

Case IPR2024-00055
Patent No. 9,924,744
Petition for *Inter Partes* Review
Attorney Docket No. JTIPAT 7.1O-001

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

LOGIC TECHNOLOGY DEVELOPMENT LLC,
and
JAPAN TOBACCO INTERNATIONAL U.S.A., INC.,
Petitioners,

v.

SHENZHEN HAPPY VAPING TECHNOLOGY LIMITED,
Patent Owner.

U.S. Patent No. 9,924,744

Inter Partes Review No. IPR2024-00055

**PETITION FOR *INTER PARTES*
REVIEW OF U.S. PATENT NO. 9,924,744**

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f. [1f] the second connection portion and the first connection portion abut against each other to be connected, the third connection portion is	

- detachably connected to the first connection portion
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- d. [1d] the vaporizer comprises a vaporizer tube body, and a second connection portion arranged at an end of the vaporizer tube body adjacent to the battery stick;.....100
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- m. [1m] one side of the protruding step is provided with a first cylindrical wall having an outer diameter smaller than that of the protruding step, the first cylindrical wall is sheathed with an inner wall of said end of the casing tube of the battery stick, the outer diameter of the protruding step equals an outer diameter of the casing tube of the battery stick;.....116
- n. [1n] the other side of the protruding step is provided with a second cylindrical wall having an outer diameter smaller than that of the protruding step and having the outer thread, one end of the second cylindrical wall is provided with a base wall having a central through hole, the central through hole is configured for installing the first positive electrode and the first insulation sleeve.....116

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d.	[2c] an inner wall at a lower portion of the second connection seat is provided with a base wall, a tubular body is protruded from a center of the base wall, the tubular body is provided with a central through hole for installing the second insulation sleeve and the second positive electrode.	118
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EXHIBIT LIST

Exhibit #	Reference
1001	U.S. Patent No. 9,924,744 (“the ’744 Patent”)
1002	Declaration of Doug Dean in Support of Petition for <i>Inter Partes</i> Review of U.S. Patent No. 9,924,744
1003	Doug Dean — Curriculum Vitae
1004	Prosecution History of U.S. Patent No. 9,924,744
1005	U.S. Patent Publication No. 2015/0164141 (“Newton ’141”)
1006	U.S. Patent Publication No. 2013/0228191 (“Newton ’191”)
1007	U.S. Patent Publication No. 2013/0192617 (“Thompson”)
1008	U.S. Patent Publication No. 2014/0060527 (“Liu ’527”)
1009	U.S. Patent Publication No. 2014/0060556 (“Liu ’556”)
1010	U.S. Patent Publication No. 2010/0242974 (“Pan”)
1011	U.S. Patent Publication No. 2015/0189919 (“Liu ’919”)
1012	Defendants’ Motion to Stay Discovery and Other Deadlines, February 17, 2023 (DE30)
1013	Defendants’ Motion to Dismiss for Improper Venue or to Transfer Venue and Incorporated Memorandum of Law, December 15, 2022 (DE13)
1014	Plaintiff’s Response to Defendants’ Motion to Dismiss for Improper Venue or to Transfer Venue, December 29, 2022 (DE17)
1015	First Amended Complaint For Patent Infringement, January 5, 2023 (DE21)
1016	Defendants’ Notice to Reassert Motion to Dismiss for Improper Venue or to Transfer Venue, January 17, 2023 (DE24)
1017	Defendants’ Reply in Support of Motion to Dismiss for Improper Venue or to Transfer Venue, January 17, 2023 (DE25)
1018	Defendants’ Motion for Clarification or, in the Alternative, for Leave to Refile Motion to Dismiss and Incorporated Memorandum of Law, July 21, 2023 (DE53)
1019	Defendants’ Renewed Motion to Stay Discovery and Other Deadlines, June 30, 2023 (DE49)
1020	Plaintiff’s Response to Defendants’ Renewed Motion to Stay Discovery and Other Deadlines, July 14, 2023 (DE50)
1021	Reply Memorandum in Support of Defendants’ Renewed Motion to Stay Discovery and Other Deadlines, July 21, 2023 (DE52)

I. INTRODUCTION

Logic Technology Development LLC (“Logic”) and Japan Tobacco International U.S.A., Inc. (“JTI”) (together “Petitioners”) request *Inter Partes* Review (“IPR”) of claims 1, 2, and 5 of U.S. Patent No. 9,924,744 (“the ’744 Patent”) (Ex.1001), assigned to SHENZHEN HAPPY VAPING TECHNOLOGY LTD. (“SHV” or “PO” (Patent Owner)).

II. MANDATORY NOTICES

A. Real Parties-In-Interest

The real parties-in-interest in this Petition are Logic, JTI, and Shenzhen Smoore Technology Limited.

B. Related Matters

SHV brought an action against Petitioners for alleged infringement of the ’744 Patent in *SHV v. LOGIC and JTI*, Civil Action No. 0:22-cv-61407-RS, Southern District of Florida (“the Litigation”).

C. Lead And Backup Counsel And Service Information

Lead Counsel	Gregory S. Gewirtz, Reg. No. 36,522
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III. PAYMENT OF FEES

Pursuant to 37 C.F.R. §42.103(a), the Office is authorized to charge the fee in 37 C.F.R. §42.15(a) and any additional fees to Deposit Account No. 121095.

IV. STANDING

Petitioners certify that the '744 Patent is available for IPR, and that Petitioners are not barred or estopped from requesting IPR on the grounds identified herein.

V. STATEMENT OF PRECISE RELIEF REQUESTED

Petitioners request institution of IPR of claims 1, 2, and 5 of the '744 Patent, and further request that each challenged claim be held unpatentable, based on the following grounds:

Ground	Claims	Statute	Prior Art
1	1, 2	§103	Newton '141 and Newton '191
2	5	§103	Newton '141, Newton '191, and Thompson
3	1, 2, 5	§103	Newton '141 and Thompson

VI. REQUEST FOR *INTER PARTES* REVIEW OF CLAIMS 1, 2, AND 5 OF THE '744 PATENT

A. Overview Of The '744 Patent

The '744 Patent is directed to “an electronic cigarette designed to have a vaporizer and a casing tube of the vaporizer as two separate parts and have a

simplified connection structure between the vaporizer and a battery stick.” (Ex.1001 col.1 ll.25-28.)

FIG.1¹ shows an electronic cigarette including a battery stick 10, a vaporizer assembly having a vaporizer 20 and a casing tube 30, and a mouth-piece 40. (Ex.1001 col.4 ll.34-44.)

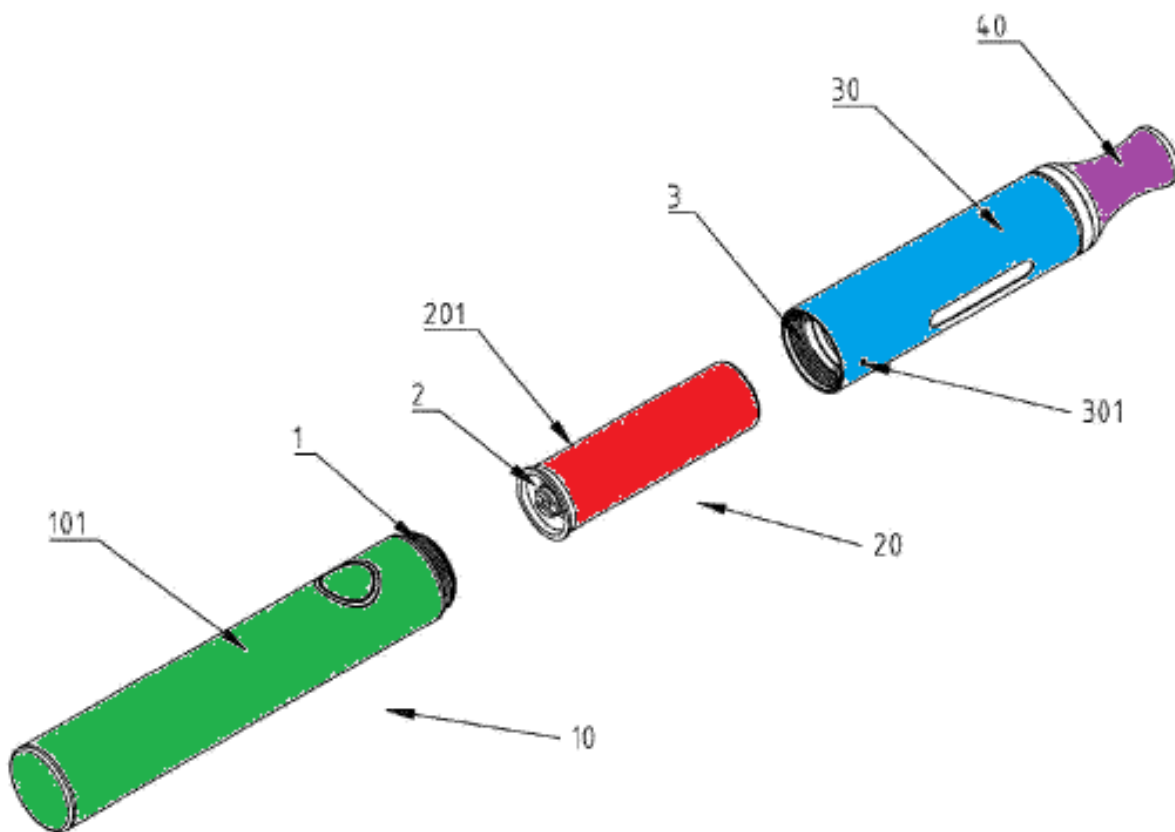


Figure 1

¹ All color and colored text is added to the figures.

Battery stick 10 includes a first connection portion 1 having a first connection seat 11, a first positive electrode 12, and a first insulation sleeve 13 adjacent to the vaporizer assembly. (Ex.1001 col.4 ll.36-41, 54-62.) Vaporizer 20 includes a second connection portion 2 having a second connection seat 21, a second positive electrode 22, and a second insulation sleeve 23 adjacent to battery stick 10. (Ex.1001 col.4 ll.44-47, col.4 l.62-col.5 l.2.) Casing tube 30 of vaporizer 20 includes a third connection portion 3 adjacent to battery stick 10. (Ex.1001 col.4 ll.47-49.)

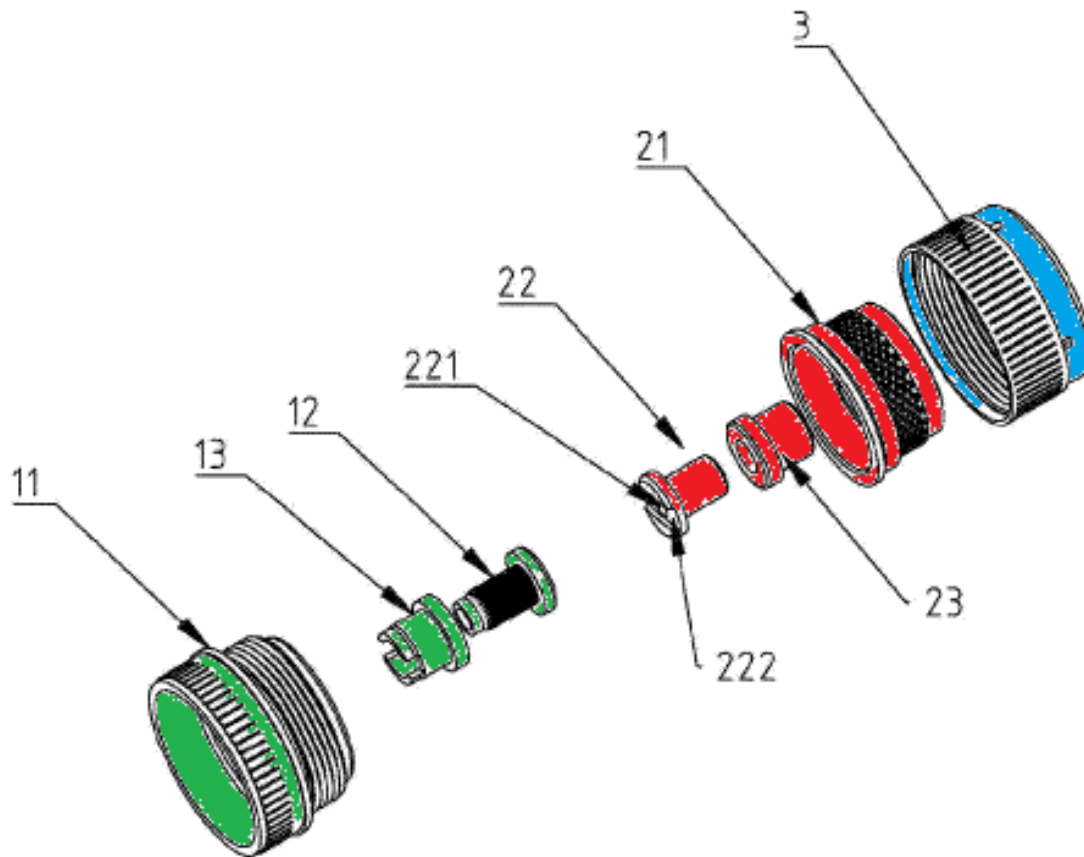
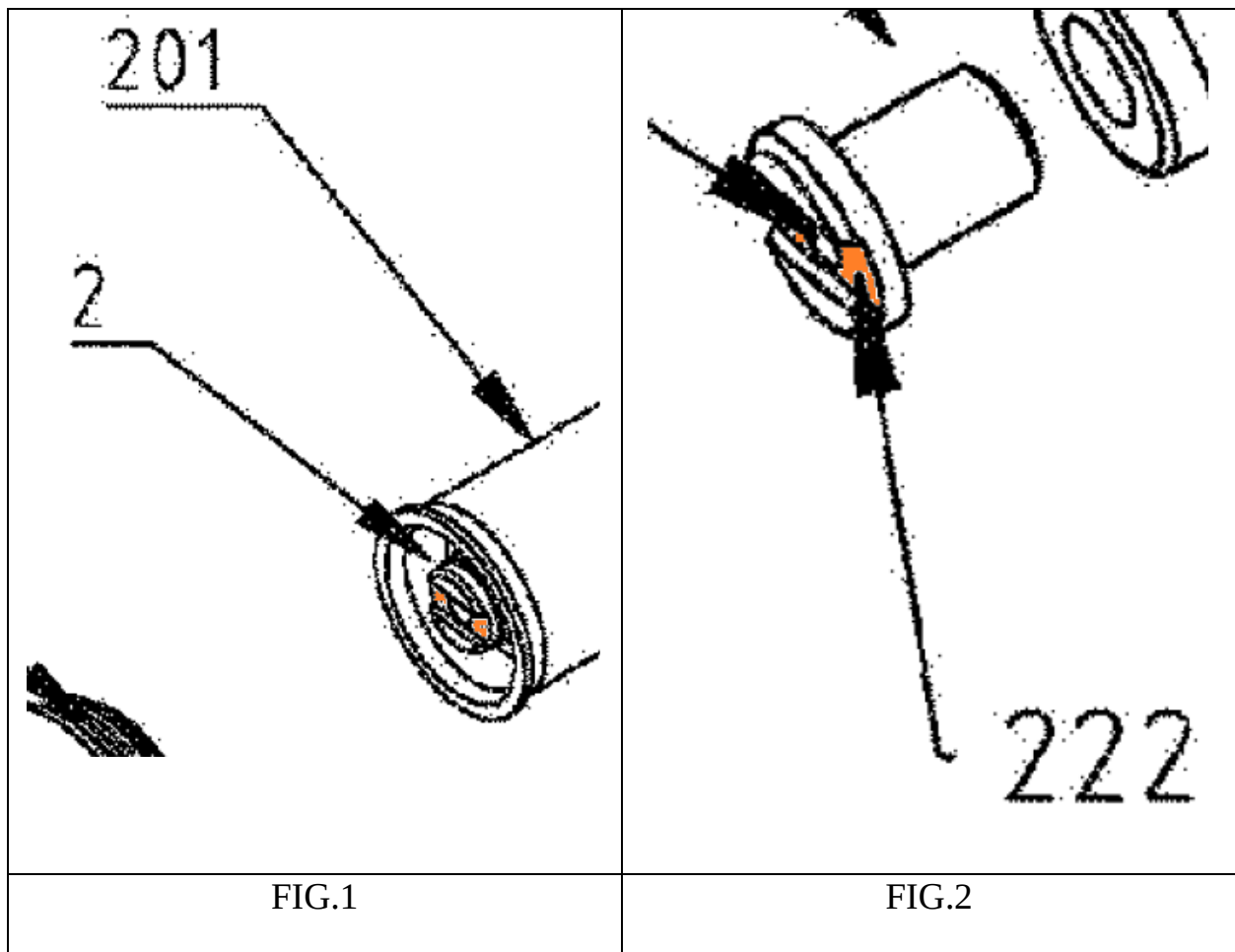


Figure 2

“The **second connection portion 2** and the **first connection portion 1** abut against each other to be connected, the **third connection portion 3** is detachably connected to the **first connection portion 1** by means of a screw thread.” (Ex.1001 col.4 ll.49-53.) **Second connection seat 21** serves “as a negative electrode electrically connected to a heating coil of the vaporizer 20,” and **second positive electrode 22** is

“electrically connected to the heating coil of the vaporizer 20.” (Ex.1001 col.4 l.62-col.5 l.2.)

FIGS. 1 and 2 show “an end surface of the second positive electrode 22 has a transversal groove 222 along a radial direction of the end surface for intercommunicating with the central through hole 221” of second positive electrode 22. (Ex.1001 col.5 ll.6-9.)



B. Prosecution History

The '744 Patent was filed on December 22, 2016, as a national phase entry of PCT/CN2014/093009 filed December 4, 2014, which claims priority to Chinese Patent Application No. 201420341430.5 filed June 25, 2014. An IDS was filed citing only two references and a written opinion of the PCT application. (Ex.1004, 114-115.)

An office action issued September 26, 2017, rejecting claims 1 and 2 as anticipated by Thompson (Ex.1008) and Liu '556 (Ex.1009), and claim 1 as anticipated by U.S. Patent Publication No. 2013/0319407. Claims 3-12 were deemed allowable if rewritten in independent form. (Ex.1004, 86-91.) The Examiner's reasons for allowance quoted the text of originally filed claims 3 and 4. (Ex.1004, 91-92.)

SHV responded on November 29, 2017, by amending claim 1 to include claims 2 and 3 and acquiescing to the rejections. (*Id.* 71-79.)

A notice of allowance issued on December 27, 2017, allowing claims 1 and 4-12. (*Id.* 60-64.) Claim 4 was renumbered as claim 2 and claim 5 remained as claim 5.

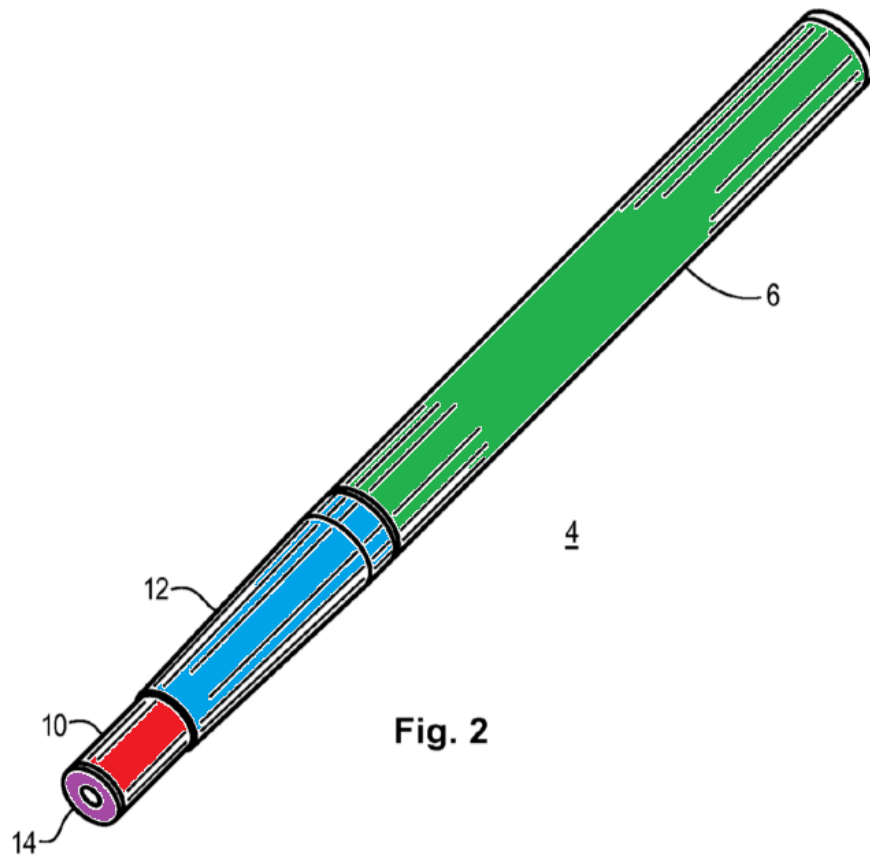
C. Overview Of The Prior Art

1. Newton '141 (Ex.1005)

Newton '141 (Ex.1005), was filed on December 13, 2013, was published June 18, 2015, and is prior art under at least 35 U.S.C. §102(a)(2) to the '744 Patent. Newton '141 was not cited during the '744 prosecution.

As demonstrated below, Newton '141 discloses every limitation of claims 1 and 2 of the '744 Patent except a transversal groove in the second positive electrode. However, as also demonstrated below, an electrode with a traversal groove was a common feature in the art (e.g., see Newton '191, Thompson, Liu '556, and Liu '527.)

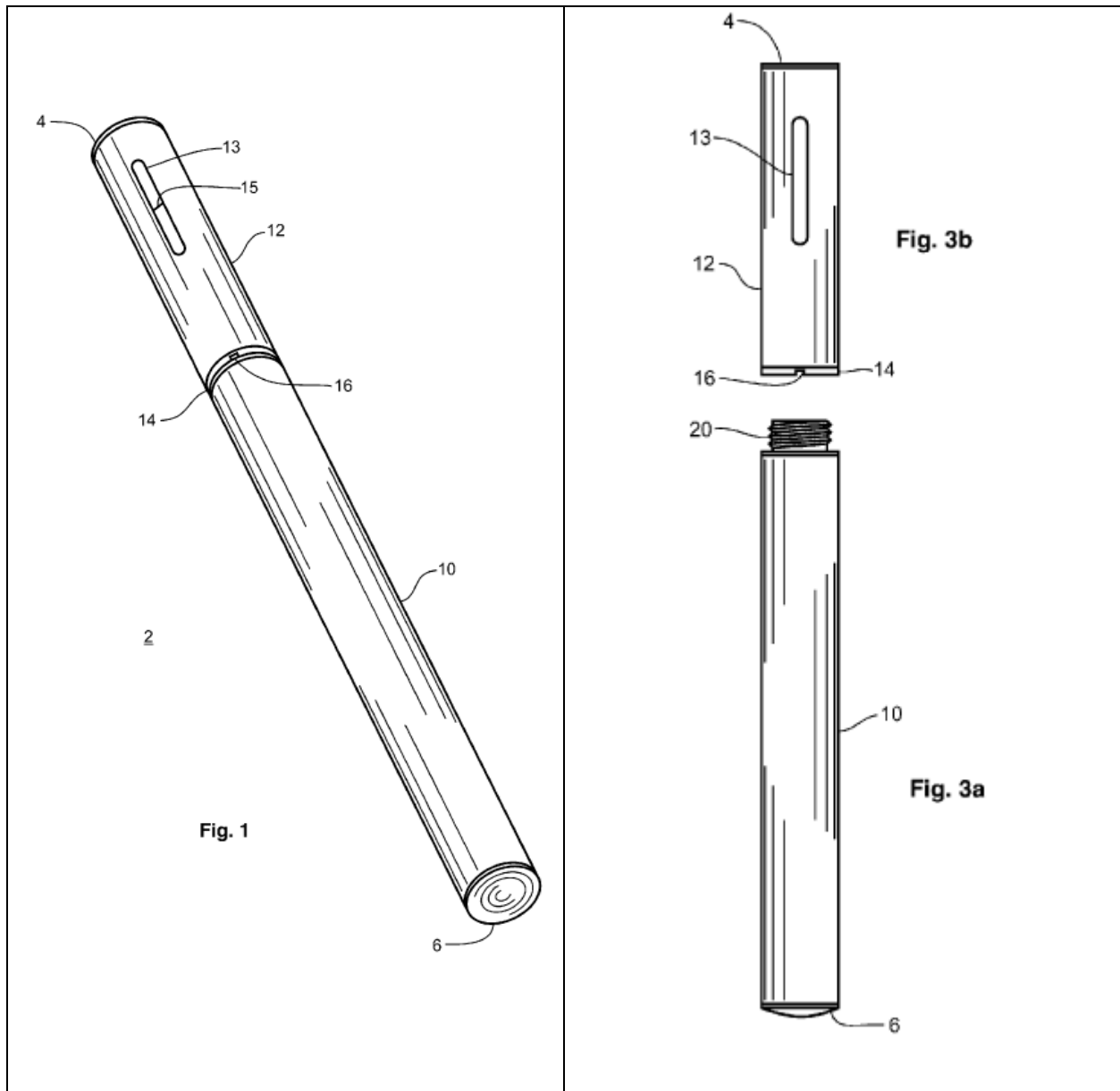
Newton '141 discloses an electronic cigarette 4 including “a connected large battery assembly 6, small atomizer assembly 10, and connector shroud 12.” (Ex.1005 ¶[0044], FIGS.2, 6-8; Ex.1002 ¶68.) A mouthpiece 14 “is presented at the exposed end of the small atomizer assembly 10.” (Ex.1005 ¶[0041], FIGS.2, 6-8; Ex.1002 ¶68.)



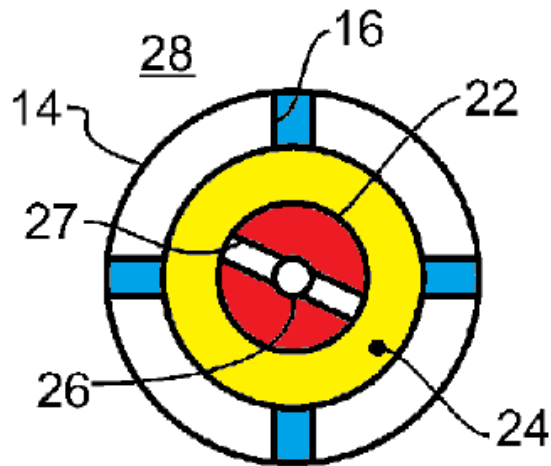
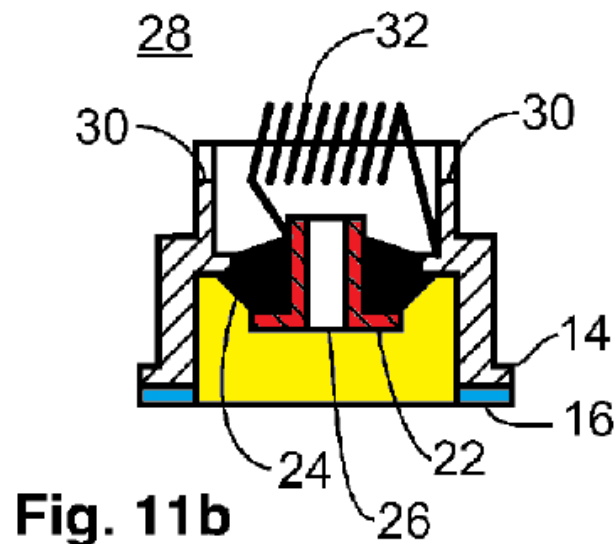
2. Newton '191 (Ex.1006)

Newton '191 (Ex.1006), was filed on June 28, 2011, was published September 5, 2013, and is prior art under 35 U.S.C. §§102(a)(1) and (2) to the '744 Patent. Newton '191 was not cited during the '744 prosecution.

Newton '191 discloses an electronic cigarette 2 including a power supply portion 10 having a battery 11 that couples to a cartridge portion 12 having an atomizer 32. (Ex.1006 ¶¶[0032], [0034], [0037], FIGS.1-4c; Ex.1002 ¶70.)



Newton '191 also discloses an electrode (electrical coupler 22) having an end surface with a transversal groove (air recesses 27) along a radial direction for intercommunicating with the central through-hole (air inlet), shown in annotated FIGS. 11a and 11b:

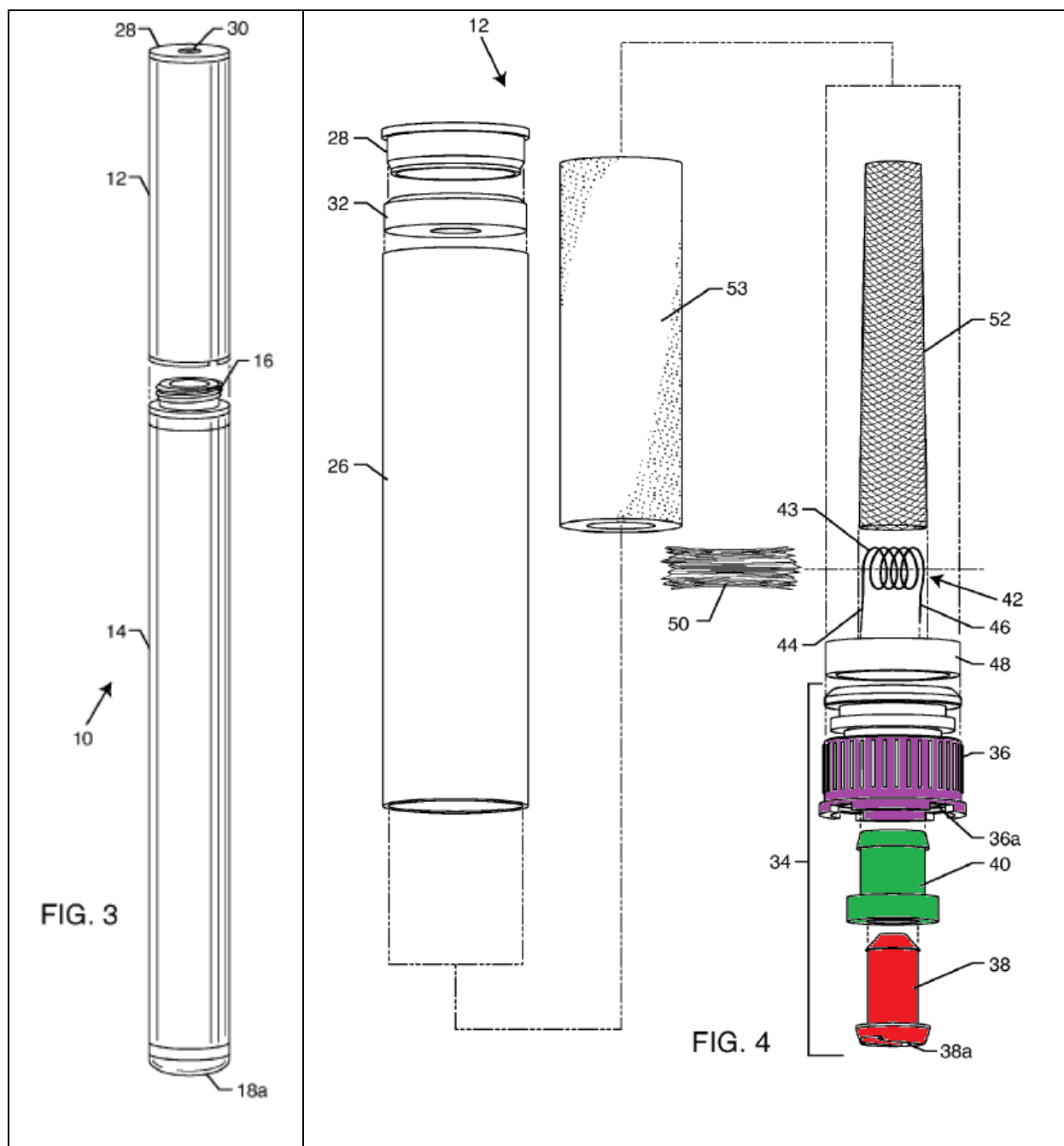


Newton '191 discusses that air enters cigarette 2 through vent openings, and that is a matter of design choice: "Air is inlet to the electronic cigarette 2 at the vent openings 16 located at the coupler 14. The air inlet openings 16 can be located elsewhere on the electronic cigarette 2, and is a matter of design choice." (Ex.1006 ¶[0033], FIG.4b; Ex.1002 ¶73.)

3. Thompson (Ex.1007)

Thompson (Ex.1007), was filed on January 30, 2012, was published August 1, 2013, and is prior art under 35 U.S.C. §§102(a)(1) and (2) to the '744 Patent. Thompson was cited by the Examiner in the sole office action to reject originally filed claims 1 and 2 of the '744 Patent as anticipated. PO acquiesced to these rejections.

Thompson discloses an electronic cigarette including a cartomizer and a battery base 14. (Ex.1007 ¶[0022], FIGS.3-4; Ex.1002 ¶75.) The cartomizer 12 includes an atomizing coil 42 electrically connected via positive and negative terminal leads 44, 46 to an outer terminal 36 and an inner terminal 38, with a silicone rubber gasket 40 concentrically disposed therebetween. (Ex.1007 ¶¶[0025]-[0027], FIGS.4, 9; Ex.1002 ¶75.) Air is inlet to the electronic cigarette at air intake vents 36a located at outer terminal 36 and flows via a transversal groove 38a in electrode 38. (Ex.1008 FIGS.3-9; Ex.1002 ¶75.)

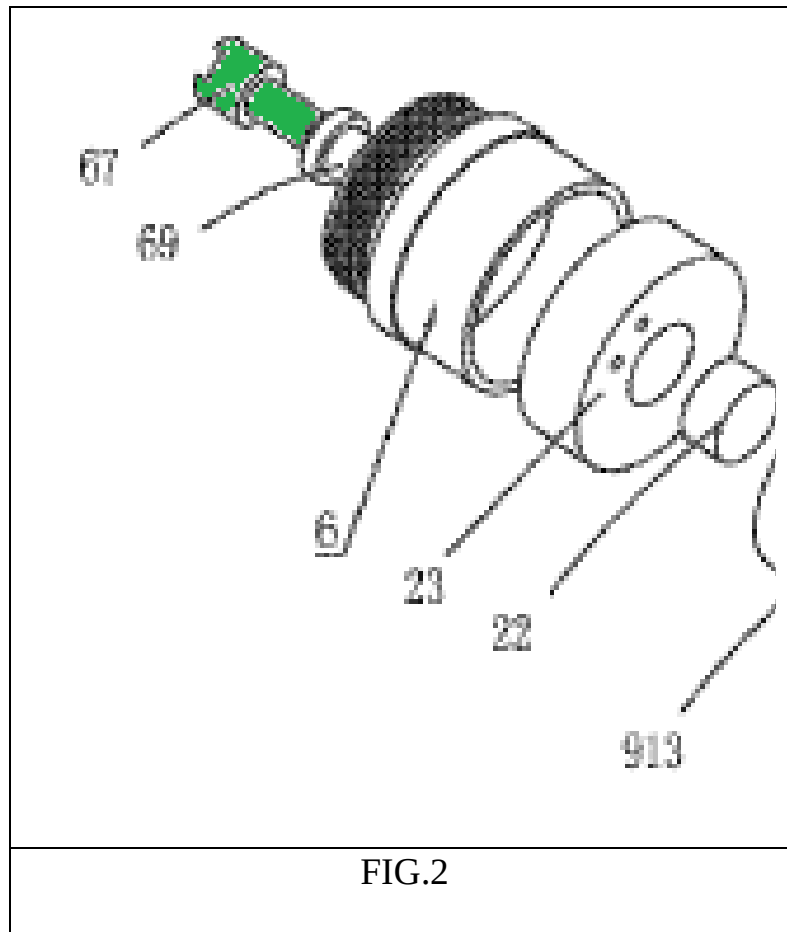


**4. State-Of-The-Art: Transversal
Groove In An End Surface Of An Electrode**

Like Newton '191 and Thompson, Liu '527 (Ex.1008) and Liu '556 (Ex.1009) evidence the state-of-the-art in electronic cigarettes.

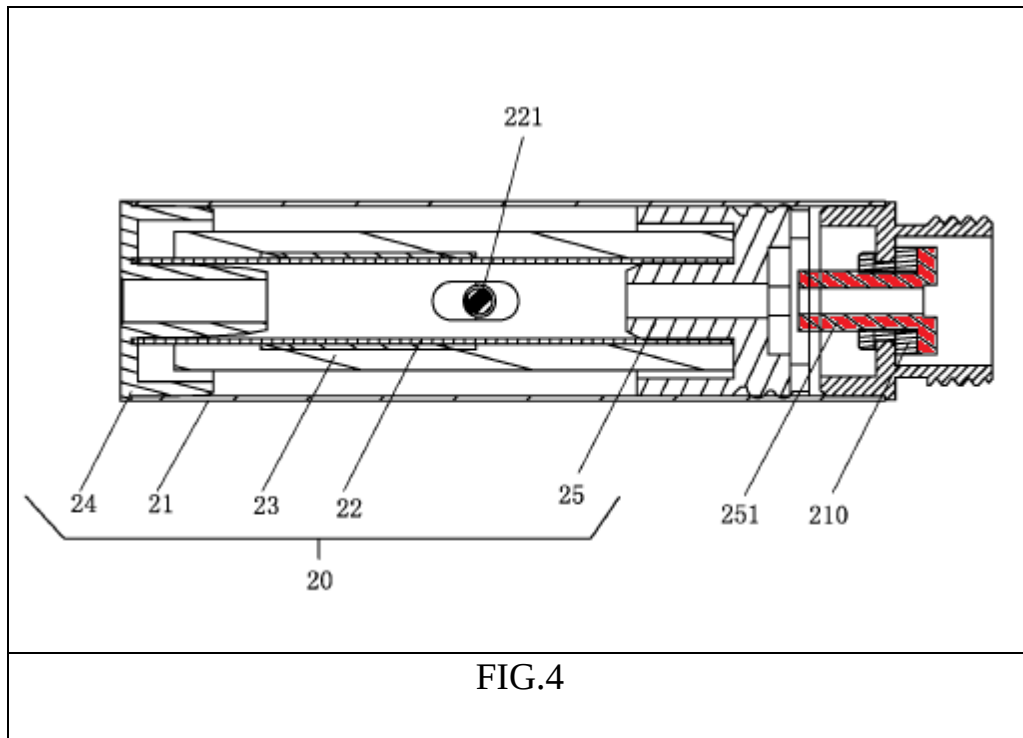
Liu '556 is a national phase application of a PCT application filed on August 31, 2012, was published March 6, 2014, and is prior art under 35 U.S.C. §§102(a)(1) and (2) to the '744 Patent. Liu '556 was cited by the Examiner in the sole office action to reject originally filed claims 1 and 2 of the '744 Patent. PO acquiesced to these rejections.

Liu '556 discloses an electronic cigarette 100 including a sucking rod 90 and a power rod 91 “connected by fastener, plug or screw.” (Ex.1009 ¶[0025], FIGS.1, 2; Ex.1002 ¶78.) Rods 90, 91 are screwed together by respective first and second connectors 5, 6. (Ex.1009 ¶[0025], FIGS.1, 2; Ex.1002 ¶78.) Connectors 5, 6 serve as electrodes with respective separate electrodes 57, 67 disposed therein. (Ex.1009 ¶[0035], [0037], FIGS.1, 2; Ex.1002 ¶78.) Electrode 67 is shown with a transversal groove at its end surface. (Ex.1009 FIG.2; Ex.1002 ¶78.)



Liu '527 is a national phase application of a PCT application filed on August 31, 2012, was published March 6, 2014, and is prior art under 35 U.S.C. §§102(a)(1) and (2) to the '744 Patent. Liu '527 was not cited during the '744 prosecution.

Liu '527 discloses an electronic cigarette with a battery stick 200, a vaporizer assembly (atomizer 20 and nozzle 10), and a mouth-piece 30. (Ex.1008 ¶[0028], FIGS.1-4; Ex.1002 ¶80.) Liu '527 discloses that second electrode's (251) end surface, facing right, has a transversal groove. (Ex.1002 ¶80.)



VII. CLAIM CONSTRUCTION

Petitioners have not proposed constructions for any claim term in this proceeding. Although Petitioners submit that multiple claim terms are indefinite and should thus be found invalid under 35 U.S.C. §112(b) in the Litigation, the indefiniteness issues are not addressed herein. The prior art relied on in this Petition meets all of the claim terms as best understood under any reasonable construction.

VIII. LEVEL OF ORDINARY SKILL IN THE ART

A person having ordinary skill in the art (“POSITA”) relating to the ’744 Patent at the time of the invention (*i.e.*, on or about the priority date of June 25, 2014) would have had a bachelor’s or graduate degree in electrical engineering,

physics, or mechanical engineering with course work in biomedical devices, and at least two years of industry experience working with electronic cigarettes or electronic aerosol-based drug delivery systems. (Ex.1002 ¶53.)

IX. PRIORITY DATE FOR THE '744 PATENT

The '744 Patent was filed as PCT/CN2014/093009 on December 4, 2014, which claimed priority to Chinese Application No. 2014 2 0341430 U, filed on June 25, 2014. June 25, 2014, is the earliest possible priority date.

X. GROUNDS FOR UNPATENTABILITY FOR EACH CLAIM

A. Ground 1: Claims 1 And 2 Are Obvious In View Of Newton '141 And Newton '191

1. The Combination Of Newton '141 And Newton '191

It would have been obvious to modify Newton '141 with the teaching of Newton '191 of using a transversal groove in the electrode of limitation [1i] as explained below. Newton '141 and Newton '191 are analogous art, filed by the same inventor, from the same field of endeavor (e-cigarettes) as the '744 Patent, and are both pertinent to multi-component e-cigarettes with connection structures among the components, including a battery stick, vaporizer, and casing tube of the vaporizer. (*Id.* ¶82.)

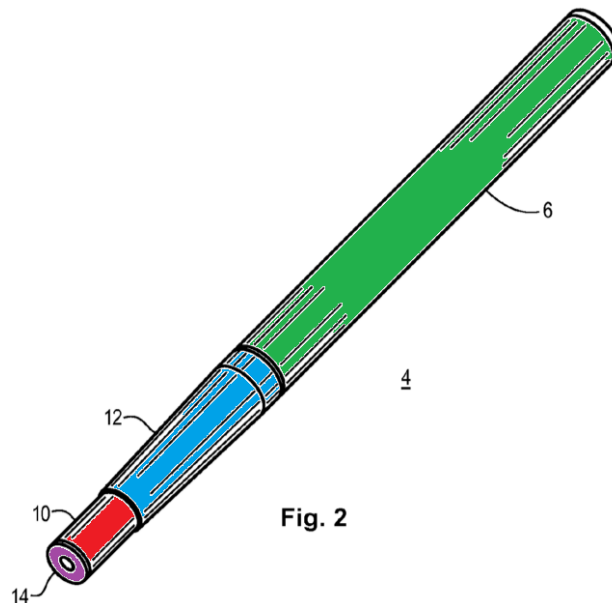
2. Independent Claim 1

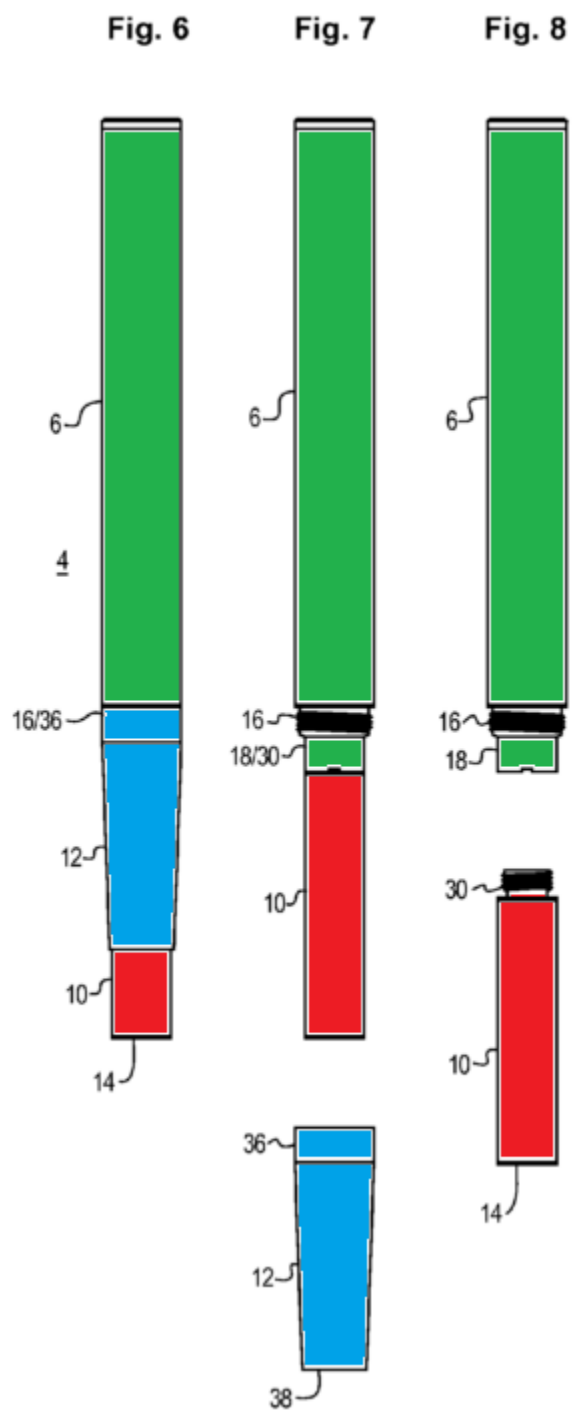
Claim 1 is obvious in view of Newton '141 and Newton '191.

a. **[1a] 1. An electronic cigarette comprising a battery stick, a vaporizer assembly and a mouth piece that are connected together, characterized in that**

The claimed e-cigarette has three connected parts: a battery stick, a vaporizer assembly (shown in red and blue below), and a mouthpiece. Newton '141 discloses all three parts, including “a connected large battery assembly 6, small atomizer assembly 10, and connector shroud 12, which result in an assembled electronic cigarette 4.” (Ex.1005 ¶[0044], FIGS.2, 6-8; Ex.1002 ¶84.) Newton '141 also “includes a mouthpiece 14, . . . at the exposed end of the small atomizer assembly 10.” (Ex.1005 ¶[0041], FIGS.2, 6-8; Ex.1002 ¶84.)

Newton '141 thus discloses all elements of limitation [1a], as further shown in FIGS. 2 and 6-8:

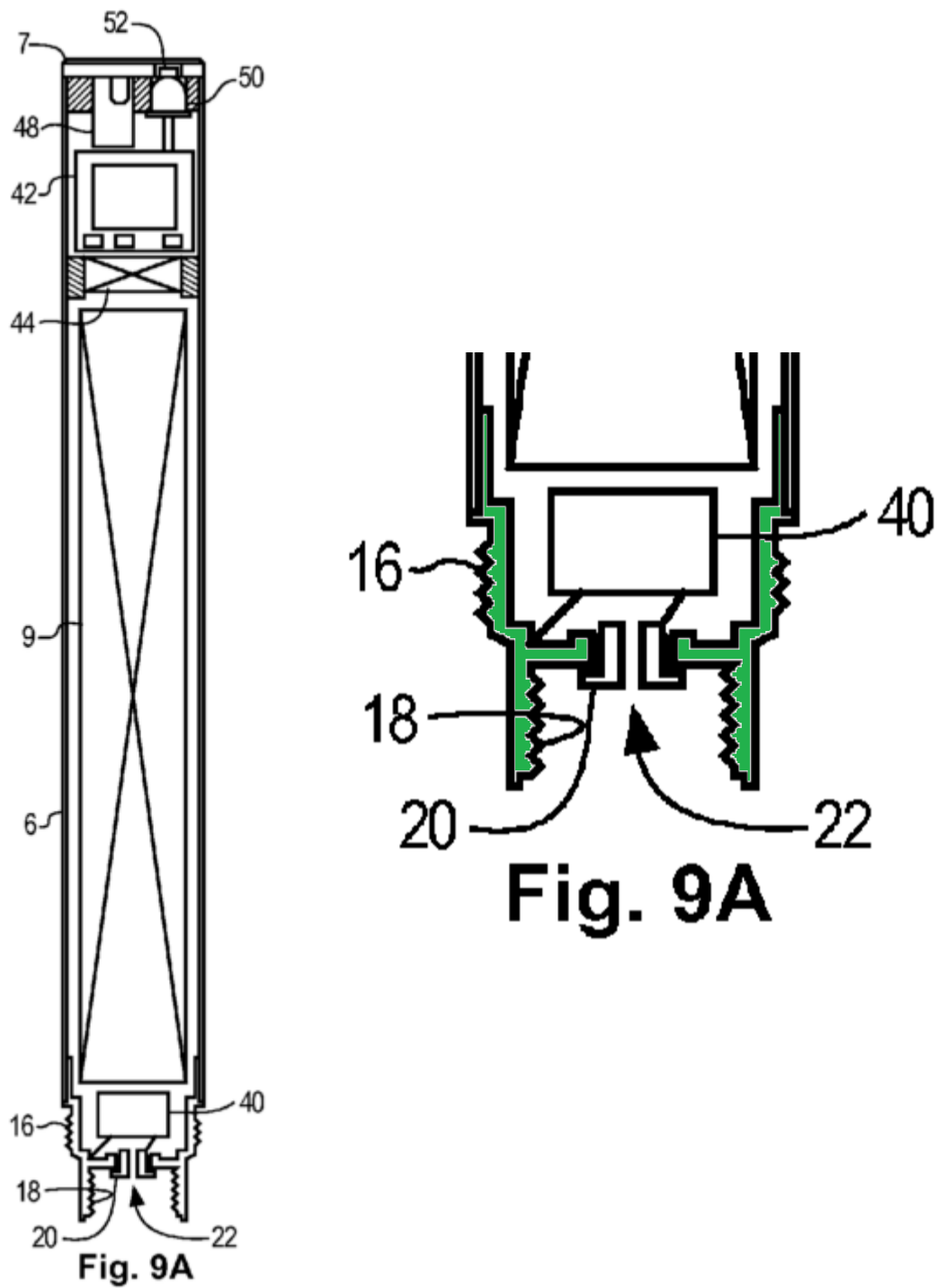




- b. [1b] the battery stick comprises a battery, a casing tube of the battery stick for sheathing the battery, and a first connection portion arranged at an end of the casing tube of the battery stick adjacent to the vaporizer assembly;**

Newton '141's battery stick includes a battery 9 and a casing tube 6 sheathing the battery 9. (Ex.1005 ¶¶[0042], [0046], FIG.9A; Ex.1002 ¶86.) A first connection portion comprises a threaded element including first and second connectors 16, 18, electrical contact terminal 20, and an insulation sleeve, as described further below in limitation [1g].

The threaded element (16/18) is shown in enlarged FIG.9A:



The connector shroud 12 has a shroud connector 36, which engages the first connector 16. . . . The small atomizer assembly 10 is connected to the second connector 18 of the large battery assembly 6

(Ex.1005 ¶[0045], FIG.9A; Ex.1002 ¶[87].)

Newton '141 thus discloses all elements of limitation [1b].

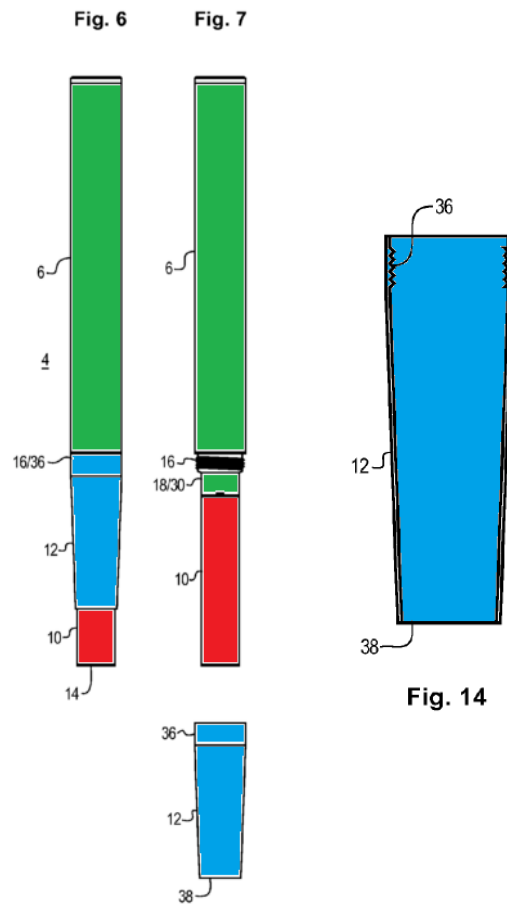
- c. [1c] the vaporizer assembly comprises a vaporizer, and a casing tube of the vaporizer for sheathing the vaporizer in an inner cavity of the casing tube;

As explained in limitation [1a], Newton '141 discloses a vaporizer assembly as atomizer assembly 10 and connector shroud 12. (Ex.1005 ¶[0044], FIGS.6, 7, 14; Ex.1002 ¶[89].) Newton '141 further states:

FIG. 14 is a cross section view of a connector shroud 12, which is tapered and hollow, open at both ends. A shroud connector 36, which is an internal machine thread, is located at one end of the connector shroud 12. The size of the connector shroud is selected to match the external size of the larger battery assembly 6 at the connector 36 end, and the size of the small atomizer assembly 10 at the other end.

(Ex.1005 ¶[0050], FIGS.6, 7, 14; Ex.1002 ¶[89].)

Connector shroud 12 is disposed around atomizer assembly 10 (vaporizer) as shown in FIGS. 6 and 7 and therefore is “a casing tube of the vaporizer for sheathing the vaporizer.” In other words, the inner cavity of casing tube 12 sheaths vaporizer 10.

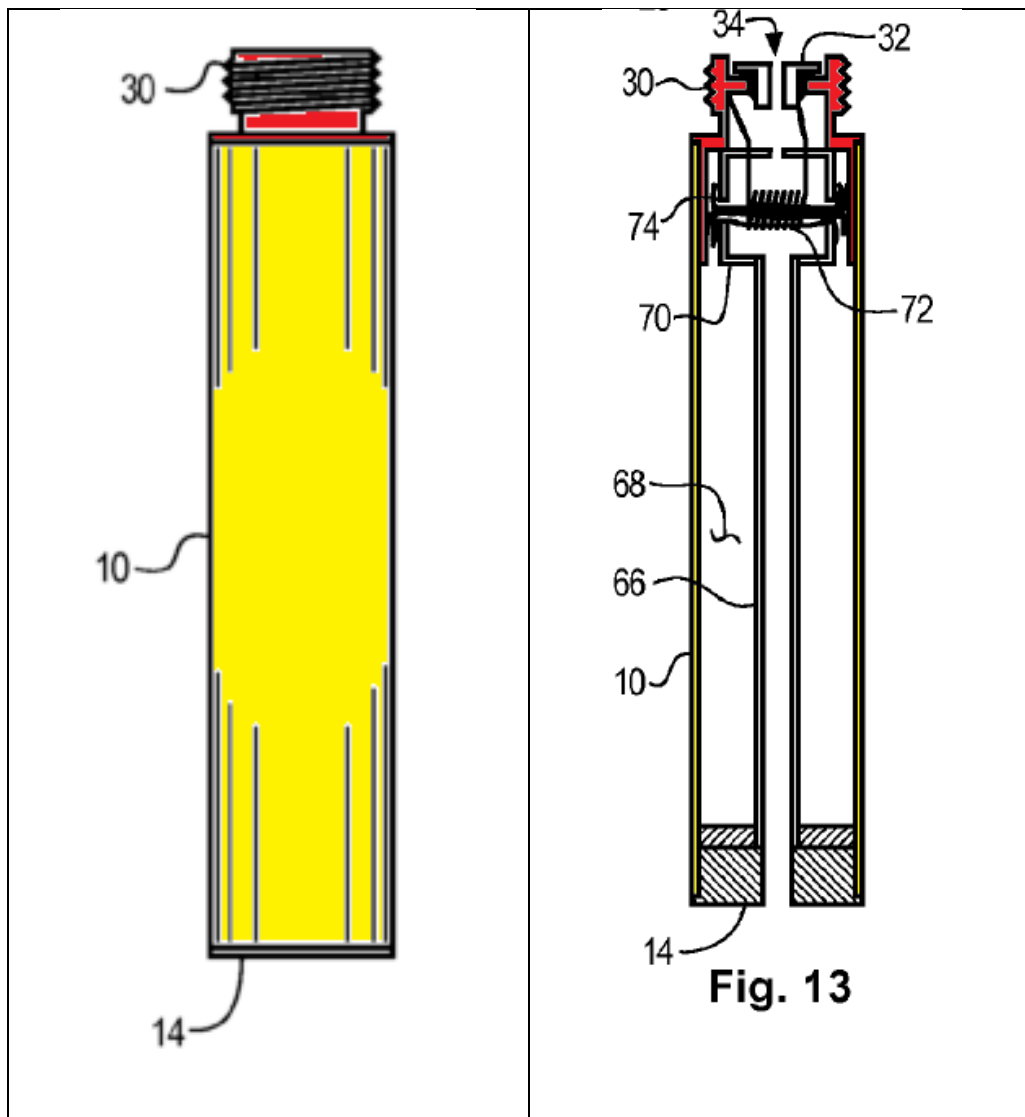


Limitation [1c] was rejected in view of the prior art during prosecution. Nonetheless, PO argued that the patentable distinction over the prior art related to the use of a vaporizer and a separate casing tube of the vaporizer. (Ex.1004, 78-79.) Newton '141, however, was not before the Examiner and discloses this alleged distinction of the '744 Patent—the vaporizer and casing tube of the vaporizer as two separate parts.

Thus, Newton '141 discloses all elements of limitation [1c].

- d. [1d] the vaporizer comprises a vaporizer tube body, and a second connection portion arranged at an end of the vaporizer tube body adjacent to the battery stick;

Newton '141's vaporizer 10 comprises a vaporizer tube body 10 (shown in yellow) and a second connection portion (part of which is shown in red) arranged at an end of vaporizer tube body 10 adjacent battery stick 6:



Portion of FIG.3	Portion of FIG.13

Newton '141 explains:

FIG. 3 also presents a small atomizer assembly 10, which includes a mouthpiece 14 at a first end and a small connector 30 at a second end. Note that the small connector 30 connects to the second connector 18 on the large battery assembly 6.

(Ex.1005 ¶[0042], FIGS.3, 13; Ex.1002 ¶93.)

The small atomizer assembly 10 is connected to the second connector 18 of the large battery assembly 6 as it engages the small connector 30 on the small atomizer assembly 10. This arrangement is more plainly visible in FIG. 8, where all of these connectors 16, 18, and 30 are exposed.

(Ex.1005 ¶[0045], FIGS.3, 8, 13; Ex.1002 ¶93.)

Newton '141's second connection portion includes a **small connector 30**, an electrical contact terminal 32, and an insulation sleeve therebetween as discussed below in limitation **[1f]**.

Thus, Newton '141 discloses all elements of limitation **[1d]**.

- e. **[1e] a third connection portion is arranged at an end of the casing tube of the vaporizer adjacent to the battery stick;**

Newton '141 discloses all elements of limitation **[1e]**, including a third connection portion comprising a shroud connector 36 arranged at an end of the casing tube 12 of the vaporizer, adjacent to battery stick assembly 6. (Ex.1005 ¶[0042], FIGS.7, 14; Ex.1002 ¶96.)

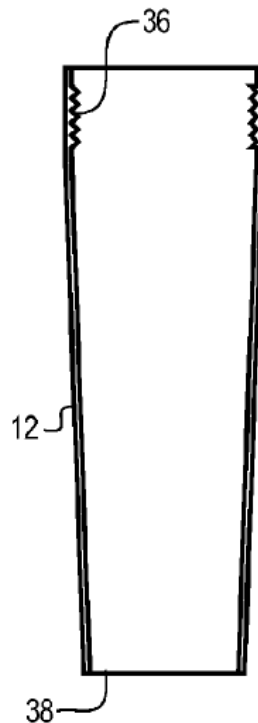


Fig. 14

The connection between the large battery assembly 6 and the connector shroud 12 is accomplished with the first connector 16 on the larger battery assembly 6 and a shroud connector 36 on the connector

shroud 12. This is more clearly pictured in FIG. 7, where the connector shroud 12 has been removed from the large battery assembly 6.

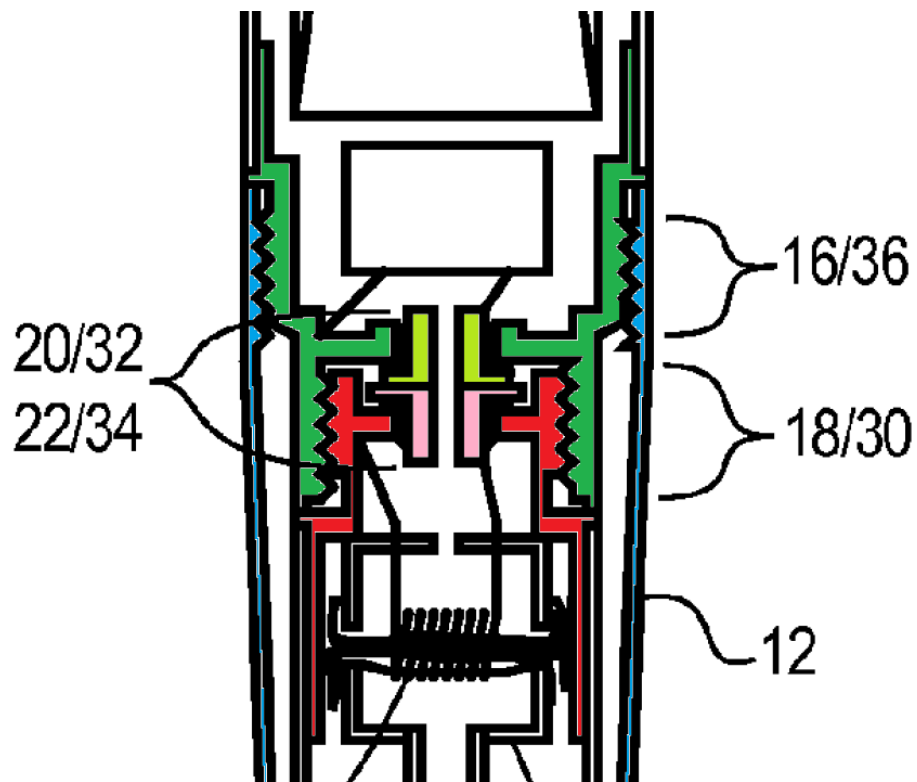
(Ex.1005 ¶[0044], FIGS.7, 14; Ex.1002 ¶96.)

- f. **[1f] the second connection portion and the first connection portion abut against each other to be connected, the third connection portion is detachably connected to the first connection portion by means of a screw thread;**

All elements of this limitation are disclosed in Newton '141, as explained in subparts **[1f](i)-(ii)** below.

- i. **“the second connection portion and the first connection portion abut against each other to be connected,”**

Newton '141 discloses all elements of limitation **[1f](i)**, including vaporizer 10 with **second connection portion (30/32/insulation sleeve)**, and battery stick 6 with **first connection portion (16/18/20/insulation sleeve)**. **Second connection portion 30** is threadedly connected with **first connection portion 18** such that the portions abut one another when connected:



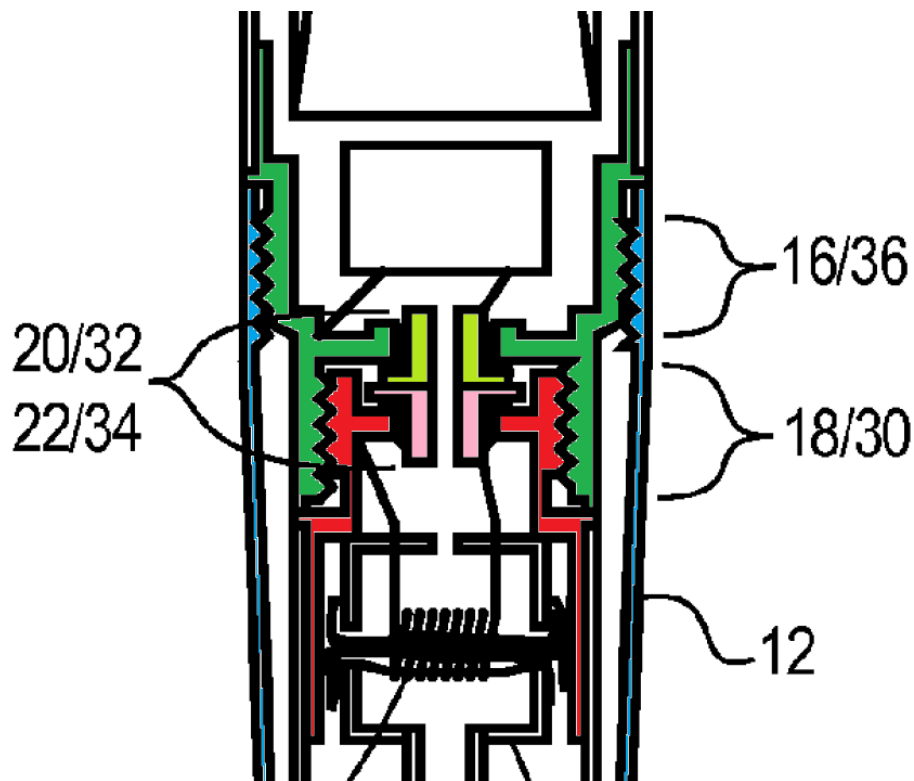
Portion of FIG.15

Note that the **second connector 18** of the larger battery assembly 6 and the **small connector 30** of the small atomizer assembly 10 are engaged together **18/30**. This connection facilitates the electrical connection of the two central contact terminals **20/32**, respectively, and also facilitates the pneumatic port coupling 22/34.

(Ex.1005 ¶[0051], FIGS.8, 15; Ex.1002 ¶98.)

- ii. “the third connection portion is detachably connected to the first connection portion by means of a screw thread;”

Newton '141 discloses all elements of limitation [1f](ii) including, third connection portion 36, which is an internal machine thread, connected to first connection portion (16/18/20/insulation sleeve):



Portion of FIG.15

The connection between the large battery assembly 6 and the connector shroud 12 is accomplished with the first connector 16 on the larger battery assembly 6 and a shroud connector 36 on the connector shroud 12.

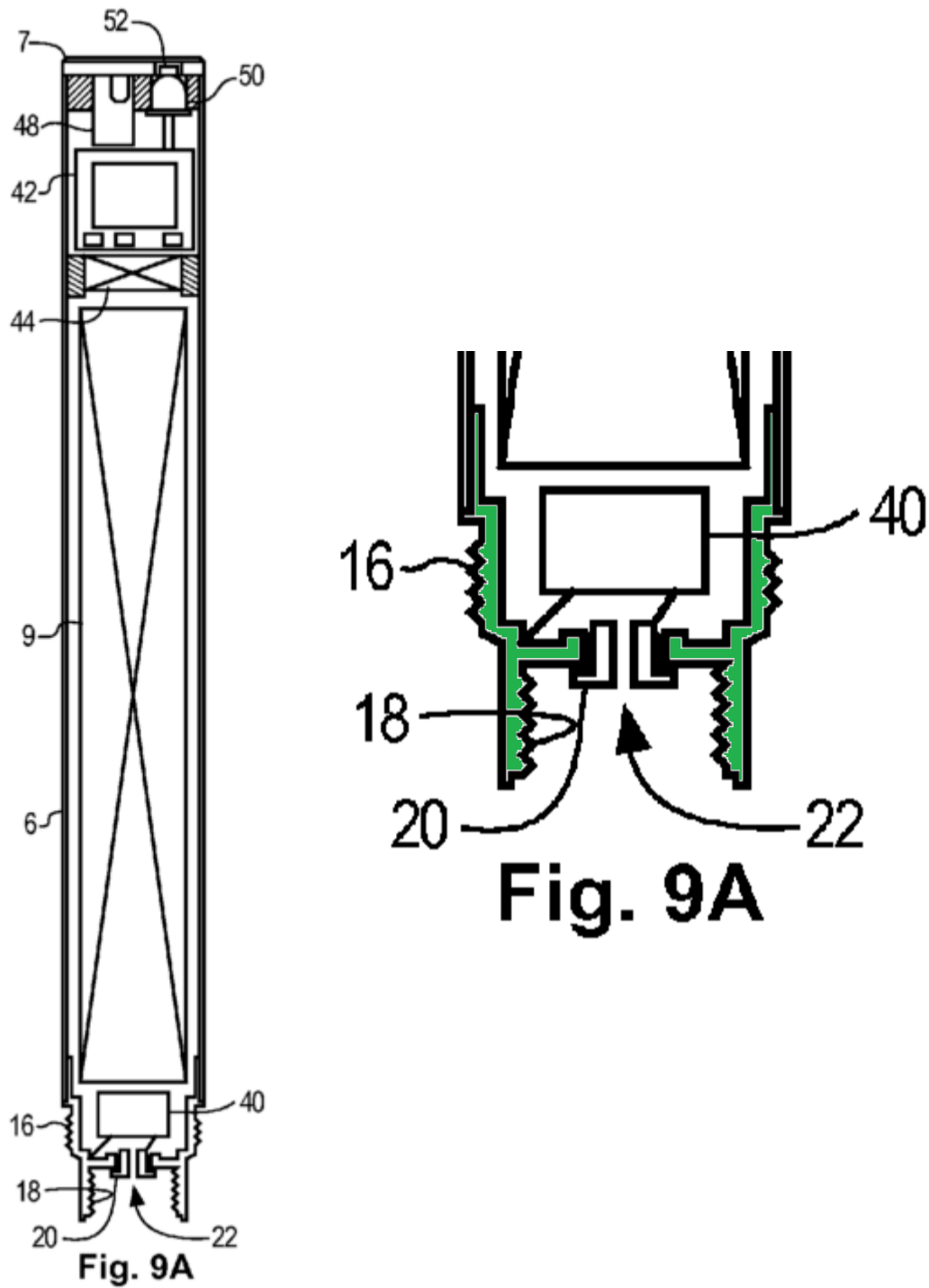
(Ex.1005 ¶[0044], FIG.15; Ex.1002 ¶99.) “The first connector 16 is an external machine tread [sic] at one end of the large battery assembly 6.” (Ex.1005 ¶[0046], FIG.15; Ex.1002 ¶99.) “A shroud connector 36, which is an internal machine thread, is located at one end of the connector shroud 12.” (Ex.1005 ¶[0050], FIG.15; Ex.1002 ¶99.)

- g. **[1g] the first connection portion comprises a first connection seat having an outer thread and serving as a negative electrode electrically connected to a negative electrode of the battery, a first positive electrode arranged at a center of the first connection seat and electrically connected to a positive electrode of the battery, and a first insulation sleeve placed between the first positive electrode and the first connection seat;**

Newton ’141 discloses, inherently discloses, or renders obvious, or renders obvious in combination with Newton’191, limitation **[1g]** as explained in subparts **[1g](i)-(iv)** below. Battery stick 6 of Newton ’141 includes a first connection portion through threaded element 16/18, electrical contact terminal 20, and an insulation sleeve.

- i. **“the first connection portion comprises a first connection seat having an outer thread”**

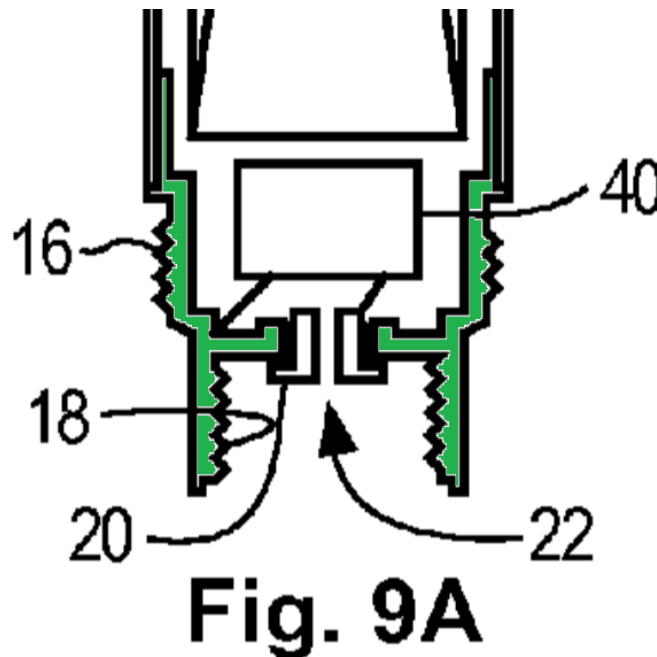
Battery stick 6 includes a first connection seat as a threaded element having first and second connectors 16, 18. (Ex.1005 ¶¶[0042], [0046], FIG.9A; Ex.1002 ¶101.) Threaded element 16/18 includes an outer thread at first connector 16:



“The large battery assembly 6 includes dual connectors, including a first, large, connector 16, and a second, small, connector 18.” (Ex.1005 ¶[0042], FIG.9A; Ex.1002 ¶101.) “The first connector 16 is an external machine tread [sic] at one end of the large battery assembly 6.” (Ex.1005 ¶[0046], FIG.9A; Ex.1002 ¶101.)

ii. **“the first connection portion comprises . . . a first . . . electrode arranged at a center of the first connection seat”**

Battery stick 6 includes a first electrode as an electrical contact terminal 20, which is arranged at a center of first connection seat 16/18:



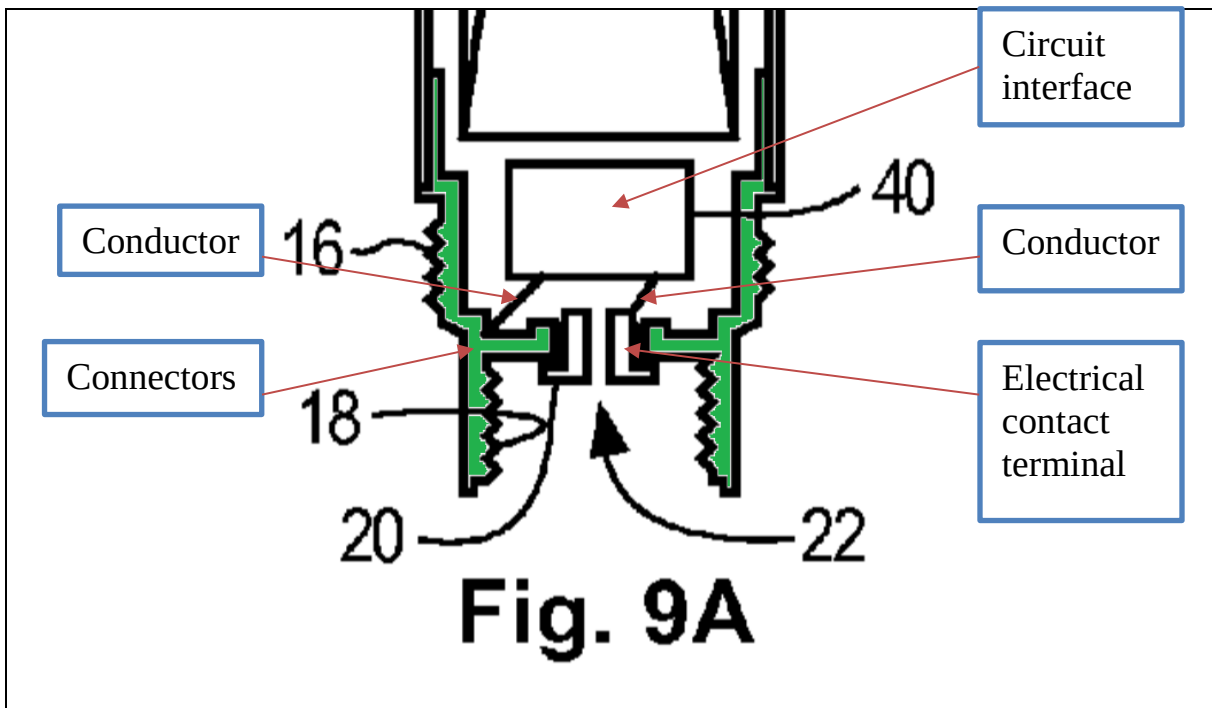
“At the center of the connector end is central electric contact terminal 20, which has a pneumatic port 22 formed there through.” (Ex.1005 ¶[0046], FIG.15; Ex.1002 ¶102.)

- iii. **“first connection seat . . . serving as a negative electrode electrically connected to a negative electrode of the battery” / “a first positive electrode . . . electrically connected to a positive electrode of the battery”**

Newton '141 discloses that a circuit interface 40 is electrically connected via conductors (*see* annotated FIG.9A below) to both threaded element 16/18 and electrical contact terminal 20, which are provided with power by battery 9:

A circuit interface 40 connects two conductors, one to the central electrical contact 20 and one to the connectors 16, 18. In this manner, the central electrical contact terminal 20 is shared with both the small and large connectors to provide a common electrical interface. . . . The pneumatic sensor 44 detects the draw, which causes a control circuit 42 to activate the atomizer electric power.

(Ex.1005 ¶[0046], FIGS.9A, 15; Ex.1002 ¶103.)



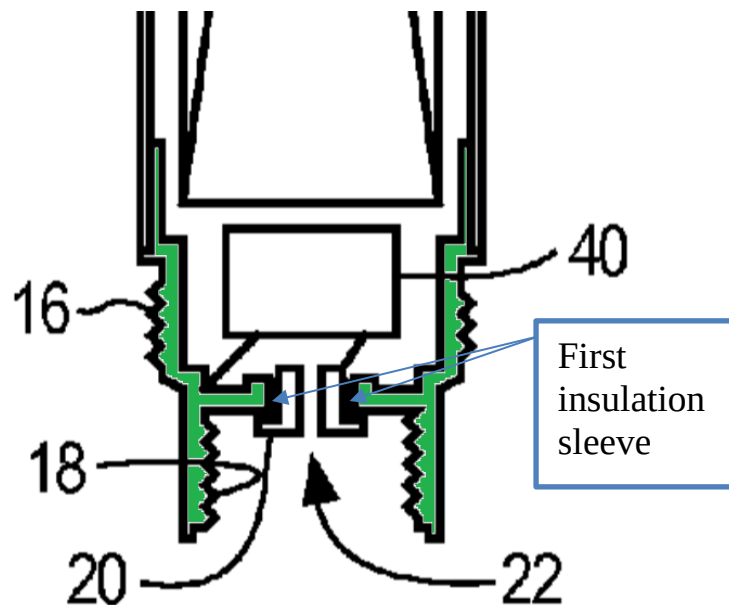
Accordingly, Newton '141 discloses first connection seat 16/18 serving as an electrode electrically connected to an electrode of battery 9, and a first electrode 20 electrically connected to an electrode of battery 9. While Newton '141 does not mention the specific polarities of the electrical connections, battery polarities can only be negative and positive. (Ex.1002 ¶104.) Thus, it is inherently disclosed and alternatively would have at least been obvious to a POSITA to make first connection seat 16/18 serve as a negative (or positive) electrode connected to a negative (or positive) electrode of the battery 9, and to make first electrode 20 a positive (or negative) electrode electrically connected to a positive (or negative) electrode of the

battery 9. It would be a matter of design choice to use the polarities of the battery electrodes in either order (negative/positive or positive/negative) for powering the circuit. (*Id.*)

Further, connecting the first connection seat (serving as an electrode) to the negative electrode of the battery and connecting the other centrally arranged electrode to the positive electrode of the battery simply involves the use of known electrical battery connection techniques provided in battery-operated electronic devices in the same way to make electrical connection. (*Id.* ¶105.) A POSITA would have applied a known technique of connecting negative and positive battery electrodes to complete a circuit in such battery-operated devices to yield predictable results of powering the devices via the battery. (*Id.*); *KSR Int’l Co. v. Teleflex Inc.*, 550 U.S. 398, 417 (2007).

iv. “the first connection portion comprises . . . a first insulation sleeve placed between the first positive electrode and the first connection seat;”

Newton ’141 discloses, or inherently discloses, a first insulation sleeve between first positive electrode 20 and first connection seat 16/18. The insulation sleeve is shown in FIG.9A as the thick lines separating (and insulating) electrical contact terminal 20 from threaded element 16/18, which lines are illustrated as relatively thicker than lines used to represent other elements in the drawing:



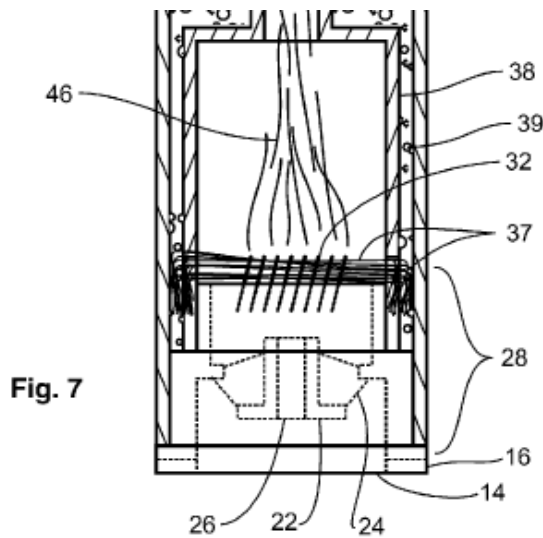
Portion of FIG.9A

The insulation sleeve shown is also inherent given that both threaded element 16/18 and electrical contact terminal 20 of Newton '141 are connected by respective conductors to circuit interface 40 and operate as electrodes, and they therefore must be insulated from one another to avoid a short circuit and enable completion of the circuit with the battery. (Ex.1002 ¶106.) The insulator is shown as a “sleeve” since it encircles electrical contact terminal 20 as shown in cross section in FIG.9A. (*Id.*)

Furthermore, it would have been obvious to a POSITA in view of Newton '141 to provide an insulation sleeve since both threaded element 16/18 and electrical contact terminal 20 are connected by respective conductors to circuit interface 40 and operate as electrodes, and they must be insulated from one another to avoid a

short circuit. (*Id.* ¶107.) Use of an insulator sleeve would involve use of well-known insulators at the location of the relatively thick lines separating (and insulating) the electrical contact terminal 20 from threaded element 16/18 and would be obvious to a POSITA to yield the result of avoiding a short circuit. (*Id.*)

The use of an insulation sleeve between first positive electrode and first connection seat is also rendered obvious by Newton '141 in view of Newton '191. As shown in FIGS. 7 and 11b of Newton '191, a metal atomizer assembly 28 includes an atomizer 32 electrically connected at each end respectively to a connection seat 30 and electrical coupler electrode 22, which is supported by an *insulative* support (sleeve) 24:



Portion of FIG.7

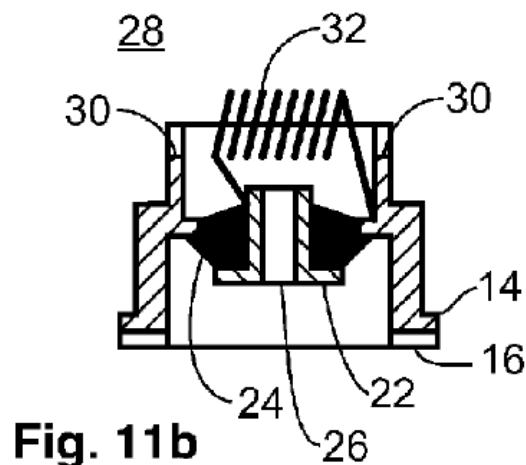


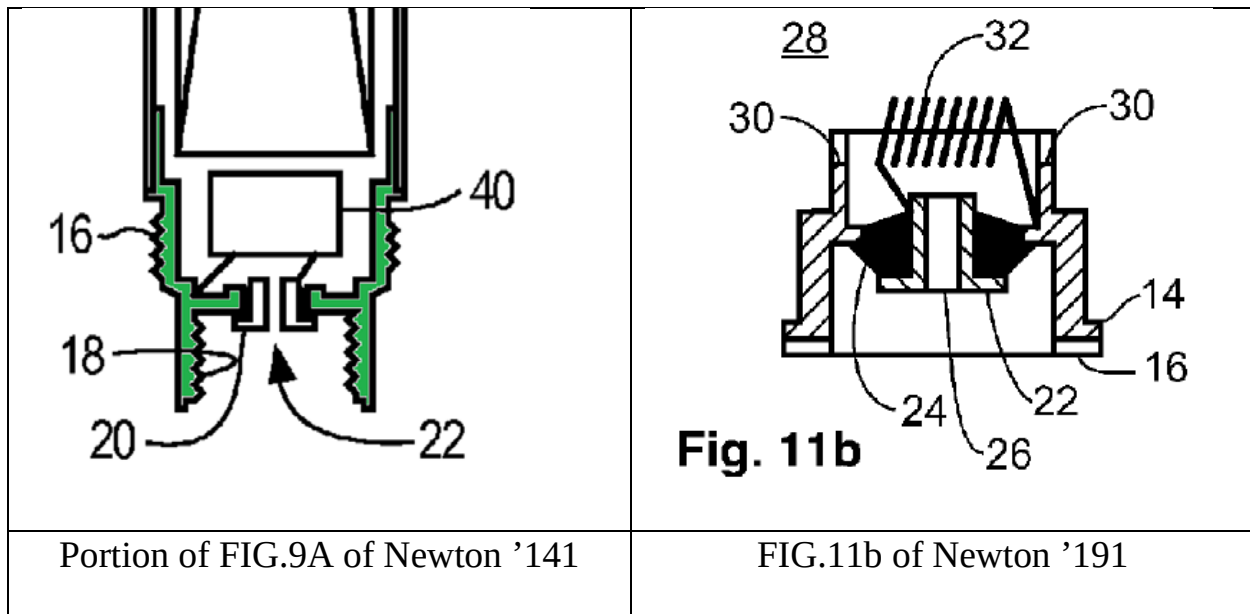
FIG.11b

The atomizer assembly 28 is machined from a suitable metal and includes the mechanical couple 14, the **electrical coupler 22**, which is supported by an **insulative support 24**, and which has the air inlet port 26 formed therethrough. . . .

(Ex.1006 ¶[0040], FIGS.7, 11b, 15; Ex.1002 ¶108 (emphasis added).)

It would have been obvious to a POSITA to use an insulation sleeve between the first positive electrode and first connection seat in Newton '141 based on the teachings of Newton '191 for multiple reasons. Both Newton '141 and Newton '191 are disclosures by the same inventor in the same field of e-cigarettes dealing with the same purpose of connecting an atomizer to a battery. Both require insulation of positive/negative electrodes from one another to prevent short circuiting during operation of the circuit. (Ex.1002 ¶109.) Further, Newton '191 expressly teaches use of a supporting insulation sleeve to insulate the electrodes of coupler 22 and connection seat 30. (*Id.*) Thus, it would have been obvious to use an insulation sleeve between the first positive electrode and first connection seat in Newton '141 since it would involve combining well-known prior art elements (insulators) according to known methods to yield predictable results and needed insulation. (*Id.*) While Newton '191's disclosure relates to the atomizer of its e-cigarette, and the first positive electrode and the first connection seat in Newton '141 are on battery stick 6 of its e-cigarette, a POSITA would be motivated to employ an insulator since the

electrical operation of the seats, electrodes, and insulators with respect to one another are the same irrespective of whether the arrangement is on an atomizer or a battery stick. (*Id.*) Based on the described electrical operation of Newton '141, including the operation of its electrical contact terminal 20 and threaded element 16/18, and the relatively thicker illustrated lines, a POSITA would have been motivated to provide an insulation sleeve (like insulative support 24 of Newton '191) at the locale of the thicker lines to engage/support electrical contact terminal 20 and insulate it from electrical contact with threaded element 16/18 to prevent a short circuit and enable operation. (*Id.*)



Thus, Newton '141 itself discloses, inherently discloses, or renders obvious, or renders obvious in combination with Newton '191, all elements of limitations **[1g](i)-(iv)**.

- h. [1h] the second connection portion comprises a second connection seat serving as a negative electrode electrically connected to a heating coil of the vaporizer, a second positive electrode arranged at a center of the second connection seat and electrically connected to the heating coil of the vaporizer, and a second insulation sleeve placed between the second positive electrode and the second connection seat;**

Newton '141 discloses, inherently discloses, or renders obvious, or renders obvious in combination with Newton'191, limitation **[1h]** as explained in subparts **[1h](i)-(iv)** below. As explained above in limitation **[1d]**, vaporizer 10 of Newton '141 includes a second connection portion met by small connector 30, electrical contact terminal 32, and an insulation sleeve.

- i. “the second connection portion comprises a second connection seat”**

Newton '141 discloses limitation **[1h](i)**.

Vaporizer 10 includes a second connection seat as **small connector 30**:

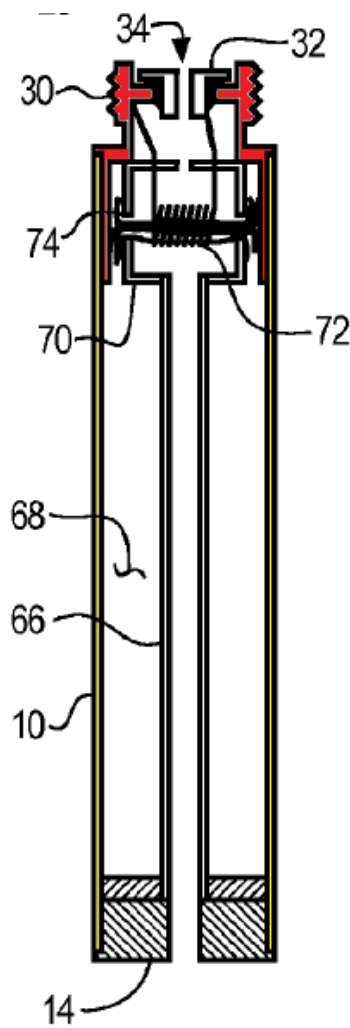


Fig. 13

Portion of FIG.13

FIG. 3 also presents a small atomizer assembly 10, which includes a mouthpiece 14 at a first end and a small connector 30 at a second end. Note that the small connector 30 connects to the second connector 18 on the large battery assembly 6.

(Ex.1005 ¶[0042], FIGS.3, 13; Ex.1002 ¶113.)

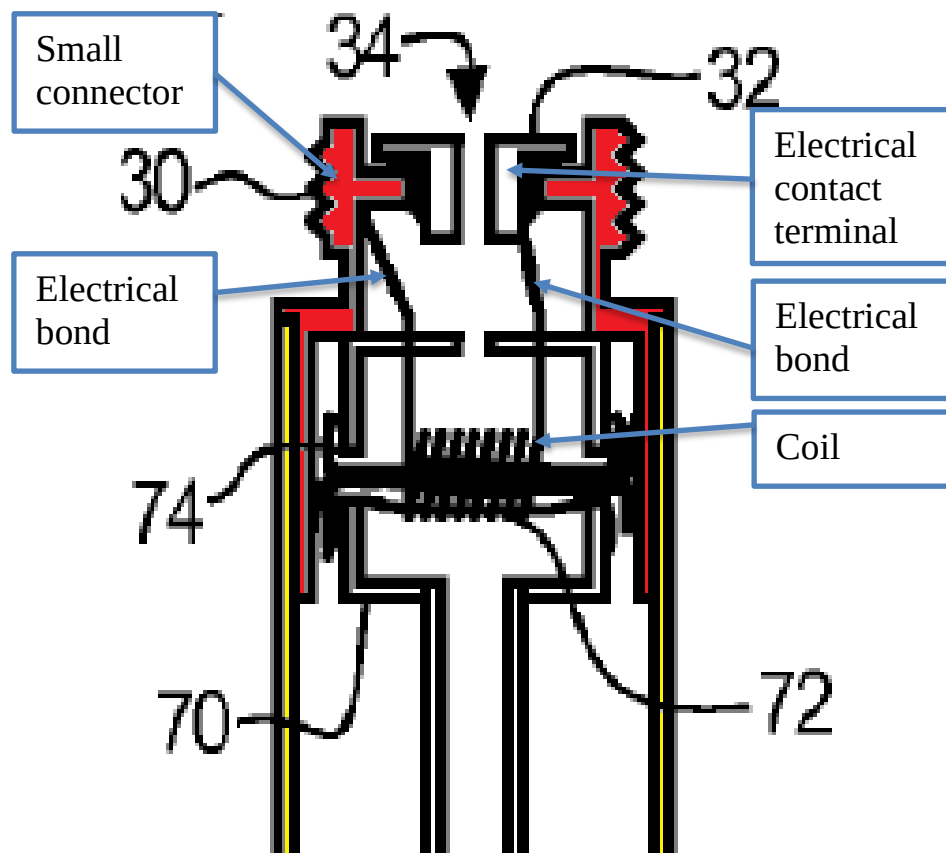
- ii. **“the second connection portion comprises . . . a second . . . electrode arranged at a center of the second connection seat”**

Vaporizer 10 includes a second electrode as an electrical contact terminal 32, which is arranged at a center of small connector 30: “Central to the small connector is an electrical contact terminal 32, which as a pneumatic port 34 formed there through.” (Ex.1005 ¶[0049], FIGS.3, 13; Ex.1002 ¶114.)

Thus, Newton ’141 discloses all elements of this limitation.

- iii. **“second connection seat serving as a negative electrode electrically connected to a heating coil of the vaporizer,” / “a second positive electrode . . . electrically connected to the heating coil of the vaporizer,”**

Newton ’141 discloses all elements of this limitation and explains how both its second connection seat 30 and its second electrode 32 electrically connect to a heating coil 72 of the vaporizer 10: “The atomizer 72 is a coil of nickel-chromium wire that is electrically bonded to both the electrical contact terminal 32 and the small connector 30.” (Ex.1005 ¶[0049], FIG.13; Ex.1002 ¶116.)



Portion of FIG.13

Newton '141 also explains how second connection seat 30 is electrically connected to first connection seat 16/18:

Note that the second connector 18 of the larger battery assembly 6 and the small connector 30 of the small atomizer assembly 10 are engaged together 18/30. This connection facilitates the electrical connection of the two central contact terminals 20/32, respectively, and also facilitates the pneumatic port coupling 22/34.

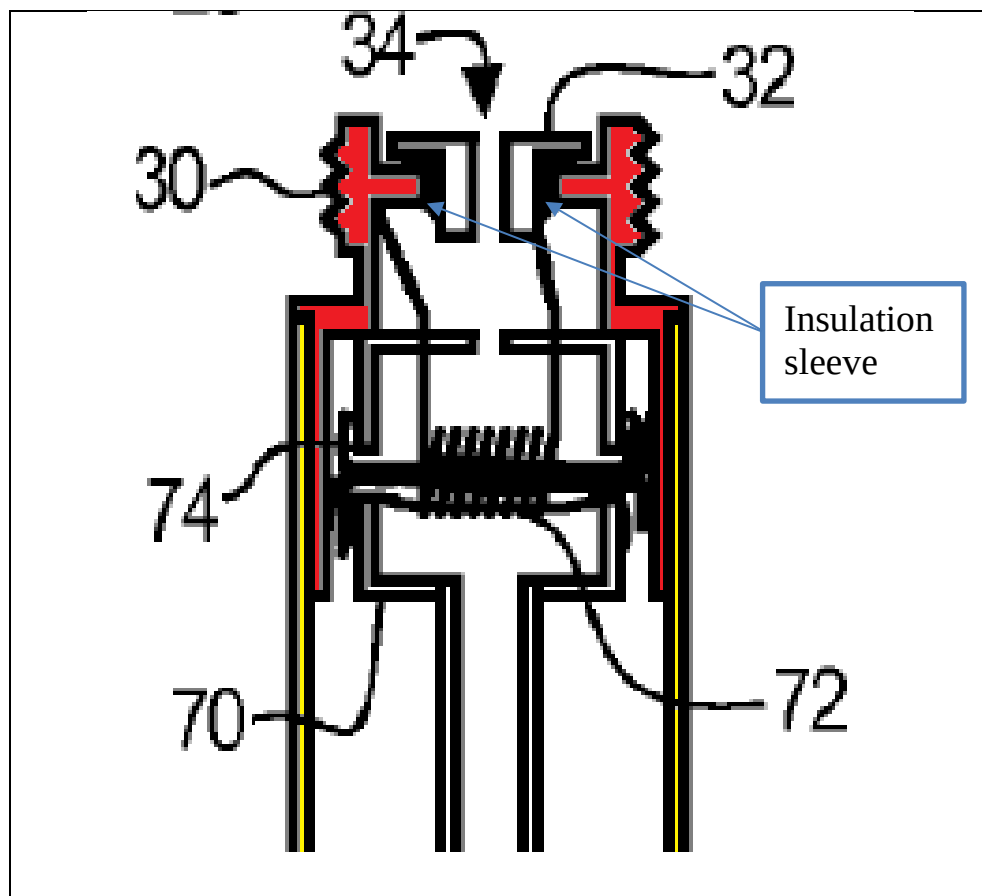
(Ex.1005 ¶[0051], FIGS.9A, 15; Ex.1002 ¶117.)

Although Newton '141 does not mention the specific polarities of the electrical connections, battery polarities can only be negative and positive. (Ex.1002 ¶118.) Thus, as explained above in limitation **[1g](iii)**, this feature is inherently disclosed in Newton '141 and, alternatively, it would have been obvious to a POSITA to make second connection seat 30 (which is connected to coil 72) serve as a negative (or positive) electrode, particularly since it is connected to first connection seat 16/18 as a negative (or positive) electrode per the discussion above in limitation **[1g](iii)**. (*Id.* ¶118.) Likewise, it would have been obvious to a POSITA to make second electrode 32 (which is also connected to coil 72) serve a positive (or negative) electrode, particularly since it is connected to first electrode 20 as a positive (or negative) electrode per the discussion above in limitation **[1g](iii)**. (*Id.* ¶118.) It would be a matter of routine and obvious design choice to use the polarities of the battery electrodes in either order (negative/positive or positive/negative) for powering the circuit. (*Id.* ¶118.)

Thus, Newton '141 meets all elements of this limitation, either inherently or through obviousness.

- iv. **“the second connection portion comprises . . . a second insulation sleeve placed between the second positive electrode and the second connection seat;”**

Newton '141 discloses, or inherently discloses, or renders obvious all elements of this limitation, including, a second insulation sleeve between second positive electrode 32 and second connection seat 30. The insulation sleeve is shown in FIG.13 as the thick lines separating (and insulating) electrical contact terminal 32 from small connector 30, which lines are illustrated as relatively thicker than lines used to represent other elements in the drawing.



Portion of FIG.13

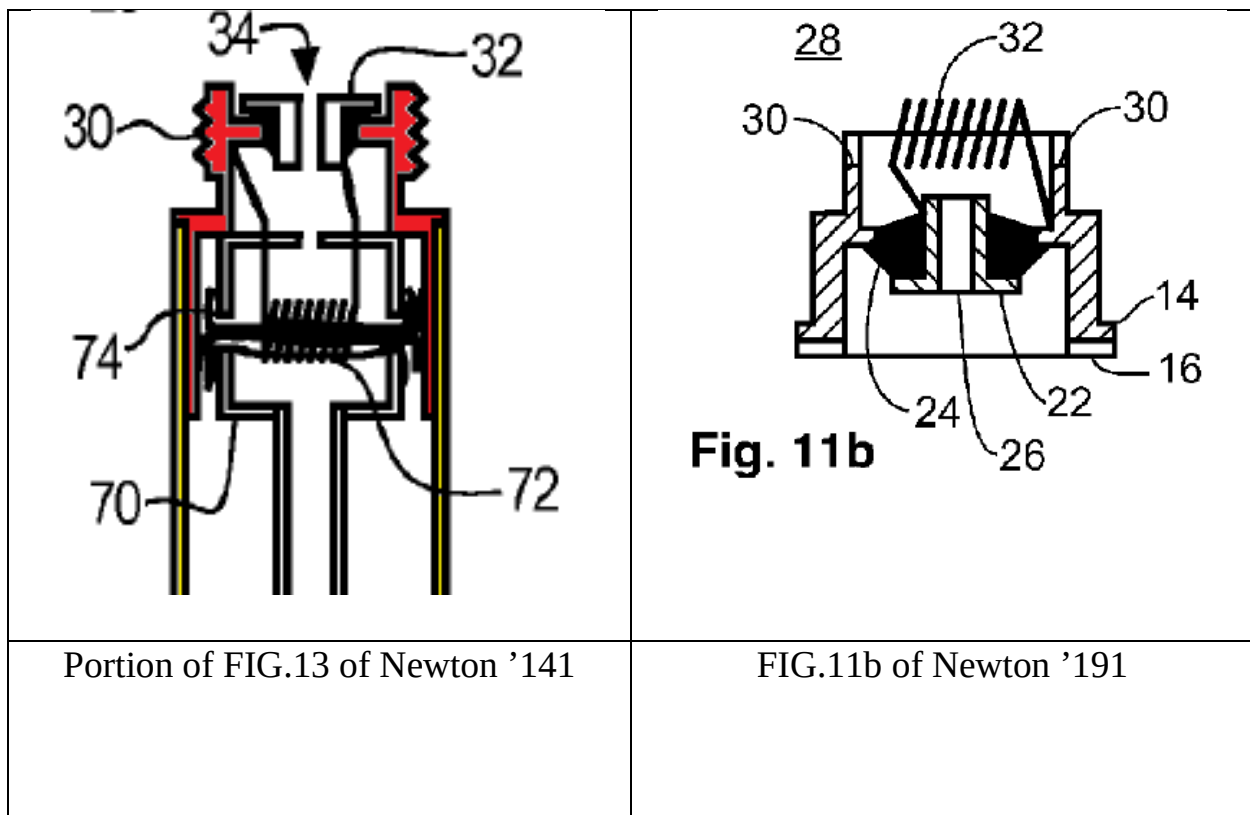
The insulation sleeve shown is also inherent given that both small connector 30 and electrical contact terminal 32 of Newton '141 are electrically connected to heating coil 72 as well as to threaded element 16/18 and electrical contact terminal 20 and operate as electrodes, and they therefore must be insulated from one another to avoid a short circuit and enable completion of a circuit with the battery. (Ex.1002 ¶121.) The insulator is shown as a “sleeve” since it encircles electrical contact terminal 32 as shown in cross section in FIG.13. (*Id.* ¶121.)

Furthermore, it would have been obvious to a POSITA in view of Newton '141 to provide an insulation sleeve since both small connector 30 and electrical contact terminal 32 are connected to heating coil 72 as well as to threaded element 16/18 and electrical contact terminal 20 and operate as electrodes, and they must be insulated from one another to avoid a short circuit. (Ex.1002 ¶122.) Use of an insulator sleeve would involve use of well-known insulators at the location of the relatively thick lines separating (and insulating) the electrical contact terminal 32 from small connector 30, and would be obvious to a POSITA as also a simple substitution of one known electrical element to obtain the predictable result of avoiding a short circuit. (Ex.1002 ¶122.)

In addition, use of an insulation sleeve between second positive electrode and second connection seat is also rendered obvious by Newton '141 in view of Newton '191. As indicated above, Newton '191 teaches an insulative support (sleeve) 24 between metal atomizer assembly 28 and electrical coupler 22.

For the same reasons set forth above, it would have been obvious to a POSITA to use an insulation sleeve between second positive electrode 32 and second connection seat 30 in Newton '141 based on the teachings of Newton '191. Namely, both Newton '141 and Newton '191 are disclosures by the same inventor in the same field of e-cigarettes dealing with the same purpose of connecting an atomizer to a battery. Both require insulation of positive/negative electrodes from one another to prevent short circuiting during operation of the circuit. (Ex.1002 ¶124.) Further, Newton '191 expressly teaches use of a supporting insulation sleeve to insulate the electrodes of coupler 22 and connection seat 30. (*Id.* ¶124.) Thus, giving this express teaching of using an insulator support sleeve 24 in Newton '191 for supporting the insulating coupler 22, it would have been obvious to use an insulation sleeve between the second positive electrode and second connection seat in Newton '141 since it would involve combining well-known prior art elements (insulators) according to known methods to avoid a predictable short circuit. (Ex.1002 ¶124.)

Further, based on the described electrical operation of Newton '141, including the operation of its electrical contact terminal 32 and small connector 30, and the relatively thicker illustrated lines, a POSITA would have been motivated to provide an insulation sleeve (like insulative support 24 of Newton '191) at the locale of the thicker lines to engage/support electrical contact terminal 32 and insulate it from electrical contact with small connector 30 to prevent a short circuit and enable operation. (Ex.1002 ¶125.)



The above is reinforced by the disclosure of Newton '191, which explicitly calls out an insulative support 24 between the same elements. (Ex.1002 ¶126.)

Thus, Newton '141 itself discloses, inherently discloses, or renders obvious, either alone or in combination with Newton '191, all elements of limitation **[1h](i)-(iv)**.

- i. **[1i] the second positive electrode has a central through hole along an axial direction of the second positive electrode for intercommunicating with a vaporizing cavity of the vaporizer, an end surface of the second positive electrode has a transversal groove along a radial direction of the end surface for intercommunicating with the central through hole;**

All elements of this limitation are disclosed in Newton '141 except for a transversal groove in the second positive electrode. However, an electrode with a traversal groove was a common feature in the art (e.g., see Newton '191, Thompson, Liu '556, and Liu '527) such that this limitation would have been obvious based on the combination of Newton '141 with either Newton '191 or Thomson, or in view of the well-known state-of-the-art. For clarity, Limitation **[1i]** is discussed in subparts **[1i](i)-(ii)** below.

- i. **“the second positive electrode has a central through hole along an axial direction of the second positive electrode for intercommunicating with a vaporizing cavity of the vaporizer,”**

Newton '141 discloses a second positive electrode 32 having a central through hole as a pneumatic port 34 for intercommunicating with a vaporizing cavity 70:

Central to the small connector is an electrical contact terminal 32, which as [sic] a pneumatic port 34 formed there through. . . . The pneumatic port 34 serves as the entry point for air to enter the atomizing chamber 70, for flow out through the chimney 66 and mouthpiece 14.

(Ex.1005 ¶[0049], FIGS.3, 13; Ex.1002 ¶129.)

Central through hole 34 extends in an axial direction of second positive electrode 32, which is vertical in the image:

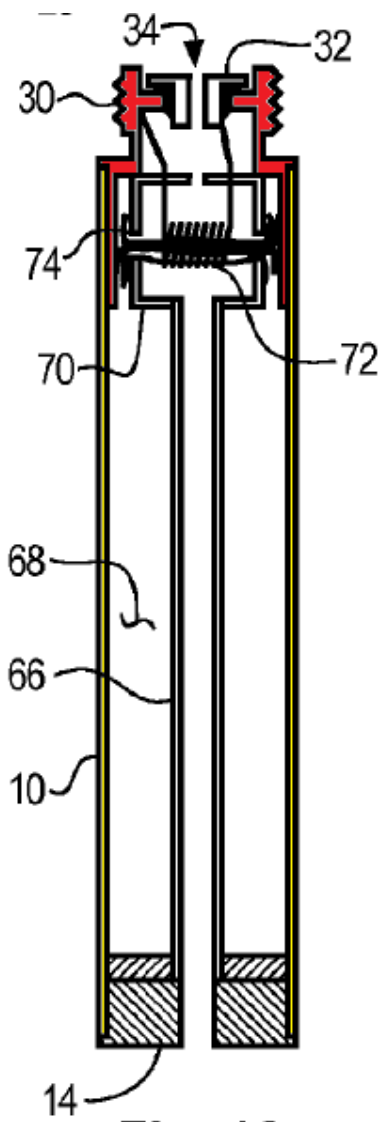


Fig. 13

Portion of FIG.13

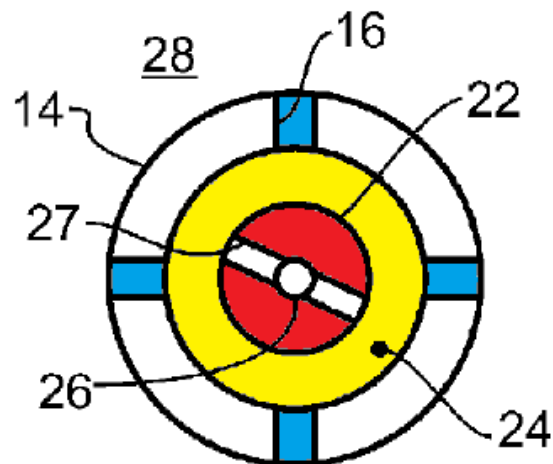
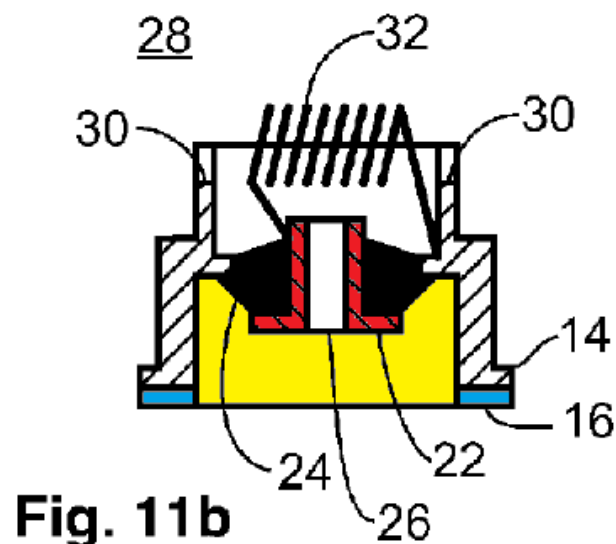
Thus, Newton '141 discloses all elements of this limitation.

- ii. **“an end surface of the second positive electrode has a transversal groove along a radial direction of the end surface for intercommunicating with the central through hole;”**

It would have been obvious to a POSITA to modify Newton '141 to use electrical coupler 22 having a transversal groove disclosed in Newton '191 in place of electrical contact terminal 20 of Newton '141. Such a modification would have been obvious to a POSITA because: (1) it was a well-known design choice and a simple substitution to use such an electrode design, (2) the use of such electrodes and air flow techniques yield predictable results, (3) Newton '141 and Newton '191 are in the same field of e-cigarettes, (4) there is express teaching, suggestion, and motivation to combine Newton '141 with Newton '191 to use an electrode with a transversal groove, and (5) PO already conceded during prosecution that a second positive electrode with a transversal groove is a known feature in the art and is thus unpatentable. (Ex.1002 ¶132.)

As discussed above, Newton '141 discloses electrical contact terminal 32 in small atomizer assembly 10 having a pneumatic port 34 to allow air to enter atomizing chamber 70. (Ex.1005 ¶[0049], FIG.13, 15; Ex.1002 ¶133.) Newton '191, by the same inventor as Newton '141, discloses the well-known state-of-the-art design choice of using an electrode having an end surface with a transversal groove.

Newton '191 discloses an electrode (electrical coupler 22) having an end surface with a transversal groove (air recesses 27) along a radial direction of the end surface for intercommunicating with the central through hole (air inlet port), as shown in the annotated FIGS. 11a and 11b:



The electrical coupler 22 has an air inlet port formed therethrough. The electrical coupler has a pair of air recesses 27 machined on its face so that an air channel is created when the cartridge is engaged with the power supply portion of the electronic cigarette. In this manner, the air path is from the exterior, through the air inlet vents 16, through the air recesses 27, through the air inlet port 26 of the electrical coupler and u [sic] to the atomizer 32.

(Ex.1006 ¶[0043], FIGS.3a, 3b, 11a, 11b; Ex.1002 ¶134.)

Using such a design of Newton '191 in place of electrical contact terminal 32 of Newton '141 would be a matter of obvious design choice and a simple substitution of one part for another. (Ex.1002 ¶135.) It was known in the art, particularly by the common inventor of Newton '141 and Newton '191, to use an electrode with a transversal groove in its end surface to accommodate the entry of external airflow, as explained in Newton '191. Designs such as that of Newton '191 were also used in other prior art electronic cigarette designs as discussed in §VI.C.4.

To a POSITA, it is clear that airflow is required in Newton '141 for the operation of e-cigarette 4. (Ex.1002 ¶136.) The positions for the air inlet openings in an e-cigarette amount to only a finite number of solutions, *i.e.*, locations along the e-cigarette, for air to enter. (Ex.1002 ¶136.) Newton '191 discloses the design choice that air is inlet to the e-cigarette at vent openings 16 located at the coupler 14 and

flows via a transversal groove 27 into electrode 22. (Ex.1006 Abstract, FIGS.11a, 11b; Ex.1002 ¶136.) Notably, Newton '191 specifically states that it is a matter of design choice where the air enters the e-cigarette: "The air inlet openings 16 can be located elsewhere on the electronic cigarette 2, and is a matter of design choice." (Ex.1006 ¶[0033], FIG.4b; Ex.1002 ¶136.)

Using coupler 22 of Newton '191 in the e-cigarette of Newton '141 would also predictably permit electrical connection from the battery to the atomizer while also providing an entrance for airflow into the internal port of the electrode. (Ex.1002 ¶137.) The interchangeability of these features in these electronic cigarette disclosures was readily known in the art, indeed by the same person.

Since Newton '191 discloses electrical coupler 22 having a transversal groove (air recesses 27) for permitting access by air to its central through hole, a POSITA would be motivated to use electrical coupler 22 so that air can be accommodated into the e-cigarette of Newton '141 to facilitate its use in the same way. (Ex.1002 ¶138.) A POSITA would have understood the significant similarities between the disclosures of Newton '141 and Newton '191, which include the same inventor in the same field of e-cigarettes dealing with the same purpose of connecting an atomizer to a battery, and therefore found it obvious to utilize electrical coupler 22

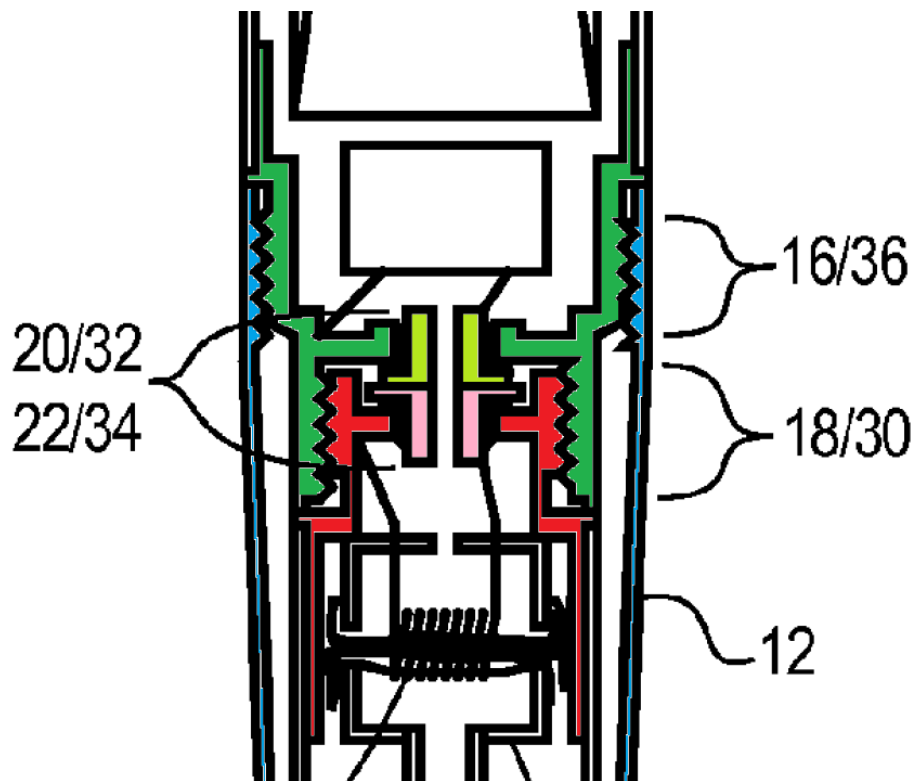
of Newton '191 in place of electrical contact terminal 20 of Newton '141. (Ex.1002 ¶138.)

In addition to being disclosed in Newton '191, this claimed transversal groove of limitation [1i] was rejected in view of Thompson or Liu '556 during prosecution (Ex.1004, 86-90), both of which disclose use of this groove. (See groove (air vents 38a) in Thompson, Ex.1008 ¶[0025], FIG.4b; Ex.1002 ¶139; see groove in first electrode 57 in Liu '556, Ex.1009 ¶[0035], FIG.2; Ex.1002 ¶139.) Both Thompson and Liu '556 evidence the state-of-the-art for electrodes used in e-cigarettes. PO did not offer any response to those rejections, and did not mention the claimed transversal groove of limitation [1i] in its arguments for patentability. (Ex.1004, 78-79.) Thus, PO conceded that the claimed transversal groove was a known design choice and was disclosed by the prior art.

Thus, in view of the foregoing, Newton '141 in view of Newton '191 renders obvious an end surface of a second positive electrode having a transversal groove 27 along a radial direction of the end surface for intercommunicating with the central through hole 26.

- j. [1j] the third connection portion has an inner thread engaging with the outer thread of the first connection seat;

As discussed above in limitation [1f], and shown below, Newton '141 discloses **third connection portion 36** as an internal thread connected to an outer thread of **first connection portion 16**:



Portion of FIG.15

The connection between the large battery assembly 6 and the connector shroud 12 is accomplished with the first connector 16 on the larger battery assembly 6 and a shroud connector 36 on the connector shroud 12.

(Ex.1005 ¶[0044], FIG.15; Ex.1002 ¶141.)

The first connector 16 is an external machine tread [*sic*] at one end of the large battery assembly 6.

(*Id.* ¶[0046], FIG.15; Ex.1002 ¶141.)

A shroud connector 36, which is an internal machine thread, is located at one end of the connector shroud 12.

(*Id.* ¶[0050], FIG.15; Ex.1002 ¶141.)

Thus, Newton '141 discloses all elements of limitation [1j].

- k. **[1k] the first positive electrode and the second positive electrode abut against each other to be electrically connected, the first connection seat and the second connection seat are electrically connected;**

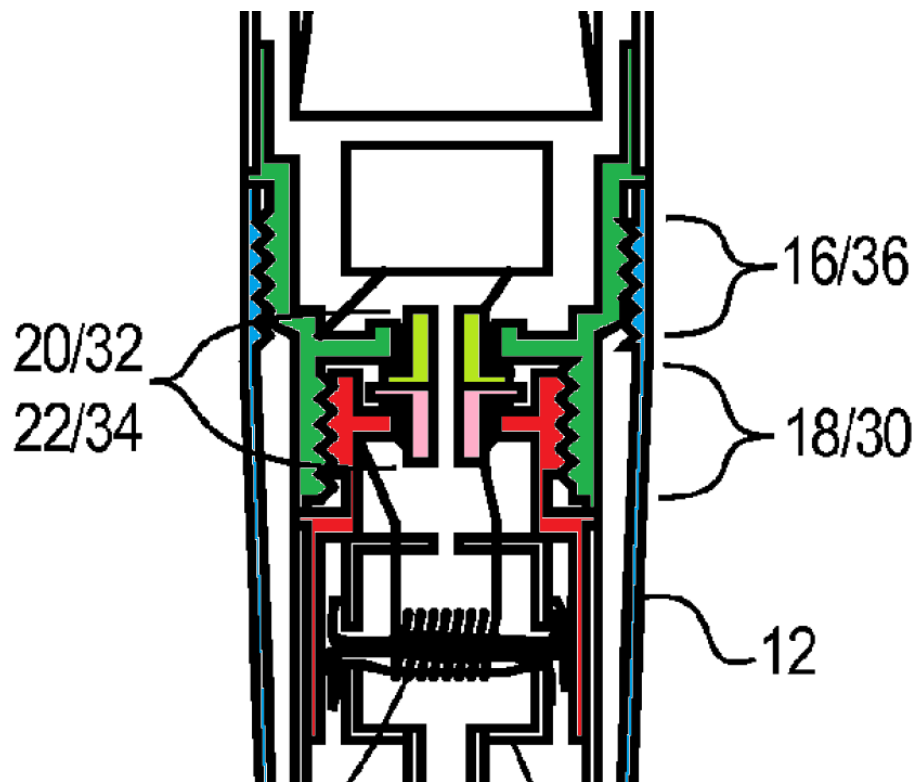
For clarity, this limitation is discussed in subparts [1k](i)-(ii) below.

- i. **“the first positive electrode and the second positive electrode abut against each other to be electrically connected,”**

As discussed above in limitation [1f], **first positive electrode 20** and **second positive electrode 32** abut and are electrically connected.

Note that the second connector 18 of the larger battery assembly 6 and the small connector 30 of the small atomizer assembly 10 are engaged together 18/30. This connection facilitates the electrical connection of the two central contact terminals 20/32, respectively, and also facilitates the pneumatic port coupling 22/34.

(Ex.1005 ¶[0051], FIGS.8, 15; Ex.1002 ¶144.)



Portion of FIG.15

Thus, Newton '141 discloses the elements of this limitation.

ii. “the first connection seat and the second connection seat are electrically connected;”

As discussed above in limitation [1h], Newton '141 discloses that first connection seat 16/18 is electrically connected to second connection seat 30:

Note that the second connector 18 of the larger battery assembly 6 and the small connector 30 of the small atomizer assembly 10 are engaged together 18/30. This connection facilitates the electrical connection of the two central contact terminals 20/32, respectively, and also facilitates the pneumatic port coupling 22/34.

(Ex.1005 ¶[0051], FIG.15; Ex.1002 ¶146.)

The atomizer 72 is a coil of nickel-chromium wire that is electrically bonded to both the electrical contact terminal 32 and the small connector 30.

(*Id.* ¶[0049], FIG.15; Ex.1002 ¶146.)

This explains the electrical connection between first connection seat 16/18 and second connection seat 30 and also between first electrode 20 and second electrode 32. As discussed above in limitation **[1g]**, Newton '141's first connection seat 16/18 serves as an electrode electrically connected to an electrode of the battery 9. It therefore follows that Newton '141 discloses an electrical connection between first connection seat 16/18 and second connection seat 30 in order to supply power from the battery 9 to the heating coil 72.

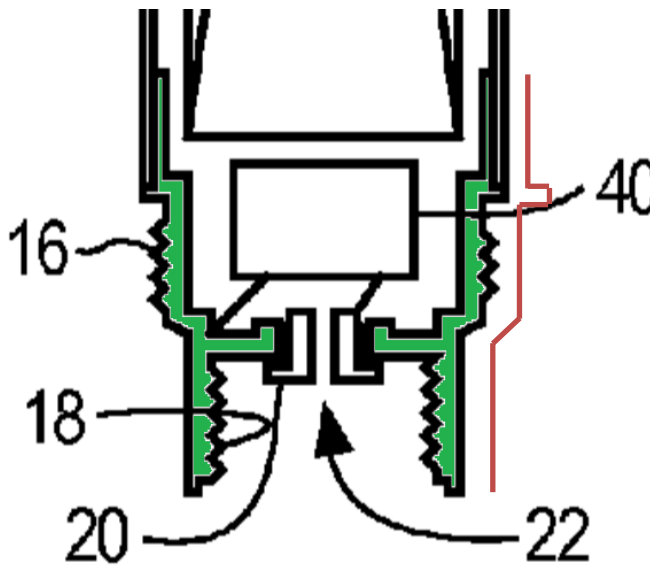
- I. **[1l] the first connection seat has a step-like shape, a protruding step is formed at a middle portion of the first connection seat that has a maximum outer diameter;**

For clarity, this limitation is discussed in subparts **[1l](i)-(ii)** below.

- i. **“the first connection seat has a step-like shape”**

Newton '141 discloses a first connection seat 16/18 with a step-like shape, as best understood. The '744 Patent states: “Referring to FIGS. 2 and 4, the first connection seat 11 has a step-like shape” (Ex.1001 col.5 ll.27-28, FIGS.2, 4;

Ex.1002 ¶150.) Accordingly, an enlarged portion of FIG.9A of Newton '141 is shown below next to FIG.4 of the '744 Patent as having the same “step-like shape”:



Portion of FIG.9A of Newton '141

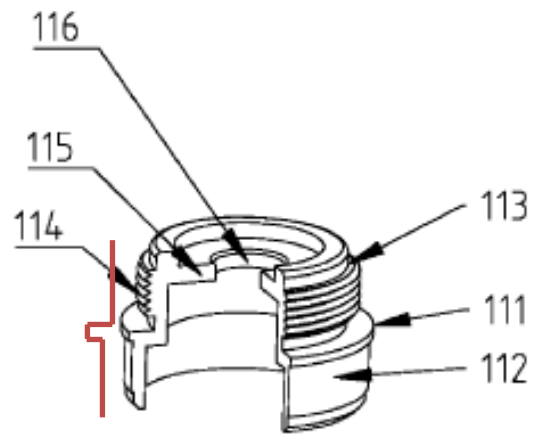


Figure 4

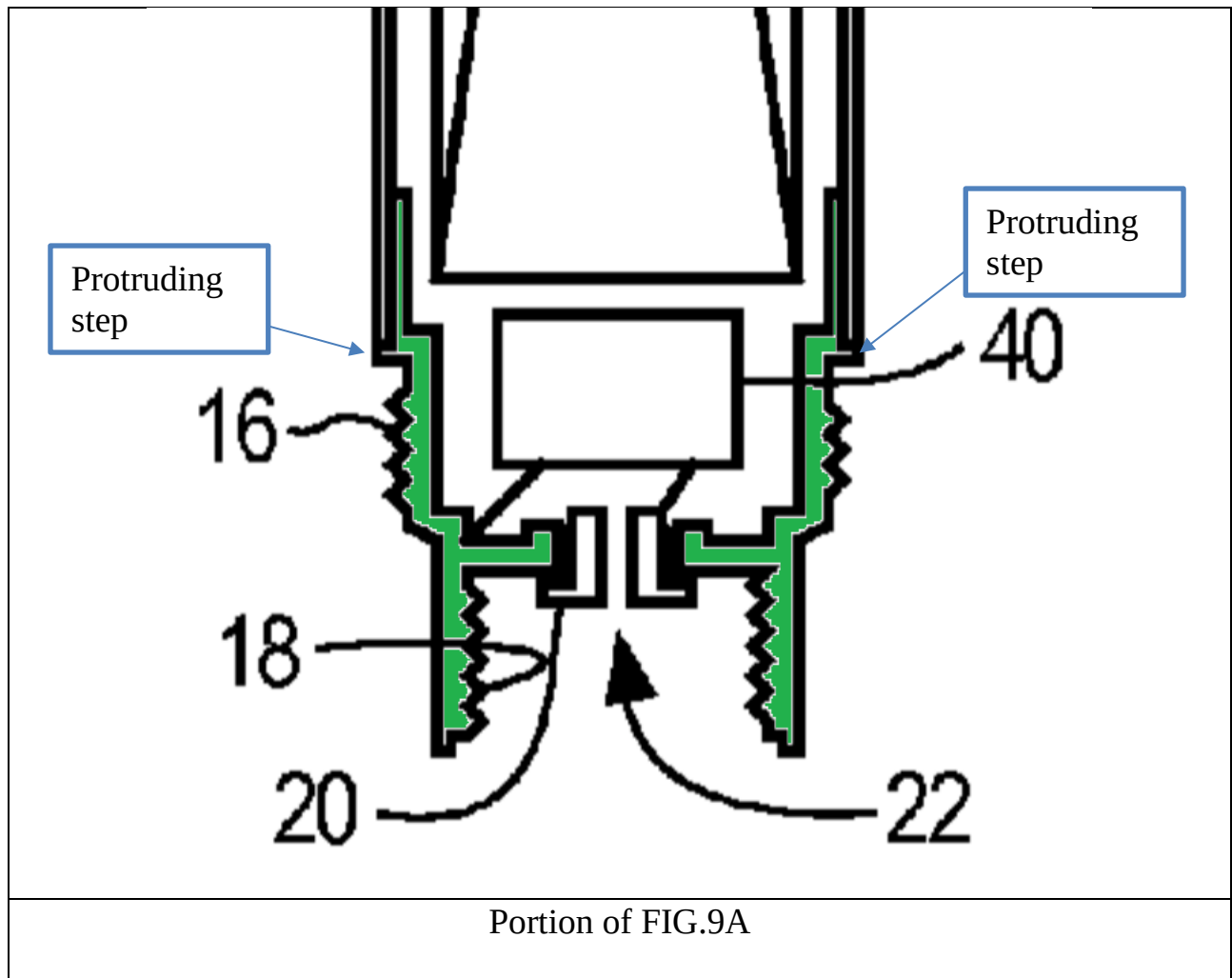
FIG.4 of the '744 Patent

Thus, Newton '141 discloses the elements of this limitation.

- ii. **“a protruding step is formed at a middle portion of the first connection seat that has a maximum outer diameter;”**

Newton '141 discloses first connection seat 16/18 having a protruding step formed at a middle portion thereof, as shown in the portion of FIG.9A annotated below. Since first connection seat 16/18 extends both above and below the annotated protruding step, the protruding step is formed at a middle portion thereof. All other portions of first connection seat 16/18 have a smaller width in FIG.9A, thereby

demonstrating that the protruding step has a maximum outer diameter of first connection seat 16/18. (Ex.1002 ¶152.)



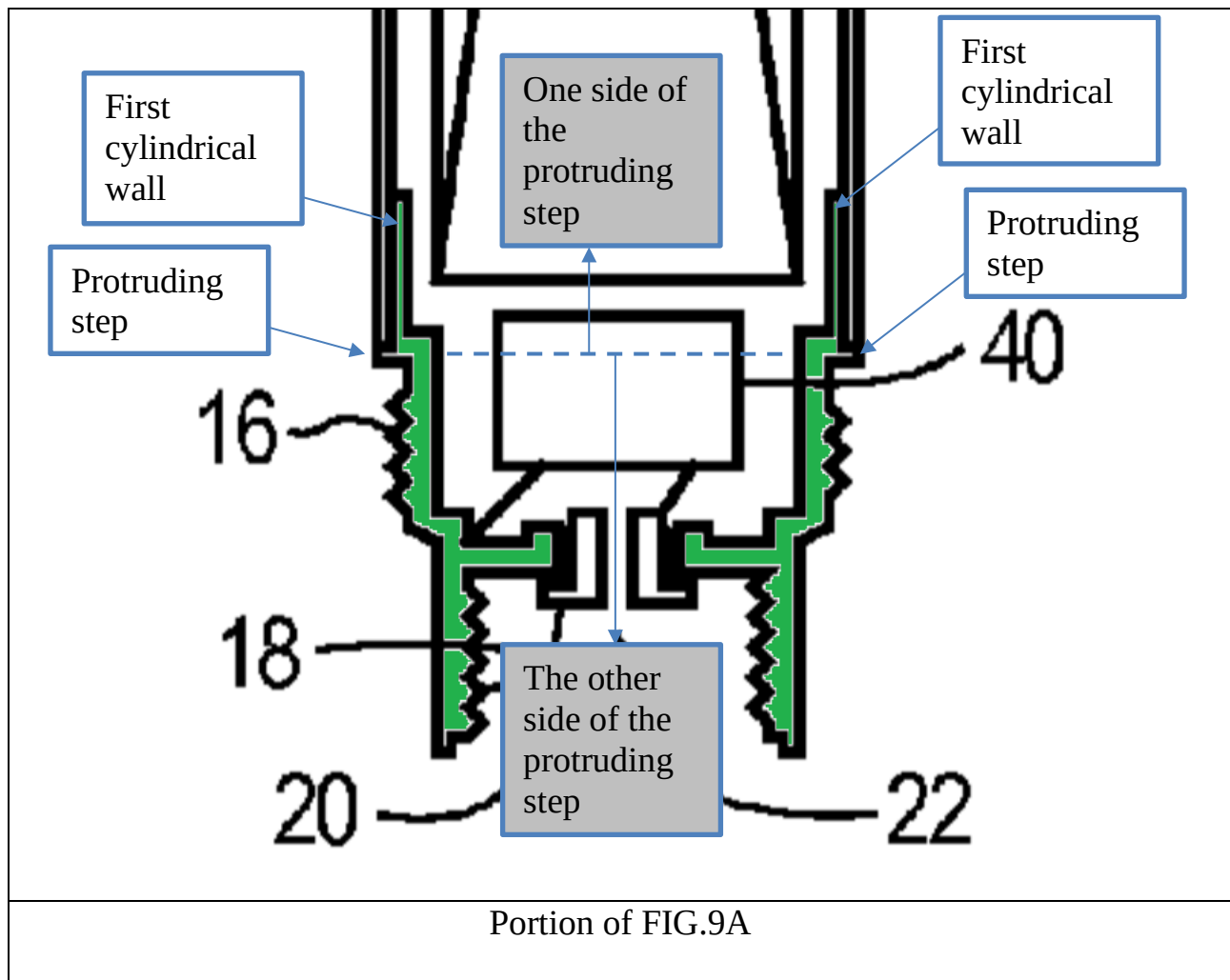
Thus, Newton '141 discloses all elements of this limitation.

- m. **[1m] one side of the protruding step is provided with a first cylindrical wall having an outer diameter smaller than that of the protruding step, the first cylindrical wall is sheathed with an inner wall of said end of the casing tube of the battery stick, the outer diameter of the protruding step equals an outer diameter of the casing tube of the battery stick;**

For clarity, this limitation is discussed in subparts **[1m](i)-(iii)** below.

- i. **“one side of the protruding step is provided with a first cylindrical wall having an outer diameter smaller than that of the protruding step”**

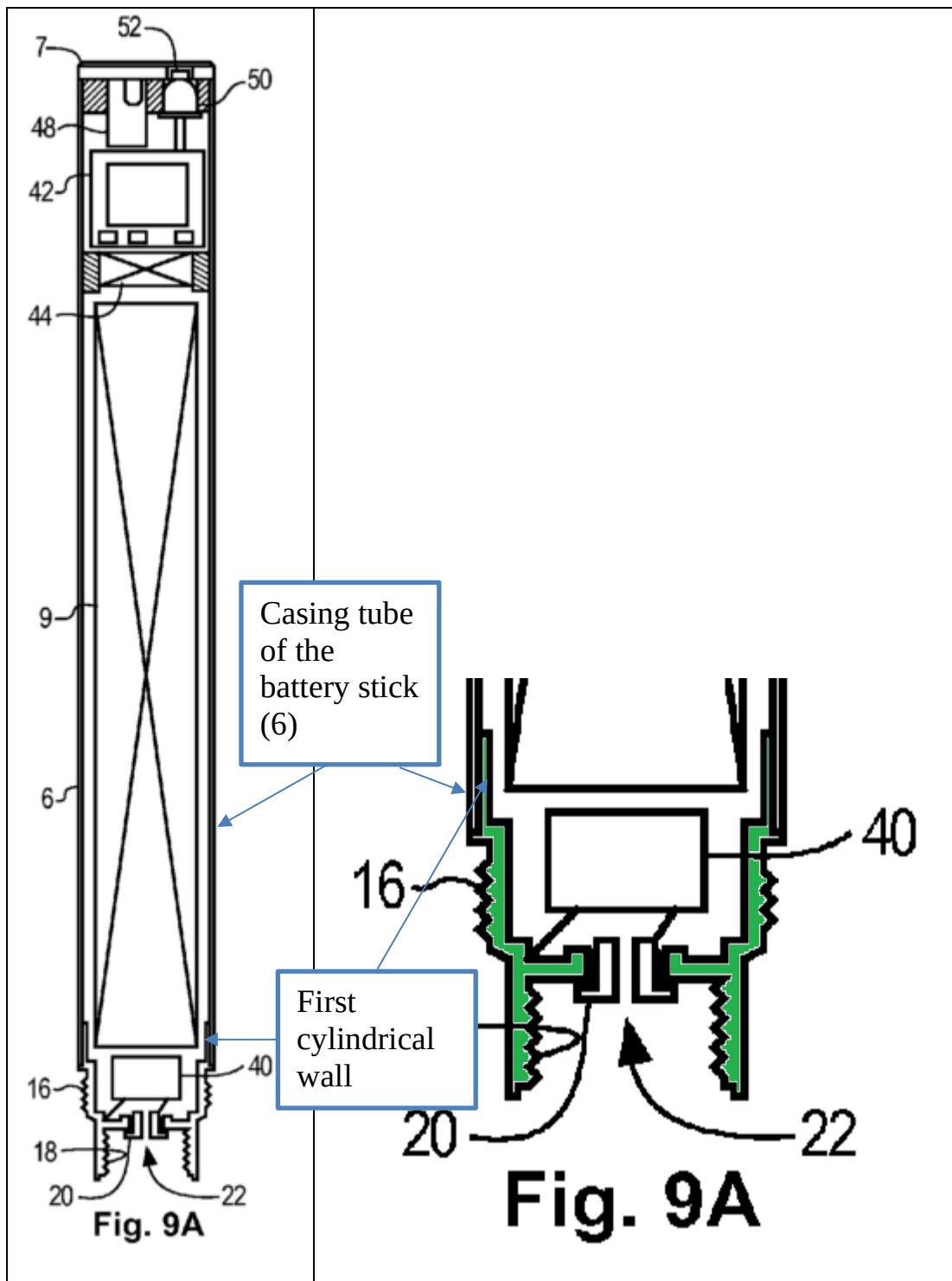
Newton '141 discloses at least in FIG.9A that one side of the protruding step (an upper side in FIG.9A) is provided with a first cylindrical wall having an outer diameter smaller than that of the protruding step. (Ex.1002 ¶155.)



Thus, Newton '141 discloses all elements of this limitation.

- ii. **“the first cylindrical wall is sheathed with an inner wall of said end of the casing tube of the battery stick”**

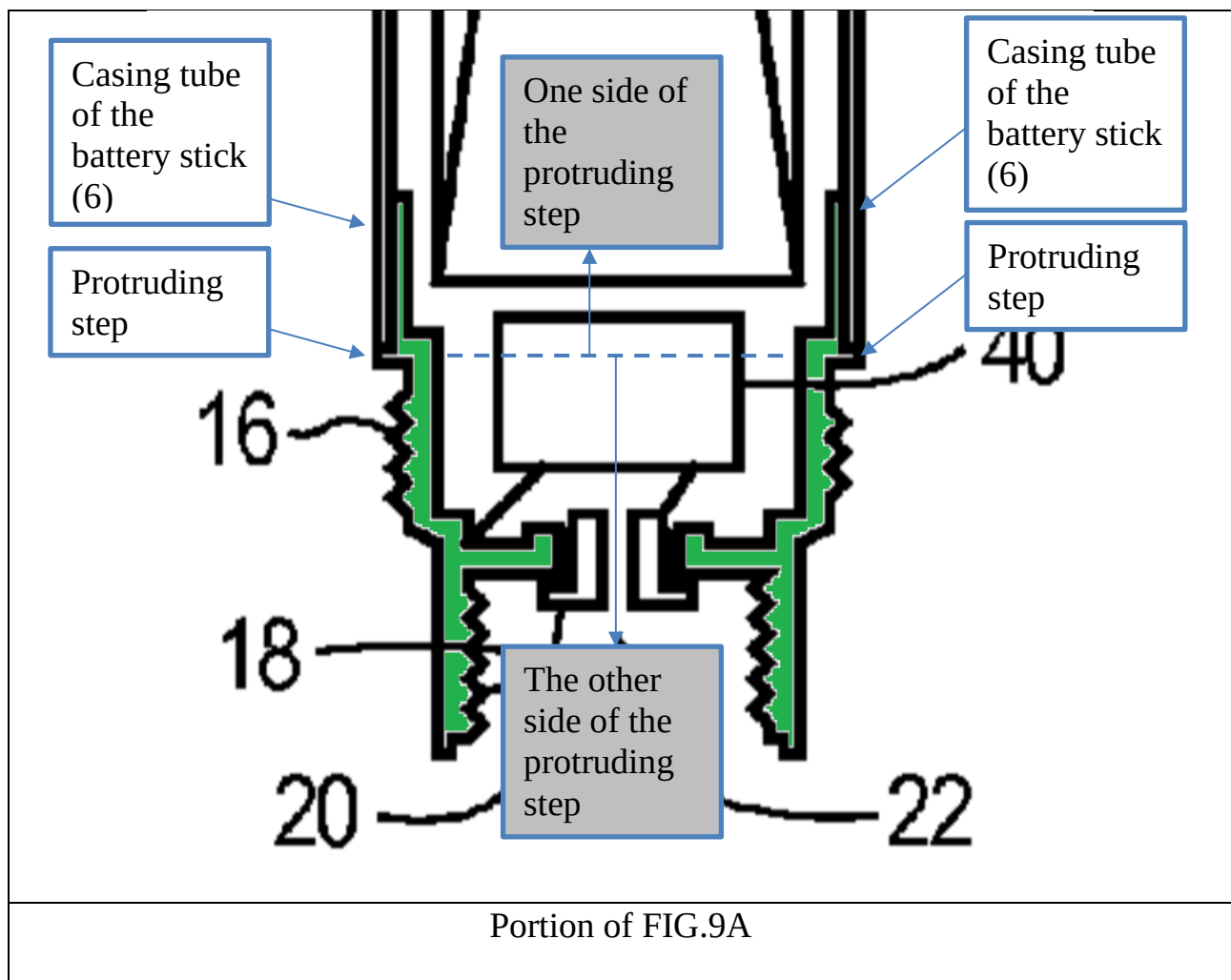
Newton '141 discloses at least in FIG.9A that the first cylindrical wall is sheathed with an inner wall of the end of the casing tube (referenced by numeral 6, as discussed in limitation [1b]) of the battery stick 6. (Ex.1002 ¶157.)



Thus, Newton '141 discloses all elements of this limitation.

iii. **“the outer diameter of the protruding step equals an outer diameter of the casing tube of the battery stick;”**

Newton '141 discloses at least in FIG.9A that in first connection seat 16/18, the outer diameter of the protruding step equals an outer diameter of the casing tube of the battery stick. Vertical lines in FIG.9A representing outermost portions of both the casing tube of battery stick 6 and the protruding step are colinear, indicating that the outer diameters are equal. (Ex.1002 ¶159.)



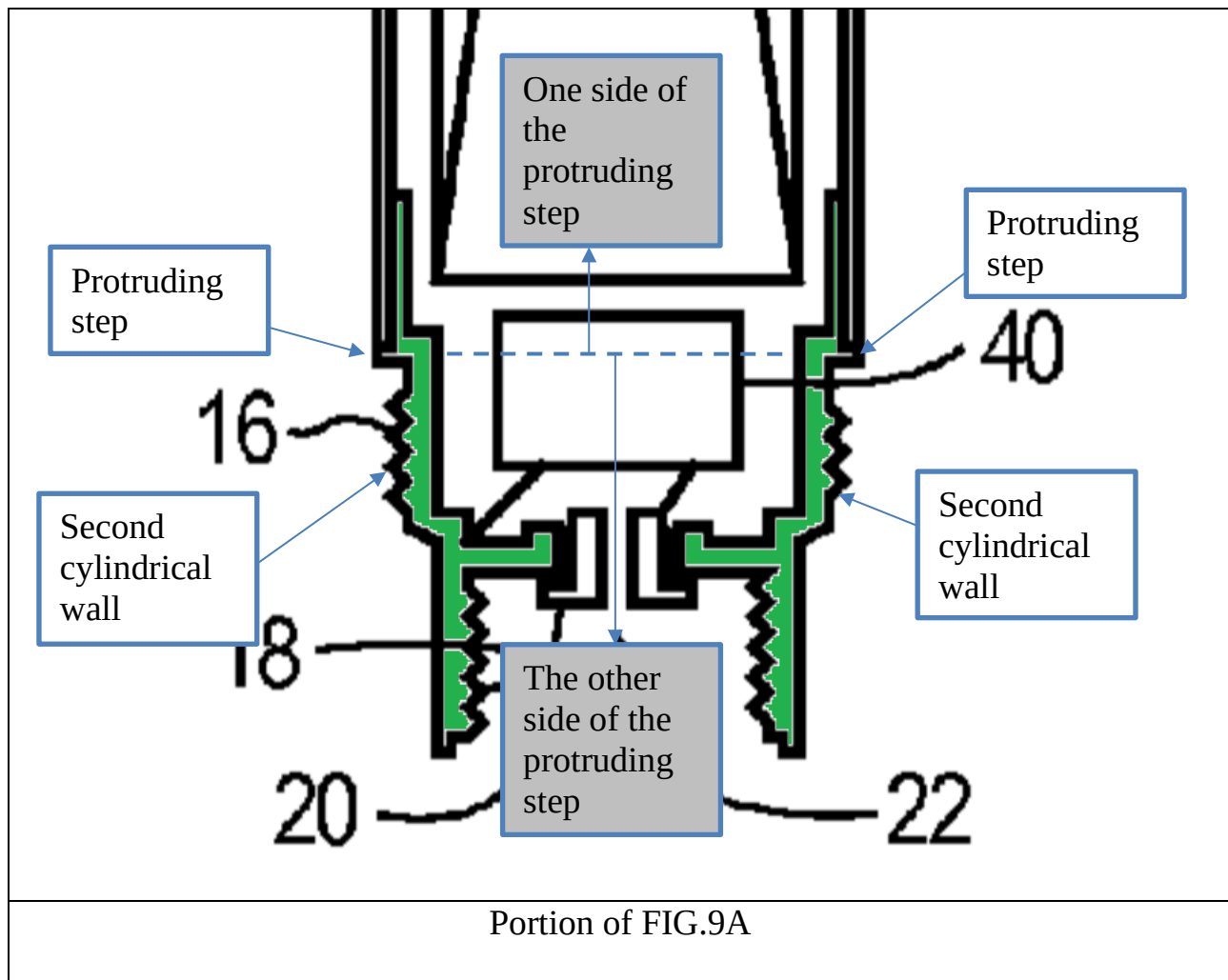
Thus, Newton '141 discloses all elements of this limitation.

- n. **[1n] the other side of the protruding step is provided with a second cylindrical wall having an outer diameter smaller than that of the protruding step and having the outer thread, one end of the second cylindrical wall is provided with a base wall having a central through hole, the central through hole is configured for installing the first positive electrode and the first insulation sleeve.**

For clarity, this limitation is discussed below in subparts [1n](i)-(iii).

- i. **“the other side of the protruding step is provided with a second cylindrical wall having an outer diameter smaller than that of the protruding step and having the outer thread”**

Newton '141 discloses at least in FIG.9A that in first connection seat 16/18, the other side of the protruding step (a lower side shown in FIG.9A) is provided with a second cylindrical wall having an outer diameter smaller than that of the protruding step. (Ex.1002 ¶162.)

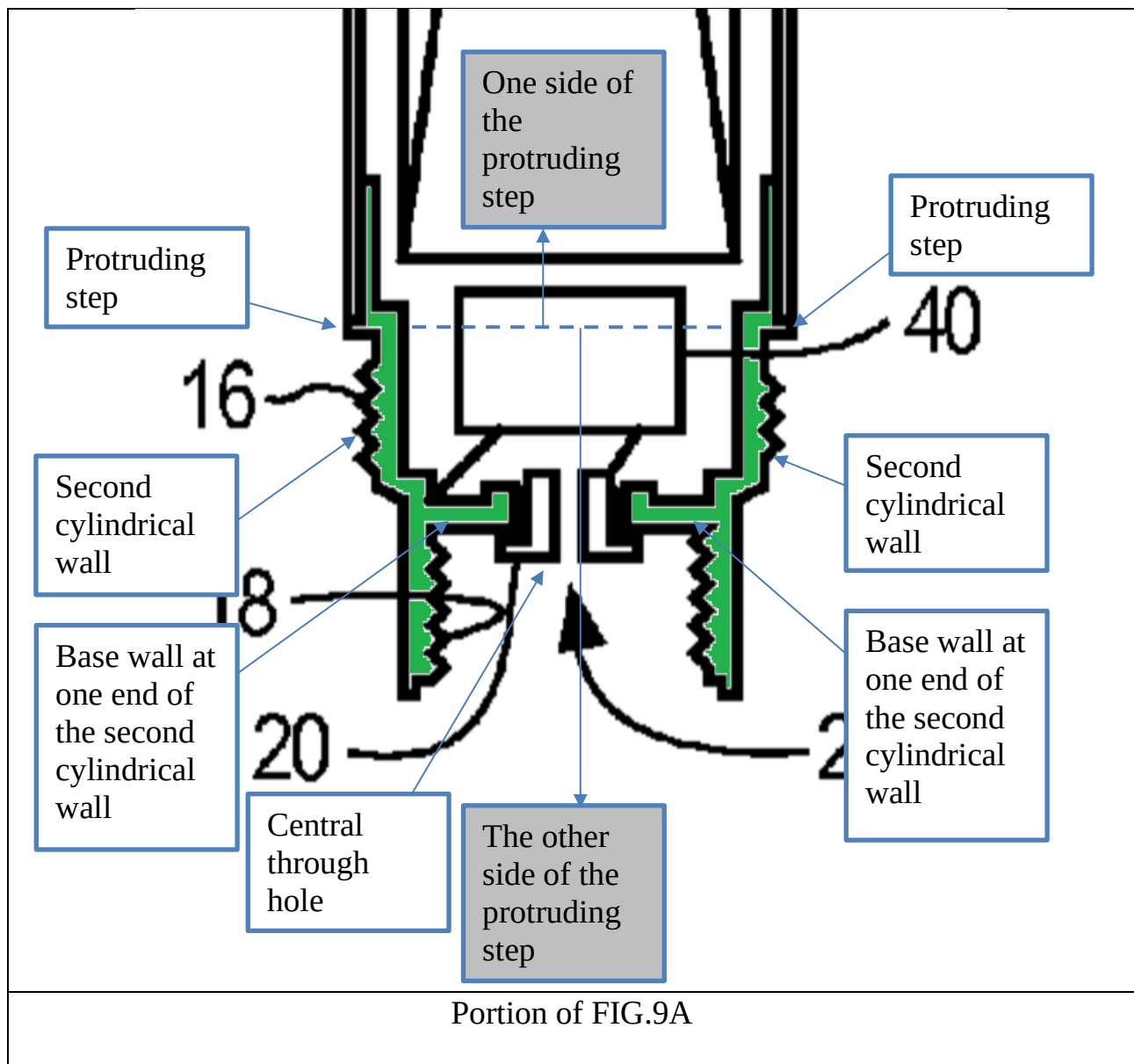


The “other side” of the protruding step includes first connector 16, and therefore has the outer thread: “The first connector 16 is an external machine tread [sic] at one end of the large battery assembly 6.” (Ex.1005 ¶[0046], FIG.15; Ex.1002 ¶163.)

Thus, Newton ’141 discloses all limitations of this element.

ii. **“one end of the second cylindrical wall is provided with a base wall having a central through hole”**

Newton '141 discloses at least in FIG.9A that in first connection seat 16/18, one end of the second cylindrical wall is provided with a base wall having a central through-hole:

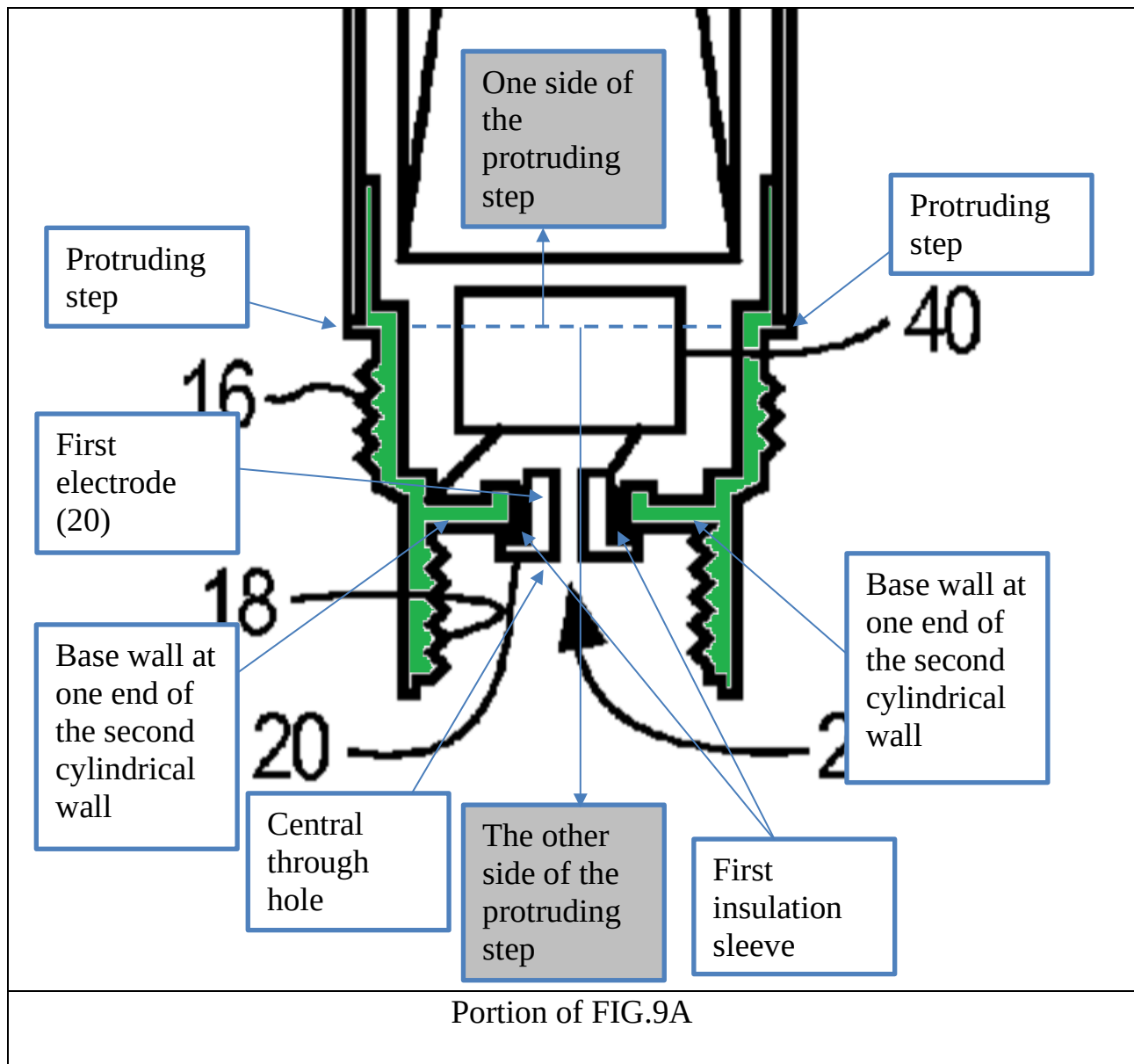


Thus, Newton '141 discloses all elements of this limitation.

iii. “the central through hole is configured for installing the first positive electrode and the first insulation sleeve.”

As indicated above in limitation [1g], Newton '141 discloses a first connection portion comprising first electrode 20 arranged at a center of first connection seat 16/18, and Newton '141 either alone or in combination with Newton '191, as discussed above, discloses or renders obvious an insulation sleeve between first positive electrode 20 and first connection seat 16/18.² As shown in FIG.9A annotated below, both first electrode 20 and the insulation sleeve represented by the relatively thicker lines are at the central through hole.

² This limitation [1n](iii) is one of several limitations that are believed to be indefinite in claim 1. For example, the term “for installing” is unclear and is not explained in the specification. Petitioner cannot assert 35 U.S.C. §112 challenges in this proceeding and has thus applied the plain meaning of this and other limitations as best understood.



Thus, Newton '141 alone, or alternatively in combination with Newton '191, discloses or renders obvious this limitation.

3. Dependent Claim 2

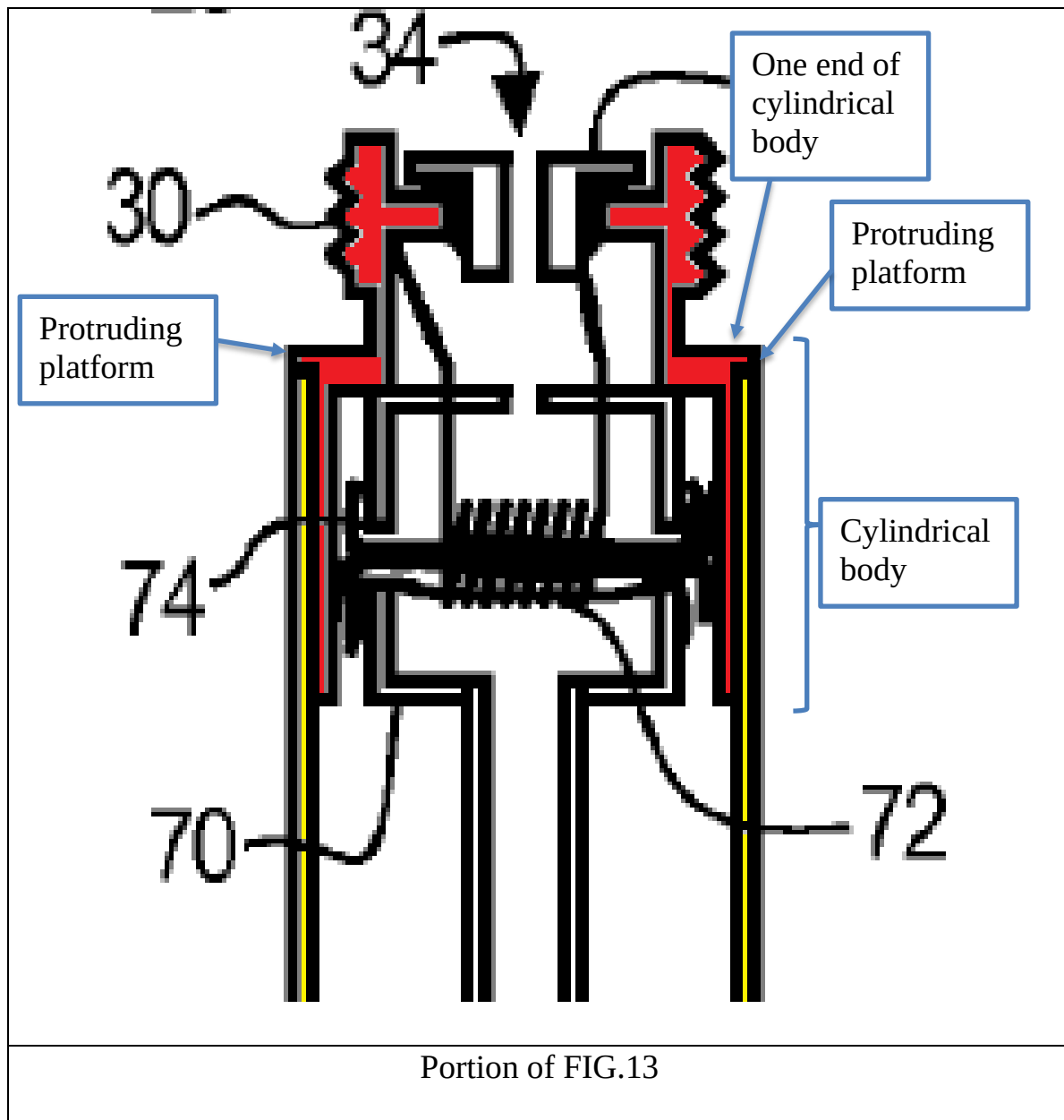
Claim 2 is obvious in view of Newton '141 combined with Newton '191.

**a. [2pre] 2. The electronic cigarette
according to claim 1, characterized in that**

Newton '141 discloses an e-cigarette 4 as recited in the preamble of claim 2 for the same reasons explained above in limitation **[1a]**.

**b. [2a] the second connection seat is a cylindrical body
having a protruding platform at one end thereof;**

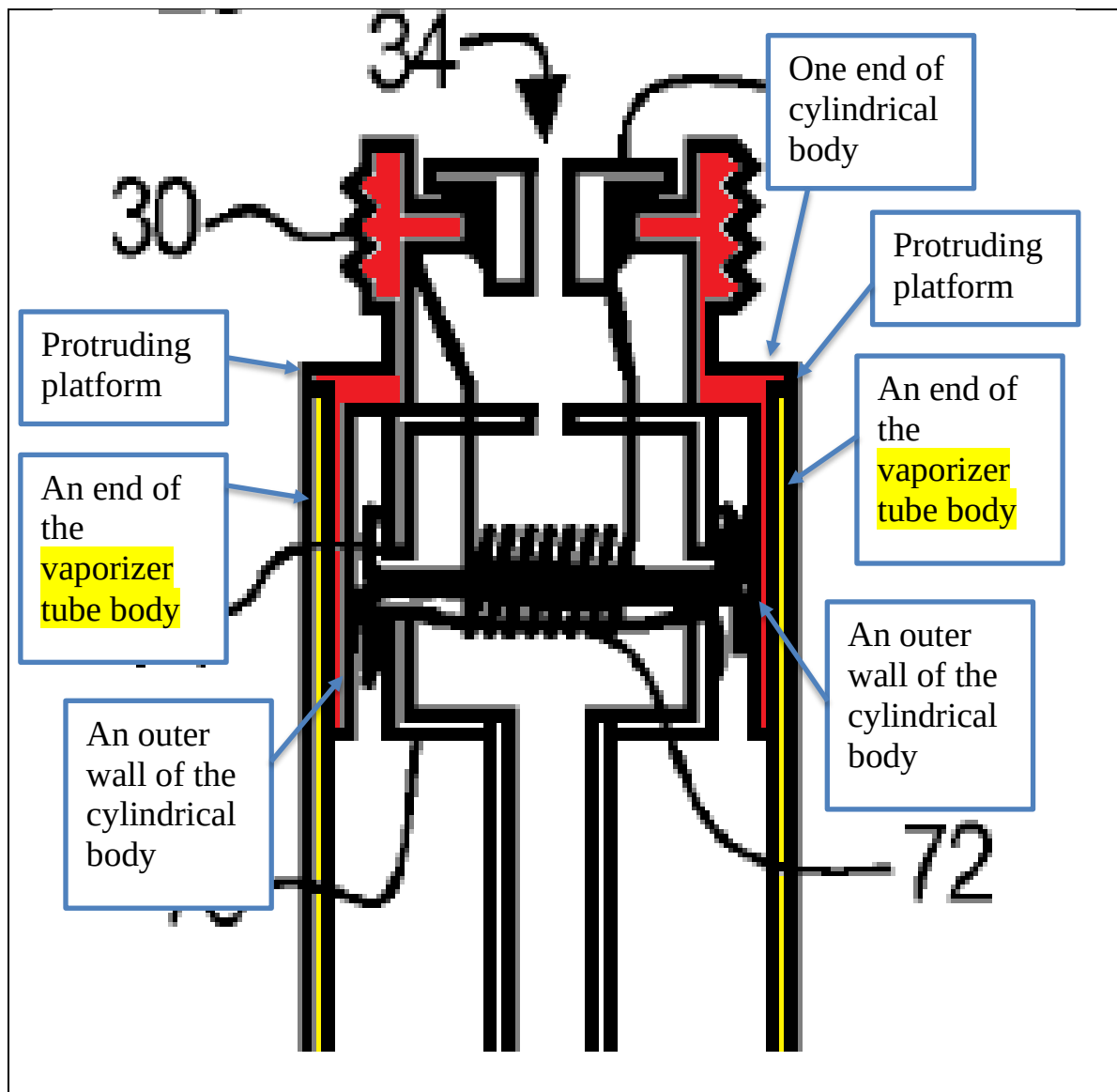
As discussed above in limitation **[1h]**, Newton '141 discloses a **second connection seat 30**. As shown in FIG.13 annotated below, second connection seat 30 is a cylindrical body having a protruding platform at one end thereof. (Ex.1002 ¶¶171.)



Thus, Newton '141 discloses the elements of this limitation.

- c. [2b] an outer wall of the cylindrical body is sheathed with an inner wall of said end of the vaporizer tube body;

As discussed above in limitation [1d], Newton '141 discloses a vaporizer tube body 10 shown in FIG.13. An outer wall of the cylindrical body of second connection seat 30 is disposed within an end of the body:



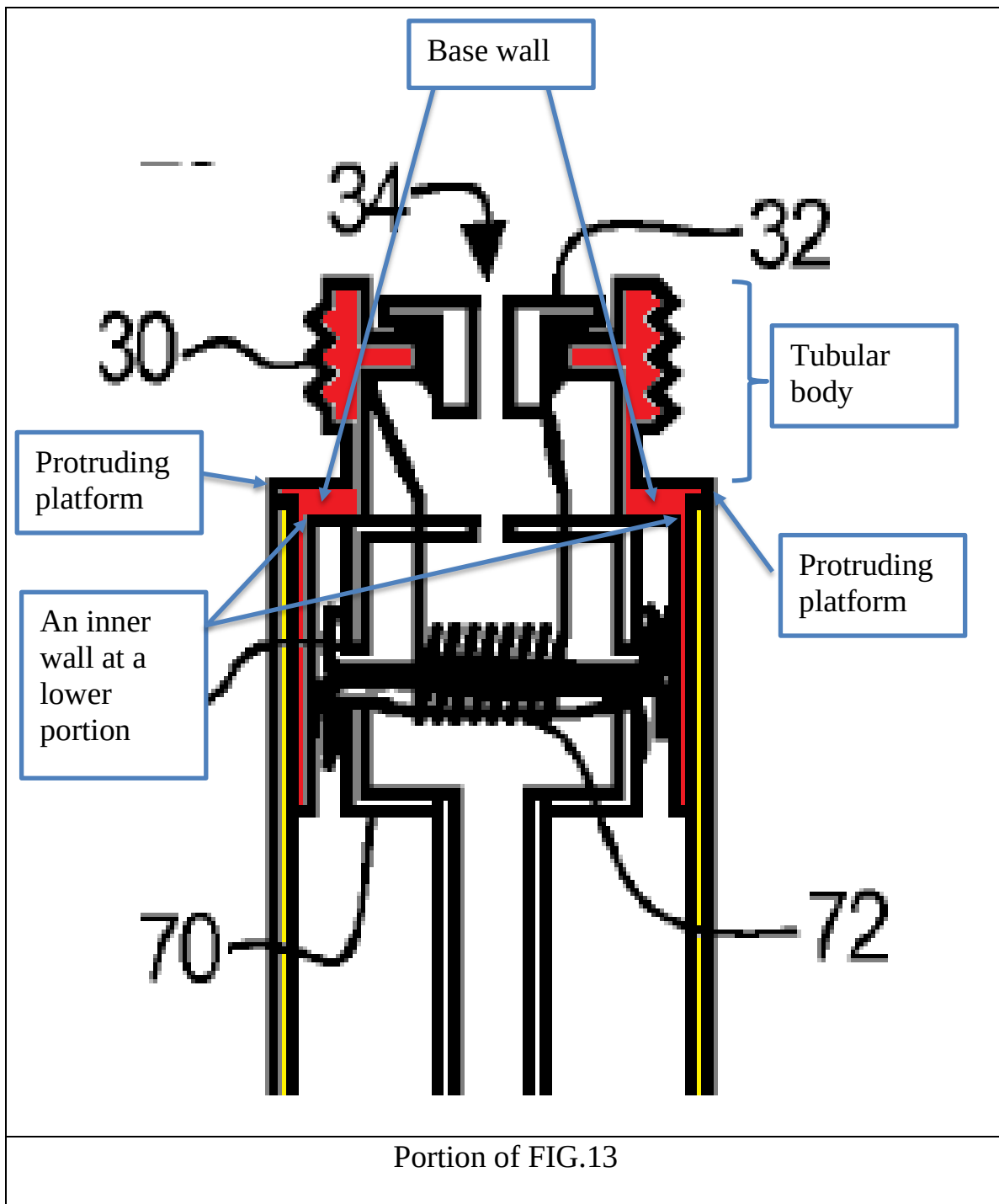
Portion of FIG.13

Thus, Newton '141 discloses the elements of this limitation.

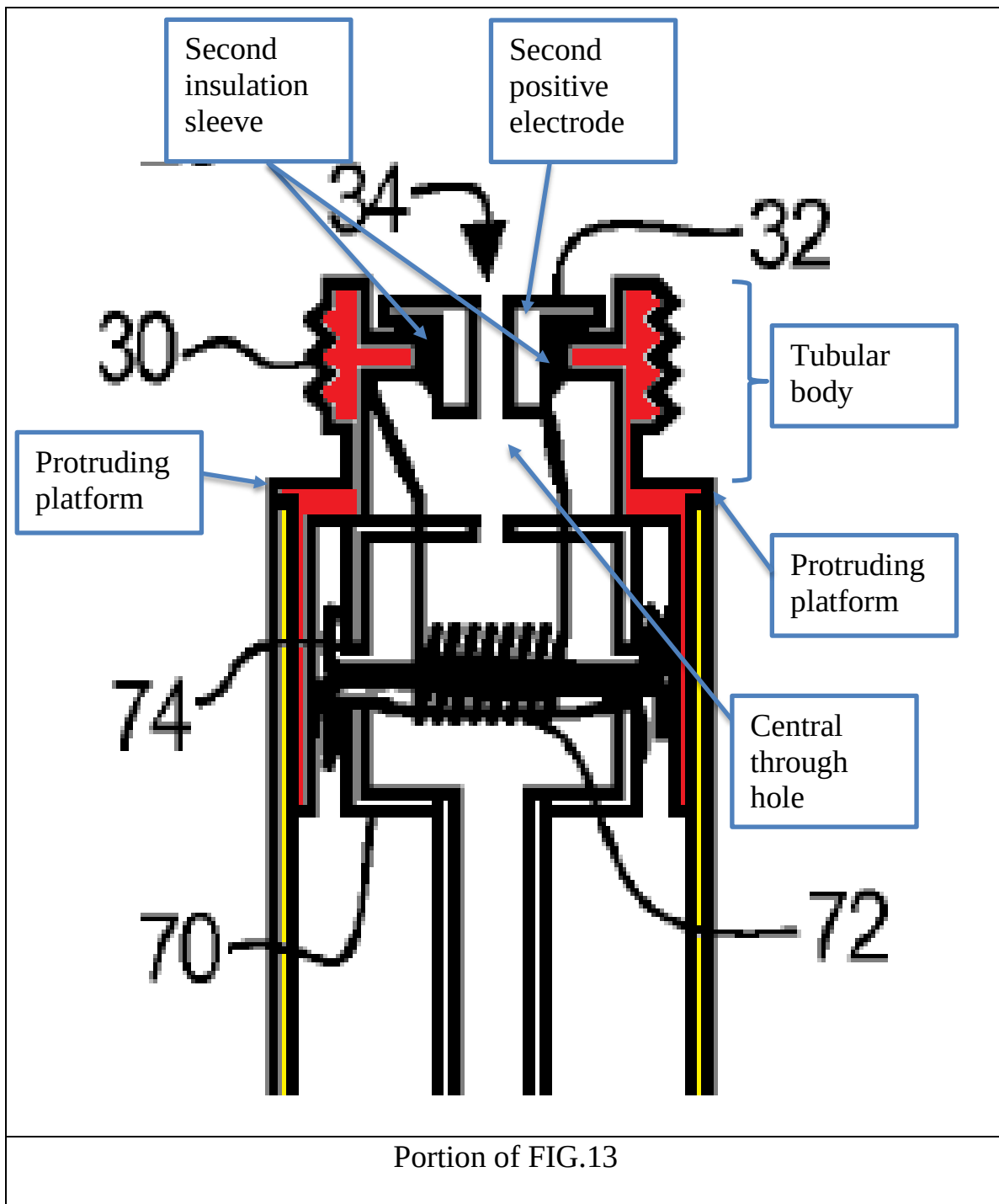
- d. **[2c] an inner wall at a lower portion of the second connection seat is provided with a base wall, a tubular body is protruded from a center of the base wall, the tubular body is provided with a central through hole for installing the second insulation sleeve and the second positive electrode.**

Newton '141 discloses at least in annotated FIG.13 that a base wall is provided at an inner wall at a lower portion³ of second connection seat 30. A tubular body is shown protruded from a center of the base wall:

³ Like limitation **[1n](iii)** above, this limitation is believed to be indefinite because Petitioner cannot assert §112 challenges in this proceeding. For example, the term “lower portion” is unclear and also can vary depending on the orientation of the subject e-cigarette. However, as best understood, this limitation is disclosed in Newton '141.



As indicated in limitation **[1h]**, Newton '141 discloses second positive electrode 32 arranged at a center of second connection seat 30, and either alone or in combination with Newton '191 discloses a second insulation sleeve placed between electrode 32 and seat 30. FIG.13 shows that electrode 32 and the insulation sleeve represented by the relatively thicker lines are at the central through-hole of the tubular body.



Thus, Newton '141 alone or in combination with Newton '191 discloses all elements of this limitation.

B. Ground 2: Claim 5 Is Obvious In View Of Newton '141, Newton '191, And Thompson

1. The Combination Of Newton '141, Newton '191, And Thompson

It would have been obvious to modify Newton '141 with the teaching of Newton '191 as discussed above, and further with the teaching of Thompson of using a cylindrical groove in the outer wall of the cylindrical body of claim element [5] as explained below. Newton '141 and Thompson are analogous art, from the same field of endeavor (e-cigarettes) as the '744 Patent, and are both pertinent to multi-component e-cigarette assemblies that hold liquid for vaporization and have simplified connection structures among the components, including a battery stick, vaporizer, and casing tube of the vaporizer. (Ex.1002 ¶178.)

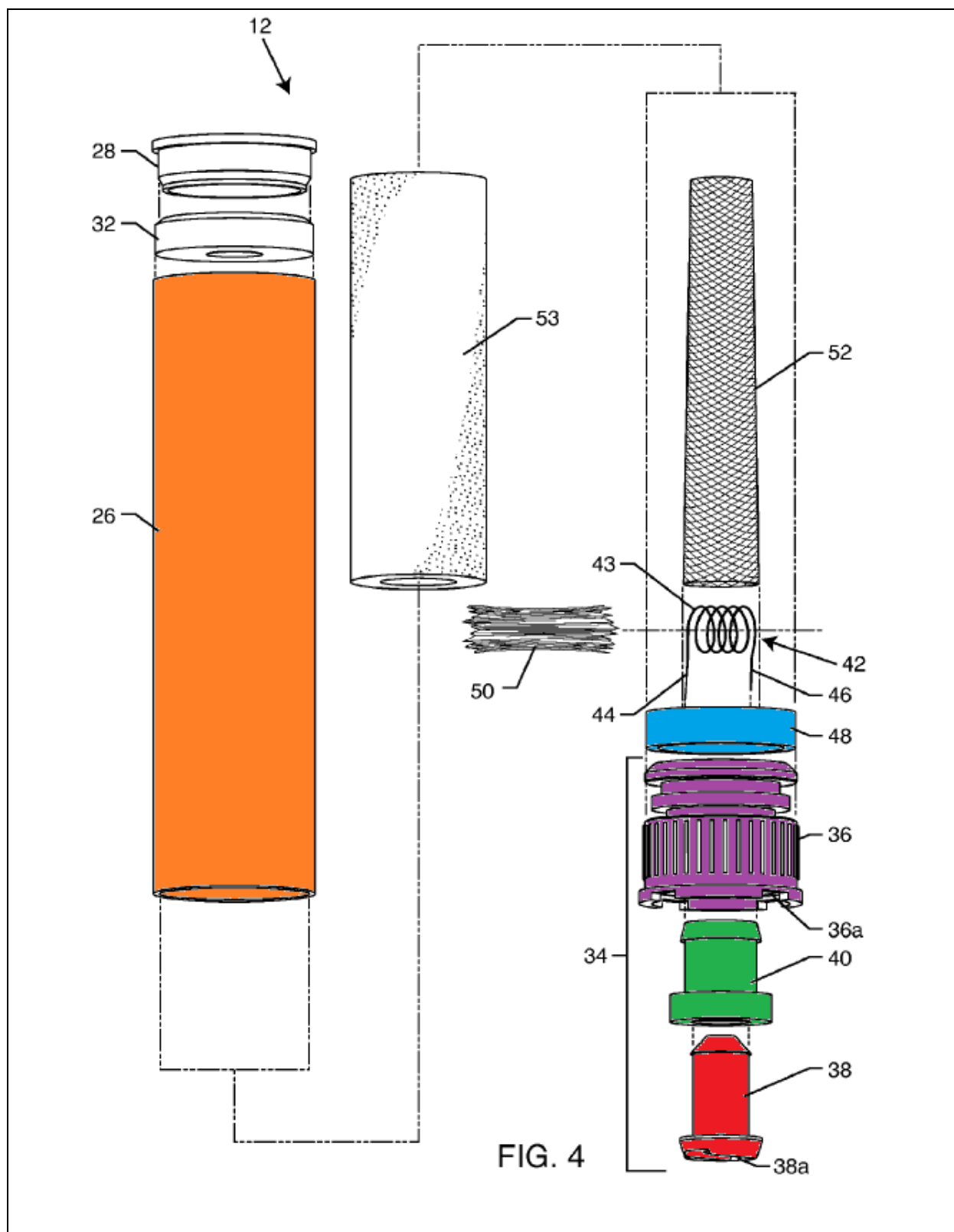
2. Dependent Claim 5

Claim 5 is obvious in view of Newton '141 combined with Newton '191 and Thompson.

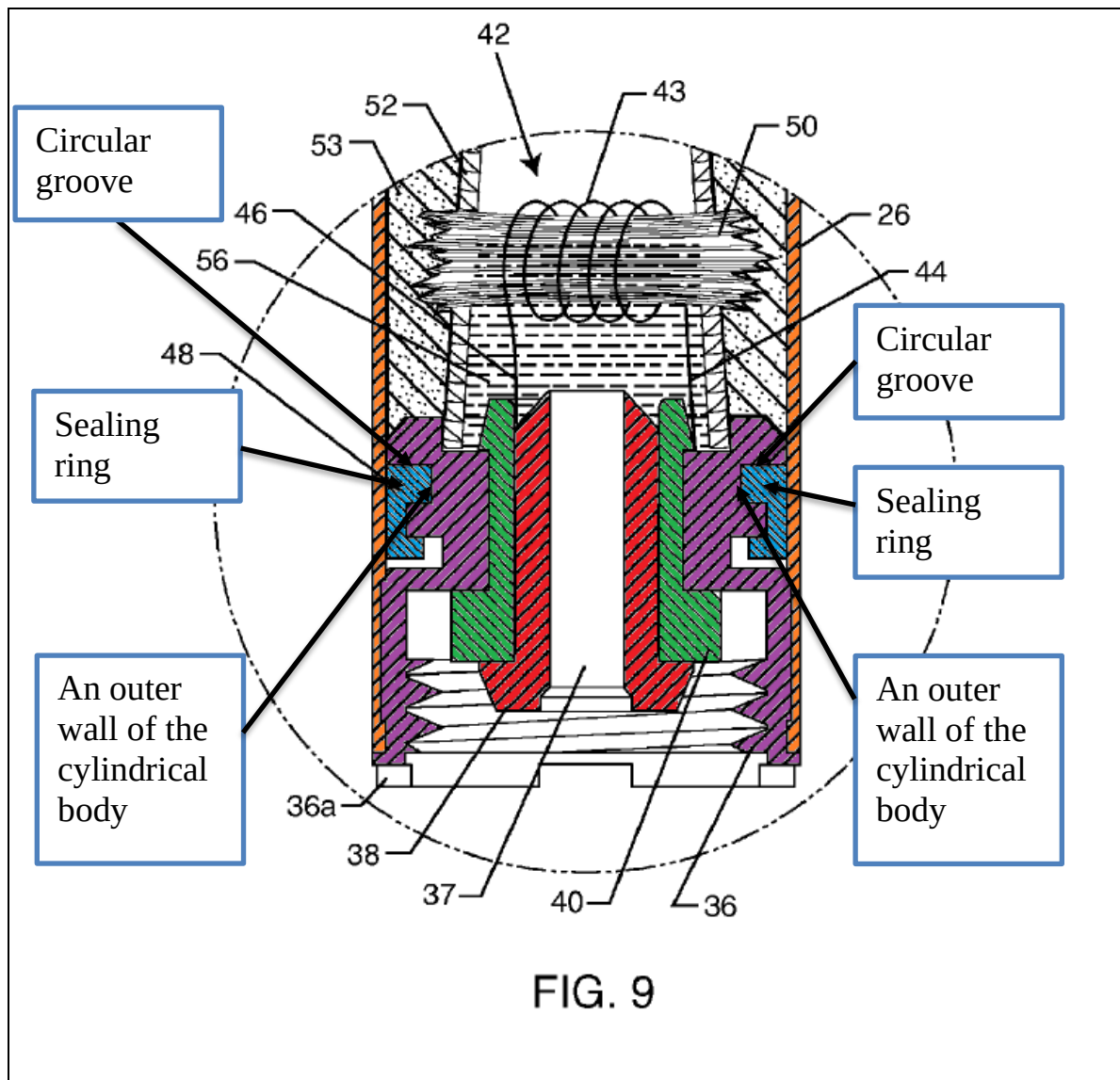
- a. **[5] 5. The electronic cigarette according to claim 2, characterized in that the outer wall of the cylindrical body is provided with a circular groove configured for mounting a sealing ring.**

As explained in limitation **[1d]**, Newton '141 discloses small atomizer assembly 10 having **small connector 30** and **vaporizer tube body 10**. (Ex.1005 ¶¶[0042], [0045], FIGS.3, 13; Ex.1002 ¶180.) Newton '141 also discloses that small atomizer assembly 10 includes “a bundle of absorbent fibers 74 enables atomizing liquid (not shown) to flow by capillary action from a liquid storage chamber 68 to the atomizer 72.” (Ex.1005 ¶[0049], FIG.13; Ex.1002 ¶180.) Thus, as shown in FIG.13, liquid storage chamber 68 is provided within **vaporizer tube body 10**, which has **small connector 30** at one end. As discussed in limitations **[2pre]-[2c]**, connection seat 30 also meets the language of claim 2.

Thompson discloses a similar liquid housing as a cartomizer 12 including an atomizing coil 42 electrically connected via positive and negative terminal leads 44, 46 to **an outer terminal 36** and **an inner terminal 38**, with a **silicone rubber gasket 40** concentrically disposed therebetween. (Ex.1007 ¶¶[0025]-[0027], FIGS.4, 9; Ex.1002 ¶181.)



As shown in FIG.9, **outer terminal 36** is cylindrical with a protruding platform at the bottom end, and is sheathed with an inner wall of an end of **a body 26** holding a vaporizable liquid 56. (Ex.1007 ¶¶[0029]-[0030], FIGS.4, 9; Ex.1002 ¶182.) “A volatile liquid 56 is contained within the **body 26** between the silicone rubber liquid barrier 32 and the **silicone rubber ring 48**.” (Ex.1007 ¶[0029], FIGS.4, 9; Ex.1002 ¶182.) FIG.9 further shows that rubber **ring 48** is disposed in a recessed groove around the cylindrical **outer terminal 36**:



It would have been obvious to a POSITA to provide the outer wall of the cylindrical body of **second connection seat 30** of Newton '141 with a circular groove configured for mounting a sealing ring, as disclosed by the recessed groove around the cylindrical **outer terminal 36** of Thompson. Both Newton '141 and Thompson are in the same field of e-cigarettes and connect an atomizer to a battery to vaporize

a liquid. (Ex.1002 ¶183.) Both include tubular housings with seats at the end and in which a liquid is disposed. (*Id.* ¶183.) Both maintain the vaporizable liquid within the designated chambers without leaking so that it is available to be heated and vaporized. (*Id.* ¶183.) Further, Thompson expressly teaches use of a circular groove mounting a [silicone rubber ring 48](#) at a location within the seat ([outer terminal 36](#)) at the end of [body 26](#). (*Id.* ¶183.) Thus, it would have been obvious to modify the outer wall of [small connector 30](#) of Newton '141 to include a circular groove mounting a [silicone rubber ring 48](#) as disclosed by Thompson since it would involve combining well-known prior art elements (seats at the end of tubular bodies holding liquids) according to known methods to yield the predictable result of ensuring that no liquid leaks from the associated chamber. (*Id.* ¶183.)

It also would have been obvious to a POSITA to modify the outer wall of [small connector 30](#) of Newton '141 to include a circular groove since doing so would use a known technique of a [silicone rubber ring 48](#) to improve a similar connection between a seat and a casing tube in the same way of providing an additional barrier to prevent leakage of the vaporizable liquid. (*Id.* ¶184.) The arrangement of the casing tube and seat of cartomizer 12 of Thompson is an obvious modification of the comparable casing tube and seat of atomizer assembly 10 of Newton '141 since it adds a circular groove for a sealing ring to enhance the ability of the device to

maintain the liquid without leaking. (Ex.1002 ¶184.) Adding the circular groove disclosed by Thompson to the outer wall of **small connector 30** of Newton '141 matches the structure of claim 5 of the '744 Patent, and achieves the same purpose of preventing leakage from a reservoir. (*Id.* ¶¶184.)

In addition to being disclosed in Thompson, other state-of-the-art e-cigarette references Pan (Ex.1010) and Liu '919 (Ex.1011) disclose the well-known feature of a circular groove configured for mounting a sealing ring of limitation [5]. (See seal washer 251 in leak-proof-piece 23 in Pan, Ex.1010 ¶[0029], FIG.3; Ex.1002 ¶185; see sealing ring 82 in groove 814 of sleeve seat 81 in Liu '919, Ex.1011 ¶[0041], FIGS.6, 7; Ex.1002 ¶185.)

Thus, the disclosure of Newton '141 combined with Newton '191, as discussed above in connection with claims 1 and 2, and further modified by the disclosure of Thompson discloses Limitation [5].

C. Ground 3: Claims 1, 2, And 5 Are Obvious In View Of Newton '141 And Thompson

1. The Combination Of Newton '141 And Thompson

It would have been obvious to modify Newton '141 with the teaching of Thompson as explained below. Newton '141 and Thompson are analogous art, from the same field of endeavor (e-cigarettes) as the '744 Patent, and are both pertinent to multi-component e-cigarette assemblies with simplified connection structures

among the components, including a battery stick, vaporizer, and casing tube of the vaporizer. (Ex.1002 ¶187.)

2. Independent Claim 1

Claim 1 is obvious in view of Newton '141 and Thompson.

- a. **[1a] 1. An electronic cigarette comprising a battery stick, a vaporizer assembly and a mouth piece that are connected together, characterized in that**

Newton '141 discloses this limitation. (See §X.A.2.a.)

- b. **[1b] the battery stick comprises a battery, a casing tube of the battery stick for sheathing the battery, and a first connection portion arranged at an end of the casing tube of the battery stick adjacent to the vaporizer assembly;**

Newton '141 discloses this limitation. (See §X.A.2.b.)

- c. **[1c] the vaporizer assembly comprises a vaporizer, and a casing tube of the vaporizer for sheathing the vaporizer in an inner cavity of the casing tube;**

Newton '141 discloses this limitation. (See §X.A.2.c.)

- d. **[1d] the vaporizer comprises a vaporizer tube body, and a second connection portion arranged at an end of the vaporizer tube body adjacent to the battery stick;**

Newton '141 discloses this limitation. (See §X.A.2.d.)

- e. **[1e] a third connection portion is arranged at an end of the casing tube of the vaporizer adjacent to the battery stick;**

Newton '141 discloses this limitation. (See §X.A.2.e.)

- f. [1f] the second connection portion and the first connection portion abut against each other to be connected, the third connection portion is detachably connected to the first connection portion by means of a screw thread;**

Newton '141 discloses this limitation. (See §X.A.2.f.)

- g. [1g] the first connection portion comprises a first connection seat having an outer thread and serving as a negative electrode electrically connected to a negative electrode of the battery, a first positive electrode arranged at a center of the first connection seat and electrically connected to a positive electrode of the battery, and a first insulation sleeve placed between the first positive electrode and the first connection seat;**

- i. “the first connection portion comprises a first connection seat having an outer thread”**

Newton '141 discloses this limitation. (See §X.A.2.g.i.)

- ii. “the first connection portion comprises . . . a first . . . electrode arranged at a center of the first connection seat”**

Newton '141 discloses this limitation. (See §X.A.2.g.ii.)

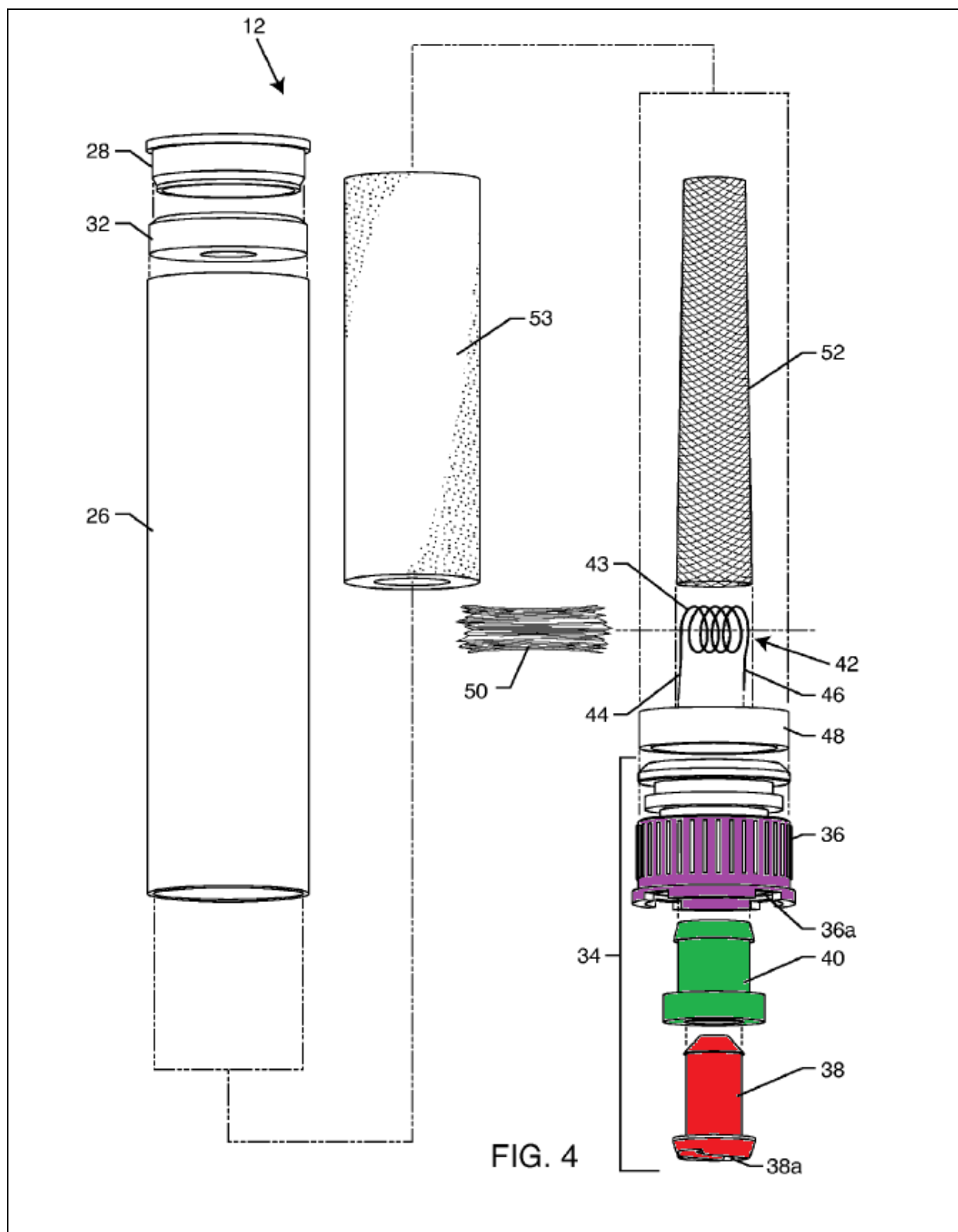
- iii. **“first connection seat . . . serving as a negative electrode electrically connected to a negative electrode of the battery” / “a first positive electrode . . . electrically connected to a positive electrode of the battery”**

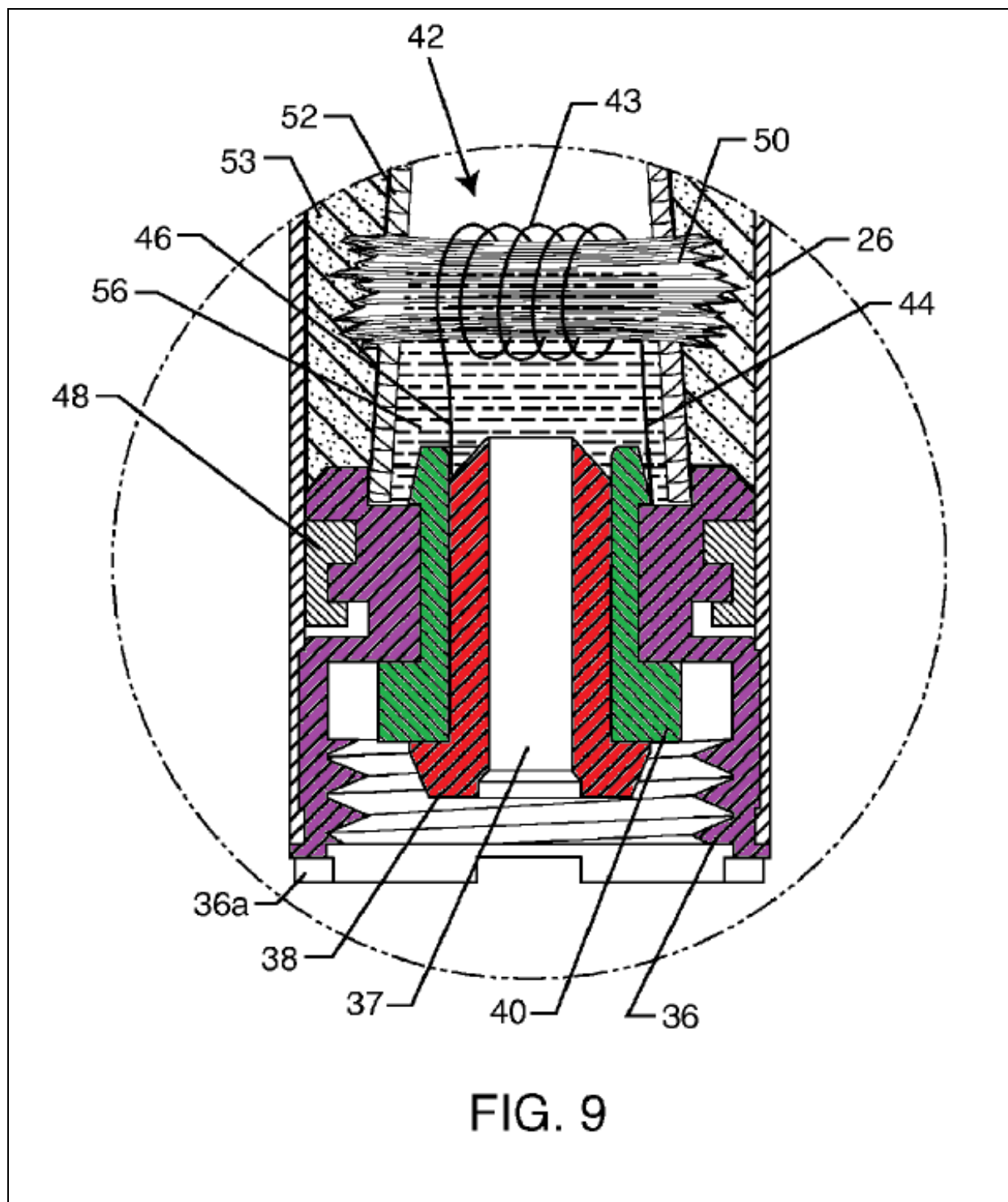
Newton '141 renders obvious this limitation. (See §X.A.2.g.iii.)

- iv. **“the first connection portion comprises . . . a first insulation sleeve placed between the first positive electrode and the first connection seat;”**

Newton '141 discloses, inherently discloses, or renders obvious a first insulation sleeve between first positive electrode 20 and first connection seat 16/18, as explained above in §X.A.2.g.iv.

Alternatively, the use of an insulation sleeve between the first positive electrode and the first connection seat is also rendered obvious by Newton '141 in view of Thompson. As shown in FIGS. 4 and 9 of Thompson, cartomizer 12 includes an atomizing coil 42 electrically connected via positive and negative terminal leads 44, 46 to an outer terminal 36 and an inner terminal 38, with a silicone rubber gasket 40 concentrically disposed therebetween:





The **outer terminal 36** and the **inner terminal 38** are concentrically disposed in the second end of the body 26 and have central passageways 37. . . . A **silicone rubber gasket 40** is disposed between the **outer terminal 36** and the **inner terminal 38** so as to prevent leakage and electrically insulate one terminal from the other, thus preventing a short circuit or other electrical failure. The **silicone rubber gasket 40** is configured such that the concentric nesting of the **outer terminal 36**, the **silicone rubber gasket 40** and the **inner terminal 38** results in a friction or press fit that maintains a tight connection.

(Ex.1007 ¶[0025], FIGS.4, 9; Ex.1002 ¶199.)

As illustrated most clearly in FIGS. 8 and 9, an atomizing coil 42 is disposed in the body 26 adjacent to the battery coupling 34. The atomizing coil 42 has a body composed of loops of conductive wire 43 ending in positive and negative terminal leads 44, 46. . . .

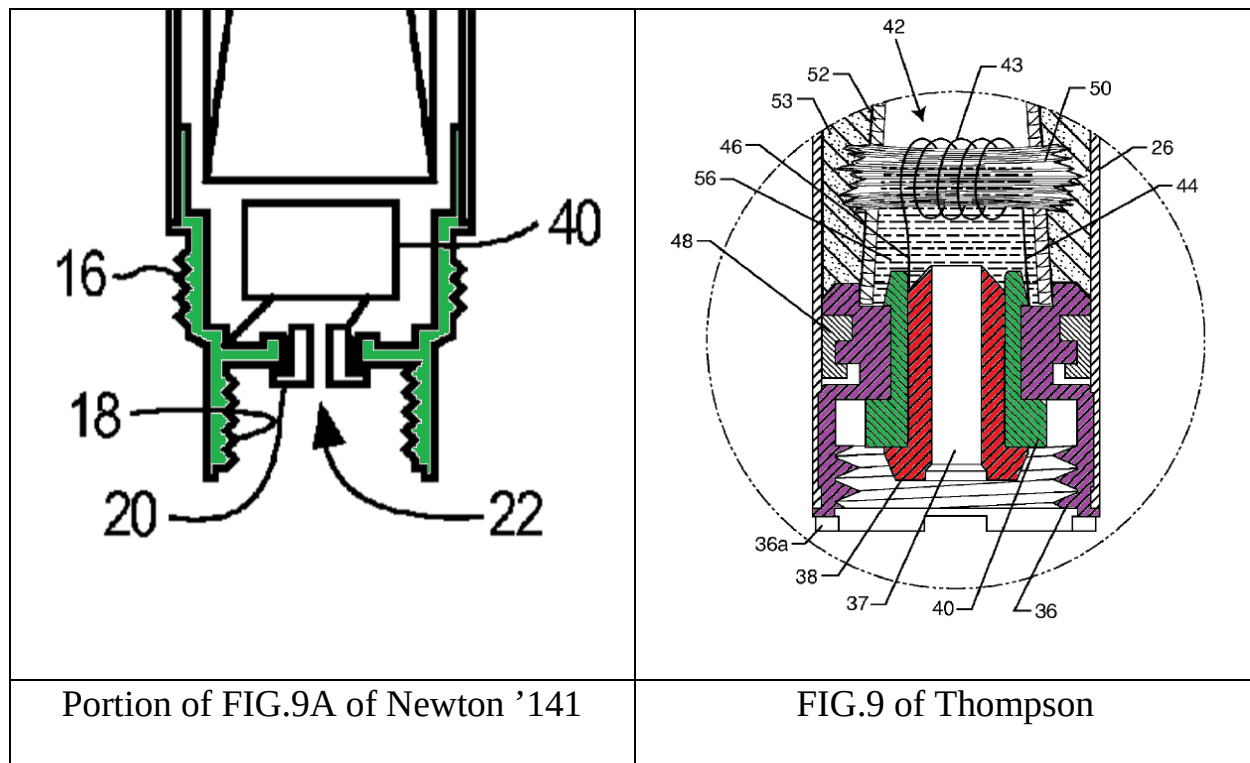
(Ex.1007 ¶[0026], FIGS.4, 9; Ex.1002 ¶199.)

In this configuration, a partial circuit is created from the **outer terminal 36** through the positive terminal lead 44, the atomizing coil 42, the negative terminal lead 46, and to the **inner terminal 38**.

(Ex.1007 ¶[0027], FIGS.4, 9; Ex.1002 ¶199.)

It would have been obvious to a POSITA to use an insulation sleeve as disclosed in Thompson between the first positive electrode and first connection seat in Newton '141 for multiple reasons. Both Newton '141 and Thompson are

disclosures in the same field of e-cigarettes having an atomizer connected to a battery. Both require insulation of positive/negative electrodes from one another to prevent short circuiting during operation of the circuit, as specifically discussed by Thompson. (Ex.1002 ¶200.) Further, Thompson expressly teaches use of a silicone rubber gasket sleeve concentrically nested between outer terminal 36 and inner terminal 38 to electrically insulate the terminals. (*Id.* ¶200.) Thus, it would have been obvious to use a gasket sleeve between the first positive electrode and first connection seat in Newton '141 since it would involve combining well-known prior art elements (insulators) according to known methods to yield predictable insulation. (Ex.1002 ¶200.) Based on the described electrical operation of Newton '141, including the operation of its electrical contact terminal 20 and threaded element 16/18, and the relatively thicker black lines illustrated in FIG.9A, a POSITA would have been motivated to provide an insulation sleeve (like gasket 40 of Thompson) at the locale of the thick black lines to engage/support electrical contact terminal 20 and insulate it from electrical contact with threaded element 16/18 to prevent a short circuit and enable operation of the circuit. (Ex.1002 ¶200.)



Thus, Newton '141 itself discloses, inherently discloses, or renders obvious, or renders obvious in combination with Thompson, all elements of limitation [1g](i-iv).

- h. [1h] the second connection portion comprises a second connection seat serving as a negative electrode electrically connected to a heating coil of the vaporizer, a second positive electrode arranged at a center of the second connection seat and electrically connected to the heating coil of the vaporizer, and a second insulation sleeve placed between the second positive electrode and the second connection seat;
- i. “the second connection portion comprises a second connection seat”

Newton '141 discloses this limitation. (See §X.A.2.h.i.)

- ii. **“the second connection portion comprises . . . a second . . . electrode arranged at a center of the second connection seat”**

Newton '141 discloses this limitation. (See §X.A.2.h.ii.)

- iii. **“second connection seat serving as a negative electrode electrically connected to a heating coil of the vaporizer,” / “a second positive electrode . . . electrically connected to the heating coil of the vaporizer,”**

Newton '141 renders obvious this limitation. (See §X.A.2.h.iii.)

- iv. **“the second connection portion comprises . . . a second insulation sleeve placed between the second positive electrode and the second connection seat;”**

Newton '141 shows, or inherently discloses, or renders obvious all elements of this limitation, including, a second insulation sleeve between second positive electrode 32 and second connection seat 30, as discussed in §X.A.2.h.iv.

In addition, use of an insulation sleeve between the second positive electrode and the second connection seat is also rendered obvious by Newton '141 in view of Thompson. As indicated above, Thompson teaches such a silicone rubber gasket 40 between metal atomizer assembly 28 and electrical coupler 22 outer terminal 36 and inner terminal 38.

For the same reasons set forth above in §X.C.2.g.iv, it would have been obvious to a POSITA to use an insulation sleeve between the second positive electrode and second connection seat in Newton '141.

The above is reinforced by the disclosure of Thompson, which explicitly discloses a gasket 40 concentrically arranged between the same elements. (Ex.1002 ¶209.)

Thus, Newton '141 discloses or renders obvious, either alone or in combination with Thompson, all elements of limitation **[1h](i)-(iv)**.

- i. **[1i] the second positive electrode has a central through hole along an axial direction of the second positive electrode for intercommunicating with a vaporizing cavity of the vaporizer, an end surface of the second positive electrode has a transversal groove along a radial direction of the end surface for intercommunicating with the central through hole;**

All elements of this limitation are disclosed in Newton '141 except for a transversal groove in the second positive electrode. However, as discussed above, an electrode with a traversal groove was a common feature in the art (*e.g.*, see Newton '191, Thompson, Liu '556, Liu '527) such that this limitation would have been obvious based on the combination of Newton '141 with either Newton '191 or Thomson, or in view of the well-known state-of-the-art. For clarity, limitation **[1i]** is discussed in subparts **[1i](i)-(ii)** below.

- i. **“the second positive electrode has a central through hole along an axial direction of the second positive electrode for intercommunicating with a vaporizing cavity of the vaporizer,”**

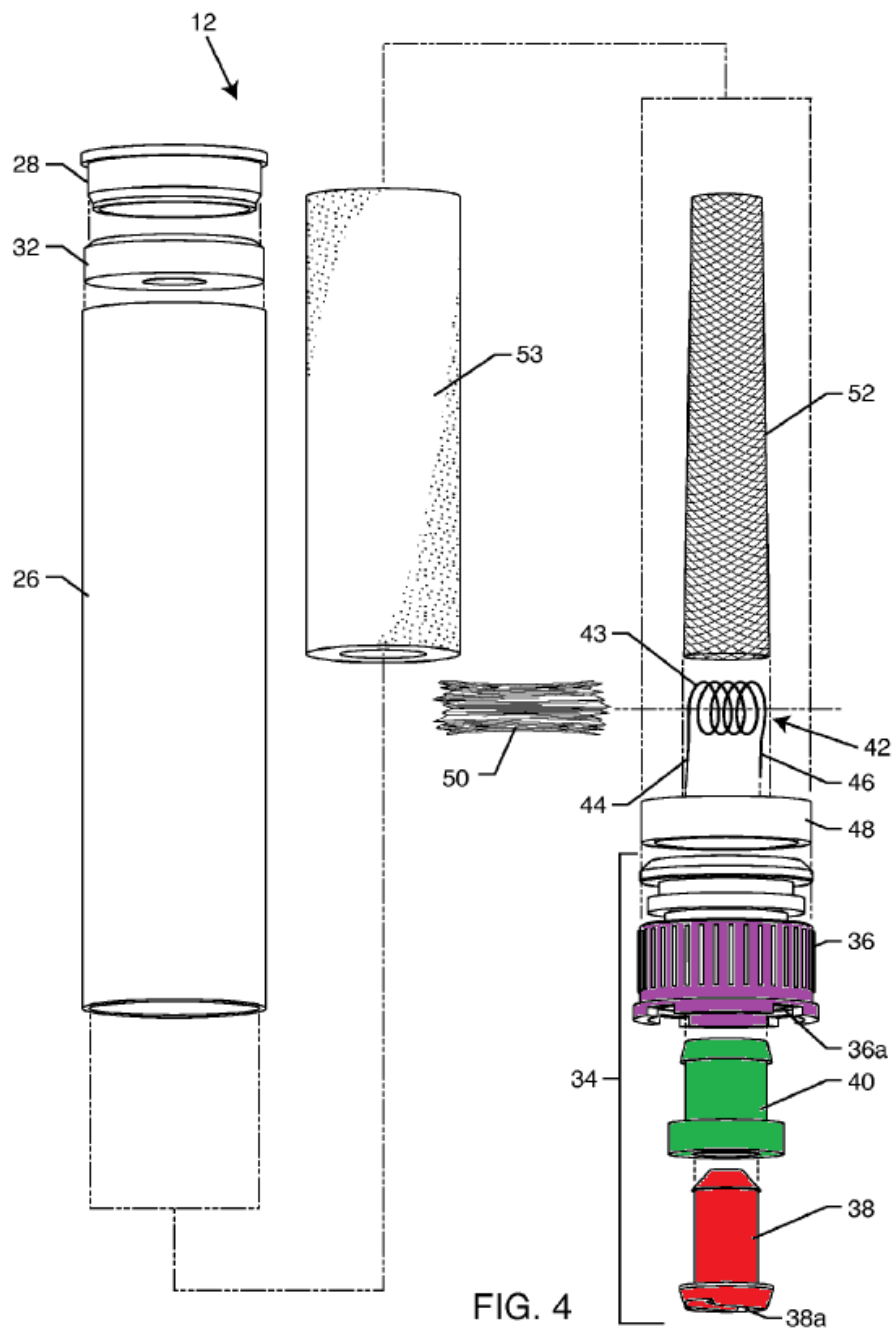
Newton '141 discloses this limitation. (See §X.A.2.i.i.)

- ii. **“an end surface of the second positive electrode has a transversal groove along a radial direction of the end surface for intercommunicating with the central through hole;”**

It would have been obvious to a POSITA to modify Newton '141 to use inner terminal 38 having a transversal groove (air vents 38a) disclosed in Thompson in place of electrical contact terminal 20 of Newton '141. Such a modification would have been obvious to a POSITA because: (1) it was a well-known design choice and a simple substitution to use such an electrode design, (2) the use of such electrodes and air flow techniques yield predictable results, (3) Newton '141 and Thompson are in the same field of e-cigarettes, (4) there is express teaching, suggestion, and motivation to combine Newton '141 with Thompson to use an electrode with a transversal groove, and (5) PO already conceded during prosecution that a second positive electrode with a transversal groove is a known feature in the art and is thus unpatentable. (Ex.1002 ¶214.) The explanation below relies on the same structural analysis of Newton '141 and modification of its disclosure with the same structural

feature (though found in Thompson instead of Newton '191), all of which is set forth above in §X.A.2.i.ii.

As discussed above, Newton '141 discloses electrical contact terminal 32 in small atomizer assembly 10 having a pneumatic port 34 to allow air to enter atomizing chamber 70. (Ex.1005 ¶[0049], FIG.13, 15; Ex.1002 ¶215.) Thompson discloses the well-known state-of-the-art design choice of using an electrode having an end surface with a transversal groove. Thompson discloses an electrode (inner terminal 38) having an end surface with a transversal groove (air vents 38a) along a radial direction of the end surface for intercommunicating with a central passageway, as shown in the annotated FIG.4:



The outer terminal 36 includes air intake vents 36a around its perimeter to allow air into the central passageway (described below) during

inhalation. The inner terminal 38 also includes air vents 38a to connect the air intake vents 36a to the central passageway.

(Ex.1008 ¶[0025], FIG.4b; Ex.1002 ¶216.)

Using such a design of Thompson in place of electrical contact terminal 32 of Newton '141 would be a matter of obvious design choice and a simple substitution of one part for another. (Ex.1002 ¶217.) It was known in the art to use an electrode with a transversal groove in its end surface to accommodate the entry of external airflow, as explained in Thompson. Designs such as that of Thompson were also used in other prior art electronic cigarette designs as discussed in §VI.C.4.

To a POSITA, it is clear that airflow is required in Newton '141 for the operation of e-cigarette 4. (*Id.* ¶218.) The positions for the air inlet openings in an electronic cigarette amount to only a finite number of solutions, *i.e.*, locations along the e-cigarette, for air to enter. (*Id.* ¶218.) Thompson discloses the design choice that air is inlet to the e-cigarette at air intake vents 36a located at the outer terminal 36 and flows via a transversal groove 38a into electrode 38. (Ex.1008 FIGS.3-9; Ex.1002 ¶218.) Thompson requires air flow through the central passageways 37 in inner terminal 38 in the same manner that Newton '141 does. (Ex.1005 ¶[0049], FIG.15; Ex.1008 FIGS.3-9; Ex.1002 ¶218.)

Using inner terminal 38 of Thompson in the e-cigarette of Newton '141 would also predictably permit electrical connection from the battery to the atomizer while also providing an entrance for airflow into the internal port of the electrode. (Ex.1002 ¶219.) The interchangeability of these features in these e-cigarette disclosures was readily known in the art.

Since Thompson discloses inner terminal 38 having a transversal groove (air vents 38a) for permitting access by air to its central through-hole, a POSITA would be motivated to use inner terminal 38 so that air can be accommodated into the electronic cigarette of Newton '141 to facilitate its use in the same way. (*Id.* ¶220.) A POSITA would have understood the similarities between the disclosures of Newton '141 and Thompson, which include the same field of e-cigarettes having an atomizer connected to a battery, such that it would have been obvious to utilize inner terminal 38 of Thompson in place of electrical contact terminal 20 of Newton '141. (*Id.* ¶220.)

This claimed transversal groove of limitation **[1i]** was rejected in view of Thompson or Liu '556 during prosecution (Ex.1004, 86-90), both of which disclose use of this groove (*see* groove (air vents 38a) in Thompson, Ex.1008 ¶[0025], FIG.4b; Ex.1002 ¶221; *see* groove in first electrode 57 in Liu '556, Ex.1009 ¶[0035], FIG.2; Ex.1002 ¶221). Liu '556 further evidences the state-of-the-art for electrodes

used in electronic cigarettes. PO did not offer any response to those rejections, and did not mention the claimed transversal groove of limitation **[1i]** in its arguments for patentability. (Ex.1004, 78-79.) Thus, PO conceded that the claimed transversal groove was a known design choice and was disclosed by the prior art.

Thus, Newton '141 in view of Thompson renders obvious an end surface of a second positive electrode having a transversal groove 38a along a radial direction of the end surface for intercommunicating with the central through-hole 26.

- j. **[1j] the third connection portion has an inner thread engaging with the outer thread of the first connection seat;**

Newton '141 discloses this limitation. (See §X.A.2.j.)

- k. **[1k] the first positive electrode and the second positive electrode abut against each other to be electrically connected, the first connection seat and the second connection seat are electrically connected;**

Newton '141 discloses this limitation. (See §X.A.2.k.)

- l. **[1l] the first connection seat has a step-like shape, a protruding step is formed at a middle portion of the first connection seat that has a maximum outer diameter;**

Newton '141 discloses this limitation. (See §X.A.2.l.)

- m. **[1m] one side of the protruding step is provided with a first cylindrical wall having an outer diameter smaller than that of the protruding step, the first cylindrical wall is sheathed with an inner wall of said end of the casing tube of the battery stick, the outer diameter of the protruding step equals an outer diameter of the casing tube of the battery stick;**

Newton '141 discloses this limitation. (See §X.A.2.m.)

- n. **[1n] the other side of the protruding step is provided with a second cylindrical wall having an outer diameter smaller than that of the protruding step and having the outer thread, one end of the second cylindrical wall is provided with a base wall having a central through hole, the central through hole is configured for installing the first positive electrode and the first insulation sleeve.**

For clarity, this limitation is discussed below in subparts [1n](i)-(iii).

- i. **“the other side of the protruding step is provided with a second cylindrical wall having an outer diameter smaller than that of the protruding step and having the outer thread”**

Newton '141 discloses this limitation. (See §X.A.2.n.i.)

- ii. **“one end of the second cylindrical wall is provided with a base wall having a central through hole”**

Newton '141 discloses this limitation. (See §X.A.2.n.ii.)

- iii. **“the central through hole is configured for installing the first positive electrode and the first insulation sleeve.”**

Newton '141 alone or in combination with Thompson discloses this limitation, noting that Newton '141 either alone or in combination with Thompson, as discussed above, discloses or renders obvious an insulation sleeve between the first positive electrode 20 and the first connection seat 16/18. (See §X.A.2.n.iii.)

3. Dependent Claim 2

Claim 2 is obvious in view of Newton '141 combined with Thompson.

- a. **[2pre] 2. The electronic cigarette according to claim 1, characterized in that**

Newton '141 discloses this limitation. (See §X.A.3.a.)

- b. **[2a] the second connection seat is a cylindrical body having a protruding platform at one end thereof;**

Newton '141 discloses this limitation. (See §X.A.3.b.)

- c. **[2b] an outer wall of the cylindrical body is sheathed with an inner wall of said end of the vaporizer tube body;**

Newton '141 discloses this limitation. (See §X.A.3.c.)

- d. **[2c] an inner wall at a lower portion of the second connection seat is provided with a base wall, a tubular body is protruded from a center of the base wall, the tubular body is provided with a central through hole for installing the second insulation sleeve and the second positive electrode.**

Newton '141 alone or in combination with Thompson discloses this limitation, noting that Newton '141 either alone or in combination with Thompson discloses a second insulation sleeve placed between the second positive electrode 32 and the second connection seat 30. (See §X.A.3.d.)

4. Dependent Claim 5

Claim 5 is obvious in view of Newton '141 combined with Thompson.

- a. **[5] 5. The electronic cigarette according to claim 2, characterized in that the outer wall of the cylindrical body is provided with a circular groove configured for mounting a sealing ring.**

Thompson discloses this limitation. (See §X.B.2.a.) Moreover, the analysis in that section explains why it would have been obvious to a POSITA to modify Newton '141 based on the disclosure of Thompson to arrive at limitation [5].⁴

⁴ The analysis in §X.B.2.a did not rely upon the disclosure of Newton '191 to invalidate limitation [5].

XI. SECONDARY CONSIDERATIONS

Secondary considerations should be considered but do not control the obviousness conclusion. *Newell Cos. v. Kenney Mfg. Co.*, 864 F.2d 757, 768 (Fed. Cir. 1988). Where a strong *prima facie* obviousness showing exists, even relevant secondary considerations supported by substantial evidence may not dislodge obviousness conclusion. *Leapfrog Enters. v. Fisher-Price, Inc.*, 485 F.3d 1157, 1162 (Fed. Cir. 2007). Petitioners reserve the right to rebut any alleged evidence of secondary considerations if submitted by PO.

XII. DISCRETIONARY DENIAL IS NOT WARRANTED

A. Discretionary Denial Is Not Warranted Under 35 U.S.C. §325(d)

Denial under §325(d) is not warranted because the grounds presented herein are not cumulative to the prior art considered during prosecution. Neither of the primary references—Newton '141 or Liu '527—were cited during prosecution and both disclose the very aspect of the claims PO asserted as novel—the vaporizer and casing tube being two separate parts. (Ex.1001 col.1 ll.25-28; Ex.1004, 78-79.)

B. Denial Of Institution Is Not Warranted Under *Fintiv*

Discretionary denial under 35 U.S.C. §314(a) is not warranted because the *Fintiv* factors discussed below support Petitioners and because the invalidity grounds here meet the compelling merits standard. (See Ex. 1012, *Commscope Technologies LLC v. Dali Wireless, Inc.*, IPR 2022-01242, Paper No. 23 at 4 (February 27, 2023))

(the Board need only consider the compelling merits addressed in the Memorandum of June 21, 2022 if *Fintiv* factors 1-5 favor denial). Although Petitioners have met the compelling merits standard here, the Board need not reach that analysis in view of *Fintiv* factors 1-5 including the strong likelihood that the parallel Litigation will be dismissed due to improper venue.

Factor 1 (stay consideration) favors institution, or is at least neutral, because a stay may be granted for efficiency since the Court has not yet considered the merits of the case, a motion to stay discovery is pending along with a motion to dismiss for lack of venue as discussed further below, and the issues in the case would be substantially simplified or fully resolved if an IPR is instituted.

Factor 2 (proximity of the court's trial date to the projected statutory deadline for a final written decision) favors transfer in view of the likely dismissal for lack of venue. While the court's present scheduling order sets trial between August 12-23, 2024, "[a] court's scheduled trial date . . . is not by itself a good indicator of whether the district court trial will occur before the statutory deadline for a final written decision." (Ex.1022, Director Memorandum, *Interim Procedure for Discretionary Denials in AIA Post-Grant Proceedings with Parallel District Court Litigation* (June 21, 2022), at 8.) Petitioners moved to dismiss for lack of venue, or alternatively to transfer to NJ and to stay discovery in view of that motion. Specifically, Petitioners

filed a Motion to Dismiss for lack of venue (Ex.1013, DE13), to which PO responded (Ex.1014, DE17) and filed an Amended Complaint (Ex.1015, DE21). Petitioners then filed a notice to reassert their Motion to Dismiss for lack of venue (Ex.1016, DE24) and a supporting Reply to their Motion to Dismiss (Ex.1017, DE25). Petitioners also filed a Motion to Stay Discovery (Ex. 1012, DE30) prior to PO's filing of an Amended Complaint. After PO filed the Amended Complaint, the Court dismissed the Motion to Dismiss and Motion to Stay Discovery as moot because the original Complaint was replaced by the Amended Complaint but has not yet ruled on Petitioners reasserted Motion to Dismiss (Ex. 1016, DE24) or renewed Motion to Stay Discovery (Ex. 1019 – 1021, DE49, 50, 52). Petitioners also sought the court's guidance on its Reasserted Motion to Dismiss (Ex.1018, DE53) in view of the clear lack of statutory venue under *TC Heartland LLC v. Kraft Foods Group Brands LLC*, 137 S. Ct. 1514 (2017). To the extent that the parallel Litigation is transferred to NJ where venue is proper, the case schedule will be reset and NJ has a median time to trial of 56.5 months as of June 2023.⁵

⁵ <https://www.uscourts.gov/statistics-reports/federal-court-management-statistics-june-2023>, at PDF p.15.

Factor 3 (investment by the court and parties in the proceeding) favors institution. In view of the pending motions to dismiss and to stay discovery, the parties have conducted little discovery with no depositions taken such that the parties' investments to date are minimal. The court has also not invested time in this matter as there has not yet been any conference and the reasserted motions to dismiss and stay discovery have not yet been addressed. A *Markman* hearing is scheduled for November 6, 2023, but it is unclear at this time whether it will proceed.

Factor 4 (overlap in the issues) strongly favors institution because there is substantial overlap in the issues. The invalidity positions decided in the IPR are likely to be case dispositive in view of the compelling strength of the prior art on the merits. At a minimum, the invalidity issues substantially overlap with the issues in the parallel Litigation and resolution by the Board would be fully dispositive of the Litigation. Further, infringement and invalidity contentions have not yet been served in the Litigation and may never be served in view of the motion to dismiss.

Factor 5 (whether the petitioner and defendant are the same party) favors institution since all the parties are the same in the district court action.

Factor 6 (other circumstances, including the merits) strongly favors institution because the unpatentability challenges herein are compelling. Newton '141, Newton '191, and Liu '527 were never considered by the Examiner. Thompson is used as a

secondary reference for reasons conceded by PO including disclosure of various limitations in the challenged claims, such as an electrode having a transverse groove. Additionally, Petitioners' IPR is the only ever challenge to the '744 Patent before the Board. Moreover, there is a strong public interest against "leaving bad patents enforceable." *Thryv, Inc. v. Click-To-Call Techs., LP*, 140 S. Ct. 1367, 1374 (2020).

XIII. CONCLUSION

Petitioners request IPR and cancellation of claims 1, 2, and 5 of the '744 Patent.

Dated: October 19, 2023

By: /s/ Gregory S. Gewirtz
Gregory S. Gewirtz
Registration No. 36,522

APPENDIX A—CLAIM LISTING

Element	Listing of Challenged Claims Of Patent No. 9,924,744
[1a]	1. An electronic cigarette comprising a battery stick, a vaporizer assembly and a mouth piece that are connected together, characterized in that
[1b]	the battery stick comprises a battery, a casing tube of the battery stick for sheathing the battery, and a first connection portion arranged at an end of the casing tube of the battery stick adjacent to the vaporizer assembly;
[1c]	the vaporizer assembly comprises a vaporizer, and a casing tube of the vaporizer for sheathing the vaporizer in an inner cavity of the casing tube;
[1d]	the vaporizer comprises a vaporizer tube body, and a second connection portion arranged at an end of the vaporizer tube body adjacent to the battery stick;
[1e]	a third connection portion is arranged at an end of the casing tube of the vaporizer adjacent to the battery stick;
[1f]	the second connection portion and the first connection portion abut against each other to be connected, the third connection portion is detachably connected to the first connection portion by means of a screw thread;
[1g]	the first connection portion comprises a first connection seat having an outer thread and serving as a negative electrode electrically connected to a negative electrode of the battery, a first positive electrode arranged at a center of the first connection seat and electrically connected to a positive electrode of the battery, and a first insulation sleeve placed between the first positive electrode and the first connection seat;

Element	Listing of Challenged Claims Of Patent No. 9,924,744
[1h]	the second connection portion comprises a second connection seat serving as a negative electrode electrically connected to a heating coil of the vaporizer, a second positive electrode arranged at a center of the second connection seat and electrically connected to the heating coil of the vaporizer, and a second insulation sleeve placed between the second positive electrode and the second connection seat;
[1i]	the second positive electrode has a central through hole along an axial direction of the second positive electrode for intercommunicating with a vaporizing cavity of the vaporizer, an end surface of the second positive electrode has a transversal groove along a radial direction of the end surface for intercommunicating with the central through hole;
[1j]	the third connection portion has an inner thread engaging with the outer thread of the first connection seat;
[1k]	the first positive electrode and the second positive electrode abut against each other to be electrically connected, the first connection seat and the second connection seat are electrically connected;
[1l]	the first connection seat has a step-like shape, a protruding step is formed at a middle portion of the first connection seat that has a maximum outer diameter;
[1m]	one side of the protruding step is provided with a first cylindrical wall having an outer diameter smaller than that of the protruding step, the first cylindrical wall is sheathed with an inner wall of said end of the casing tube of the battery stick, the outer diameter of the protruding step equals an outer diameter of the casing tube of the battery stick;
[1n]	the other side of the protruding step is provided with a second cylindrical wall having an outer diameter smaller than that of the protruding step and having the outer thread, one end of the second cylindrical wall is provided with a base wall having a central through hole, the central through hole is configured for installing the first positive electrode and the first insulation sleeve.
[2pre]	2. The electronic cigarette according to claim 1, characterized in that

Element	Listing of Challenged Claims Of Patent No. 9,924,744
[2a]	the second connection seat is a cylindrical body having a protruding platform at one end thereof;
[2b]	an outer wall of the cylindrical body is sheathed with an inner wall of said end of the vaporizer tube body;
[2c]	an inner wall at a lower portion of the second connection seat is provided with a base wall, a tubular body is protruded from a center of the base wall, the tubular body is provided with a central through hole for installing the second insulation sleeve and the second positive electrode.
[5]	5. The electronic cigarette according to claim 2, characterized in that the outer wall of the cylindrical body is provided with a circular groove configured for mounting a sealing ring.

**CERTIFICATE OF COMPLIANCE
WITH TYPE-VOLUME LIMITATION**

Pursuant to Rule 37 C.F.R. §42.24(d), the undersigned hereby certifies that, based upon the word count of the word-processing system used to prepare this IPR, the number of words in this IPR is 13,870. Pursuant to 37 C.F.R. §42.24(a), this word count does not include “a table of contents, a table of authorities, a certificate of service or word count, exhibits, appendix, or claim listing.”

Dated: October 19, 2023

By: /s/ Gregory S. Gewirtz
Gregory S. Gewirtz
Registration No. 36,522

CERTIFICATE OF SERVICE

The undersigned hereby certifies that a copy of the foregoing **PETITION FOR *INTER PARTES* REVIEW OF U.S. PATENT NO. 9,924,744**, together with all exhibits, the Power of Attorney, and all other papers filed therewith was served in its entirety by filing these documents through the PTAB E2E System, as well as by FedEx to the following correspondence address of record for Patent Owner on October 19, 2023, as follows.

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