

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

NJOY, LLC and NJOY HOLDINGS, INC.,
Petitioners,

v.

JUUL LABS, INC.,
Patent Owner

PETITION FOR *INTER PARTES* REVIEW
OF U.S. PATENT NO. 11,606,981

NJOY Exhibit 1057.001
NJOY v. JUUL
IPR2024-00268

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PETITIONERS' EXHIBIT LIST

No.	Exhibit
1001	U.S. Patent No. 11,606,981 (“981 Patent”)
1002	U.S. Patent No. 8,794,231 (“Thorens231”)
1003	U.S. Patent No. 9,427,022 (“Levin”)
1004	WO2011160788A1 (“Thorens788”)
1005	Expert Declaration of Jason Janet
1006	Curriculum Vitae of Jason Janet
1007	U.S. Patent No. 11,606,981 File History
1008	U.S. Patent No. 9,155,336
1009	U.S. Patent No. 7,717,756
1010	U.S. Patent Publication No. 2014/0150783 A1 (“Liu783”)
1011	Universal Serial Bus Micro-USB Cable and Connections Specification – April 4, 2007
1012	U.S. Patent No. 9,420,831
1013	U.S. Patent Publication No. 2013/0319438 A1
1014	U.S. Patent No. 5,505,214
1015	U.S. Patent No. 8,550,068
1016	<i>Intentionally left blank</i>
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1018	<i>Intentionally left blank</i>

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No.	Exhibit
1019	<i>Intentionally left blank</i>
1020	U.S. Patent No. 2,057,353
1021	U.S. Patent No. 8,863,752
1022	U.S. Patent Publication No. 2010/0031968 A1
1023	<i>Intentionally left blank</i>
1024	U.S. Patent No. 8,205,622 (“Pan”)
1025	U.S. Patent Publication No. 2014/0190502 A1
1026	U.S. Patent No. 11,229,239
1027	U.S. Patent No. 8,156,944
1028	U.S. Patent No. 9,386,805
1029	U.S. Patent No. 9,408,416
1030	U.S. Patent No. 9,861,138
1031	U.S. Patent No. 8,528,569
1032	Insight: No Smoke, Plenty of Fire Fuels E-Cigarettes – Reuters
1033	U.S. Patent Publication No. 2013/0081642 A1
1034	U.S. Patent Publication No. 2013/0192623 A1
1035	U.S. Patent Publication No. 2014/0261495 A1
1036	U.S. Patent No. 10,143,242
1037	<i>Intentionally left blank</i>
1038	U.S. Patent No. 9,901,120

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No.	Exhibit
1039	<i>Intentionally left blank</i>
1040	U.S. Patent No. 9,301,548
1041	U.S. Patent No. 9,820,509
1042	U.S. Patent No. 9,675,114
1043	U.S. Patent No. 9,609,893
1044	CN202697716U
1045	CN202919037U
1046	KR200453424Y1
1047	<i>Intentionally left blank</i>
1048	<i>Intentionally left blank</i>
1049	Joint Claim Construction Chart (2023-11-07)
1050	U.S. Patent No. 9,060,548 (“Zheng”)
1051	<i>Intentionally left blank</i>
1052	U.S. Patent No. 6,155,268
1053	U.S. Patent No. 6,340,320
1054	U.S. Patent No. 7,201,613
1055	Jonny Stevenson, <i>Guide to Avoid a Dry Hit When Vaping</i> , Vapour Depot, July 18, 2023, available at https://vapourdepot.com/blog/dry-hit-vape-guide-avoid-dry-hits-vaping
1056	CN2002819631U

I. MANDATORY NOTICES

A. Real Party-in-Interest

NJOY, LLC, NJOY Holdings, Inc. (collectively, “Petitioners”), Altria Group, Inc., Altria Group Distribution Company, Altria Client Services LLC, and Shenzhen Smoore Technology Limited are the real parties-in-interest.

B. Related Matters

U.S. Patent No. 11,606,981 (“’981 Patent”), along with U.S. Patent Nos. 10,709,173 (“’173 Patent”), RE49,114 (“’114 Patent”), 10,130,123 (“’123 Patent”), and 11,134,722 (“’722 Patent”), are all subject to a Section 337 Investigation before the International Trade Commission, *Certain Vaporizer Devices, Cartridges Used Therewith, and Components Thereof*, 337-TA-1368, initiated by Patent Owner and co-Complainant VMR Products LLC. The ’123 Patent, the ’173 Patent, the ’114 Patent, the ’722 Patent, and the ’981 Patent are also part of the civil litigation matter filed by Patent Owner and VMR Products LLC against Petitioners, *JUUL Labs, Inc. v. NJOY, LLC*, Case No. 23-cv-01204 (D. Ariz.). Both matters were filed on June 30, 2023.

Petitions for *inter partes* review for the ’123 Patent (IPR2024-00231), the ’173 Patent (IPR2024-00223), the ’722 Patent (IPR2024-00267), and the ’981 Patent (IPR2024-00268) have been filed prior to this Petition. Concurrent with the filing of this Petition, Petitioner has filed a motion to withdraw the Petition in IPR2024-00268 through a dismissal without prejudice. ~~A Petition for *inter partes*~~

~~review for the '114 Patent is being filed contemporaneously with this~~
~~Petition~~~~Petitions for *inter partes* review for the '123 Patent, the '173 Patent, the '114~~
~~Patent, and the '722 Patent are being filed contemporaneously with this Petition.~~

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II. GROUNDS FOR STANDING

Petitioner certifies that the '981 Patent is available for *inter partes* review and that Petitioner is not barred or estopped from requesting *inter partes* review challenging the patent claims on the grounds identified in this Petition.

III. STATUTORY GROUNDS FOR THE CHALLENGES

Ground 1	Claims 1, <u>2</u> , 5, and 13-16 of the '981 Patent are unpatentable under 35 U.S.C. § 103 as rendered obvious by U.S. ~~Pat. Pub. No.~~ 2014/0150783A1 (“Liu783”) and U.S. ~~Pat. App. Pub. No.~~ 2013/0319438 (“Liu438”) further in view of the knowledge of a POSA.
Ground 2	Claims 9-11 and 17-18 of the '981 Patent are unpatentable under 35 U.S.C. § 103 as rendered obvious by Liu783 and Liu438 further in view of U.S. ~~Pat. Pub. No.~~ 2013/0192623 (“Tucker”) and the knowledge of a POSA.
Ground 3	Claim 8 of the '981 Patent is unpatentable under 35 U.S.C. § 103 as rendered obvious by Liu783 and Liu336 further in view of U.S. ~~Patent No.~~ 9,060,548 (“Zheng”).
Ground 4	Claims 1, <u>2</u> , and 13-16 of the '981 Patent are unpatentable under 35 U.S.C. § 103 as rendered obvious by International Application No. WO2011/160788 (“Thorens788”) in view of U.S. ~~Patent No.~~ 8,794,231 (“Thorens231”).

Ground 5	Claim 5 of the '981 Patent is unpatentable under 35 U.S.C. § 103 as rendered obvious by Thorens788 and Thorens231 further in view of U.S. ~~Patent No.~~ 9,427,022 (“Levin”).
Ground 6	Claims 9-11 and 17-18 of the '981 Patent are unpatentable under 35 U.S.C. § 103 as rendered obvious by Thorens788 and Thorens231 further in view of Tucker.
Ground 7	Claim 8 of the '981 Patent is unpatentable under 35 U.S.C. § 103 as rendered obvious by Thorens788 and Thorens231 further in view of Zheng.

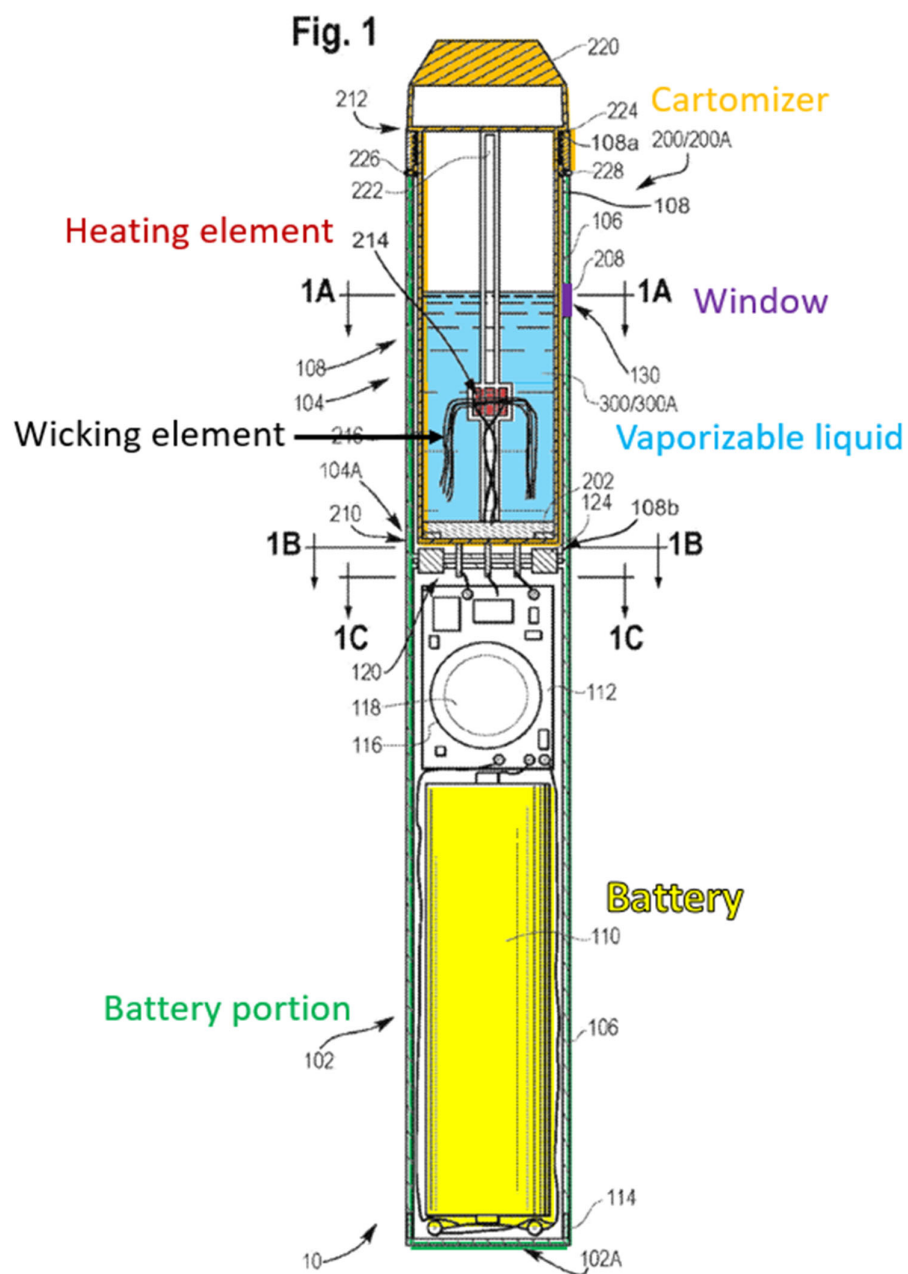
IV. OVERVIEW OF THE '981 PATENT

A. Overview of the Claims

The '981 Patent was filed on November 11, 2020 and claims priority to three provisional applications, the earliest filed November 12, 2013. The grounds are based on references that qualify as prior art as of November 12, 2013, which is the earliest possible priority date of the '981 Patent.

The claims of the '981 Patent relate to an e-cigarette device comprising a cartomizer and a battery portion, wherein the battery portion includes a chamber for receiving the cartomizer, and the cartomizer comprises a body for holding a vaporizable liquid, a heating element for vaporizing the liquid, and a wicking

element for transporting the liquid to the heating element. EX1001, Abstract, 18:33-61.



EX1001, Fig.1

B. Prosecution History

VMR Products LLC (“the Applicant”) filed U.S. Patent Application No. 17/095,567 on November 11, 2020, which resulted in the ’981 Patent. EX1007.007. During prosecution, the Applicant amended the claims to distinguish two references – U.S. Patent Publications Nos. 2013/0228191 (“Newton”) and 2012/0199663 (“Qiu”) – on the basis that neither Newton nor Qiu disclosed a cartomizer receiving chamber. EX1007.229-231. Applicant further distinguished Qiu on the basis that it did not disclose a cartridge body comprising a translucent material. EX1007.232.

On October 21, 2022, the Examiner issued an advisory action, indicating that pending independent claim 24 would be anticipated by U.S. 2013/0037041 (“Worm”), and suggested that incorporating dependent claim 26 into claim 24 would overcome Worm. EX1007.278. Applicant added to claim 24 the limitation “wherein the cartomizer electrical contacts are on an exterior of the cartomizer body.” EX1007.300-301.

The ’981 Patent issued on March 21, 2023. EX1001, (45). Pending claims 10 and 24 were renumbered as claims 1 and 13, respectively. EX1007.316.

V. LEVEL OF ORDINARY SKILL IN THE ART

A person of ordinary skill in the art (“POSA”) would have at least a B.S. degree in Mechanical Engineering, Electrical Engineering, Industrial Design, Product Design, or similar field, with at least two years of industry experience in one

of these fields, and such POSA would have been familiar with electrically powered vaporizing articles, their components or the underlying technologies.

VI. CLAIM CONSTRUCTION

The parties have exchanged proposed constructions for the terms “wicking element,” “heating element,” and “window” in the related Section 337 Investigation. EX1049.

A. “wicking element” (claims 1, 9, 13)

In the Section 337 Investigation, Patent Owner contends that the term “wicking element” means “*e.g.*, any material through which liquid may be drawn via capillary action.” EX1049.003. Solely for purposes of this Petition, Petitioner has adopted Patent Owner’s construction. *See 10X Genomics, Inc. v. Bio-Rad Labs., Inc.*, IPR2020-00086, Paper 8 at 18 (PTAB Apr. 27, 2020) (“Under the circumstances of this case, we disagree with Patent Owner’s assertion that the applicable rules and guidance prohibit Petitioner from relying on a claim construction that it believes is incorrect, namely a claim construction relied upon by Patent Owner to assert infringement in the related district court action. In pertinent part, Rule 42.104(b) requires that a petition set forth: “(3) How the challenged claim is to be construed...[and] (4) How the construed claim is unpatentable.” 37 C.F.R. § 104(b)(3), (4).”).

In the Section 337 Investigation, Petitioner contends that the term “wicking element” is subject to 35 U.S.C. § 112(6) and has proposed that the function is to “deliver the vaporizable liquid to the heating element,” and the structure is “pliable bundle of fibers as shown in Fig. 1, wick 216.” EX1049.003. Petitioner has not adopted this construction for this Petition.

B. “heating element” (claims 1, 9, 13, 17)

In the Section 337 Investigation, Patent Owner contends that the term “heating element” in the ’722 Patent means “e.g., a conductive material shaped into a wire, coil, or flat ribbon that generates heat in response to current.” EX1049.003. Solely for purposes of this Petition, Petitioner has adopted Patent Owner’s construction.

In the Section 337 Investigation, Petitioner contends that the term “heating element” is subject to 35 U.S.C. § 112(6), and has proposed that the function is “heating the vaporizable liquid,” and the structure is indefinite. Petitioner has not adopted this construction for this Petition.

C. “window” (claims 9, 17)

The parties agree the term “window” should be construed as an “opening or slit...in[] the shell through which the cartomizer is viewed.” EX1049.004.

VII. BACKGROUND ART

A. Cartomizer Design

By 2000, it was well-known that e-cigarettes may adopt a two-part design, where a liquid-containing cartridge is removably attached to a main body containing a battery. For example, U.S. [Patent No.](#) 8,863,752 discloses a cartridge containing an atomizer assembly and vaporizable liquid that is removably connected to a battery assembly. EX1021, 1:63-2:4.

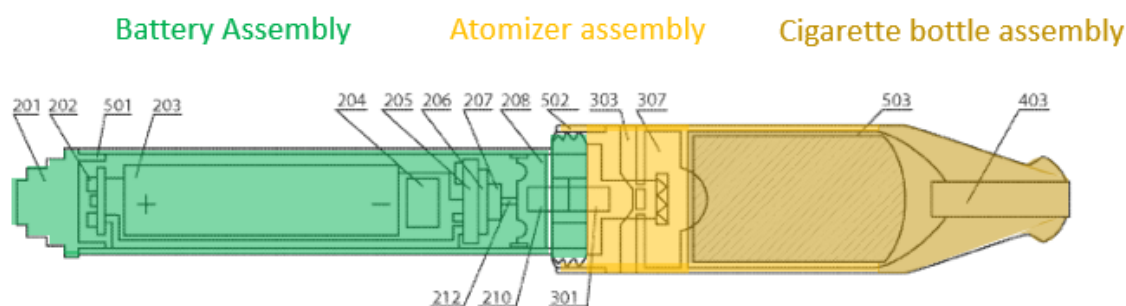


Figure 5B

EX1021, Fig. 5B

See EX1022, Abstract. A cartridge containing vaporizable liquid and an atomizer assembly was known as a “cartomizer.” EX1005 ¶34; EX1033, [0008].

The prior art discloses that the cartridge and the power source may be connected in various ways, including with a threaded connection. See *e.g.*, EX1022, [0043] (“The proximal end 90 of the rechargeable power portion 40 includes an external screw-thread, which engages with the internal screw thread of the distal end

80 of the cartridge portion 30.”). Alternatively, the cartridge may be inserted into a recess formed at one end of the power source. *See e.g.*, EX1024, Fig. 7; EX1025, [0005], Figs. 2-4.

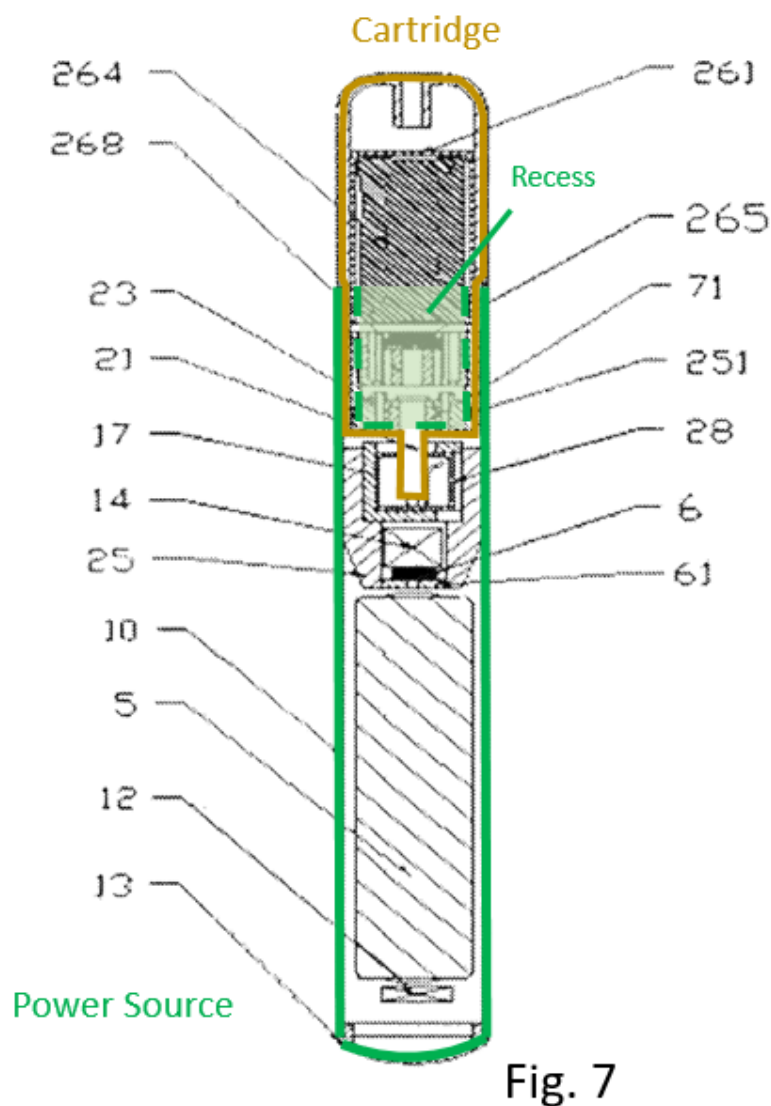


Fig. 7

EX1024, Fig. 7

It was also known that the cartridge could be magnetically connected to the power source. *See e.g.*, EX1025, [0003] (“An object of the present invention is to provide an electronic cigarette with magnetic connection which makes assembly of the electronic cigarette convenient and quick.”); *see also* EX1026, 6:15-24. EX1005 ¶36.

B. Translucent Window

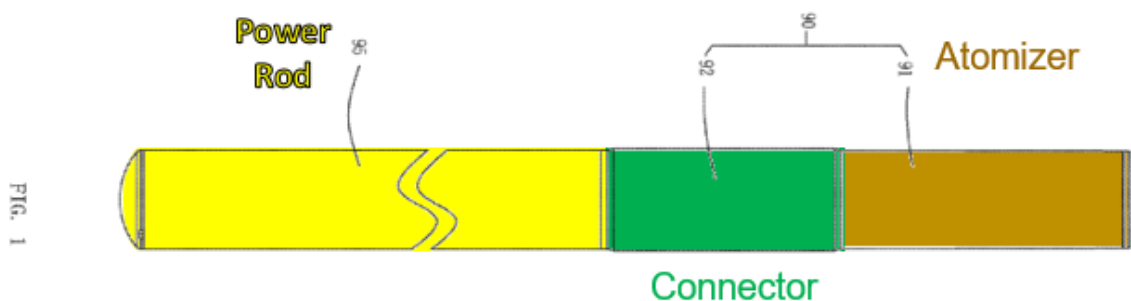
By 2013, it was known that an e-cigarette device may include a window for viewing the liquid within. For example, U.S. ~~Patent No.~~ 9,420,831 discloses an e-cigarette having a cartridge having “transparent material, for facilitating to observe the amount of the internal liquid smoke, and prevent an empty burning of the heating wire after the liquid smoke has run out.” EX1030, 4:32-35; *see also* EX1031, 4:22-25 (“The liquid reservoir includes a clear or translucent window 13...for visually determining the liquid level 15 within the liquid reservoir.”); EX1052, 7:31-41 (“a transparent peeping window (not shown) can be formed in that portion of the side wall of the casing 12 which corresponds to the liquid container 32... to observe the remaining amount of the liquid flavor source 34 within the liquid container 32. In this case, the liquid container 32 itself must be formed of a transparent or translucent material. Naturally, the remaining amount of the liquid flavor source 34 within the liquid container 32 can be observed through the peeping window so as to find the timing of replenishing the liquid flavor source 34.”).

VIII. PRIOR ART ASSERTED IN THE GROUNDS

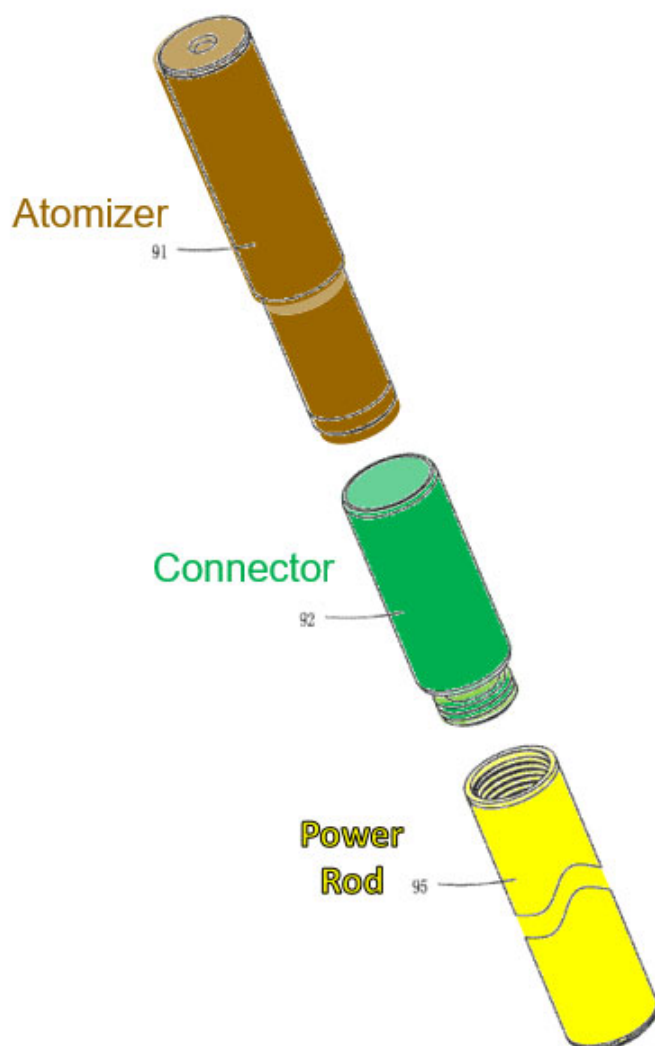
A. ~~Liu783-(EX1010)-(Primary Reference)~~

~~U.S. Pat. Pub. No. 2014/0150783A1~~ (“Liu783”), titled “Electronic Cigarette Having A Connector for Magnetic Connection,” was filed on December 5, 2012 and is prior art under 35 U.S.C. § 102(a)(2).

Liu783 discloses an e-cigarette with a magnetic connector between a power rod 95 and atomizer 91. EX1010, [0030]; EX1005, ¶¶66-69. Connector 92 has one end magnetically connected to atomizer 91 and another end detachably and threadedly connected to power rod 95. *Id.*; EX1010, [0037].



EX1010, Fig. 1

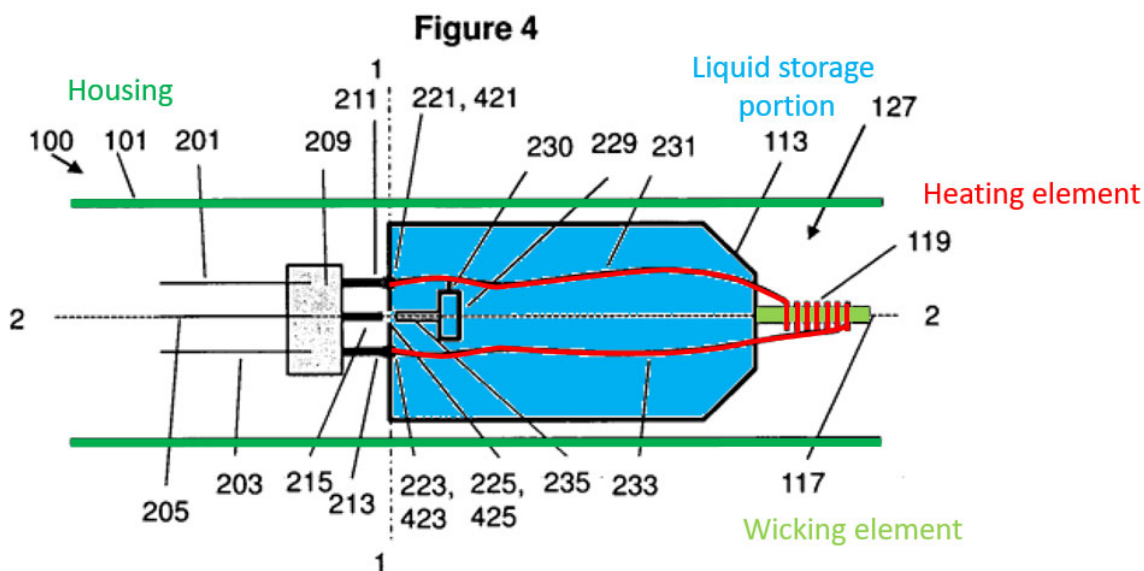


EX1010, Fig. 2.

B. Thorens788 (~~EX1004~~) (Primary Reference)

~~International Application No. WO2011/160788~~ (“Thorens788”), titled “An Improved Aerosol Generator And Liquid Storage Portion For Use With The Aerosol Generator,” was published December 29, 2011 and is prior art under 35 U.S.C. § 102(a)(2).

Thorens788 discloses a two-piece smoking system having an aerosol generating system portion comprising a battery. EX1004, 9:21-33; EX1005, ¶¶55-57. The aerosol generating system further includes a chamber for receiving a cartomizer, which comprises a heating coil, liquid storage portion, and a wick. EX1004, 3:7-9, 10:25-11:1. The cartomizer electrically couples to the aerosol generating system by electrical contacts located at the base of the cartomizer. *Id.*, 14:5-18.

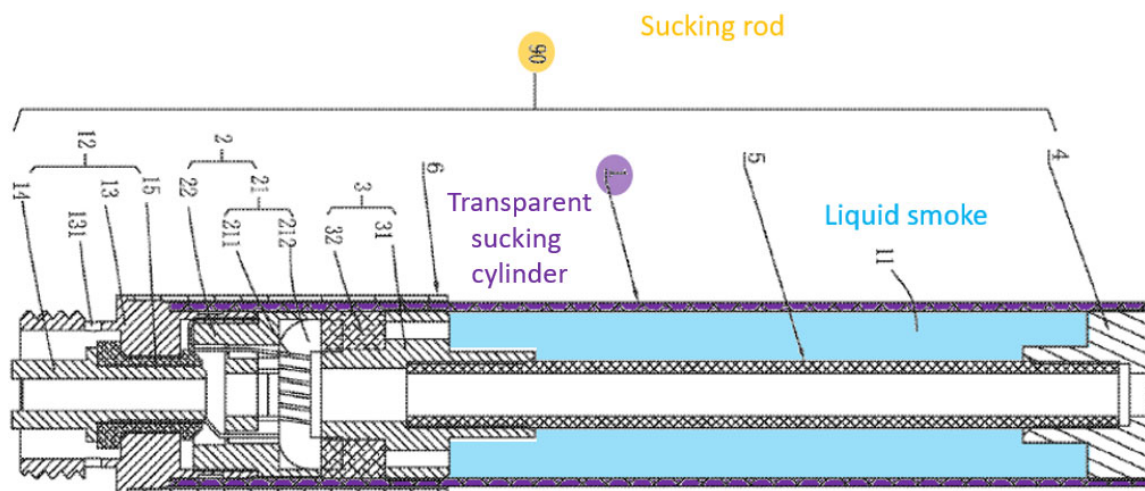


EX1004, Fig. 4.

C. Thorens231 (~~EX1002~~) (~~Secondary Reference~~)

~~U.S. Patent No. 8,794,231~~ (“Thorens231”), titled “Electrically Heated Smoking System Having a Liquid Storage Portion,” was filed April 29, 2009 and is prior art under U.S.C. § 102(a)(2).

compartment 11 is configured is transparent, to facilitate to observe the amount of the liquid smoke in the liquid smoke compartment 11.”); EX1005, ¶¶70-73.

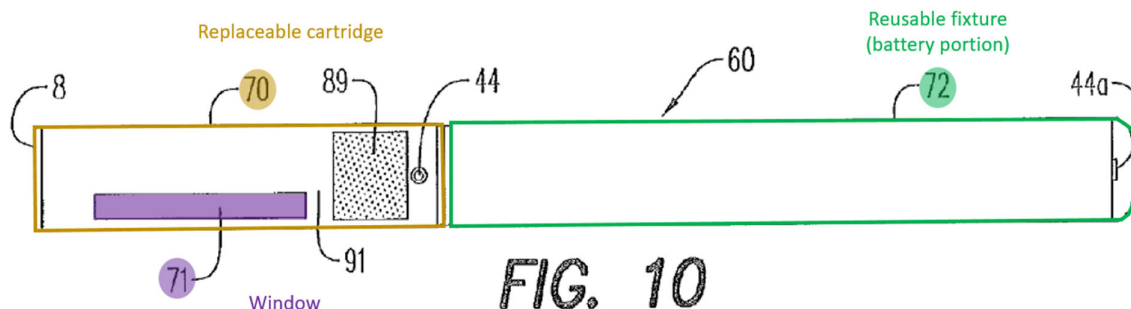


EX1013, Fig. 3

E. Tucker (~~EX1034~~) (Secondary Reference)

~~U.S. Pat. Pub. No. 2013/0192623~~ (“Tucker”), titled “Electronic Cigarette,” was filed on January 31, 2013 and is prior art under 35 U.S.C. § 102(a)(2).

Tucker is relied upon for its disclosure of an electronic cigarette having an outer shell that includes “[a] window 71 formed of a transparent material so as to allow a smoker to see the amount of liquid material remaining[.]” *Id.*, [0038]; EX 1005, ¶¶74-77.

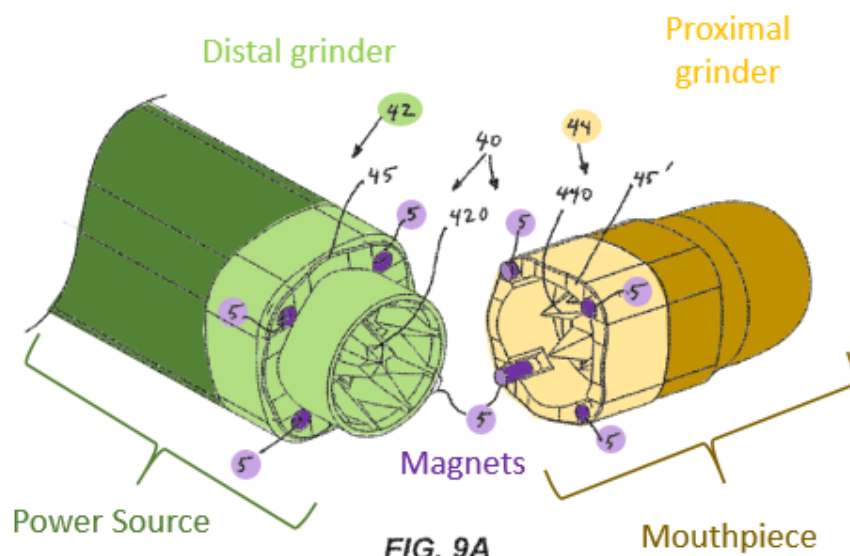


EX1034, Fig. 10

F. Levin (~~EX1003~~) (Secondary Reference)

U.S. Patent No. 9,427,022 (~~“Levin”~~), titled “Electronic Vaporizing Device and Methods for Use,” was filed on March 12, 2013 and is prior art under 35 U.S.C. § 102(a)(2).

Levin is relied upon for its disclosure of an e-cigarette comprising a mouthpiece portion and a power source portion coupled together using magnets. EX1003, 3:64-4:2, 20:63-67; EX1005, ¶¶47-53. In one exemplary embodiment, the mouthpiece portion contains four magnets and the power source portion includes four corresponding magnets. EX1003, 20:51-60.



EX1003, Fig. 9A

Levin is further relied upon for its disclosure of a micro-USB port located at the distal end of the power source for charging the battery. EX1003, 14:10-16.

G. Zheng (~~EX1050~~) (~~Secondary Reference~~)

~~U.S. Patent No. 9,060,548~~ (“Zheng”), titled “Fast Connector of Electronic Cigarette,” has a PCT filing date of June 20, 2013 and a § 371(c)(1) date of October 1, 2013, and is prior art under 35 U.S.C. § 102(a)(2).

Zheng discloses a two-piece electronic cigarette having battery contacts that are a “simple structure” and “easy to manufacture.” EX1050, 1:58-61. Zheng is relied upon for these battery contacts, which comprise “resilient battery columns” having “a spring 302 inside [a] hollow cavity” and “a movable probing head [] disposed at the opening of the hollow cavity.” EX1050, 3:7-13; EX1005, ¶¶78-82.

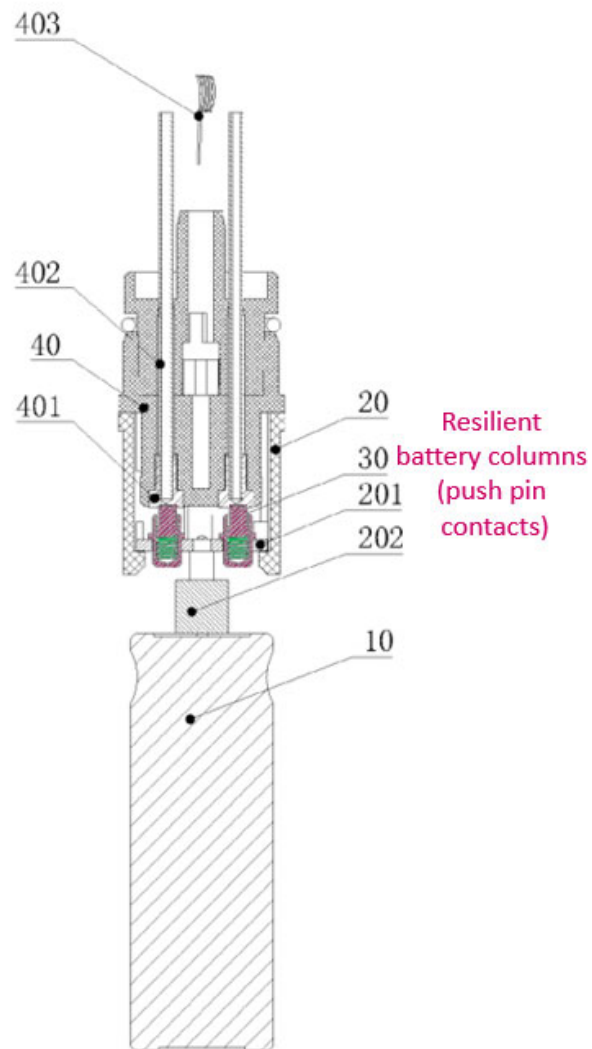


FIG.1

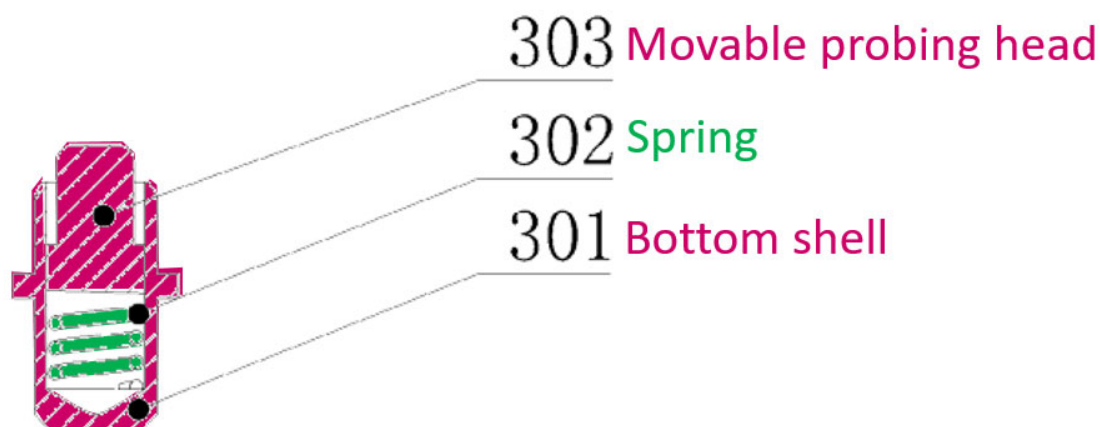


FIG.2

EX1050, Figs. 1-2

IX. IDENTIFICATION OF HOW THE CHALLENGED CLAIMS ARE UNPATENTABLE

A. Ground 1: Liu783, ~~and~~ Liu438 ~~in view of the~~ and knowledge of a POSA ~~render (claims 1, 2, 5, and 13-16) unpatentable under 35 U.S.C. § 103~~

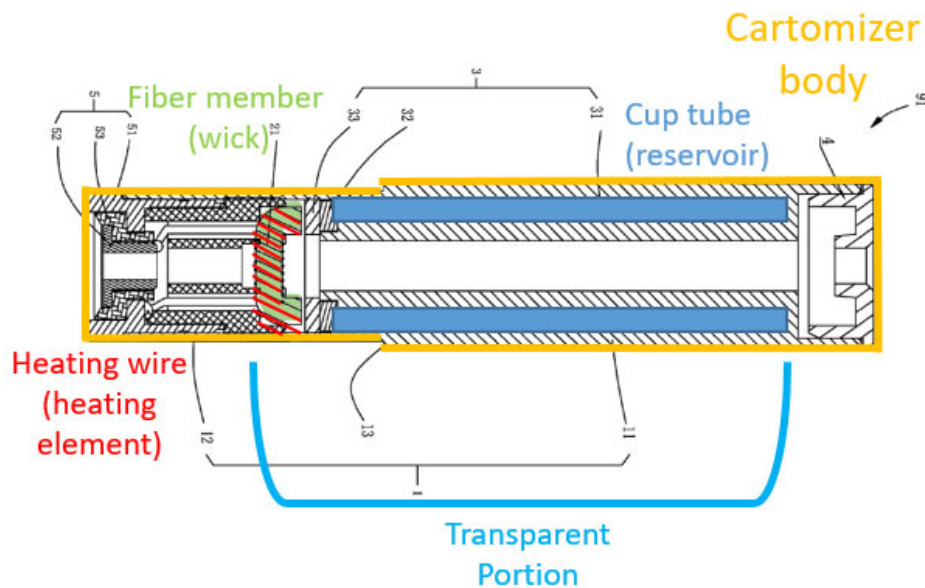
1. Motivation to Combine

a. Transparent Cartridge

Liu783 discloses a disposable electronic atomizer containing vaporizable liquid. *See* EX1010, [0019] (“when the liquid smoke is used out, it is only required to replace the atomizer instead of the connector, this can save manufacture and use cost”). Liu783, however, does not disclose any means for viewing the liquid remaining in the cartomizer. Liu438 (to the same inventor), however, teaches a

transparent liquid cartridge “to facilitate to observe the amount of the liquid smoke in the liquid smoke [cup 3].” EX1013, [0046].

A POSA would have been motivated to provide the consumer a means to determine whether the atomizer was depleted by making a portion of Liu783’s cartridge translucent. EX1005, ¶¶328-331.



Modified Liu783, Fig. 5

This provides a convenient indicator that the cartridge needs replacing. *See e.g.*, EX1012, 5:49-52 (teaching transparency because “it could be convenient for observing the smoke tar amount[.]”). Further, enabling a visual determination that the cartridge is nearly depleted promotes safety. For example, if the consumer takes a drag on depleted e-cigarette, the consumer may get a “dry hit,” which is a super-heated blast of air. EX1005, ¶ []. EX1038, 4:58-61 (“In order to facilitate observing

the usage and balance of the e-liquid in the cartridge 1, and avoiding phenomenon of the e-liquid dryout in the cartridge 1, the cartridge 1 is made of transparent plastic material.”). EX1005, ¶330.

A POSA would have had a reasonable expectation of success in making this modification. Transparent cartridges were well-known in the art. *See, e.g.*, EX1013, [0046] (teaching a transparent cartridge “to facilitate to observe the amount of the liquid smoke in the liquid smoke compartment 11.”); EX1002, 7:34-35 (disclosing a glass cartridge); EX1031, 4:22-24 (disclosing a translucent cartridge window). It would have been a simple modification to apply Liu483’s teaching and use a transparent or translucent material for Liu783’s sucking cylinder. EX1005, ¶331. Such modification would not require modification of other components and would not impede the operation of the device.

b. Battery Housing Integrated With Connector

Liu783 discloses a three piece design: a battery component, a cartomizer component, and a connector for connecting the two. To the extent it is argued that Liu788’s battery component and connector do not share a common housing or shell because they are two pieces, it would have been within the knowledge of a POSA to integrate the battery component with the connector. The prior art, for example, is replete with teachings that an e-cigarette device connector can be integrally formed with the battery portion. EX1005, ¶332. For example, U.S. Pat. App. 2014/0261495

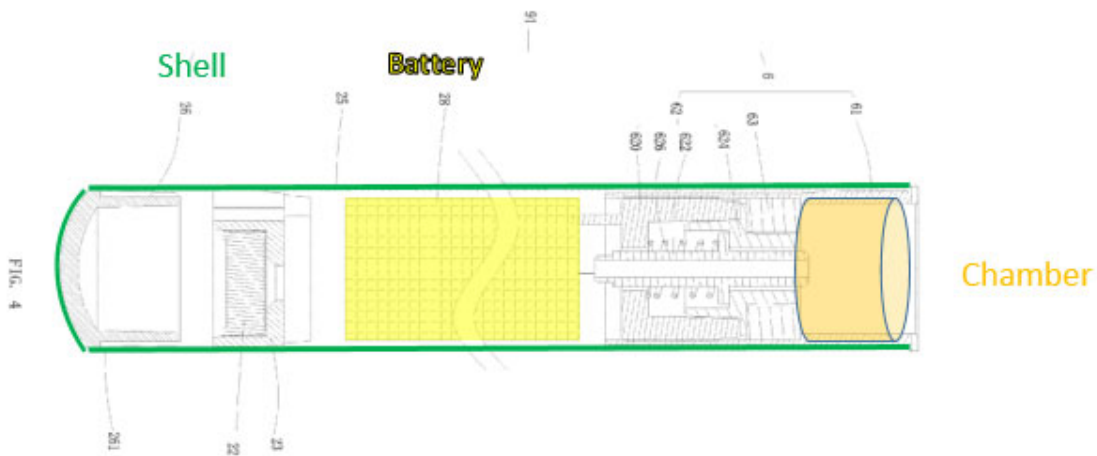
(EX1035) teaches a connector “which may comprise a portion of the control body [(battery portion)].” EX1035, [0092]; *see also e.g.*, EX1022, [0046] (teaching a two-piece e-cigarette, which improves upon prior-art three-piece e-cigarettes by having “a superior aesthetic appearance”); EX1036, 3:46-49 (“...an adaptor connecting the two portions [of an e-cigarette]...may be part of the battery portion, part of the cartomizer, or a separate component.”).

A POSA would have been motivated to adapt Liu783 to include an integrated battery/connector component for several reasons. EX1005, ¶¶332-334. First, an integrated component reduces the components and would therefore reduce the complexity and expense of manufacturing the device. EX1005, ¶333. Second, whether the connector is a separate component or integrated with the battery component is a matter of design choice from a finite number of options. EX1036, 3:46-49 (“...an adaptor connecting the two portions [of an e-cigarette]...may be part of the battery portion, part of the cartomizer, or a separate component.”). Third, a POSA would have recognized that integrating the connector with the battery component would have been beneficial to the consumer. The consumer would have fewer pieces to assemble and fewer pieces to misplace. EX1005, ¶333. Fourth, by integrating the connector with the battery component, there is less possibility the consumer damages the device during assembly/disassembly. In contrast, if the connector is a separate piece, removing the connector from the battery component

exposes the battery electrodes and other structures that would otherwise be protected in an integrated component. EX1005, ¶333.

A POSA would have had a reasonable expectation in making this modification. EX1005 ¶334. The connector is simply an extension of the battery component and integrating the connector would not interfere with the operation of the battery component or the connector. Indeed, Liu783 only contemplates replacing the cartomizer after assembly. EX1010, [0019] (“the atomizer and the connector are independently manufactured, when the liquid smoke is used out, it is only required to replace the atomizer instead of the connector, this can save manufacture and use cost[.]”).

Further, it was well-known and common practice for the battery component to connect directly to the atomizer. EX1005, ¶334. Indeed, U.S. Pat. App. 2014/0190502 (EX1025), listing the same inventor as Liu783, discloses a one-piece power shell 91 containing a battery and a chamber for receiving a cartomizer (inhaling shell 90). EX1025, [0028] (“the inhaling shell 90 and the power shell 91 is connected with each other as a whole via magnetic attraction”).



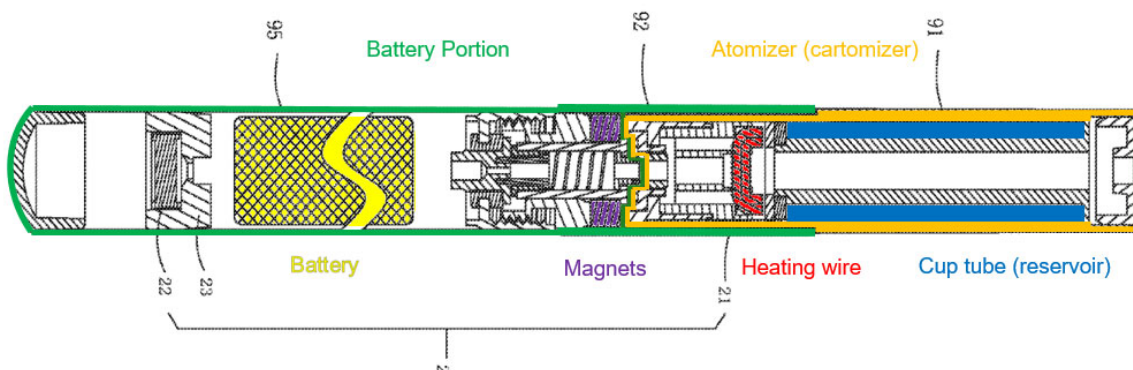
EX1025, Fig. 4

2. Claim 1

a. [1.A] A vaporizer device comprising:

Liu783 discloses this limitation. EX1005, ¶¶335-337.

Liu783 discloses an electronic cigarette. EX1010, [0001] (“This invention relates to an electronic cigarette field, and particularly to an electronic cigarette having a connector for magnetic connection.”).



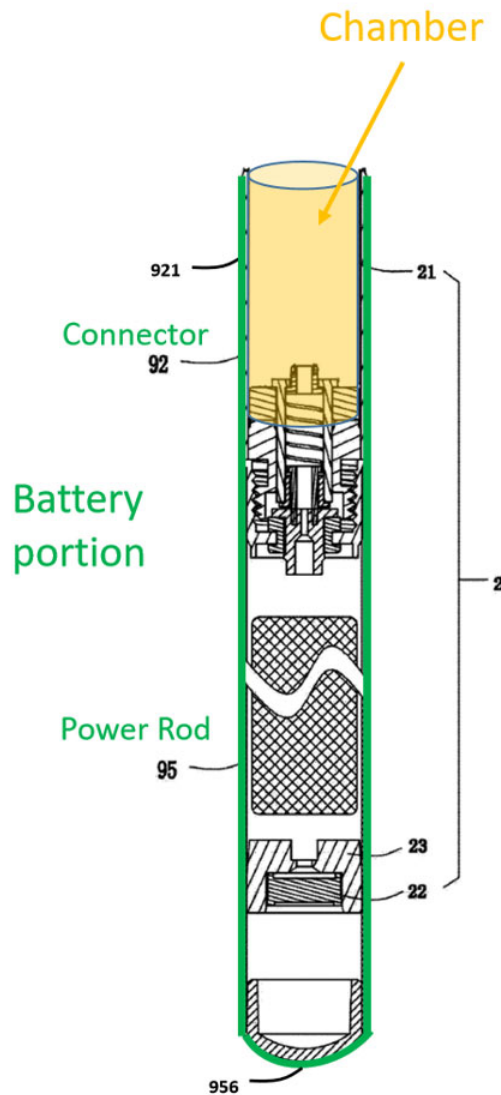
EX1010, Fig. 3

The electronic cigarette comprises heating wire 211 for vaporizing liquid. EX1010, [0034] (“The atomizing mechanism 21 is for transforming the liquid smoke into smog, and comprises a heating wire 211...”). Liu783’s electronic cigarette is a vaporizing device.

b. **[1.B] a battery portion having an outer shell and a chamber defined by the outer shell; and**

Liu783 discloses and renders obvious this limitation. EX1005, ¶¶338-341.

Liu783 discloses power rod 95 containing battery 955 and having end cap 956 joined to connector 92 (collectively the outer shell of the battery portion). EX1010, [0043] (“The power rod 95 is configured with a storage battery 955...”); [0043] (“The power rod 95 has its [*sic*] another end configured with an end cap 956...”); [0004] (“the connector has its one...end detachably connected with the power rod.”); [0043] (“the power rod 95 [has] end connected with the connector 92 [] configured with an inner thread joint 951 mating with the outer thread joint[.]”).



Liu783's Power Rod and Connector (annotated)

The combined power rod 95 and connector 92 is the recited “battery portion” as it contains the battery and chamber defined by an outer shell. Note that Liu783 does not contemplate disassembling the connector from the power rod once connected. Only the cartomizer is subsequently removed. EX1010, [0019]. Moreover, the '981 Patent itself contemplates that the battery portion may comprise

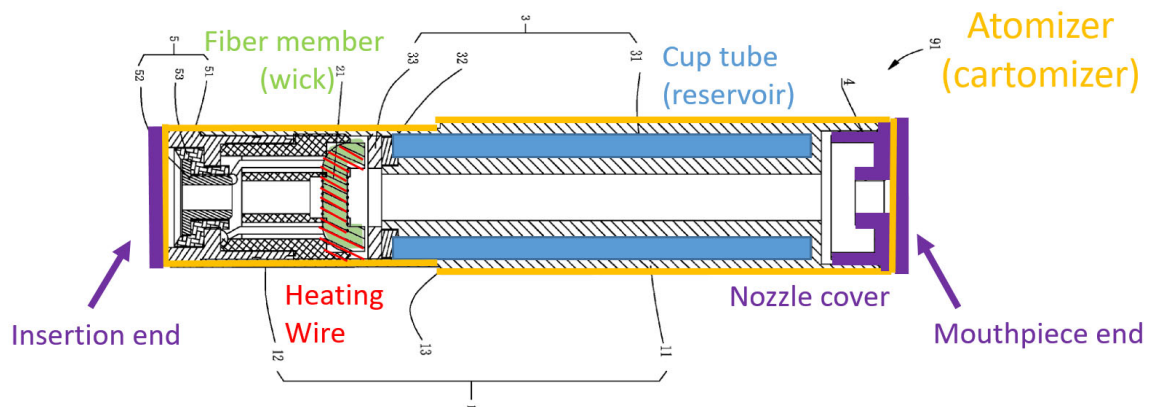
multiple segments. EX1001, 5:5-7 (“In another embodiment...the vaporizer may include a shell having a battery segment and a cartomizer receiving segment”).

To the extent the Board determines that this limitation requires a unitary outer shell, it would have been obvious to a POSA to modify Liu783 in view of the knowledge of a POSA as discussed in IX.A.1.

- c. **[1.C] a cartomizer having a mouthpiece end and an insertion end disposed opposite the mouthpiece end, the cartomizer comprising:**

Liu783 discloses this limitation. EX1005, ¶¶342-345.

Liu783 discloses atomizer 91 comprising atomizing mechanism 21 and liquid smoke cup 3 having cup tube 31 for storing liquid.

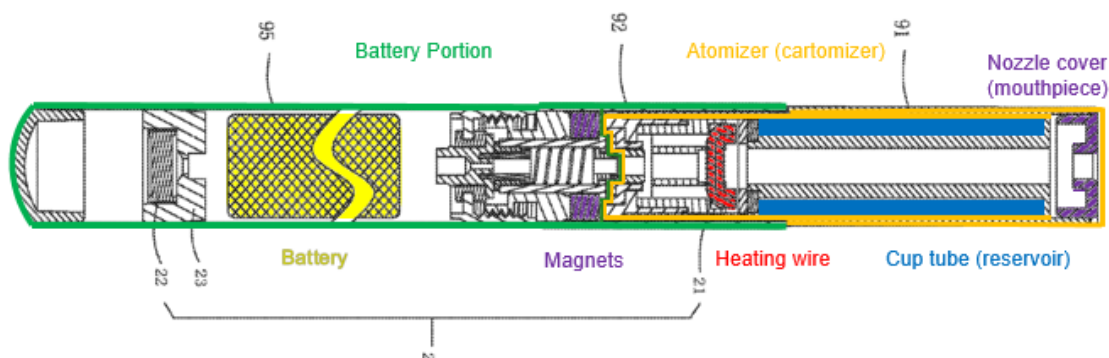


EX1010, Fig. 5

Atomizer 91 is the recited “cartomizer” because it has both liquid storage and an atomizer. Moreover, it is releasably engaged with the shell and is replaceable.

EX1010, [0004] (“the prevent invention provides an electronic cigarette having...a replaceable atomizer”).

Lui783’s atomizer 91 includes nozzle cover 4, which is at the recited “mouthpiece end.” EX1010, [0044] (“[Vapor] finally flows out of the sucking rod 90 via the vent of the nozzle cover 4.”). Atomizer 91 comprises an insert end opposite nozzle cover 4. EX1010, [0031] (“The nozzle cover 4 and the first connecting mechanism 5 are respectively installed at opposite ends of the sucking cylinder 1.”); [0030] (“the atomizer 91 and the connector 92 are magnetically connected in a manner of one inserting into another.”).



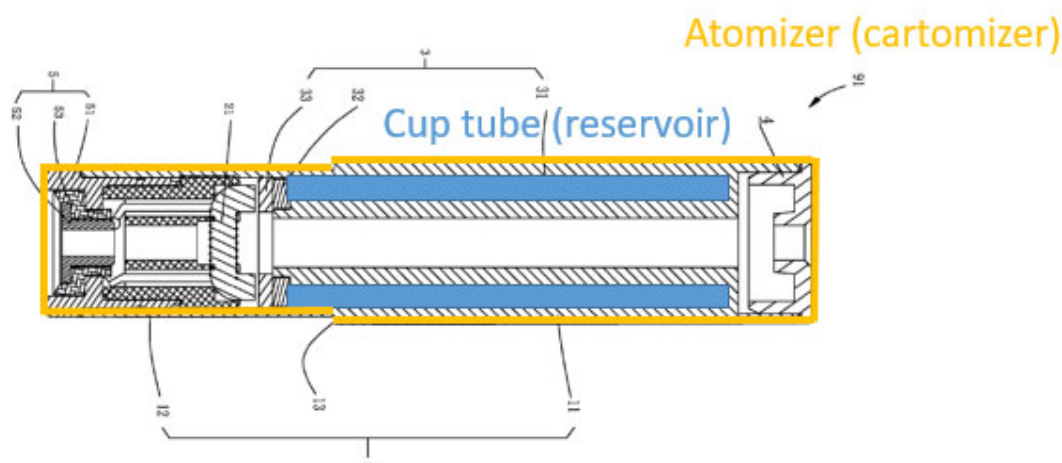
EX1010, Fig. 3.

- d. [1.D] a cartomizer body having a volume defined therein, the volume configured to hold a fluid vaporizable substance,

Liu783 discloses this limitation. EX1005, ¶¶346-347.

Atomizer 91 (cartomizer) comprises a body defined by “a hollow tubular-shaped sucking cylinder 1.” EX1010, [0031]. Cylinder 1 comprises liquid smoke

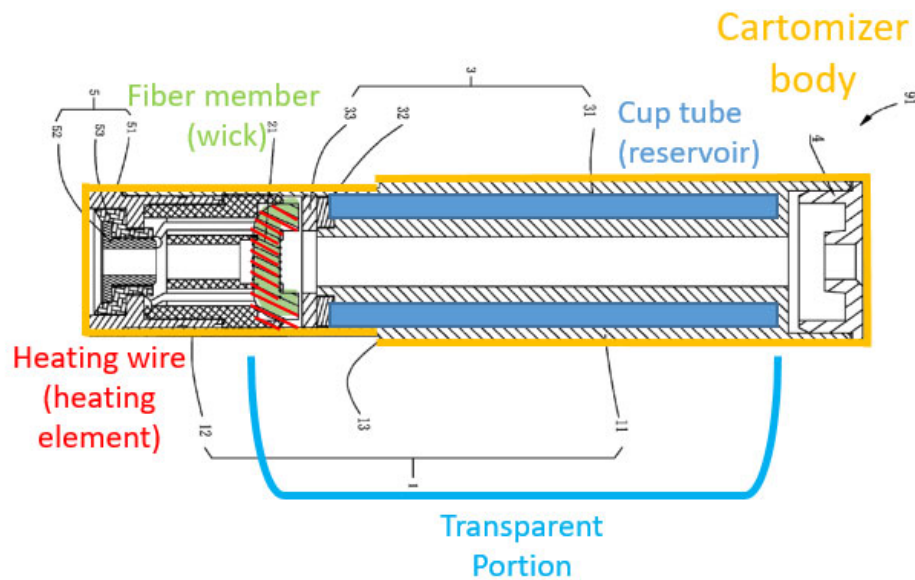
cup 3 having cup tube 31 (reservoir with defined volume) for storing liquid. *See id.*, [0035] (“The liquid smoke cup 3 comprises a cup tube 31 for storing the liquid smoke and a liquid guiding component for guiding the liquid smoke in the cup tube 31 to the atomizing mechanism 21 for atomization of the liquid smoke.”).



EX1010, Fig. 5

- e. **[1.E] wherein at least a portion of the cartomizer body comprises a translucent material configured to allow viewing of the fluid vaporizable substance,**

Liu783 and Liu438 in combination renders obvious this limitation. EX1005, ¶348. As discussed in IX.A.1, it would have been obvious to modify Liu783’s sucking cylinder 1 to include a translucent material configured to allow viewing of the remaining liquid.



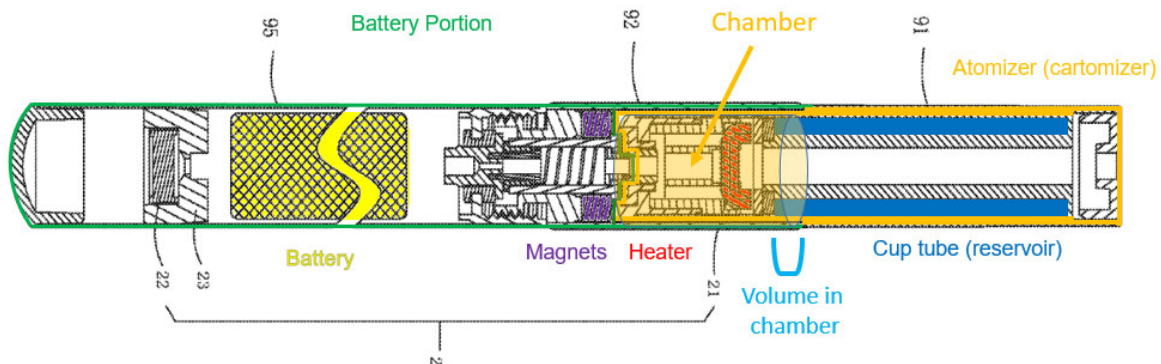
EX1010, Fig. 5

- f. [1.F] wherein the cartomizer body is configured for insertion into the chamber such that at least part of the volume is positioned in the chamber when the cartomizer body is inserted into the chamber;

Liu783 discloses this limitation. EX1005, ¶¶349-351.

Atomizer 91 (cartomizer) is configured to be inserted into the chamber of connector 92. EX1010, [0031] (“The sucking cylinder 1 comprises a main portion 11 exposed from the connector 92 and an inserting portion 12 inserted into the connector 92.”); [0030].

When atomizer 91 is inserted into connector 92, a portion of liquid smoke cup 3 (reservoir) is positioned within the chamber of connector 92:

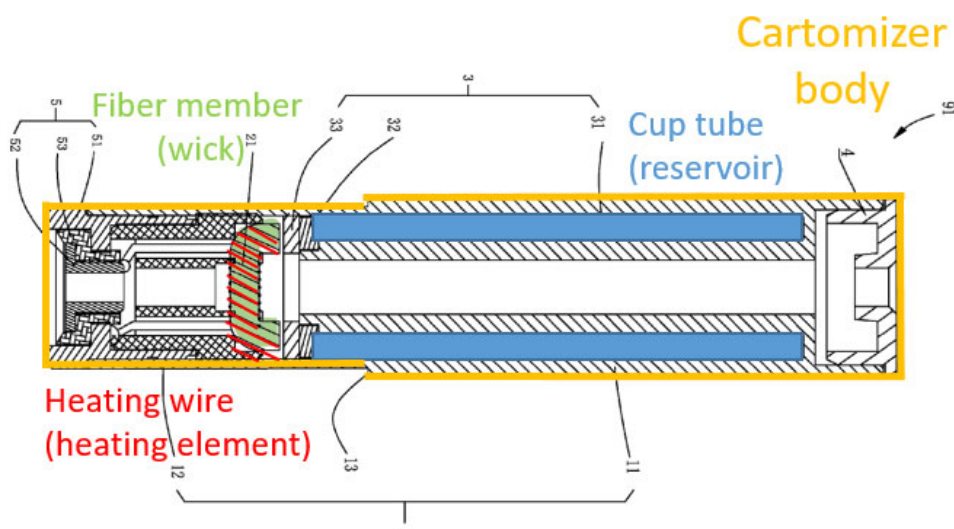


EX1010, Fig. 3

g. **[1.G] a heating element and a wicking element within the cartomizer body;**

Liu783 discloses this limitation. EX1005, ¶¶352-356.

Liu783 discloses that atomizer 91 comprises atomizing mechanism 21 having heating wire 211 (heating element) and fiber member 212 (wicking element). Fiber member 212 “is capable of absorbing water and reserving water like a sponge, and is capable of being made of fiberglass or a material having liquid-absorbent and liquid barrier properties such as cotton material.” EX1010, [0034]; *id.* (“fiber member 212 abuts against the liquid smokecup 3 to absorb the liquid smoke out of the liquid smoke cup 3.”).



EX1010, Fig. 5

Liu783 discloses a heating element under the adopted construction because Liu783’s heating wire is a “conductive material shaped into a wire, coil, or flat ribbon that generates heat in response to current.” Liu783’s heating wire is a “wire” that is “wound around” the wick, *i.e.*, coiled around, and is electrically connected to a power source for “atomizing it [fluid].” *See* EX1010, [0034].

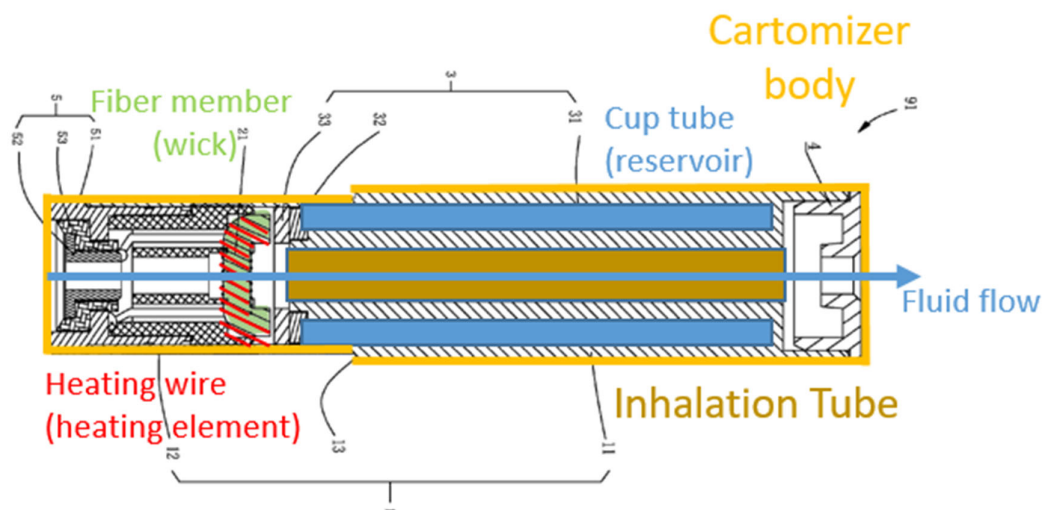
Liu783 discloses a wicking element under the adopted construction because Liu783 discloses a “fiber member 212” that absorbs liquid from the cup tube for vaporization by a wire wound around the fiber member. EX1010, [0034], *see also* [0015], [0035]. Because fiber member 212 is “made of fiberglass or a material having liquid-absorbent and liquid barrier properties such as cotton material,” it transports liquid by capillary action. EX1010, [0034]; ~~EX1005, [0034]~~.

Note that Liu783 even discloses a wick under the construction proposed by Petitioner in the ITC Investigation (but not adopted here) because Liu783 discloses that “fiber member 212” that delivers liquid to heating wire 211, and which is a pliable bundle of fiberglass fibers. EX1010, [0034], *see also* [0015], [0035].

h. **[1.H] an inhalation tube in fluid communication with the heating element and the wicking element;**

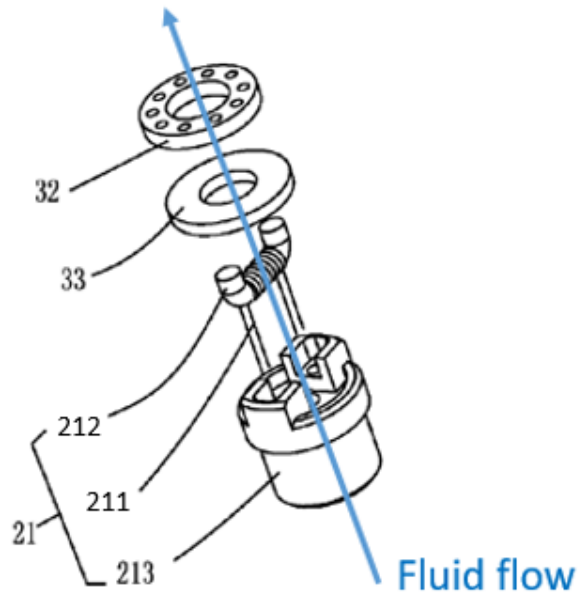
Liu783 discloses this limitation. EX1005, ¶¶357-359.

Sucking cylinder 1 comprises a “vent axially extended therethrough” (inhalation tube). EX1010, [0031].



EX1010, Fig.5

The vent is in fluid communication with heating wire 211 and fiber member 212. “Air enters the atomizer 91... then passes by the vent of the atomizing holder 213 and the vent of the sucking cylinder 1.” EX1010, [0044].



EX1010, Fig.4¹

- i. **[1.I] a mouthpiece at or proximate to the mouthpiece end, the mouthpiece in fluid communication with the inhalation tube; and**

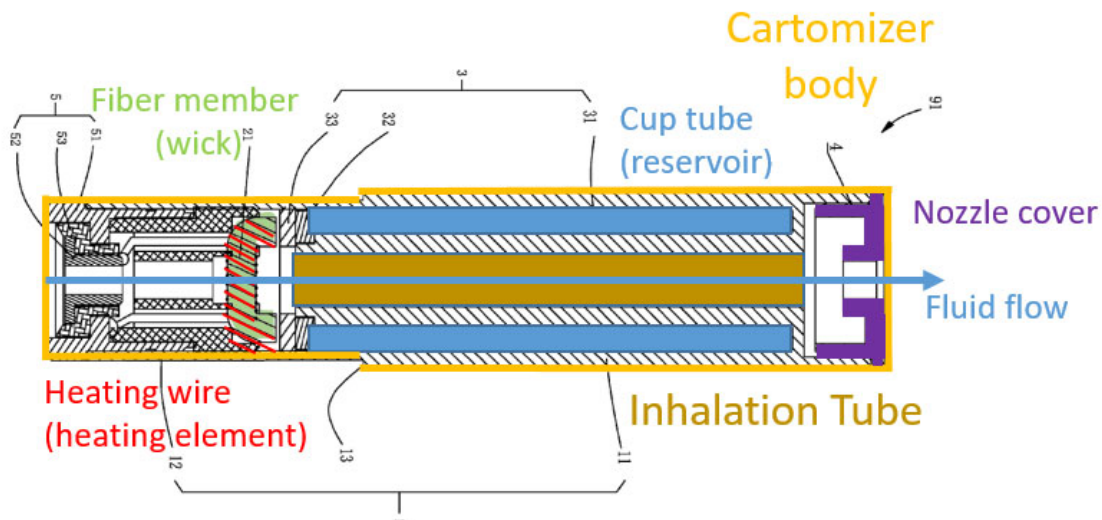
Liu783 discloses this limitation. EX1005, ¶¶360-362.

A consumer inhales vapor from nozzle cover 4. EX1005, ¶361. Thus, the nozzle cover 4 is a portion of the device to be used by a mouth and therefore a mouthpiece as Patent Owner has applied that term in the ITC investigation.

¹ Numbers 211 and 212 have been swapped in the annotated figure above. What is now marked as 212 is the fiber element, and 211 is the heating wire. EX1005, ¶¶359. EX1010, [0044].

Specifically, Patent Owner has taken the position that the term mouthpiece means a portion used by a mouth. EX1049.002. Petitioner has applied that meaning for purpose of this Petition.²

Air “enters the atomizer 91...then passes by the vent of the atomizing holder 213 and the vent of the sucking cylinder 1, finally flows out of the sucking rod 90 via the vent of the nozzle cover 4.” EX1010, [0044]. Thus, nozzle cover 4 is in fluid communication with the vent (“inhalation tube”).



EX1010, Fig. 5.

² Petitioner applied that meaning for this Petition without conceding that Patent Owner’s construction is appropriate for any other patent. Petitioner notes that other patents can require a mouthpiece that is a separate component from the other components of a cartridge, such as a storage compartment.

j. **[1.J] a plurality of cartomizer electrical contacts on an exterior of the insertion end,**

Liu783 discloses this limitation. EX1005, ¶¶363-364.

Liu783 discloses that “an end of the atomizer 91 mated with the connector 92 is configured with a first connecting mechanism 5.” EX1010, [0030]. Liu783 discloses that “first connecting mechanism 5 comprises a first seat 51 as a first electrode..., and a first pole 52 as a second electrode... and a first insulating sleeve 53.” EX1010, [0032]. First seat 51 and first pole 52 are the recited “cartomizer electrical contacts” (see next limitation for engagement with battery contacts) and are located on the exterior of the insertion end of atomizer 91 (cartomizer).

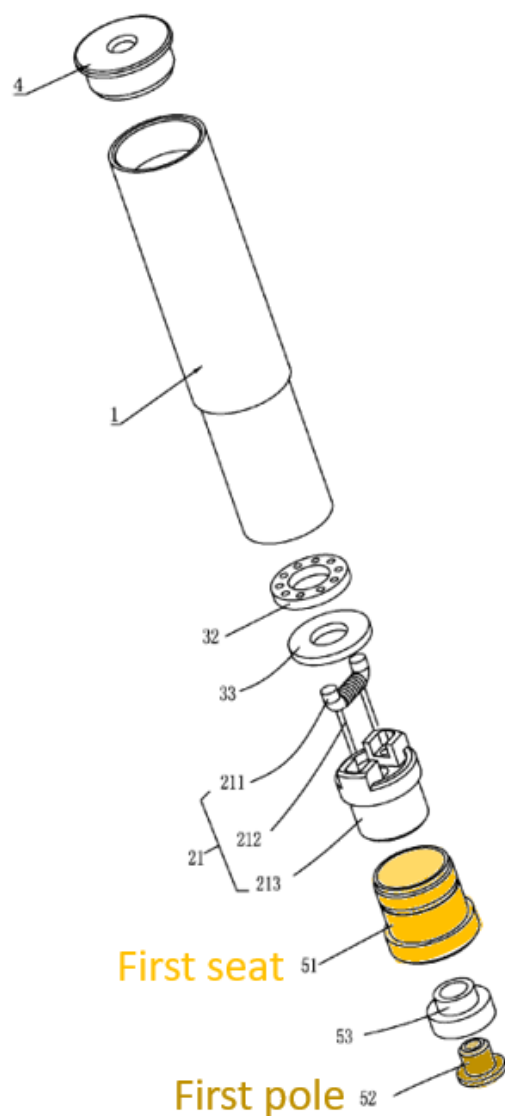
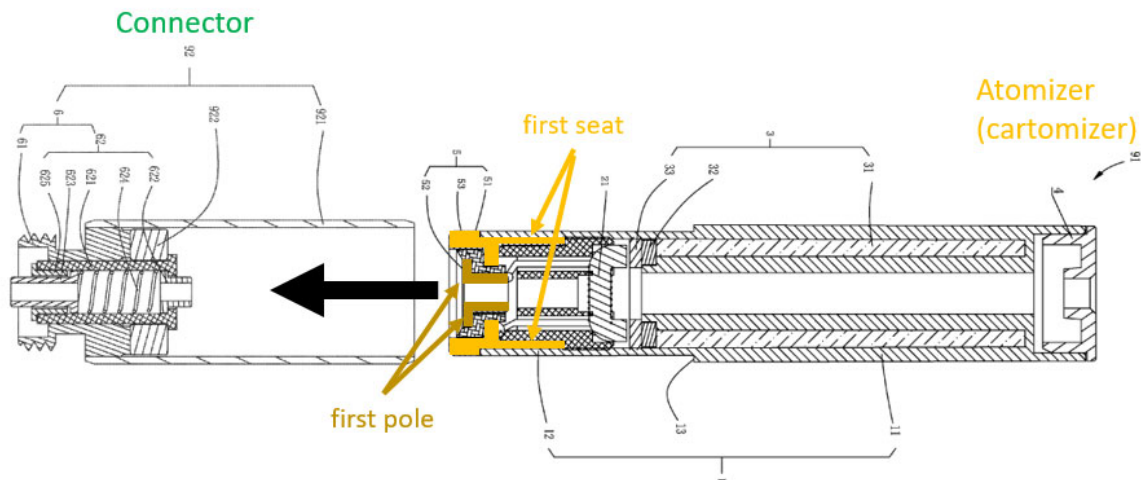


FIG. 4

Liu783, Fig. 4.



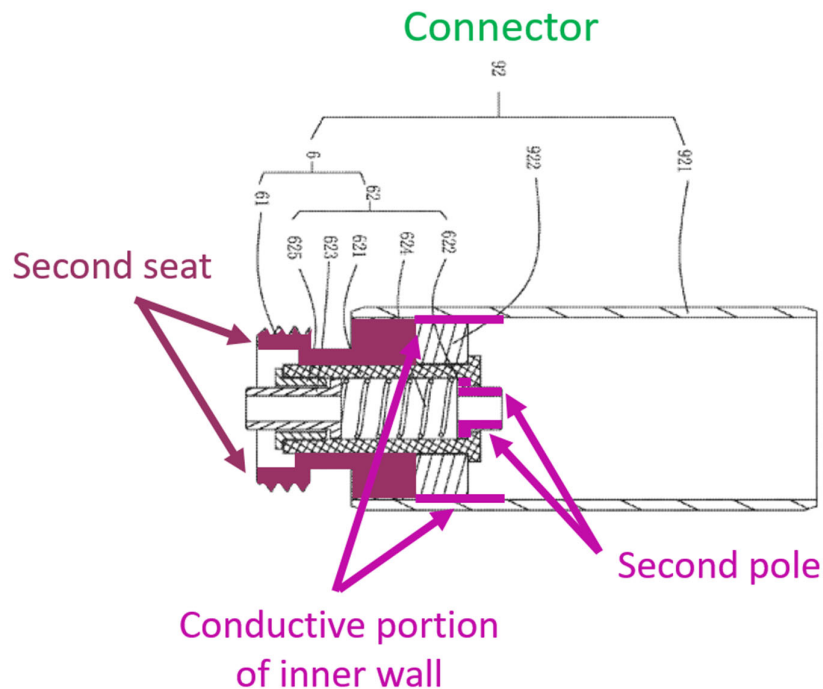
- k. **[1.K] wherein the plurality of cartomizer electrical contacts is positioned to contact a plurality of battery electrical contacts at a base end of the chamber when the cartomizer body is inserted into the chamber.**

Liu783 discloses this limitation. EX1005, ¶¶365-369.

Liu783 discloses first connecting mechanism 5 comprises first seat 51 and first pole 52. [1.J]. Liu783 also discloses second connecting mechanism 6 comprising second seat 61 and second pole unit 6 having second pole 622, spring 624, and upper pole 623.

When Liu783's cartridge is inserted into the chamber, second pole 622 contacts first pole 52. EX1010, [0042] ("the second pole 622 of the second connecting mechanism 6 is slightly retracted for it is abutted against by an end face of the first pole 52").

Second seat 61, however, is separated from the chamber base by permanent magnet 922 and does not contact first seat 51. *See* Fig. 7, below. To provide electrical coupling, a portion of inner wall of casing 921 is conductive. EX1010, [0042] (“moreover, the side wall of the first seat 51 and the inner wall of the connecting casing 921 circumferentially contact with each other to realize conduction therebetween, to thereby achieve corresponding conduction of inner circuits of the atomizer and the connector 92.”).



EX1010, Fig. 7.

Thus, the conductive portion of the inner wall of the connecting casing 921 is the electrical contact (it does the contacting).

Accordingly, the “battery electrical contacts” at the base end of the chamber consist of second pole 622 and the conductive portion of casing 921. Note that Liu783 discloses, in one embodiment, conductive magnets, in which case the circuit could also be completed through the magnets. EX1010, [0018].

3. Claim 2: The cartomizer of claim 1, wherein the translucent material comprises glass or plastic.

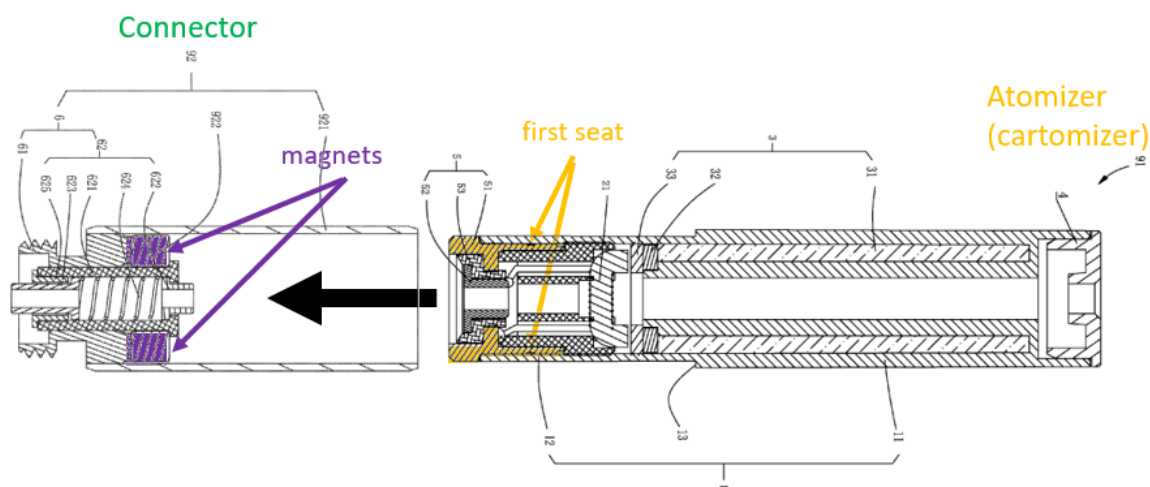
Liu783 in view of Liu438 and the knowledge of a POSA renders obvious this limitation. EX1005, ¶¶590-593.

Liu783 in combination with Liu438 renders obvious a cartridge comprising a translucent material. [1.E]. It would have been further obvious in view of a POSA’s knowledge to use glass or plastic as the translucent material. A POSA would have been motivated to use glass or plastic and would have had a reasonable expectation of success because they are the most commonly used translucent materials. EX1005, ¶593. Also, the prior art is replete with cartridges made with glass or plastic. See e.g., EX1002, 7:33-35 (disclosing a glass or plastic cartridge); EX1031, 7:52-53 (disclosing a cartridge made of translucent plastic); EX1038, 4:58-61 (“the cartridge 1 is made of transparent plastic material.”).

3.4. Claim 5: The cartomizer of claim 1, wherein the cartomizer further comprises a structure that secures the cartomizer in the chamber, and wherein the structure comprises a cartomizer metallic surface configured to be attracted to at least one magnet in or proximate to the chamber.

Liu783 disclose this limitation. EX1005, ¶¶ 370-372.

Liu783 discloses that atomizer 91 (cartomizer) is secured within the chamber by a permanent magnet. EX1010, [0042] (“As shown in FIG. 3, when the first connecting mechanism 5 of the atomizer 91 is inserted into the connecting casing 921 of the connector 92 to the right place, the first seat 51 has its one end to abut against or be close to the permanent magnet 922 of the second connecting mechanism 6. Because of the magnetic force of the permanent magnet 922, the first seat 51 is firmly attracted by the permanent magnet 922 but cannot be easily detached from the connector 91.”).



Liu783 discloses that first seat 51 “is capable of being made of a conductive magnet or magnetic material such as an iron material”. EX1010, [0041], [0032]. Iron provides a metallic surface. EX1005 ¶372.

4.5. Claim 13

a. **[13.A] A vaporizer device comprising:**

Disclosed. [1.A].

b. **[13.B] a battery portion having an outer shell and a chamber defined by the outer shell; and**

Disclosed. [1.B].

c. **[13.C] a cartomizer having a mouthpiece end and an insertion end disposed opposite the mouthpiece end, the cartomizer comprising:**

Disclosed. [1.C].

d. **[13.D] a cartomizer body having a volume defined therein, the volume configured to hold a vaporizable substance,**

Disclosed. [1.D].

e. **[13.E] wherein the vaporizable substance is in a fluid state,**

Disclosed. [1.D].

f. **[13.F] wherein the cartomizer body is configured for insertion into the chamber such that at least part of the volume is positioned in the chamber when the cartomizer body is inserted into the chamber;**

Disclosed. [1.F].

g. **[13.G] a heating element within the cartomizer body;**

Disclosed. [1.G].

h. **[13.H] cartomizer electrical contacts operable to direct current to the heating element, wherein the cartomizer electrical contacts are on an exterior of the cartomizer body; and**

Liu783 discloses this limitation. EX1005, ¶¶380-382.

Liu783 discloses first seat 51 and first pole 52 as “cartomizer electrical contacts [] on an exterior of the insertion end of the cartomizer body.” [1.J].

Liu783 further discloses that the “opposite ends of the heating wire 211 pass through the atomizing holder 213 and then are electrically connected with the positive and the negative.” EX1010, [0034]. Liu783 also discloses “heating wire 211 to atomize it [liquid].” EX101, [0035]. A POSA would have understood that first seat 51 and first pole 52 are operable to direct current to heating wire 211. EX1005.

- i. **[13.I] a wicking element inside the cartomizer body, the wicking element configured to absorb the vaporizable substance;**

Liu783 discloses this limitation. EX1005, ¶¶383-384.

Liu783 discloses fiber member 212 (“wicking element”) within the cartomizer body. *See* [1.G]. Liu783 discloses that the fiber member is “for absorbing liquid smoke,” *i.e.*, vaporizable substance. EX1010, [0034].

- j. **[13.J] an inhalation tube in fluid communication with the heating element and the wicking element; and**

Disclosed. [1.H].

- k. **[13.K] a mouthpiece at or proximate to the mouthpiece end, the mouthpiece in fluid communication with the inhalation tube.**

Disclosed. [1.I].

5.6. Claim 14: The cartomizer of claim 13, wherein at least a portion of the cartomizer body comprises a translucent material configured to allow viewing of the fluid vaporizable substance.

Obvious. [9.D].

6.7. Claim 15: The cartomizer of claim 13, wherein the vaporizable substance comprises a liquid comprising nicotine.

Liu783 discloses claim 15. EX1005, ¶¶388-390.

Liu783 describes its invention as an “electronic cigarette,” and nicotine is the main ingredient of cigarette. EX1010, [0001]; EX1005 ¶389; *see e.g.*, EX1021, 1:33-34, 3:45-47 (disclosing an “electronic cigarette” using a nicotine-containing “cigarette liquid”). Liu783 further discloses its liquid is liquid smoke. [1.D]. The phrase “liquid smoke” indicates the liquid comprises nicotine. EX1005 ¶389. In addition. To the extent is argued that Liu783 and Liu438 do not disclose nicotine, it would have been obvious to a POSA, in view of the knowledge of a POSA, that liquid smoke in an e-cigarette device would contain nicotine as nicotine is common in e-cigarette devices and is simply a design choice. EX1005 ¶390; *See, e.g.*, EX1015, 1:24-28; EX1021, 1:33-34, 3:45-47; EX1027, 3:51-55. A POSA would have had a reasonable expectation of success using nicotine because of its pervasiveness in e-cigarettes and it would not negatively impact the functioning of the device. EX1005, ¶390.

~~7.8.~~ **Claim 16:** The cartomizer of claim 13, wherein cartomizer electrical contacts are positioned to contact a plurality of battery electrical contacts at a base end of the chamber when the cartomizer body is inserted into the chamber.

Disclosed. [1.K].

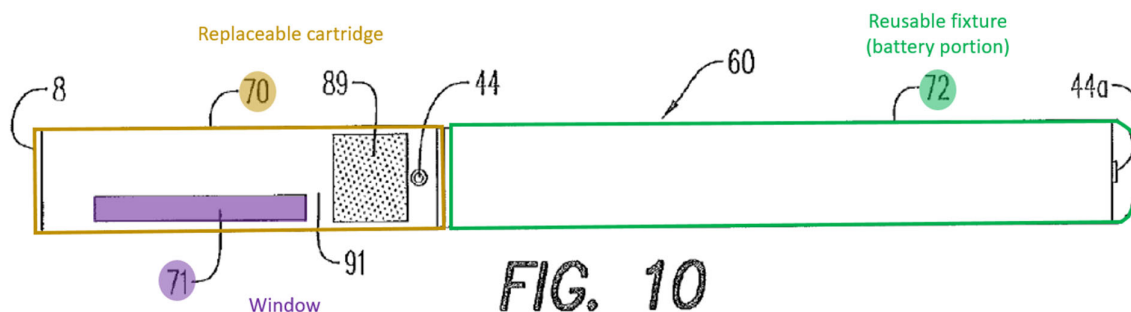
B. **Ground 2:** Liu783, ~~and Liu438 further in view of~~ and Tucker ~~and the knowledge of a POSA reader (claims 9-10, and 17-18) unpatentable under 35 U.S.C. § 103~~

1. **Motivation to Combine**

a. **Window on the Outer Shell**

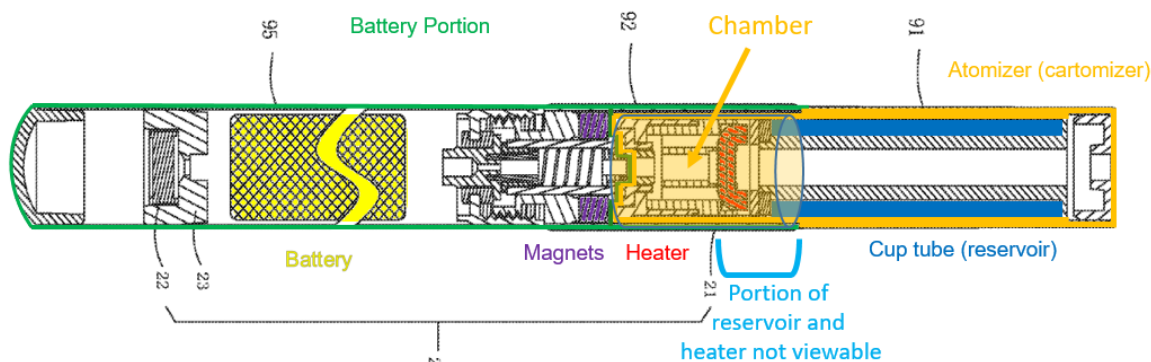
Liu783 in view of Liu483 disclose a transparent cartridge but do not disclose that the outer shell covering the cartridge includes a window. Ground 1, [1.E].

Tucker, on the other hand, teaches a window for review the remaining liquid. EX1034, [0038] (disclosing an e-cigarette with an “outer tube [] includ[ing] a clear (transparent) window 71 formed of a transparent material so as to allow a smoker to see the amount of liquid material remaining in the liquid supply reservoir 22.”).



EX1034, Fig. 10

A POSA would have been motivated to take Tucker’s teachings and include a window on the outer shell, either as transparent plastic or a cutout for “facilitating to observe the amount of the internal liquid smoke, and prevent an empty burning of the heating wire after the liquid smoke has run out.” EX1030, 4:32-25; EX1005, ¶¶393-399. The figure below illustrates the portion of Liu783 that a POSA would be motivated to make transparent in order to view liquid in the liquid container.



EX1010, Fig. 3

Using a window to view liquid amounts was common in the prior art. U.S. Pat. No. 6,155,268, for example, discloses a “peeping window” that permits viewing of a transparent e-vapor liquid container. EX1052, 7:31-41 (“a transparent peeping window (not shown) can be formed in that portion of the side wall of the casing 12 which corresponds to the liquid container 32... to observe the remaining amount of the liquid flavor source 34 within the liquid container 32. In this case, the liquid container 32 itself must be formed of a transparent or translucent material. Naturally, the remaining amount of the liquid flavor source 34 within the liquid container 32

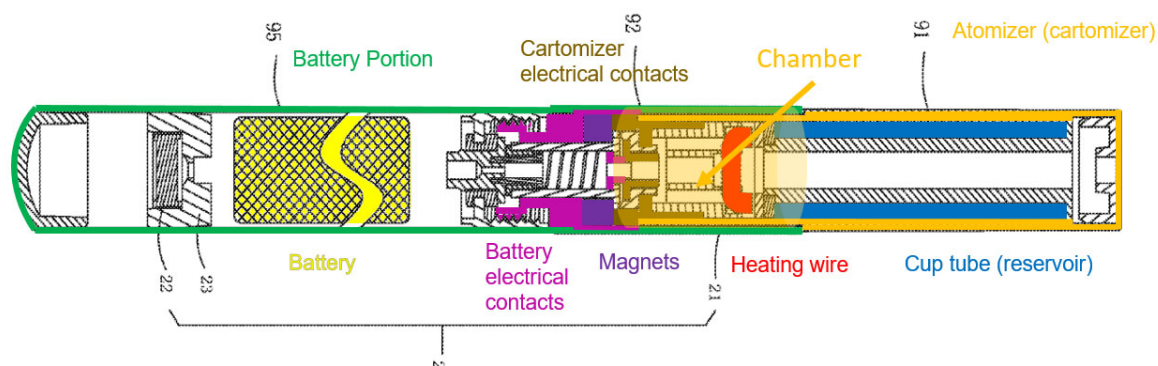
can be observed through the peeping window so as to find the timing of replenishing the liquid flavor source 34.”). *See also* EX1030, 4:32-35; EX1031, 4:22-25.

Without a window, a consumer might be misled about the remaining liquid because the visible transparent portion of the cartridge may suggest the cartridge is depleted. The consumer may replace a cartridge not needing replacement. Or, a consumer might assume liquid remains in the obscured portion, which may lead to the consumer using the device when the wick is desiccated, potentially resulting a “dry hit.” *See* EX1030, 4:32-35. Finally, while Fig. 3 depicts a small overlapping portion, Fig. 3 is not an engineering drawing and is not necessarily drawn to scale. Moreover, a POSA would have been further motivated to include a window because the overlap could be extended to make a more stable connection with the cartomizer portion.

A POSA would have had a reasonable expectation of successfully adding a Tucker’s transparent window to Liu783’s battery portion. EX1005, ¶399. Such a modification simply requires making a portion of the shell transparent or translucent (and plastic can be either) or cutting an opening on the connector wall. Neither affects the functioning of Liu783’s device. EX1005 ¶399.

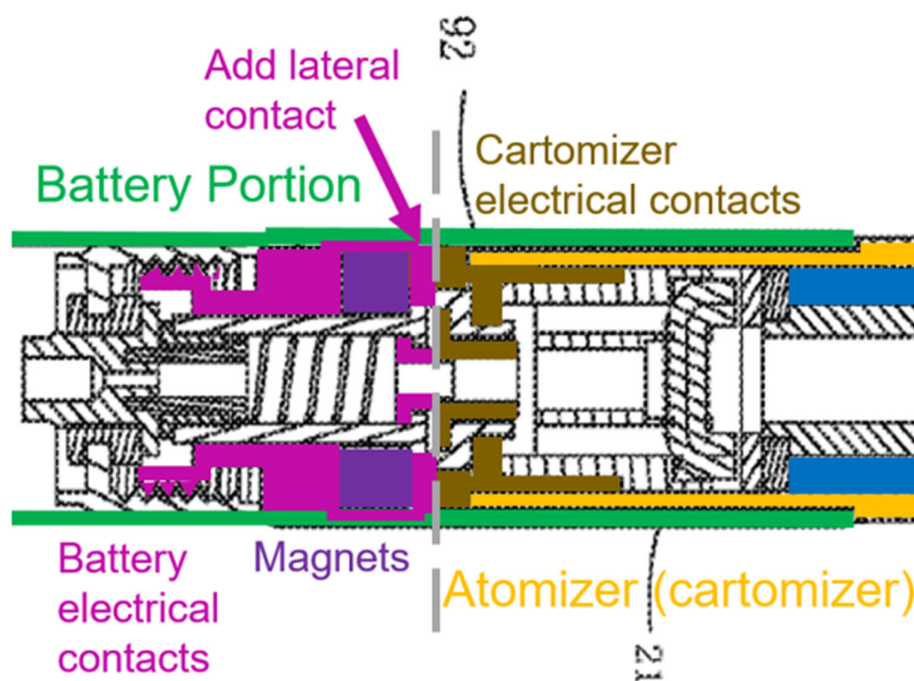
b. Coplanar Electrical Contacts

Liu783 discloses battery electrical contacts at a base end of the chamber. The battery electrical contacts are configured to contact the cartomizer electrical contacts. See Ground 1, [1.K].

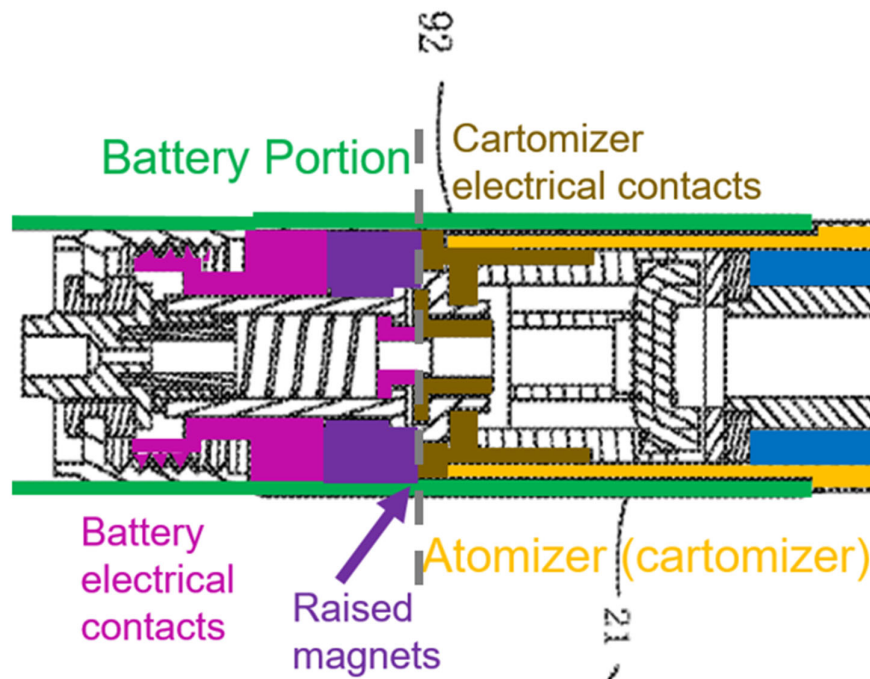


EX1010, Fig. 3

To the extent these battery electrical contacts are not “coplanar,” the knowledge of a POSA renders obvious coplanar contacts. EX1005, ¶¶400-404. There are a finite number of ways to arrange concentric electrical contacts, *e.g.*, male-female, female-male, or flat. Liu783 discloses a female (atomizer) – male (battery portion) arrangement. EX1005 ¶401. A POSA would have recognized that Liu783’s electrodes could easily be arranged to be flat. EX1005, ¶401; EX1004, Fig. 2. For example, the outer battery electrical contact on the side wall could be extended over the top surface of the magnets. EX1005 ¶401.



Alternatively, the magnets could be used as the outer battery electrical contacts and raised level with the inner electrode (requiring a corresponding adjustment with the cartomizer contacts). EX1005, ¶402. Liu783, itself, teaches that magnets can be electrical contacts. EX1010, [0041].



A POSA would have been motivated to modify Liu783's electrical contacts to be coplanar. EX1005, ¶403. This would be a better arrangement than the side wall connector because the magnet is biasing the atomizer towards the base of the battery portion, not the side wall – thus providing a more stable electrical contact. EX1005, ¶403. Moreover, level contacts minimize dirt buildup in the recessed contacts. EX1005, ¶403.

A POSA would have had a reasonable expectation of success modifying Liu783's contacts to be coplanar because the modifications would be simple without affecting the operation of the device. Further, coplanar contacts were well known in the art, and are thus a predictable use of electronic vaporizer components according to their established functions. EX1005, ¶404; *see e.g.*, EX1004, [0027], [0034];

EX1002, 6:58-60; EX1044, [0017], Fig. 2; EX1045, [0017], Fig. 2; EX1046, [0030], Fig. 2.

c. Rechargeable Battery

Liu783 discloses a battery housing segment containing a battery. EX1010, [0043] (“power rod 92 is configured with a storage battery 955”). Liu783, however, does not explicitly disclose a rechargeable battery.

A POSA would have been motivated to adapt Liu783 to use a rechargeable battery because there are a finite number of design options, *e.g.*, battery, rechargeable battery, or connected power. EX1005, ¶¶ 405-409; *see, e.g.*, EX1004, 9:28-33 (disclosing a rechargeable battery). Moreover, Liu783 already discloses a battery, thus it would have been obvious to use a rechargeable battery in place of the battery. EX1005, ¶406.

A POSA would have been further motivated to adapt Liu783 to use a rechargeable battery because, as compared to disposable batteries, rechargeable batteries provide economic savings, convenience, and ease of mind. EX1005, ¶407. For example, when a disposable battery runs dry, a new battery must be purchase. With a rechargeable battery, consumers can simply recharge the battery. *See e.g.*, EX1005, ¶407; EX1027, 4:1-5 (“When the rechargeable battery inside the electronic cigarette runs out of power, it may be directly plugged into the charger for charging, with no need to remove the rechargeable battery, resulting in very easy use.”).

A POSA would have had a reasonable expectation of successfully adding a rechargeable battery to Liu783. EX1005, ¶408. Indeed, the art is replete with other vaporization devices that have rechargeable batteries. *See e.g.*, EX1021, 2:26-27; EX1022, [0010]; EX1027, 2:10-13. A POSA would have had every expectation that a device already containing a battery would continue to operate once that battery is made rechargeable. EX1005, ¶408.

2. Claim 9

a. [9.A] A vaporizer device comprising:

Disclosed. [1.A].

b. [9.B] a cartomizer comprising,

Disclosed. [1.C].

c. [9.C] a cartomizer body configured to hold a fluid vaporizable substance,

Disclosed. [1.D].

d. [9.D] wherein at least a portion of the cartomizer body comprises a translucent material configured to allow viewing of the fluid vaporizable substance;

Obvious. [1.F].

e. [9.E] a heating element and a wicking element within the cartomizer body; and

Disclosed. [1.G].

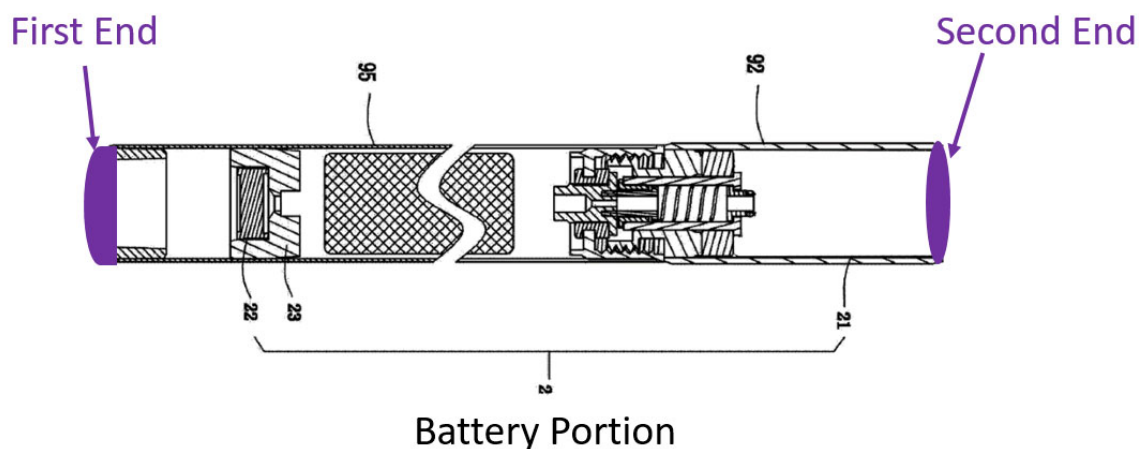
f. [9.F] a plurality of cartomizer electrical contacts on an exterior of the insertion end; and

Disclosed. [1.J].

g. **[9.G] a battery portion, the battery portion having a first end and a second end and comprising:**

Liu783 discloses this limitation. EX1005, ¶¶416-417.

Liu783 discloses power rod 95 and connector 92, which, when engaged, is the recited “battery portion.” Ground 1, [1.B]. The battery portion has first and second ends:

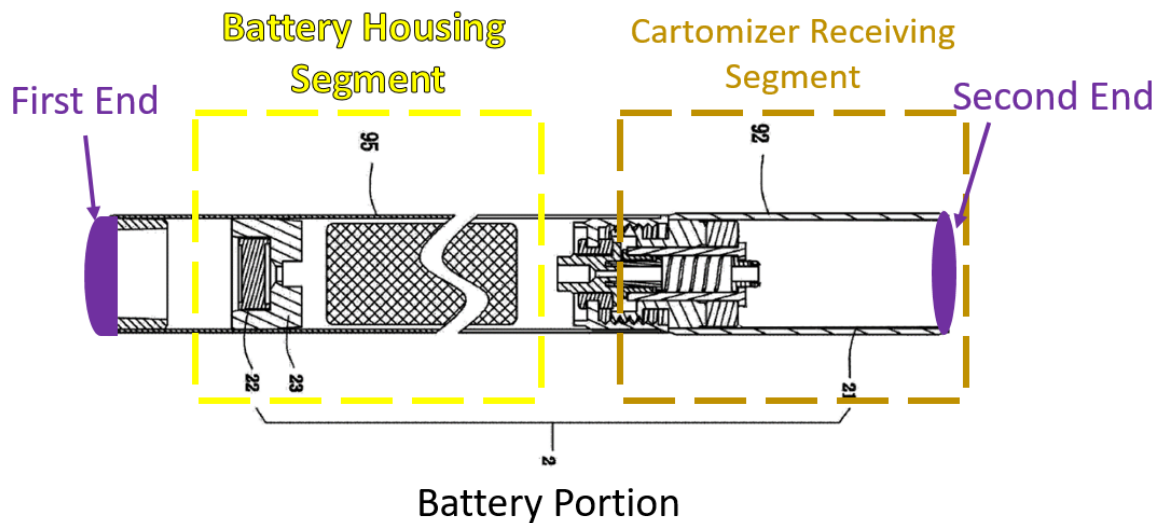


EX1010, Fig.3

h. **[9.H] a battery housing segment proximate the first end of the battery portion; and**

Liu783 discloses this limitation. EX1005, ¶¶418-419.

Liu783 discloses a battery portion consisting of power rod 95 and connector 92. Ground 1, [1.B]. Power rod 92 contains a battery, and is the recited “battery housing segment” proximate the first end of the battery portion. Ground 1, [1.B].

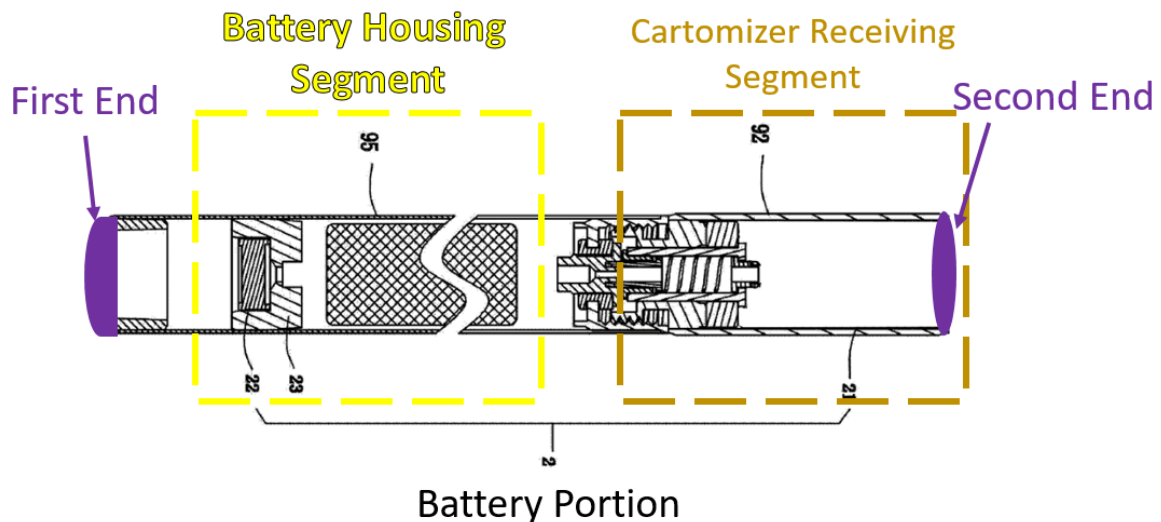


EX1010, Fig.3.

- i. [9.I] a cartomizer receiving segment proximate the second end of the battery portion,

Liu783 discloses this limitation. EX1005, ¶¶420-421.

Liu783 discloses a battery portion consisting of power rod 95 and connector 92. Ground 1, [1.B], Ground 2 [9.I]. Connector 92 is the receiving segment.

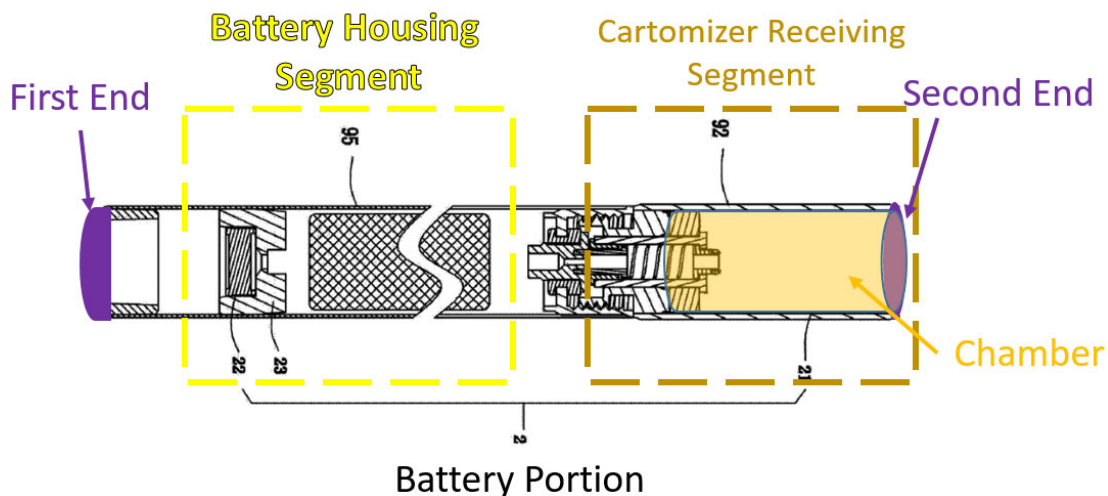


EX1010, Fig. 3.

- j. **[9.J] the cartomizer receiving segment comprising a chamber defined by an outer shell of the battery portion,**

Liu783 discloses and renders obvious this limitation. EX1005, ¶¶422-424.

Liu783 discloses a battery portion having a chamber defined by the outer shell. Ground 1, [1.B], [1F].



EX1010, Fig. 3.

To the extent that this limitation requires a unitary outer shell, a POSA would have been motivated to provide a power rod integrated with the connection as discussed in IX.A.1.

- k. **[9.K] wherein a window is provided in the outer shell, and wherein the translucent portion of the cartomizer body aligns with the window when the cartomizer body is inserted into the chamber.**

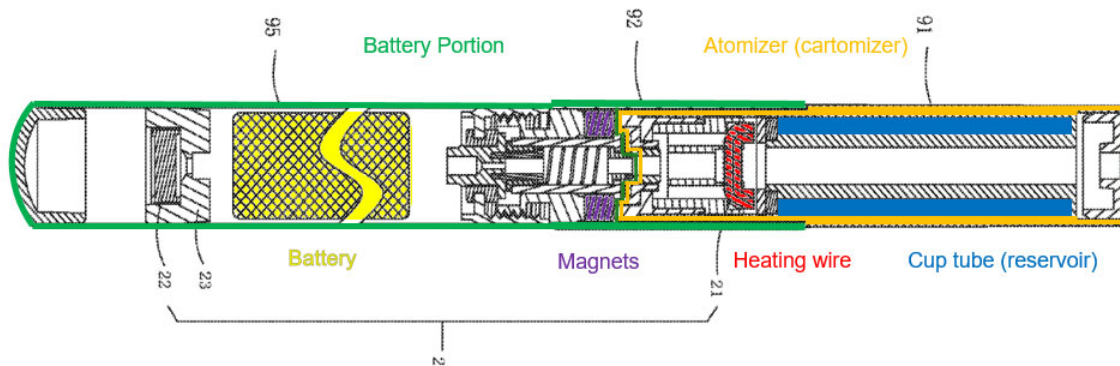
Liu783, Liu438, and Tucker in combination renders obvious this limitation. EX1005, ¶¶425-426.

Liu783 and Liu438 renders obvious a translucent cartomizer. [9.D]. As discussed in IX.B.1, a POSA would have found it obvious to modify Liu783's cartridge receptacle, in view of Tucker's teachings, such that it comprises a transparent window permitting viewing of the liquid smoke cup when the atomizer 91 is inserted into the connector. EX1005, ¶426. This would be a "window" under the parties' constructions.

3. Claim 10: The vaporizer device of claim 9, wherein outer shell is commonly shared by the battery housing segment and the cartomizer receiving segment.

Liu783 and Tucker in view of the knowledge of a POSA renders obvious this limitation. EX1005, ¶¶427-429.

Liu783 discloses a battery portion consisting of connector 92 threadedly connected to power rod 95. Ground 1, [1.B]. The battery portion has an outer shell defined by connecting case 921, end cap 956, and the side wall of the power rod, which is a commonly shared outer shell. *Id.*



EX1010, Fig. 3

To the extent that this limitation requires a unitary outer shell, a POSA would have been motivated to produce a power rod integrated with the connection as discussed in IX.A.1.

4. **Claim 11: The vaporizer device of claim 9, further comprising a rechargeable battery in the battery housing segment.**

Liu783, Liu438, and Tucker in view of the knowledge of a POSA renders obvious this limitation. EX1005, ¶¶430-431.

Liu783 discloses power rod 95 (battery housing segment) containing a battery. Ground 1, [1.B], Ground 2, [9.H]. A POSA would have recognized that disposable batteries are readily interchangeable with rechargeable batteries. *See* IX.B.1.

5. **Claim 17**

- a. **[17.A] A vaporizer device comprising:**

Disclosed. [9.A].

- b. **[17.B] a cartomizer comprising:**

Disclosed. [9.B].

- c. [17.C] a cartomizer body configured to hold a vaporizable substance, wherein the vaporizable substance is in a fluid state,

Disclosed. [9.D], [13.E].

- d. [17.D] wherein the cartomizer body is configured for insertion into a chamber defined by an outer shell of a battery portion of a vaporizer device,

Disclosed. [1.B], [1.F].

- e. [17.E] a heating element within the cartomizer body,

Disclosed. [1.G].

- f. [17.F] cartomizer electrical contacts operable to direct current to the heating element, and

Disclosed. [13.H].

- g. [17.G] a mouthpiece at or proximate to the mouthpiece end, the mouthpiece in fluid communication with the inhalation tube; and

Disclosed. [1.I].

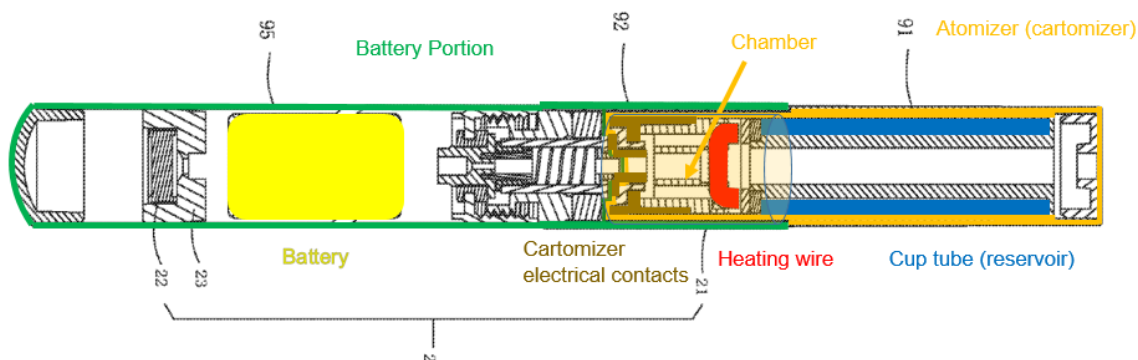
- h. [17.H] a battery portion, the battery portion having a first end and a second end, the battery portion comprising:

Disclosed. [9.G].

- i. [17.I] a chamber of a cartomizer receiving segment, the chamber configured for receiving the cartomizer body, the cartomizer electrical contacts, and the heating element through an opening at a distal insertion end of the battery portion,

Liu783 discloses this limitation. EX1005, ¶¶440-441.

Liu783 discloses a cartomizer receiving segment having a chamber configured to receive the atomizer 91. Ground 1, [1.F], Ground 2, [9.J]. When the atomizer is inserted into the connector, first seat 51 and first pole 52 and heating wire 21 are disposed within the chamber. *See* Fig. 3:

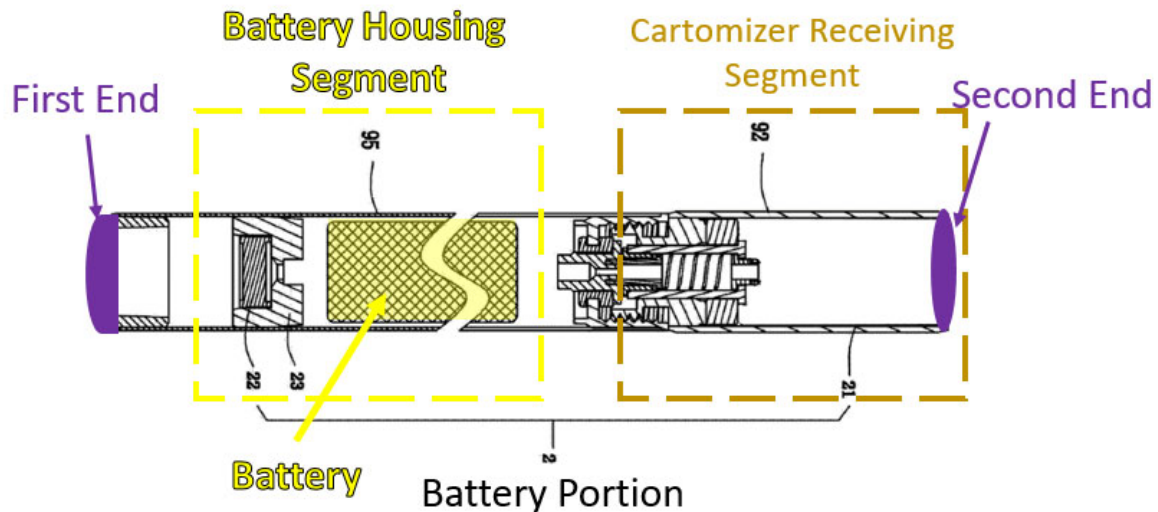


EX1010, Fig. 3

- j. [17.J] a battery segment disposed between the cartomizer receiving segment and a battery end of the battery portion opposite from the distal insertion end of the battery portion, the battery segment comprising a battery,

Liu783 discloses this limitation. EX1005, ¶¶442-443.

Liu783 discloses a battery portion comprising a battery. Ground 1, [1.B]. Power rod 95, the recited “battery segment,” is disposed between connector 92, the “cartomizer receiving segment”, and a battery end of the battery portion opposite from the distal insertion end. *See* [9.H]; [9.I].



EX1010, Fig. 3.

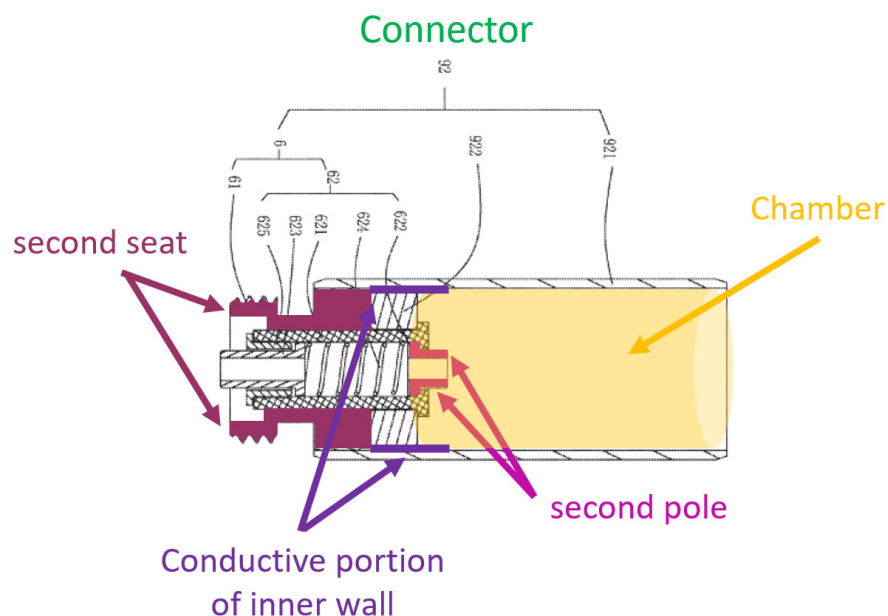
- k. [17.K] battery electrical contacts for completing a circuit with the cartomizer electrical contacts when the cartomizer electrical contacts are received into the chamber, the battery electrical contacts being coplanar, and

Liu783 discloses this limitation. EX1005, ¶¶444-448.

This limitation requires the “battery electrical contacts being coplanar” with no recitation of what the contacts are co-planar with, *e.g.*, the surface of the receiving end of the chamber³. Because Liu783 discloses two contacts, and two points always

³ “Co-planar” is not used in the ’981 specification in the context of the battery electrical contacts, and where it is used, the specification provides a reference point – *i.e.*, it defines the plane and then considers the objects. EX1001, 7:31-34 (“In

fall on a plane, Liu783's contacts are co-planar. This is seen in Fig. 7, which is a 2-D image (*i.e.*, a plane), that simultaneously depicts the inner side wall of connecting casing 921 and second pole 622 (the two battery contacts). The contacts further exist in at least a second plane as a straight line and be drawn across Fig. 7 that runs through casing 921 (purple line, outer contact) and pole 622 (pink, inner contact).



EX1010, Fig. 7

To the extent that the Board requires that the topmost portions (not express in the limitation) of the battery contacts must be planar with the surface of the receiving

embodiments where button 118 is *coplanar or aligned with the surface of outer shell 106*, as described herein, ring indicator 116 may also be coplanar or aligned *with button 118 and the surface of outer shell 106.*”).

end of the chamber (not express in the limitation), Liu783 in view of the knowledge of a POSA renders this limitation obvious as set forth in IX.B.1.

- l. [17.L] an outer shell forming at least part of the chamber, wherein a window is formed in the outer shell to permit viewing of the cartomizer body when the cartomizer body is received into the chamber.

Obvious. [9.K].

6. Claim 18

- a. [18.A] The vaporizer device of claim 9, wherein the cartomizer has a mouthpiece end and an insertion end disposed opposite the mouthpiece end, the cartomizer further comprises,

Disclosed. Ground 1, [1.C].

- b. [18.B] an inhalation tube in fluid communication with the heating element and the wicking element; and

Disclosed. Ground 1, [1.H].

- c. [18.C] a mouthpiece at or proximate to the mouthpiece end, the mouthpiece in fluid communication with the inhalation tube;

Disclosed. Ground 1, [1.I].

- d. [18.D] wherein the plurality of cartomizer electrical contacts is positioned to contact a plurality of battery electrical contacts at a base end of the chamber when the cartomizer body is inserted into the chamber.

Disclosed. [17.K].

C. **Ground 3: Liu783, ~~and~~ Liu438 ~~further in view of~~ and Zheng**
~~(render claim 8 unpatentable under 35 U.S.C. § 103)~~

1. **Motivation to Combine**

a. **Compressible Electrical Contacts**

Liu783 discloses two pairs of corresponding cartomizer and battery electrical contacts and provides that one pair includes a compressible electrode. Ground 1, [1.J], Ground 1, [1.K]. Liu 783, however, does not disclose that the second pair includes a compressible electrode.

Zheng, however, discloses compressible battery contact push pins for an e-cigarette device. The push pins comprise “resilient battery columns” having “a spring 302 inside [a] hollow cavity” and “a movable probing head [] disposed at the opening of the hollow cavity.” EX1050, 3:7-13.

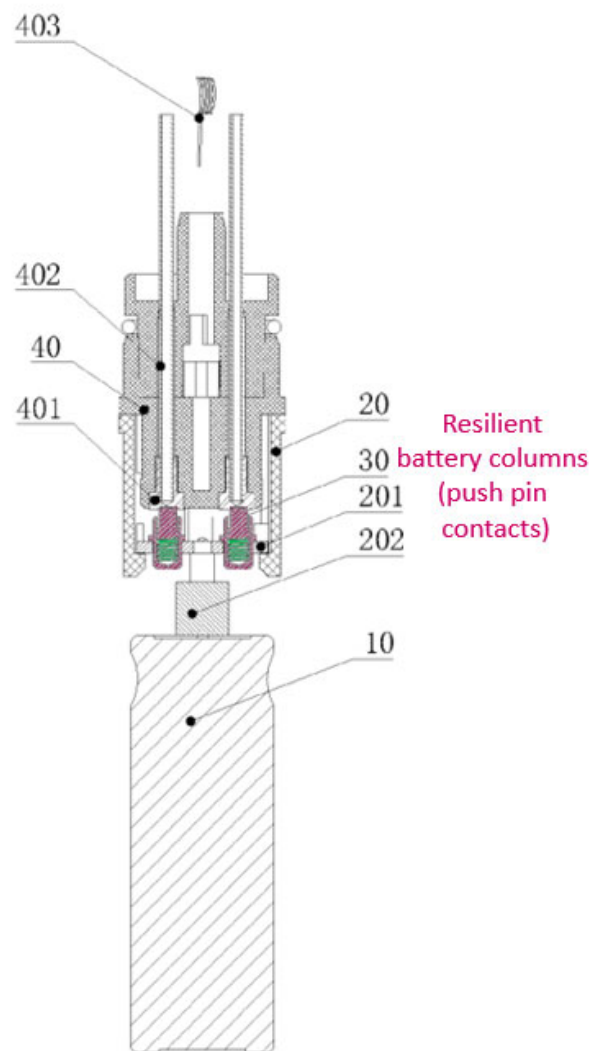


FIG.1

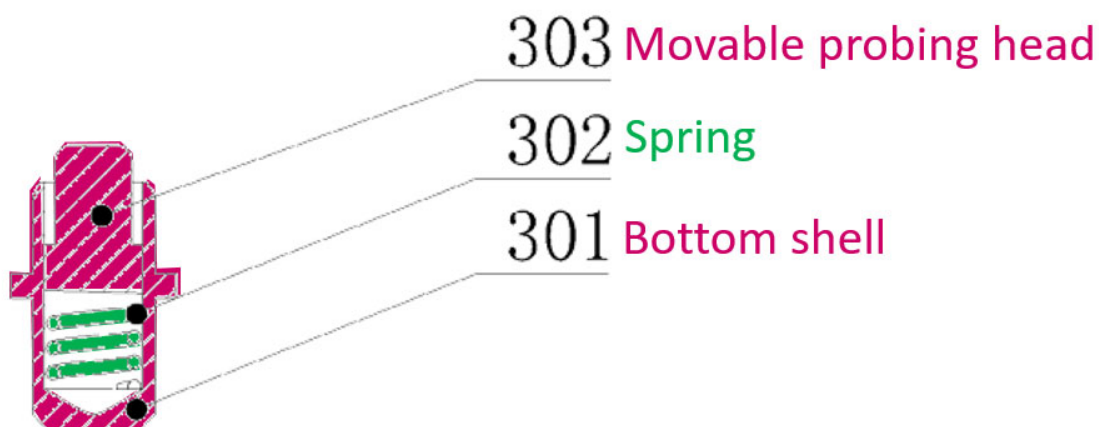
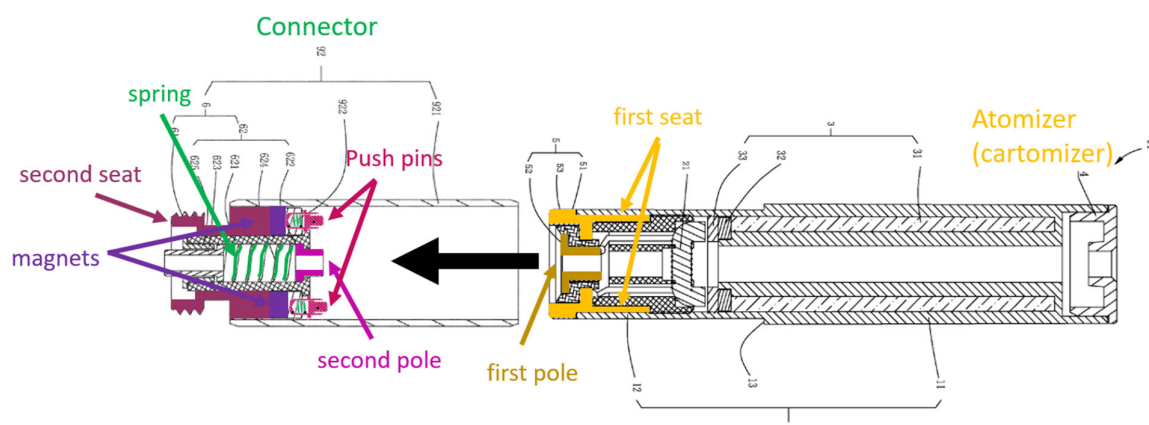


FIG.2

EX1050, Figs. 1-2

A POSA would have been motivated to adapt Liu783 to include such push pins because they provide a reliable alternative to Liu783's side wall connectors. EX1005, ¶457. In unmodified Liu783, there is no biasing force towards the side wall connectors. Thus, as the sidewall connectors wear down from sheer forces from repeated cartomizer insertions, the electrical coupling could become destabilized. *Id.* Push pin connectors, in contrast, have a biasing force towards the cartomizer contacts. So even if the contacts wear, the biasing forces will ensure a stable electrical coupling. *Id.* Moreover, by using push pins over the Liu783's battery magnets, the magnets will provide an attractive force to the cartomizer contacts, pulling those contacts into the push pins. Push pins located over the battery magnets

can connect to the battery electrode either through the side wall contact or the battery magnets themselves can be conductive. *Id.*; EX1010, [0041].



A POSA would have been further motivated to use push pin contacts because the contacts are self-cleaning – movement against the corresponding cartomizer contacts would remove dirt and debris from the contacts. Ex1005, ¶459. Finally, Zheng notes that its push pins are “simple” and “easy to manufacture.” EX1050, 1:58-61.

A POSA would have had a reasonable expectation of successfully adding push pin contacts to Liu783. EX1005, ¶460. Push pin contacts are well-known, available, and commonly used in electrical devices. *See, e.g.*, EX1009 at 1:5-7, 3:35-41, Fig. 3. A POSA would have had no trouble adapting Liu783 to include such contacts. EX1005, ¶460. Moreover, combining Zheng with Liu783 would be routine and predictable. *Id.*

1. **Claim 8: The cartomizer of claim 1, wherein the plurality of cartomizer electrical contacts is further configured to at least partially compress the plurality of battery electrical contacts when the cartomizer body is inserted into the chamber.**

Liu783 and Lin438 in view of Zheng renders obvious this limitation. EX1005, ¶461-462.

As discussed in IX.C.1, it would have been obvious to a POSA to use push pin contacts. EX1005, ¶462.

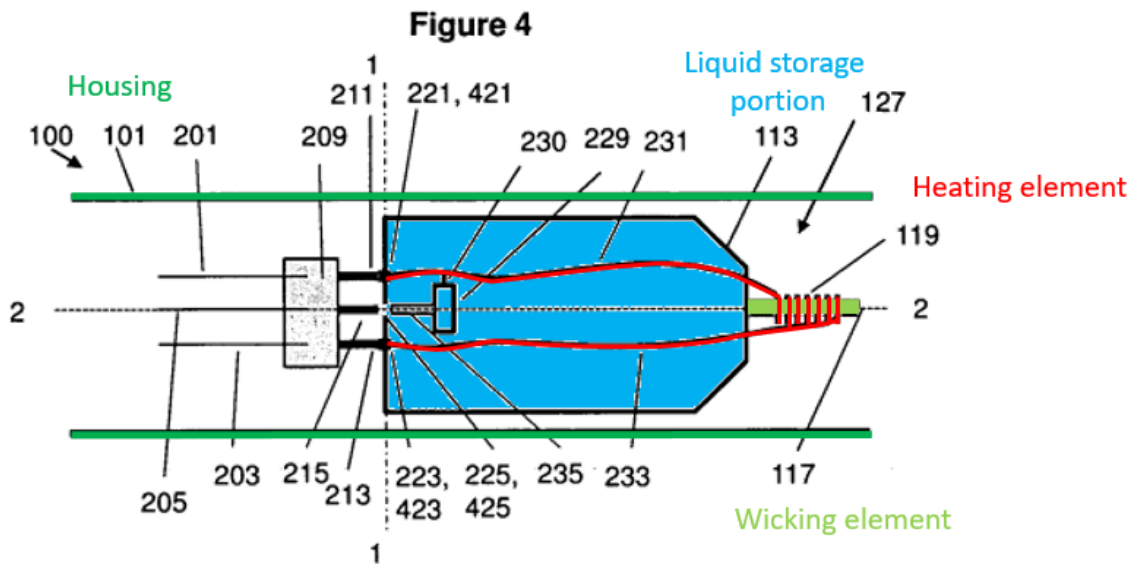
D. Ground 4: Thorens788 and in view of Thorens231 renders (claims 1, 2 and 13-16) unpatentable under 35 U.S.C. § 103

1. **Motivation to Combine**

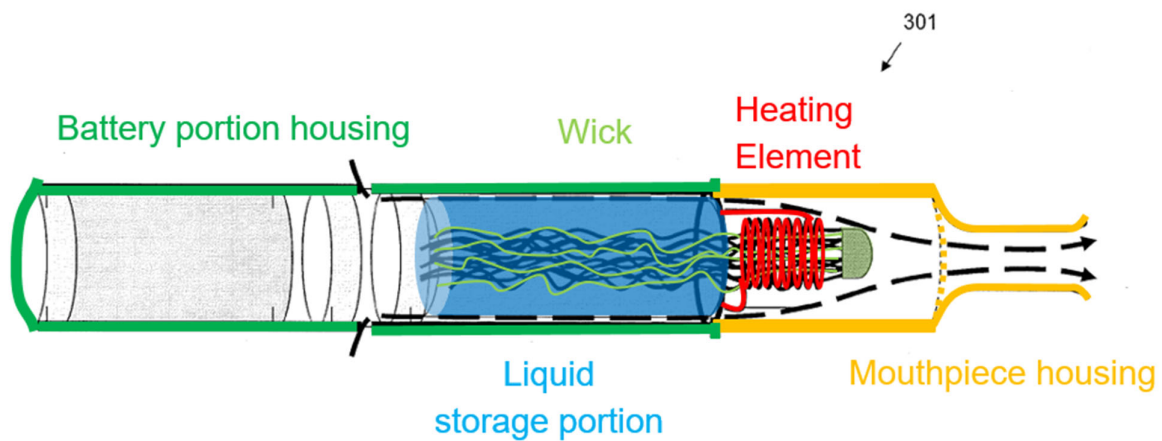
- a. **Mouthpiece housing**

Thorens788 and Thorens231 share common inventors and are directed to substantially the same device. Thorens788 discloses an aerosol generating system comprising a housing having a shell and a mouthpiece. EX1004, 10:25-11:1. Thorens231 discloses an electrically heated smoking system that includes a shell and a replaceable mouthpiece. EX1002, Abstract. There are a few material differences between the references. First, while Thorens788 describes a “mouthpiece” comprising a heating element and liquid container, it does not provide an illustration of the mouthpiece housing in any of its figures. Thorens231, however, provides such an illustration. EX1002, Fig. 3. Second, Thorens788 discloses that its heating element is fully contained within the shell. EX1004, Fig. 4. Thorens231, in contrast,

discloses that the heating element is outside the shell. EX1002, Fig. 3. These differences, however, are minor and do not diminish that these devices are substantially identical.

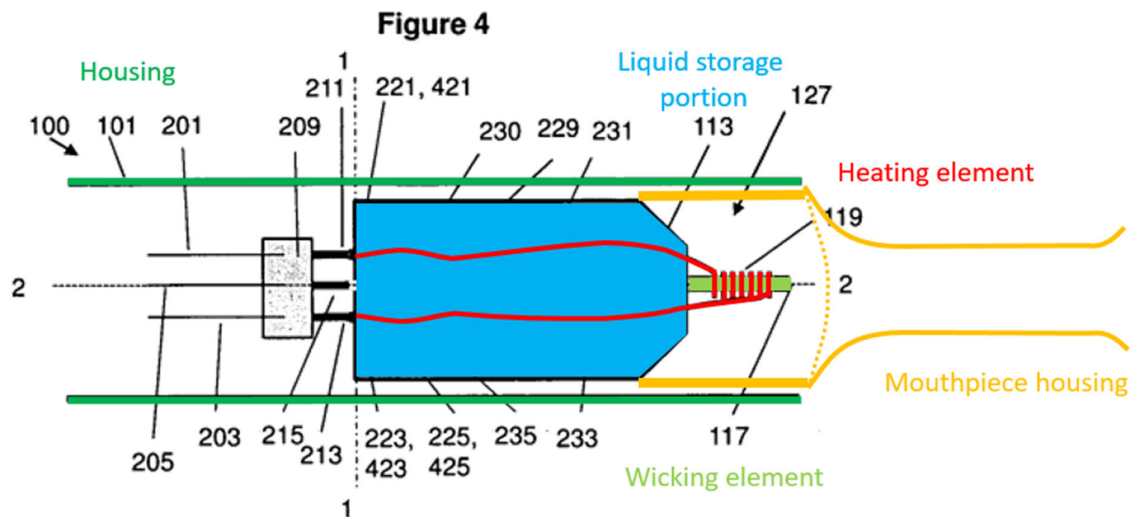


EX1004, Fig. 4



EX1002, Fig. 3.

A POSA would have been motivated to modify Thorens788 to have a mouthpiece housing such as the mouthpiece housing illustrated by Thorens231 that protects the heating and wick elements. EX1005, ¶¶464-467. Thorens788 already discusses a mouthpiece housing and a POSA would have looked to Thorens231, which shares common inventors and is directed to substantially the same invention. EX1005, ¶467. Moreover a POSA would have been motivated to provide a mouthpiece housing for Thorens788 because the mouthpiece is replaceable, and without a housing, a consumer would be forced to grip the heating element to remove the mouthpiece. EX1005, ¶467. That could lead to injury if the heating coil is still hot. Accordingly, a POSA would have been motivated to modify Thorens788, for example, as follows:



2. Claim 1

a. [1.A] A vaporizer device comprising:

Thorens788 discloses this limitation. EX1005, ¶¶468-469.

Thorens788 is directed to an “aerosol generator or a smoking system.” EX1004, 1:4. Thorens788 discloses a device that provides liquid to a heater for vaporization. EX1004, 6:22-23 (“In use, when the heater is activated, liquid provided by the liquid storage portion is vaporized by the heater to form a supersaturated vapour.”). Accordingly, Thorens788 discloses a vaporizer device.

b. [1.B] a battery portion having an outer shell and a chamber defined by the outer shell; and

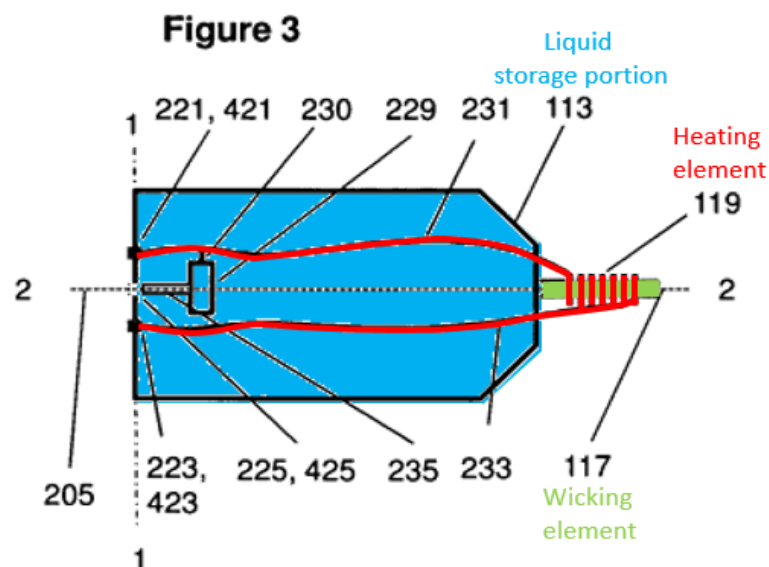
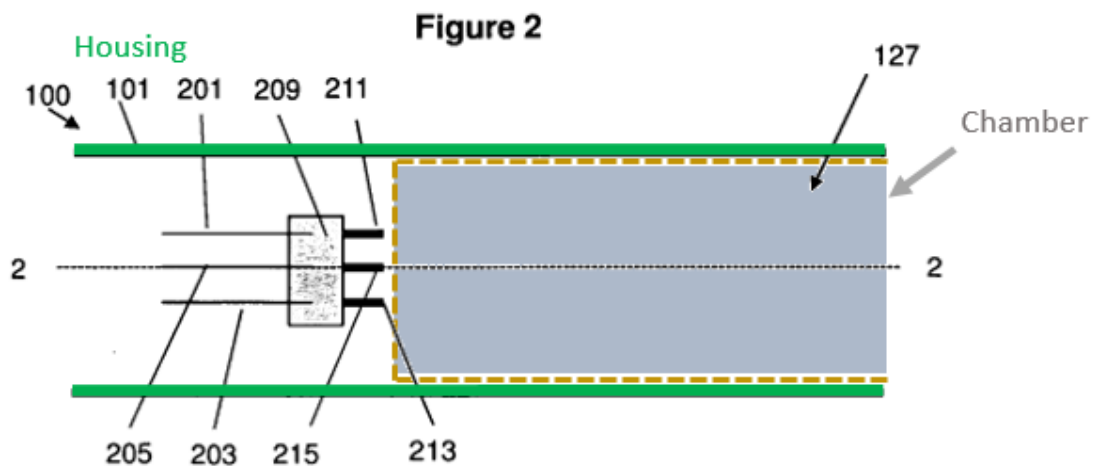
Thorens788 discloses this limitation. EX1005, ¶¶470-474.

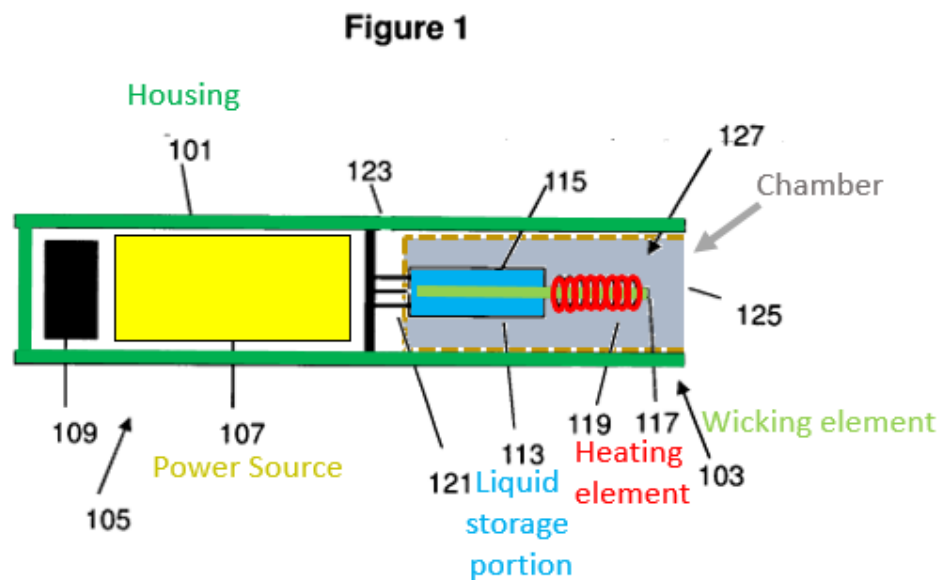
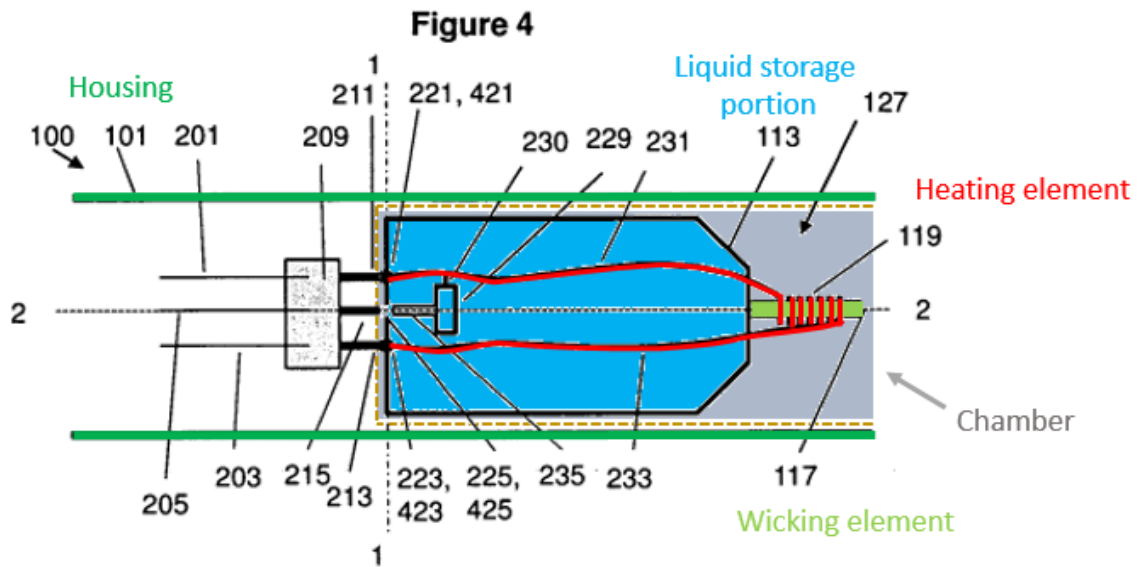
Thorens788 discloses aerosol generating system 100 that contains a power source. EX1004, 12:8-11 (“The aerosol generating system 100 of Figure 1 is an electrically heated aerosol generating system 100 and comprises a housing 101 having a mouthpiece end 103 and a body end 105. In the body end 105, there is provided an electric power supply in the form of a battery 107 and electric circuitry in the form of circuitry 109 and a puff detection system, not shown.”).

Aerosol generating system 100 further includes mouthpiece end 103 defining a chamber for receiving a cartridge (*see* Fig. 3) having a heating element and a liquid storage portion. EX1004, 12:12-15 (“In the mouthpiece end 103, there is provided a liquid storage portion or cartridge 113 containing liquid 115, a capillary wick 117 and a heating element in the form of a heating coil 119. A first end of the capillary

wick 117 extends into the cartridge 113 and a second end of the capillary wick 117 is at least partially surrounded by the heating coil 119.”).

Aerosol generating system 100 is depicted in Fig. 2, cartridge 113 is depicted in Fig. 3, and cartridge 113 inserted into the chamber of the aerosol generating system is depicted in Figs. 1 and 4:





EX1004, Figs. 1-4

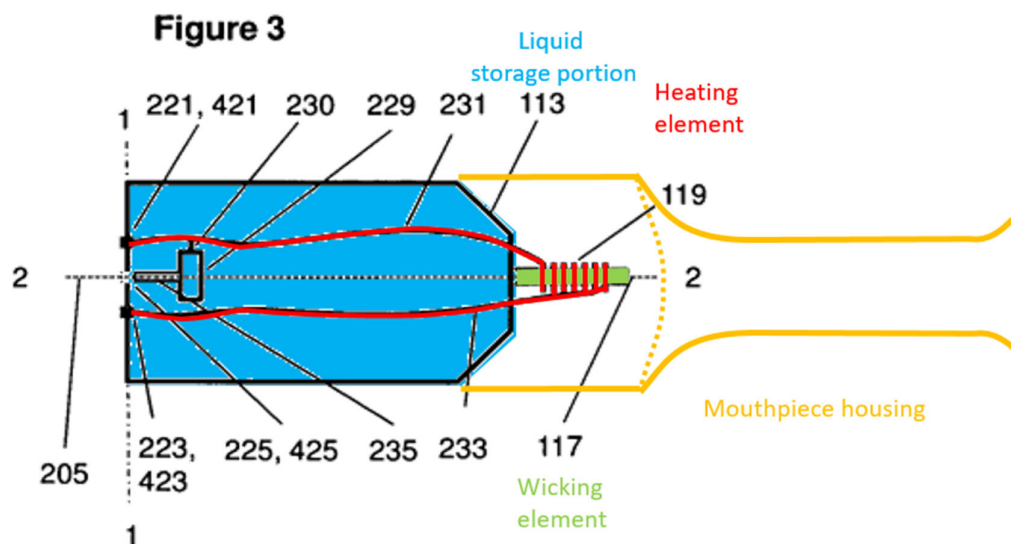
- c. [1.C] a cartomizer having a mouthpiece end and an insertion end disposed opposite the mouthpiece end, the cartomizer comprising:

Thorens788 in view of Thorens231 renders this limitation obvious. EX1005,

¶¶475-479.

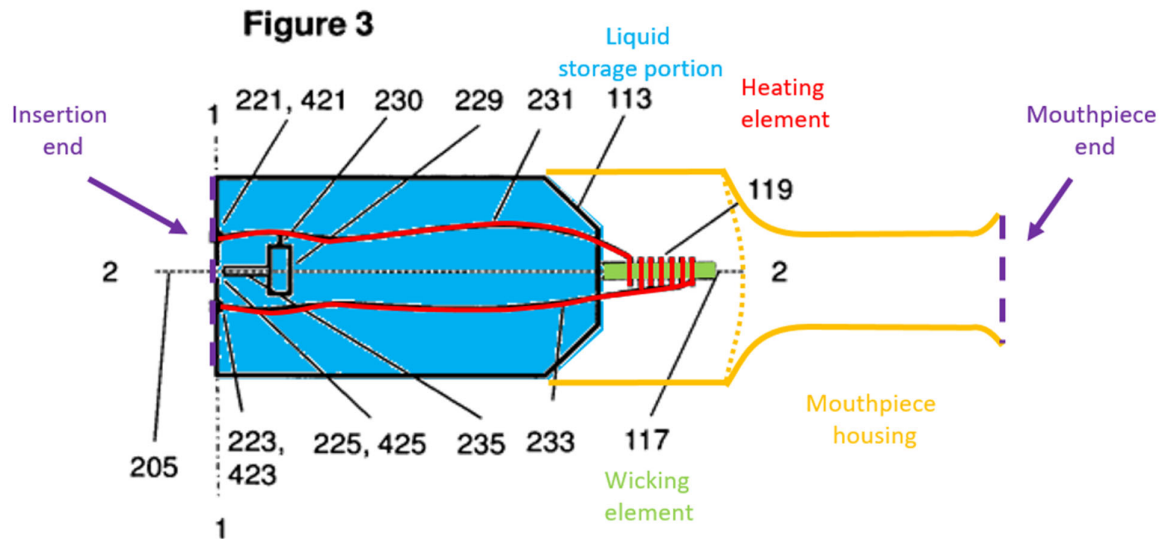
Thorens788 discloses a cartridge 113 having liquid 115 and heating coil 119. EX1004, 12:12-13 (“In the mouthpiece end 103, there is provided a liquid storage portion or cartridge 113 containing liquid 115, a capillary wick 117 and a heating element in the form of a heating coil 119.”). Thus, cartridge 113 is a “cartomizer.”

It would have been obvious to modify Thorens788’s cartridge to incorporate Thorens231’s mouthpiece housing. *See* IX.D.1. The modified cartridge is a cartomizer because it contains the same heating coil 119 and liquid 115.



The right-most end of the modified cartomizer is a mouthpiece end because it is where a consumer inhales vapor. EX1002, 7:8-12 (“In the aerosol forming chamber 213, the vapor condenses to form an inhalable aerosol, which is carried towards the outlet 211 and into the mouth of a user.”). The left-most end is an

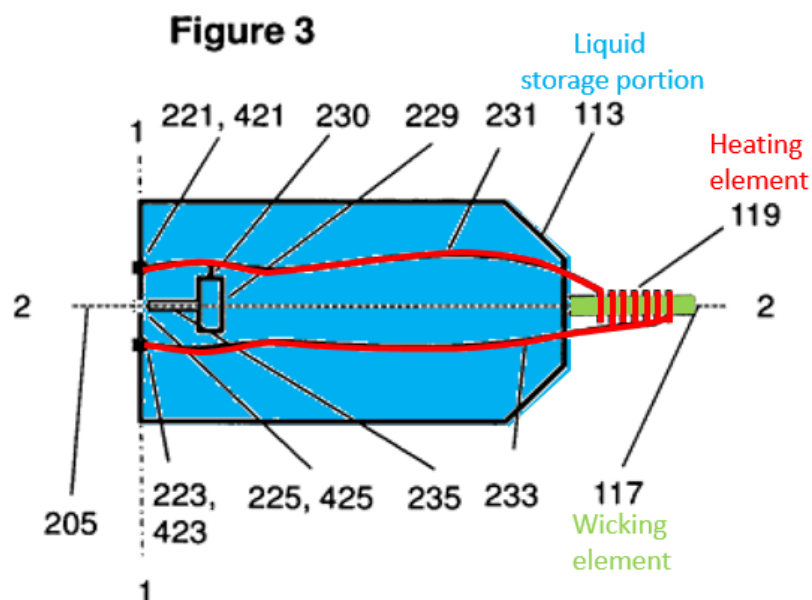
insertion end disposed opposite the mouthpiece end because the modified cartomizer inserts into the aerosol generating system 100 from that side.



- d. [1.D] a cartomizer body having a volume defined therein, the volume configured to hold a fluid vaporizable substance,

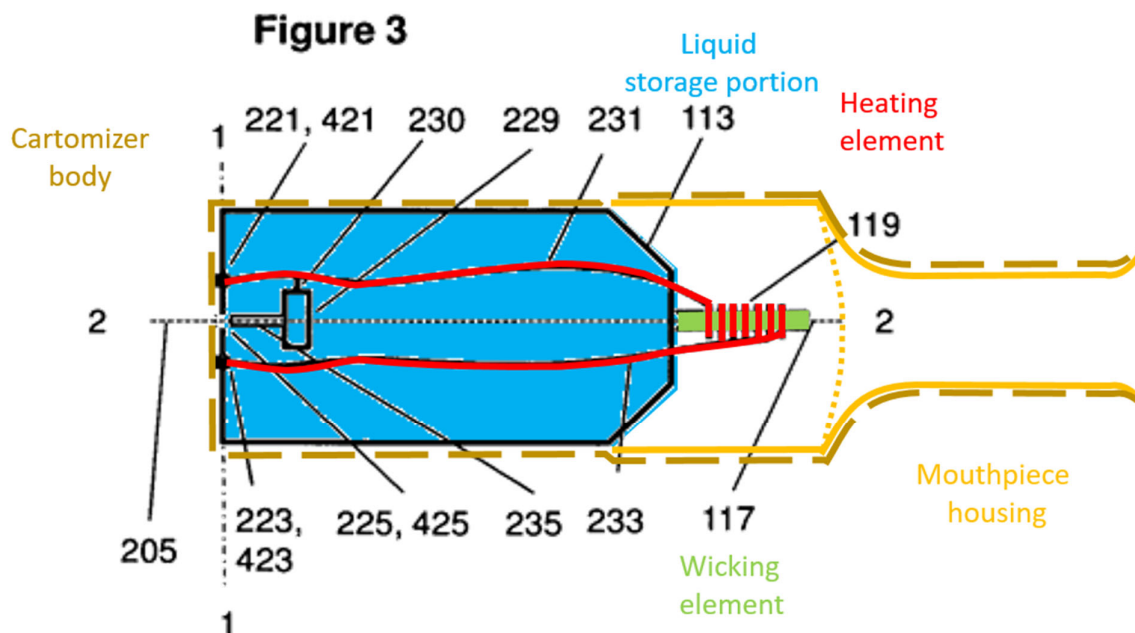
Thorens788 in view of Thorens231 renders this limitation obvious. EX1005, ¶¶480-483.

Thorens788 discloses a mouthpiece wherein, “[p]referably, the liquid storage portion, the capillary wick, the at least one heater and the air outlet are contained in the mouthpiece.” EX1004, 10:28-29. Thorens788 at Fig. 3, however, does not illustrate a mouthpiece housing for protecting the heating element.



EX1004, Fig. 1

Thorens231, in contrast, illustrates the mouthpiece housing. EX1002, Fig. 2. Thorens788 in view of Thorens231 provides a cartomizer body (collectively the mouthpiece housing and liquid container) having a liquid storage portion 113. EX1004, 12:12-13 (“In the mouthpiece end 103, there is provided a ***liquid storage portion or cartridge 113 containing liquid 115***, a capillary wick 117 and a heating element in the form of a heating coil 119.”).



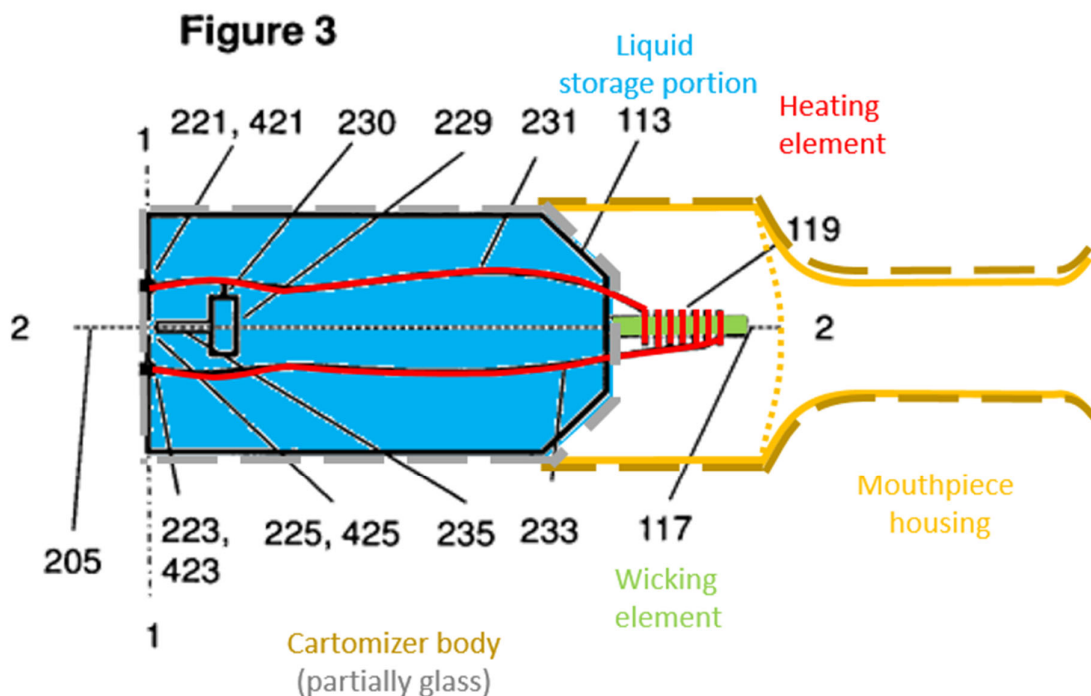
- e. [1.E] wherein at least a portion of the cartomizer body comprises a translucent material configured to allow viewing of the fluid vaporizable substance,

Thorens788 in view of Thorens231 discloses and renders obvious this limitation. EX1005, ¶¶484-487.

Thorens788 discloses that, “[p]referably, the container is opaque, thereby limiting degradation of the liquid by light.” EX1004, 7:26-27. Thus, Thorens788 discloses that the container may be opaque or not opaque (*i.e.*, translucent), but the preference is for opaque.⁴ EX1005, ¶485. Notwithstanding, Thorens213 provides a separate disclosure that the cartridge may be made of glass. EX1002, 7:33-35 (“The

⁴ All emphases added unless otherwise stated.

cartridge 203 can be made from any suitable material. Examples include glass and plastic polymers such as PET or others used in the pharmaceutical or food industries.”). Glass is translucent and would allow viewing of the liquid material therein. EX1005, ¶486. Accordingly, Thorens788 discloses this limitation and Thorens788 in view of Thorens231 renders this limitation obvious. EX1005, ¶486



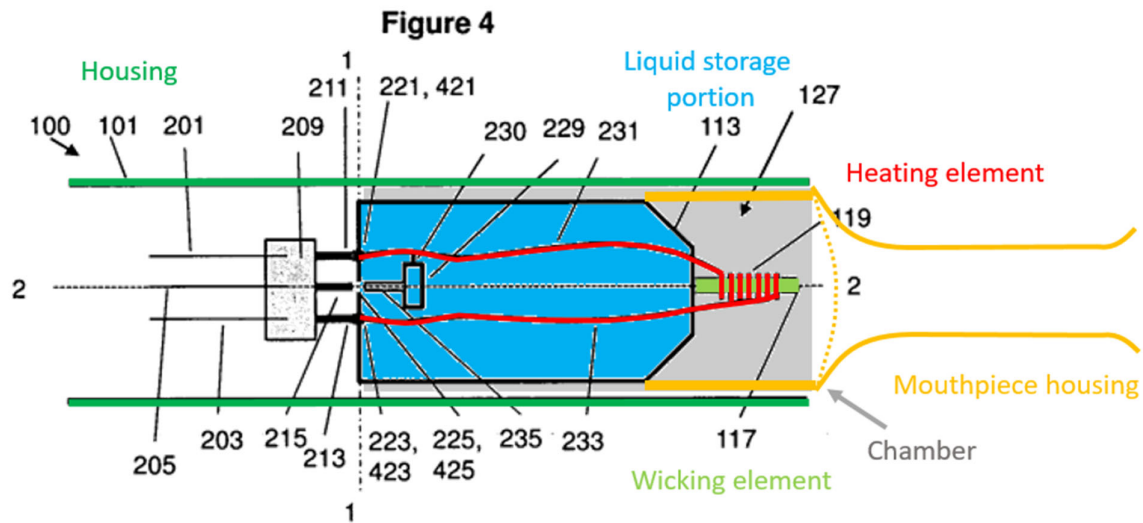
To the extent that it is argued that Thorens788 does not disclose translucent material for the liquid container, it would have been obvious to a POSA to make it translucent. EX1005, ¶487. Thorens788 itself makes clear that this is a design choice from a finite number of choices. EX1004, 7:26-27. A POSA would have been motivated to make Thorens788’s cartridge translucent for the reasons articulated

with respect to Ground 1 and Liu438. *See* IX.A.1. Moreover, Thorens788 discloses that the liquid container is refillable. EX1004, 7:29 (“Alternatively, the liquid storage portion may be refillable.”). A POSA would be further motivated to make the container translucent to facilitate refilling the cartridge. EX1005, ¶487. While Thorens788 expresses a preference for an opaque container, the liquid could remain protected in a translucent embodiment by using a tinted glass.

- f. **[1.F] wherein the cartomizer body is configured for insertion into the chamber such that at least part of the volume is positioned in the chamber when the cartomizer body is inserted into the chamber;**

Thorens788 discloses this limitation. EX1005, ¶¶488-489.

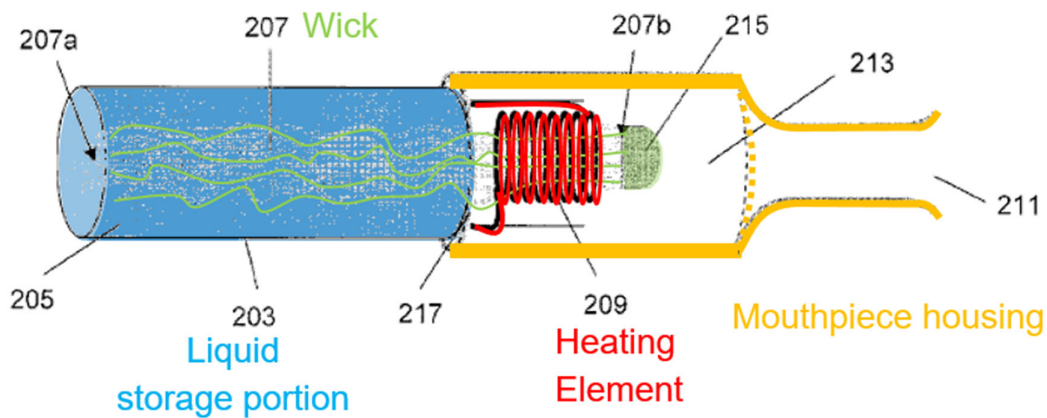
Thorens788 discloses that the liquid storage portion of the cartomizer is positioned within the receiving chamber. EX1004, 15:15-16 (“Figure 4 shows the liquid storage portion 113 of Figure 3 inserted into the aerosol generating system 100 of Figure 2.”).



g. **[1.G] a heating element and a wicking element within the cartomizer body;**

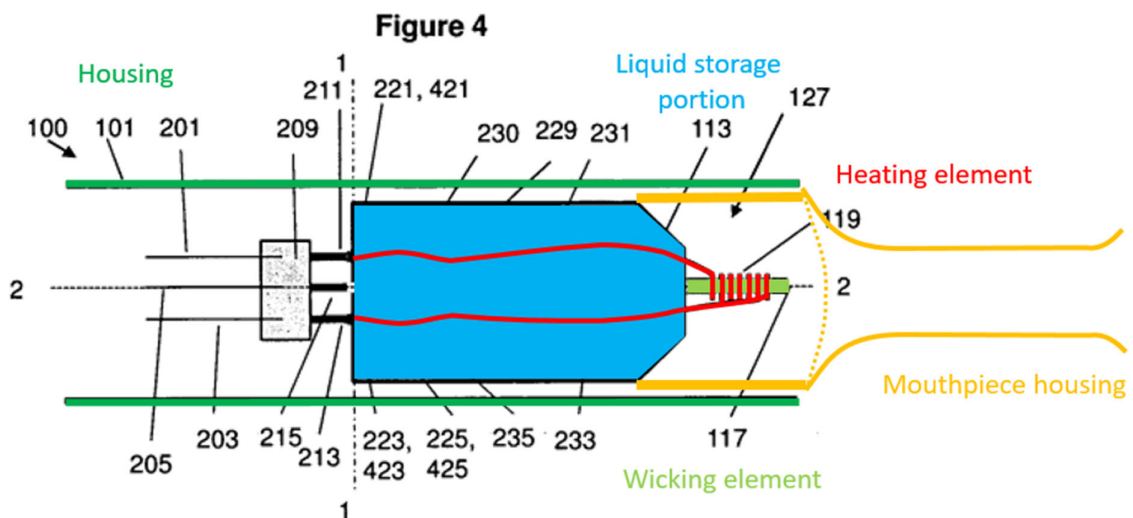
Thorens788 in view of Thorens231 renders this limitation obvious. EX1005, ¶¶490-495.

Thorens788 discloses a mouthpiece wherein, “[p]referably, the liquid storage portion, capillary wick, the at least one heater and the air outlet are contained in the mouthpiece” but provides no illustration. EX1004, 10:28-29; 10:31-34. Thorens231 illustrates a mouthpiece housing that protects the heating and wick elements.



EX1002, Fig. 2

Accordingly, Thorens788 in view of Thorens231 discloses a heating element and a wicking element within a cartomizer body. *See* IX.D.1.



Thorens788 discloses a heating element under the adopted construction because Thorens788’s heating element is a “conductive material shaped into a wire,

coil, or flat ribbon that generates heat in response to current.” See, EX1004, 12:23-25 (“The battery 107 supplies electrical energy to the *heating coil 119 to heat* the end of the wick 117 surrounded by the heating coil. The liquid in that end of the wick 117 is *vaporized by the heating coil 119* to create a supersaturated vapour.”).

Thorens788 discloses a wicking element under the construction adopted in this Petition because Thorens788’s wick 117 is “any material through which liquid may be drawn via capillary action.” Thorens788 discloses capillary wick 117, which draws liquid by “capillary action from the cartridge 113 from one end of the wick 117 which extends from the cartridge to another end of the wick 117 which is surrounded by the heating coil 119.” EX1004, 12:19-21.

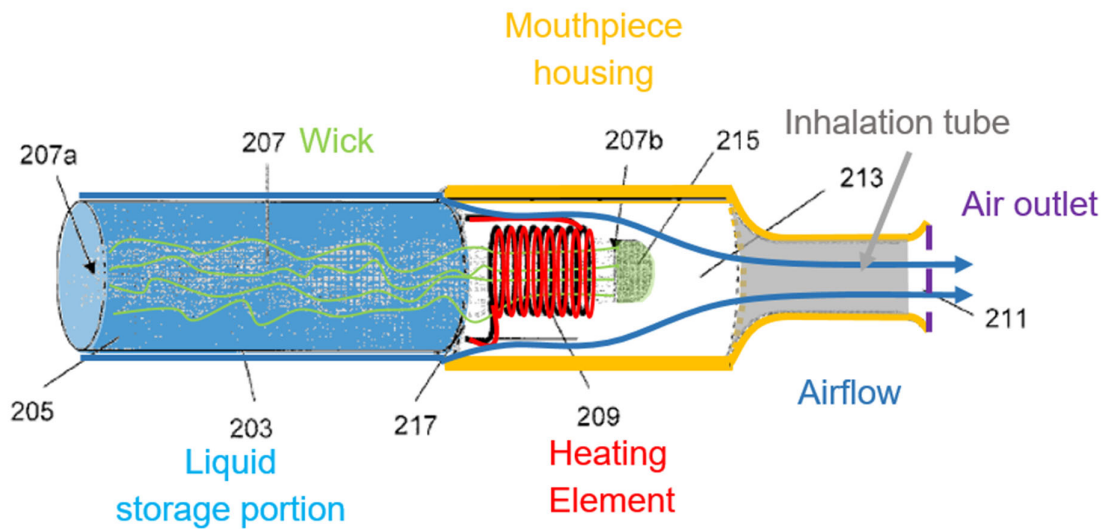
Note that Thorens788 even discloses a wick under the construction proposed by Petitioner in the ITC Investigation (but not adopted here) because capillary wick 117 is a pliable bundle of fibers that delivers vaporizable liquid to heating element 119. EX1004, 7:32-33 (“For example, the capillary wick may comprise a plurality of fibres or threads.”); EX1004, 12:19-21 (“Liquid 115 is transferred by capillary action from the cartridge 113 from one end of the wick 117...”).

h. **[1.H] an inhalation tube in fluid communication with the heating element and the wicking element;**

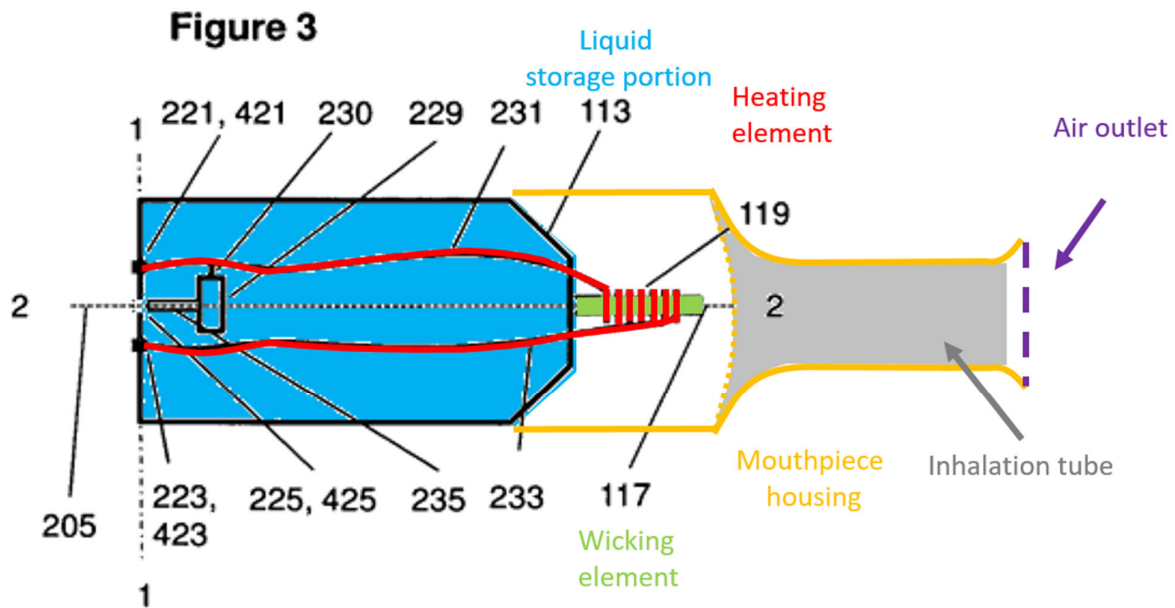
Thorens788 in view of Thorens231 renders this limitation obvious. EX1005, ¶¶496-498.

Thorens788 discloses heating coil 119 and wick 117 in fluid communication with an air outlet. EX1004, 12:12-13 (“In the mouthpiece end 103, there is provided a liquid storage portion or cartridge 113 containing liquid 115, **a capillary wick 117** and a heating element in the form of **a heating coil 119**.”). Vapor is created in the aerosol forming chamber, in which the heating coil and wick are disposed, and carried out the chamber towards the consumer’s mouth. EX1004, 12:27-30 (“The supersaturated vapour created is mixed with and carried in the air flow from the air inlet 123. In the aerosol forming chamber 127, the vapour condenses to form an inhalable aerosol, which is carried towards the outlet 125 and into the mouth of the user.”).

Thorens231 discloses an inhalation tube located between an atomizing chamber and air outlet 211 that receives vapor from the heating element. EX1002, 7:9-12 (“In the aerosol forming chamber 213, the vapor condenses to form an inhalable aerosol, which is carried towards the outlet 211 and into the mouth of a user.”). Thus, Thorens788 in view of Thorens231 discloses an inhalation tube in communication with the heater and wick.



EX1002, Fig. 2.

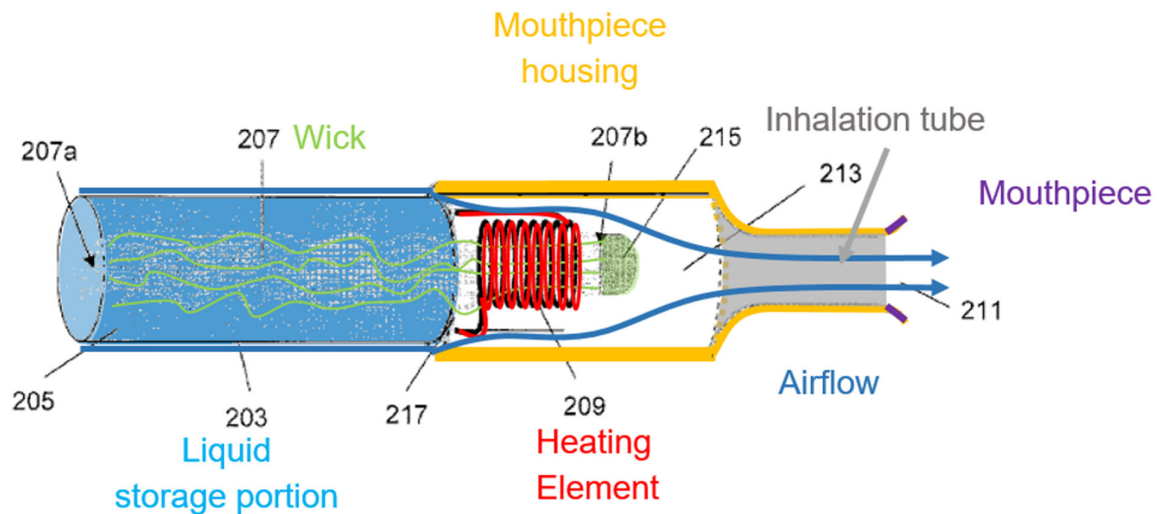


- i. [1.I] a mouthpiece at or proximate to the mouthpiece end, the mouthpiece in fluid communication with the inhalation tube; and

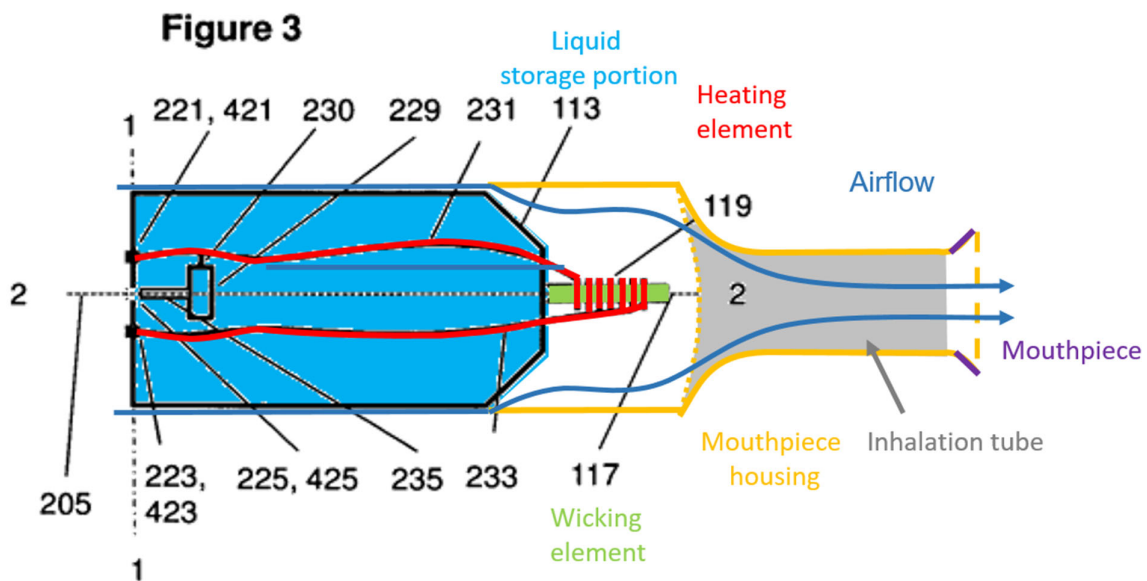
Thorens788 in view of Thorens231 renders this limitation obvious. EX1005, ¶¶499-501.

Thorens231 discloses an inhalation tube ([1.H]) which directs air from the heating element and wicking element to the air outlet 211. The area surrounding the air outlet is a portion of the device to be used by a mouth. EX1002, 7:9-12 (“In the aerosol forming chamber 213, the vapor condenses to form an inhalable aerosol, which is carried towards the outlet 211 and into the mouth of a user.”). It is therefore a mouthpiece as Patent Owner has applied that term in the ITC investigation. *See* Section IX.A.2.i.

Thorens788 and Thorens231 disclose that air passes from the atomizing chamber to the air outlet and into the consumer’s mouth. EX1004, 12:28-30 (“In the aerosol forming chamber 127, the vapour condenses to form an inhalable aerosol, which is carried towards the outlet 125 and into the mouth of the user.”); EX1002, 7:9-12. Therefore, the mouthpiece is in communication with the inhalation tube.



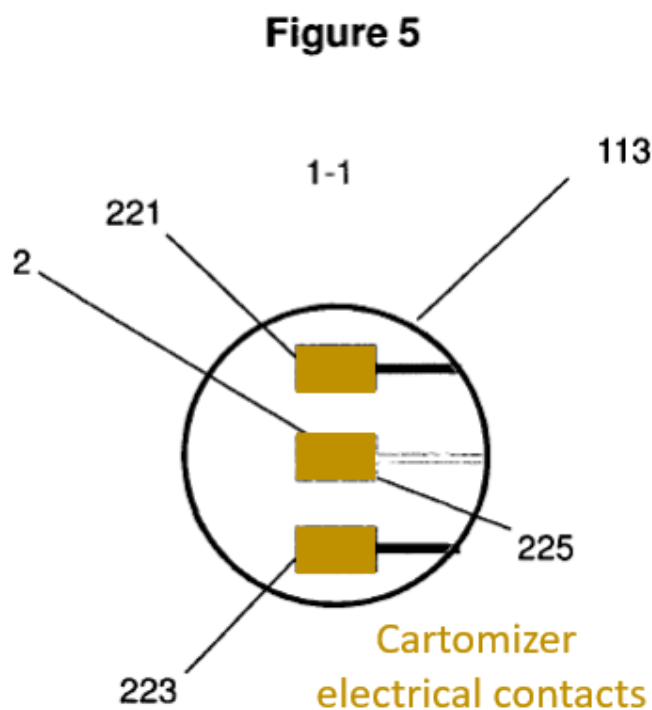
EX1002, Fig. 2



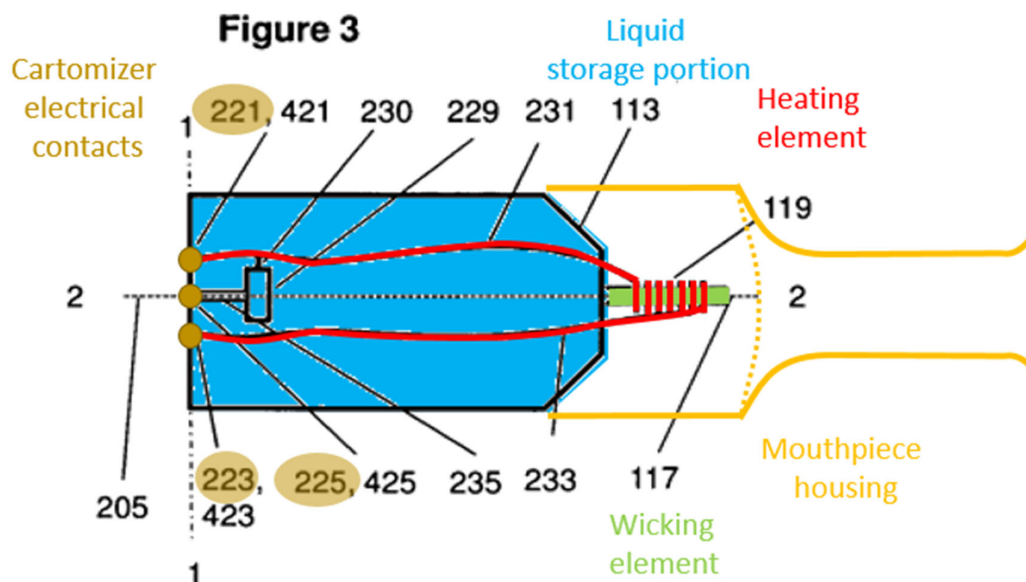
- j. [1.J] a plurality of cartomizer electrical contacts on an exterior of the insertion end,

Thorens788 discloses this limitation. EX1005, ¶¶ 502-504.

Thorens788 disclose three electrical contacts at the base of liquid storage portion of the cartomizer. EX1004, 16:9-10 (“In one embodiment shown in Figure 5, the electrical contacts 221, 223, 225 on the liquid storage portion are arranged in a row or substantially straight line.”).



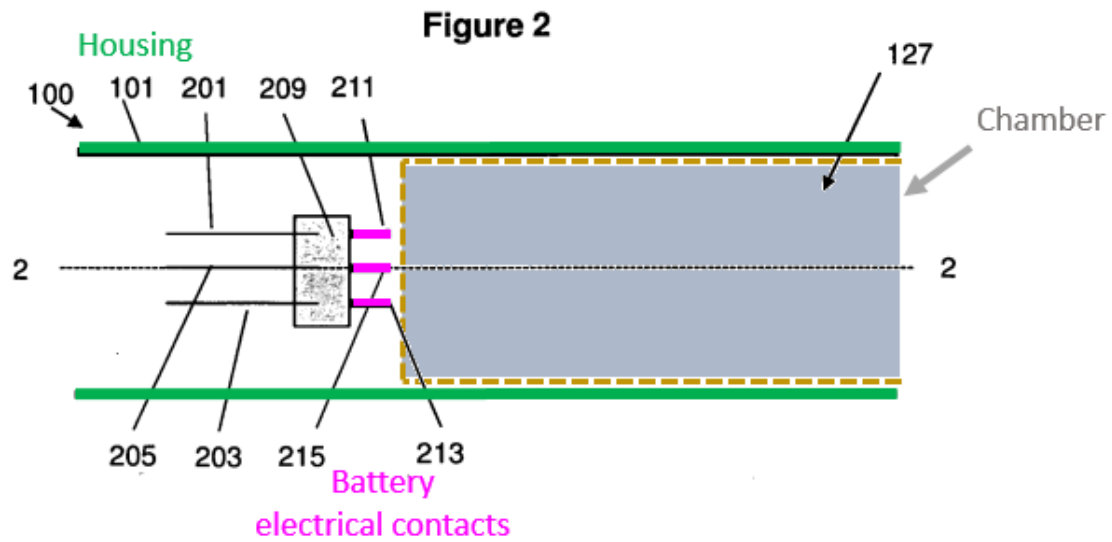
EX1004, Fig. 5



- k. [1.K] wherein the plurality of cartomizer electrical contacts is positioned to contact a plurality of battery electrical contacts at a base end of the chamber when the cartomizer body is inserted into the chamber.

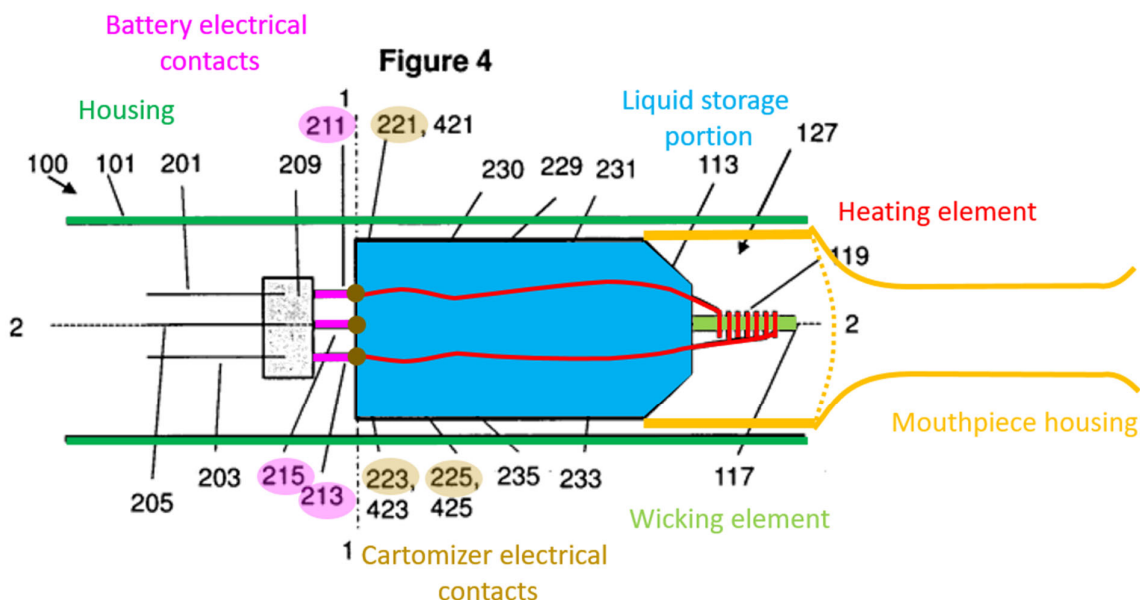
Thorens788 discloses this limitation. EX1005, ¶¶505-508.

Thorens discloses corresponding battery electrical contacts 211, 213, and 215. EX1004, 16:19-23 (“The electrical contacts mounted on the aerosol generating system are arranged in a similar arrangement to the electrical contacts mounted on the liquid storage portion 113, shown in Figure 5. Therefore, the corresponding electrical contacts 211, 213, 215 on the aerosol generating system 100 are also arranged in a row or substantially straight line. In this embodiment, each electrical contact 211, 213, 215 is equidistant from its neighbouring contact.”).



EX1004, Fig. 2

Cartomizer contacts are positioned to contact these contacts. EX1004, 13:25-27 (“The electrically conductive elements 201, 203, 205 and electrical connectors 211, 213, 215 allow electrical signals to pass between the circuitry 109 and liquid storage portion 113.”); 15:5-7 (“When a liquid storage portion is inserted into the aerosol generating system, electrical contacts 221, 223 on the liquid storage portion and two electrical contacts 211, 213 on the aerosol generating system 100 allow electrical energy to be transmitted to the heating element 119.”).



3. Claim 2: The cartomizer of claim 1, wherein the translucent material comprises glass or plastic.

Disclosed. [1.E]. EX1005, ¶¶594-595.

3.4. Claim 13

a. [13.A] A vaporizer device comprising:

Disclosed. [1.A].

b. [13.B] a battery portion having an outer shell and a chamber defined by the outer shell; and

Disclosed. [1.B].

c. [13.C] a cartomizer having a mouthpiece end and an insertion end disposed opposite the mouthpiece end, the cartomizer comprising:

Disclosed. [1.C].

- d. **[13.D] a cartomizer body having a volume defined therein, the volume configured to hold a vaporizable substance,**

Obvious. [1.D].

- e. **[13.E] wherein the vaporizable substance is in a fluid state,**

Disclosed. [1.D].

- f. **[13.F] wherein the cartomizer body is configured for insertion into the chamber such that at least part of the volume is positioned in the chamber when the cartomizer body is inserted into the chamber;**

Disclosed. [1.F].

- g. **[13.G] a heating element within the cartomizer body;**

Obvious. [1.G].

- h. **[13.H] cartomizer electrical contacts operable to direct current to the heating element, wherein the cartomizer electrical contacts are on an exterior of the cartomizer body; and**

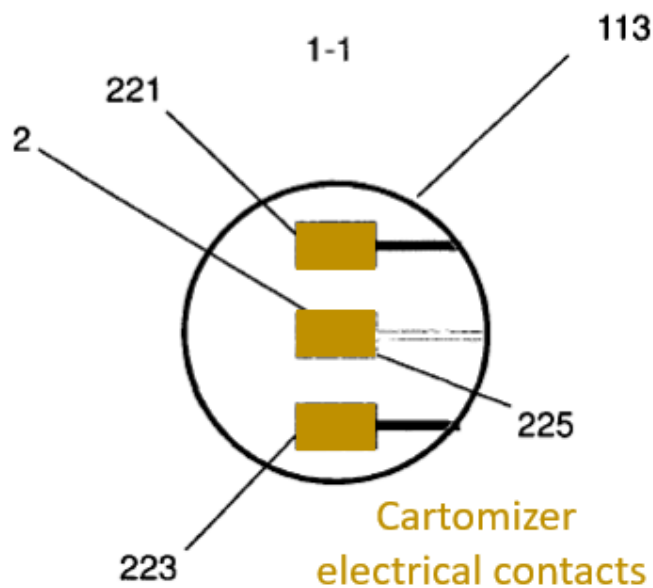
Thorens788 discloses this limitation. EX1005, ¶¶516-517.

Thorens788 discloses that, “[w]hen a liquid storage portion is inserted into the aerosol generating system, electrical contacts 221, 223 on the liquid storage portion and two electrical contacts 211, 213 on the aerosol generating system 100 allow electrical energy to be transmitted to the heating element 119.” EX1004, 15:5-7.

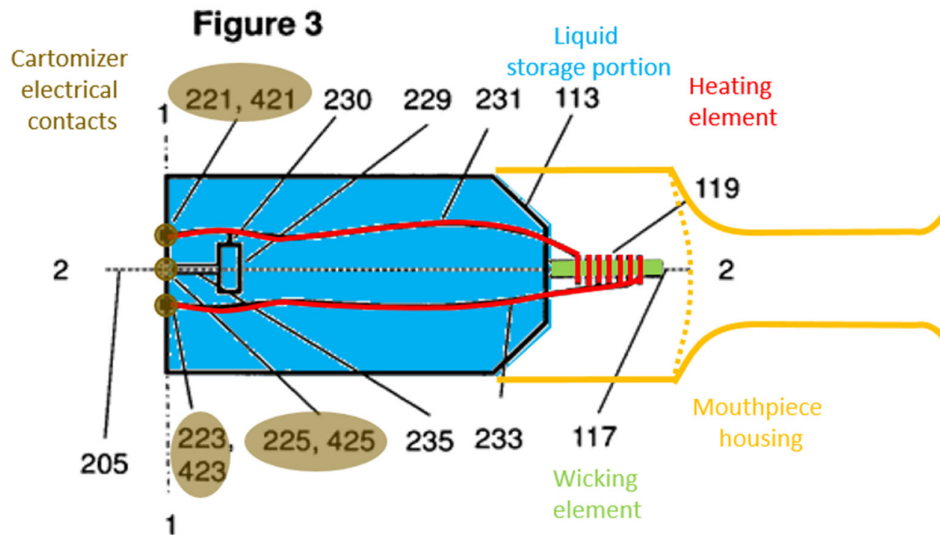
The cartomizer contacts are on the exterior of the cartomizer body. EX1004, 16:9-10 (“In one embodiment shown in Figure 5, the electrical contacts 221, 223,

225 on the liquid storage portion are arranged in a row or substantially straight line.”).

Figure 5



EX1004, Fig. 5.



- i. [13.I] a wicking element inside the cartomizer body, the wicking element configured to absorb the vaporizable substance;

Obvious. [1.G].

- j. [13.J] an inhalation tube in fluid communication with the heating element and the wicking element; and

Obvious. [1.H].

- k. [13.K] a mouthpiece at or proximate to the mouthpiece end, the mouthpiece in fluid communication with the inhalation tube.

Obvious. [1.I].

- 4.5.** Claim 14: [14.A] The cartomizer of claim 13, wherein at least a portion of the cartomizer body comprises a translucent material configured to allow viewing of the fluid vaporizable substance.

Disclosed and obvious. [1.E].

5.6. Claim 15: [15.A] The cartomizer of claim 13, wherein the vaporizable substance comprises a liquid comprising nicotine.

Thorens788 discloses claim 15. EX1005, ¶¶522-523.

Thorens788 discloses that, “[i]n one embodiment, the liquid may comprise nicotine.” EX1004, 20:18-19.

6.7. Claim 16: The cartomizer of claim 13, wherein cartomizer electrical contacts are positioned to contact a plurality of battery electrical contacts at a base end of the chamber when the cartomizer body is inserted into the chamber.

Disclosed. [1.K].

E. Ground 5: Thorens788, ~~and Thorens231~~ further in view of and Levin ~~(renders Claim 5) unpatentable under 35 U.S.C. § 103~~

1. Motivation to Combine

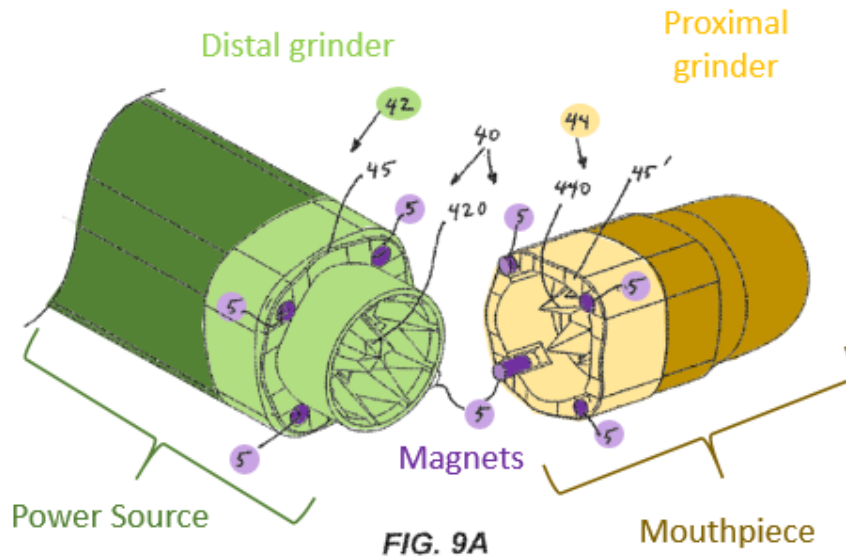
a. Magnetic Coupling

Thorens788 discloses that its battery portion and the cartomizer are releasably locked together. EX1004, 10:36-11:1 (“Preferably, the shell and mouthpiece are arranged to releasably lock together when engaged.”). Thorens788 does not disclose the mechanism for releasably locking the two pieces.

The prior art, however, is replete with examples of magnetic coupling in e-vapor devices. *See e.g.*, EX1025, [0003] (“An object of the present invention is to provide an electronic cigarette with magnetic connection which makes assembly of the electronic cigarette convenient and quick.”); EX1026, 6:15-23 (disclosing “an

aerosol delivery device...compris[ing] a control body 102 and a cartridge 104 that can be...detachably aligned [via]...magnetic engagement”); EX1005 ¶527.

Levin, for example, discloses a two-piece design, with a first portion of a battery piece (called a proximal grinder portion) connected to a second portion of a mouthpiece (called a distal grinder portion) via magnetic connection. EX1003, 10:31-38; 22:7-14. The pieces magnetically couple using four magnets spaced about the periphery of each grinder; thus attaching the mouthpiece to the battery piece. EX1003, 3:64-4:2, 20:51-67, 27:57-60 (“the magnets 5 disposed at each corner of the grinder components facilitate alignment of the components in a more desirable, aesthetically appealing configuration.”).

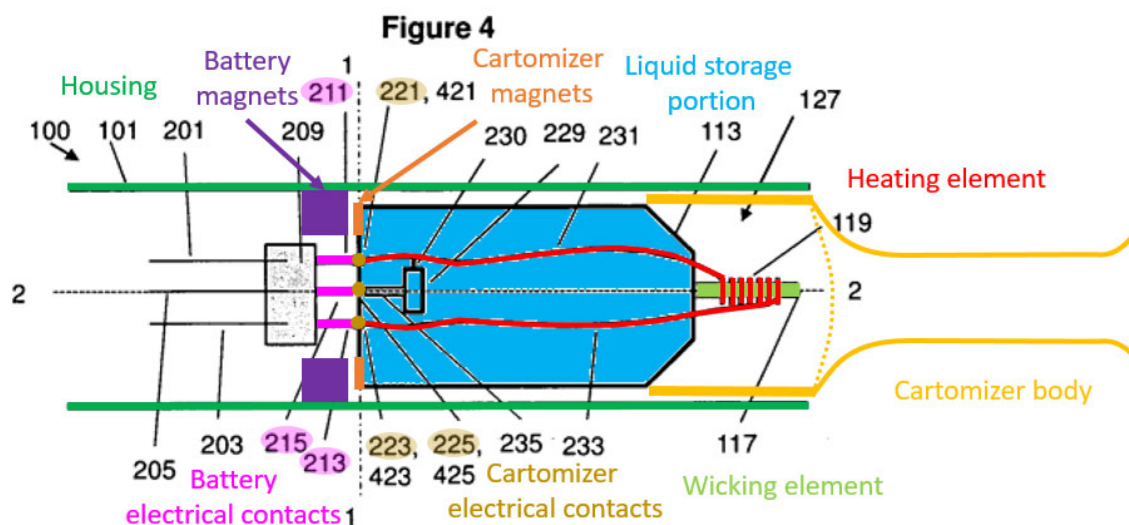


EX1003, Fig.9A

First, a POSA would have been motivated to use magnetic coupling because magnetic couplers are easier to use than screw designs and more reliable than friction fit designs. *See e.g.*, EX1025, [0003] (“An object of the present invention is to provide an electronic cigarette with magnetic connection which makes assembly of the electronic cigarette convenient and quick.”); EX1005, ¶530. Screw designs, for example, require manual strength and dexterity to couple and decouple and over time the screw threads may become damaged. EX1035, [0111] (“[U]se of a threaded connection...may take more time, and the strength required to decouple the cartridge from the control body may vary...”); EX1005, ¶530. Friction fits require precise tolerances and if not correctly aligned, the cartomizer may jam during insertion. *Id.*

Second, a POSA would have been motivated to use magnetic coupling because magnets are generally self-aligning. EX1026, 6:15-23 (disclosing “an aerosol delivery device ... compris[ing] a control body 102 and a cartridge 104 that can be ... detachably aligned [via] ... magnetic engagement”); EX1005, ¶531. In contrast, screw couplings require an exact number of turns to ensure alignment. A consumer may, for instance, under or overtighten the components. EX1043, 22:63-67 (“[U]se of a threaded connection, as may be employed in other embodiments of aerosol delivery devices, may require unthreading the cartridge from the control body, which may take more time, and the strength required to decouple the cartridge

from the control body[.]”). Overtightening also has the drawback that the components may become damaged. EX1005, ¶531.



The as-modified shell comprises magnets for the battery portion in or proximate to the cartomizer chamber. The modified cartomizer comprises corresponding magnets configured to attract the shell magnets. A POSA would have understood that an exposed magnet has a metallic surface, and thus, the cartomizer magnets constitute a recited “cartomizer metallic surface.” EX1005, ¶532.

A POSA would have had a reasonable expectation of successfully adding magnets to Thorens788. EX1005, ¶533. Magnets are small and it would have been

trivial to place magnets in the receptacle and the cartomizer. EX1005 ¶533. Combining Levin with Thorens788 is a predictable use of electronic vaporizer components according to their established functions. EX1005, ¶533.

2. **Claim 5: The cartomizer of claim 1, wherein the cartomizer further comprises a structure that secures the cartomizer in the chamber, and wherein the structure comprises a cartomizer metallic surface configured to be attracted to at least one magnet in or proximate to the chamber.**

Thorens788 and Thorens231 further in view of Levin render obvious this limitation. EX1005, ¶¶534-535.

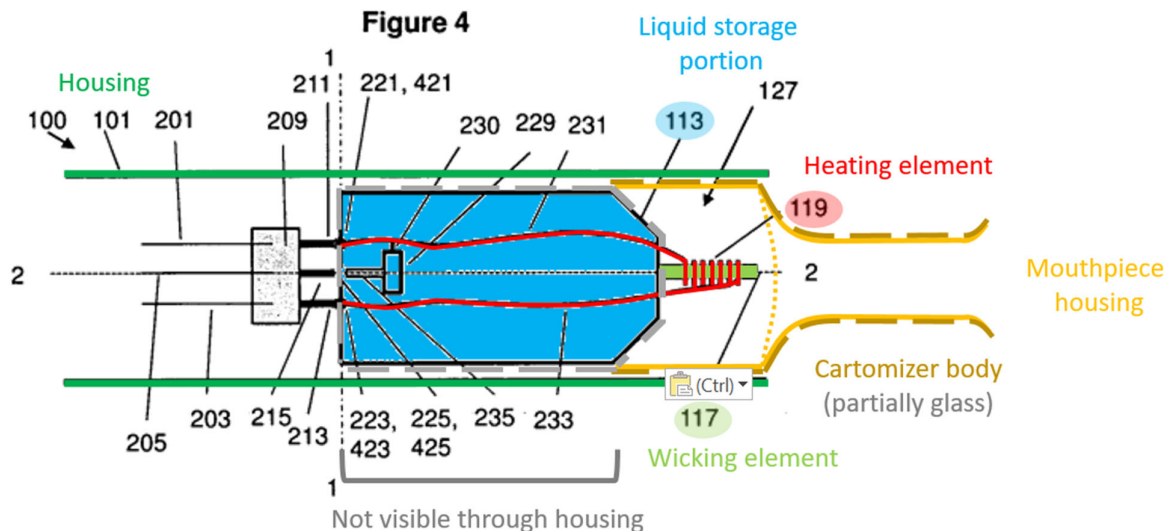
As discussed in IX.E.1, a POSA would have been motivated to incorporate Levin's teachings of using magnets to connect the cartomizer and the battery portion in the Thorens788 smoking system for a more convenient and secure connection. A POSA would have recognized that magnets may comprise a metallic surface. EX1005, ¶535.

- F. **Ground 6: Thorens788, ~~and~~ Thorens231 ~~further in view of~~ and Tucker renders ~~(c) Claims 9-11, and 17-18~~ unpatentable under 35 U.S.C. § 103**

1. **Motivation to Combine**

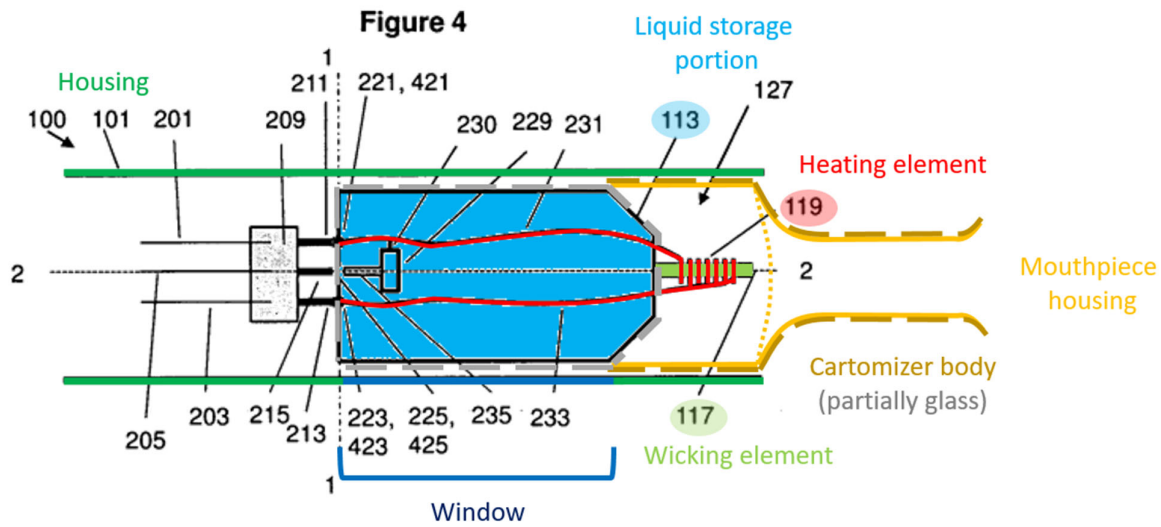
- a. **Transparent Outer Shell**

Thorens788 in view of Thorens213 discloses and renders obvious a transparent cartridge. Ground 1, [1.E]. The advantages of a translucent container, however, are mitigated by Thorens788's housing 101, which extends to cover the entirety of the liquid container when the cartomizer is inserted into the housing.



Tucker teaches that a window can be provided to view the remaining liquid. EX1034, [0038] (disclosing an e-cigarette with an “outer tube [] includ[ing] a clear (transparent) window 71 formed of a transparent material so as to allow a smoker to see the amount of liquid material remaining in the liquid supply reservoir 22.”).

A POSA would have been motivated to modify Thorens788’s housing 101 such that the consumer would be able to see through housing 101 and into the glass cartridge. EX1005, ¶¶537-539. A POSA would have been so motivated and expected success for the same reasons articulated in IX.B.1 in the context of Liu783.



2. Claim 9

a. [9.A] A vaporizer device comprising:

Disclosed. Ground 4, [1.A].

b. [9.B] a cartomizer comprising,

Disclosed. Ground 4, [1.C].

c. [9.C] a cartomizer body configured to hold a fluid vaporizable substance,

Obvious. Ground 4, [1.D].

d. [9.D] wherein at least a portion of the cartomizer body comprises a translucent material configured to allow viewing of the fluid vaporizable substance;

Disclosed and obvious. Ground 4, [1.E].

e. [9.E] a heating element and a wicking element within the cartomizer body; and

Obvious. Ground 4, [1.G].

- f. **[9.F] a plurality of cartomizer electrical contacts on an exterior of the insertion end; and**

Disclosed. Ground 4, [1..J].

- g. **[9.G] a battery portion, the battery portion having a first end and a second end and comprising:**

Thorens788 discloses this limitation. EX1005, ¶¶ 546-547.

Thorens788 discloses aerosol generating system 100 having a body end (having a first end) and a mouthpiece end (having a second end). EX1004, 12:8-11.

Figure 1

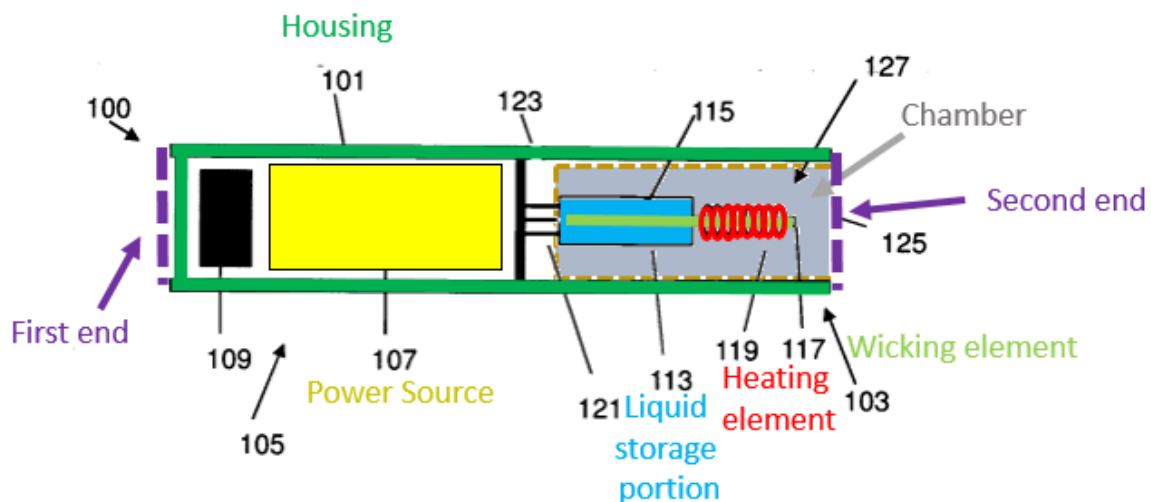
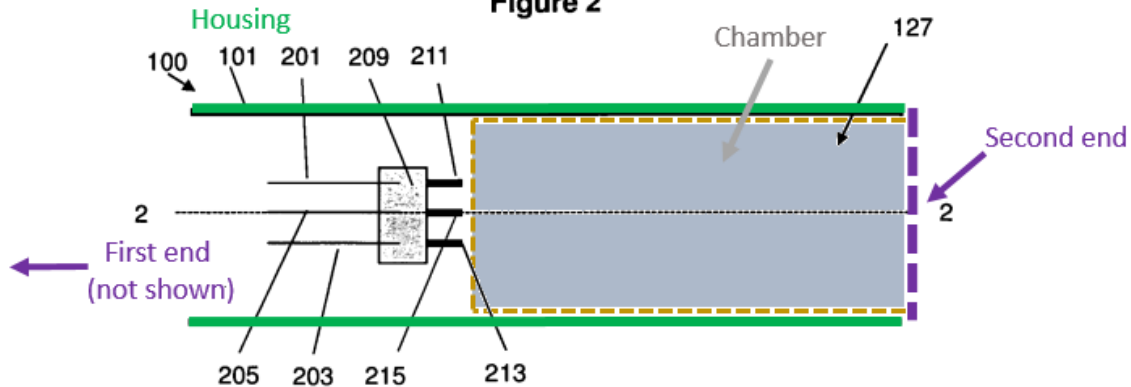


Figure 2

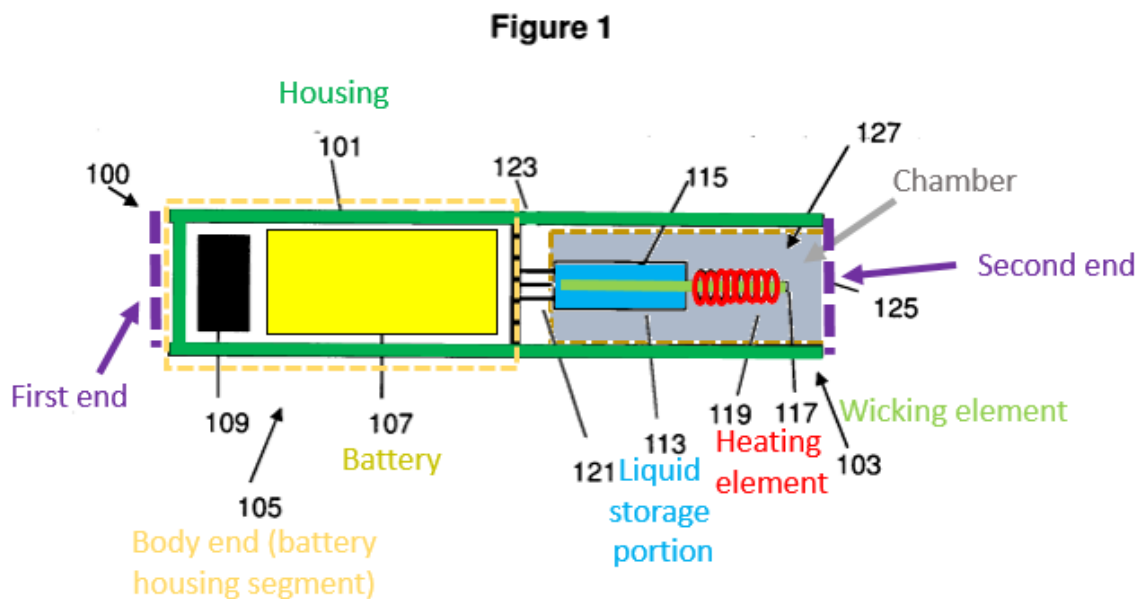


EX1004, Figs. 1-2

- h. [9.H] a battery housing segment proximate the first end of the battery portion; and

Thorens788 discloses this limitation. EX1005, ¶¶548-549.

Thorens788 discloses that the aerosol generating system has a body end the houses a battery. EX1004, 12:10-11 (“In the body end 105, there is provided an electric power supply in the form of a battery 107 and electric circuitry in the form of circuitry 109 and a puff detection system, not shown.”).

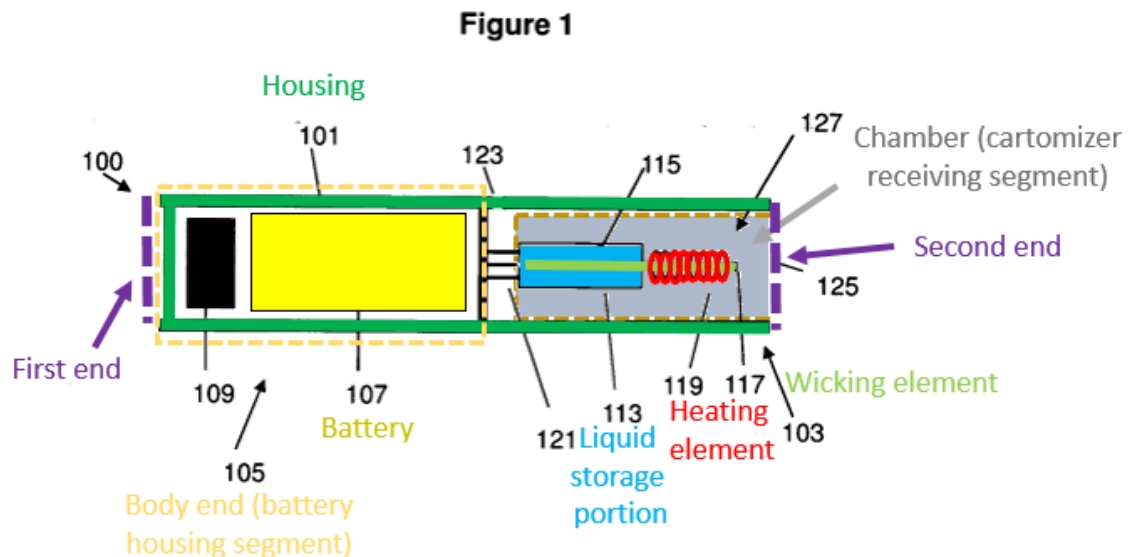


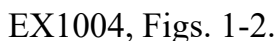
EX1004, Fig. 1

- i. [9.I] a cartomizer receiving segment proximate the second end of the battery portion,

Thorens788 discloses this limitation. EX1005, ¶¶550-553.

Thorens788 discloses that aerosol generating system 100 has a mouthpiece end for receiving a cartomizer. EX1004, 12:12-13 (“In the mouthpiece end 103, there is provided a liquid storage portion or cartridge 113 containing liquid 115, a capillary wick 117 and a heating element in the form of a heating coil 119.”). Cartridge 113 is removed by pulling cartridge 113 out of the aerosol generating system’s housing 101 and inserted by pushing cartridge 113 into housing 101. EX1004, 15:27-35.





- Disclosed. Ground 4, [1.B]; Ground 6, [9.I].

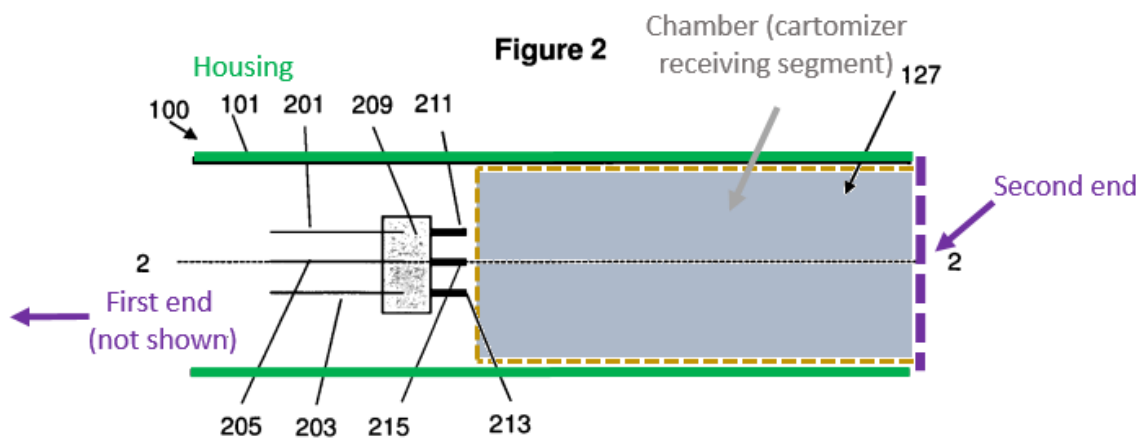
- Thorens788 and Thorens231 further in view of Tucker render obvious this limitation. EX1005, ¶¶555-556.

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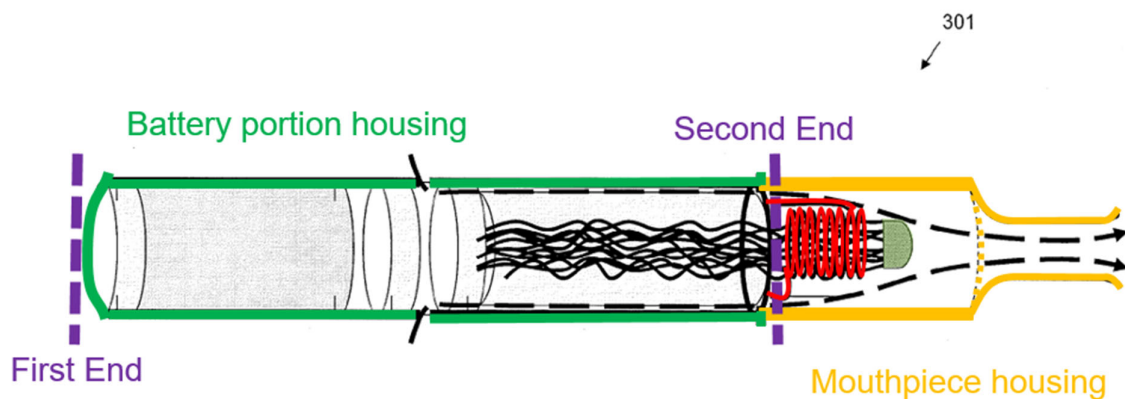
3. **Claim 10: The vaporizer device of claim 9, wherein outer shell is commonly shared by the battery housing segment and the cartomizer receiving segment.**

Thorens788 discloses this limitation. EX1005, ¶¶557-559.

Thorens788 discloses that the aerosol generating system has a housing 101 that extends to encompass both a battery segment and a cartomizer segment. As seen in the figure below, housing 101 is depicted as a continuous outer shell.



Thorens231 likewise depicts a continuous outer shell.



EX1002, Fig. 3

4. **Claim 11: The vaporizer device of claim 9, further comprising a rechargeable battery in the battery housing segment.**

Thorens788 discloses this limitation. EX1005, ¶¶560-561.

Thorens788 discloses a rechargeable battery in the battery housing segment. EX1004, 9:28-33 (“In that case, preferably, the electrically heated smoking system is usable by a smoker until the energy in the power cell is used up. Alternatively, the electric power supply may comprise circuitry chargeable by an external charging portion. In that case, preferably the circuitry, when charged, provides power for a pre-determined number of puffs, after which the circuitry must be reconnected to the external charging portion. An example of suitable circuitry is one or more capacitors or rechargeable batteries.”).

5. **Claim 17**

- a. **[17.A] A vaporizer device comprising:**

Disclosed. Ground 4, [1.A].

- b. **[17.B] a cartomizer comprising:**

Disclosed. Ground 4, [1.B].

- c. **[17.C] a cartomizer body configured to hold a vaporizable substance, wherein the vaporizable substance is in a fluid state,**

Obvious. Ground 4, [1.D].

- d. **[17.D] wherein the cartomizer body is configured for insertion into a chamber defined by an outer shell of a battery portion of a vaporizer device,**

Disclosed. Ground 4, [1.B], Ground 4, [1.F].

- e. **[17.E] a heating element within the cartomizer body,**

Obvious. Ground 4, [1.G].

- f. **[17.F] cartomizer electrical contacts operable to direct current to the heating element, and**

Disclosed. Ground 4, [13.H].

- g. **[17.G] a mouthpiece at or proximate to the mouthpiece end, the mouthpiece in fluid communication with the inhalation tube; and**

Obvious. Ground 4, [1.I].

- h. **[17.H] a battery portion, the battery portion having a first end and a second end, the battery portion comprising:**

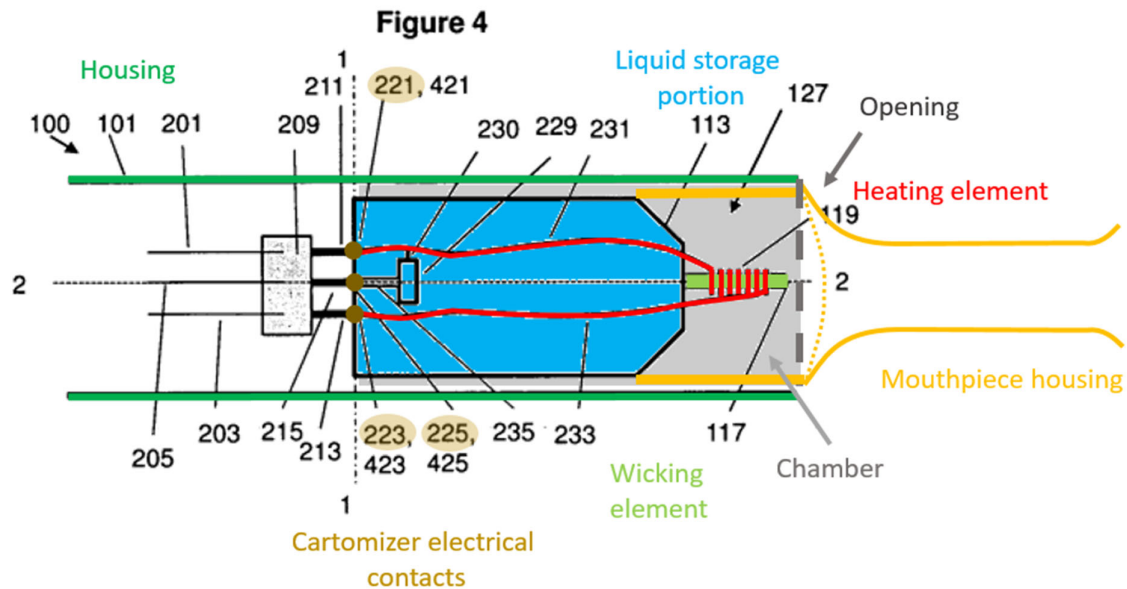
Disclosed. [9.G].

- i. **[17.I] a chamber of a cartomizer receiving segment, the chamber configured for receiving the cartomizer body, the cartomizer electrical contacts, and the heating element through an opening at a distal insertion end of the battery portion,**

Thorens788 discloses this limitation. EX1005, ¶¶570-572.

Thorens788 discloses aerosol generating system having a mouthpiece end (cartomizer receiving segment defining a chamber). [9.I], [9.J]. The mouthpiece end has a chamber is configured to receive the cartomizer. Ground 4, [1.C], [1.F]. The

cartomizer has a cartomizer body, cartomizer contacts, and heating element. Ground 4, [1.D], [1.G], [1.J], [1.K].

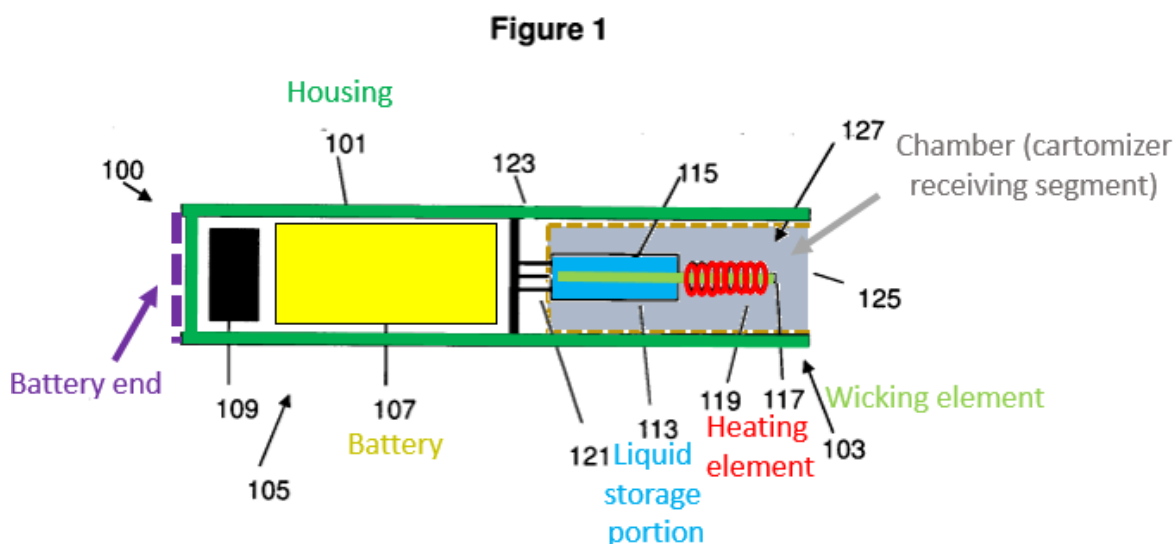


- j. [17.J] a battery segment disposed between the cartomizer receiving segment and a battery end of the battery portion opposite from the distal insertion end of the battery portion, the battery segment comprising a battery,

Thorens788 discloses this limitation. EX1005, ¶¶573-575.

Thorens788 discloses aerosol generating system 100 with a body end having a battery segment that is between the mouthpiece end and a battery end of the body end opposite from the distal insertion end of the battery portion. EX1004, 12:8-11 (“The aerosol generating system 100 of Figure 1 is an electrically heated aerosol generating system 100 and comprises a housing 101 having a mouthpiece end 103

and a body end 105. In the body end 105, there is provided an electric power supply in the form of a battery 107 and electric circuitry in the form of circuitry 109 and a puff detection system, not shown.”).



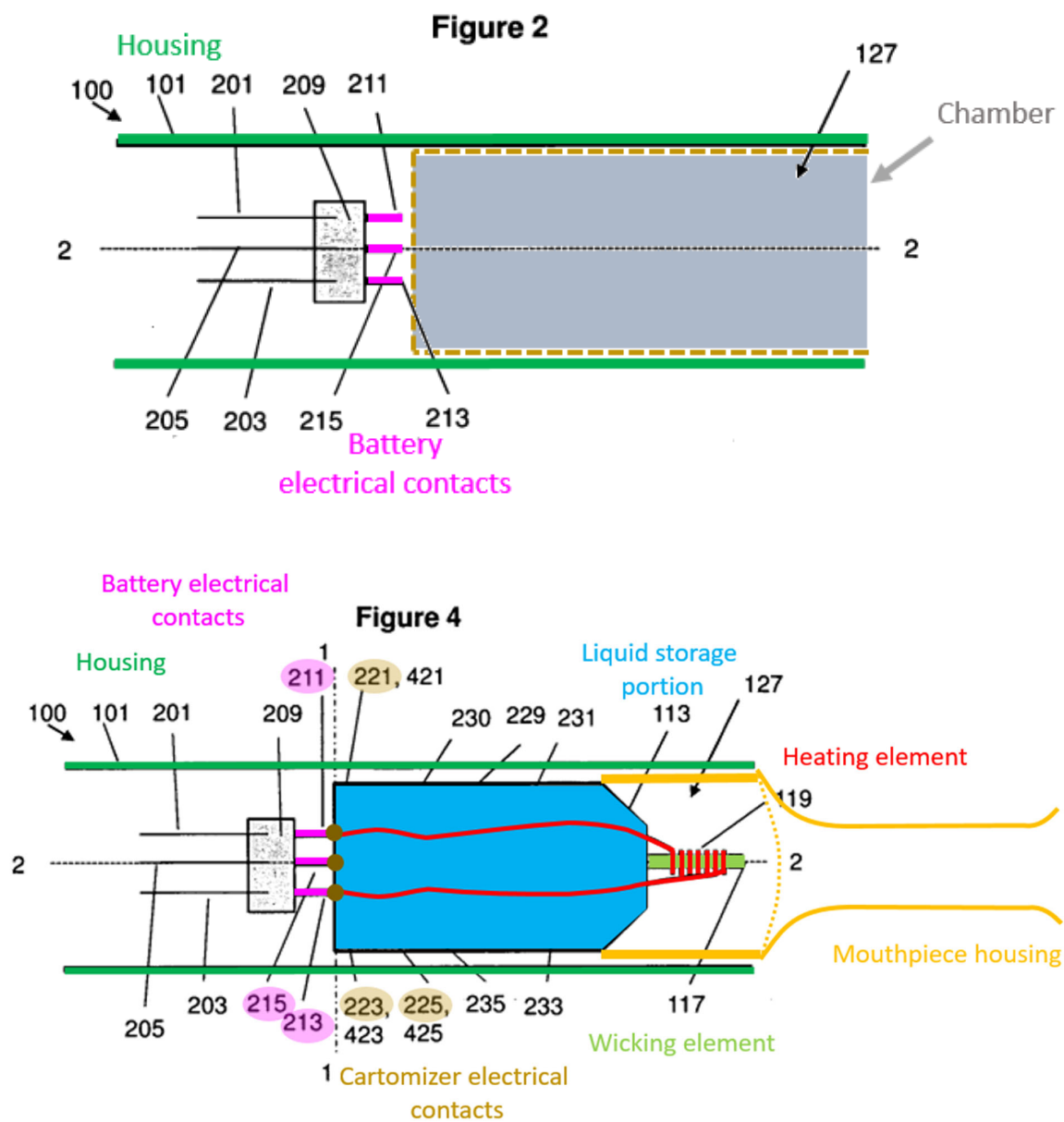
EX1004, Fig. 1

- k. [17.K] battery electrical contacts for completing a circuit with the cartomizer electrical contacts when the cartomizer electrical contacts are received into the chamber, the battery electrical contacts being coplanar, and

Thorens788 discloses this limitation. EX1005, ¶¶576-578.

Thorens788 discloses that, “[w]hen a liquid storage portion is inserted into the aerosol generating system, electrical contacts 221, 223 on the liquid storage portion and two electrical contacts 211, 213 on the aerosol generating system 100 allow electrical energy to be transmitted to the heating element 119.” EX1004, 15:5-7.

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- l. [17.L] an outer shell forming at least part of the chamber, wherein a window is formed in the outer shell to permit viewing of the cartomizer body when the cartomizer body is received into the chamber.

Obvious. [9.K].

6. Claim 18

- a. [18.A] The vaporizer device of claim 9, wherein the cartomizer has a mouthpiece end and an insertion end disposed opposite the mouthpiece end, the cartomizer further comprises,

Disclosed. Ground 4, [1.C].

- b. [18.B] an inhalation tube in fluid communication with the heating element and the wicking element; and

Obvious. Ground 4, [1.H].

- c. [18.C] a mouthpiece at or proximate to the mouthpiece end, the mouthpiece in fluid communication with the inhalation tube;

Obvious. Ground 4, [1.I].

- d. [18.D] wherein the plurality of cartomizer electrical contacts is positioned to contact a plurality of battery electrical contacts at a base end of the chamber when the cartomizer body is inserted into the chamber.

Obvious. Ground 4, [1.K].

G. Ground 7: Thorens⁷⁸⁸, ~~and Thorens²³¹~~ further in view of and Zheng renders (C) claim 8) is unpatentable under 35 U.S.C. § 103

1. Motivation to Combine

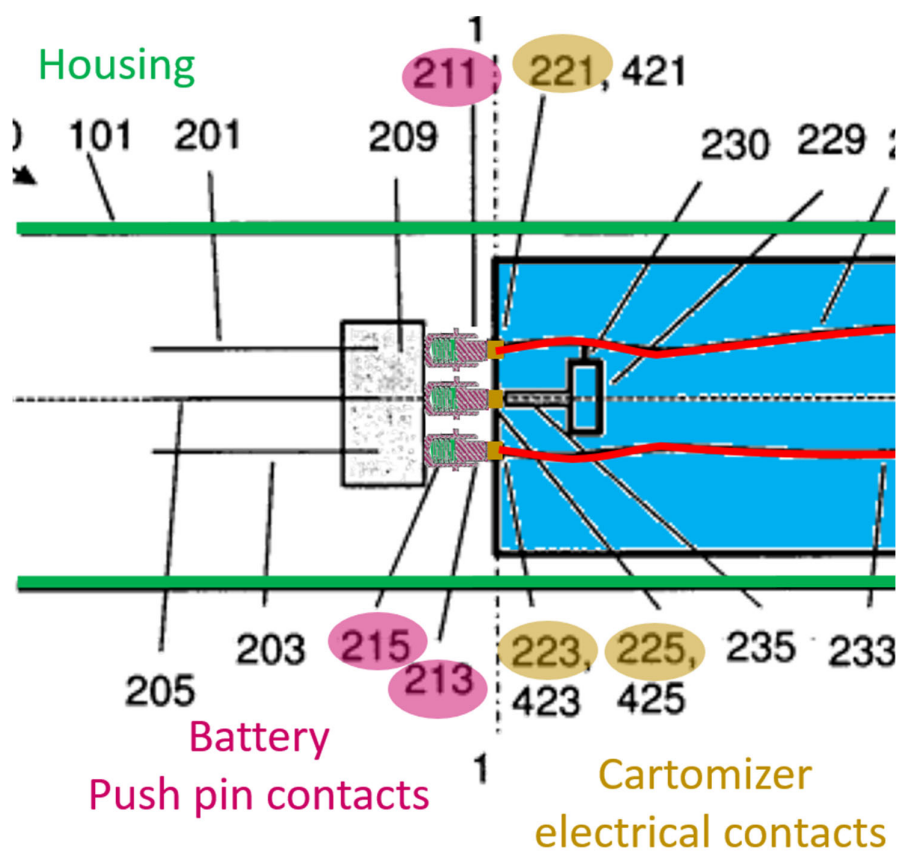
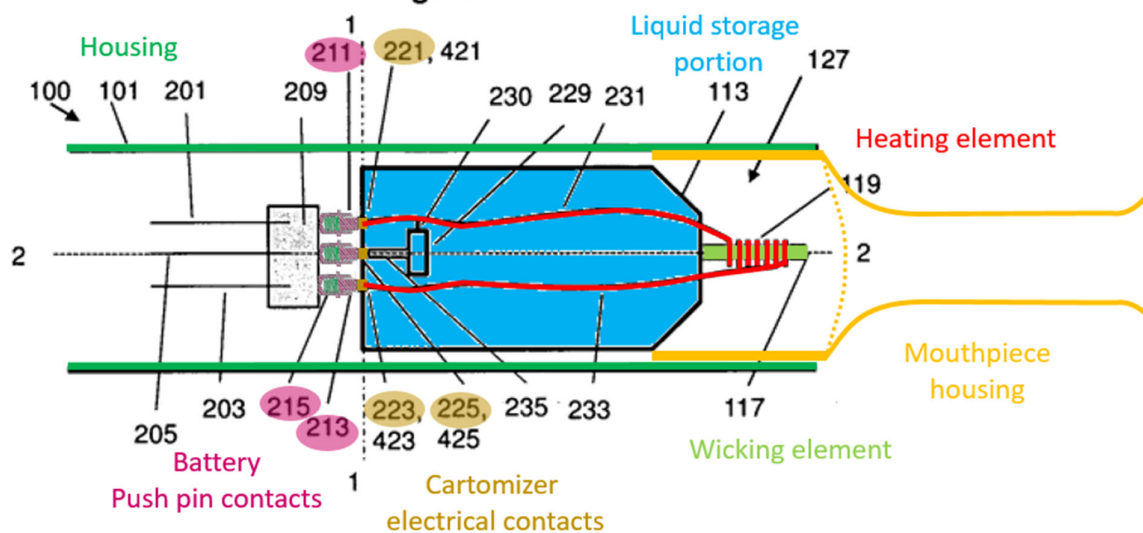
- a. Compressible Electrical Contacts

Thorens788 discloses battery contacts 211, 213. EX1004, 15:5-7 (“When a liquid storage portion is inserted into the aerosol generating system, electrical contacts 221, 223 on the liquid storage portion and two electrical contacts 211, 213 on the aerosol generating system 100 allow electrical energy to be transmitted to the heating element 119.”). Thorens788 does not disclose that the battery contacts are compressible.

Zheng, however, discloses “resilient battery columns” having “a spring 302 inside [a] hollow cavity.” Section IX.C.1; EX1050, 3:7-13. A POSA would have been motivated to modify Thorens788 to include the push pin connectors of Zheng for many of the same reasons as discussed in IX.C.1. EX1005, ¶¶585-587. Specifically, push pin connectors bias the connector towards the corresponding cartomizer connector. EX1005, ¶586. That ensures a stable electrical coupling even if the contacts wear from the repeated insertion of different cartomizers. *Id.* Further, push pin connectors are self-cleaning, which also facilitates a stable electrical connection. *Id.* Moreover, as discussed by Zheng, Zheng’s push pin connectors are “simple” and “easy to manufacture”. EX1050, 1:58-61.

Given the simple construction of Zheng’s push pin connectors, and the ubiquitous of push pin connectors, it would have been inconsequential to modify Thorens788 to include such connection pins. EX1005, ¶587.

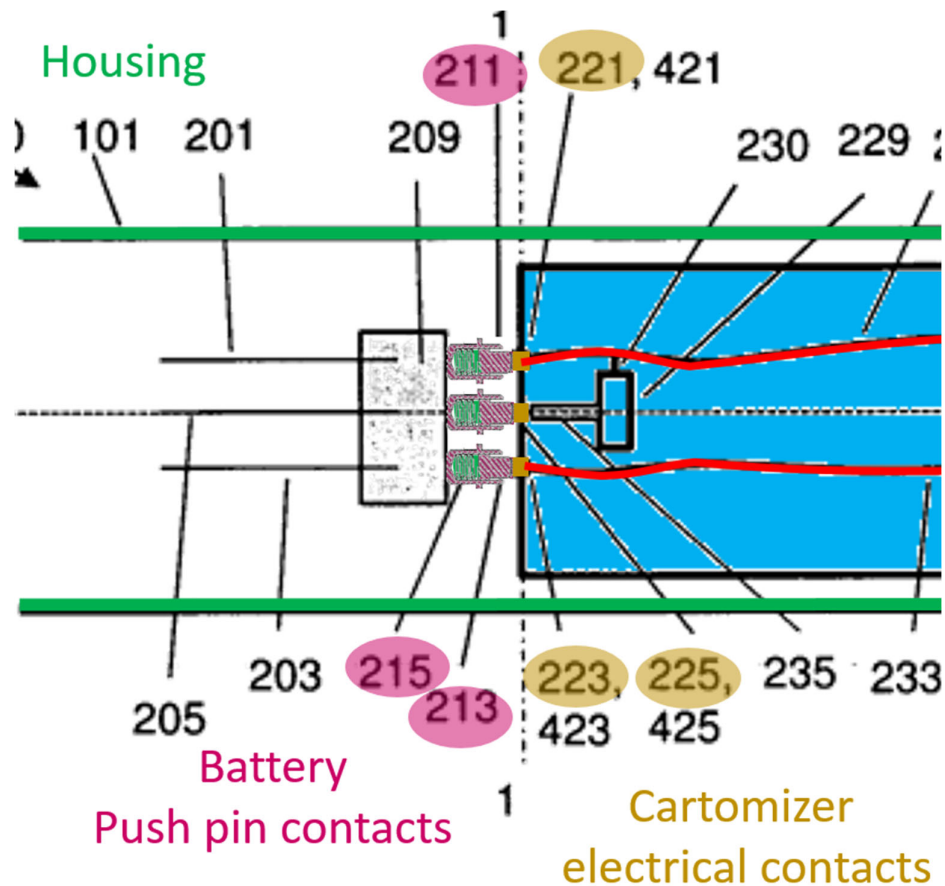
Figure 4



2. **Claim 8: The cartomizer of claim 1, wherein the plurality of cartomizer electrical contacts is further configured to at least partially compress the plurality of battery electrical contacts when the cartomizer body is inserted into the chamber.**

Thorens788 and Thorens213 further in view Zheng render obvious this limitation. EX1005, ¶¶588-589.

As discussed in IX.G.1, it would have been obvious to a POSA to use push pin contacts, such as those disclosed in Zheng. EX1005, ¶589.



X. SECONDARY CONSIDERATIONS

Although Patent Owner presents alleged evidence of secondary indicia of

nonobviousness in its October 3, 2023 first supplemental response to Petitioner's Interrogatory No. 3 in the ITC Investigation, Patent Owner did not even attempt to establish a nexus between the alleged evidence and the challenged claims.⁵ Also, Liu783, Liu438, Levin, Thorens788, Thorens231, Tucker, and Zheng demonstrate there was no long-felt but unsolved need or failure by others because the features recited in the challenged claims were readily available in the prior art. EX1005, ¶590. Thus, Petitioner is unaware of any evidence of secondary considerations that would support a nonobviousness finding.

XI. THE BOARD SHOULD REACH THE MERITS OF THIS PETITION

~~A. The Board Should Not Exercise Its Discretion to Deny Institution Under § 325(d)~~

In deciding whether to exercise its discretion to deny institution under 35 U.S.C. § 325(d), the Board applies a two-part framework that considers six non-exclusive factors. *See Advanced Bionics, LLC v. MED-EL Elektromedizinische Geräte GmbH*, IPR2019-01469, Paper 6 (P.T.A.B. Feb. 13, 2020) (precedential), *Becton, Dickinson & Co. v. B. Braun Melsungen AG*, IPR2017-01586, Paper 8 at 17-18 (P.T.A.B. Dec. 15, 2017) (precedential).

Although Liu783, Thorens788, Tucker, Thorens231, and the publications of

⁵ Patent Owner's Interrogatory Responses are marked confidential. Petitioner will work with Patent Owner to submit their Interrogatory Response.

Levin and Zheng were disclosed by the applicant in IDSs, nothing in the record suggests the examiner evaluated or appreciated the relevance of these references. These reference were among over 600 references cited during prosecution. Among this sea of references, the examiner did not identify any references relied upon in the Petition as the basis for any rejection, and did not otherwise discuss them during prosecution. As such, the Board should not exercise its discretion to deny institution under § 325(d).

XII. CONCLUSION

For the reasons stated above, Petitioner respectfully request institution of the review.

Petition for *Inter Partes* Review of U.S. Patent No. 11,606,981

Respectfully submitted,

Dated: ~~December~~February 5, 2024~~3~~ By: /Anish R. Desai/
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