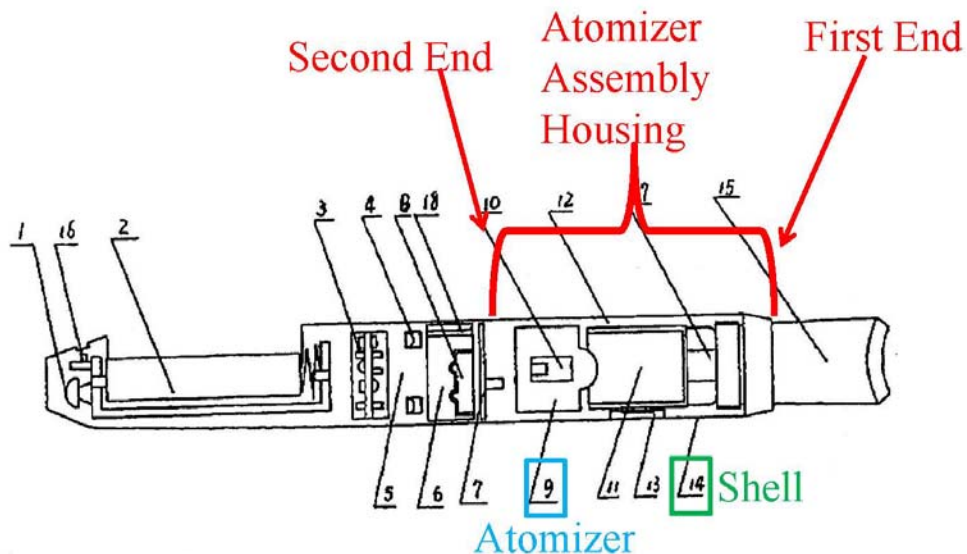


Fig. 1

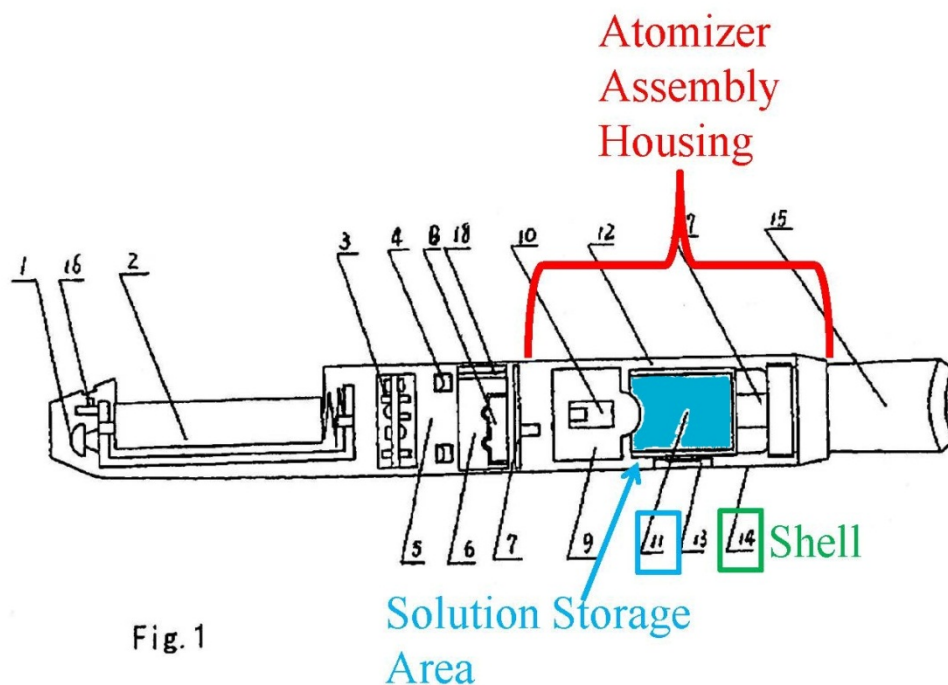
(j) [1.5a] - An Atomizer

100. All of the ‘957 independent claims require an atomizer. CN 2719043 discloses “an **atomizer 9.**” Hon ‘031 at ¶ 26; Ex. 1004 at 9.

(k) [1.5b] - And a Solution Storage Area in the Atomizer Assembly Housing

101. Using the following definition of “solution storage area” - “a contained volume such as a cigarette liquid bottle or container,” 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. Accordingly, the liquid-supplying bottle 11 of CN 2719043 is a “contained volume such as a cigarette liquid bottle or container” and a “solution storage area.” The claim limitations are shown in the annotated drawing below:



102. As CN 2719043 further discloses: “The atomizer 9 is in contact with the **liquid supplying bottle 11** via the bulge 36, and the atomization cavity 10 is provided in the atomizer 9.” Hon ‘031 at ¶ 26; Ex. 1004 at 9. “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.

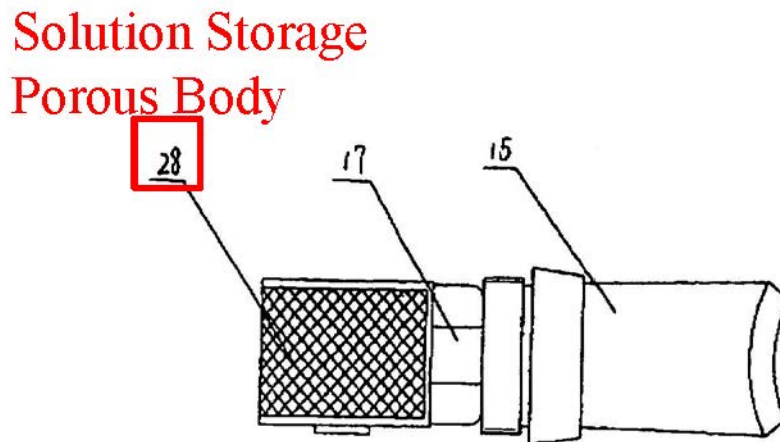


Fig. 11

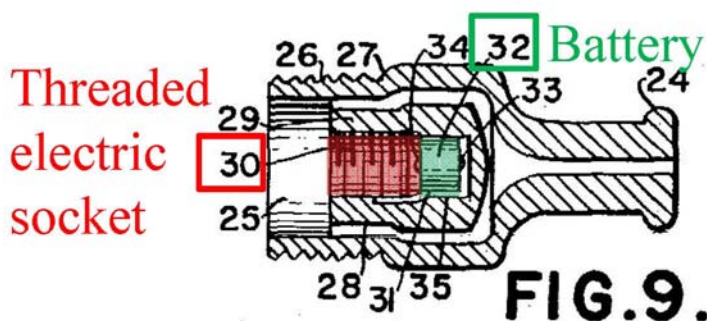
(I) [1.6] - Secondary Screwthread Electrode Located on the Second End of the Atomizer Assembly Housing and Having a Hole Through its Center . . .

103. 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.”

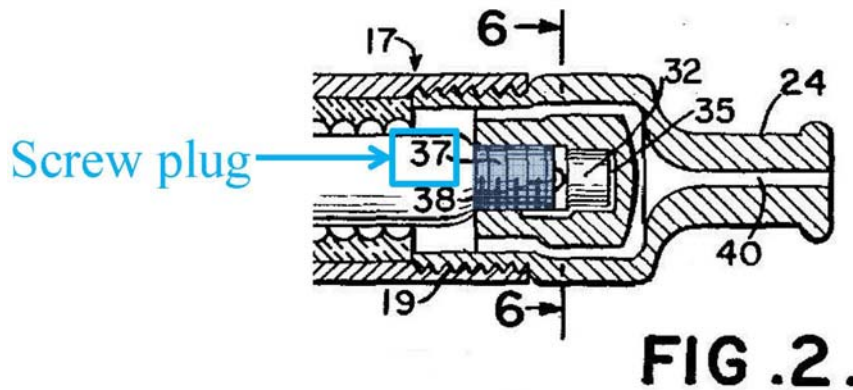
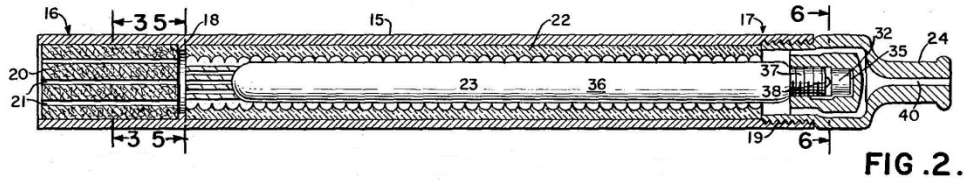
104. For the same reasons discussed in connection with the “primary screwthread electrode” limitation (paragraphs 85- 90), it would have been obvious to use primary and secondary screwthread electrodes to connect a battery assembly and atomizer assembly.

105. **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.



106. **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.**” *Id.* at 2:45-48. The screw plug 37 of

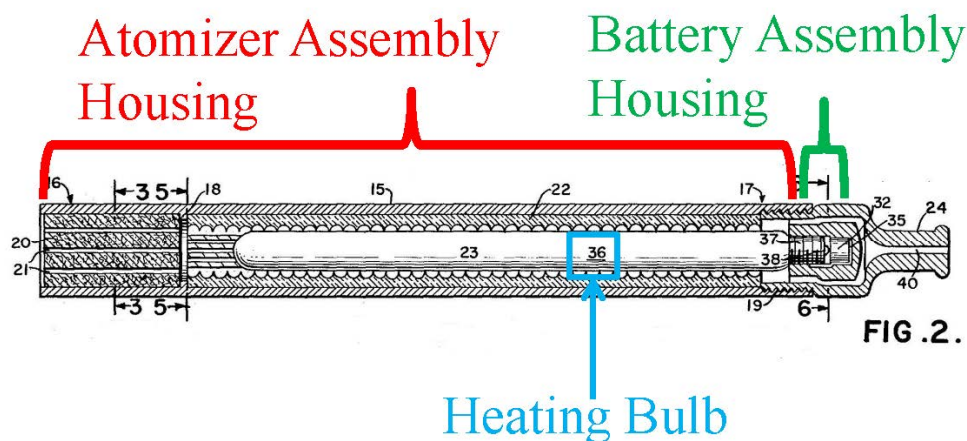
the threaded heating element for the atomizer assembly of Gilbert is the secondary screwthread electrode.



107. Secondary Screwthread Electrode on the End of the Atomizer Assembly Housing and Having a Hole Through its Center. Gilbert establishes 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.**” *Id.* at 3:8-18. Additionally, just as

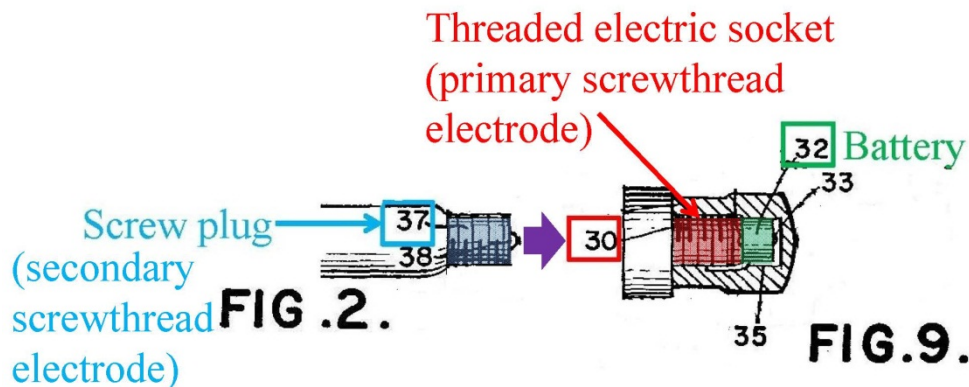
described in ¶¶ 90-94, the hole through the center of the battery assembly would extend into the atomizer assembly housing.

108. 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.



109. **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.” *Id.* at 2:70-3:2.

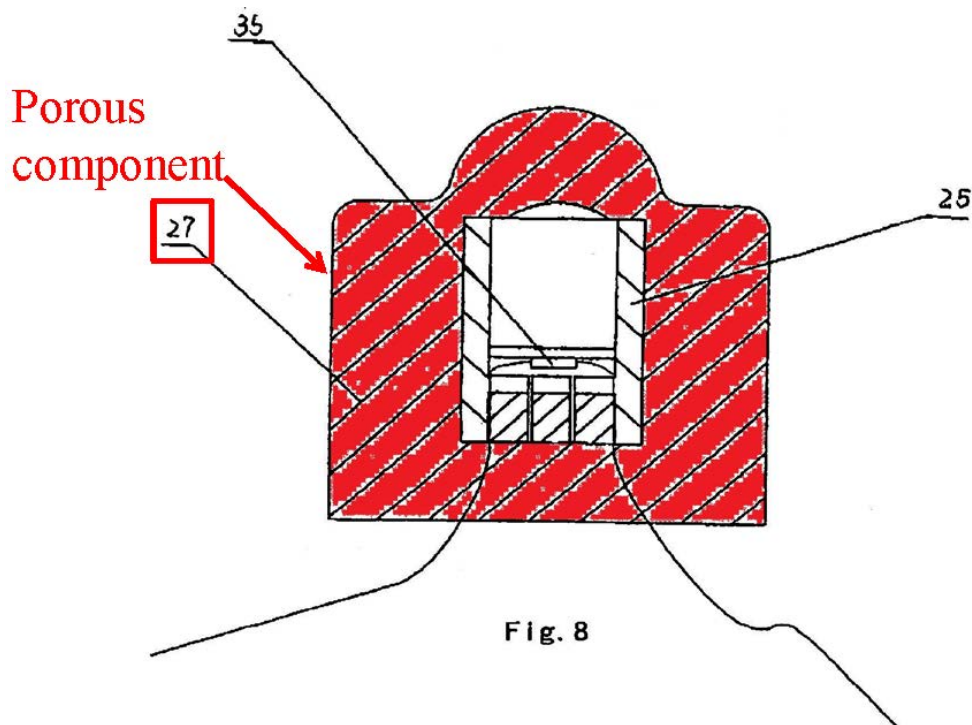


(m) [1.7] - And with the Atomizer Including a Heater Coil Wound Around a Porous Component.

110. Applicant added the following limitation to get the independent claims 1, 10, and 23 allowed: “and with the atomizer including a heater coil wound around a porous component.”

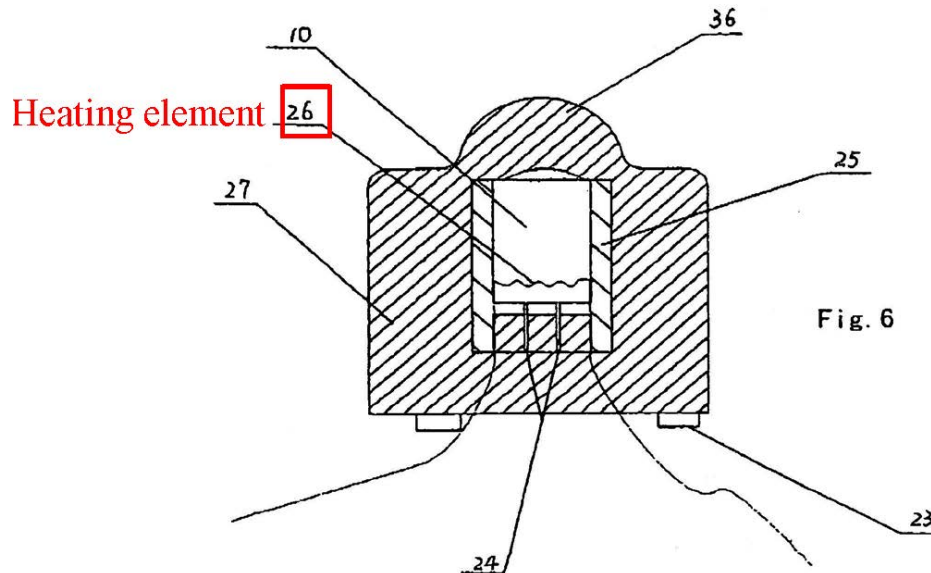
111. **Porous Component.** For the purposes of this analysis, I use the following definition of “porous component:” “a component of the atomizer assembly in the electronic cigarette that includes pores and is permeable to liquid, such as cigarette solution from the cigarette solution storage area.” CN 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. The porous component is shown in the annotated drawing below:



112. **Heater Coil.** CN 2719043 discloses the use of a heating element which is the equivalent of the heater coil 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.

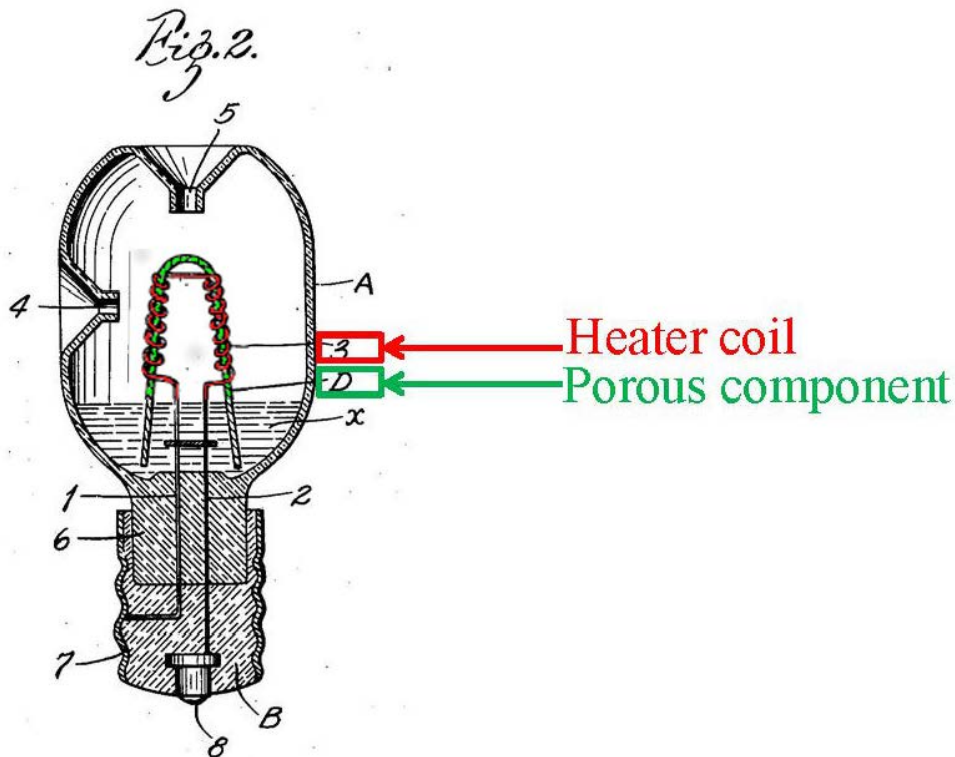


113. CN 2719043 discloses that the design could be simplified by just using a heating element and eliminating the piezoelectric element 23: “To simplify the design, the first piezoelectric element 23 on the atomizer 9 can be omitted, and the atomization of the nicotine solution will be made only by the **heating element 26.**”

114. **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, Whittemore at 1:50-2:11.

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

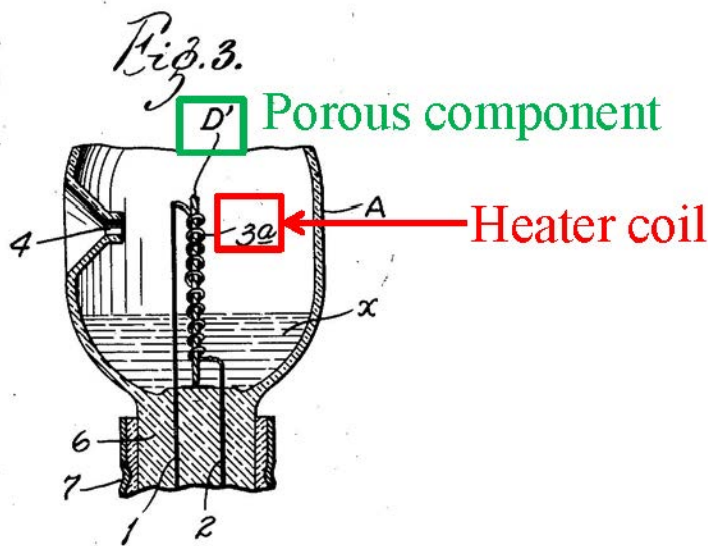


116. One of ordinary skill in the art would have known that thread or string

is made of up fiber and is porous because it has pores and is liquid permeable.

Accordingly, Whittemore's "wick D" is a porous component.

117. As Whittemore further discloses: "Figure 3 illustrates another form of my invention, in which the **filament or heating element 3a** is constructed in the form of a single vertically-disposed coil attached to the electrical conductors 1 and 2, and arranged so as to surround a wick D' whose lower end terminates in close proximity to the inner face of the bottom 6 of the vaporizing vessel up through which the conductors 1 and 2 project." *Id.* at 2:26-34.



118. 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." *Id.* at Claim 4.

119. 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.

2. Claim 2 (and 12 and 24)

120. 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.”

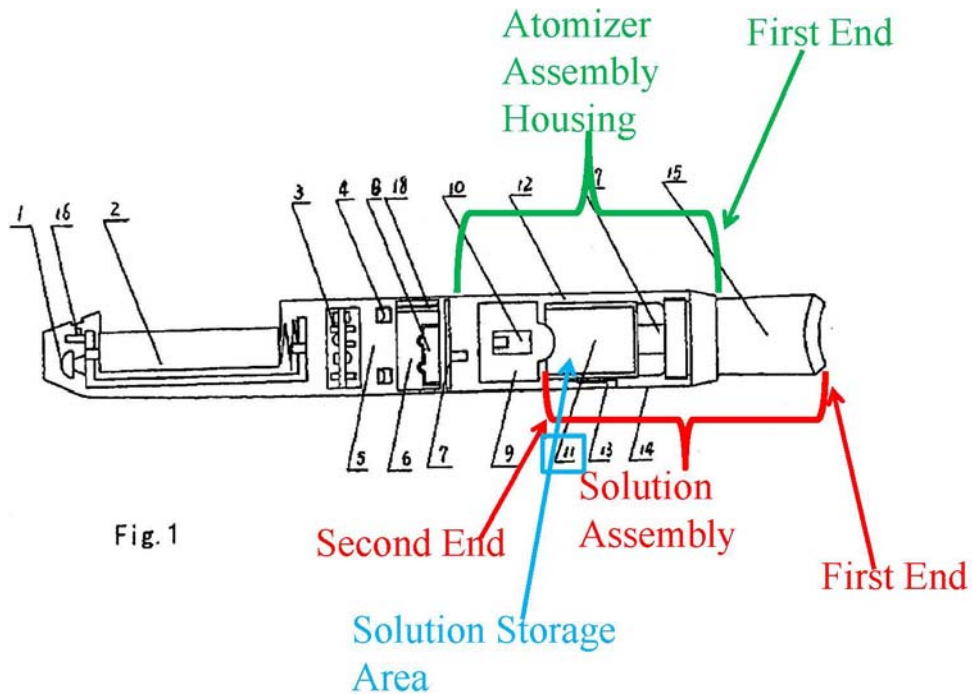
121. Claim 12 incorporates some of the requirements of claim 2 and requires: “the second end of the solution assembly is inserted into the first end of the atomizer assembly, thus forming a cigarette or cigar body.”

122. Claim 24 is similar to claim 2, but uses the words: “within” instead of “in”; “front” instead of “second”; and “back” instead of “first.” Specifically, claim 24 requires: “the solution storage area **within** a solution assembly, and with a **front** end of the solution assembly inserted into the **back** end of the atomizer assembly.”

123. CN 2719043 discloses the limitations of claim 2. I agree with the Examiner’s statement in the Office Action dated June 8, 2011 (Ex. 1019 at 6) regarding claim 33, that CN 2719043 “contains a **liquid-supplying bottle (11)**

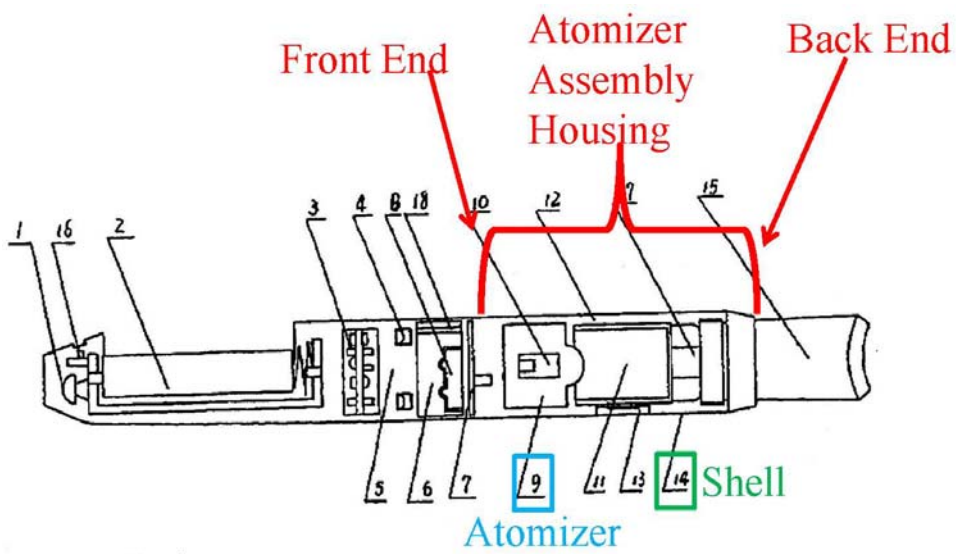
corresponding to the claimed ‘a cigarette bottle assembly including a cigarette liquid bottle, wherein the cigarette bottle assembly is inserted into one end of the atomizer assembly.’” *See* Ex. 1004 at 9-10. Additionally, I agree with the Examiner’s statement in the Office Action dated August 7, 2012 (ex. 1023 at 5), regarding claim 87 (issued claim 2) that the electronic cigarette of CN 2719043 (citing Hon ‘031) 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.

124. The claim limitations of claim 2 are shown in the annotated drawing below:



125. Annotated Fig. 1, above, also shows that CN 2719043 forms “a cigarette or cigar body,” so the limitations of claim 12 are also met.

126. The limitations of claim 24 are shown in the annotated drawing below:

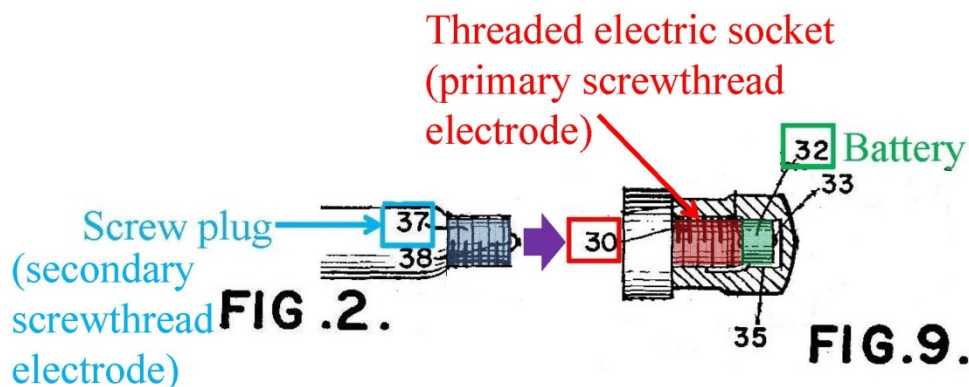


3. Claim 3 (and 14)

127. 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.

128. **Primary and Secondary Screwthread Electrodes.** As discussed in paragraphs 105 and 106, Gilbert discloses primary and secondary screwthread electrodes. Paragraph 90 explains the rationale for the motivation to combine CN 2719043 and Gilbert.

129. **Primary Screwthread Electrode is an External Screwthread Electrode and the Secondary Screwthread Electrode is an Internal Screwthread Electrode.** 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.” Ex. 1007 at 2:70-3:2.



130. 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, in 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.” 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.

131. Alternatively, it is common that screw plugs 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 be 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.

4. Claim 4 (and 15)

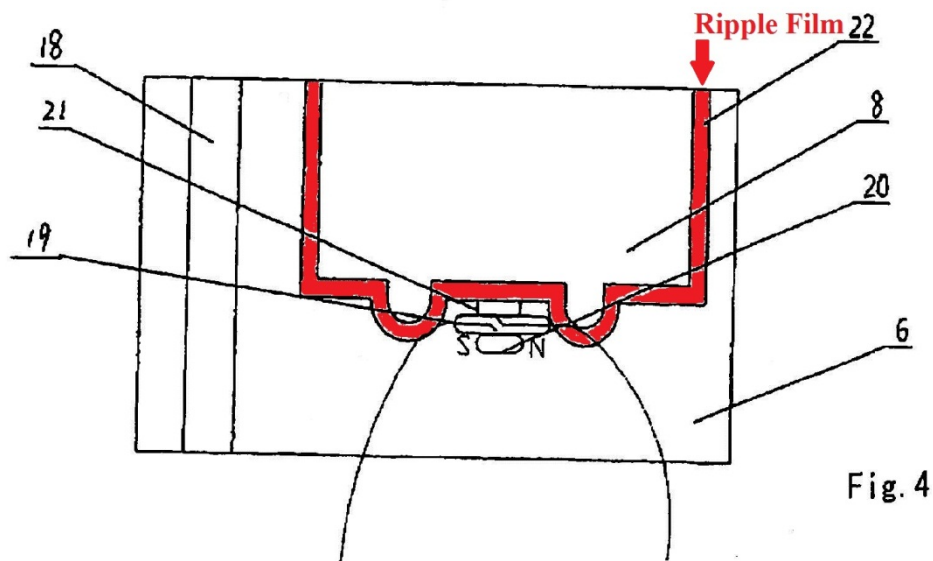
132. Claim 4 requires: “the battery assembly further comprises a membrane located between the primary screwthread electrode and the sensor.”

Claim 15 has the same limitations.

133. CN 2719043 discloses a battery assembly further comprising a membrane located between the primary screwthread electrode and the sensor. I agree with the Examiner’s statement in the Office Action dated August 7, 2012 (p. 6), that the electronic cigarette of CN 2719043 [as disclosed in Hon ‘031] 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.

134. As 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 context of the ‘957 patent. The ripple film membrane is shown in the annotated drawing below:



135. 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 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 be 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.

136. The claim limitations are shown in the annotated drawing below:

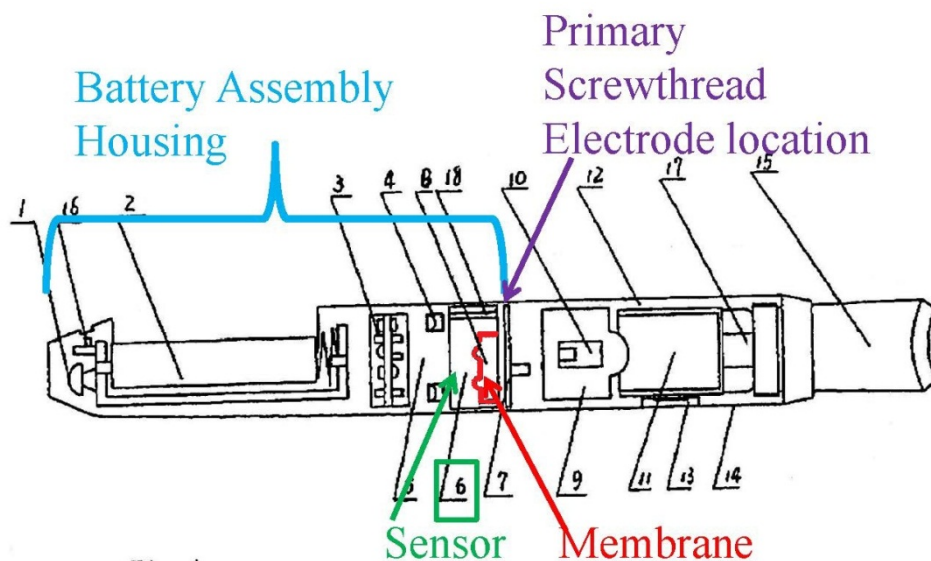


Fig. 1

5. Claim 6

137. Claim 6 requires: “the sensor comprises a switch sensor, a Hall element, a semiconductor force-sensitive chip, a semiconductor matrix thermoelectric bridge chip, a capacitance sensor or an inductance sensor.”

138. 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. 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.

6. Claim 7 (and 17, and 18)

139. 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.”

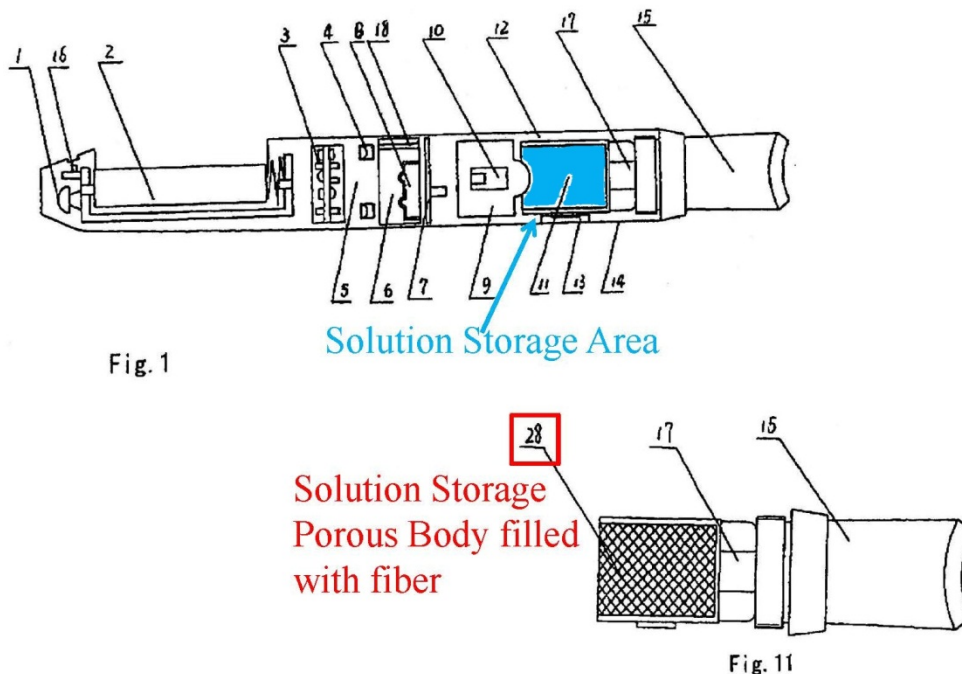
140. I agree with the Examiner’s statement in the Office Action dated August 7, 2012 (ex. 1023 at 7), regarding claim 98 (issued claim 7), that “it would have been obvious to one having ordinary skill in the art at the time of the invention to have included a ‘hole’ along the exterior surface/or screwthread 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.” Accordingly, 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.

7. Claim 8

141. Claim 8 requires: “a fiber material within the solution storage area.”

142. 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. The claim limitations are shown in the annotated drawings below:



8. Claim 9 (and 11)

143. 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.

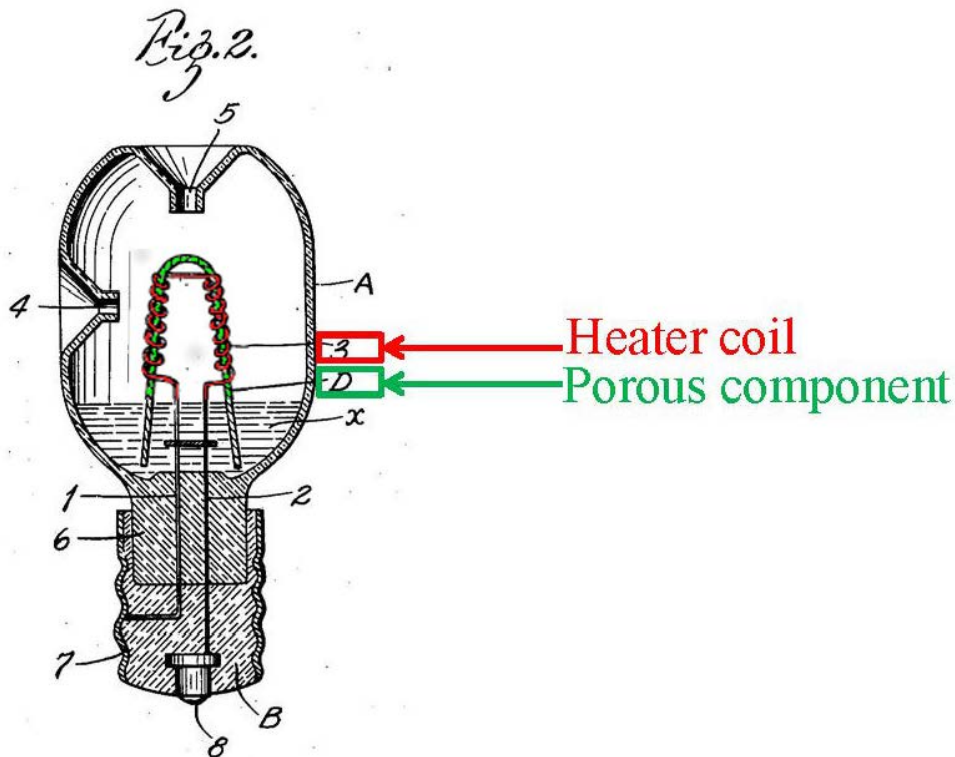
144. **Porous Component Comprising a Fiber Material.** CN 2719043 discloses a “**porous body** in the atomizer can be made of foam nickel, **stainless steel fiber felt . . .**” Hon ‘031 at ¶ 9. CN 2719043 discloses fiber material within the solution storage area: “solution storage **porous body 28** is provided in the

liquid-supplying bottle, and **can be filled with polypropylene fiber, terylene fiber or nylon fiber.**” Hon ‘031 at ¶ 28, Fig. 11.

145. **Heater Coil.** CN 2719043 discloses the use of a heating element, which is the equivalent of the heater coil 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. CN 2719043 discloses that the design could be simplified by eliminating the piezoelectric element 23: “To simplify the design, the first piezoelectric element 23 on the atomizer 9 can be omitted, and the atomization of the nicotine solution will be made only by the **heating element 26.**”

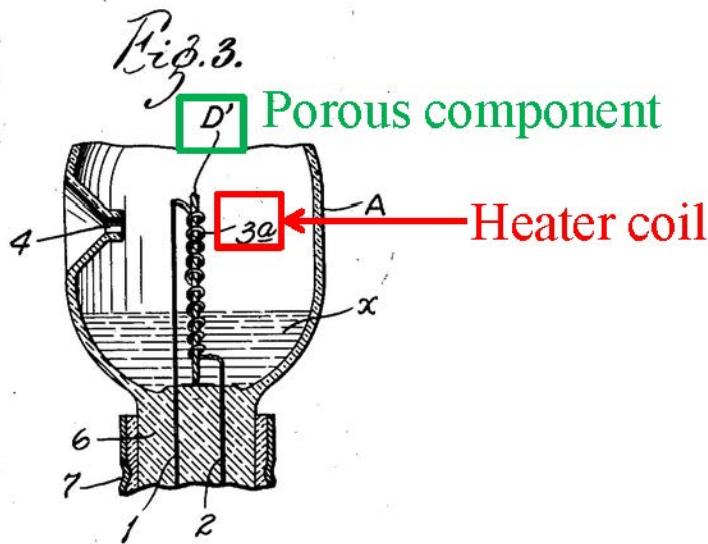
146. **Heater Coil Wound Around Porous Component Comprising Fiber Material.** Whittemore discloses the well-known structure of a heater coil “wound around” a porous component comprising fiber material: “In order that the unit will function properly, even though the heating element or filament 3 is spaced 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. Annotated Fig. 2 shows a heater coil would around the porous component of the filament made of a fiber material.



147. One of ordinary skill in the art knows that thread or string is made of up fiber and is porous. Accordingly, Whittemore’s “wick D” is a porous component.

148. Whittemore further discloses: “Figure 3 illustrates another form of my invention, in which the filament or heating element 3a is constructed in the form of a single vertically-disposed coil attached to the electrical conductors 1 and 2, and arranged so as to surround a wick D’ whose lower end terminates in close proximity to the inner face of the bottom 6 of the vaporizing vessel up through which the conductors 1 and 2 project.” *Id.* at 2:26-34.



149. Whittemore also discloses: “A vaporizing unit of the kind described in claim 1, in which the **heating filament is coiled around** a portion of said wick.” *Id.* at Claim 4.

150. The rationale supporting a combination of Whittemore and CN 2719043 is discussed in paragraph 119. Claims 9 and 11 would have been rendered obvious in view of CN 2719043 and Whittemore.

9. Claim 10

151. Many of the limitations of claim 10 have already been discussed in connection with claims 1 and 2. The chart below identifies where some of the limitations of claim 10 have already been discussed.

Claim 10 Limitation	Prior Discussion
10. [Preamble] An electronic cigarette or cigar comprising:	<i>See</i> 1 (§ 69), as the words of the preamble are the same: “An electronic cigarette or cigar comprising.”
[10.1] a battery assembly housing having a first end and a second end;	<i>See</i> [1.1a] (§§ 70-73), as the words of this limitation are included in [1.1a].
[10.3] a primary screwthread electrode located on the first end of the battery assembly housing;	<i>See</i> [1.2a] (§§ 85-90), as the words of this limitation are the same as [1.2a].
[10.4] an atomizer assembly comprising:	<i>See</i> [1.3] (§§ 95-98), as the words of this limitation are the same as [1.3].
[10.5] an atomizer assembly housing having a first end and a second end;	<i>See</i> [1.4] (§ 99), as the words of this limitation are the same as [1.4].
[10.6] a secondary screwthread electrode located on the second end of the atomizer assembly housing with	<i>See</i> [1.6] (§§ 103-109), as the words of this limitation are the same as [1.6], except that [10.6] does not include the words

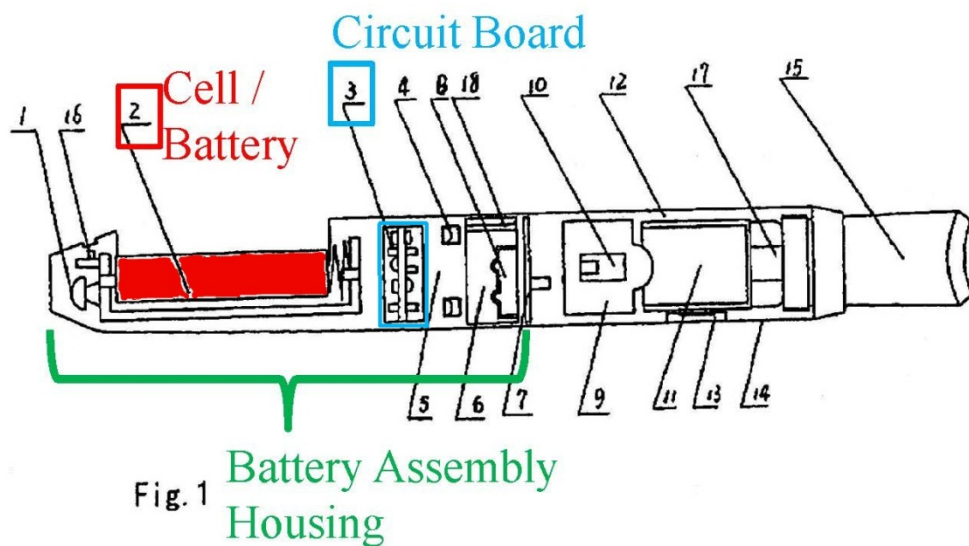
the battery assembly and the atomizer assembly connected through the primary and secondary screwthread electrodes;	“and having a hole through its center.”
[10.7a] an atomizer	<i>See</i> [1.5a] (§ 100), which is “an atomizer.”
[10.7b] in the atomizer assembly housing,	<i>See</i> [1.4] (§§ 99-100), which includes the words “an atomizer assembly housing.”
[10.7c] with atomizer including a heater coil wound around a porous component;	<i>See</i> [1.7] (§§ 110-119), which is “with the atomizer including a heater coil would around a porous component.”
[10.8a] and a solution assembly, which comprises,	<i>See</i> 2 (§§ 120-126), which identifies a solution assembly.

152. The other limitations of claim 10 are discussed below.

(a) [10.2] a battery connected to a circuit board within the battery assembly housing;

153. See [1.1b] (§ 74), [1.1c] (§§ 78-79), and [1.1d] (§§ 80-84), as the words of this limitation are in limitations [1.1b] and [1.1d]. 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.**” Hon ‘031 at ¶ 26 Ex. 1004 at 9. The claim limitations are shown in the annotated drawing below:



154. As CN 2719043 further discloses, the battery is connected to the circuit board. “Fig. 12 is a functional diagram of a circuit according to the present invention.” Hon ‘031 at ¶ 24; Ex. 1004 at 8.

155. The drawings in the original Chinese patent CN2719043 clearly show a battery symbol with the indication “DC” for “Direct Current” next to it.

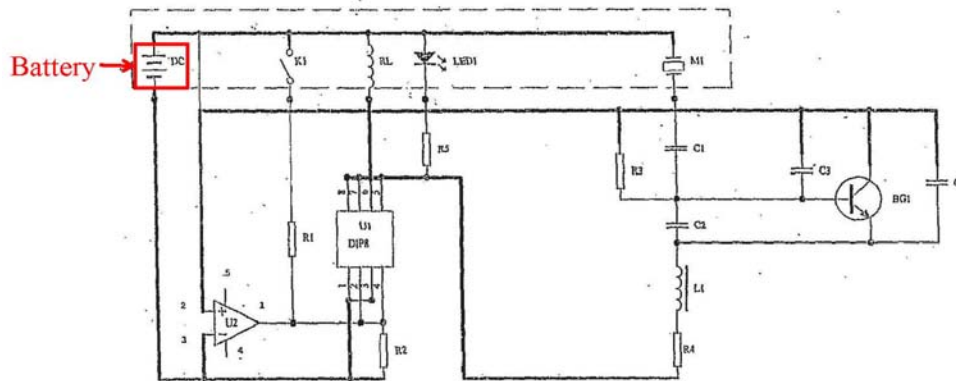
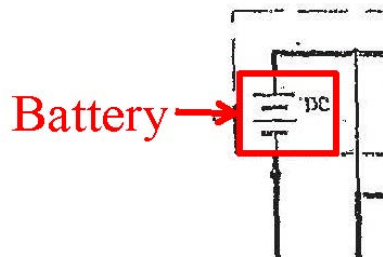


图 12

Shown close up:

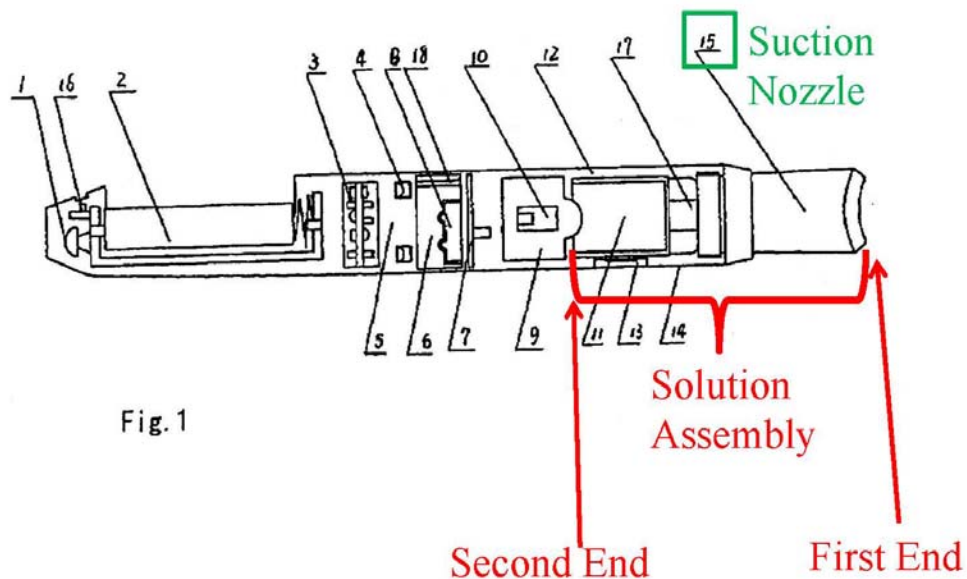


156. As the cell / rechargeable battery 2 is the only disclosed source of electrical power to the electronic circuit board 3, the battery is connected to the circuit board.

(b) [10.8b] a suction nozzle at a first end of the solution assembly,

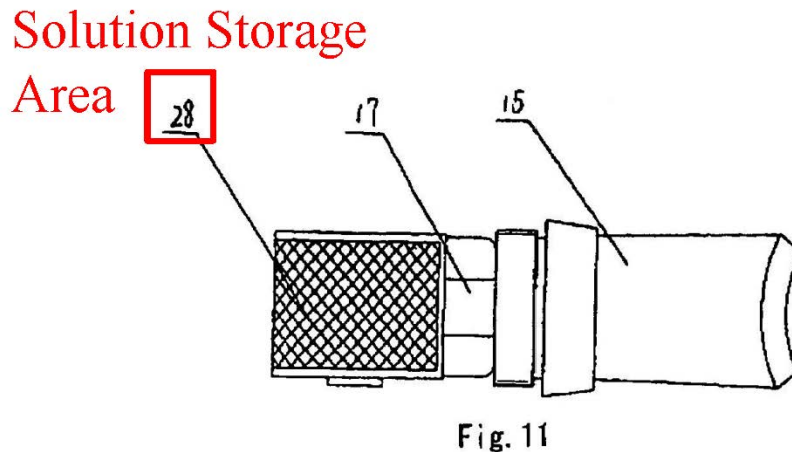
157. CN 2719043 discloses a suction nozzle, in the form of a mouthpiece, at a first end of the solution assembly: “When a smoker smokes, the **mouthpiece 15** is under negative pressure, the air pressure difference or high speed stream between the normal pressure cavity 5 and the negative pressure cavity 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. The claim limitations are shown in the annotated drawing below:



(c) [10.8c] and a solution storage area with a liquid containing fiber material in the solution storage area.

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.



10. Claim 11

159. Claim 11 requires: “The electronic cigarette or cigar of claim 10, with the porous component that the heater coil is wound around comprising a fiber material.”

160. The discussion of how CN2719043 combined with Whittemore discloses a “porous component that the heater coil is wound around comprising a fiber material” is provided in connection with Claim 9 at ¶¶ 143-150.

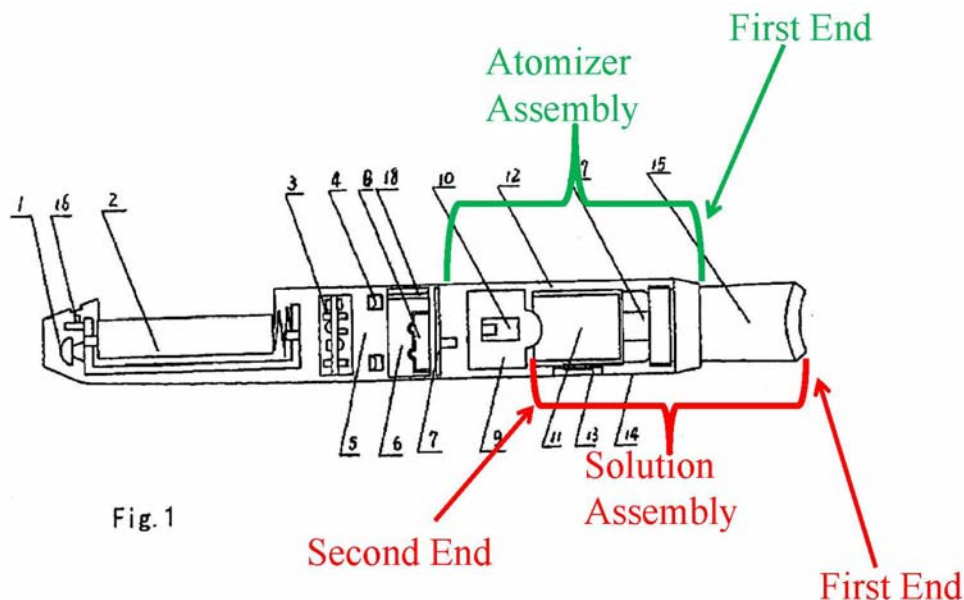
11. Claim 12

161. Claim 12 requires: “The electronic cigarette or cigar of claim 10, wherein the second end of the solution assembly is inserted into the first end of the atomizer assembly, thus forming a cigarette or cigar body.” Some of the limitations of Claim 12 are found in Claim 2, as discussed in ¶¶ 120-126.

162. To further elaborate, as noted in the Prosecution History of the '957 patent, specifically the Office Action dated August 7, 2012 (p. 5), regarding claim

87 (issued claim 2) the electronic cigarette of CN 2719043 (as disclosed in Hon '031) 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.

163. The claim limitations are shown in the annotated drawing below:



12. Claim 13

164. Claim 13 requires: “the circuit board is a Metallic Oxide Semiconductor Field Effect Transistor (MOSFET) circuit board.”

165. One of ordinary skill in the art would have found it obvious to make the control circuit using a MOSFET circuit board. As correctly noted by the

Examiner in the June 8, 2011 Office Action (pp. 6-7) and August 7, 2012 Office Action (pp. 5-6): “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.” See Exs. 1012, 1013.

166. 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. In my experience, a MOSFET is the most 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.

167. Regarding the “TechPowerUp” Internet webpage, I understand that the version identified in the file history “What is a MOSFET, what does it look

like, and how does it work?” dated 5/24/2004, printed from the Internet of June 4, 2011, 3 pages, is not available in the file history of the ‘957 patent. I have examined versions printed from the Internet Archive, i.e., the Wayback machine, which were archived on March 5, 2010 (Ex. 1012) and July 20, 2011 (Ex. 1013). Both versions disclose the same information concerning MOSFETs, and both versions are consistent with my knowledge of MOSFETs. It is my understanding that Exhibits 1012 and 1013 are the versions of the article available on archive.org that are the closest in time before and after the print date identified in the file history.

13. Claim 14

168. Claim 14 requires: “The electronic cigarette or cigar of claim 10, wherein the primary screwthread electrode is an external screwthread electrode and the secondary screwthread electrode is an internal screwthread electrode.” These limitations are found in claim 3, except that claim 3 depends on claim 1. The disclosure of the limitations of claim 14 are identified in connection with the discussion above of claim 3 at ¶¶ 127-131.

14. Claim 15

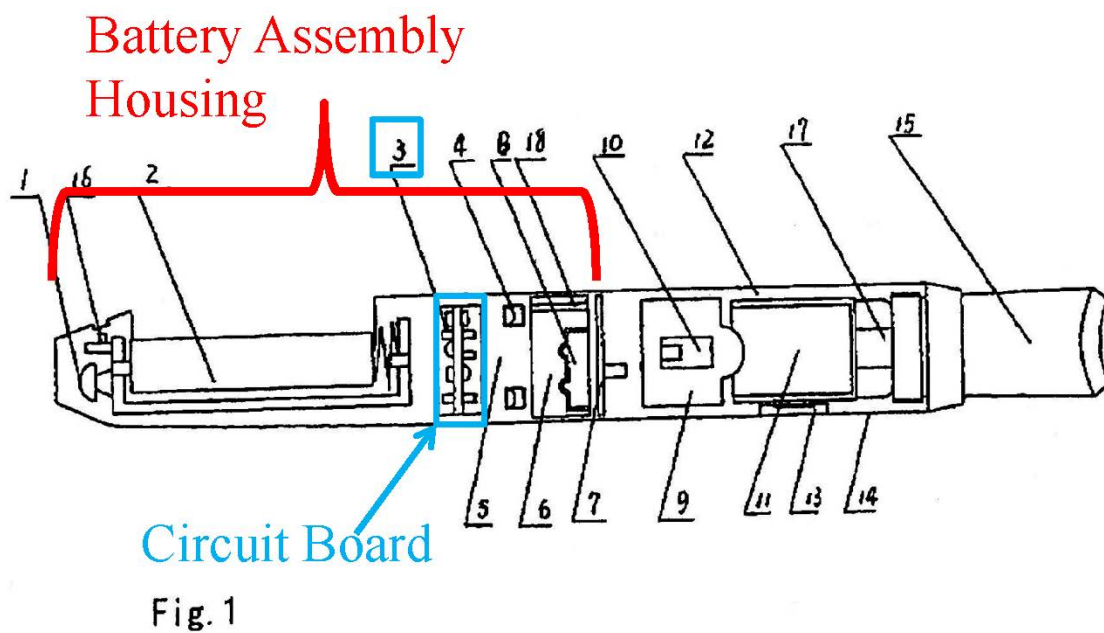
169. Claim 15 requires: “The electronic cigarette or cigar of claim 10, wherein the battery assembly further comprises a membrane located between the primary screwthread electrode and the sensor.” These limitations are found in

claim 4, except that claim 4 depends on claim 1. The disclosure of the limitations of claim 15 are identified in connection with the discussion above of claim 4 at ¶¶ 132-136.

15. Claim 16

170. 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 ¶¶ 75-79.

171. 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:



172. As CN 2719043 discloses, 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 claim limitation [10.2] 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. Accordingly, the limitations of this claim are disclosed.

16. Claim 17

173. Claim 17 requires: “The electronic cigarette or cigar of claim 10, wherein the atomizer assembly has an air intake hole.” These limitations are found in claim 7, except that claim 7 depends on claim 1. The disclosure of the limitations of claim 17 are identified in connection with the discussion above of claim 7 at ¶¶ 139-140.

17. Claim 18

174. Claim 18 requires: “The electronic cigarette or cigar of claim 17, wherein the air intake hole is at the secondary screwthread.” These limitations are found in claim 7, except that claim 7 depends on claim 1. The disclosure of the limitations of claim 17 are identified in connection with the discussion above of claim 7 at ¶¶ 139-140.

18. Claim 21

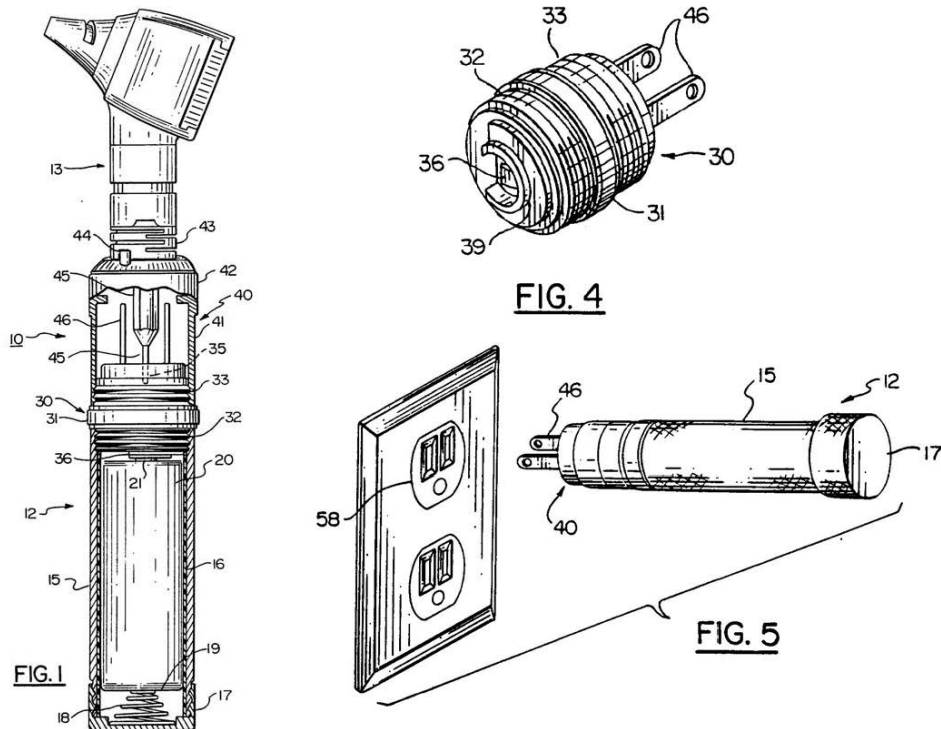
175. Claim 21 requires: “The electronic cigarette or cigar of claim 10, wherein the primary screwthread electrode connects to a charger.”

176. CN 2719043 discloses that a “rechargeable cell 2” may be used as the battery. See [1.1b] (¶ 74). I agree with the Examiner’s statement in the Office Action dated August 7, 2012 (p. 8), 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.”

177. 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. 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 battery recharger, and providing the ability for the 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.

178. 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. The reasons why it would have been obvious to combine Connors with CN 2719043 are the same as the reasons discussed in ¶ 177.



19. Claim 22

179. 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.”

180. Limitations [1.2a] (¶¶ 85-90) and [1.2b] (¶¶ 91-94) discuss a primary screwthread electrode having a hole through its center.

181. Limitation [1.6] (¶¶ 103-109) discusses a secondary screwthread electrode having a hole through its center.

182. Accordingly, claim 22 would have been obvious to one of ordinary skill in the art.

20. Claim 23

183. Many of the limitations of claim 23 have already been discussed in connection with claim 1. The chart below identifies where some of the limitations of claim 23 have already been discussed.

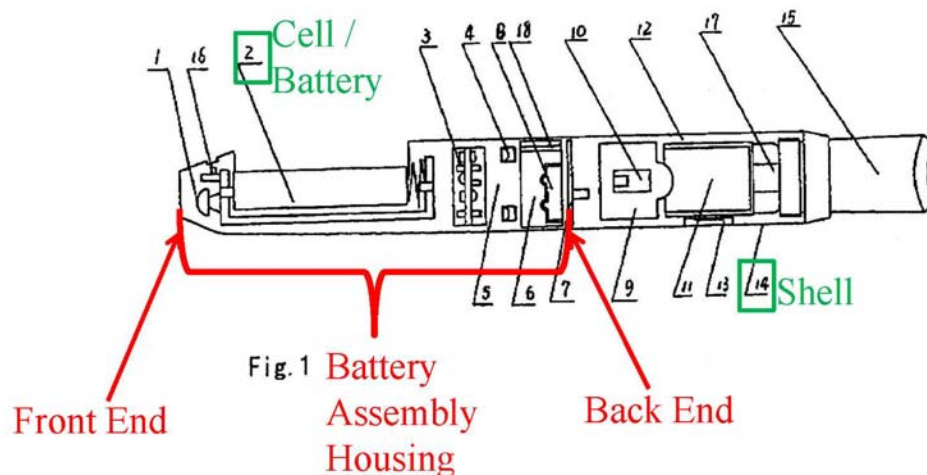
23. [Preamble] An electronic cigarette comprising:	<i>See</i> 1 (¶ 69).
[23.1b] with a battery,	<i>See</i> [1.1b] (¶ 74), which has the words of this limitation.
[23.1c] a micro-controller unit (MCU)	<i>See</i> [1.1c] (¶¶ 75-79), which has the words of this limitation.
[23.1d] and a sensor electrically connected to a circuit board within the battery assembly housing;	<i>See</i> [1.1d] (¶¶ 80-84), which has the words of this limitation.
[23.2] a first screwthread electrode located on the back end of the battery assembly housing;	<i>See</i> [1.2a] (¶¶ 85-90). The only difference between this limitation and [1.2] is that [23.2] uses the words “first” instead of “primary” and “back” instead of “first.”

[23.3] an atomizer assembly comprising:	<i>See</i> [1.3] (§ 95-98), which has the words of this limitation.
[23.5a] an atomizer,	<i>See</i> [1.5a] (§ 100), which has the words of this limitation.
[23.5b] and a solution storage area in the atomizer assembly housing;	<i>See</i> [1.5b] (§§ 101-102), which has the words of this limitation.
[23.6] a second screwthread electrode located on the front end of the atomizer assembly housing, the battery assembly and the atomizer assembly connected through the first and second screwthread electrodes;	<i>See</i> [1.6] (§§ 103-109) and [10.6] (§ 151). The only significant difference between this limitation and [10.6] is that [23.6] uses the words “second screwthread” instead of “secondary screwthread”; “front” instead of “second”; and “first and second” instead of “primary and secondary.”
[23.7] and with the atomizer including a heater coil wound around a porous component.	<i>See</i> [1.7] (§§ 110-119), which has the words of this limitation.

184. The other limitations of claim 23 are discussed below.

(a) **[23.1a] A Battery Assembly Including a Battery
Assembly Housing Having a Front End and a Back
End**

185. See [1.1a] (§§ 70-73). The only difference between this limitation and [1.1a] is that [23.1a] uses the word “front” instead of “second” and “back” instead of “first.” The claim limitations are shown in the annotated drawing below:



(b) **[23.4] an atomizer assembly housing having a front
end and a back end**

186. See [1.4] (§ 99). The only difference between this limitation and [1.4] is that [23.4] uses the words “front” instead of “second” and “back” instead of “first.” The claim limitations are shown in the annotated drawing below:

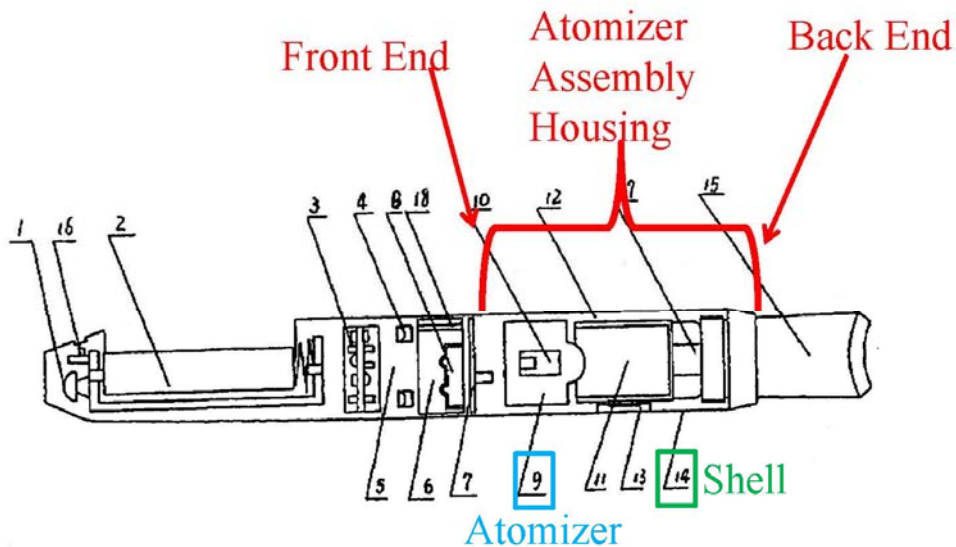
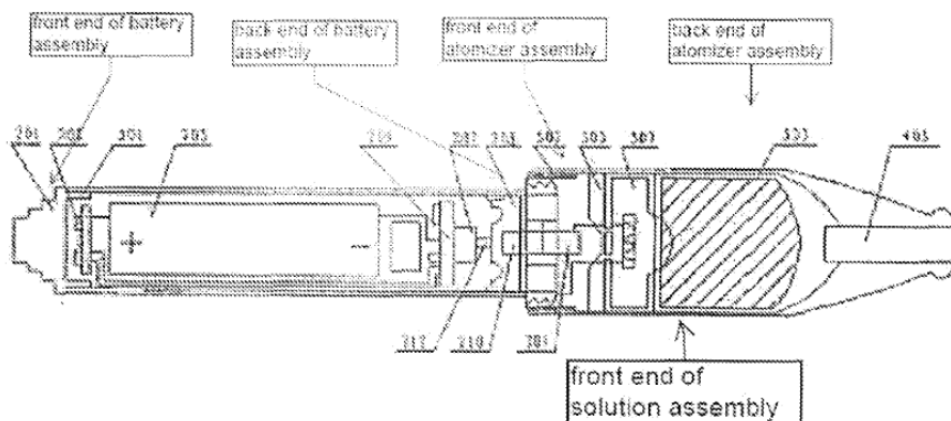


Fig. 1

187. Comparison of the annotated Fig. 1 of CN 2719043 shows how similar it is to the marked up Fig. 5A the Applicant submitted during prosecution of the '957 patent. *See* August 29, 2012 arguments and remarks (Ex. 1024 at 7):



188. Accordingly, claim 23 would have been obvious to one of ordinary skill in the art.

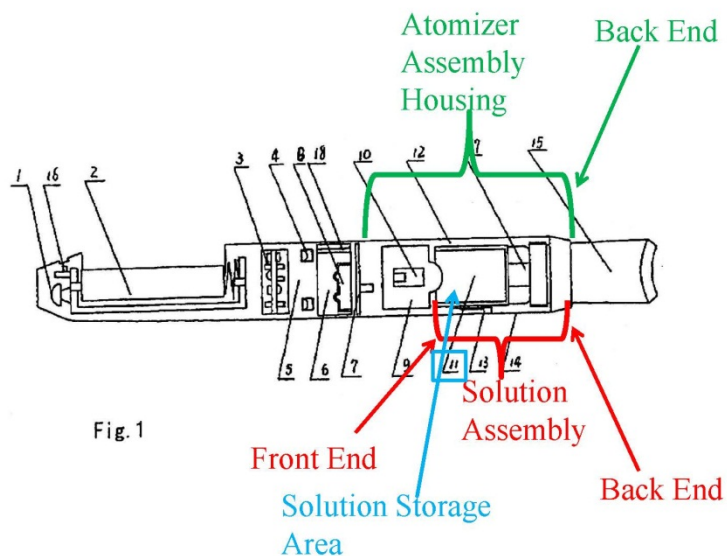
21. Claim 24

189. Claim 24 requires: "The electronic cigarette of claim 23 with the

solution storage area **within** a solution assembly, and with a **front** end of the solution assembly inserted into the **back** end of the atomizer assembly.”

190. This claim is similar to claim 2, which reads: “The electronic cigarette or cigar of claim 1, with 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.”

191. The only significant difference between claim 24 and claim 2 is that claim 24 uses the words: “within” instead of “in”; “front” instead of “second”; and “back” instead of “first.” The claim limitations are shown in the annotated drawing below:



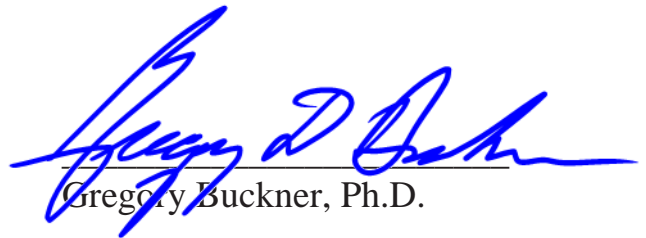
192. Accordingly, claim 24 would have been obvious to one of ordinary skill in the art.

V. CONCLUSION

193. For the reasons discussed herein, I believe that Claims 1-4, 6-18, and 21-24 of the '957 patent are not patentable in view of the prior art.

I, Gregory Buckner, do hereby declare and state, that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code.

Dated: October 17, 2014



Gregory Buckner, Ph.D.