

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. 11,134,722

TABLE OF CONTENTS

	Page
Contents	
I. MANDATORY NOTICES	1
A. Real Party-in-Interest	1
B. Related Matters.....	1
C. Lead and Back-up Counsel and Service Information	2
II. GROUNDS FOR STANDING	2
III. BACKGROUND AND OVERVIEW OF THE '722 PATENT	3
A. Overview of the Claims.....	4
B. Prosecution History	6
IV. STATUTORY GROUNDS FOR THE CHALLENGES.....	3
V. LEVEL OF ORDINARY SKILL IN THE ART	8
VI. CLAIM CONSTRUCTION	8
A. “wicking element” (claims 1, 10, 15).....	8
B. “heating element” (claims 1, 10, 15).....	9
C. “window” (claims 14, 17)	10
VII. BACKGROUND ART	10
A. Cartomizer Design.....	10
B. Charging Contacts	12
C. Translucent Window	13

VIII.	PRIOR ART ASSERTED IN THE GROUNDS	14
A.	Pan (EX1024) (Primary Reference)	14
B.	Thorens788 (EX1004) (Primary Reference)	16
C.	Levin (EX1003) (Secondary Reference)	17
D.	Thorens231 (EX1002) (Secondary Reference)	18
E.	Tucker (EX1034) (Secondary Reference)	19
IX.	IDENTIFICATION OF HOW THE CHALLENGED CLAIMS ARE UNPATENTABLE	20
A.	Ground 1: Pan in view of Levin renders claims 1, 3, 7, 9-13, 15- 16, 18-21 unpatentable under 35 U.S.C. § 103.	20
1.	Motivation to Combine	20
2.	Claim 1	30
3.	Claim 5: The vaporizer of claim 1, wherein the plurality of charger electrical contacts are arranged linearly at the first end of the battery portion.	44
4.	Claim 7: The vaporizer of claim 1, wherein the cartomizer further comprises a mouthpiece opposite an end of the cartomizer configured for insertion into the chamber.	45
5.	Claim 9: The vaporizer of claim 1, wherein the cartomizer further comprises electrical circuitry connected with the heating element.	46
6.	Claim 10	47
7.	Claim 11: The vaporizer of claim 10, wherein the battery portion further comprises one or more battery electrical	

	contacts in or proximate the cartomizer chamber of the cartomizer receiving segment.	51
8.	Claim 12: The vaporizer of claim 10, wherein the cartomizer further comprises one or more cartomizer electrical contacts for connecting with one or more battery electrical contacts in or proximate the cartomizer chamber.	53
9.	Claim 13: The vaporizer of claim 10, wherein the plurality of charger electrical contacts are arranged linearly at the first end of the battery portion.	53
10.	Claim 15.....	53
11.	Claim 16: The vaporizer of claim 15, wherein the plurality of charger electrical contacts are arranged linearly at the first end of the battery portion.	55
12.	Claim 18: The vaporizer of claim 1, the battery portion further comprising at least one magnet in or proximate to the chamber of the cartomizer receiving segment.	56
13.	Claim 19: The vaporizer of claim 18, the cartomizer further comprising a metal element disposed near a base end of the cartomizer for coupling with the at least one magnet of the battery portion.	56
14.	Claim 20: The vaporizer of claim 15, the battery portion further comprising at least one magnet in or proximate to the chamber of the cartomizer receiving segment.	56
15.	Claim 21: The vaporizer of claim 20, the cartomizer further comprising a metal element disposed near a base end of the cartomizer for coupling with the at least one magnet of the battery portion.	56
B.	Ground 2: Pan and Levin further in view of Tucker renders claims 14 and 17 unpatentable under 35 U.S.C. § 103	56

Petition for *Inter Partes* Review of U.S. Patent No. 11,134,722

1.	Motivation to Combine	56
2.	Claims 14 and 17: The vaporizer of claim [10/15], further comprising a window on or proximate to the shell, the window permitting viewing of the cartomizer when the cartomizer is inserted into the cartomizer chamber.....	61
C.	Ground 3: Thorens788 in view of Thorens231 further in view of Levin renders claims 1, 5, 7, 9-13, 15-16, 18-21 unpatentable under 35 U.S.C. § 103	62
1.	Motivation to Combine	62
2.	Claim 1	70
3.	Claim 5: The vaporizer of claim 1, wherein the plurality of charger electrical contacts are arranged linearly at the first end of the battery portion.....	88
4.	Claim 7: The vaporizer of claim 1, wherein the cartomizer further comprises a mouthpiece opposite an end of the cartomizer configured for insertion into the chamber.	89
5.	Claim 9: The vaporizer of claim 1, wherein the cartomizer further comprises electrical circuitry connected with the heating element.	91
6.	Claim 10.....	92
7.	Claim 11: The vaporizer of claim 10, wherein the battery portion further comprises one or more battery electrical contacts in or proximate the cartomizer chamber of the cartomizer receiving segment.	95
8.	Claim 12: The vaporizer of claim 10, wherein the cartomizer further comprises one or more cartomizer electrical contacts for connecting with one or more battery electrical contacts in or proximate the cartomizer chamber.	97

Petition for *Inter Partes* Review of U.S. Patent No. 11,134,722

9.	Claim 13: The vaporizer of claim 10, wherein the plurality of charger electrical contacts are arranged linearly at the first end of the battery portion.	98
10.	Claim 15	99
11.	Claim 16: The vaporizer of claim 15, wherein the plurality of charger electrical contacts are arranged linearly at the first end of the battery portion.	101
12.	Claim 18: The vaporizer of claim 1, the battery portion further comprising at least one magnet in or proximate to the chamber of the cartomizer receiving segment.	101
13.	Claim 19: The vaporizer of claim 18, the cartomizer further comprising a metal element disposed near a base end of the cartomizer for coupling with the at least one magnet of the battery portion.....	101
14.	Claim 20: The vaporizer of claim 15, the battery portion further comprising at least one magnet in or proximate to the chamber of the cartomizer receiving segment.	101
15.	Claim 21: The vaporizer of claim 20, the cartomizer further comprising a metal element disposed near a base end of the cartomizer for coupling with the at least one magnet of the battery portion.....	101
D.	Ground 4: Thorens788, Thorens231, and Levin further in view of Tucker render claims 14 and 17 unpatenable under 35 U.S.C. § 103	102
1.	Motivation to Combine	102
2.	Claims 14 and 17: The vaporizer of claim [10/17], further comprising a window on or proximate to the shell, the window permitting viewing of the cartomizer when the cartomizer is inserted into the cartomizer chamber.....	106

Petition for *Inter Partes* Review of U.S. Patent No. 11,134,722

X.	SECONDARY CONSIDERATIONS.....	106
XI.	THE BOARD SHOULD REACH THE MERITS OF THIS PETITION	107
	A. The Board Should Not Exercise Its Discretion to Deny Institution Under § 325(d)	107
XII.	CONCLUSION	108

Petition for *Inter Partes* Review of U.S. Patent No. 11,134,722

PETITIONERS’ EXHIBIT LIST

No.	Exhibit
1001	U.S. Patent No. 11,134,722 (“722 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. 11,134,722 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>
1017	<i>Intentionally left blank</i>
1018	<i>Intentionally left blank</i>

Petition for *Inter Partes* Review of U.S. Patent No. 11,134,722

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

Petition for *Inter Partes* Review of U.S. Patent No. 11,134,722

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. 11,134,722 (“’722 Patent”), along with U.S. Patent Nos. 10,709,173 (“’173 Patent”), RE49,114 (“’114 Patent”), 10,130,123 (“’123 Patent”), and 11,606,981 (“’981 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, the ’173 Patent, the ’114 Patent, and the ’981 Patent have been or will be filed shortly.

C. Lead and Back-up Counsel and Service Information

Anish R. Desai (lead counsel) Reg. No. 73,760 Elizabeth S. Weiswasser (backup counsel) Reg. No. 55,721 Weil, Gotshal & Manges LLP 767 Fifth Ave. New York, NY 10153 T: 212-310-8000 F: 212-310-8007 anish.desai@weil.com elizabeth.weiswasser@weil.com Adrian C. Percer (backup counsel) Reg. No. 46,986 Weil, Gotshal & Manges LLP 201 Redwood Shores Parkway Redwood Shores, CA 94065 T: 650-802-3000 F: 650-802-3100 adrian.percer@weil.com	W. Sutton Ansley (backup counsel) Reg. No. 67,828 Christopher M. Pepe (backup counsel) Reg. No. 73,851 Matthew Sieger (backup counsel) Reg. No. 76,051 Taylor J. Lawrence (backup counsel) Reg. No. 79,817 Weil, Gotshal & Manges LLP 2001 M Street NW, Suite 600 Washington, DC 20036 T: 202-682-7000 F: 202-857-0940 sutton.ansley@weil.com christopher.pepe@weil.com matthew.sieger@weil.com taylor.lawrence@weil.com
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II. GROUNDS FOR STANDING

Petitioner certifies that the '722 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

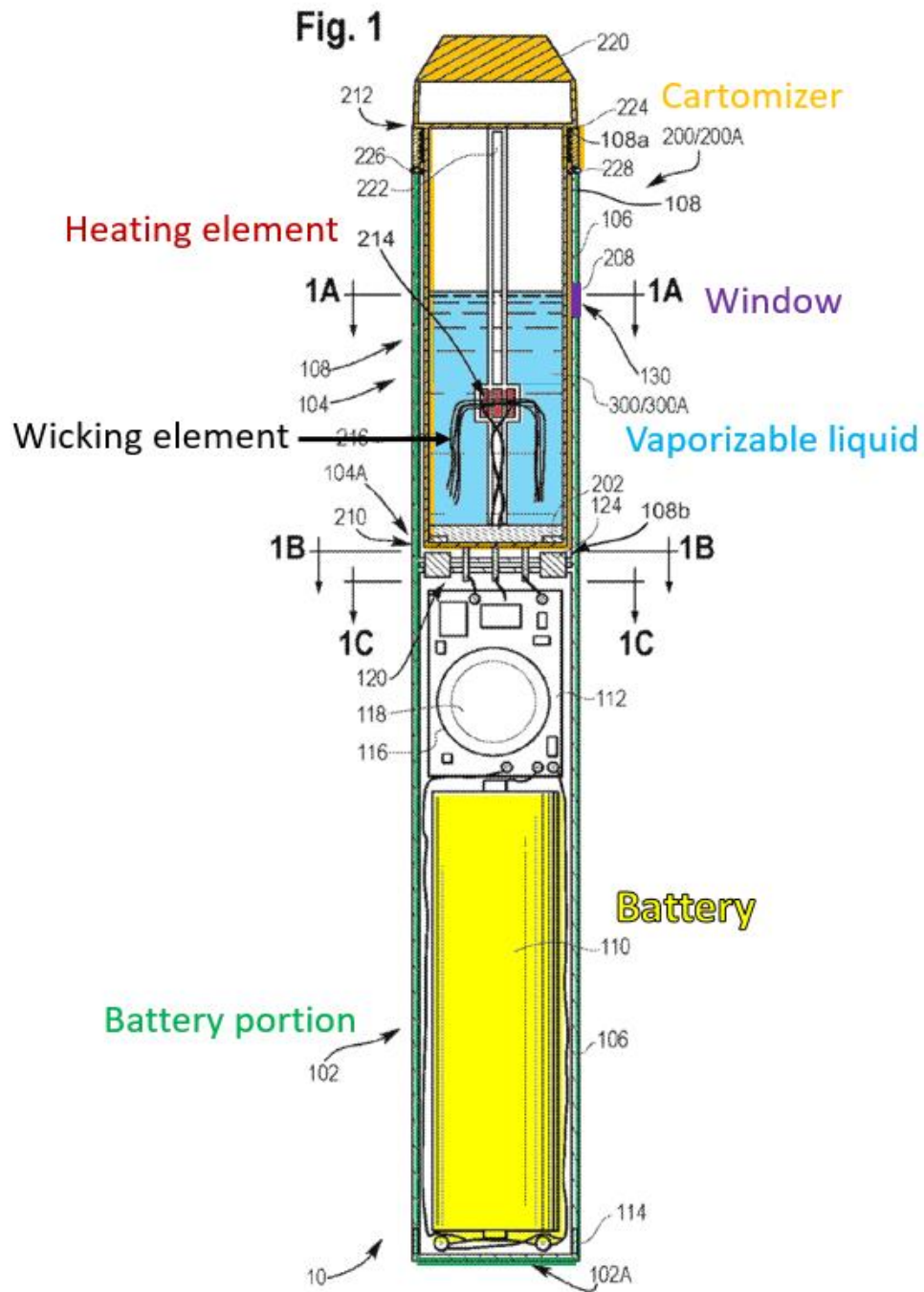
Ground 1	Claims 1, 5, 7, 9-13, 15-16, 18-21 of the '722 Patent are unpatentable under 35 U.S.C. § 103 that they are rendered obvious by the U.S. Pat. No. 8,205,622 ("Pan") in view of U.S. Patent No. 9,427,022 ("Levin").
Ground 2	Claims 14 and 17 of the '722 Patent are unpatentable under 35 U.S.C. § 103 on the ground that they are rendered obvious by the Pan and Levin further in view of U.S. Pat. Pub. No. 2013/0192623 ("Tucker") and the knowledge of a POSA.
Ground 3	Claims 1, 5, 7, 9-13, 15-16, 18-21 of the '722 Patent are unpatentable under 35 U.S.C. § 103 on the ground that they are rendered obvious by International Application No. WO2011/160788 ("Thorens788") in view of U.S. Patent No. 8,794,231 ("Thorens231") and Levin.
Ground 4	Claims 14 and 17 of the '722 Patent are unpatentable under 35 U.S.C. § 103 on the ground that they are rendered obvious by Thorens788 in view of Thorens231, Levin, and Tucker.

IV. BACKGROUND AND OVERVIEW OF THE '722 PATENT

A. Overview of the Claims

The '722 Patent was filed on August 31, 2018 and claims priority to three provisional applications, the earliest filed on November 12, 2013. The grounds in this Petition are based on references that qualify as prior art as of November 12, 2013, which is the earliest possible priority date of the '722 Patent.

The challenged claims of the '722 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 structure 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. Certain challenged claims of the '722 Patent include additional features of the e-cigarette such as (1) the entire heating element be within the chamber when the cartomizer is inserted; (2) charging contacts at an end of the battery portion opposite the chamber; (3) a magnetic connection between the battery portion and the cartomizer; and (4) a translucent window formed on the battery portion through which the cartomizer is viewed when the cartomizer is inserted. EX1001, 18:57-61, 18:38-42, 19:35-37, 19:7-10.



EX1001, Fig. 1

B. Prosecution History

On August 31, 2018, VMR Products, LLC (the “Applicant”) filed U.S. Patent Application No. 16/119,359, which resulted in the ’722 Patent. EX1007.044. The Examiner rejected all pending claims as being anticipated and rendered obvious by U.S. Patent Publication No. 2014/0150783 (“Liu783”). EX1007.094-096. Applicant subsequently amended the claims to recite “a plurality of charger electrical contacts ... disposed at a first end of the battery portion opposite the insertion end of the chamber.” EX1007.215. In its remarks, the Applicant argued that Liu783 does not disclose a plurality of charger electrical contacts. EX1007.225. Applicant also added claims 3-20, which became issued claims 3-21. EX1007.216-.218.

On August 8, 2019, the Examiner rejected all claims as being rendered obvious by various combinations of U.S. Patent Publications 2015/0157055 (“Lord”) (disclosing a vaporizer comprising a battery segment and a cartomizer receiving segment having a chamber), 2014/0096781 (“Sear”) (disclosing a vaporizer comprising a battery segment and a cartomizer receiving segment defining a chamber having an opening at an insertion end distal to the battery segment), 2013/0042865 (“Monsees”) (disclosing a vaporizer having a plurality of charger electric contacts disposed at a distal end of the device), 2011/0036346 (“Cohen”) (disclosing a vaporizer comprising a battery portion having a window, which allows

viewing of the cartomizer), and Liu783 (disclosing a vaporizer comprising cartomizer that is magnetically connected to a battery portion). EX1007.235-244.

Applicant subsequently amended all independent claims to require the “entire heating element [be] disposed between the insertion end...and the base end of the chamber[,]” and argued that “Lord, Sears, and Monsees...fail[ed] to teach or suggest” the new limitation. EX1007.314, .319-.321. Applicant did not argue that Liu783 failed to teach magnetically connecting the cartomizer with the battery portion, or that Cohen failed to teach a window on the battery portion. *See* EX1007.319-.322.

On March 5, 2020, the Examiner rejected all claims as being anticipated by U.S. Patent Publication 2013/0037041 (“Worm”), or rendered obvious by Worm and Cohen and/or Liu783. EX1007.363-.372. The Applicant subsequently amended the claims to require the recited vaporizable substance to be a liquid. EX1007.386; *see also* EX1007.381 (“Worm fails to disclose or suggest a body including a structure to hold a vaporizable liquid...”).

On September 11, 2020, the Examiner issued nonstatutory double patenting rejection. EX1007.394-395. Applicant filed terminal disclaimer to obviate the rejection. EX1007.419. On December 30, 2020, the Examiner issued a Notice of Allowance, stating that the closest prior art reference, Worm, fails to disclose a

vaporizable substance that is liquid. EX1007.439. The '722 Patent issued on September 15, 2021.

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. See EX1049.

A. “wicking element” (claims 1, 10, 15)

In the Section 337 Investigation, Patent Owner contends that the term “wicking element” in the '722 Patent means “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).”).

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, 10, 15)

In the Section 337 Investigation, Patent Owner contends that the term “heating element” in the ’722 Patent means 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 14, 17)

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

VII. BACKGROUND ART

A. Cartomizer Design

By 2000, it was well-known that an e-cigarette 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; EX1005, ¶33.

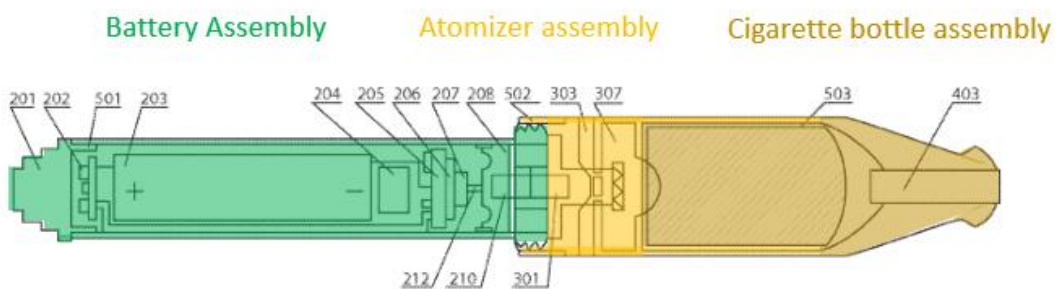
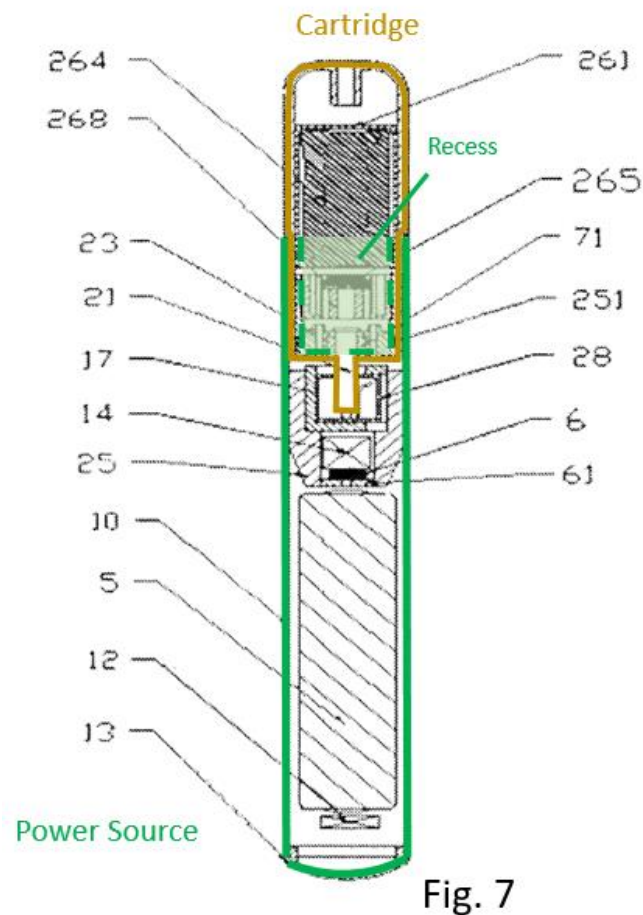


Figure 5B

EX1021, Fig. 5B

See also 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; EX1005, ¶35.

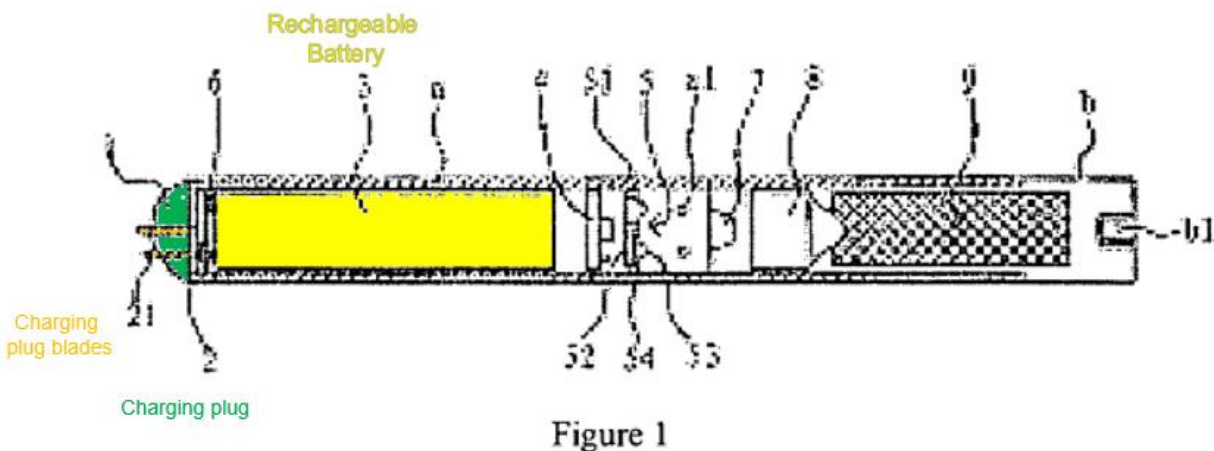


EX1024, Fig. 7

It was also known that the cartridge could be connected to the power source via magnetic connection. *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. Charging Contacts

By 2013, it was well-known that the battery in an e-cigarette is preferably rechargeable to avoid replacing disposable batteries and thus reduce cost for the consumer. EX1005, ¶37. It was also known that the battery may be recharged from charging contacts disposed at an end of the e-cigarette. For example, U.S. Patent No. 8,156,944 discloses an e-cigarette comprising “a rechargeable battery, which has a flexibly connected charging plug. The blades of the said plug come out of the other end of the said shell.” EX1027, 2:10-13; *see also id.*, 4:1-5 (“When the rechargeable battery... 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.”).



EX1027, Fig. 1

See also *e.g.*, EX1028, 6:1-5, Fig. 2 (disclosing a USB port at an end of an e-cigarette for recharging the battery); EX1029, 15:10-21, Fig. 8 (disclosing charging contacts disposed at an end of the e-cigarette); EX1005, ¶38.

C. Translucent Window

By 2013, it was also known that an e-cigarette device may include a window to allow viewing of 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.”); EX1053, 7:31-41 (“a transparent peeping window (not shown) can be

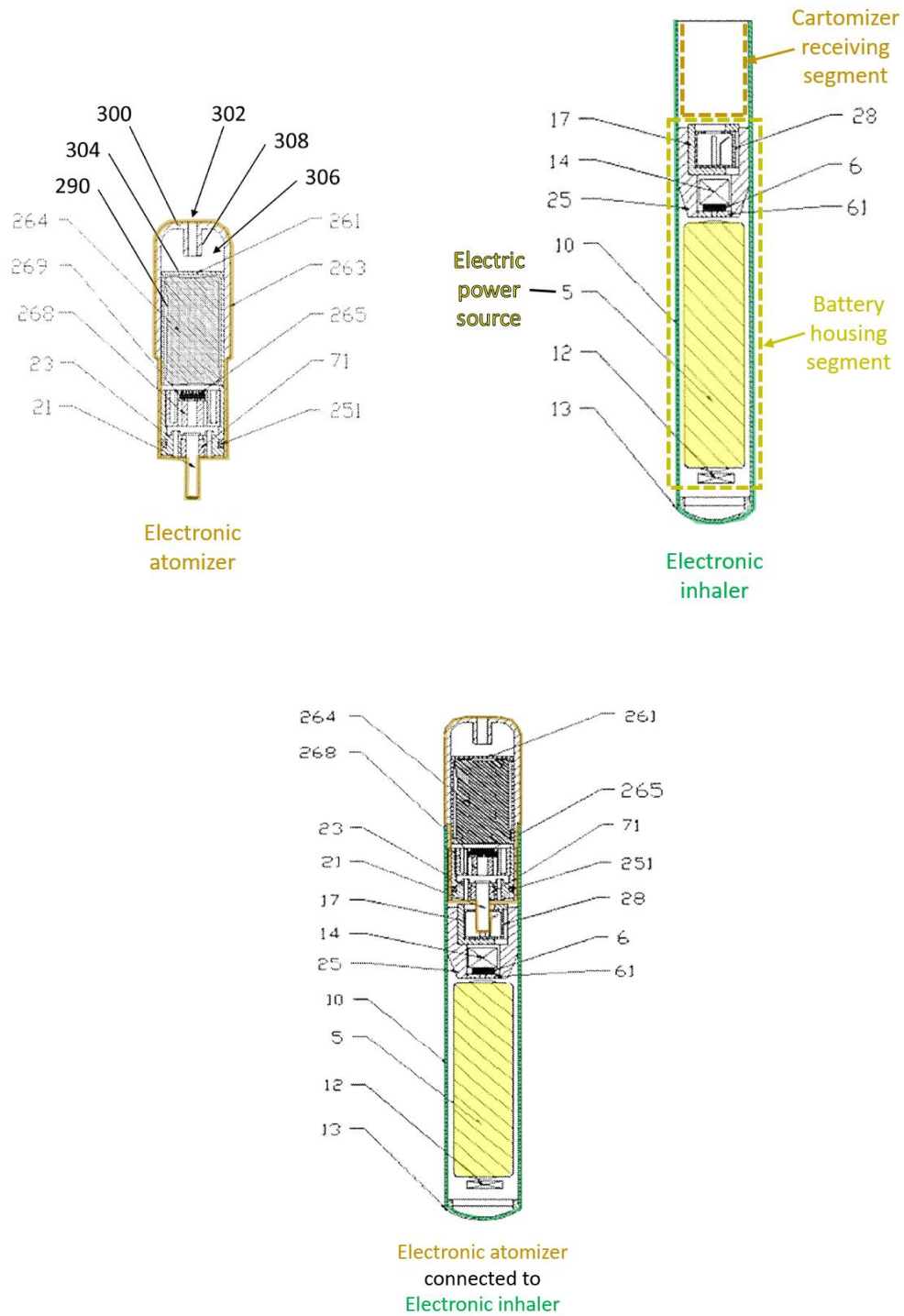
formed in that portion of the side wall of the casing 12 which corresponds to the liquid container 32... to observe the remaining amount of the liquid flavor source 34 within the liquid container 32. In this case, the liquid container 32 itself must be formed of a transparent or translucent material. 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.”); EX1005, ¶¶39-40.

VIII. PRIOR ART ASSERTED IN THE GROUNDS

A. Pan (EX1024) (Primary Reference)

U.S. Pat. No. 8,205,622 (“Pan”), titled “Electronic Cigarette” was filed on May 7, 2009, and is prior art under 35 U.S.C. § 102(a)(2).

Pan discloses a vaporizer having an “electronic inhaler” portion (*i.e.*, battery portion), shown in Fig. 3, and an “electronic atomizer” portion (*i.e.*, cartomizer), shown in Fig. 5. EX1024, Abstract, 2:25-35, 4:63-5:7, 5:29-36, 6:1-18, Fig 3, Fig. 5, Fig. 7. The inhaler houses the electric power source 5, which may be rechargeable, and further includes a chamber to receive the integrated electronic atomizer. The integrated electronic atomizer mechanically and electrically connects to the inhaler portion when inserted into the chamber, as shown in Fig. 7. EX1005, ¶¶41-46.

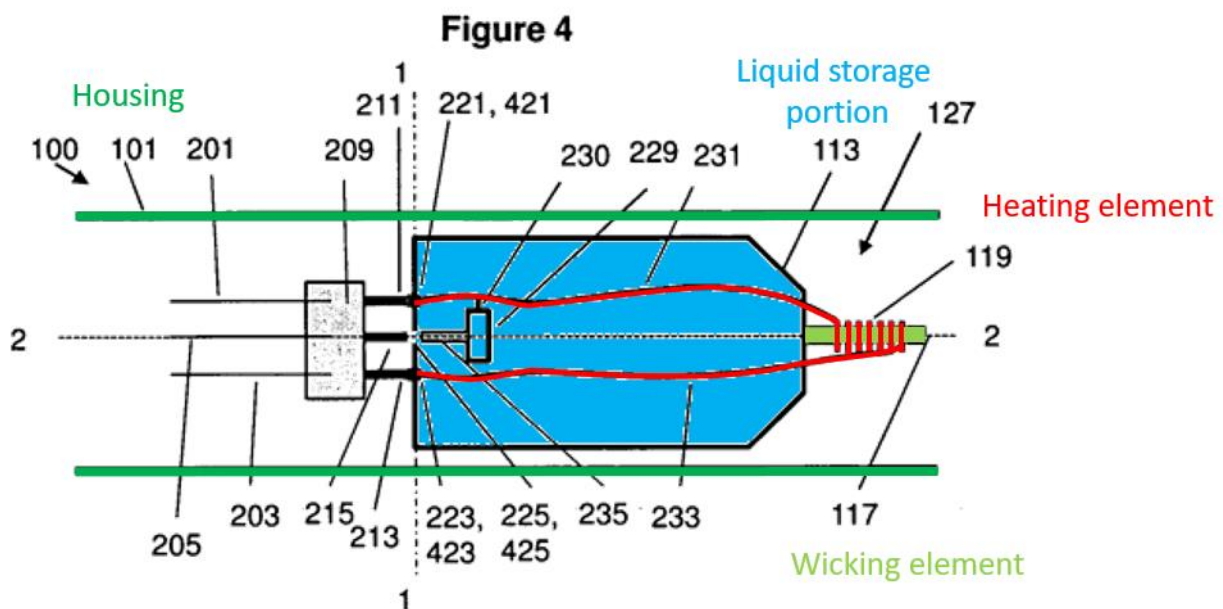


EX1024, Figs. 3, 5, 7

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 aerosol generator having a housing portion comprising a battery. The housing portion 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 housing portion by electrical contacts located at the base of the cartomizer. *Id.*, 14:5-18; EX1005, ¶¶54-61.



C. Levin (EX1003) (Secondary Reference)

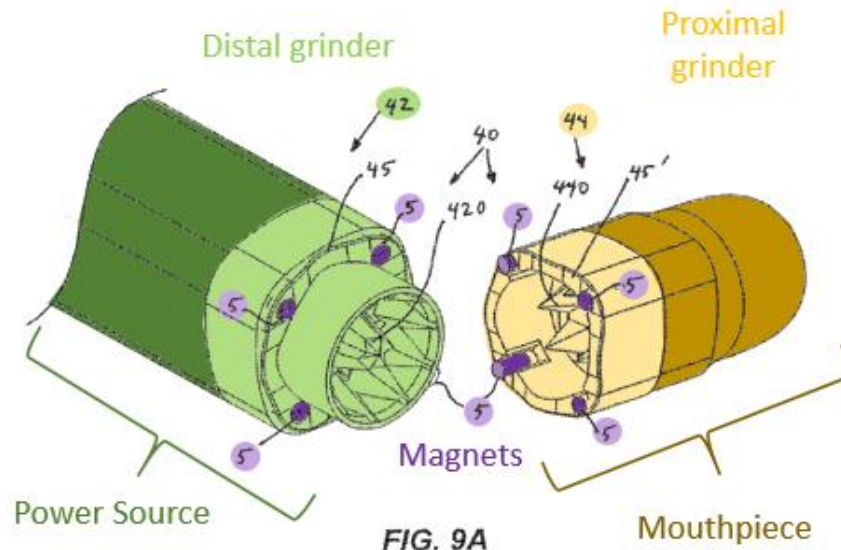
U.S. Patent No. 9,427,022 (“Levin”), titled “Electronic Vaporizing Device and Methods for Use” was filed on March 12, 2013 is prior art under 35 U.S.C. § 102(a)(2).

Levin discloses a vaporizer having a mouthpiece portion detachably engaged with a power source portion containing a battery. EX1003, 22:7-14, 10:31-34; EX1005, ¶¶48-49. The engagement of the mouthpiece portion and the power source portion creates a “grinder,” wherein nicotine containing substances such as tobacco leaves can be ground up before vaporization. EX1003, 22:64-67, 19:29-35; EX1005, ¶50.

Levin is relied on for its disclosure of USB charger contacts. Levin discloses that, “the device includes a port 31 to recharge the power source 30, such as a micro-USB charging port located on a printed circuit board behind a distal lens tip or endcap...to recharge non-removable batteries by connecting a recharging cable 70, such as a USB cable...” EX1003, 14:11-156; *see also* 23:58-62; Figs. 6A-6D, 14A-14C; EX1005, ¶53.

Levin is also 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. In one exemplary embodiment, the mouthpiece portion

contains four magnets and the power source portion includes four corresponding magnets. EX1003, 20:51-60; EX1005, ¶¶ 51-52.

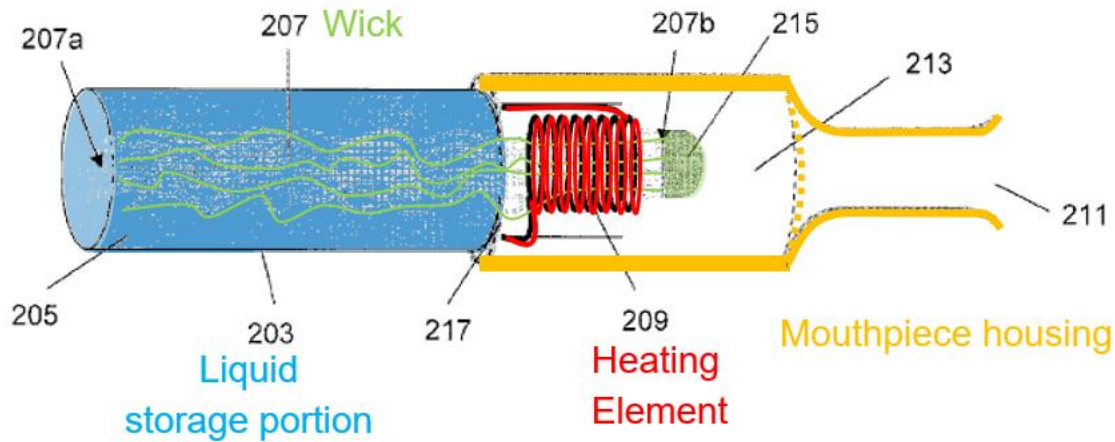


EX1003, Fig. 9A

D. Thorens231 (EX1002) (Secondary Reference)

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

Thorens231 shares common inventorship with Thorens788 and describes a substantially similar device. EX1005, ¶¶214-216. Thorens231 is relied upon for its illustration of a mouthpiece housing and its disclosure of a cartridge made of glass. See EX1002, Abstract, Fig. 2, 7:33-35; EX1005, ¶¶63-65.

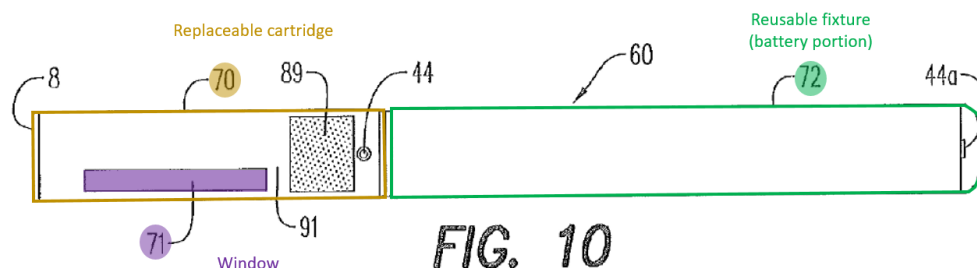


EX1002, Fig. 2

E. Tucker (EX1034) (Secondary Reference)

U.S. Patent Publication 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]; EX1005, ¶¶75-77.



EX1034, Fig. 10

IX. IDENTIFICATION OF HOW THE CHALLENGED CLAIMS ARE UNPATENTABLE

A. Ground 1: Pan in view of Levin renders claims 1, 5, 7, 9-13, 15-16, 18-21 unpatentable under 35 U.S.C. § 103.

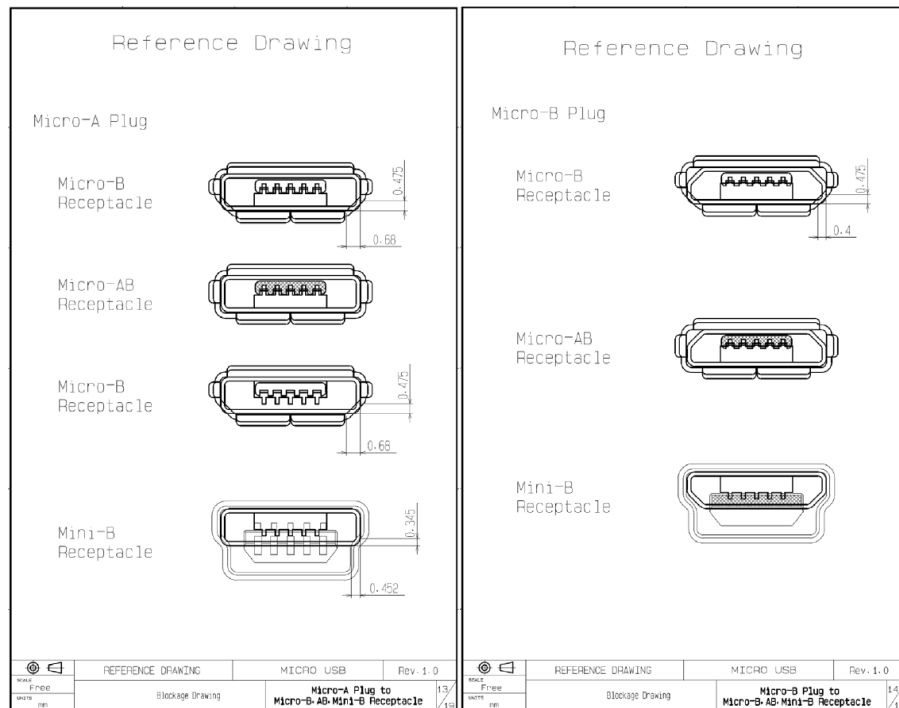
1. Motivation to Combine

a. USB Charging

Pan discloses rechargeable batteries, but does not disclose charger contacts on the battery portion to charge those batteries. EX1024, 2:32-35, 5:29-49. Levin, however, teaches an electronic vaporizing device including a micro-USB charging port for charging its battery. EX1003, 1:14-15 (“The present invention generally relates to an electronic vaporizing device...”), 14:11-26 (“the device includes a port 31 to recharge the power source 30, such as a micro-USB charging port...”), 8:66-9:6, 23:58-62; EX1005, ¶¶97-98.

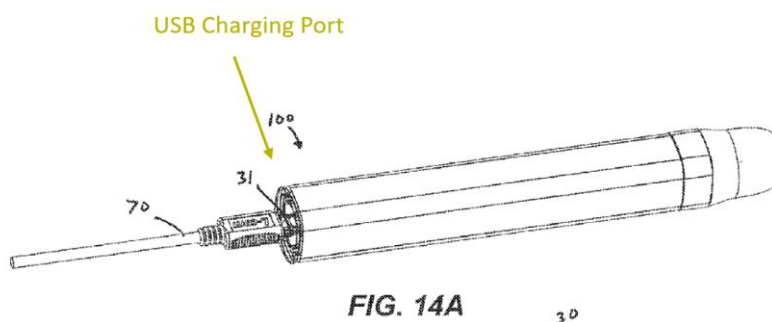
It would have been obvious to a POSA to combine Pan with Levin to incorporate charger contacts in Pan to recharge its rechargeable batteries. A POSA

would have understood that Levin’s micro-USB charging port referred to the standardized micro-USB specification at the time, rev. 1.01 April 2007, and therefore comprises the claimed “plurality of charger electrical contacts.” EX1011.010; EX1011.026-.027 (showing that a micro-USB receptacle has five electrical contacts); EX1005, ¶99. Two of such five contacts – the VBUS and the GND pins – are used for providing power. EX1011.010; EX1005, ¶99.



EX1011.026-027, Figs. 4-13, 4-14.

Levin also teaches that its charging port 31 is positioned at a distal end of its device. EX1003, 23:58-60 (“In certain embodiments, the distal end also includes a recharging port 31, such as in a USB connector 31...”); EX1005, ¶100.



EX1003, Fig. 14A

A POSA would have been motivated, consistent with Levin’s teaching, to incorporate Levin’s micro-USB charger port into Pan’s inhaler at a distal end of opposite the insertion end. EX1005, ¶¶101-102. As stated above, Pan discloses that its battery is rechargeable, but lacks any disclosure of charger contacts. A POSA would have recognized the advantages of including charger contacts on the device, such as the ability to recharge the battery without having to remove the battery from the device, thereby making it more convenient for the consumer. *See, e.g.*, EX1027, 6:51-55. (“The rechargeable battery (3) may be charged without frequent change of battery. The user just needs to plug the cigarette bottle assembly into the open end of the shell (a), for easy use and very easy change.”). A POSA would have further recognized that, in the context of e-vapor devices, these charger contacts could be a micro-USB receptacle at the distal end of the device. EX1005, ¶¶103-104. Also, a POSA would have been motivated to include charger contacts on the device because

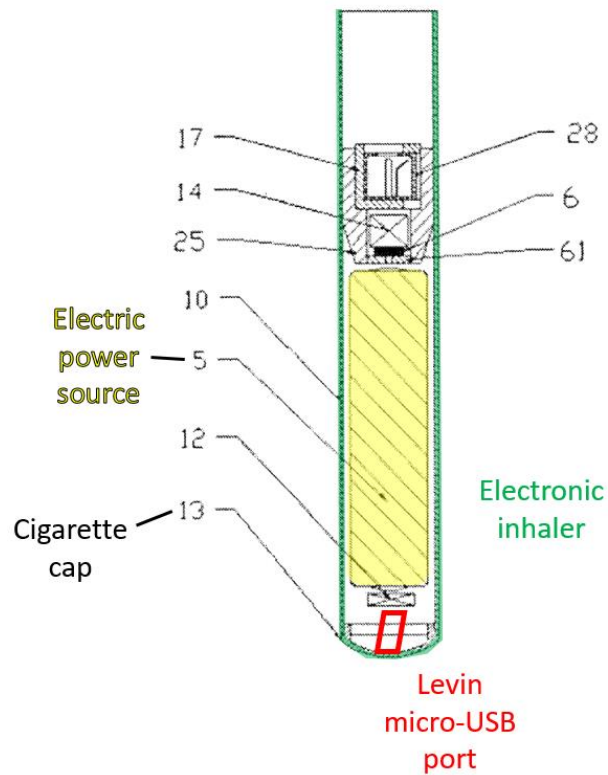
it would have enabled a consumer to use the device while the batteries are charging. It is not uncommon for a consumer to run the battery down but still continue to want to use the device. EX1005, ¶101.

A POSA would have been further motivated to include charger contacts on the device because it would have enabled the consumer to recharge the batteries anywhere having a compatible charging cord, *e.g.*, at a friend's house. Without charging ports, *e.g.*, a micro-USB port, a consumer would need to bring their own battery charging station with them so that they could remove their batteries and charge them. EX1005, ¶103. As Levin discloses, a micro-USB connector can be used with “a wall charging adapter or cigarette lighter adapter in an automobile.” EX1003, 14:16-17.

A POSA would have been motivated to include USB charger contacts to enable additional features in the device – *i.e.*, provide access to the internal electronics. A micro-USB receptacle, for example, enables data transmission in addition to charging. EX1005 ¶104; EX1041, 6:23-32 (disclosing an e-cigarette device having a USB port which “services two functions” – first, “to charge the internal battery,” and second, to provide an “interface to an external computing device”).

A POSA would have known to place the charger contacts at the distal end of the device because it is an ergonomic location for charger contacts. Specifically, the consumer can grip the device in one hand along the longitudinal axis and easily insert the charger cable (and possibly continue to use the device). If the charging contacts are along the length of the device, it would be more difficult for a consumer to insert the charger cable because there would be torque on the device during insertion. Moreover, there are a finite number of places to put the charger contacts, and the distal end is a typical location. *See e.g.*, EX1003, Fig. 14A; EX1027, Fig. 1; EX1028, Fig. 2; EX1005 ¶102.

A POSA would have had a reasonable expectation to successfully incorporate a micro-USB receptacle with electrical contacts at the distal end of Pan's inhaler. Micro-USB receptacles were standardized, well-known in the art, and specifically disclosed in prior art e-vapor devices. EX1005 ¶105; *see, e.g.*, EX1026, 6:26-32; EX1042, 5:57-60; EX1003, 23:58-60. Moreover, Levin's micro-USB charger contacts are installed at its end cap; Pan likewise has an end cap 13. Thus, a POSA would have expected Levin's micro-USB charger contacts to work equally well at Pan's end cap.



EX1010, Fig. 5

b. Magnetic Coupling

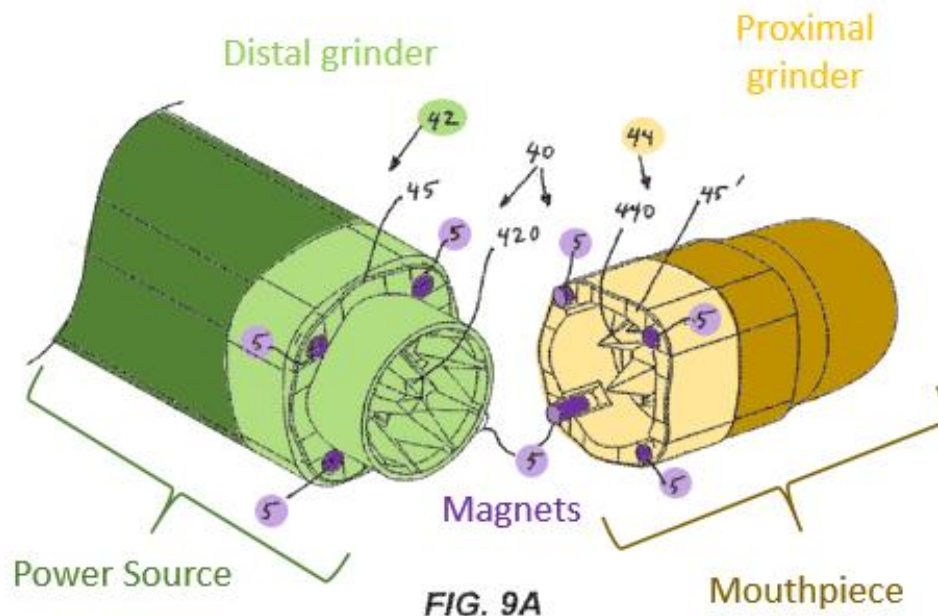
Pan discloses its electronic inhaler and electronic atomizer device are coupled together by a threaded connection or a plug type connection. EX1010, 2:45-47. Pan does not disclose a magnetic coupling.

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 ¶¶36, 106.

Levin, for example, discloses a two-piece design, with the first piece comprising a battery portion (called a proximal grinder portion) connected to second piece comprising a mouthpiece (called a distal grinder portion). 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 portion. EX1003, 3:64-4:2, 20:51-67; EX1005, ¶107.

In one embodiment, Levin discloses a mouthpiece portion containing four magnets configured to attract to four corresponding magnets in the power source portion. EX1003 at 27:57-60 (“the magnet 5 disposed at each corner of the grinder components facilitate alignment of the components in a more desirable, aesthetically appealing configuration.”); EX1005, ¶108.

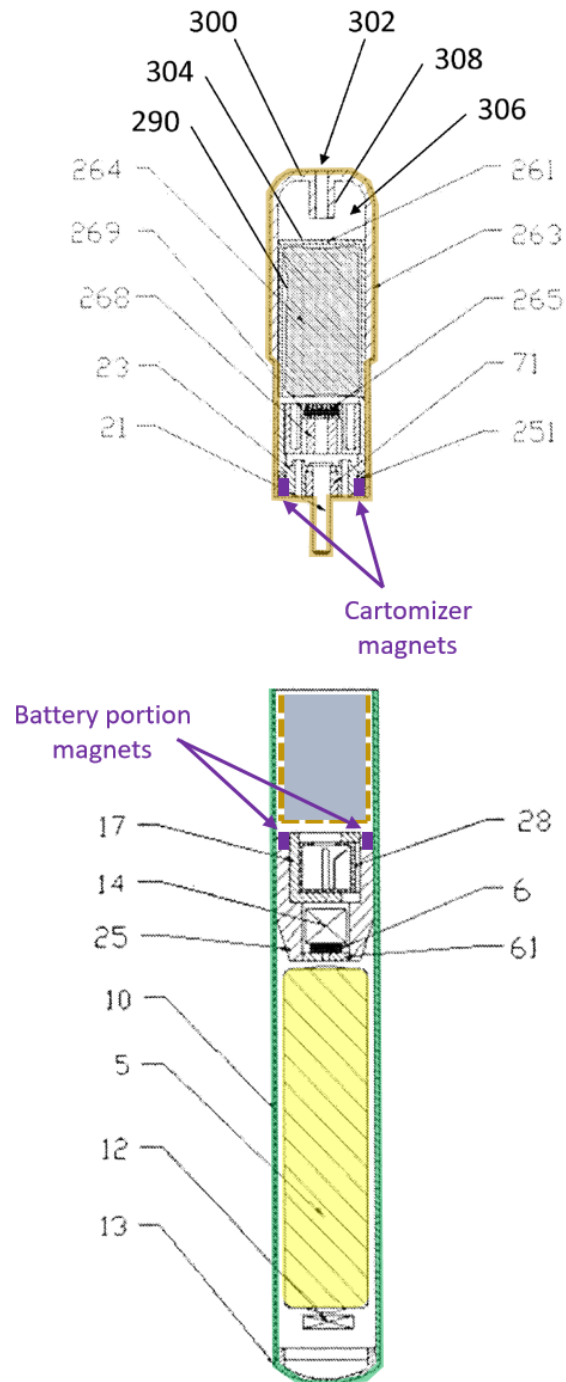


EX1003, Fig. 9A

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, ¶110. And 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, ¶110. 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, 6:15-24 (disclosing “an aerosol delivery device ... compris[ing] a control body 102 and a cartridge 104 that can be ... detachably aligned [via] ... magnetic engagement”); EX1005, ¶111. 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, ¶111.

The as-modified Pan device comprises magnets for the inhaler in or proximate to the atomizer chamber. The modified atomizer comprises corresponding magnets configured to attract the inhaler magnets. A POSA would have understood that an exposed magnet has a metallic surface, and thus, the atomizer magnets constitute a recited “cartomizer metallic surface.” EX1005, ¶281.



A POSA would have had a reasonable expectation of successfully adding magnets to Pan. EX1005, ¶112. A POSA would have known that Levin's magnets

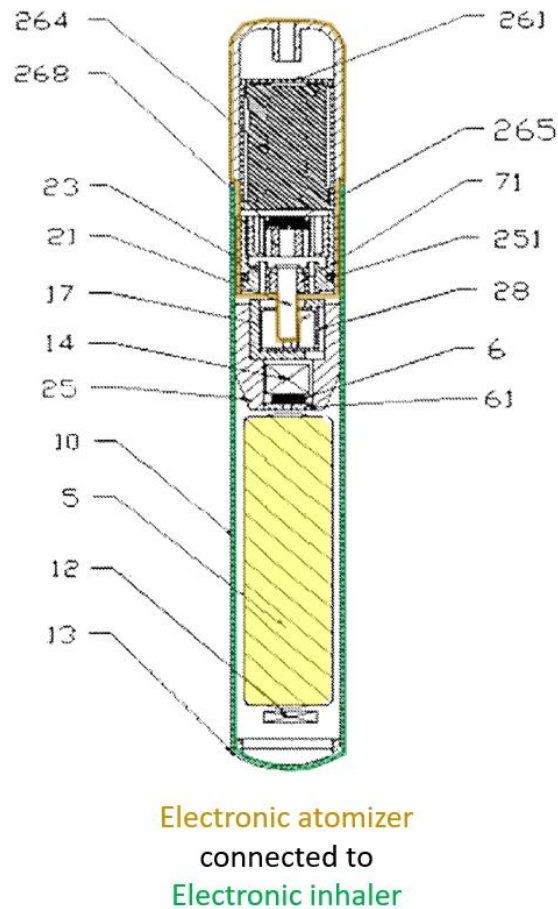
could be added to Pan to produce a functional device because both references are directed to the same field, which is, generally, two-part electronic cigarettes. *Id.* Moreover, as stated above, magnetic coupling in e-vapor devices was well-known. Accordingly, it would have been routine for a POSA to combine Levin with Pan.

2. Claim 1

a. [1.A] A vaporizer comprising:

Pan discloses this limitation. EX1005, ¶¶113-114.

Pan discloses an electronic vapor cigarette “comprised of two parts, one being an electronic inhaler and the other being an integrated electronic atomizer” wherein the atomizer vaporizes liquid. EX1024, 2:25-28. “The inhaler preferably includes one or more of an electric power source...which can be a rechargeable or non-rechargeable battery, [that] supplies electricity to the atomizer to vaporize a liquid inside an atomizer chamber.” EX1024, 2:30-35.



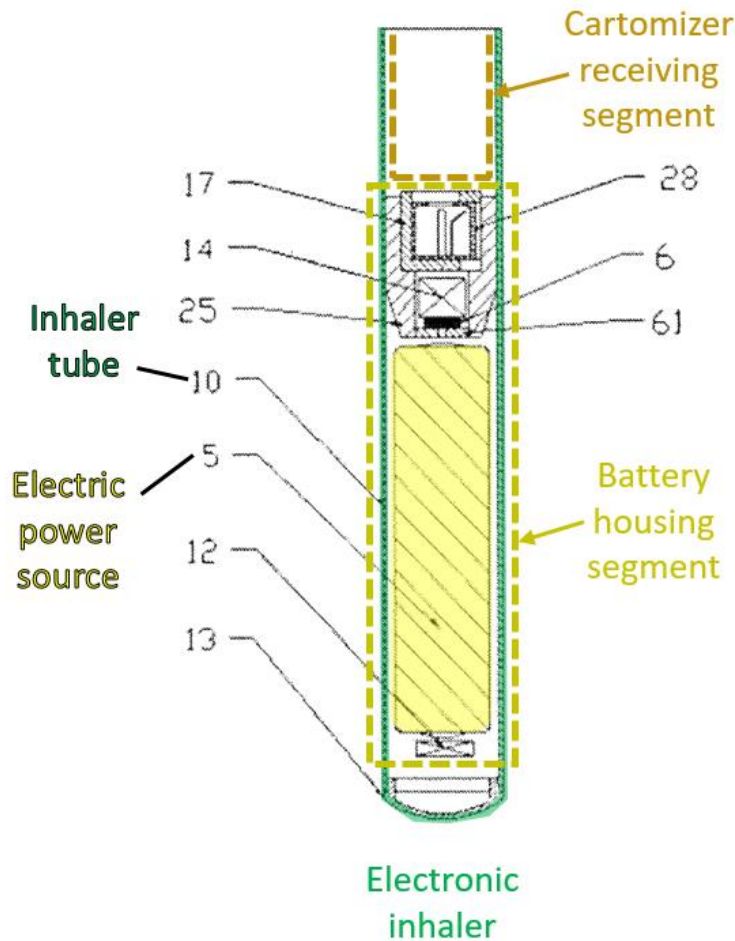
EX1024, Fig. 7

- b. [1.B] a battery portion comprising a battery housing segment and a cartomizer receiving segment,

Pan discloses this limitation. EX1005, ¶¶115-117.

Pan discloses that its electronic cigarette comprises two pieces: (1) an electronic inhaler and (2) an integrated electronic atomizer. *See* [1.A]. The electronic inhaler includes an electric power source, which can be “a rechargeable or non-rechargeable battery.” EX1024, 2:30-35, 5:29-49.

Figure 5 depicts the inhaler having tube 10 and electric power source 5. The electronic inhaler is the recited “battery portion,” and the portion of the inhaler housing the battery is the “battery housing segment.”

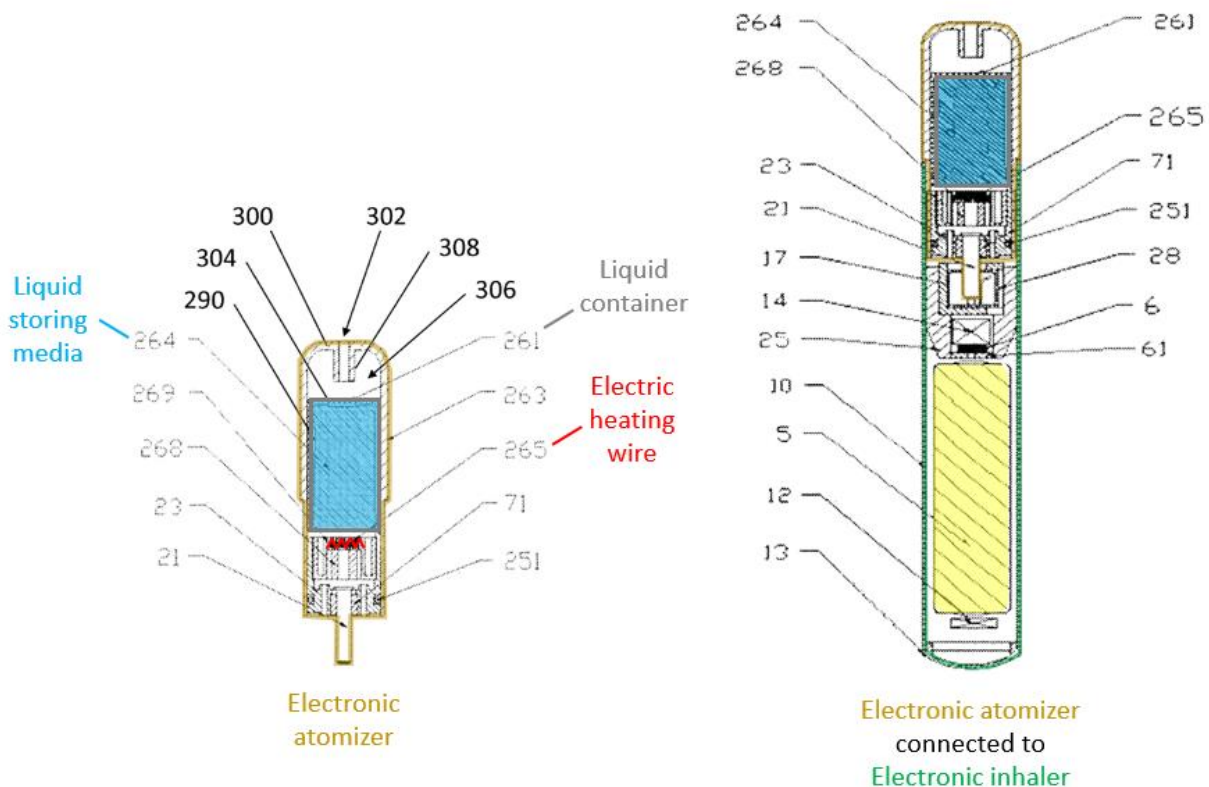


EX1024, Fig. 5

The portion of electronic inhaler receiving electronic atomizer 22 is the cartomizer receiving segment. EX1024, 6:4-9 (“The electronic inhaler and the integrated electronic atomizer are fit together through their connectors of the same

type to form the electronic cigarette. The connection is done through the first electric connector socket 28 of the electronic inhaler and the second electric connector plug 21 of the integrated electronic atomizer.”).

Pan’s electronic atomizer, shown in Figure 3, below, is a “cartomizer” at least because it is the combination of a cartridge having liquid container 261 with an atomizer having electric heating wire 265. EX1024, 4:65-5:7, 4:63-64; EX1005, ¶117. Moreover, Pan’s integrated atomizer is releasably engaged with the inhaler and is replaceable. See EX1024, Fig. 7, 3:6-9, 6:1-28.

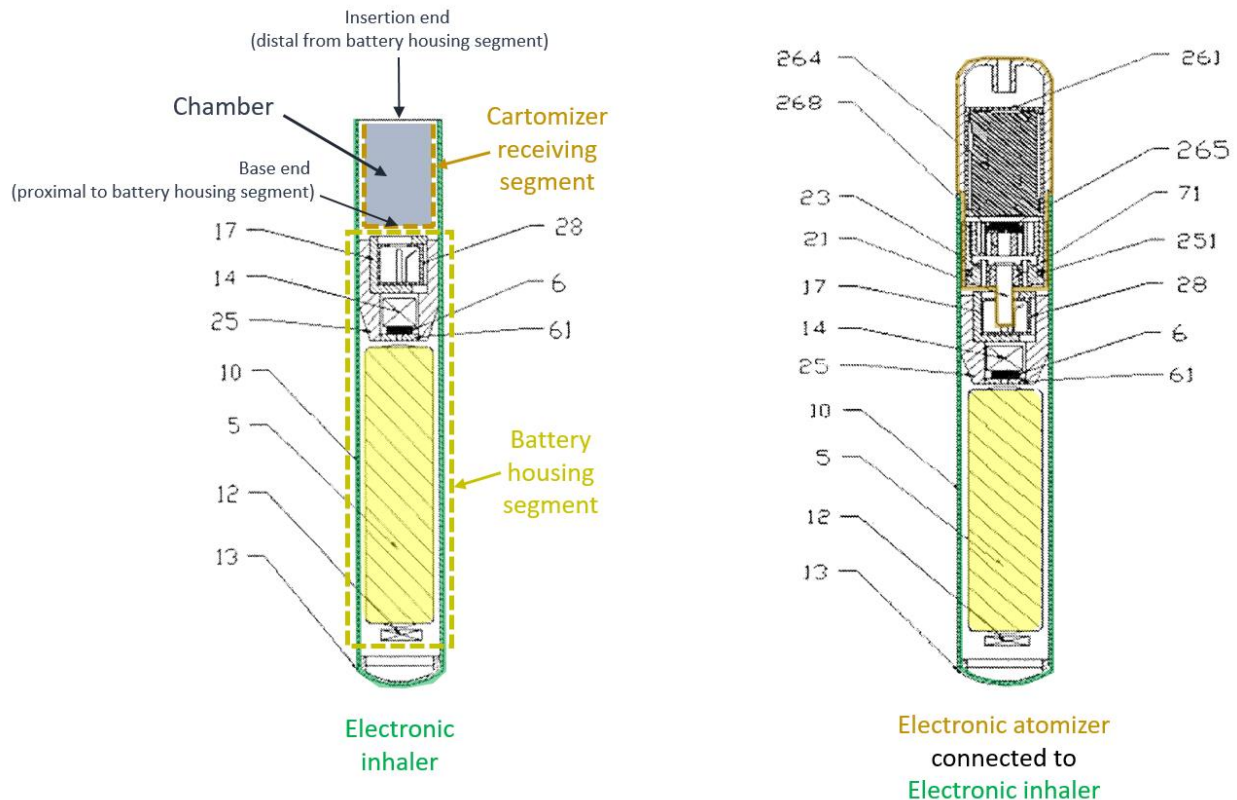


EX1024, Figs. 3, 7

- c. [1.C] the cartomizer receiving segment defining a chamber having an insertion end distal from the battery housing segment and a base end proximate to the battery housing segment,

Pan discloses this limitation. EX1005, ¶¶118-119.

Pan discloses that its inhaler includes a cartomizer receiving segment. See [1.B]. As shown Figs. 5 and 7, cartomizer receiving segment defines a chamber having an insertion end distal from the battery housing segment and a base end proximate to the battery housing segment.

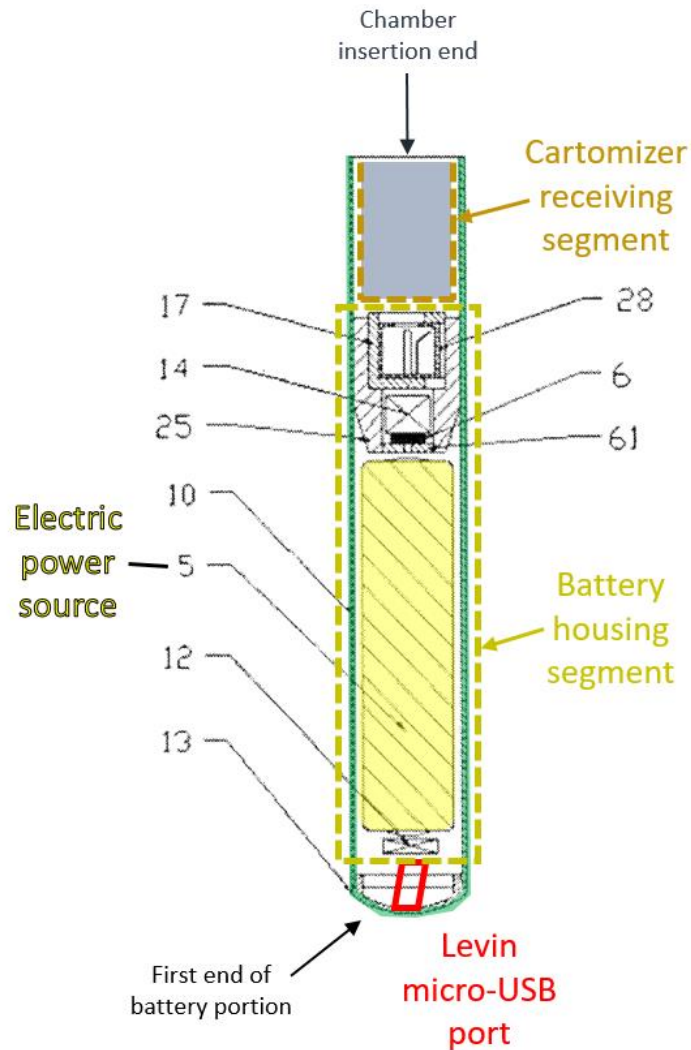


EX1024, Figs. 5, 7

- d. [1.D] the battery portion further comprising a plurality of charger electrical contacts to provide electrical charge to a battery housed in the battery housing segment, the charger electrical contacts disposed at a first end of the battery portion opposite the insertion end of the chamber of the cartomizer receiving segment,

Pan in view of Levin renders obvious this limitation. EX1005, ¶¶120-122.

Pan discloses that the inhaler may comprise a rechargeable battery, but does not disclose charger electrical contacts. EX1024, 2:30-35, 5:29-49. As discussed above in IX.A.1.a, Levin discloses an electronic vaporizer device with a micro-USB charging port that has a plurality of electrical contacts to provide electrical charge to a battery in a housing, and which is disposed at a distal end of the device. It would have been obvious for the reasons discussed in IX.A.1.a to adapt Pan to include Levin's micro-USB charging port at the distal end of Pan's device opposite the insertion end of the chamber of the cartomizer receiving segment. For example, Pan could be modified in view of Levin as shown below to include a micro-USB charging port. EX1005, ¶122.



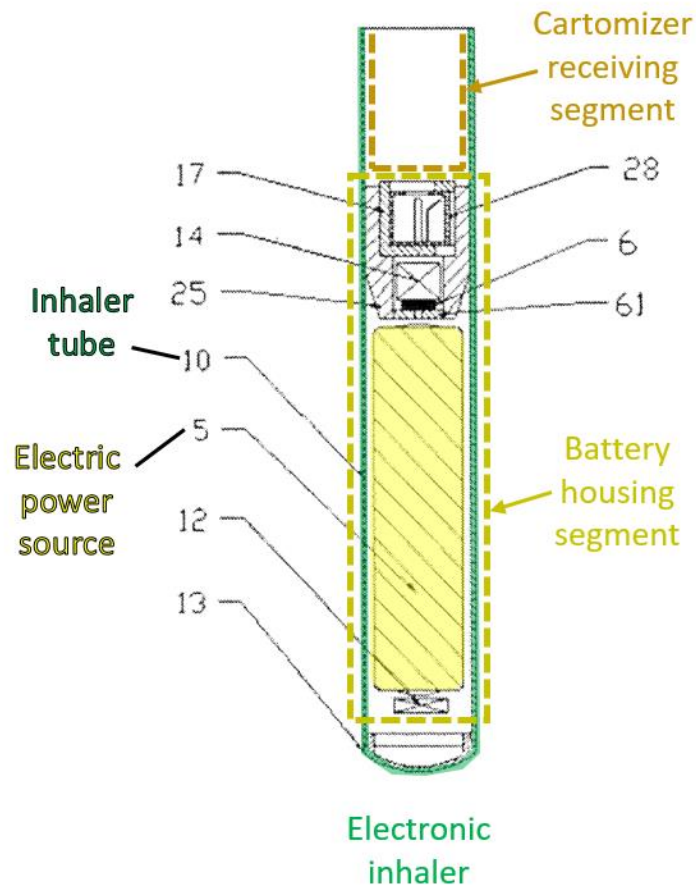
EX1024, Fig. 5

- e. **[1.E] wherein an outer shell is commonly shared by the battery housing segment and the cartomizer receiving segment; and**

Pan discloses this limitation. EX1005, ¶¶123-124.

Pan discloses that its electronic inhaler has inhaler tube 10 and cigarette cap 13, which in combination forms an outer shell. EX1024, 5:21-24; *see also* EX1024,

Fig. 5. The outer shell contains the battery housing segment and the cartomizer receiving segment into which the electronic atomizer 22 is inserted. See Fig. 7. As shown below, inhaler tube 10 is commonly shared by the battery housing segment and the cartomizer receiving segment.

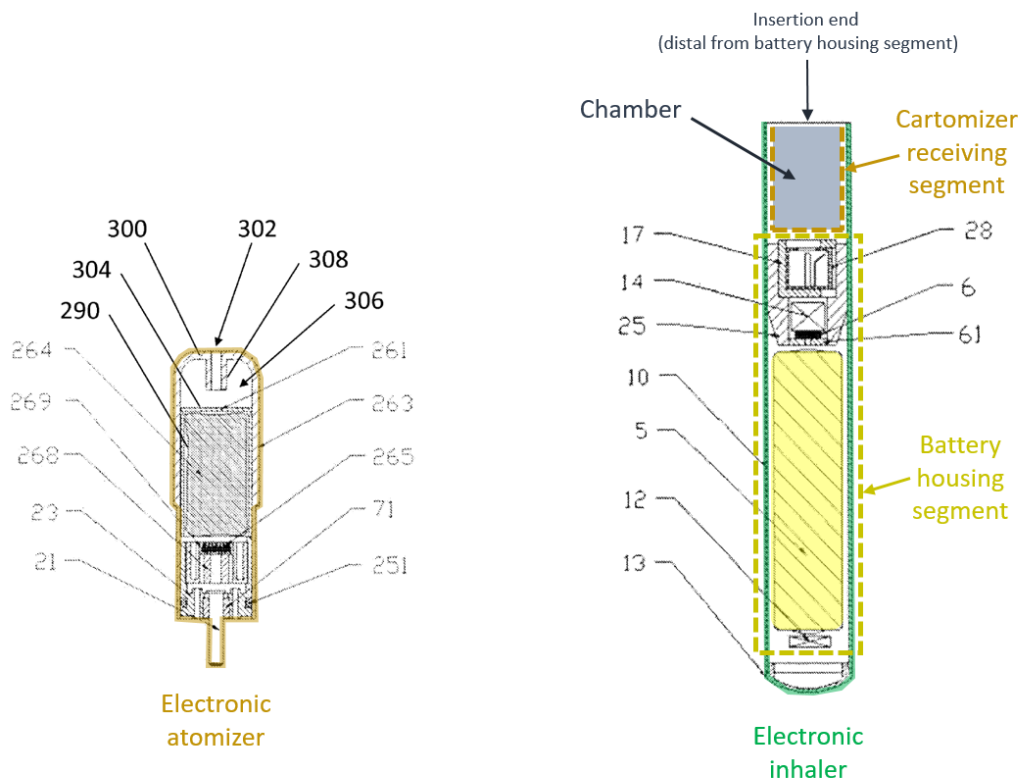


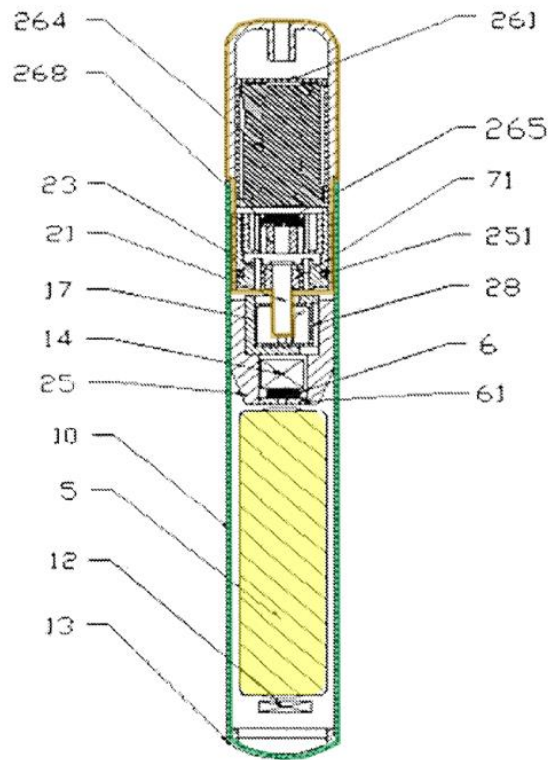
EX1024, Fig. 5

- f. [1.F] a cartomizer insertable into the chamber at the insertion end, the cartomizer comprising:

Pan discloses this limitation. EX1005, ¶¶125-126.

Pan discloses an electronic atomizer (*i.e.*, cartomizer) that is insertable into the chamber at the insertion end as shown below. See [1.B], [1.C]. See EX1024, 2:48-50 (“In a preferred embodiment, the connection between the electronic inhaler and electronic atomizer through the connectors on both parts forms an entire electronic cigarette.”); 6:4-9 (“The electronic inhaler and the integrated electronic atomizer are fit together through their connectors of the same type to form the electronic cigarette. The connection is done through the first electric connector socket 28 of the electronic inhaler and the second electric connector plug 21 of the integrated electronic atomizer.”).





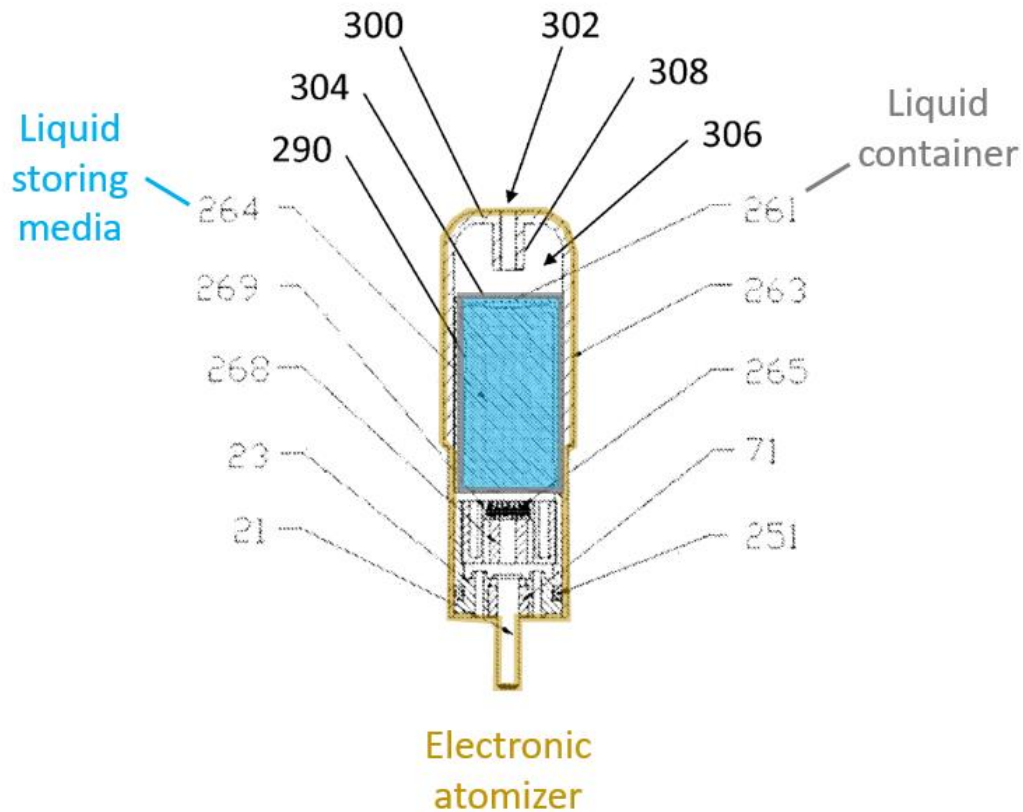
Electronic atomizer
connected to
Electronic inhaler

EX1024, Figs. 3, 5, 7

g. [1.G] a body including a structure configured to hold a vaporizable liquid;

Pan discloses this limitation. EX1005, ¶¶127-128.

Pan discloses an electronic atomizer housing (body) that comprises “liquid container 261 inside which liquid-storing media 264 being filled with liquids is inserted[.]” EX1024, 4:40-42. The liquid container 261 is a structure configured to hold a vaporizable liquid. EX1024, 2:32-35, 4:15-18.



EX1024, Fig. 3

- h. **[1.H] a wicking element provided within the body and at least partially in contact with the vaporizable liquid; and**

Pan discloses this limitation. EX1005, ¶¶129-132

Pan discloses that the body of electronic atomizer 22 includes a heat equalizer 269 made of fiber material that absorbs liquid from the liquid-container (and is therefore at least partially in contact with the liquid). EX1024, 4:53-55 (“The heat equalizer 269 is preferably made of a special fiber which can withstand temperature as high as 2000 degrees centigrade.”), 2:57-60 (“This electric current preferably

flows through the electric heat wire inside the atomizer tube, which then heats up the heat equalizer with absorbed liquid from the liquid-container.”); 8:43-45 (“a heat equalizer coupled with an electric heating wire, the [liquid] container filled with the media, and the air-puffing hole.”), Fig. 3.

Pan discloses a wicking element under the adopted construction because Pan discloses a “heat equalizer with absorbed liquid from the liquid-container.” EX1024, 2:57-60. Because the heat equalizer is made of a liquid-absorbent “fiber,” it transports liquid by capillary action. EX1005, ¶131.

Note that Pan even discloses a wick under the construction proposed by Petitioner in the ITC Investigation (but not adopted here) because (i) the heat equalizer performs the function of delivering the vaporizable liquid to the heating wire and (ii) Pan describes the wicking element as a fiber material twined with the electric heating wire, which a POSA would understand to be a pliable bundle of fibers. EX1024, 5:2-3; EX1005, ¶132.

- i. **[1.I] a heating element provided within the body in contact with the wicking element and operable to heat the vaporizable liquid,**

Pan discloses this limitation. EX1005, ¶¶133-135.

Pan discloses that the electronic atomizer includes a “heat equalizer 269 twined with an electric heating wire 265.” EX1024, 5:2-3, Fig. 3. The “electric

heating wire 265...can be made from tungsten or another electric heating material, which produces heat when the electric current flows therethrough.” EX1024, 4:55-58. The electric heating wire is therefore a “heating element” under the adopted construction.

Pan further discloses that electric heating wire 265 is operable to vaporize liquid. EX1024, 4:55-62 (“The electric heating wire 265...produces heat when the electric current flows therethrough...to supply heat for atomization or vaporization of the liquid inside the liquid-storing media 264.”); 5:62-67 (“The user puffs on the end of the electronic cigarette...[to] generate an electric current flowing through the electric heating wire, which achieves vaporization of the solution inside the liquid container.”).

j. **[1.J] wherein the wicking element is configured to deliver the vaporizable liquid to the heating element, and**

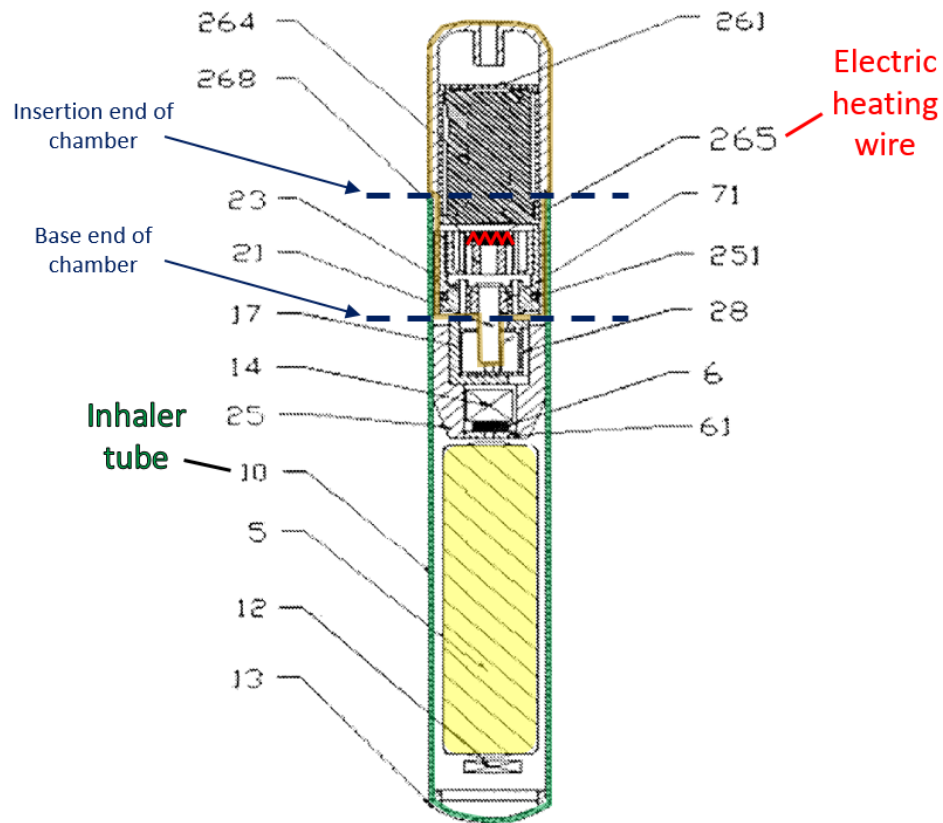
Pan discloses this limitation. EX1005, ¶¶136-137.

The heat equalizer 269 absorbs liquid from the liquid container and is twined with the heating wire 265 to allow the heating wire to vaporize the liquid (*i.e.*, the heat equalizer 269 is configured to deliver the vaporizable liquid to the heating wire). See [1.H]; EX1024, Fig. 3, 2:57-60, 8:43-45.

- k. **[1.K] wherein the entire heating element is disposed between the insertion end of the chamber and the base end of the chamber when the cartomizer is inserted into the chamber such that the outer shell protects the heating element.**

Pan discloses this limitation. EX1005, ¶¶138-139.

As shown in Fig. 7 below, when the electronic atomizer is inserted into the chamber of the electronic inhaler, the entire heating wire 265 is disposed between the insertion and base ends of the chamber and protected by inhaler tube 10 (outer shell).



Electronic atomizer
connected to
Electronic inhaler
EX1024, Fig. 7

3. **Claim 5: The vaporizer of claim 1, wherein the plurality of charger electrical contacts are arranged linearly at the first end of the battery portion.**

Pan in view of Levin renders obvious this limitation. EX1005, ¶¶140-142.

Pan in view of Levin renders obvious a vaporizing device comprising a micro-USB charging port, which comprises a plurality of external contacts that are charger electrical contacts. *See* [1.D]. The micro-USB port specified by the USB standard at

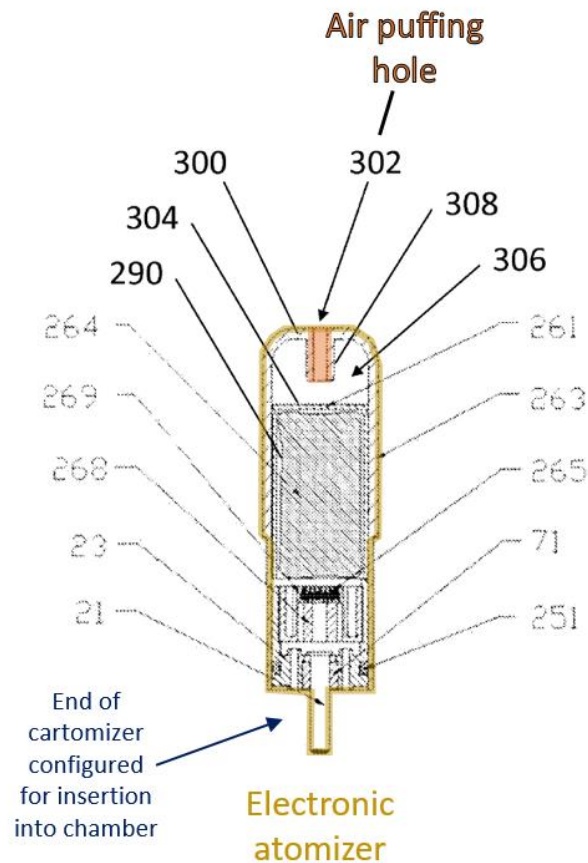
the time of Levin comprises linearly arranged contacts. See IX.A.1.a; EX1005, ¶¶140-142.

4. Claim 7: The vaporizer of claim 1, wherein the cartomizer further comprises a mouthpiece opposite an end of the cartomizer configured for insertion into the chamber.

Pan discloses this limitation. EX1005, ¶¶143-144.

Pan also discloses that electronic atomizer (cartomizer) comprises air outlet 302 from which a consumer inhales vapor. EX1024, 6:13-24. The air outlet is opposite the end of the cartomizer that is configured for insertion into the chamber of the electronic inhaler (battery portion). The area surrounding the air outlet is a portion of the device to be used by a mouth. EX1024, 5:62-63 (“The user puffs on the end of the electronic cigarette with the air-puffing hole...”). It is therefore a mouthpiece as Patent Owner has applied that term in the ITC investigation. 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 purposes of this Petition.¹

¹ Petitioner applies that meaning for this Petition without conceding that Patent Owner’s construction is appropriate for any other patent. Petitioner notes that other



EX1024, Fig. 3.

5. **Claim 9: The vaporizer of claim 1, wherein the cartomizer further comprises electrical circuitry connected with the heating element.**

Pan discloses this limitation. EX1005, ¶¶145-146.

Pan discloses that the “two ends of the electric heating wire 265 are going through the small holes of the supporting piece 268 and connected to the second

patents can require a mouthpiece that is a separate component from the other components of the cartridge, such as a storage compartment.

electric connector[.]” EX1024, 4:58-61. As contemplated by the ’722 patent, connective conductive wiring (*e.g.*, the ends of heating wire 265) is “electrical circuitry.” EX1005, ¶146; EX1001, 3:67-4:9 (“the cartomizer including:...cartomizer electrical circuitry operable to direct an electric current between the cartomizer electrical contacts and the heating element...”).

6. Claim 10

a. [10.A] A vaporizer comprising:

Disclosed. [1.A].

a. [10.B] a battery portion comprising: a battery housing segment;

Disclosed. [1.B].

a. [10.C] a cartomizer receiving segment defining a cartomizer chamber having an insertion end distal from the battery housing segment, the cartomizer chamber further having a base end proximate to the battery housing segment,

Disclosed. [1.C].

a. [10.D] wherein an outer shell is commonly shared by the battery housing segment and the cartomizer receiving segment;

Disclosed. [1.E].

- b. [10.E] a plurality of charger electrical contacts disposed at a first end of the battery portion opposite the insertion end of the cartomizer chamber, the insertion end of the cartomizer chamber being at a second end of the battery portion; and

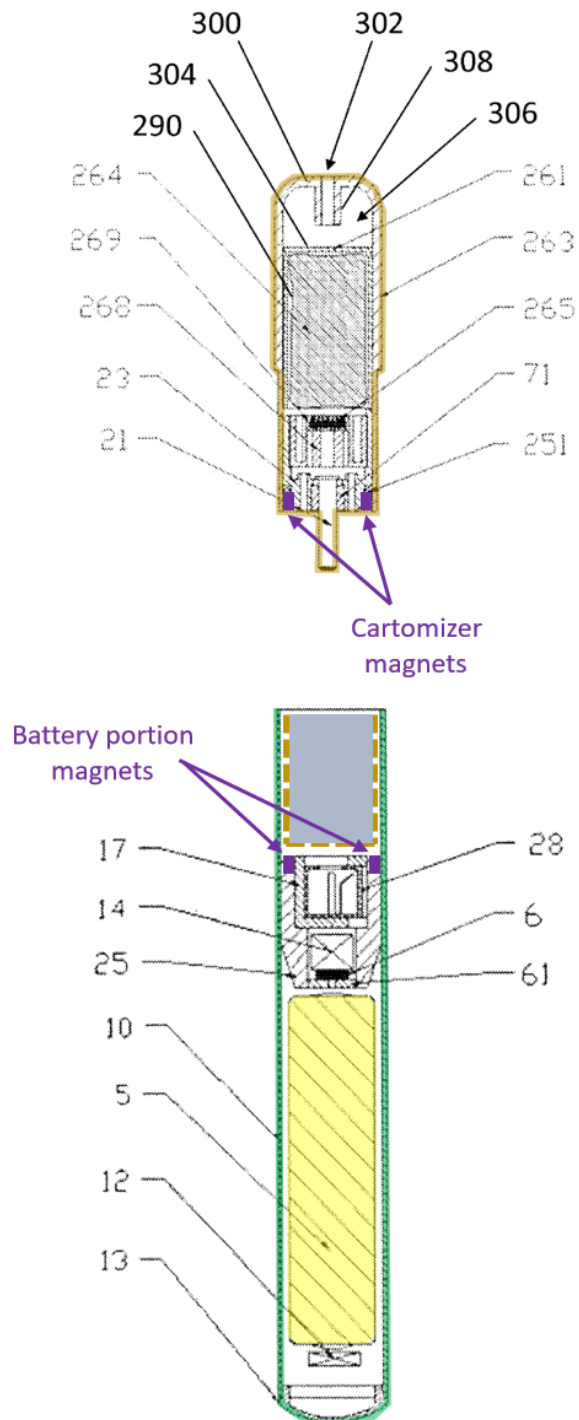
Pan in view of Levin renders obvious this limitation. EX1005, ¶¶151-152

Pan in view of Levin renders obvious a vaporizer comprising a plurality of charger electrical contacts disposed at a first end of the battery portion opposite the insertion end of the cartomizer, the insertion end of the cartomizer chamber being at a second end of the battery portion. *See* [1.D].

- c. [10.F] at least one magnet of the battery portion, the at least one magnet of the battery portion in or proximate to the cartomizer chamber; and

Pan in view of Levin renders obvious this limitation. EX1005, ¶¶153-154

A POSA would have been motivated to incorporate Levin's magnetic coupling into Pan's electronic cigarette, such that the battery portion (electronic inhaler) contains one or more magnets configured to couple with one or more corresponding magnets in the cartomizer (electronic atomizer). *See* IX.A.1.b; EX1005, ¶154. The magnets of the modified battery portion are in or proximate the cartomizer chamber as shown in the figure below. EX1005, ¶154.



EX1024, Fig. 5

- d. [10.G] a cartomizer insertable into the cartomizer chamber at the insertion end, the cartomizer comprising:

Disclosed. [1F].

- a. [10.H] a body including a structure configured to hold a vaporizable liquid;

Disclosed. [1.G].

- b. [10.I] a wicking element provided within the body and at least partially in contact with the vaporizable liquid;

Disclosed. [1.H].

- c. [10.J] a heating element provided within the body in contact with the wicking element and operable to heat the vaporizable liquid,

Disclosed. [1.I].

- d. [10.K] wherein the wicking element is configured to deliver the vaporizable liquid to the heating element, and

Disclosed. [1.J].

- e. [10.L] wherein the entire heating element is disposed between the insertion end of the cartomizer chamber and the base end of the cartomizer chamber when the cartomizer is inserted into the cartomizer chamber such that the outer shell protects the heating element; and

Disclosed. [1.K].

- f. **[10.M] a metal element disposed near a base end of the cartomizer for coupling with the at least one magnet of the battery portion.**

Pan in view of Levin renders obvious this limitation. EX1005, ¶¶161-163.

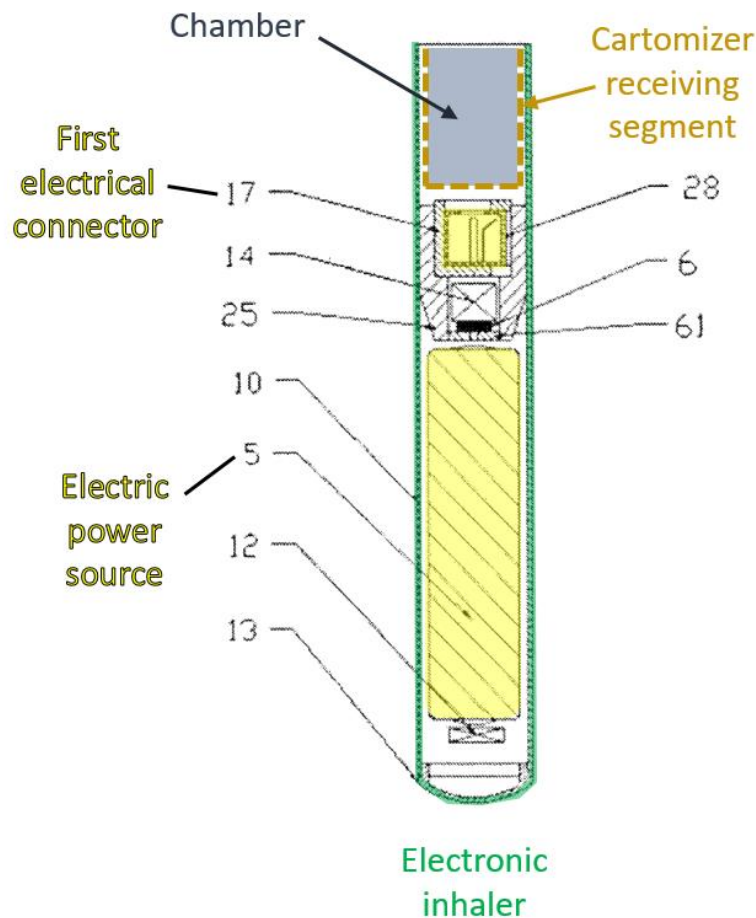
Levin discloses the use of magnets to affect coupling in e-cigarette vaporizing devices. EX1003, 20:51-60. A POSA would have been motivated to incorporate Levin's magnetic coupling into Pan's electronic cigarette such that the battery portion (electronic inhaler) contains one or more magnets configured to couple with one or more corresponding magnets in the cartomizer (electronic atomizer). *See* IX.A.1.b; EX1005, ¶162. The magnets of the cartomizer would be disposed near a base end of the cartomizer as shown below. EX1005, ¶162. A magnet is most typically a metal element. EX1005, ¶163. Thus, the magnets disposed near the base end of the Pan's modified cartomizer constitute the recited "metal element." *Id.*

7. **Claim 11: The vaporizer of claim 10, wherein the battery portion further comprises one or more battery electrical contacts in or proximate the cartomizer chamber of the cartomizer receiving segment.**

Pan discloses this limitation. EX1005, ¶¶164-166.

Pan discloses that its electronic inhaler (battery portion) comprises "a first electric connector 17 of a DC plug-socket type...located on the DC socket area 28." EX1024, 5:30-36. The electric connector 17 is a battery contact and is proximate to the cartomizer chamber of the cartomizer receiving segment as shown in the figure

below. EX1024, 4:7-12 (“Referring to FIG. 1, **the electric power source 5 supplies an electric current** to the electronic atomizer 22 and other electric units to heat up the heat equalizer through the connected electronic inhaler and atomizer 22 **through the first electric connector 17** of the inhaler and the second electric connector 21 of atomizer 22.”) (emphasis added), 5:47-48 (“The electric power source 5 may be a battery of rechargeable or non-rechargeable type.”).



EX1024, Fig. 5

8. **Claim 12: The vaporizer of claim 10, wherein the cartomizer further comprises one or more cartomizer electrical contacts for connecting with one or more battery electrical contacts in or proximate the cartomizer chamber.**

Pan discloses this limitation. EX1005, ¶¶167-168.

Pan discloses that the electronic atomizer (cartomizer) comprises a “second electric connector 21 being of a DC plug-socket type.” EX1024, 4:64-65. The second electric connector 21 (cartomizer electrical contact) is connected to the first electric connector 17 (battery electrical contact) to enable electric connection between the electronic inhaler (battery portion) and the electronic atomizer (cartomizer). EX1024, 6:1-9 (“FIG. 7 is a section view of another electronic cigarette when the electronic inhaler and electronic atomizer are connected via the electric connectors of the DC plug-socket type...The connection is done through the first electric connector socket 28 of the electronic inhaler and the second electric connector plug 21 of the integrated electronic atomizer.”).

9. **Claim 13: The vaporizer of claim 10, wherein the plurality of charger electrical contacts are arranged linearly at the first end of the battery portion.**

Obvious. [1.D] and claim 5.

10. **Claim 15**

- a. **[15.A] A vaporizer comprising:**

Disclosed. [1.A].

b. [15.B] a battery portion comprising:

Disclosed. [1.B].

c. [15.C] a plurality of charger electrical contacts disposed at a first end of the battery portion;

Obvious. [1.D].

d. [15.D] a battery housing segment for housing a battery between the first end of the battery portion and a second end of the battery portion;

Disclosed. [1.B], [1.C].

e. [15.E] a cartomizer receiving segment defining a chamber having an insertion end at the second end of the battery portion and distal from the battery housing segment, the chamber further having a base end proximate to the battery housing segment,

Disclosed. [1.B], [1.C].

f. [15.F] wherein an outer shell is commonly shared by the battery housing segment and the cartomizer receiving segment; and

Disclosed. [1.E].

g. [15.G] one or more battery electrical contacts in or proximate the chamber of the cartomizer receiving segment; and

Disclosed. [11.A].

h. [15.H] a cartomizer insertable into the insertion end of the chamber, the cartomizer comprising:

Disclosed. [1.F].

- i. **[15.I] a body including a structure configured to hold a vaporizable liquid;**

Disclosed. [1.G].

- j. **[15.J] a wicking element provided within the body and at least partially in contact with the vaporizable liquid;**

Disclosed. [1.H].

- k. **[15.K] a heating element provided within the body in contact with the wicking element and operable to heat the vaporizable liquid,**

Disclosed. [1.I].

- l. **[15.L] wherein the wicking element is configured to deliver the vaporizable liquid to the heating element, and**

Disclosed. [1.J]

- m. **[15.M] wherein the entire heating element is disposed between the insertion end of the chamber and the base end of the chamber when the cartomizer is inserted into the chamber such that the outer shell protects the heating element; and**

Disclosed. [1.K].

- n. **[15.N] one or more cartomizer electrical contacts for connecting with the one or more battery electrical contacts in or proximate the chamber.**

Disclosed. See claim 12.

- 11. **Claim 16: The vaporizer of claim 15, wherein the plurality of charger electrical contacts are arranged linearly at the first end of the battery portion.**

Obvious. [1.D] and claim 5.

- 12. Claim 18: The vaporizer of claim 1, the battery portion further comprising at least one magnet in or proximate to the chamber of the cartomizer receiving segment.**

Obvious. [10.F].

- 13. Claim 19: The vaporizer of claim 18, the cartomizer further comprising a metal element disposed near a base end of the cartomizer for coupling with the at least one magnet of the battery portion.**

Obvious. [10.M].

- 14. Claim 20: The vaporizer of claim 15, the battery portion further comprising at least one magnet in or proximate to the chamber of the cartomizer receiving segment.**

Obvious. [10.F].

- 15. Claim 21: The vaporizer of claim 20, the cartomizer further comprising a metal element disposed near a base end of the cartomizer for coupling with the at least one magnet of the battery portion.**

Obvious. [10.M].

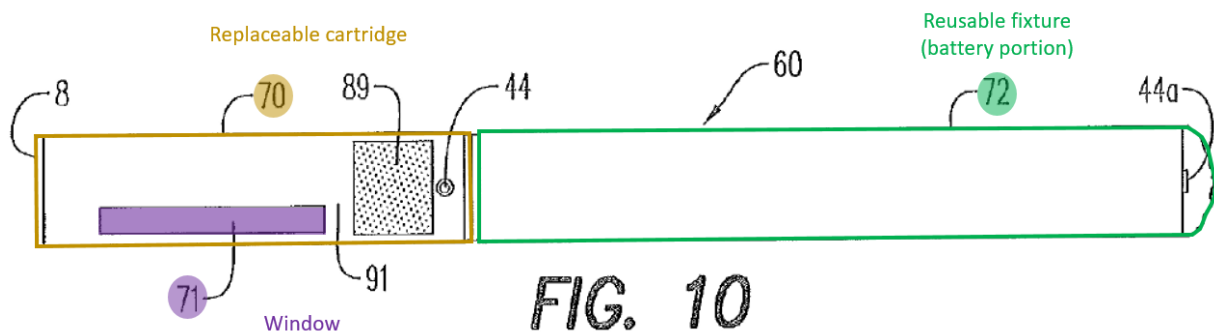
- B. Ground 2: Pan and Levin further in view of Tucker renders claims 14 and 17 unpatentable under 35 U.S.C. § 103**

- 1. Motivation to Combine**

- a. Window on or Proximate the Outer Shell**

Pan in view of Levin disclose every element of each of these claims except for a translucent window on or proximate the shell to enable viewing of the cartomizer when it is inserted into the shell. Tucker, on the other hand, teaches that

a window can be provided to view the remaining liquid in the cartomizer. 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

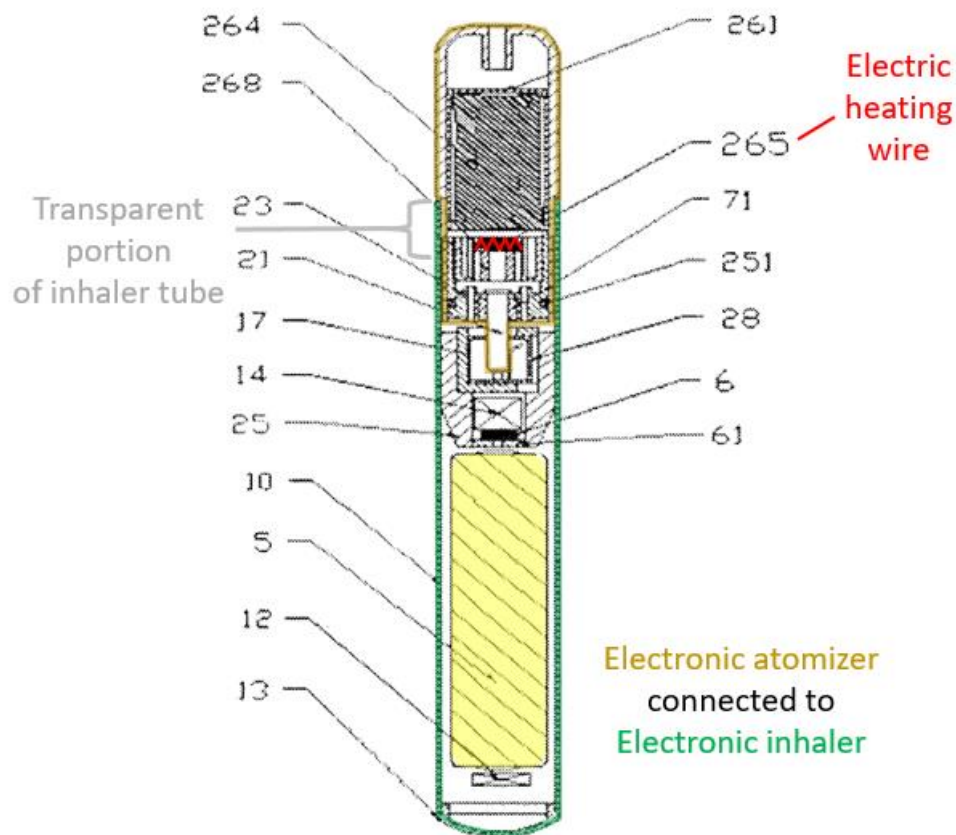
And indeed, using a window to view liquid amounts was common in the prior art. See, e.g., EX1030, 4:32-35 (“the sucking cylinder is made of transparent material, for facilitating to observe the amount of the internal liquid smoke, and prevent an empty burning of the heating wire after the liquid smoke has run out.”); 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.”).

Moreover, Pan discloses that its inhaler (battery portion) and atomizer (cartridge) are “made of either a metal or a plastic.” EX1024, 5:25 (“The inhaler tube 10 is made of either a metal or a plastic”); 4:47-48 (“The atomizer tube 263 is

preferably made of a metallic or plastic material.”). Confirming Tucker’s teaching, it was well-known that plastics may be transparent and were commonly used in e-cigarette devices to provide a window to view the liquid remaining in the cartridge. EX1005, ¶¶193-195; 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.**”) (emphasis added); EX1039, 5:14-21 (“The sucking cylinder 1 is made of stainless steel, or **can be made of plastic** or other suitable materials. The sucking cylinder 1 can be **designed to be whole transparent** or at least partially transparent, or the portion thereof where the liquid smoke cup 3 is mounted is transparent **to facilitate to observe the amount of the liquid smoke** in the liquid smoke cup 3.”) (emphasis added); EX1031, 7:52-7:55 (“The housing 12 is a **cylindrical plastic tube** in the illustrative embodiment. The **plastic is transparent or translucent to facilitate visual inspection of the liquid content.**”) (emphasis added); EX1040, 5:22-25 (“The inhaling cylinder 1 is a hollow cylindrical structure, especially in this embodiment, **a cylindrical casing which is made of transparent or translucent plastic material,** or made as a metal casing.”) (emphasis added).

A POSA would have been motivated, as taught by Tucker, to include a window on or proximate to Pan’s housing, 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, 4:32-35; EX1005, ¶¶195-197. The figure below illustrates a portion of the inhaler tube 10 in Pan that a POSA would be motivated to make transparent in order to view liquid in the liquid remaining closest to the heating element.



EX1024, Fig. 7

A POSA would have been motivated to provide a window because it provides 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 of the liquid level 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, ¶199; 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.”).

A POSA would be motivated to put the window near the wicking element because otherwise a consumer might be misled about the remaining liquid. For example, if the window were placed near the tip of the cartridge, visual inspection of the cartridge may suggest the cartridge is depleted and the consumer may replace a cartridge not needing replacement. Or, a consumer might see a bit of liquid near the tip of the cartridge and incorrectly assume liquid remains down near the wicking element, which may lead to a dry hit. EX1005, ¶200.

This problem is further compounded because a consumer is likely to hold the cigarette vertically, with the cartridge up, to check the remaining liquid. A consumer would be much less likely to hold the e-cigarette with the cartridge tilted down because the consumer would be concerned that the cartridge may fall out (and it would draw the liquid away from the wick). EX1005, ¶200. Finally, while Fig. 3

depicts a small overlapping portion, Fig. 3 is not an engineering drawing and not necessarily drawn to scale. *Id.*

As explained above, Pan discloses a “liquid-storing media 264 being filled with liquids.” Ground 1, [1.G]; EX1024, 4:44-47. Pan’s liquid-storing media 264 is preferably made of “specially designed cotton.” *Id.* 4:48-49. Despite the liquid-media being made of cotton, the consumer would be able to view the level of liquid in the media. EX1005, ¶201. The liquid used in e-cigarettes is often yellowish in color. *See, e.g.*, EX1032.001 (“Puffing on slim metal tubes loaded with pale yellow liquid...”). The saturation level of the cotton in Pan’s cartridge would be observable through the window due to the yellow tint and glisten of the cotton at various liquid levels. EX1005, ¶201.

A POSA would have had a reasonable expectation of success modifying Pan’s inhaler tube or atomizer to include a transparent window and to use Pan in combination with Levin. EX1005, ¶203. PAN itself discloses that its components may be made of plastic and it POSA would have had every expectation that the device would continue to operate with a transparent plastic window or an opening cut in the inhaler tube.

- 2. Claims 14 and 17: The vaporizer of claim [10/15], further comprising a window on or proximate to the shell, the window permitting viewing of the cartomizer when the cartomizer is inserted into the cartomizer chamber.**

As set forth in Ground 1, Pan in view of Levin renders obvious claims 10 and 15. The further combination of Pan and Levin in view of Tucker renders obvious claims 14 and 17. EX1005, ¶204.

A POSA would have been motivated to modify Pan based on the teachings of Tucker to include a transparent portion on the inhaler tube (shell) to permit viewing of the electronic atomizer (cartomizer) when the electronic atomizer is inserted into the chamber. The transparent portion of the inhaler tube would be an opening (made of transparent material) on the inhaler tube through which the cartomizer is viewed. See IX.B.1; EX1005, ¶205.

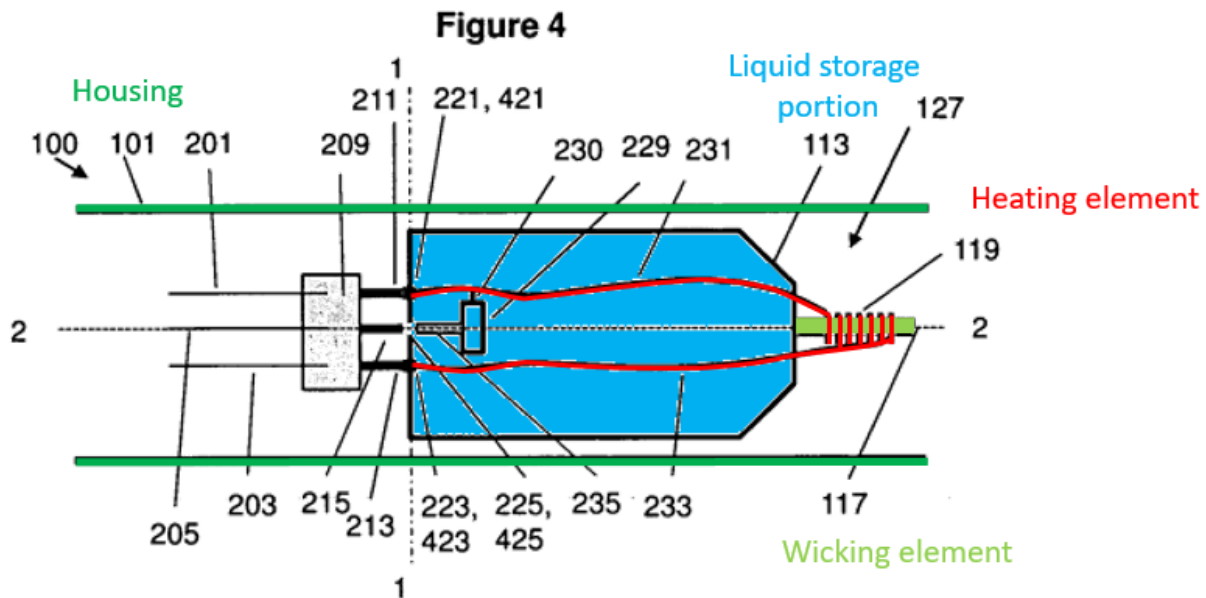
C. Ground 3: Thorens788 in view of Thorens231 further in view of Levin renders claims 1, 5, 7, 9-13, 15-16, 18-21 unpatentable under 35 U.S.C. § 103

1. Motivation to Combine

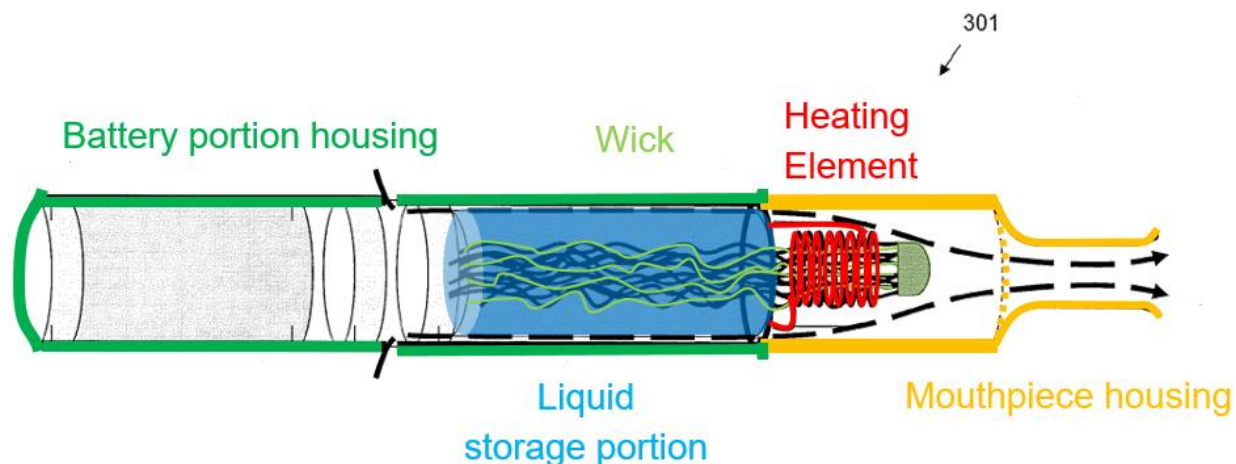
a. Mouthpiece housing

Thorens788 and Thorens231 share common inventors and are directed to substantially the same device. Thorens788 discloses a smoking 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 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 similar. EX1005, ¶¶214-216.

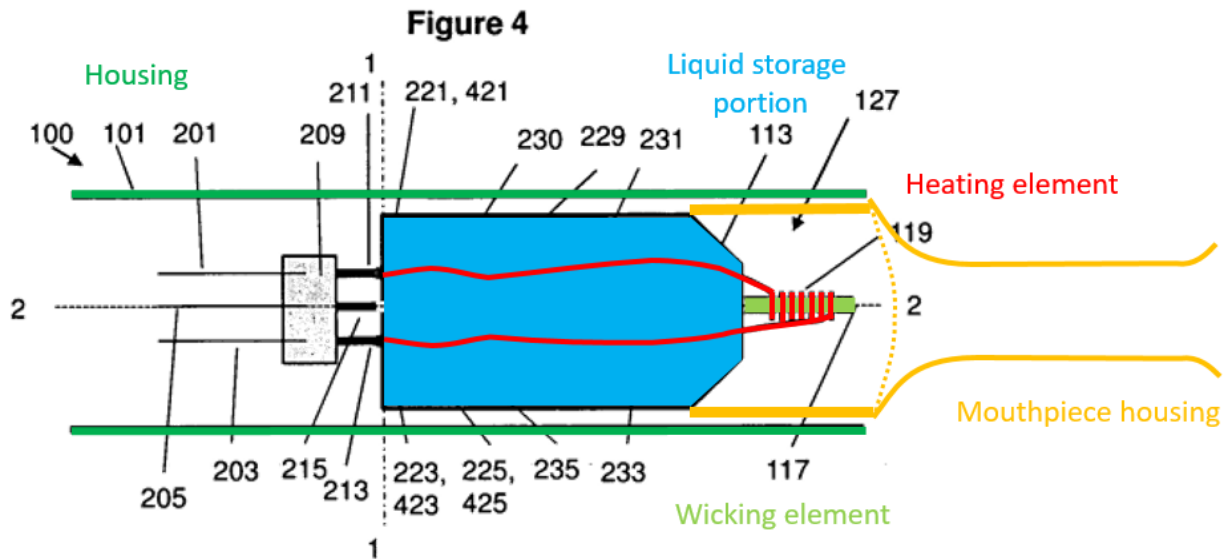


EX1004, Fig. 4



EX1002, Fig. 3.

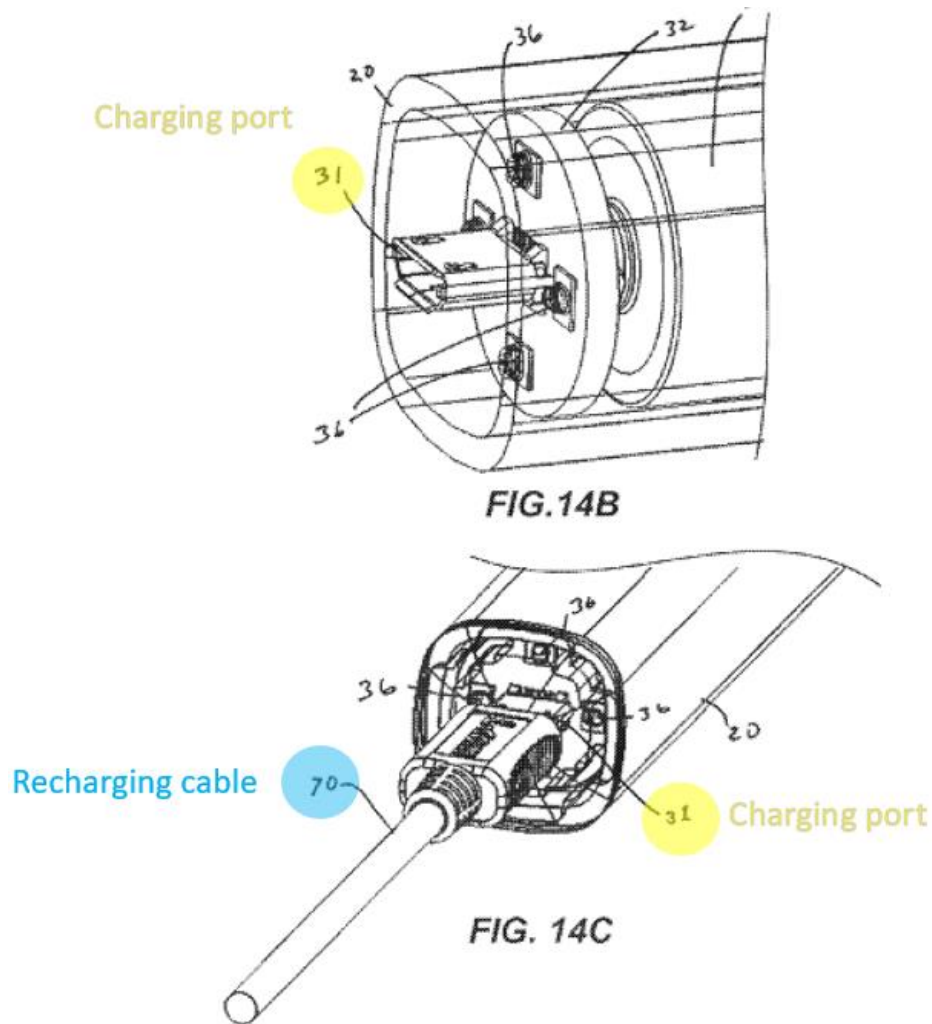
A POSA would have been motivated to modify Thorens788 to have a mouthpiece housing such as the mouthpiece housing illustrated by Thorens231. EX1005, ¶217. Thorens788 already discussing a mouthpiece housing and a POSA would have looked to Thorens231, which shares common inventors and is directed to substantially the same invention. Moreover, a POSA would have been motivated to provide a mouthpiece housing for Thorens788 because the cartridge is replaceable, and without a housing, a consumer would be forced to grip the heating element to remove the mouthpiece. That could lead to injury if the heating coil is still hot. *Id.* Accordingly, a POSA would have been motivated to modify Thorens788 by attaching a mouthpiece housing to the cartridge, for example, as follows:



b. USB charging

Thorens788 discloses a rechargeable battery, but it does not disclose charging contacts on the housing 101. EX1004, 9:29-33.

Levin, in contrast, teaches that charging contacts, *e.g.*, a micro-USB charger, can be placed at the end of the battery portion to charge a rechargeable battery:



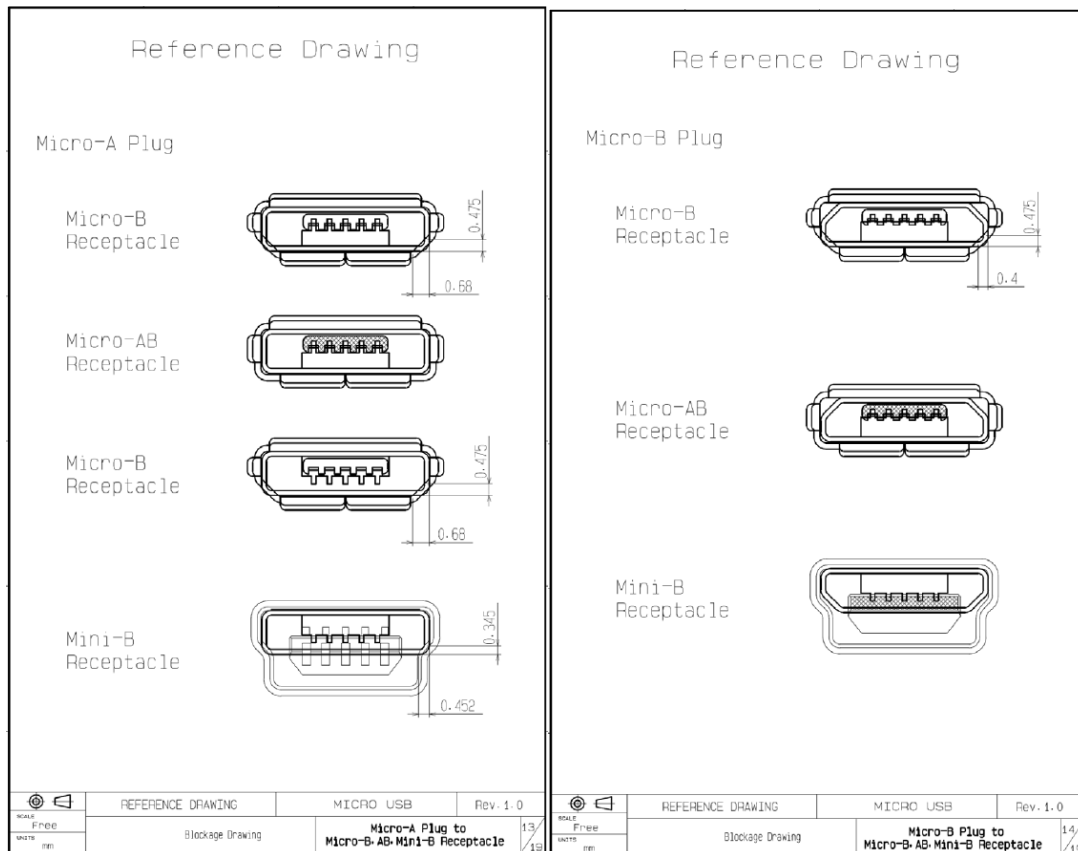
EX1003, Figs. 14B-C

See, e.g., EX1003, 23:58-61 (“In certain embodiments, the distal end also includes a recharging port 31, such as in a USB connector 31...so as to facilitate recharging of the power source[.]”).

A POSA would have understood that a micro-USB port specified by the USB standard at the time of Levin comprises five linearly arranged contacts. Two of such

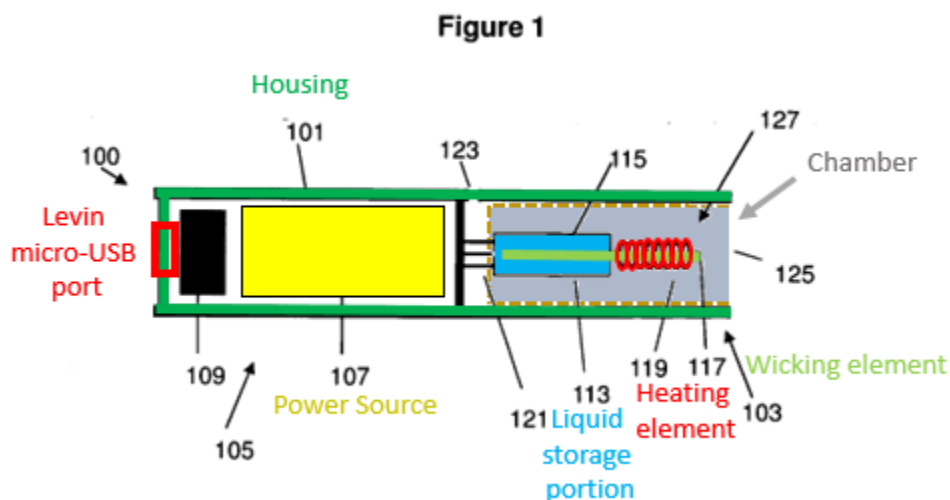
five pins – the VBUS and the GND pins – are used for providing power.

EX1011.010; EX1005 ¶208.



EX1011.026-027, Figs. 4-13, 4-14

A POSA would have been motivated to modify Thorens788 to include the micro-USB charging contacts at the distal end of Thorens788 housing 101 for the reasons articulated for Pan: *e.g.*, convenience, compatibility, use of the device while charging, possibility of additional features, and ergonomics. See IX.A.1. Further, locating the charging contacts at the distal minimizes the risk of the consumer touching the contacts during use. EX1005, ¶209.



EX1002, Fig. 1

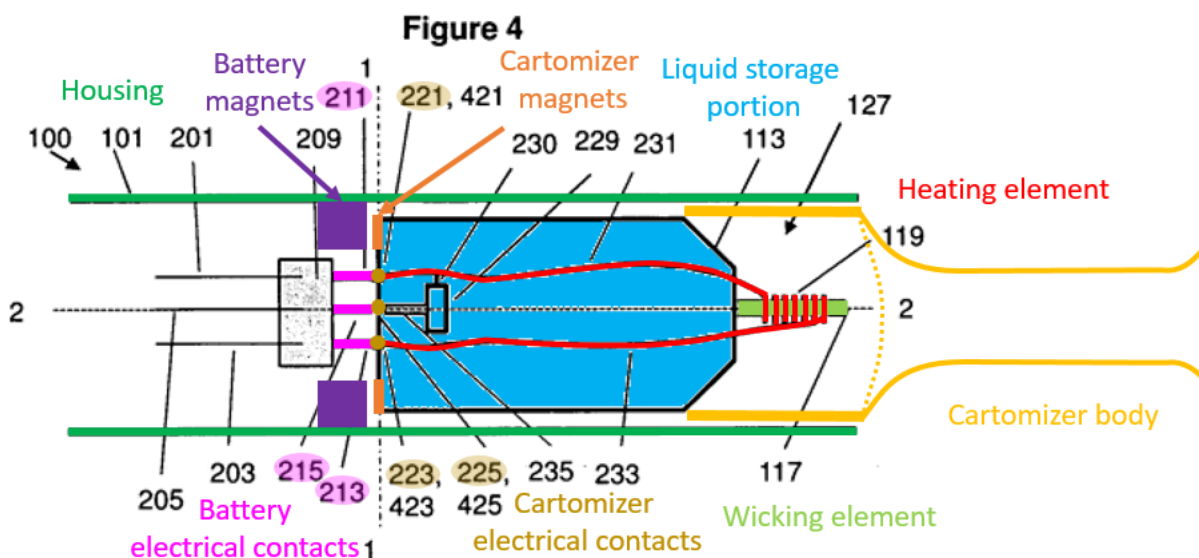
A POSA would have had a reasonable expectation of success incorporating a micro-USB receptacle at the distal end of Thorens788’s housing 101. Micro-USB receptacles were standardized, well-known in the art, and regularly used in e-vapor devices for charging and other purposes. EX1005 ¶210; *see, e.g.*, EX1026, 6:26-32; EX1042, 5:57-60; EX1003, 23:58-60.

c. Magnetic coupling

Thorens788 discloses that housing 101 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, however, the mechanism for releasably locking the two pieces.

As discussed in the context of Ground 1, the prior art is replete with examples of magnetic coupling in e-vapor devices. *See e.g.*, IX.A.1; EX1025, [0003]; EX1026,

6:15-24; EX1005 ¶¶36, 106. A POSA would have been motivated for the same reasons a POSA would have been motivated to modify Pan to incorporate a magnetic coupling: magnetic couplers are easy to use and self-aligning. *See, e.g.*, IX.A.1. In contrast, other connections, such as threaded connections and friction fit connections, require manual dexterity or tight tolerances. EX1035, [0111]; EX1043, 22:63-23:3; EX1005, ¶¶110-111.



Modified Thorens788

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, ¶281.

A POSA would have had a reasonable expectation of successfully adding magnets to Thorens788. EX1005, ¶¶112, 213. Magnets are small and it would have been trivial to place magnets in the receptacle and the cartomizer. *Id.* Combining Thorens788 with Levin is a predictable use of electronic vaporizer components according to their established functions and would not disrupt or interfere with the operation of the device. *Id.*

2. Claim 1

a. [1.A] A vaporizer comprising:

Thorens788 discloses this limitation. EX1005, ¶218-219.

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 comprising a battery housing segment and a cartomizer receiving segment,

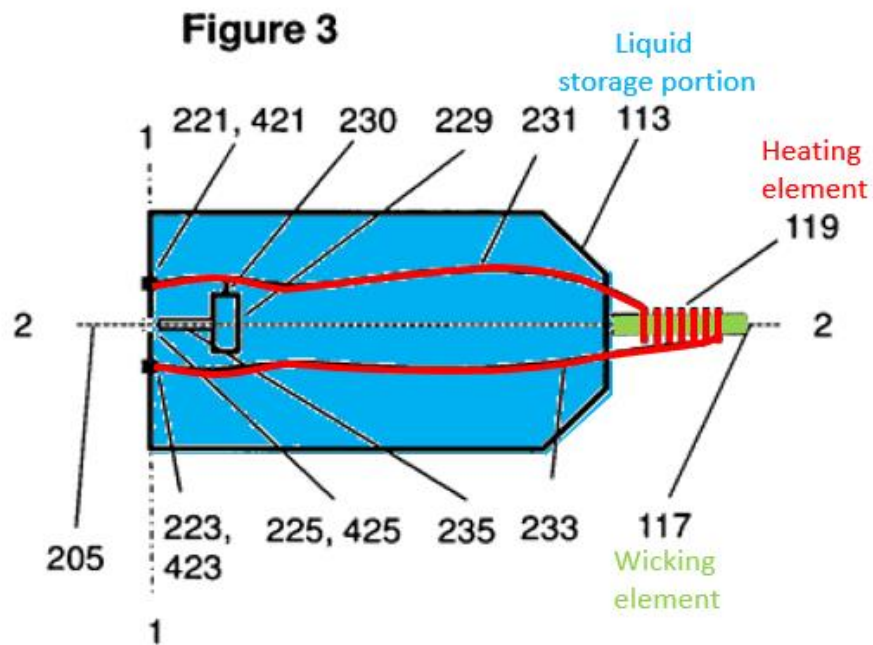
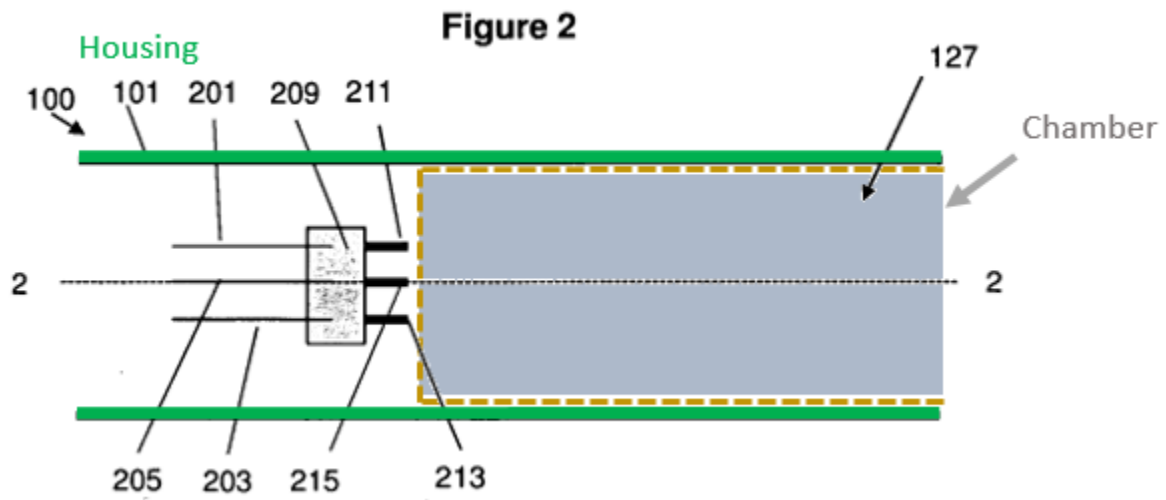
Thorens788 discloses this limitation. EX1005, ¶¶220-225.

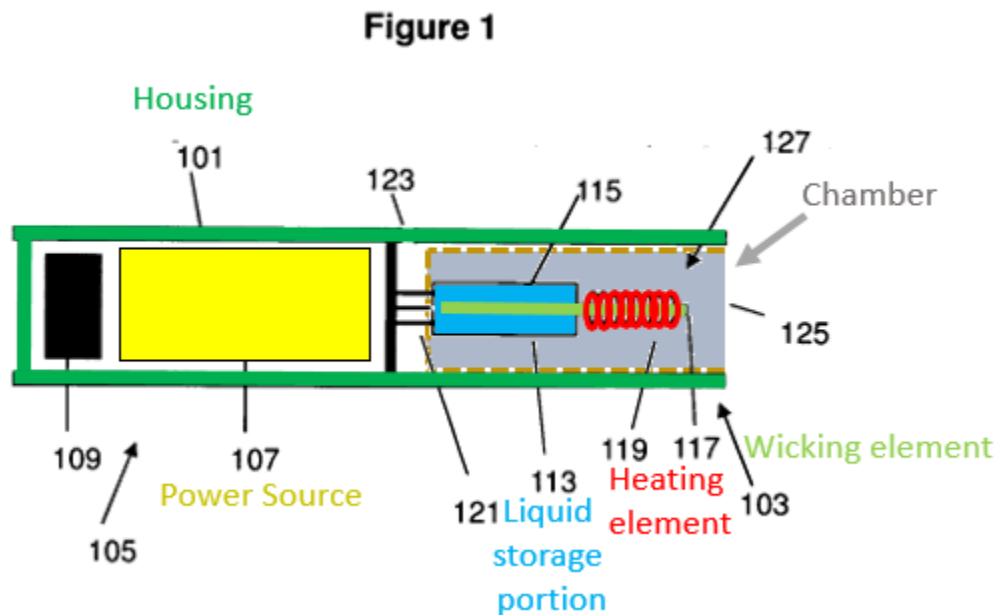
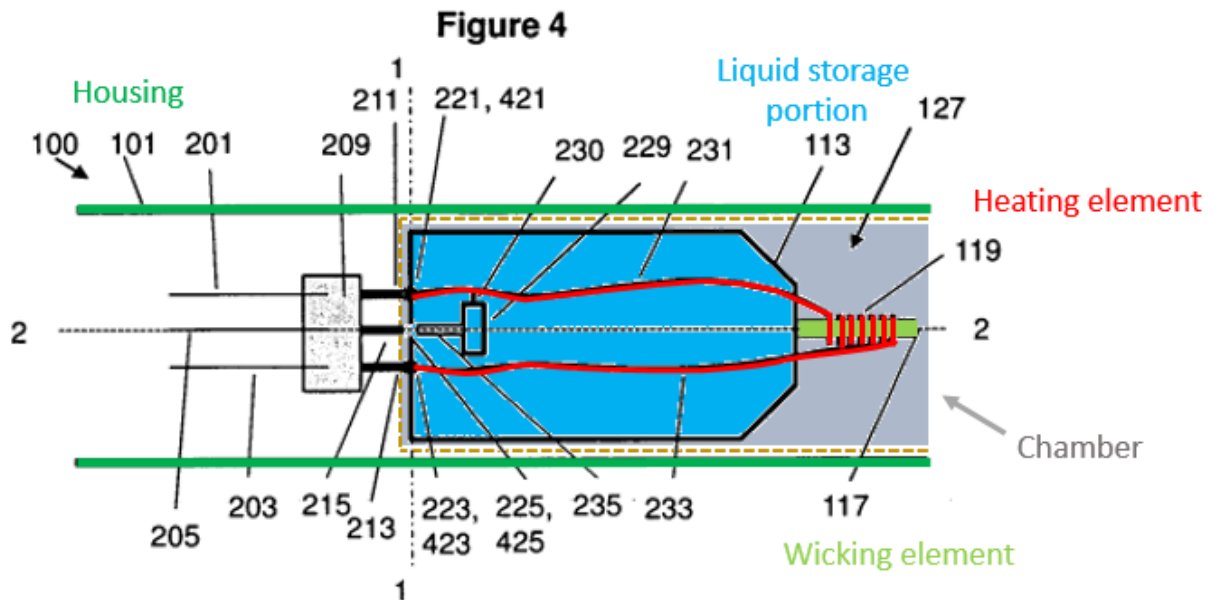
Thorens788 discloses that aerosol generating system 100 contains battery 107. EX1004, 12:8-11 (“The aerosol generating system 100 of Figure 1 is an electrically heated aerosol generating system 100 and comprises a housing 101 having a

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.”). Thus, aerosol generating system 100 is a battery portion comprising a battery housing segment.

Aerosol generating system 100 further includes mouthpiece end 103 defining a receiving segment for receiving a cartridge having a heating element and a liquid storage portion (*i.e.* cartomizer). 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 aerosol generating system 100 is depicted in Figs. 1 and 4:



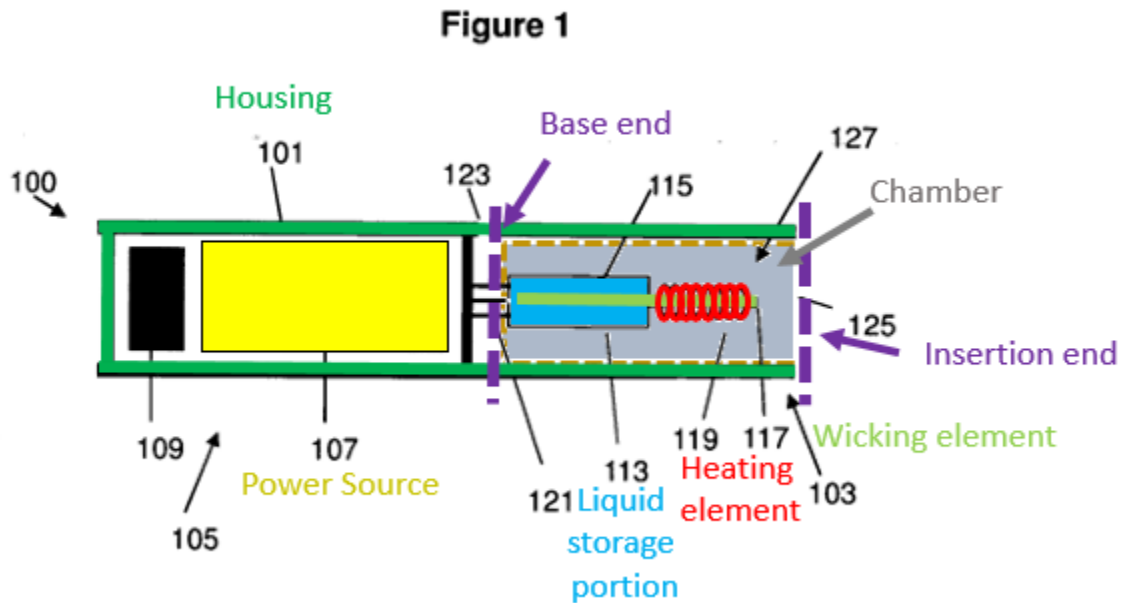


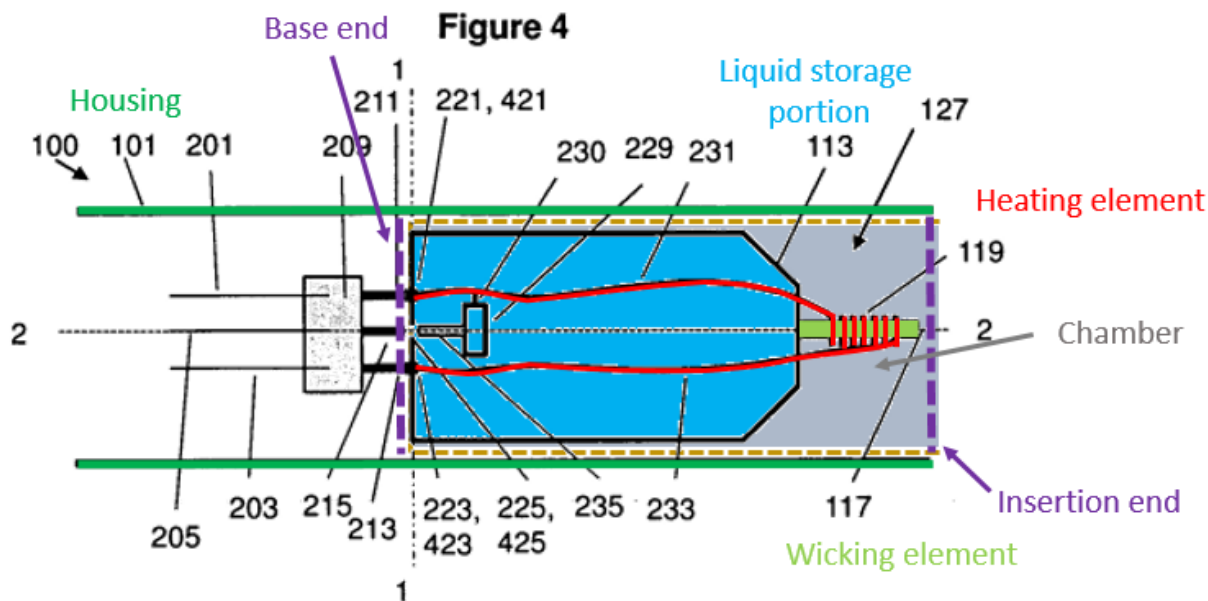
EX1004, Figs. 1-4

- c. [1.C] the cartomizer receiving segment defining a chamber having an insertion end distal from the battery housing segment and a base end proximate to the battery housing segment,

Thorens788 discloses this limitation. EX1005, ¶¶226-227.

Aerosol generating system 100 includes a chamber for receiving a cartomizer. See [1.B]. The chamber includes an insertion end that is distal from the segment housing battery 107 and a base end proximate to the battery 107.





EX1004, Figs. 1, 4.

- d. [1.D] the battery portion further comprising a plurality of charger electrical contacts to provide electrical charge to a battery housed in the battery housing segment, the charger electrical contacts disposed at a first end of the battery portion opposite the insertion end of the chamber of the cartomizer receiving segment,

Thorens788 in view of Levin renders obvious this limitation. EX1005, ¶¶228-229.

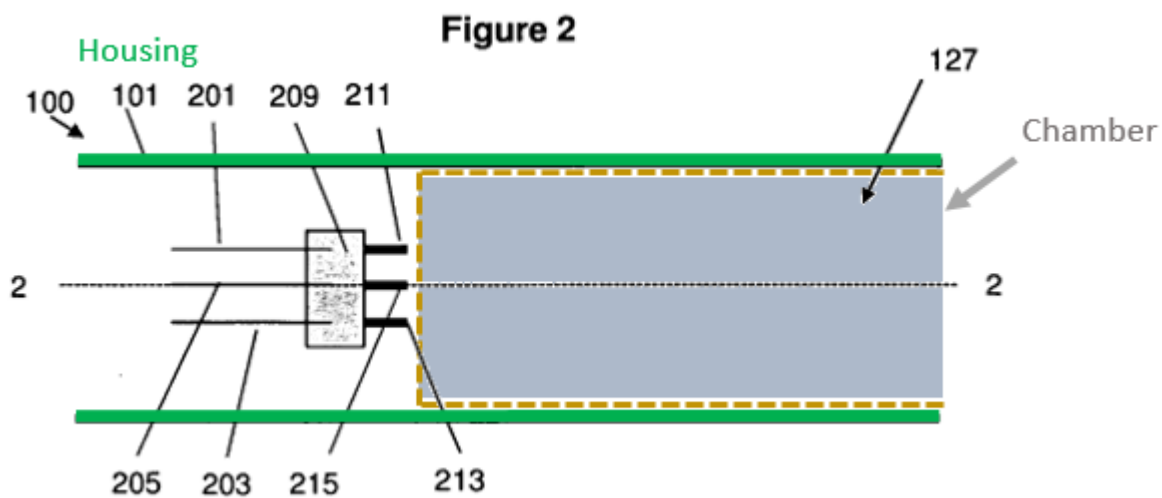
Thorens788 discloses, a rechargeable battery. EX1004, 9:29-33 (“Alternatively, the electric power supply may comprise circuitry chargeable by an external charging portion. In that case, preferably the circuitry, when charged, provides power for a pre-determined number of puffs, after which the circuitry must

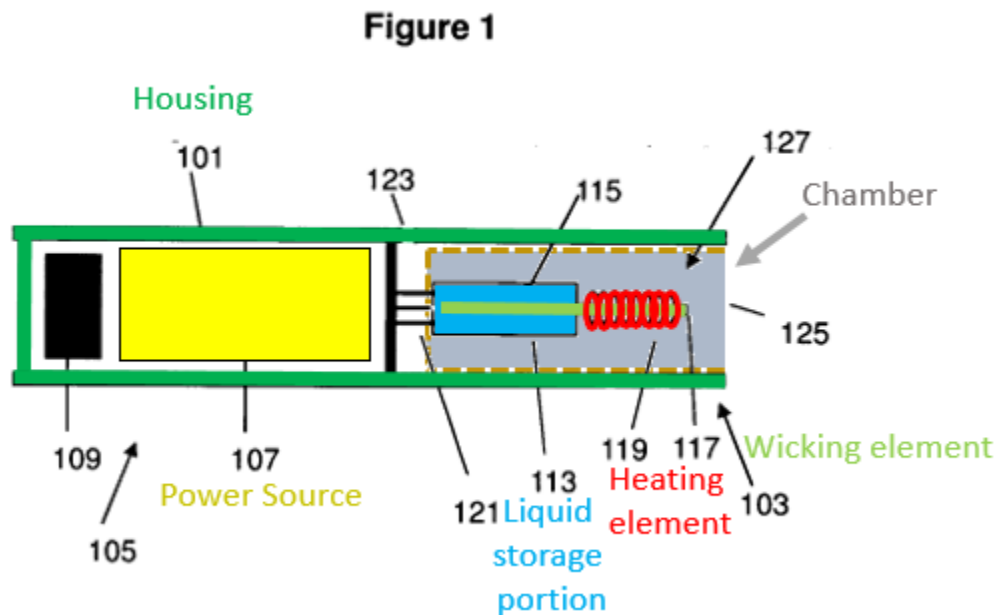
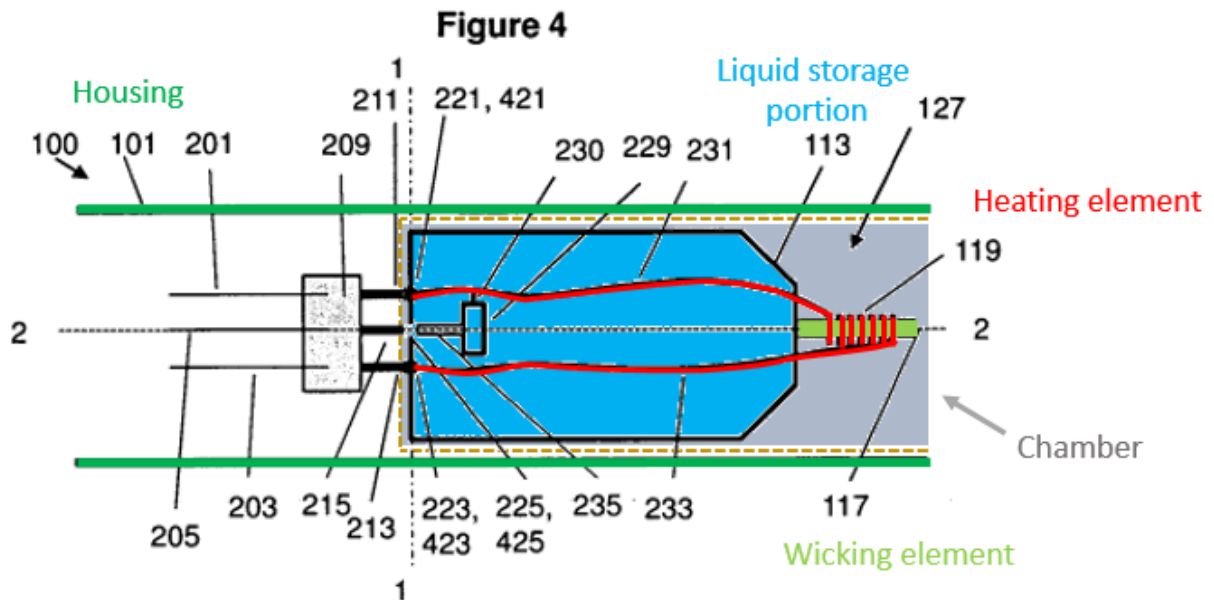
be reconnected to the external charging portion. An example of suitable circuitry is one or more capacitors or rechargeable batteries.”). Levin discloses an external charging port for recharging rechargeable batteries that a POSA would understand includes electrical contacts. EX1003, 8:66-9:6, 23:58-62. As discussed in IX.C.1, it would have been obvious to a POSA to include charger electrical contacts at the distal end of Thoren788’s housing 101. EX1005, ¶229.

- e. **[1.E] wherein an outer shell is commonly shared by the battery housing segment and the cartomizer receiving segment; and**

Thorens788 discloses this limitation. EX1005, ¶¶230-231.

Thorens788 discloses aerosol generating system 100 having housing 101, which extends to encompass both the battery segment and a cartomizer segment. As seen in the figure below, housing 101 is depicted as a continuous outer shell.



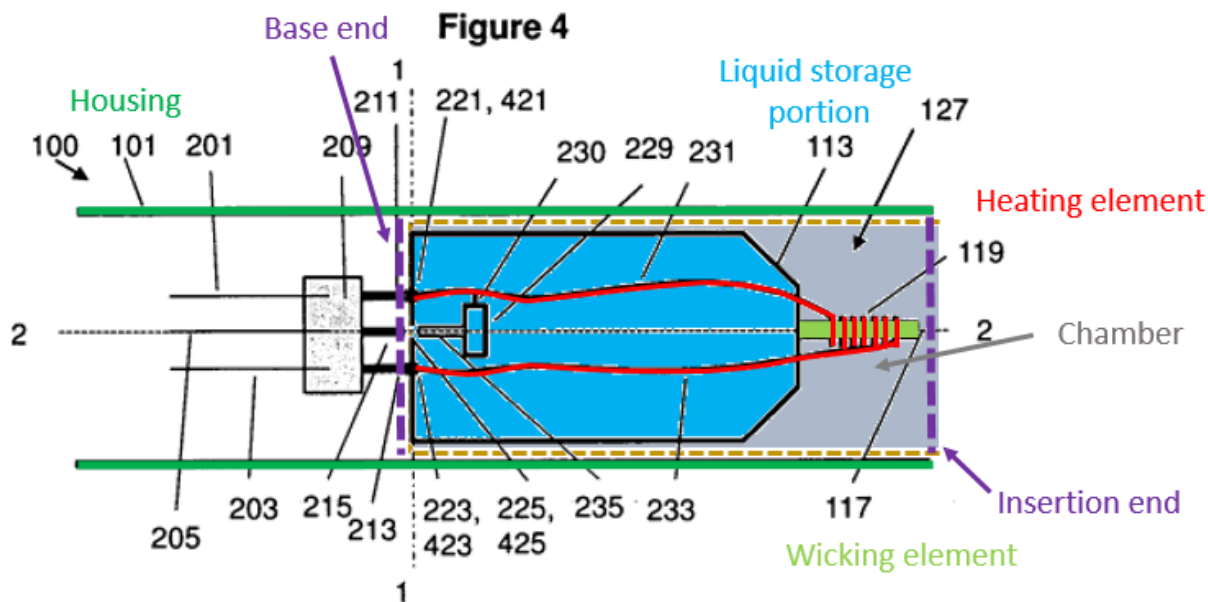


- f. [1.F] a cartomizer insertable into the chamber at the insertion end, the cartomizer comprising:

Thorens788 discloses this limitation. EX1005, ¶¶232-234.

Thorens788 discloses cartridge 113 containing 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.”); *id.*, 1:35-36 (“The liquid storage portion may further comprise a heating element.”). Cartridge 113 is thus a “cartomizer.” EX1005, ¶233.

Cartridge 113 is insertable into the chamber at the insertion end. See [1.B], [1.C]; 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.”),

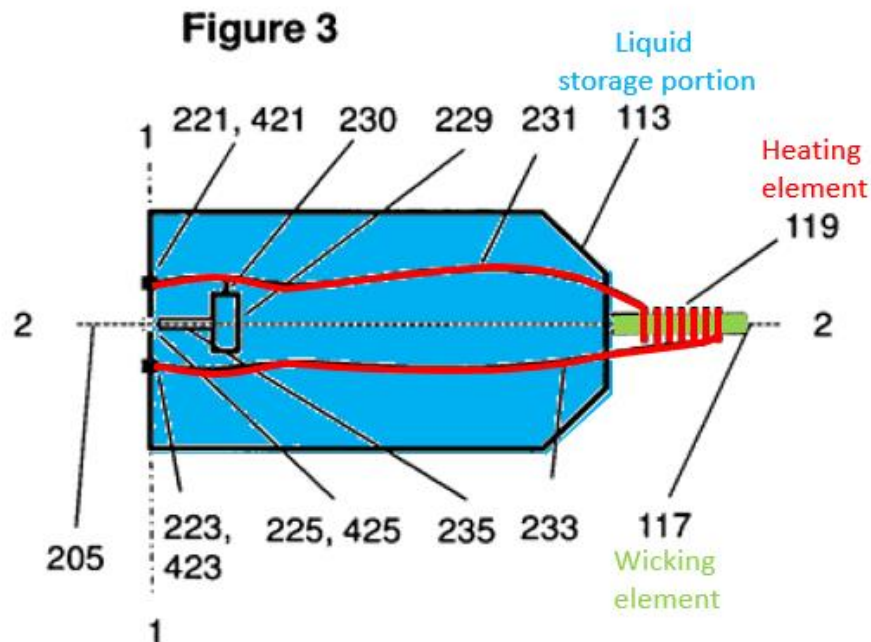


EX1004, Fig. 4

- g. **[1.G] a body including a structure configured to hold a vaporizable liquid;**

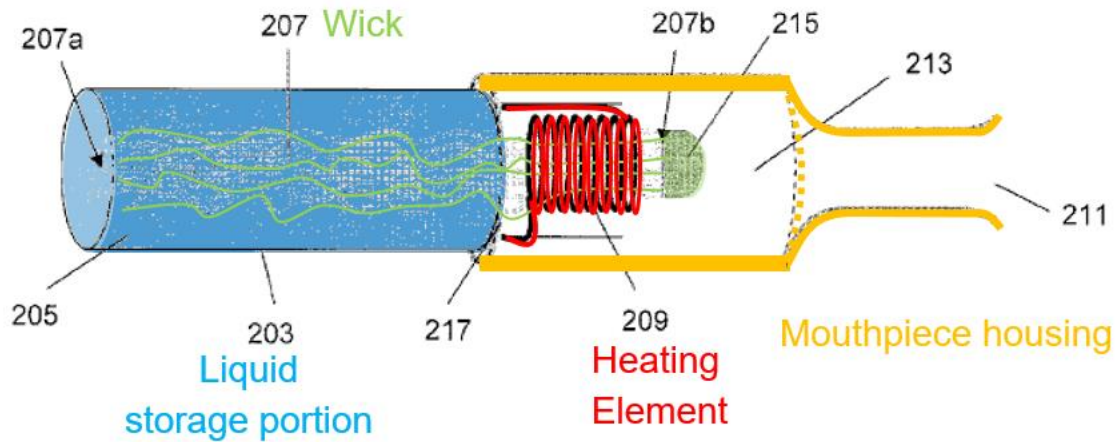
Thorens788 in view of Thorens231 renders this limitation obvious. EX1005, ¶¶235-238.

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.” EX1004, 10:28-29.



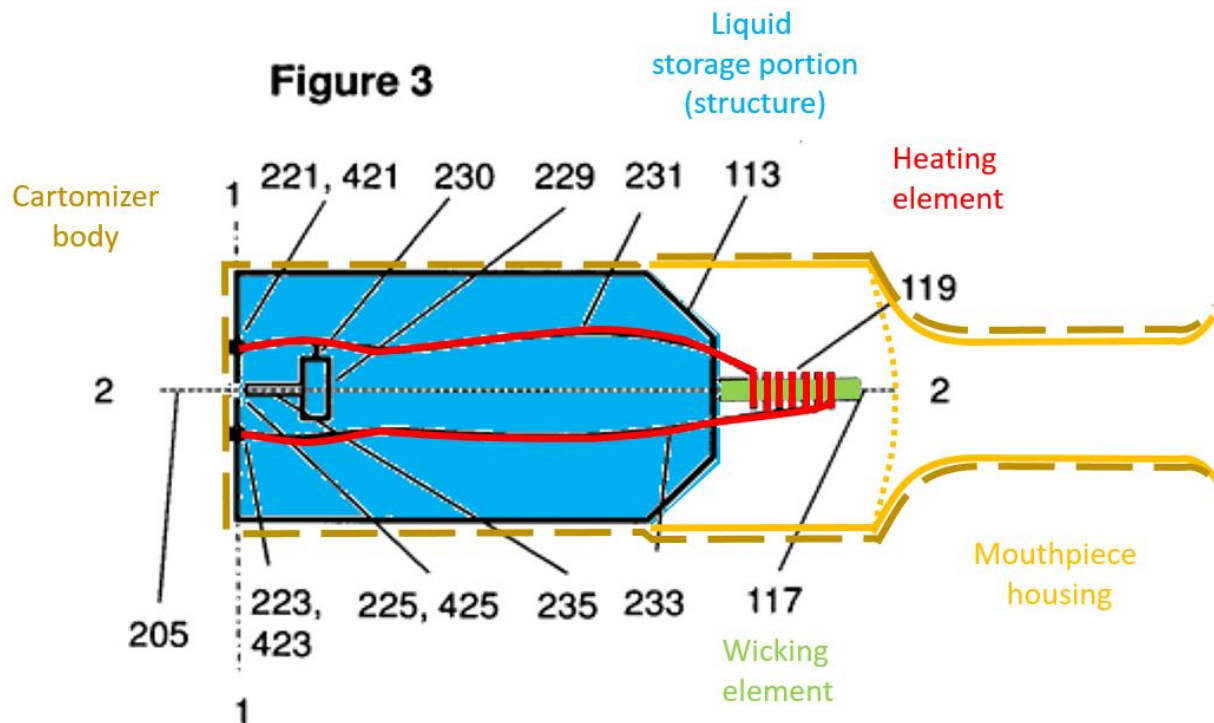
EX1004, Fig. 3

Thorens231 discloses that the mouthpiece may include a housing to protect the heating and wicking elements. EX1002, Fig. 2.



EX1002, Fig. 2

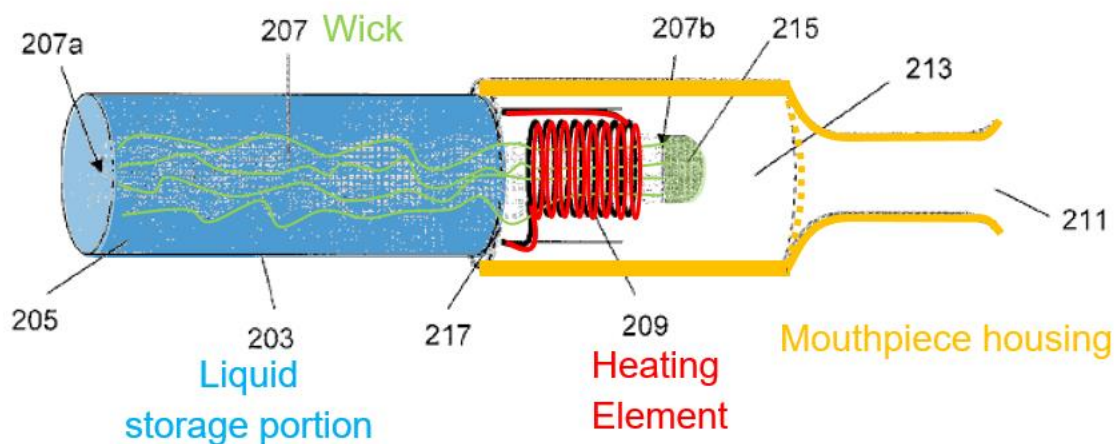
Thorens788 in view of Thorens231 thus provide a cartomizer body (cartridge and mouthpiece housing) having a liquid storage portion 113. EX1004, 12:12-13 (“In the mouthpiece end 103, there is provided a **liquid storage portion or cartridge 113 containing liquid 115**, a capillary wick 117 and a heating element in the form of a heating coil 119.”) (emphasis added).



- h. [1.H] a wicking element provided within the body and at least partially in contact with the vaporizable liquid; and

Thorens788 in view of Thorens231 renders this limitation obvious. EX1005, ¶¶239-243.

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” but provides no illustration. EX1004, 10:28-29; 10:31-34. Thorens231 illustrates that these components may be in the cartomizer body when the heating and wicking elements are protected by a housing.



EX1002, Fig. 2

Thorens788 discloses that capillary wick 117 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. Thorens788 discloses that wick 117 has a “first end extending into the liquid storage portion for contact with liquid therein[,]” and is therefore in the cartomizer body and partially in contact with the vaporizable liquid. EX1004, 7:14-16.

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

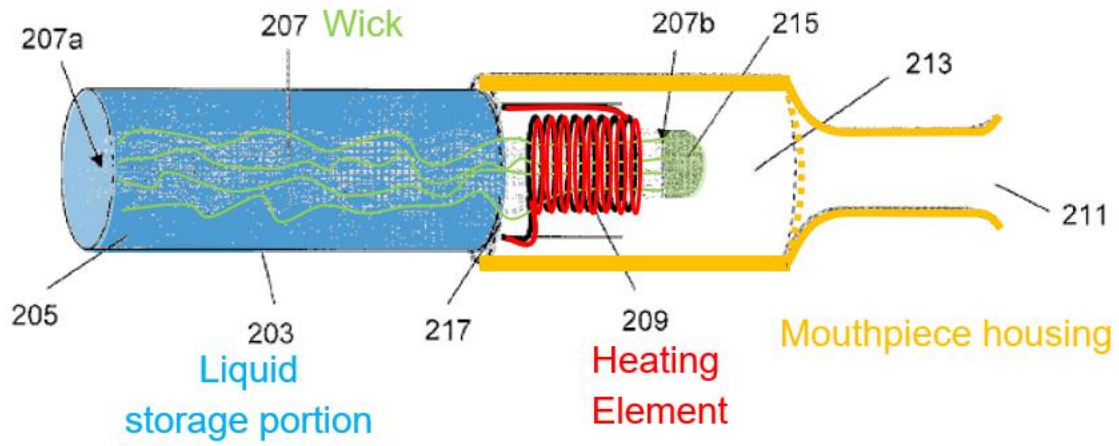
117 which extends from the cartridge to another end of the wick 117 which is surrounded by the heating coil 119.” EX1004, 12:19-21.

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...”).

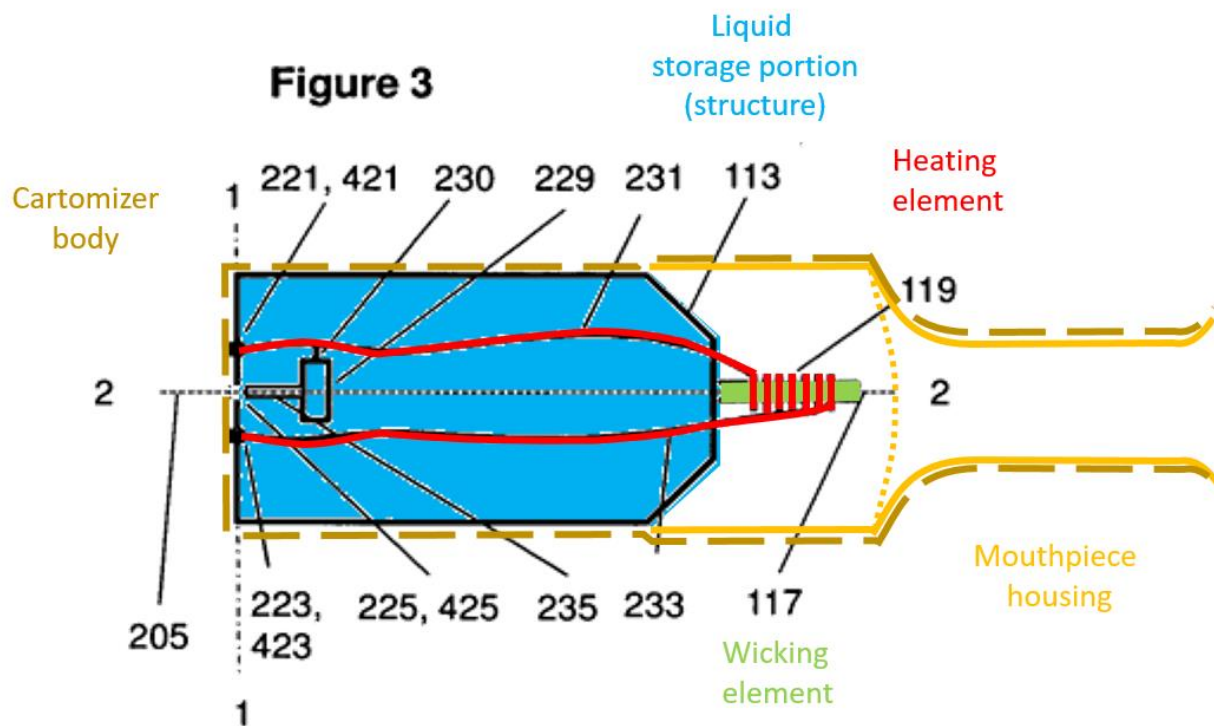
- i. [1.I] a heating element provided within the body in contact with the wicking element and operable to heat the vaporizable liquid,

Thorens788 in view of Thorens231 renders this limitation obvious. EX1005, ¶¶244-250.

Thorens788 discloses a mouthpiece housing wherein, “[p]referably, the liquid storage portion, the **capillary wick**, the at least **one heater** and the air outlet are contained in the mouthpiece” but provides no illustration. EX1004, 10:28-29 (emphasis added); 10:31-34. Thorens231 illustrates that these components may be in the cartomizer body when the heating and wicking elements are protected by a housing.



EX1002, Fig. 2



Heating coil 119 receives current from the power supply and vaporizes the liquid received from the liquid container. 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 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.”) (emphasis added).

- j. **[1.J] wherein the wicking element is configured to deliver the vaporizable liquid to the heating element, and**

Thorens788 discloses this limitation. EX1005, ¶¶251-252. *See* [1.H], [1.J].

Thorens788 discloses a wicking element that wicks liquid to heating coil 119. Capillary wick 117 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. Power is then

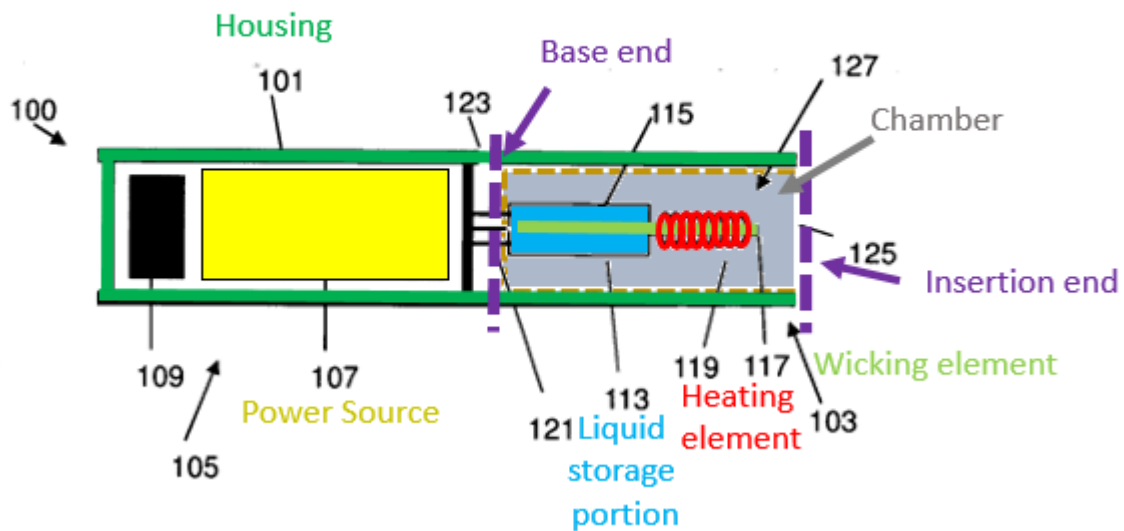
provided to heating coil 119 to vaporize the liquid delivered by wick 117. EX1004, 12:23-27 (“The battery 107 supplies electrical energy to the heating coil 119 to heat the end of the wick 117 surrounded by the heating coil. The liquid in that end of the wick 117 is vaporized by the heating coil 119 to create a supersaturated vapour. At the same time, the vaporized liquid is replaced by further liquid which is conveyed along the wick 117 by capillary action.”).

- k. **[1.K] wherein the entire heating element is disposed between the insertion end of the chamber and the base end of the chamber when the cartomizer is inserted into the chamber such that the outer shell protects the heating element.**

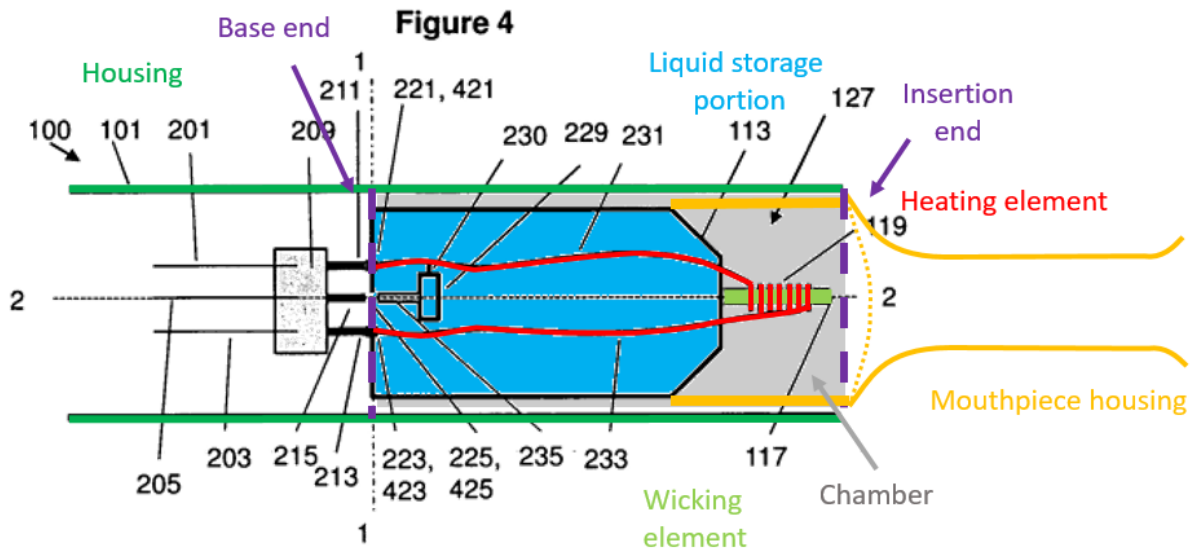
Thorens788 discloses this limitation. EX1005, ¶¶253-255.

As seen in Figs 1 and modified Fig. 4, heating element 119 is entirely disposed within the chamber within housing 101.

Figure 1



EX1004, Fig. 1

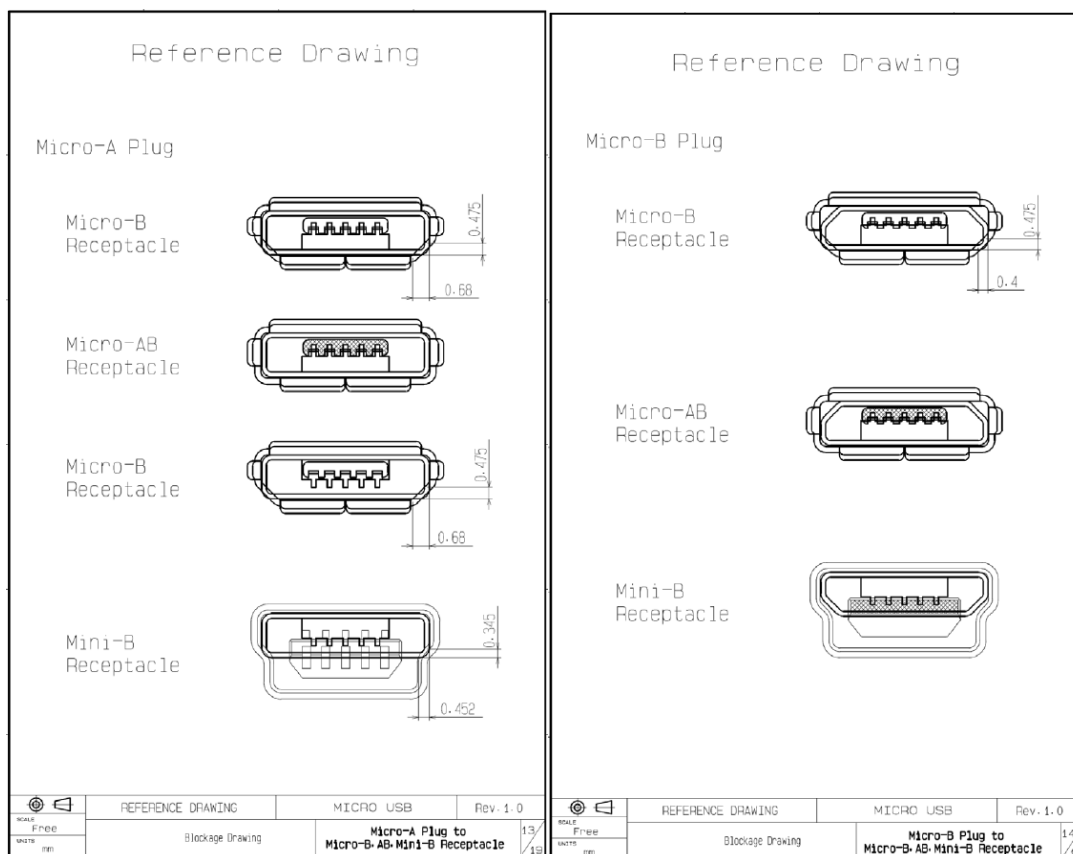


The shell provides additional protection to the heating element as it provides another layer of material between the heating element and the outside environment. EX1005, ¶255.

3. Claim 5: The vaporizer of claim 1, wherein the plurality of charger electrical contacts are arranged linearly at the first end of the battery portion.

Thorens788 in view of Levin renders obvious this limitation. EX1005, ¶¶256-257.

Thorens788 and Levin in combination renders obvious a vaporizing device comprising a micro-USB charging port at the first end of the battery portion where the LEDs are located, which comprises a plurality of linearly arranged charger electrical contacts. *See* Section IX.C.1.



EX1011.026-027, Figs. 4-13, 4-14

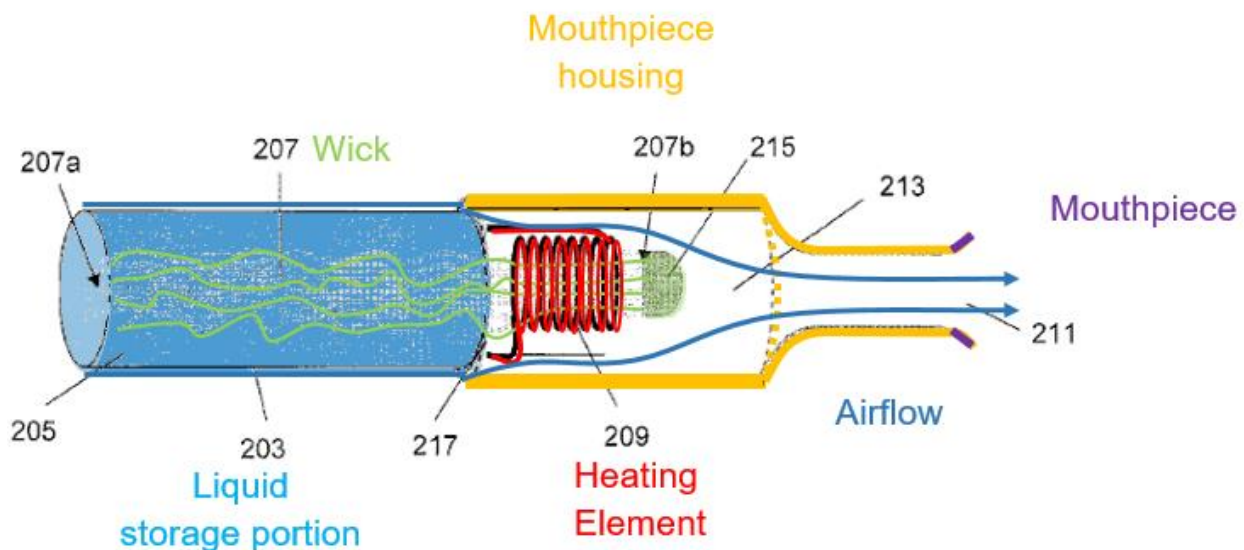
4. **Claim 7: The vaporizer of claim 1, wherein the cartomizer further comprises a mouthpiece opposite an end of the cartomizer configured for insertion into the chamber.**

Thorens788 in view of Thorens231 discloses this limitation. EX1005, ¶¶258-260.

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,

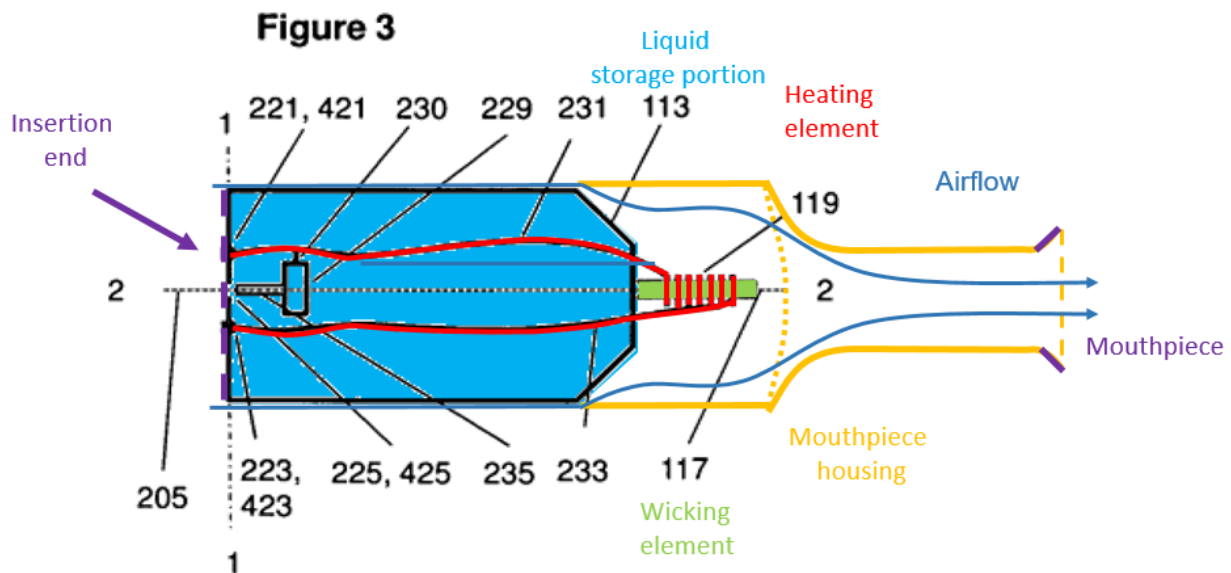
7:9-12 (“In the aerosol forming chamber 213, the vapor condenses to form an inhalable aerosol, which is carried towards the outlet 211 and into the mouth of a user.”).

Thorens231 provides a “mouthpiece” at air outlet 211 for the consumer to place their mouth. 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.4.



EX1002, Fig. 2

The modified Thorens788's cartomizer comprises the same mouthpiece.



5. **Claim 9: The vaporizer of claim 1, wherein the cartomizer further comprises electrical circuitry connected with the heating element.**

Thorens788 discloses this limitation. EX1005, ¶¶261-263.

Thorens788 discloses that, “[t]he heating coil 119 is connected to the electric circuitry via connections 121.” EX1004, 12:16-17. Thorens788 also discloses that the cartridge 113 comprises electrical conductive portions 231 and 233 electrically connected to a first and a second end of the heating element. EX1004, 14:12-14. The electrical conductive portions “allow electrical energy to be supplied to the heating element 119 from a battery or other power source.” EX1004, 14:14-17. Thus, at least the electrically conductive portions are the recited “electrical circuitry connected with the heating element.”

6. Claim 10

a. [10.A] A vaporizer comprising:

Disclosed. Ground 3, [1.A].

b. [10.B] a battery portion comprising: a battery housing segment;

Disclosed. Ground 3, [1.B].

c. [10.C] a cartomizer receiving segment defining a cartomizer chamber having an insertion end distal from the battery housing segment, the cartomizer chamber further having a base end proximate to the battery housing segment,

Disclosed. Ground 3, [1.C].

d. [10.D] wherein an outer shell is commonly shared by the battery housing segment and the cartomizer receiving segment;

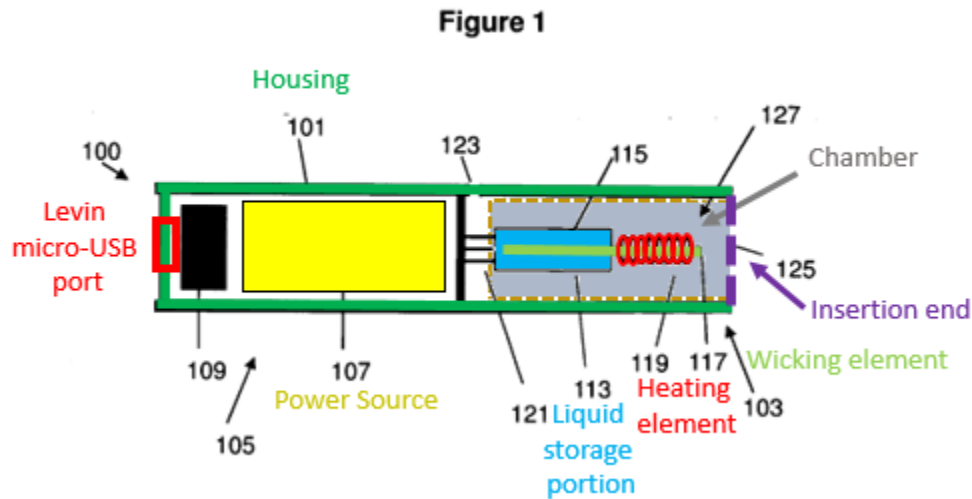
Disclosed. Ground 3, [1.E].

e. [10.E] a plurality of charger electrical contacts disposed at a first end of the battery portion opposite the insertion end of the cartomizer chamber, the insertion end of the cartomizer chamber being at a second end of the battery portion; and

Thorens788 in view of Levin renders obvious this limitation. EX1005, ¶¶268-269.

As explained for limitation [1.D], the combination of Thorens788 and Levin renders obvious a vaporizer comprising a plurality of charger electrical contacts

disposed at a first end of the battery portion opposite the insertion end of the cartomizer, the insertion end of the cartomizer chamber being at a second end of the battery portion.



EX1004, Fig. 1

- f. [10.F] at least one magnet of the battery portion, the at least one magnet of the battery portion in or proximate to the cartomizer chamber; and

Thorens788 in view of Levin renders obvious this limitation. EX1005, ¶¶270-272.

A POSA would have been motivated to incorporate Levin's teachings of using magnets to connect the cartomizer and the battery portion in Thorens788 smoking system for a more convenient and secure connection. See IX.E.1; EX1005, ¶271.

- g. [10.G] a cartomizer insertable into the cartomizer chamber at the insertion end, the cartomizer comprising:

Disclosed. Ground 3, [1F].

- h. [10.H] a body including a structure configured to hold a vaporizable liquid;

Obvious. Ground 3, [1.G].

- i. [10.I] a wicking element provided within the body and at least partially in contact with the vaporizable liquid;

Obvious. Ground 3, [1.H].

- j. [10.J] a heating element provided within the body in contact with the wicking element and operable to heat the vaporizable liquid,

Obvious. Ground 3, [1.I].

- k. [10.K] wherein the wicking element is configured to deliver the vaporizable liquid to the heating element, and

Disclosed. Ground 3, [1.J].

- l. [10.L] wherein the entire heating element is disposed between the insertion end of the cartomizer chamber and the base end of the cartomizer chamber when the cartomizer is inserted into the cartomizer chamber such that the outer shell protects the heating element; and

Disclosed. Ground 3, [1.K].

- m. **[10.M] a metal element disposed near a base end of the cartomizer for coupling with the at least one magnet of the battery portion.**

Thorens788 in view of Levin renders obvious this limitation. EX1005, ¶279-281.

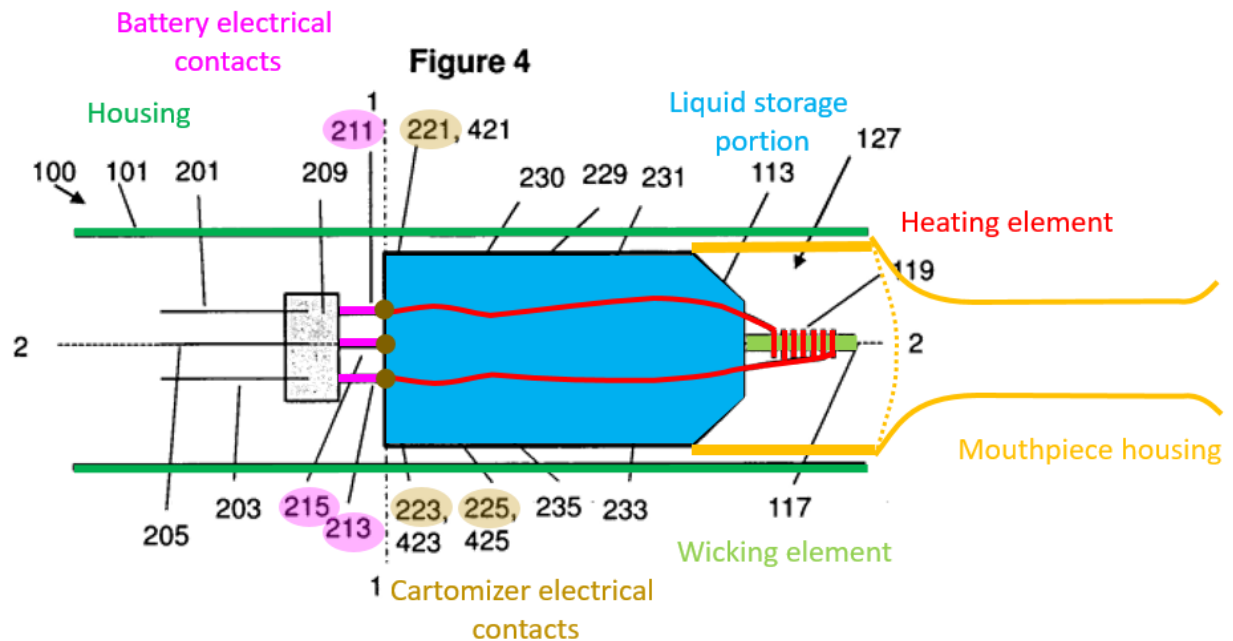
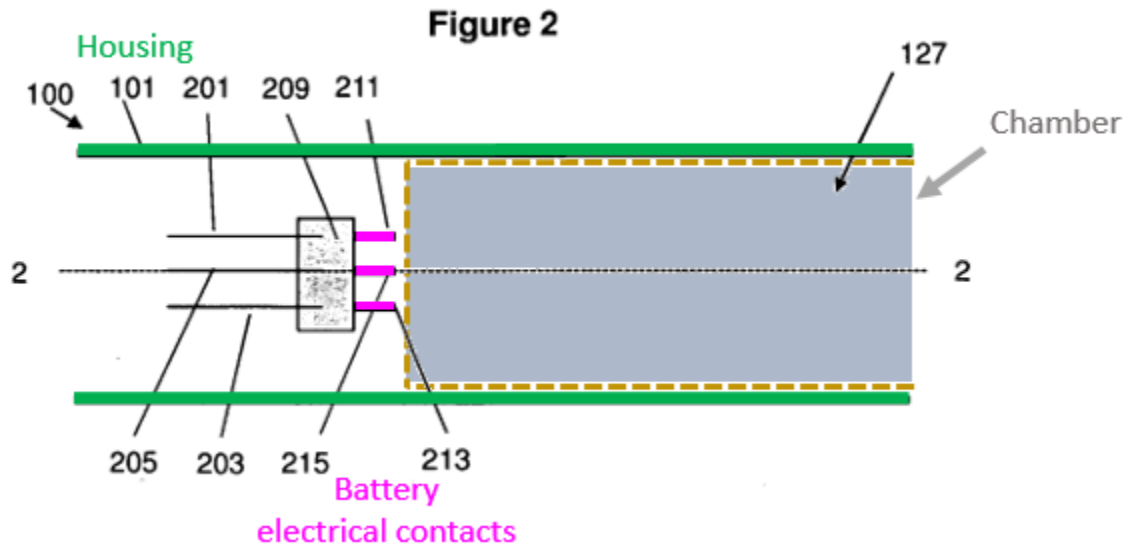
A POSA would have been motivated to incorporate Levin’s teachings of using magnets to connect the cartomizer and the battery portion in Thorens788 smoking system for a more convenient and secure connection. A POSA would have recognized that magnets may comprise a metallic surface. See IX.E.1; EX1005, ¶280-281.

7. **Claim 11: The vaporizer of claim 10, wherein the battery portion further comprises one or more battery electrical contacts in or proximate the cartomizer chamber of the cartomizer receiving segment.**

Thorens788 discloses this limitation. EX1005, ¶¶282-284.

Thorens788 discloses battery electrical contacts 211, 213, and 215 proximate the receiving cartomizer chamber as seen in Fig. 4, below. 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

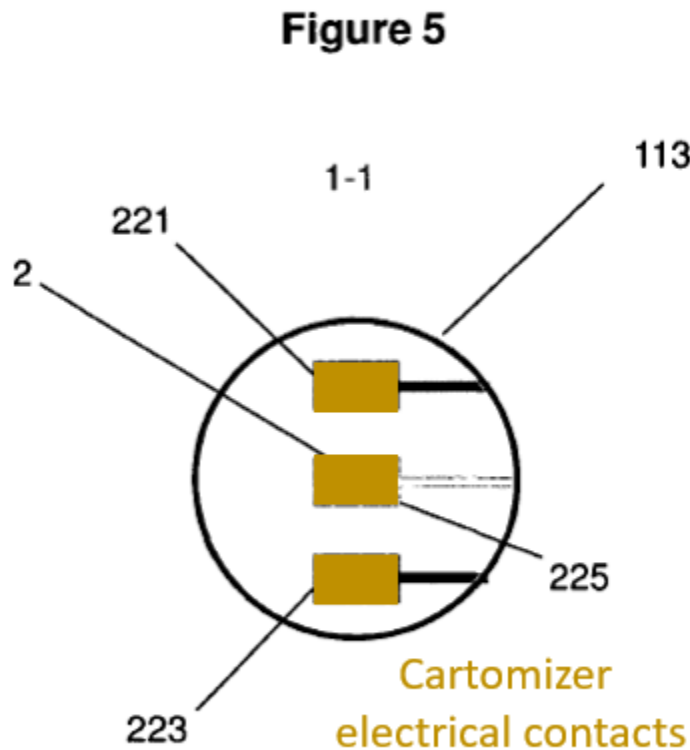
straight line. In this embodiment, each electrical contact 211, 213, 215 is equidistant from its neighbouring contact.”).



8. **Claim 12: The vaporizer of claim 10, wherein the cartomizer further comprises one or more cartomizer electrical contacts for connecting with one or more battery electrical contacts in or proximate the cartomizer chamber.**

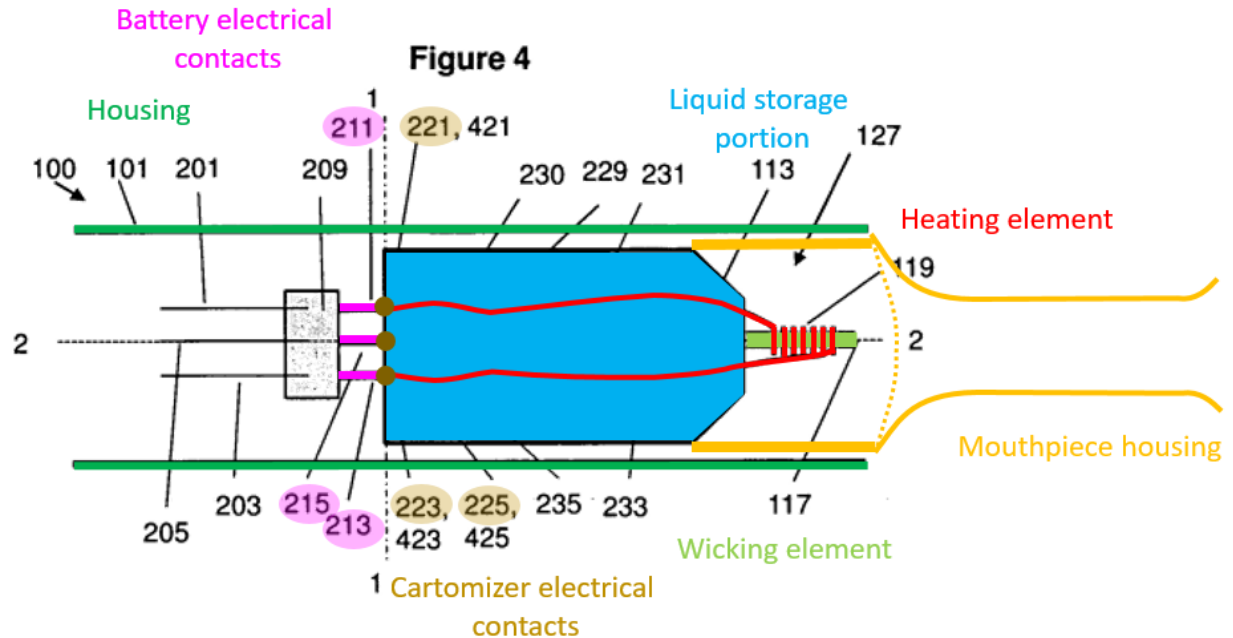
Thorens788 discloses this limitation. EX1005, ¶¶285-286.

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

The cartomizer contacts are positioned to contact the battery 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.”).



9. **Claim 13:** The vaporizer of claim 10, wherein the plurality of charger electrical contacts are arranged linearly at the first end of the battery portion.

Obvious. Ground 3, [1.D] and claim 5.

10. Claim 15

a. [15.A] A vaporizer comprising:

Disclosed. Ground 3, [1.A].

b. [15.B] a battery portion comprising:

Disclosed. Ground 3, [1.B].

c. [15.C] a plurality of charger electrical contacts disposed at a first end of the battery portion;

Obvious. Ground 3, [1.D].

d. [15.D] a battery housing segment for housing a battery between the first end of the battery portion and a second end of the battery portion;

Disclosed. Ground 3, [1.B], [1.C].

e. [15.E] a cartomizer receiving segment defining a chamber having an insertion end at the second end of the battery portion and distal from the battery housing segment, the chamber further having a base end proximate to the battery housing segment,

Disclosed. Ground 3, [1.B], [1.C].

f. [15.F] wherein an outer shell is commonly shared by the battery housing segment and the cartomizer receiving segment; and

Disclosed. Ground 3, [1.E].

g. [15.G] one or more battery electrical contacts in or proximate the chamber of the cartomizer receiving segment; and

Disclosed. Ground 3, [11.A].

- h. **[15.H] a cartomizer insertable into the insertion end of the chamber, the cartomizer comprising:**

Disclosed. Ground 3, [1.F].

- i. **[15.I] a body including a structure configured to hold a vaporizable liquid;**

Obvious. Ground 3, [1.G].

- j. **[15.J] a wicking element provided within the body and at least partially in contact with the vaporizable liquid;**

Obvious. Ground 3, [1.H].

- k. **[15.K] a heating element provided within the body in contact with the wicking element and operable to heat the vaporizable liquid,**

Obvious. Ground 3, [1.I].

- l. **[15.L] wherein the wicking element is configured to deliver the vaporizable liquid to the heating element, and**

Disclosed. Ground 3, [1.J]

- m. **[15.M] wherein the entire heating element is disposed between the insertion end of the chamber and the base end of the chamber when the cartomizer is inserted into the chamber such that the outer shell protects the heating element; and**

Disclosed. Ground 3, [1.K].

- n. **[15.N] one or more cartomizer electrical contacts for connecting with the one or more battery electrical contacts in or proximate the chamber.**

Disclosed. Ground 3, claim 12.

11. **Claim 16: The vaporizer of claim 15, wherein the plurality of charger electrical contacts are arranged linearly at the first end of the battery portion.**

Obvious. Ground 3, [1.D] and claim 5.

12. **Claim 18: The vaporizer of claim 1, the battery portion further comprising at least one magnet in or proximate to the chamber of the cartomizer receiving segment.**

Obvious. Ground 3, [10.F].

13. **Claim 19: The vaporizer of claim 18, the cartomizer further comprising a metal element disposed near a base end of the cartomizer for coupling with the at least one magnet of the battery portion.**

Obvious. Ground 3, [10.M].

14. **Claim 20: The vaporizer of claim 15, the battery portion further comprising at least one magnet in or proximate to the chamber of the cartomizer receiving segment.**

Obvious. Ground 3, [10.F].

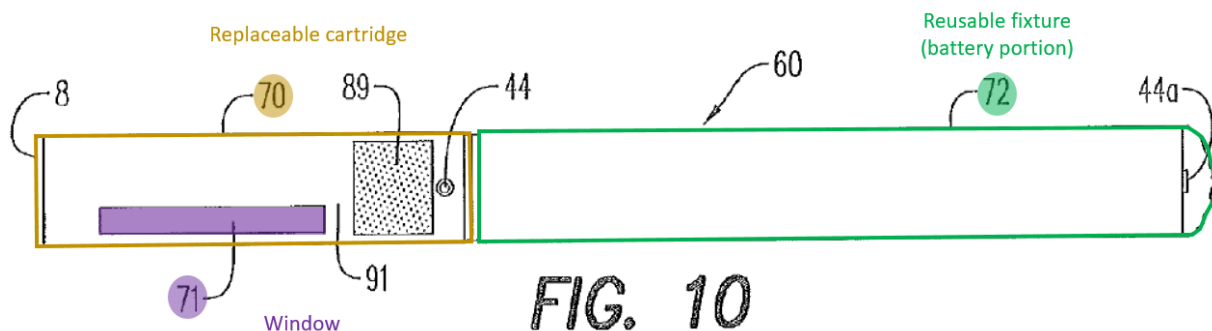
15. **Claim 21: The vaporizer of claim 20, the cartomizer further comprising a metal element disposed near a base end of the cartomizer for coupling with the at least one magnet of the battery portion.**

Obvious. Ground 3, [10.M].

D. Ground 4: Thorens788, Thorens231, and Levin further in view of Tucker render claims 14 and 17 unpatenable under 35 U.S.C. § 103

1. Motivation to Combine

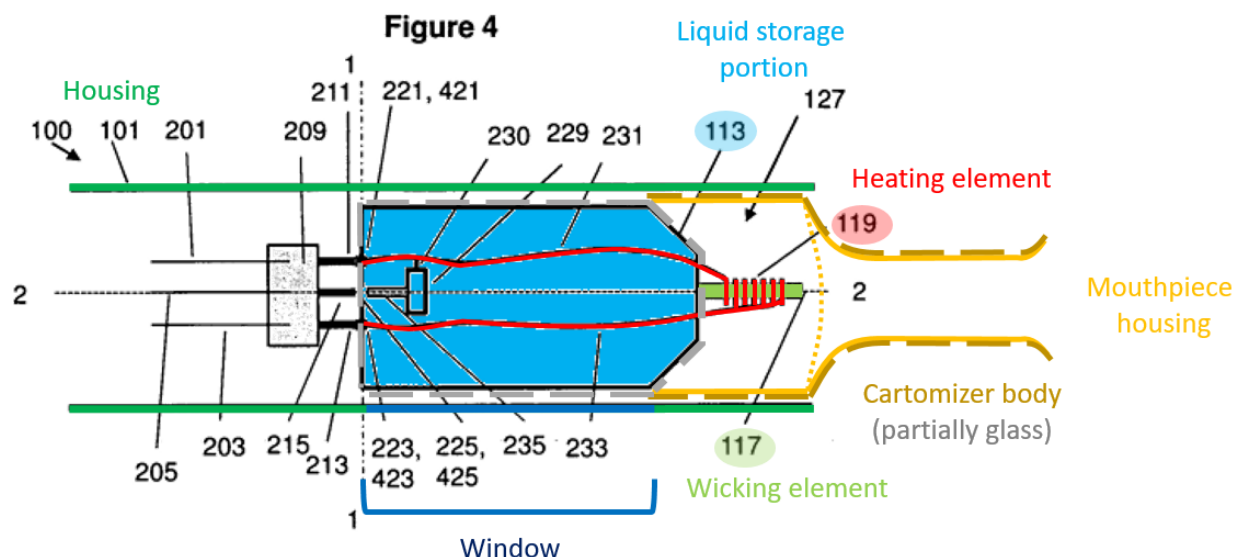
Thorens788, Thorens231, and Levin, in combination, discloses all the elements of claims 14 and 17 except for a window on or proximate to the shell. Tucker, however, teaches that a window can be provided to view the liquid remaining in the cartridge. EX1034, [0038] (disclosing an e-cigarette with an “outer 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.”). And because Thorens788’s housing 101 covers the cartridge, the window would need to be provided in housing 101.



EX1034, Fig. 10

A POSA would have been motivated to take Tucker’s teachings and include a window on Thorens788 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, 4:32-35; EX1005, ¶¶308-315. The figure below illustrates the portion of Thorens788 that a POSA would be motivated to make transparent in order to view liquid in the liquid container.



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. EX1053, 7:31-36 (“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.”); EX1005, ¶316.

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; EX1005, ¶¶313-315.

Note that Thorens788 discloses that, “[p]**referably**, the [liquid] container is opaque, thereby limiting degradation of the liquid by light.” EX1004, 7:26-27 (emphasis added). Thus, Thorens788 is disclosing that the container may be opaque or not opaque (*i.e.*, translucent), but the preference is for opaque. EX1005, ¶309.

To the extent that this is not sufficient to disclose a translucent cartridge, Thorens231 provides a separate disclosure that the cartridge may be made of glass. EX1005, ¶310; EX1002, 7:33-35 (“The 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 a POSA would have been motivated to use a translucent glass because it would be needed to allow a consumer to view the remaining liquid therein. EX1005, ¶310; *see, e.g.*, U.S. Patent No. 6,155,268 teaching that when a window is provided in the outer shell, the liquid container

should be transparent. 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.”) (emphasis added).

Moreover, Thorens788 itself makes clear that this is a design choice from a finite number of choices: opaque or translucent. EX1004, 7:26-27. Thorens788 also discloses that the liquid container is refillable. EX1004, 7:29 (“Alternatively, the liquid storage portion may be refillable.”). A POSA would thus be further motivated to make the container translucent to facilitate refilling the cartridge. While Thorens788 expresses a preference for an opaque container, the liquid could remain protected in a translucent embodiment by using tinted glass and/or a wrapper that is removed when the cartridge is ultimately used. EX1005, ¶¶311-312.

A POSA would have had a reasonable expectation of successfully adding a Tucker’s transparent window to Thorens788’s housing 101. EX1005, ¶317. 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 Thorens788's device. *Id.* A POSA would also have had a reasonable expectation of using a translucent glass cartridge because Thorens231 is directed to substantially the same device and a glass cartridge would not interfere with the operation of the rest of the e-cigarette.

2. Claims 14 and 17: The vaporizer of claim [10/17], further comprising a window on or proximate to the shell, the window permitting viewing of the cartomizer when the cartomizer is inserted into the cartomizer chamber.

Thorens788, Thorens231, and Levin in combination renders obvious claims 10 and 17. *See* Ground 3, claims 10 and 17. Thorens788, Thorens231, Levin further in view of Tucker render obvious this limitation. EX1005, ¶318-320.

As discussed in IX.D.1, it would have been obvious, in view of the teachings of Tucker, to modify Thorens788 shell such that it comprises a transparent window permitting viewing of the cartomizer when the cartomizer is inserted into the cartomizer chamber.

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.² Also, Pan, Levin, Thorens788, Thorens231, and Tucker 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. 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 Pan, Levin, Thorens231, and Tucker were disclosed by the applicant in IDSs, nothing in the record suggests the examiner evaluated or appreciated the

² Patent Owner's Interrogatory Responses are marked confidential. Petitioner will work with Patent Owner to submit their Interrogatory Responses.

relevance of these references. These reference were among over 1600 references cited during prosecution. Among this sea of references, the examiner did not identify Pan, Levin, Thorens²³¹, or Tucker 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. 11,134,722

Respectfully submitted,

Dated: December 5, 2023

By: /Anish R. Desai/

Anish R. Desai

Lead Counsel for Petitioner

Registration No. 73,760

Weil, Gotshal & Manges LLP

767 Fifth Avenue

New York, NY 10153

T: 212-310-8000

F: 212-310-8007

CERTIFICATE OF COMPLIANCE

1. The undersigned certifies that this brief complies with the type volume limitations of 37 CFR § 42.24(a)(1)(i). This brief contains 13,787 words (excluding the table of contents, the table of authorities, mandatory notices under 37 CFR § 42.8, the certificate of service, certificate of compliance, and appendix of exhibits), as calculated by the “Word Count” feature of Microsoft Word 2016, the word processing program used to create it.

2. The undersigned further certifies that this brief complies with the typeface requirements of 37 CFR § 42.6(a)(2)(ii) and typestyle requirements of 37 CFR § 42.6(a)(2)(iii). This brief has been prepared in a proportionally spaced typeface using Microsoft Word 2016 in Times New Roman 14 point font.

Respectfully submitted,

WEIL, GOTSHAL & MANGES LLP

Dated: December 5, 2023

By: /Anish R. Desai/
Anish R. Desai
Lead Counsel for Petitioner
Registration No. 73,760
Weil, Gotshal & Manges LLP
767 Fifth Avenue
New York, NY 10153
T: 212-310-8000
F: 212-310-8007

CERTIFICATE OF SERVICE

Pursuant to 37 C.F.R. § 42.105 and § 42.6(e), the undersigned certifies that on December 5, 2023, a complete and entire copy of this **PETITION FOR *INTER PARTES* REVIEW OF U.S. PATENT NO. 11,134,722, PETITIONERS'S POWER OF ATTORNEY, and all supporting exhibits** were sent via FedEx next business day delivery to the following:

Elissa M. Kingsland
Mintz Levin
One Financial Center
Boston, MA 02111

/Ryan Sotnick/
Ryan Sotnick
IP Paralegal
Weil, Gotshal & Manges LLP
2001 M Street, N.W., Suite 600
Washington, D.C. 20036
202-682-7000
ryan.sotnick@weil.com