MINTZ

Petitioner JLI's Hearing Presentation

IPR2024-00160
IPR2024-00161

Overview

- Summary of Arguments
- Patent Overview
- Ground 1
  - Xia Alone
  - Xia with Wang and/or Fang
- Ground 2
  - Wang alone
  - Wang with Fang

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Summary of Arguments

- Base references Xia (Ground 1) and Wang (Ground 2) alone individually invalidate all claims
  - Patent Owner's purported distinctions contradict its arguments in the ITC regarding infringement and domestic industry
- Base references Xia and Wang invalidate with simple modifications that have clear and obvious benefits
  - Patent Owner's arguments either (1) mischaracterize the modification or (2) ignore benefits and rely on inflated drawbacks that do not take the modification outside of obviousness

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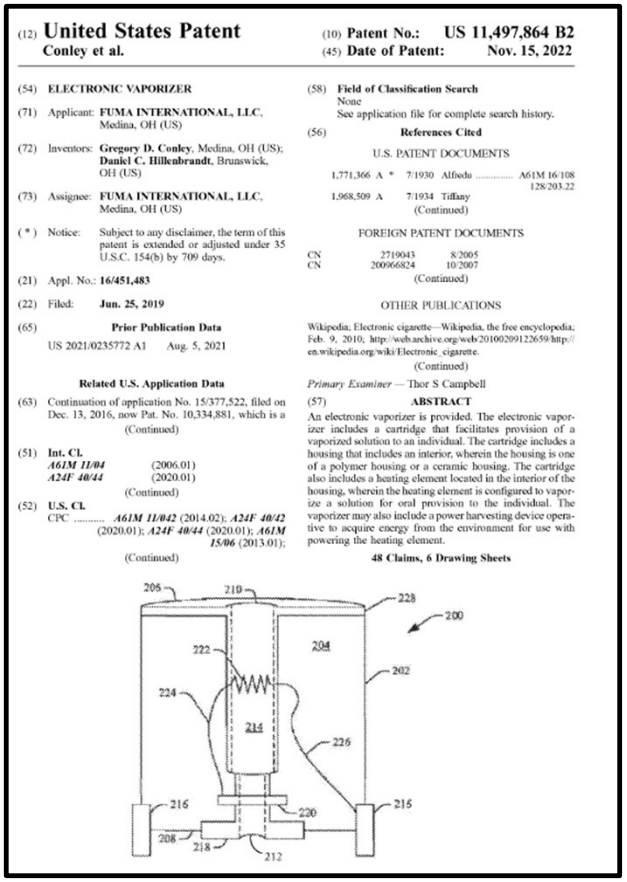
Patent Overview: ’864 and ’881 Patents



(12) **United States Patent**
Conley et al.

(10) **Patent No.: US 11,497,864 B2**
(45) **Date of Patent: Nov. 15, 2022**

(54) **ELECTRONIC VAPORIZER**

(71) Applicant: **FUMA INTERNATIONAL, LLC**, Medina, OH (US)

(72) Inventors: **Gregory D. Conley**, Medina, OH (US); **Daniel C. Hillenbrandt**, Brunswick, OH (US)

(73) Assignee: **FUMA INTERNATIONAL, LLC**, Medina, OH (US)

(*) Notice: Subject to any disclaimer, the term of this patent is extended or adjusted under 35 U.S.C. 154(b) by 709 days.

(21) Appl. No.: **16/451,483**

(22) Filed: **Jun. 25, 2019**

(65) **Prior Publication Data**

US 2021/0235772 A1 Aug. 5, 2021

Related U.S. Application Data

(63) Continuation of application No. 15/377,522, filed on Dec. 13, 2016, now Pat. No. 10,334,881, which is a (Continued)

(51) **Int. Cl.**
A61M 11/04 (2006.01)
A24F 40/44 (2020.01)
(Continued)

(52) **U.S. Cl.**
CPC ***A61M 11/042*** (2014.02); ***A24F 40/42*** (2020.01); ***A24F 40/44*** (2020.01); ***A61M 15/06*** (2013.01);
(Continued)

(58) **Field of Classification Search**
None
See application file for complete search history.

(56) **References Cited**

U.S. PATENT DOCUMENTS

1,771,366 A * 7/1930 Alfredu A61M 16/108 128/203.22
1,968,509 A 7/1934 Tiffany
(Continued)

FOREIGN PATENT DOCUMENTS

CN 2719043 8/2005
CN 200966824 10/2007
(Continued)

OTHER PUBLICATIONS

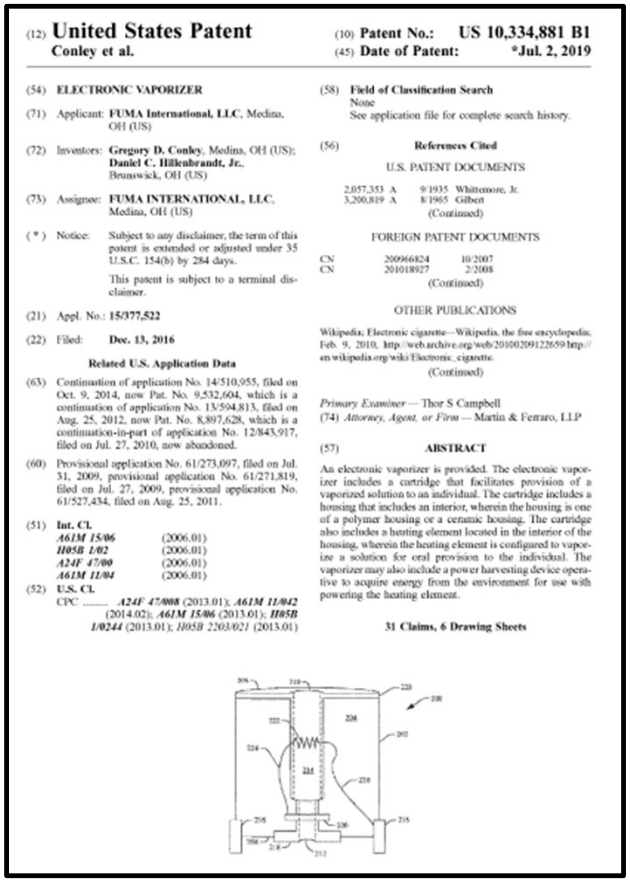
Wikipedia; Electronic cigarette—Wikipedia, the free encyclopedia; Feb. 9, 2010; http://web.archive.org/web/20100209122659/http://en.wikipedia.org/wiki/Electronic_cigarette.
(Continued)

Primary Examiner — Thor S Campbell

(57) **ABSTRACT**

An electronic vaporizer is provided. The electronic vaporizer includes a cartridge that facilitates provision of a vaporized solution to an individual. The cartridge includes a housing that includes an interior, wherein the housing is one of a polymer housing or a ceramic housing. The cartridge also includes a heating element located in the interior of the housing, wherein the heating element is configured to vaporize a solution for oral provision to the individual. The vaporizer may also include a power harvesting device operative to acquire energy from the environment for use with powering the heating element.

48 Claims, 6 Drawing Sheets



(12) **United States Patent**
Conley et al.

(10) **Patent No.: US 10,334,881 B1**
(45) **Date of Patent: *Jul. 2, 2019**

(54) **ELECTRONIC VAPORIZER**

(71) Applicant: **FUMA International, LLC**, Medina, OH (US)

(72) Inventors: **Gregory D. Conley**, Medina, OH (US); **Daniel C. Hillenbrandt, Jr.**, Brunswick, OH (US)

(73) Assignee: **FUMA INTERNATIONAL, LLC**, Medina, OH (US)

(*) Notice: Subject to any disclaimer, the term of this patent is extended or adjusted under 35 U.S.C. 154(b) by 284 days.

This patent is subject to a terminal disclaimer.

(21) Appl. No.: **15/377,522**

(22) Filed: **Dec. 13, 2016**

Related U.S. Application Data

(63) Continuation of application No. 14/510,955, filed on Oct. 9, 2014, now Pat. No. 9,532,604, which is a continuation of application No. 13/594,813, filed on Aug. 25, 2012, now Pat. No. 8,897,628, which is a continuation-in-part of application No. 12/843,917, filed on Jul. 27, 2010, now abandoned.

(60) Provisional application No. 61/273,097, filed on Jul. 31, 2009, provisional application No. 61/271,819, filed on Jul. 27, 2009, provisional application No. 61/527,434, filed on Aug. 25, 2011.

(51) **Int. Cl.**
A61M 15/06 (2006.01)
H05B 1/02 (2006.01)
A24F 47/00 (2006.01)
A61M 11/04 (2006.01)

(52) **U.S. Cl.**
CPC ***A24F 47/008*** (2013.01); ***A61M 11/042*** (2014.02); ***A61M 15/06*** (2013.01); ***H05B 1/0244*** (2013.01); *H05B 2203/021* (2013.01)

(58) **Field of Classification Search**
None
See application file for complete search history.

(56) **References Cited**

U.S. PATENT DOCUMENTS

2,057,353 A 9/1935 Whittemore, Jr.
3,200,819 A 8/1965 Gilbert
(Continued)

FOREIGN PATENT DOCUMENTS

CN 200966824 10/2007
CN 201018927 2/2008
(Continued)

OTHER PUBLICATIONS

Wikipedia; Electronic cigarette—Wikipedia, the free encyclopedia; Feb. 9, 2010; http://web.archive.org/web/20100209122659/http://en.wikipedia.org/wiki/Electronic_cigarette.
(Continued)

Primary Examiner — Thor S Campbell
(74) *Attorney, Agent, or Firm* — Martin & Ferraro, LLP

(57) **ABSTRACT**

An electronic vaporizer is provided. The electronic vaporizer includes a cartridge that facilitates provision of a vaporized solution to an individual. The cartridge includes a housing that includes an interior, wherein the housing is one of a polymer housing or a ceramic housing. The cartridge also includes a heating element located in the interior of the housing, wherein the heating element is configured to vaporize a solution for oral provision to the individual. The vaporizer may also include a power harvesting device operative to acquire energy from the environment for use with powering the heating element.

31 Claims, 6 Drawing Sheets

IPR2024-00160, Ex. 1001;
IPR2024-00161, Ex. 1001

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’864 and ’881 Specifications – Background

BACKGROUND

Electronic cigarettes (also referred to as e-cigarettes or personal vaporizers) are generally battery-powered devices that are configured to deliver a vapour that comprises nicotine to an individual. Conventional electronic cigarette designs generally include a battery, a heating element, and a mouthpiece. The mouthpiece includes a liquid solution that comprises nicotine, and the battery provides power to the heating element, which in turn operates to vaporize the solution. Accordingly, when the user places the mouthpiece in her mouth and draws from the mouthpiece, the user receives vaporized nicotine. Due to the ever-increasing taxes on tobacco products, popularity of electronic cigarettes is expected to continue to correspondingly increase.

Ex. 1001 at 1:18-32

* Citations are to ‘864 patent proceeding (-160) unless otherwise noted

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’864 and ’881 Specifications – Summary of Invention

SUMMARY

The following is a brief summary of subject matter that is described in greater detail herein. This summary is not intended to be limiting as to the scope of the claims.

Described herein are various aspects generally pertaining to electronic vaporizers, and more particularly pertaining to cartridges that comprise heating elements configured to vaporize a solution. In an exemplary embodiment, a cartridge configured for utilization in connection with an electronic vaporizer comprises a housing that has an interior, a first end, and a second end. The housing is constructed of one of a polymer, wood, ceramic or any combination thereof. The cartridge can also include a heating element that resides in the interior of the housing. The cartridge can be manufactured as a single assembly or can be designed so that the cartridge can be manufactured as a multi-piece assembly. The cartridge also comprises a solution that is positioned proximate to the heating element. The heating element is configured to vaporize the solution responsive to receiving power from a power source (e.g., a battery). Pursuant to an example, the cartridge can be designed for utilization as a portion of an electronic cigarette. Accordingly, the solution may comprise nicotine or other components. Furthermore, the solution can be configured such that the vapor has a flavor when received by a user as well as other ingredients.

Additionally, an adapter is described herein, wherein the adapter is configured to electrically or electronically couple a power source (such as a battery) having a first configuration with a heating element having a second configuration. Specifically, manufacturers of vaporizers generally manufacture a power source and a heating element in a proprietary manner, such that only a heating element provided by the manufacturer can be electrically or electronically coupled to a power source provided by the manufacturer. Typically, the power source (battery) is significantly more expensive than associated cartridges, and once a user purchases a power source they may not wish to purchase a different power source from a different manufacturer even if the tastes of the user change over time. The adapters described herein are configured to electrically or electronically couple power sources from a first manufacturer with a heating element from a second manufacturer.

The aforementioned adapter can provide for air flow (both direct and indirect), electrical and or electronic connection, data connections as well as power or an external heating source. The adapter may also incorporate onboard circuitry and/or sensors for collecting data from the adapter.

Other aspects will be appreciated upon reading and understanding the attached figures and description.

Ex. 1001 at 1:33-2:16

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’864 and ’881 Specifications – Figure 2

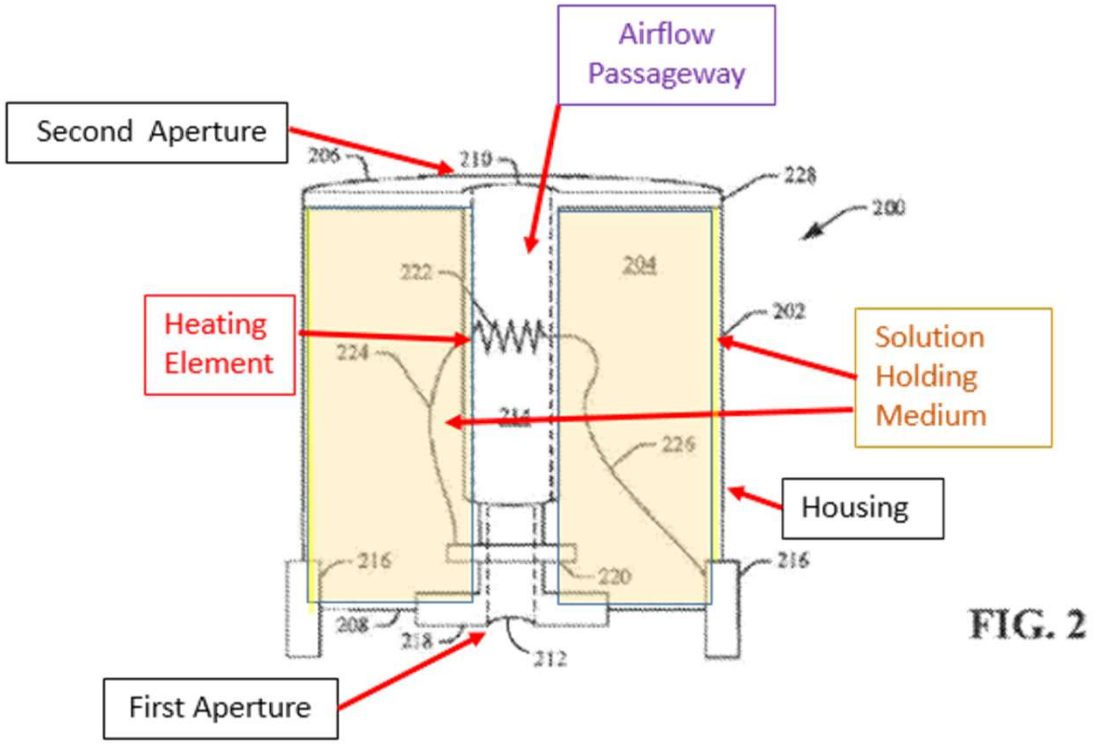

FIG. 2

Ex. 1001, Fig. 2 (annotated); Pet at 10.

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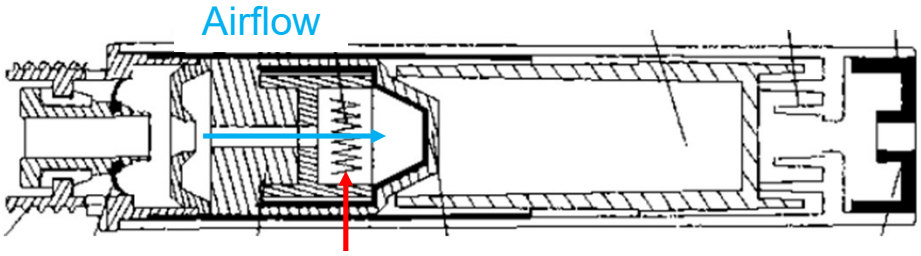
Patent Owner's Identified Point Of Novelty Fails

Patent Owner Response

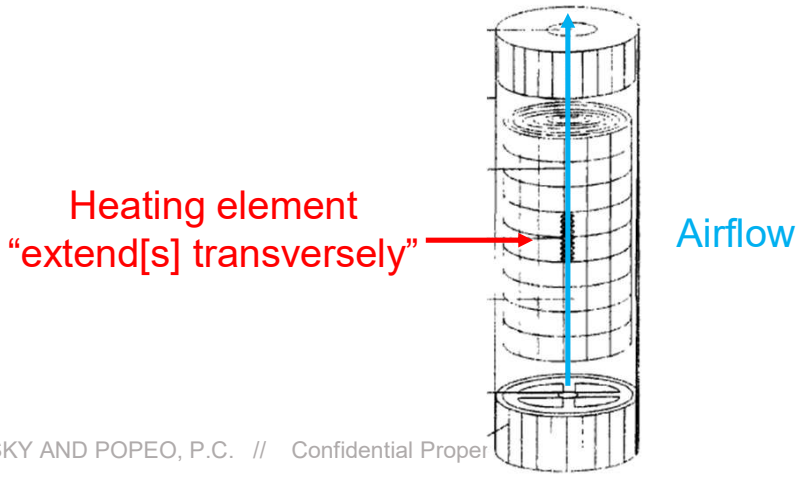
with the challenged claims. This evidence demonstrates that the patented arrangement of a transverse heating element in the airflow was a new and non-obvious idea that changed the industry's approach to e-cigarette design.

POR at 3

Xia (Ex. 1004)



Wang (Ex. 1005)



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Ground 1

Ground 1 Slide Organization

Disputed Limitations

- ‘864 patent, claim 1 under Xia alone: Slides 11-49
- ‘864 patent, claim 1 under Xia as modified with Wang and/or Fang: Slides 50-71
- ‘881-patent-specific independent claim limitations under Xia alone and as modified: Slides 72-76
- ‘864 patent, dependent claims under Xia alone and as modified: Slides 77-88
- ‘881 patent, dependent claims under Xia alone and as modified: Slides 89-94

Undisputed Limitations

- ‘864 patent, claim 1 undisputed limitations: Slides 147-151
- Remaining undisputed limitations: refer to briefing

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‘864 Patent, Claim 1 Under Xia Alone

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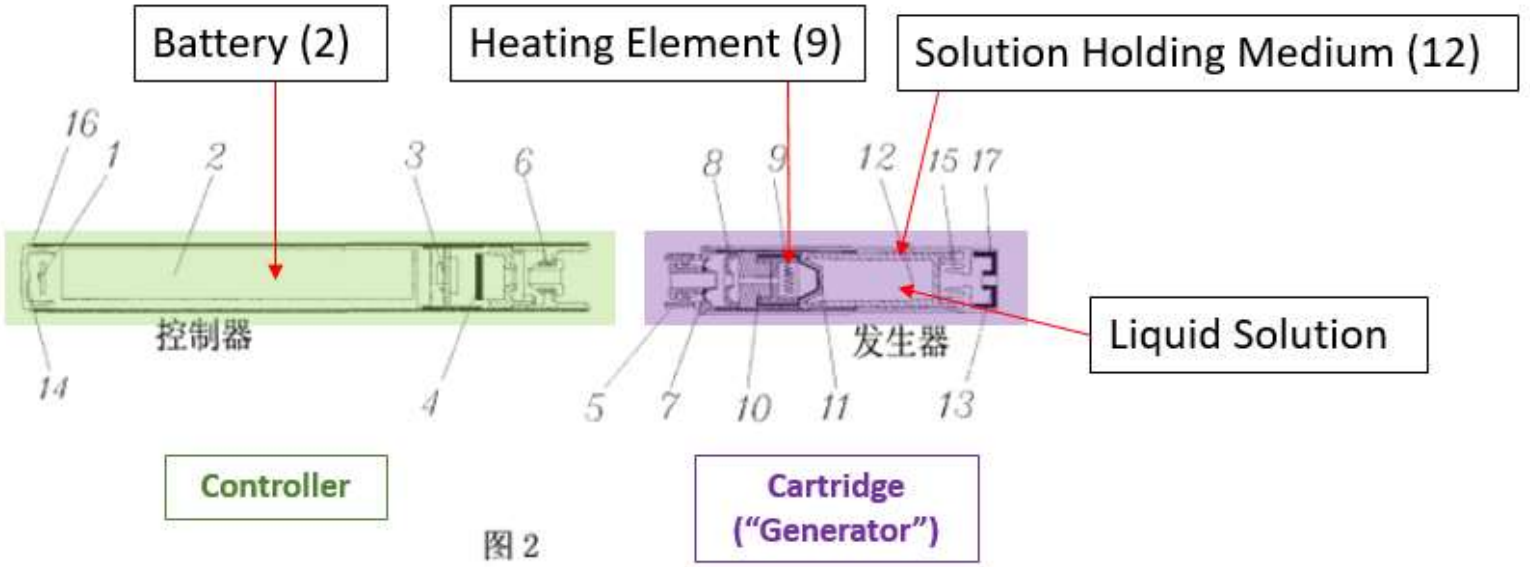
Xia Alone



Ex. 1004, Fig. 2 (annotated); Pet. at 18.

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Patent Owner's Arguments Regarding Xia Alone

1. Xia is "three piece" but claims only cover "two piece" e-cigarettes
2. First Aperture Is Not In The Housing
3. Airflow Passageway Has Obstacles And Therefore Is Not Central And Axial

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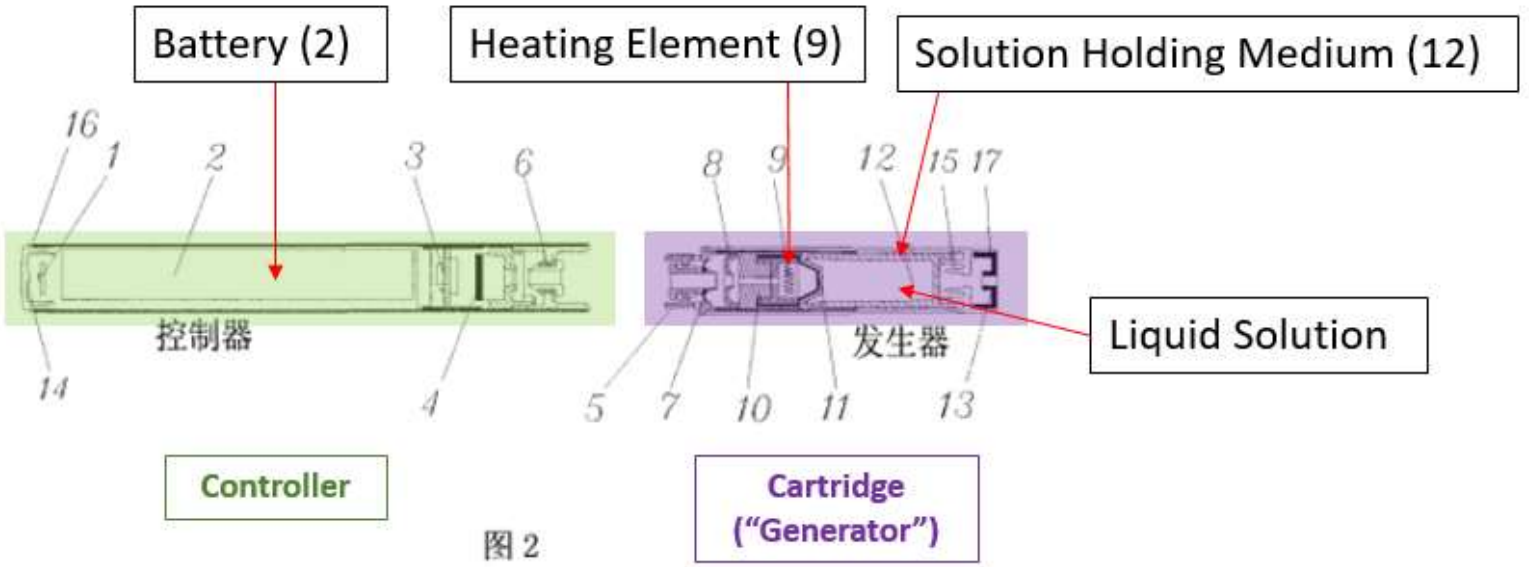
1[p] A cartridge configured to couple to a power source of an electronic vaporizer, the cartridge comprising
1[a1] a housing having an interior and a solution holding medium adapted to hold a solution,
…1[b1] a heating element located in the interior of the housing

Xia's Cartridge ("Generator")



Pet. at 18, 31-35; Ex. 1004, Fig. 2 (partial) (annotated) , 3, 6-10; Ex. 1007, ¶76

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1[p] A cartridge configured to couple to a power source of an electronic vaporizer, the cartridge comprising
1[a1] a housing having an interior and a solution holding medium adapted to hold a solution,
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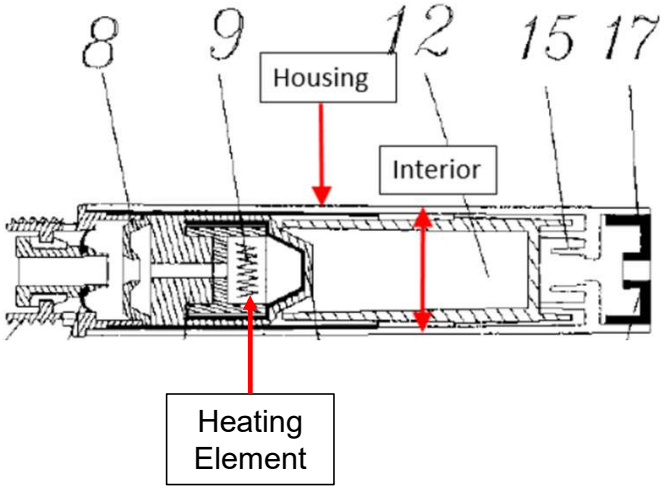

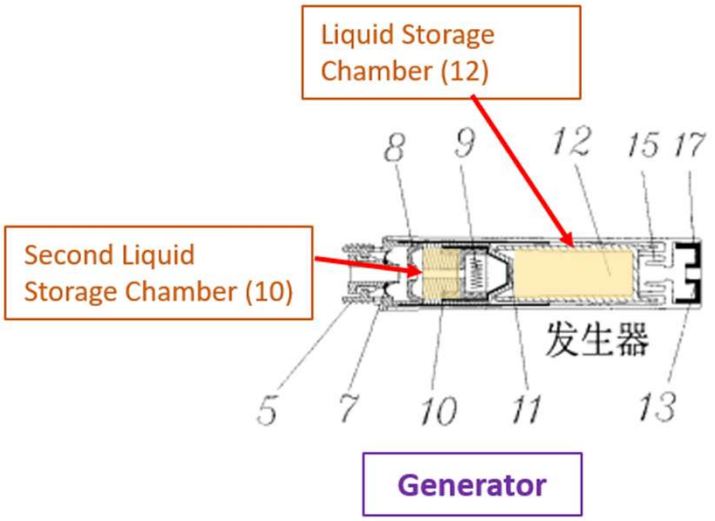

"[S]tainless steel shells are arranged on an outer surface of the controller and an outer surface of the generator[.]" Ex. 1004 at 3.

Pet. at 31-35; Ex. 1004, Fig. 2 (partial) (annotated) , 3, 6-10; Ex. 1007, ¶76.

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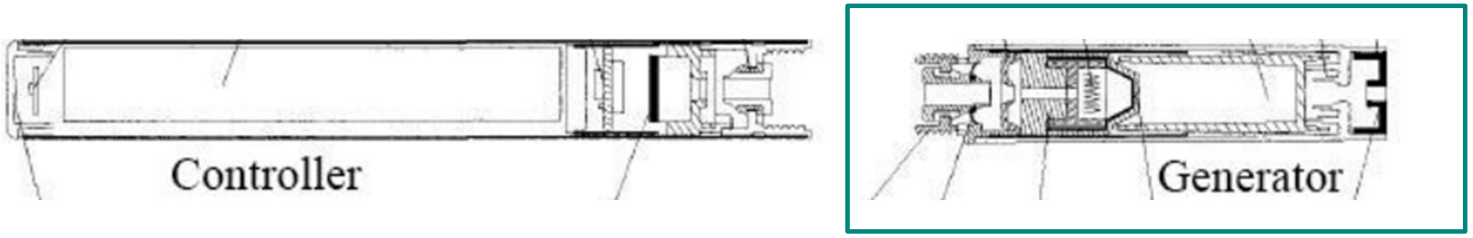
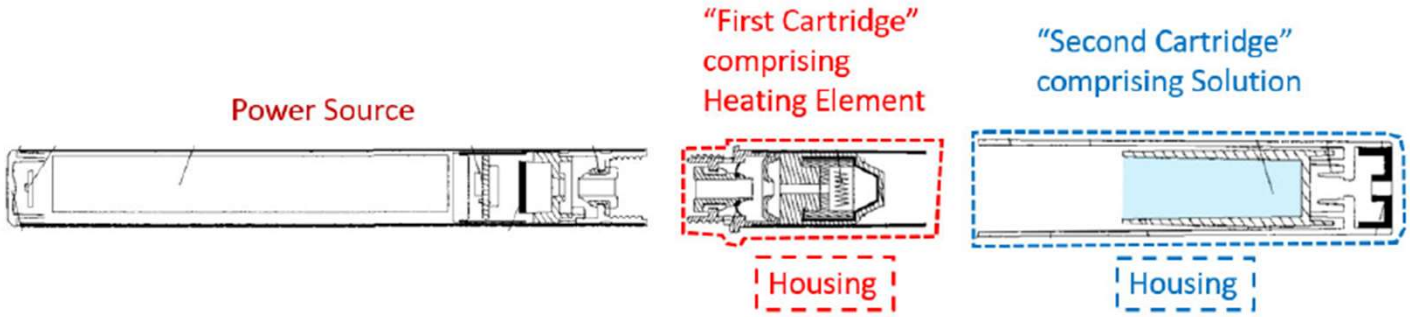
Patent Owner's Argument

Xia, Figure 2



Cartridge Depicted In Patent Specification Figure

Patent Owner Response at 65-66



Patent Owner's Manufactured Image

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Patent Owner's Claim Construction

Patent Owner Response

a. Xia Does Not Render Obvious "a cartridge having a housing...[including] a solution holding medium...a heating element" (Claims 1, 8, 16)

* * *

Petition, 30–35, 43–47. As explained in Section II.D., the claims are directed to a two-piece design having a cartridge comprises a housing having both the solution holding medium and heating element.

Xia is a three-piece design. *See* Section V.A. Xia's heating element and solution holding medium are in separate cartridges. This is confirmed by NPRO, which Petitioner used to map Xia to the 864 Patent in the ITC Investigation.

Patent Owner Response at 65-66

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The Claims Do Not Distinguish Between Number Of "Pieces" In The Cartridge Or The E-Cigarette

1. A cartridge configured to couple to a power source of an electronic vaporizer, the cartridge comprising:

a housing having an interior and a solution holding medium adapted to hold a solution, the housing having a first end and a second end that is opposite the first end, the housing having a first aperture proximate the first end and a second aperture proximate the second end, the first end of the housing being adapted to electrically couple to the power source, the first aperture and the second aperture being in communication with one another to permit an airflow through the housing from the first aperture to the second aperture;

a heating element located in the interior of the housing, the heating element extending transversely to a central longitudinal axis of the housing and being at least partially exposed to the airflow, the heating element being configured to vaporize at least a portion of the solution for oral provision to an individual in the airflow, the heating element being responsive to electrical power received from the power source; and

an airflow passageway in the housing, at least a portion of the airflow passageway extending centrally and axially with respect to the housing,

wherein the airflow passageway extends centrally and axially from the first aperture to the second aperture.

Ex. 1001, Claim 1

Nothing precluding a so-called "three-piece" e-cigarette design

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Specification Confirms So-Called "Three Piece" Design Is Covered By The Claims

'864 Patent Specification

SUMMARY

The following is a brief summary of subject matter that is described in greater detail herein. This summary is not intended to be limiting as to the scope of the claims.

Described herein are various aspects generally pertaining to electronic vaporizers, and more particularly pertaining to cartridges that comprise heating elements configured to vaporize a solution. In an exemplary embodiment, a cartridge configured for utilization in connection with an electronic vaporizer comprises a housing that has an interior, a first end, and a second end. The housing is constructed of one of a polymer, wood, ceramic or any combination thereof. The cartridge can also include a heating element that resides in the interior of the housing. The cartridge can be manufactured as a single assembly or can be designed so that the cartridge can be manufactured as a multi-piece assembly.

Ex. 1001, 1:48-50; Reply at 18-19

'864 Patent, Claim 1

1. A cartridge configured to couple to a power source of an electronic vaporizer, the cartridge comprising:

a housing having an interior and a solution holding medium adapted to hold a solution, the housing having a first end and a second end that is opposite the first end, the housing having a first aperture proximate the first end and a second aperture proximate the second end, the first end of the housing being adapted to electrically couple to the power source, the first aperture and the second aperture being in communication with one another to permit an airflow through the housing from the first aperture to the second aperture;

a heating element located in the interior of the housing, the heating element extending transversely to a central longitudinal axis of the housing and being at least partially exposed to the airflow, the heating element being configured to vaporize at least a portion of the solution for oral provision to an individual in the airflow, the heating element being responsive to electrical power received from the power source; and

an airflow passageway in the housing, at least a portion of the airflow passageway extending centrally and axially with respect to the housing,

wherein the airflow passageway extends centrally and axially from the first aperture to the second aperture.

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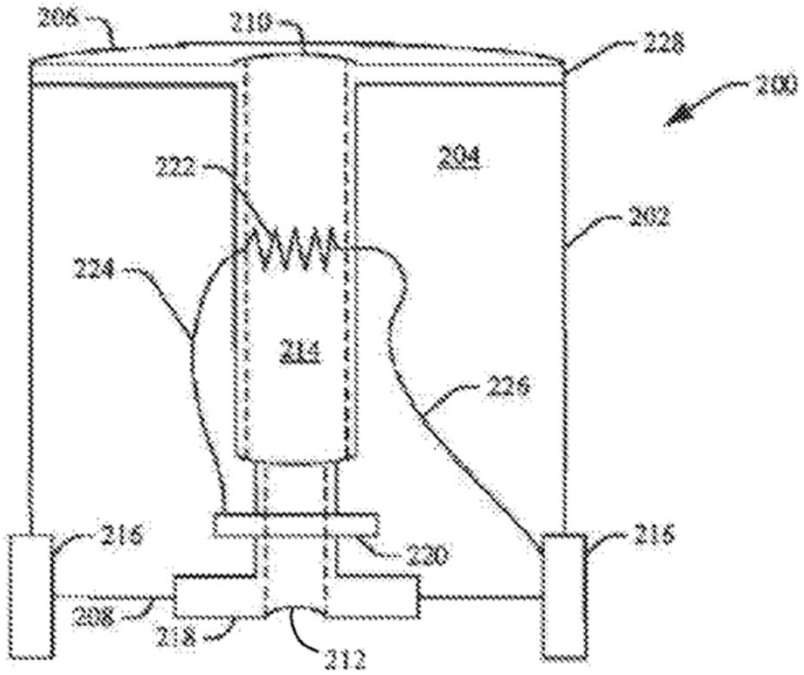
Specification Confirms So-Called "Three Piece" Design Is Covered By Claims

'864 Patent, Figure 2



'864 Patent Specification Re Figure 2

The first end **206** comprises a first aperture **210**, and the second end **208** comprises a second aperture **212**. As shown, the first aperture **210** and the second aperture **212** are positioned at approximately the centers of the first and second ends **206** and **208**, respectively, such that a central axis of the cartridge **200** passes through both apertures **210** and **212**. Both or either the first end **206** or second end **208** can be integrated into a single assembly as part of the housing **202**. Additionally, the resulting assembly may or may not be able to be unassembled by the end user. An air passageway **214** begins at the first aperture **210** and extends to the second aperture **212** approximately along the central axis of the cartridge **200**. For example, the wall of the air passageway **214** may be constructed from a polymer or other suitable material.

Ex. 1001, 6:20-24; Reply at 18-19

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Patent Owner Agrees Cartridge / Housing Is Not Limited To "A Unity Construction"

Patent Owner Response

provides one end of the structure containing the device internals. The specification makes clear that the housing is not necessarily a unity construction: "The cartridge 200 comprises a housing 202, which is constructed of a non-metallic material, such as a polymer, wood, ceramic, ***and/or any combination thereof***." EX1001, 5:65–6:3;

POR at 26

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Patent Owner's Arguments Regarding Xia Alone

1. Xia is "three piece" but claims only cover "two piece" e-cigarettes
2. First Aperture Is Not In The Housing
3. Airflow Passageway Has Obstacles And Therefore Is Not Central And Axial

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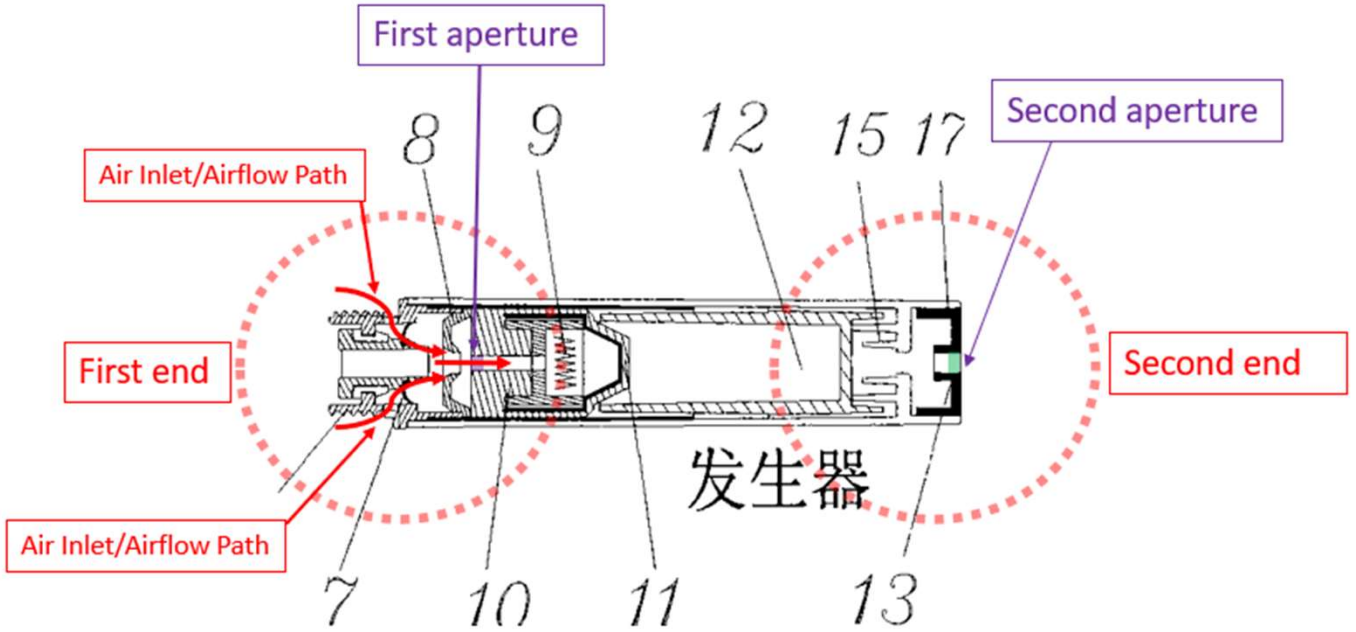
1[a2] the housing having a first end and a second end that is opposite the first end, the housing having a first aperture proximate the first end and a second aperture proximate the second end,



Pet. at 38; Ex. 1004, Fig. 2 (partial, annotated).

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Patent Owner's Argument

Patent Owner Response

Apertures

The correct construction of "the housing having a first aperture proximate the first end" refers to an aperture formed in the housing wall at or near the housing's end; it does not encompass apertures in objects within the housing. *See* Section IV.C.1. The Petitioner's aperture resides within the housing as part of the secondary liquid storage chamber 10. EX2022 ¶171. Thus, Petitioner's "first aperture" is not a *housing* aperture. EX2022 ¶¶172-173.

Patent Owner Response at 68

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Petitioner's Argument Is Incorrect

Under Patent Owner's ITC infringement and domestic industry allegations:

1. Board's construction that the first aperture does not need to be in the housing is correct

2. An internal structure that contains a further internal component is "housing" and thus an aperture in that internal component is a first aperture

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Under Patent Owner's Allegations Re Internal Apertures, Board's Preliminary Claim Construction Is Correct

1. A cartridge configured to couple to a power source of an electronic vaporizer, the cartridge comprising:

a housing having an interior and a solution holding medium adapted to hold a solution, the housing having a first end and a second end that is opposite the first end, the housing having a first aperture proximate the first end and a second aperture proximate the second end, the first end of the housing being adapted to electrically couple to the power source, the first aperture and the second aperture being in communication with one another to permit an airflow through the housing from the first aperture to the second aperture;

a heating element located in the interior of the housing, the heating element extending transversely to a central longitudinal axis of the housing and being at least partially exposed to the airflow, the heating element being configured to vaporize at least a portion of the solution for oral provision to an individual in the airflow, the heating element being responsive to electrical power received from the power source; and

an airflow passageway in the housing, at least a portion of the airflow passageway extending centrally and axially with respect to the housing,

wherein the airflow passageway extends centrally and axially from the first aperture to the second aperture.

Term	Board's Preliminary Construction
"the housing having a first aperture proximate the first end" of the housing ('864 patent, indep. claims) "the housing includes/having a first aperture on the first end" ('881 patent, indep. claims)	Construed to "encompass apertures that are located within the first end of the housing. The term does not require that the first aperture be located in the housing itself." '864 Inst. Dec. at 22

Ex. 1001, Claim 1

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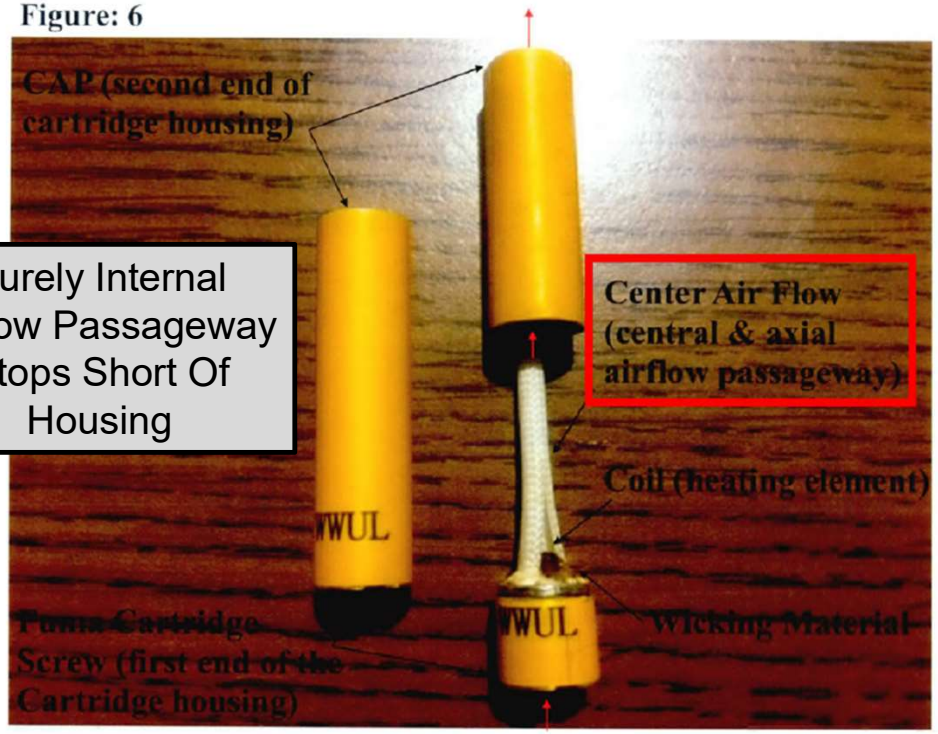
Under Patent Owner's Allegations Re Internal Apertures, Board's Preliminary Claim Construction Is Correct

Inventors' 1.131 Declaration Swearing Behind Prior Art

Figure: 6



Purely Internal Airflow Passageway Stops Short Of Housing

Ex. 2029.021.

Deposition Of Inventor Daniel Hillenbrandt

Q. What is the component that is labeled "central and axial airflow passageway"?
MR. SIEGER: Objection, form, vague.
A. That there represents our airflow passageway that we had in our cartridge.
Q. And is that a woven material?
A. Yes.
Q. What's the purpose of that woven material?
A. To provide an airflow passageway.

Ex. 1038, 67:21-68:24

Pet. Reply at 13-15

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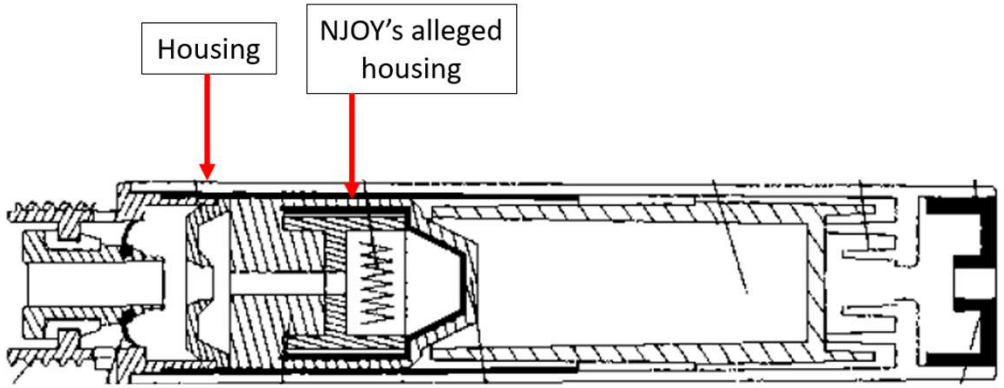
Alternatively, Per Patent Owner, Internal Structure Is Housing If It Houses Internals

Patent Owner Argues Generator's Internal Black Lines Are The Heating Element's Housing



Reply at 11-12; Ex. 1004, Fig. 2 (annotated); Ex. 1035, 60:2-85:1

Testimony Of Patent Owner's Expert

Q And you've used the term "outside structure," so your definition is the housing is the outside structure containing the device internals. That's what a housing is, right?

A Yes.

* * *

A Whatever the external structure holding that within its internals, that would be the housing of the heating element. And you could put it deep inside of a product, and it would still be recognized as the housing of that internals. Again, we -- we often see nested housings.

Q So the -- you can have a structure that's a housing even if it's not the outermost structure then? For example, in figure 2, generator?

MR. ANSLEY: Objection. Vague.

THE WITNESS: Yeah, certainly I'm aware of a lot of products that have nested housings, like there's a housing for one component, and then a housing is then within some other housing. But I think a person of

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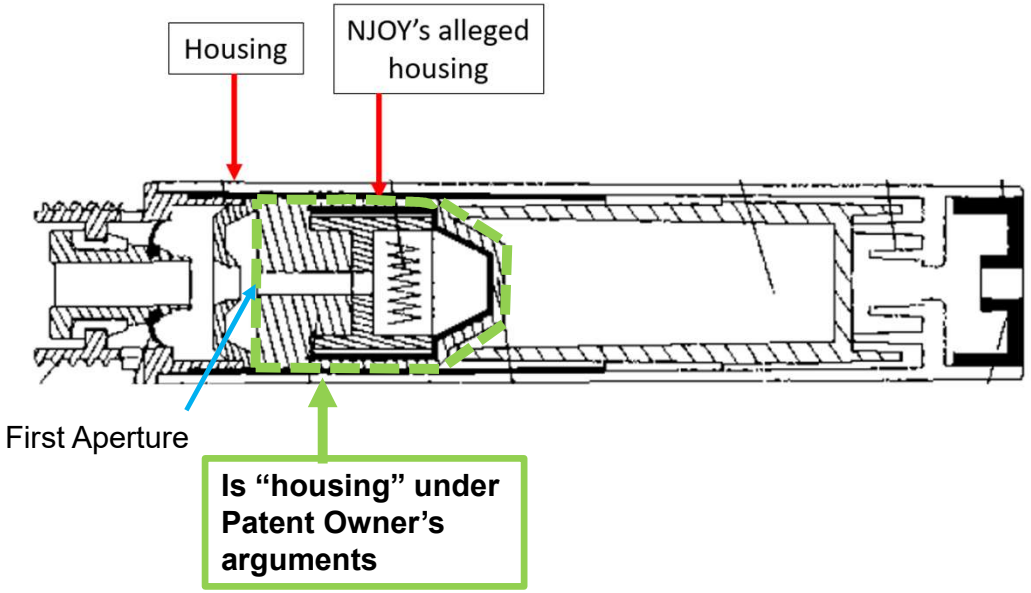
Alternatively, Per Patent Owner, Internal Structure Is Housing If It Houses Internals

Patent Owner Argues Generator's Internal Black Lines Are The Heating Element's Housing



Reply at 11-12; Ex. 1004, Fig. 2 (annotated); Ex. 1035, 60:2-85:1

Patent Owner's Expert

17 Q And you've used the term "outside structure,"
18 so your definition is the housing is the outside
19 structure containing the device internals. That's what a
20 housing is, right?
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21 A Whatever the external structure holding that
22 within its internals, that would be the housing of the
23 heating element. And you could put it deep inside of a
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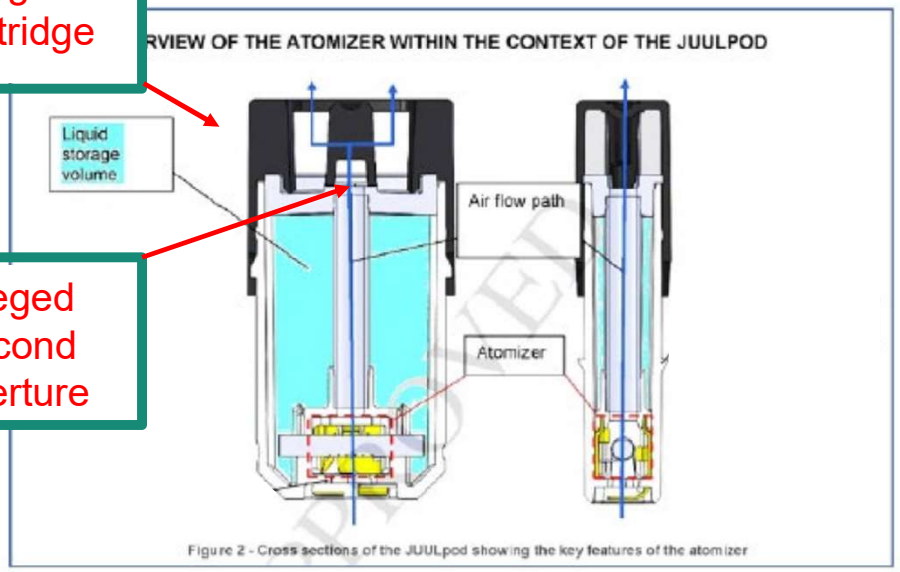
Alternatively, Per Patent Owner, Internal Structure Is Housing If It Houses Internals

Patent Owner's Infringement Arguments In ITC

ITC Initial Determination

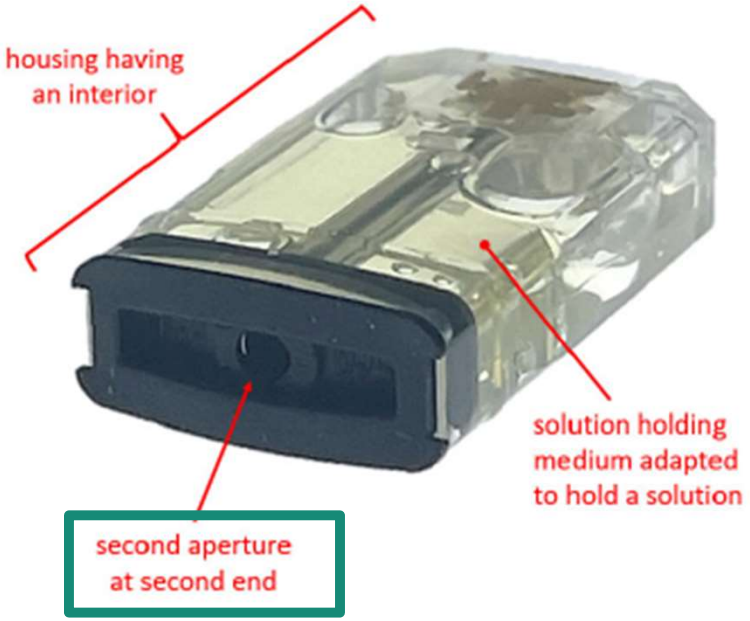
Alleged cartridge

Alleged Second aperture



Certain Vaporizer Devices, Cartridges Used Therewith, And Components Thereof, Inv. No. 337-TA-1372, Final ID, 38-40 (Dec. 5, 2024); Ex. 1033 at 1-2 (alleging tank plus mouthpiece as claimed cartridge); PO Sur-Reply at 6 (citing Final ID without exhibit).

Patent Owner's Infringement Contentions



Reply at 9-11; Ex. 1033 at 2 (alleging aperture internal to cartridge as second aperture)

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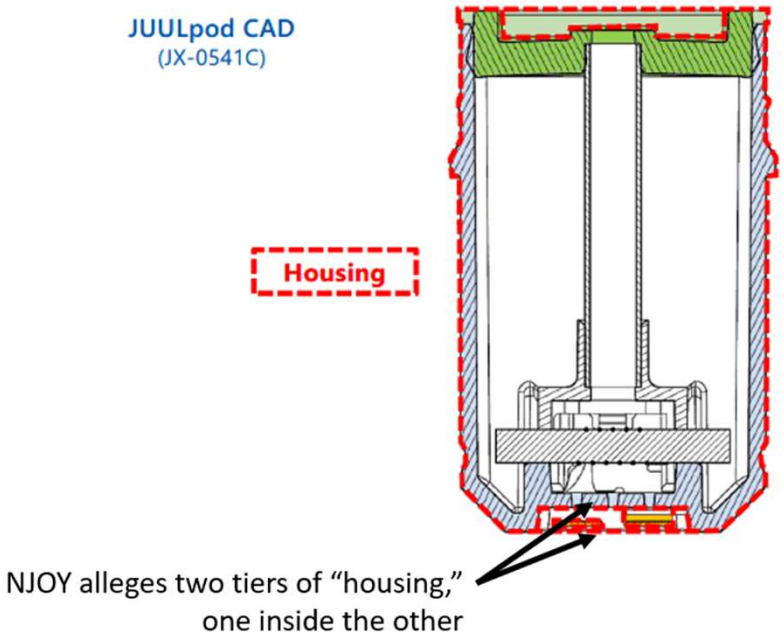
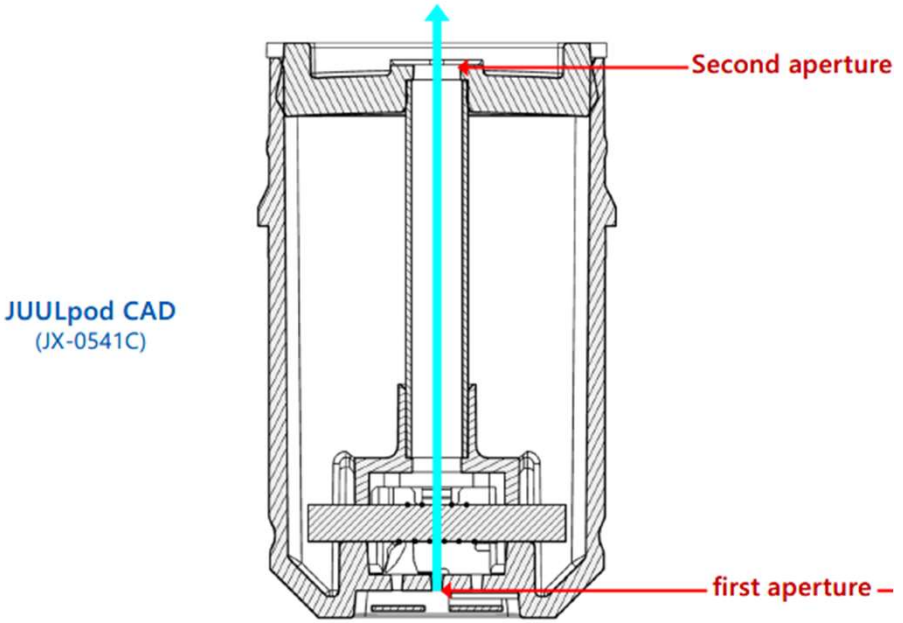
Alternatively, Per Patent Owner, Internal Structure Is Housing If It Houses Internals

Patent Owner's Infringement Arguments In ITC



Ex. 1043, CDX-0002C.021



Ex. 1043, CDX-0002C.034.

Pet. Reply at 9-11

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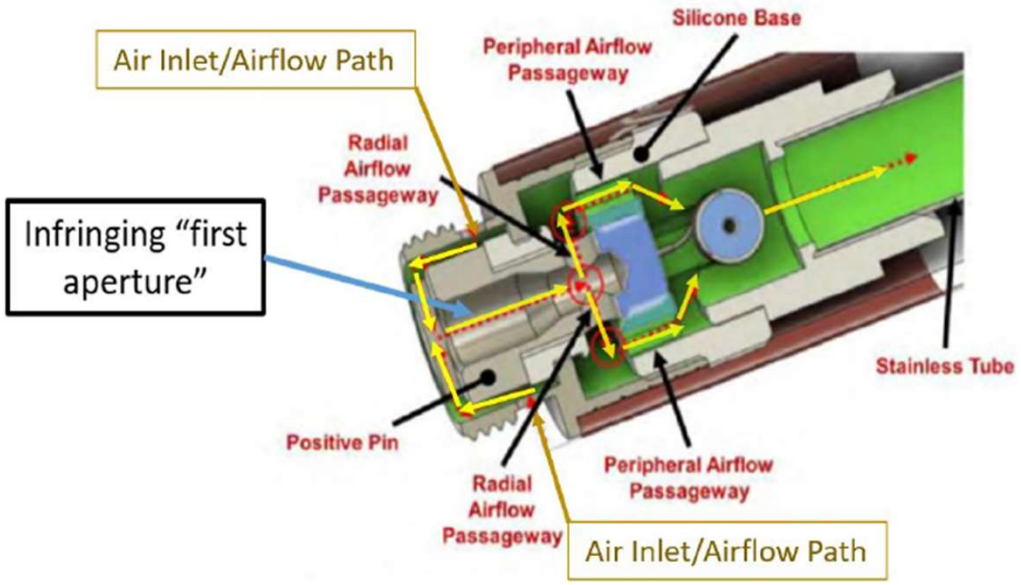
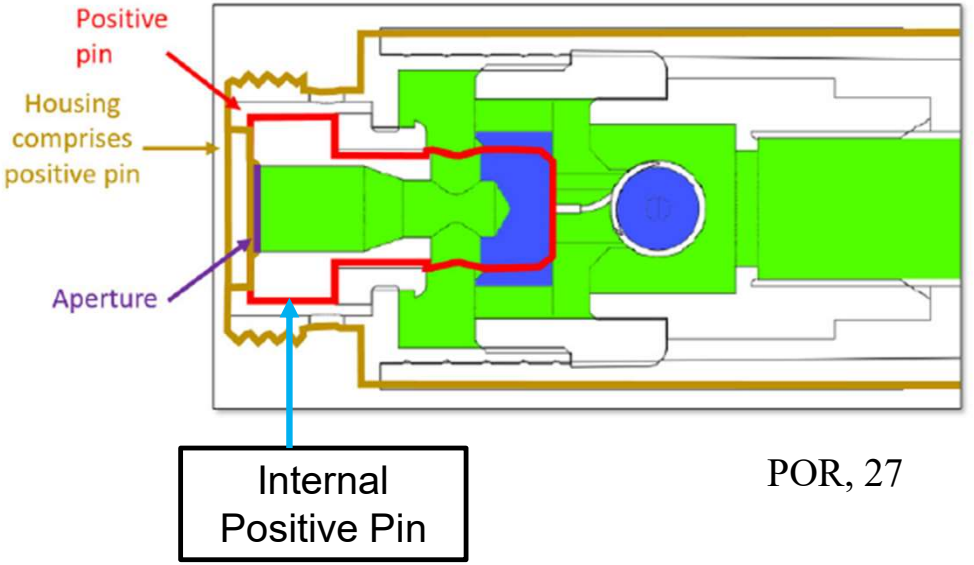
Alternatively, Per Patent Owner, Internal Structure Is Housing If It Houses Internals

MDNC Litigation



Pet., 36; Ex. 1014 at 22, 44.

Patent Owner Response



POR, 27

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Claim Construction Dispute: “First End” / “Second End”

Patent Owner Response

The term “end” means the extrema of an object. EX2022 ¶¶ 71-78.

Patent Owner Response at 21

Patent Owner’s Dictionary

end (end), *n.*, *v.*, **end•ed, end•ing,** *adj.* —*n.* **1.** the last part, lengthwise, of anything that is longer than it is wide: *the end of a rope.* **2.** a point that indicates the full extent of something; limit; bounds. **3.** a part or place at or adjacent to an extremity: *the west end of town.* **4.** the most remote place or point. **5.** termination; conclusion. **6.** the concluding

Ex. 2021; Reply at 6-9

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Claim Construction Dispute: “First End” / “Second End”

Deposition Of Patent Owner’s Expert, Dr. Singhose

But my question is, do you agree with the definition of the word "end" as, quote, a part or place at or adjacent to an extremity?

A I would say yes, just as long as we understand adjacent to have some bounds on it.

Ex. 1035, 104:7-11; Reply at 6-9

Q Well, there would be a range of distances from the very end somewhere inward towards the center of the cartridge that you would call the end, right?

A That's correct. If you established a -- I think you are referring to a reference frame, like an origin in the middle of this. If we traveled from that origin down to one end, it's definitely not gonna be planar. These ends have interesting shapes. And again, figure 2 is a perfect example of that.

Ex. 1035, 95:12-96:6; Reply at 6-9

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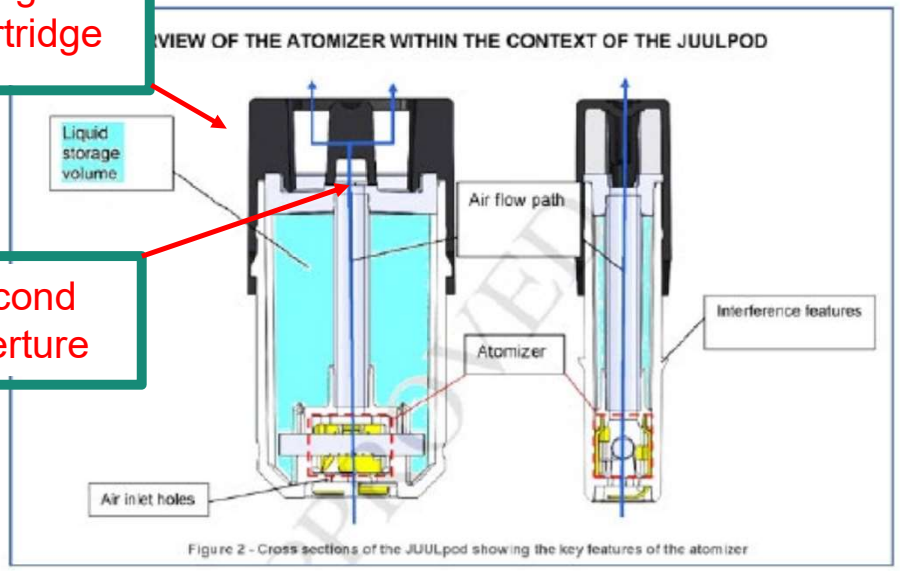
In ITC, Patent Owner Argued "End" Has Substantial Width

Patent Owner's Infringement Arguments In ITC

ITC Initial Determination

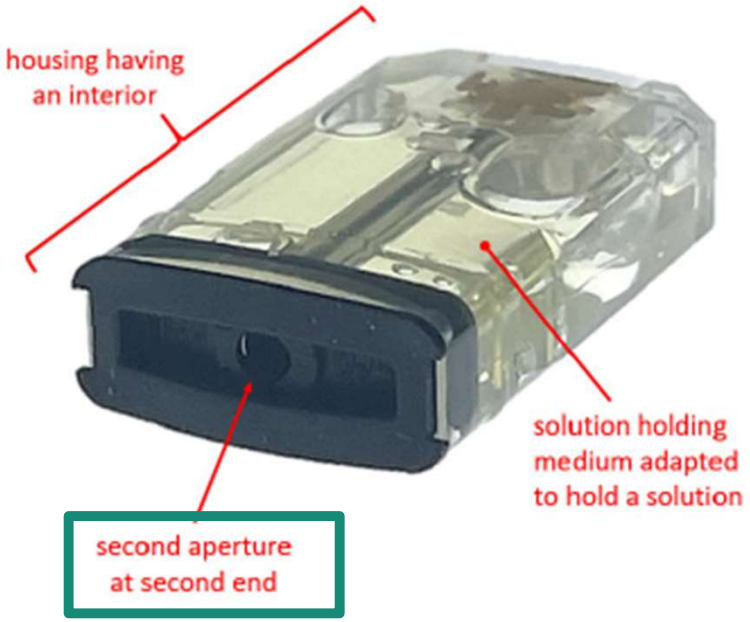
Alleged cartridge

Second aperture



Certain Vaporizer Devices, Cartridges Used Therewith, And Components Thereof, Inv. No. 337-TA-1372, Final ID, 38-40 (Dec. 5, 2024); Ex. 1033 at 1-2 (alleging tank plus mouthpiece as claimed cartridge); PO Sur-Reply at 6 (citing Final ID without exhibit).

Patent Owner's Infringement Contentions



Ex. 1033 at 2 (alleging aperture internal to cartridge as second aperture); Reply at 6-9

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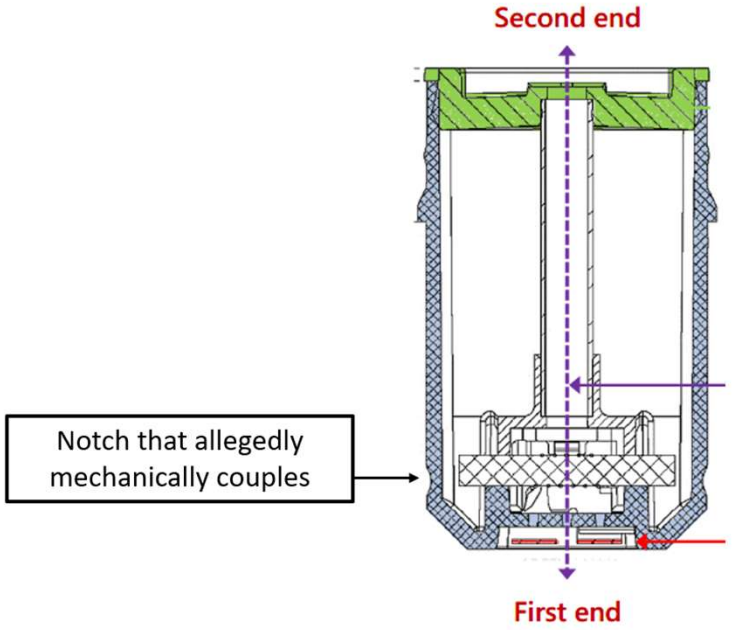
In ITC, Patent Owner Argued "End" Has Substantial Width

Patent Owner's Arguments For Infringement In ITC

Pet. at 37; Reply at 8; Ex. 1033 at 5; Ex. 1007, ¶84



Ex. 1043, CDX-2C.151; Reply at 8; Pet. at 37

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Patent Owner's Arguments Regarding Xia Alone

1. Xia is "three piece" but claims only cover "two piece" e-cigarettes
2. First Aperture Is Not In The Housing
3. Airflow Passageway Has Obstacles And Therefore Is Not Central And Axial

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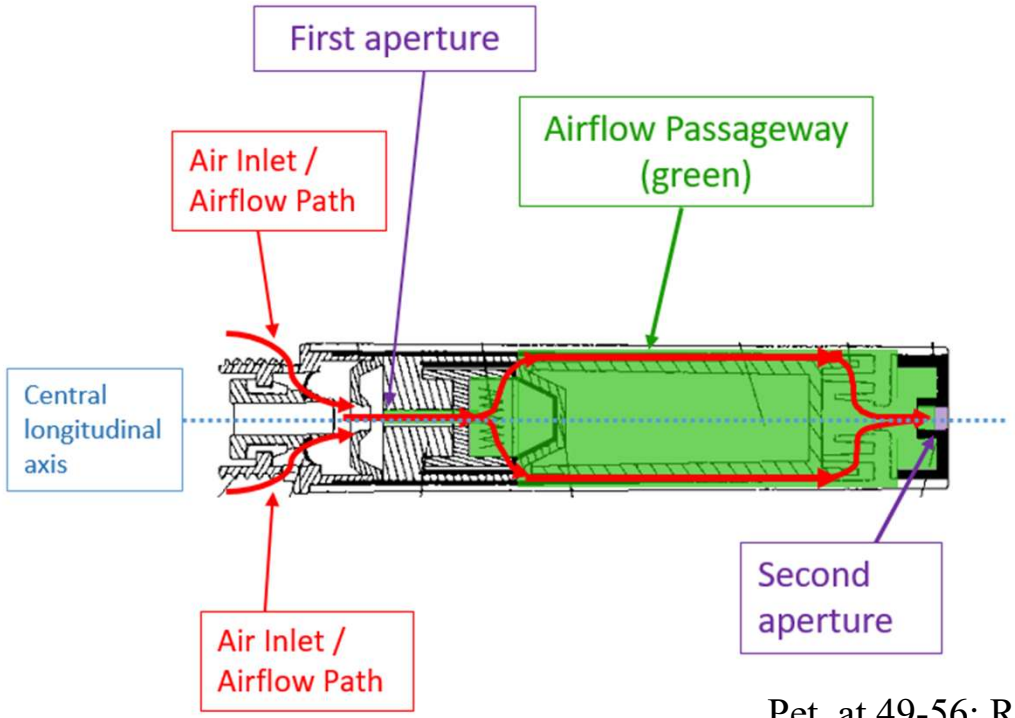
1[c] an airflow passageway in the housing, at least a portion of the airflow passageway extending centrally and axially with respect to the housing,

1[d] wherein the airflow passageway extends centrally and axially from the first aperture to the second aperture.

Xia's Airlfow Passageway



Pet. at 49-56; Reply at 15-17; Ex. 1004, Fig. 2

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Under Patent Owner's Infringement and Domestic Industry Assertions In The ITC, The Board's Preliminary Construction Is Correct

Term	Board's Preliminary Construction
"wherein the airflow passageway extends centrally and axially from the first aperture to the second aperture" ('864 patent claim 1, and similar terms in all challenged independent claims)	"encompasses an airflow passageway that encompasses obstacles located in the center and along the axis of the housing that force airflow around these obstacles." '864 Inst. Dec. at 22-26

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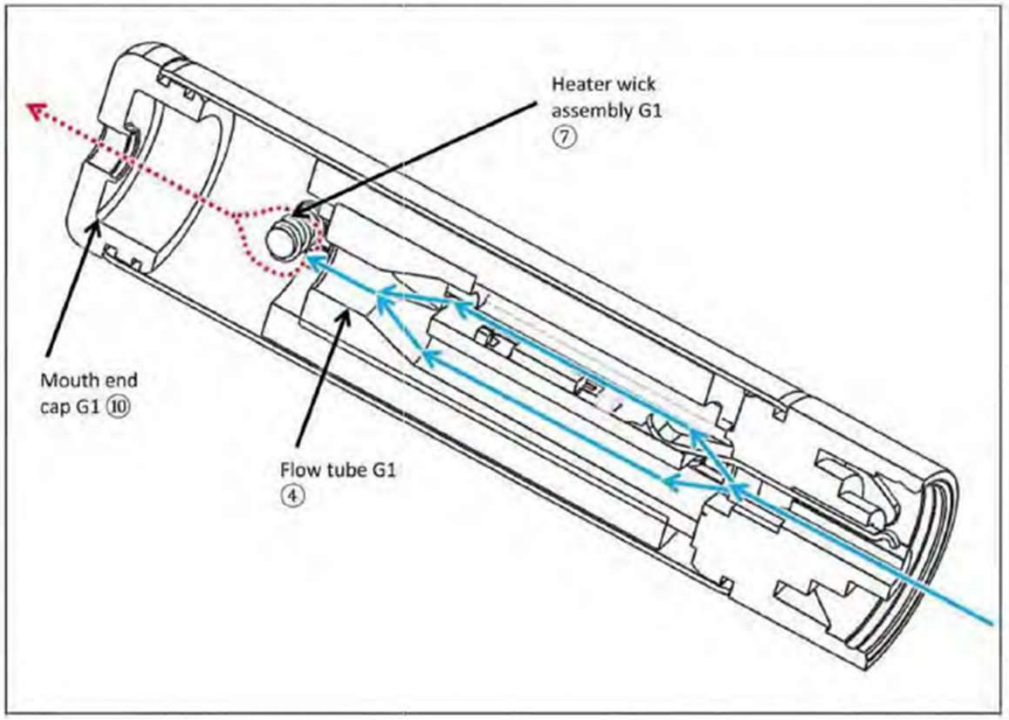
JUUL Ex. 1046
Case No.: IPR2024-00160
Page 40 of 184

NJOY Argued In The ITC That Obstacles Are Permitted

Patent Owner Arguments Re
Domestic Industry Product Vuse Solo G1



Ex. 2022.267; Ex. 2036, Fig. H-14.

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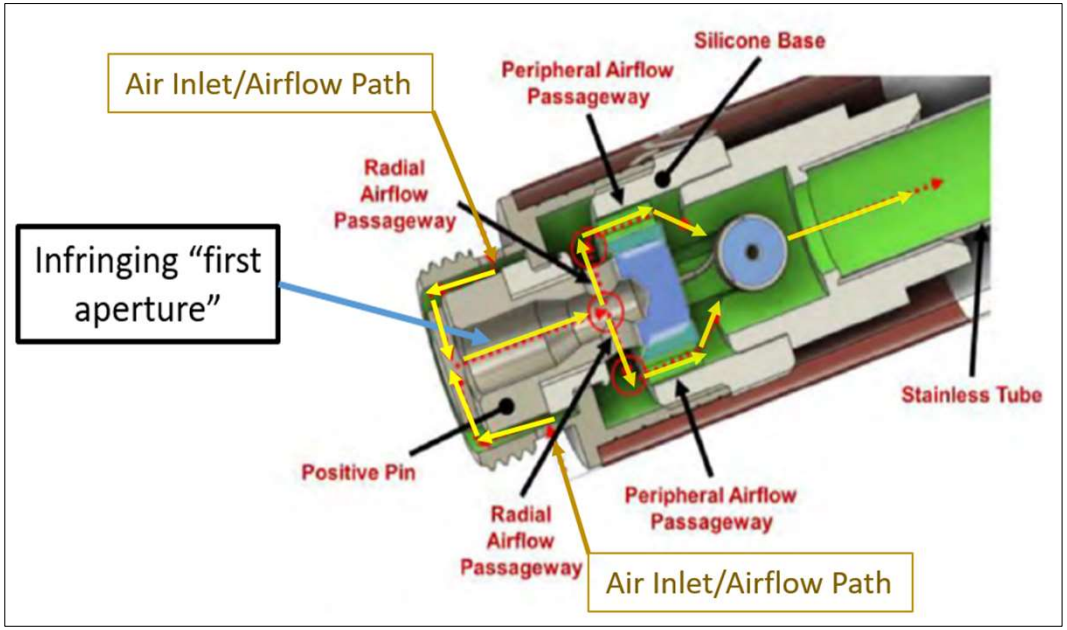
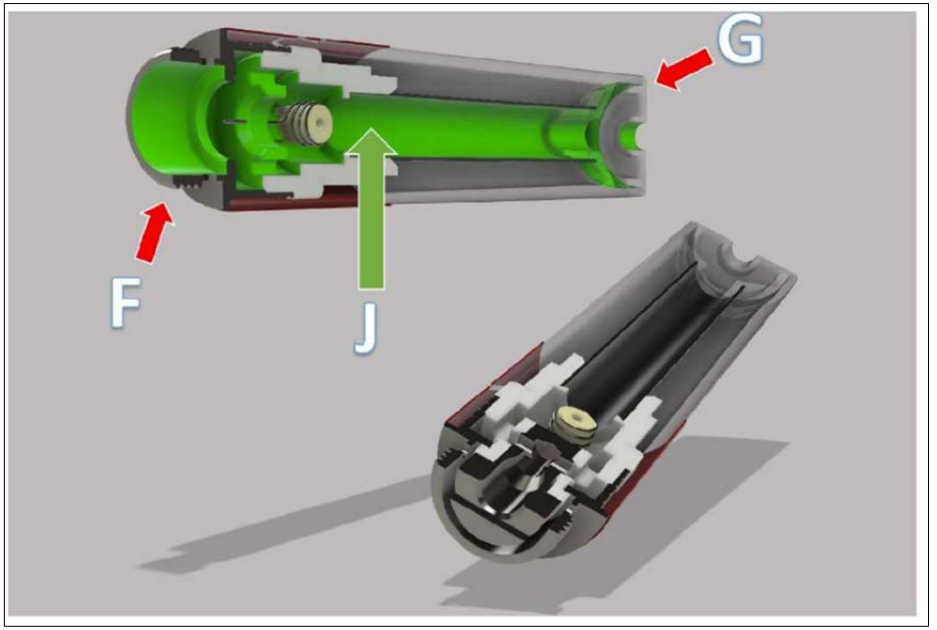
Infringement Argument By Patent Owner's Predecessor-In-Interest, Fuma



Argument That Obstacles Do Not Negate Central Airflow Passageway



Pet. at 15-17; Ex. 1021 at 9-12; Ex. 1025 at 17

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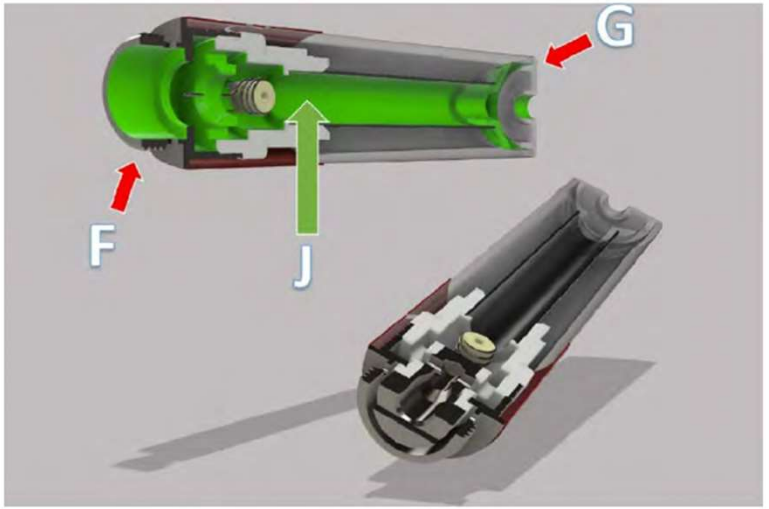
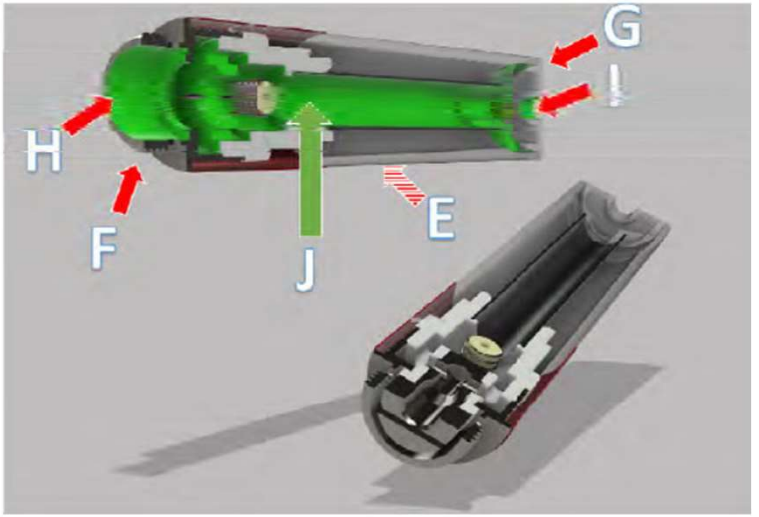
In ITC NJOY Repeated Fuma's Argument

Fuma's Infringement Contentions in MDNC	Patent Owner's Domestic Industry Contentions In ITC
	
"The Vuse Ciro has **an airflow passageway—element J**, shown in green—that extends in a straight path through the cartridge." Ex. 1025 at 17. Pet. at 17.	"The VUSE Ciro comprises a cartridge where the housing [E] includes **an airflow passageway [J]** that extends centrally and axially with respect to the housing intermediate of the first and second aperture [H, I], and is configured to allow airflow from the first to the second aperture." Ex. 1045 ('881 patent DI Contentions, Vuse Ciro) at 7; see also Ex. 1032 ('864 contentions) at 19. Pet. at 17

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Relevant Constructions Of Passageway Terms

MDNC Litigation (Fuma v. RJR)	ITC (NJOY v. JLI)
The airflow passageway extends in a straight path through the center of the cartridge from a first opening on the first end to a second opening on the opposite end of the cartridge. Pet. at 13.	The airflow passageway extends in a straight path through the center of the housing from a first opening on the first end to a second opening on the opposite end of the housing. *Certain Vaporizer Devices, Cartridges Used Therewith, And Components Thereof,* Inv. No. 337-TA-1372, Final ID, 32-33 (Dec. 5, 2024)

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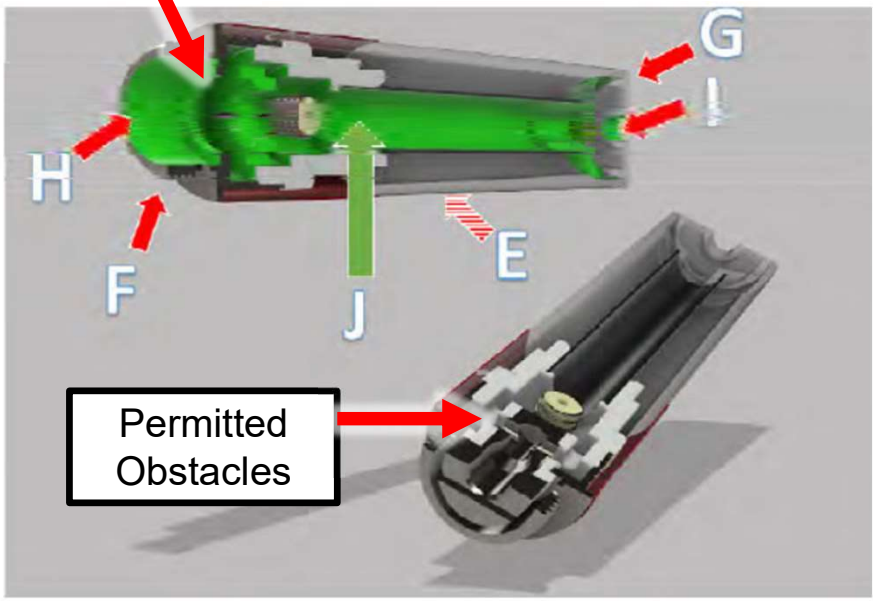
Under NJOY's Interpretation, Xia Discloses The Required Central And Axial Passageway

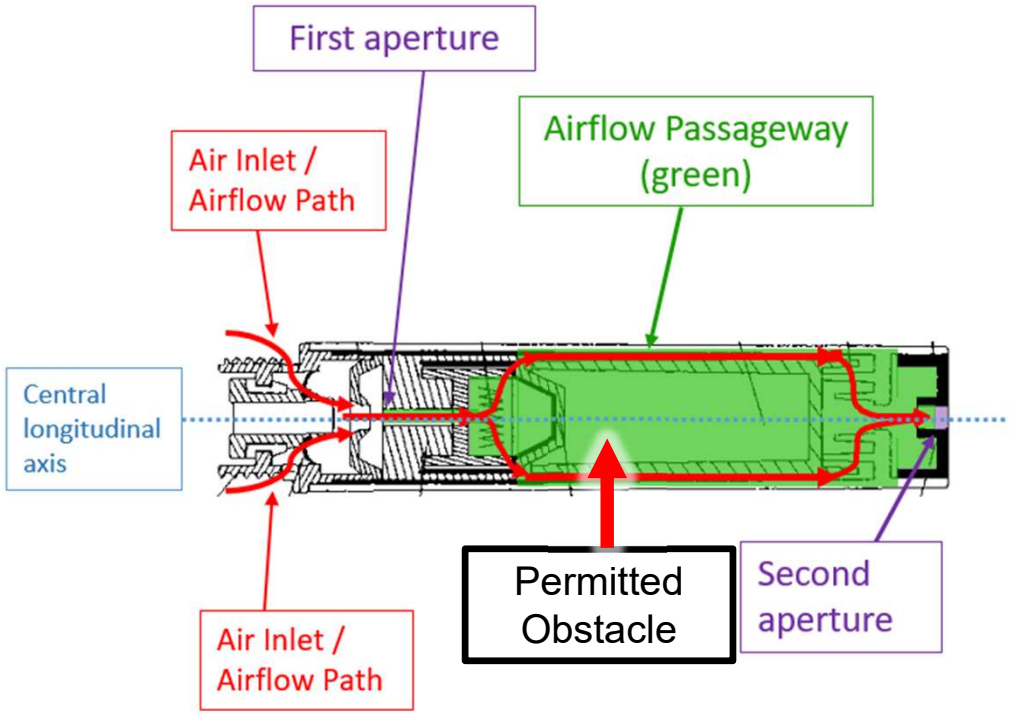
NJOY ITC Infringement Theory

Airflow passageway identification ignores obstacles



Ex. 1045 at 7; Ex. 1032 at 19.

Invalidity In View Of Xia



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Patent Owner's Claim Construction Is Baseless

Patent Owner Sur-Reply

This term's proper construction encompasses central, axial airflow passageways that may include small obstructions. POR, 30. To support its contention that Xia's circuitous passageway is central, JLI argues, "[t]here is no principled distinction between large and small obstacles." Reply, 15. False. The prosecution history and M.D.N.C. decision (EX1015) provide guidance on this: obstructions like Han's or Xia's liquid storage are "large," and obstructions diverting airflow no more than the heating element are "small." POR, 31-35.

Patent Owner Sur-Reply at 12

Patent Owner Reply

the airflow passageway may include a heating element (222). However, as determined in the M.D.N.C. litigation, obstructions must not divert the airflow any more than the heating element.

Patent Owner Reply at 7

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Patent Owner's Construction Has No Basis In The Claims

1. A cartridge configured to couple to a power source of an electronic vaporizer, the cartridge comprising:

a housing having an interior and a solution holding medium adapted to hold a solution, the housing having a first end and a second end that is opposite the first end, the housing having a first aperture proximate the first end and a second aperture proximate the second end, the first end of the housing being adapted to electrically couple to the power source, the first aperture and the second aperture being in communication with one another to permit an airflow through the housing from the first aperture to the second aperture;

a heating element located in the interior of the housing, the heating element extending transversely to a central longitudinal axis of the housing and being at least partially exposed to the airflow, the heating element being configured to vaporize at least a portion of the solution for oral provision to an individual in the airflow, the heating element being responsive to electrical power received from the power source; and

an airflow passageway in the housing, at least a portion of the airflow passageway extending centrally and axially with respect to the housing,

wherein the airflow passageway extends centrally and axially from the first aperture to the second aperture.

Ex. 1001, Claim 1

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Patent Owner's Construction Has No Basis In The Prosecution History

'864 Patent Prosecution History Re Han Reference

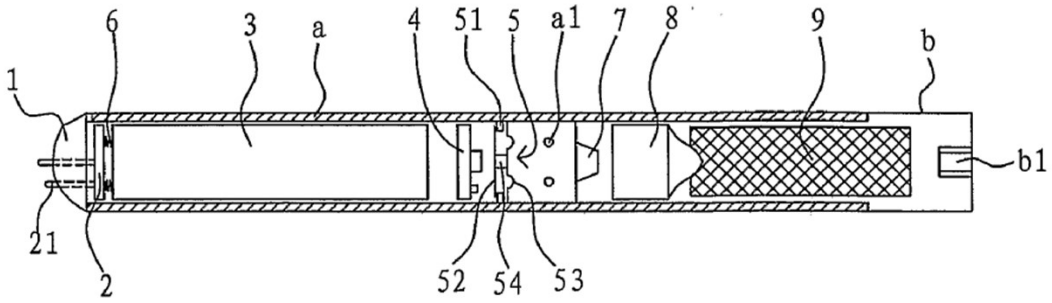

FIG. 1

first aperture and (b1) as the second aperture. However, the structure of Han cannot meet the limitations of dependent claims 49, 63, and 75 for two reasons. First, Han's shell (b) does not include a central airflow passageway and instead places the perforated component for liquid storage (9) in the middle of shell (b), thereby forcing the airflow around the peripheral surface of perforated component for liquid storage (9) as described in paragraph [0070] of Han and shown in FIG. 3. Second, the first aperture

Conflicts with NJOY's later ITC infringement and domestic industry assertions

Does not support "big" vs. "small" construction

Reply at 15-17, 20-21; Pet. at 49-54; Ex. 1002 at 273-74

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MDNC Agreed With Fuma And Did Not Create An "Obstacle Size" Construction

MDNC Grant Of Fuma's Motion For Summary Judgment Of Infringement

18:36–41; Doc. 76-3 at p. 18 ¶¶ 17:26–33, 18:31–38. While the physical structure of the Ciro is not in dispute, RJR contends that the presence of certain obstructions within the Ciro's airflow passageway prevent the air from proceeding in a straight line from one end to the other. Doc. 122 at 43–46; Doc. 131 at 36–49.

RJR conflates the airflow's path with the airflow passageway. RJR is correct that the air itself does not flow in a straight path through the Ciro, as it must travel around and through certain obstacles housed within the airflow passageway. *See, e.g.*, Doc. 122-8 at ¶ 94 (showing an image of the airflow within the Ciro). These obstacles include a "positive pin," a "silicone base," and a "heating element," *see id.* at ¶¶ 87–88, 94, which both alter the air's path as it travels from the base of the airflow passageway to the opposite end. But the Court's construction order dealt only with the structure of the airflow passageway—not with the airflow's path within that interior passageway.

RJR contends that the "positive pin," "silicone base," and "heating element" are not merely obstacles within the airflow passageway, but that they are themselves part of the passageway and therefore prevent the passageway from extending in a straight path.

* * *

In addition to a heating element, the Ciro also has a positive pin and a silicone base that similarly obstruct airflow. But these obstructions do not alter the direction of the Ciro's airflow passageway any more than the heating element. Air enters through an

* * *

Doc. 120-1 at ¶ 88; Doc. 120-7 at ¶¶ 65–66. The positive pin and silicone base obstruct airflow and alter the airflow's path but not the Ciro's interior airflow passageway, which at all times extends straight through the center of the Ciro's cartridge to the second end as required by the claim. *See, e.g.*, 120-8 at 27 (showing images of the airflow passageway

Ex. 1015 at 14-17

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‘864 Patent, Claim 1 Under Xia As Modified

JUUL Ex. 1046
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Wang And Fang

Wang

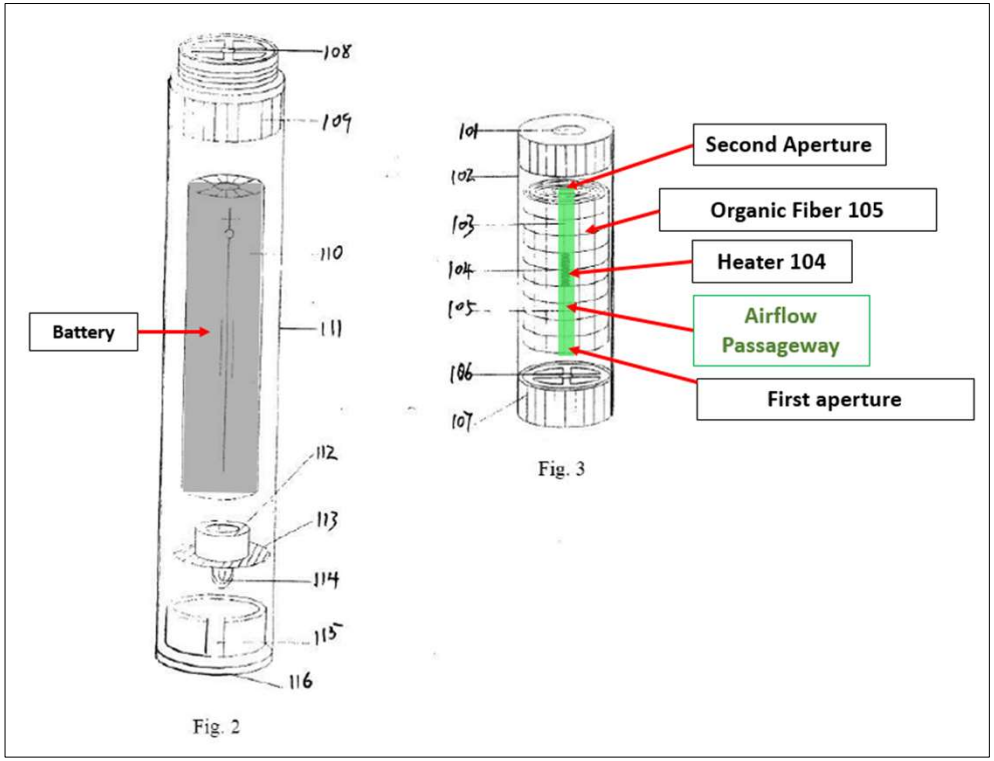
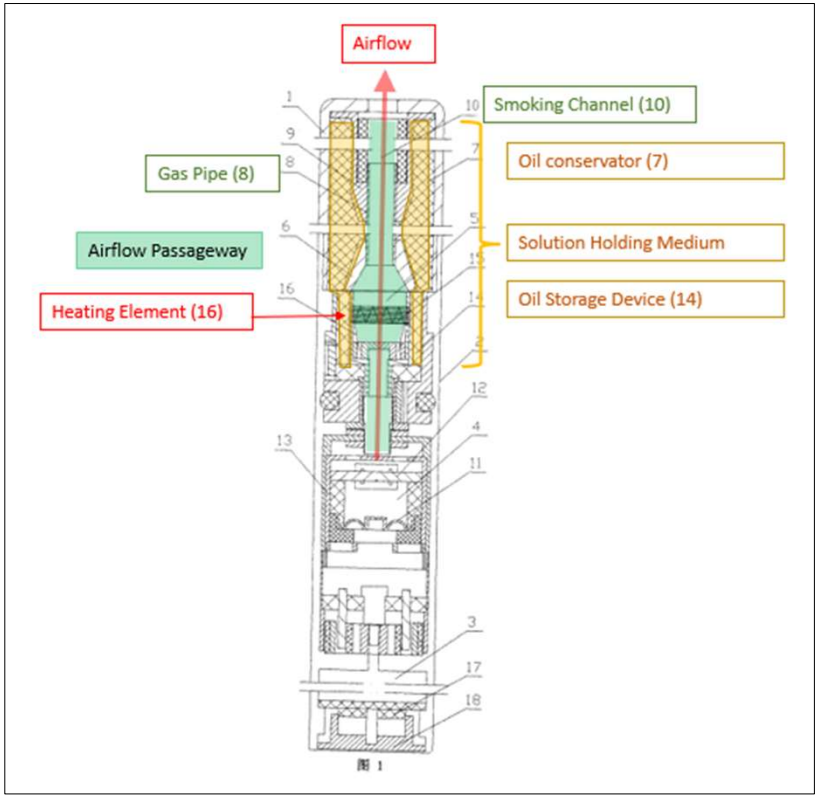


Fig. 3

Fig. 2

Fang



Pet. at 57-65

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Xia, Wang, and Fang Are Very Similar References

1. Vapor-based electronic cigarettes
2. Handheld, portable
3. Cylindrical-shaped “cig-alikes”
4. Use an internal heating element powered by battery
5. To vaporize liquid nicotine solution
6. Initiated by user suction at one end
7. Well known components
8. Filed in Chinese Patent Office by Chinese inventors
9. Published within a year of each other (Xia and Wang: 3 months apart)

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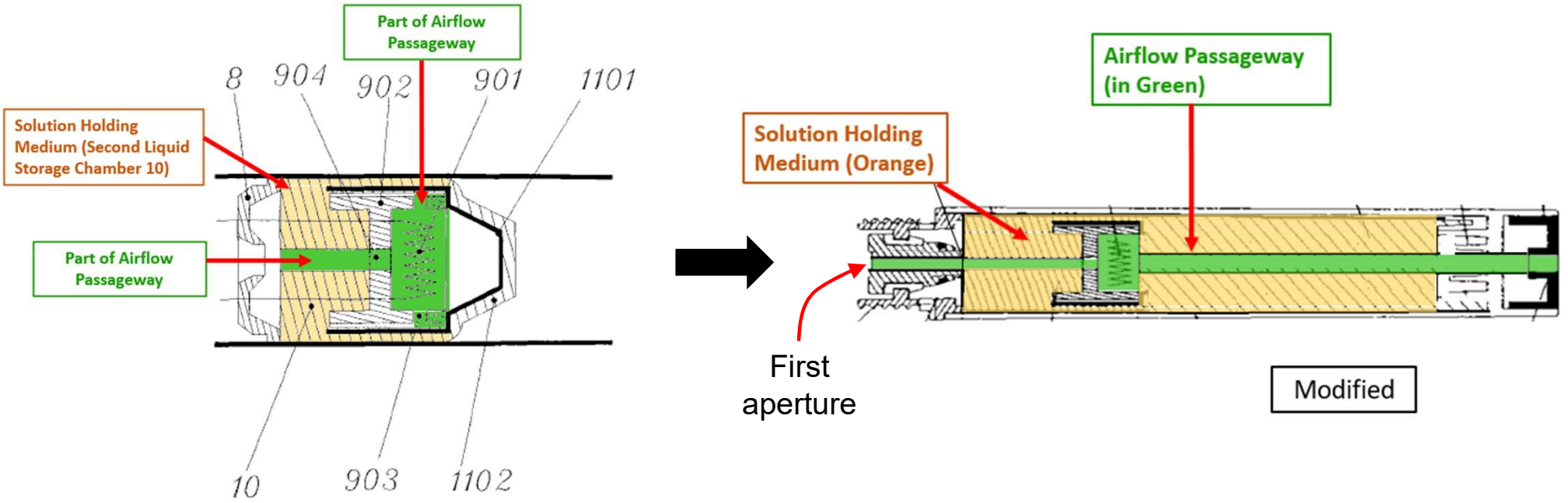
Pet. at 28-30

Xia As Modified With Wang Or Fang

Extend Central Passageway Throughout



Pet. at 38-39, 54-62; Reply at 22-25; Ex. 1007 at ¶90

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Rationales For Modification

- Improvements
  1. Less complex, fewer parts, and thus reduced cost
  2. Improved airflow with fewer pinch points
  3. Improved temperature control (solution insulates vapor to prevent overcooling and prevent heat escaping)
  4. Increased liquid storage capacity
- Extends already-used structure
- Substitution of simple, known structures with predictable results

Pet. at 38-39, 54-62; Reply at 22-25

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Patent Owner's Arguments Regarding Xia As Modified

- Design removes liquid blocking plate
- Design removes structures for leakage prevention and reabsorption
- Design impairs suction detection
- Degrades vaporization efficiency

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Patent Owner's Arguments Regarding Xia As Modified

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Patent Owner's Alleged Disadvantages Are Incorrect

Patent Owner Sur-Reply at 17

First, the combination removes the liquid blocking plate. POR, 57;

Proposed Modification

150. This modification would also simplify the structure of the device, making it (1) have fewer parts, and (2) be more easily manufactured by increasing the use of cylindrical shapes. In doing so, a POSITA would move the portion of the liquid blocking plate 8 that stops the backflow of liquid to the end of the secondary liquid storage chamber.

* * *

12 is bigger in the modified design. The liquid blocking plate 8 in Xia also keeps its function, that is, blocking backflow of chemical liquid by having a one-way valve in the path of airflow. *See* Ex. 1004, 13 ("The liquid-blocking plate 8 may prevent

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Ex. 1007 at 98-99

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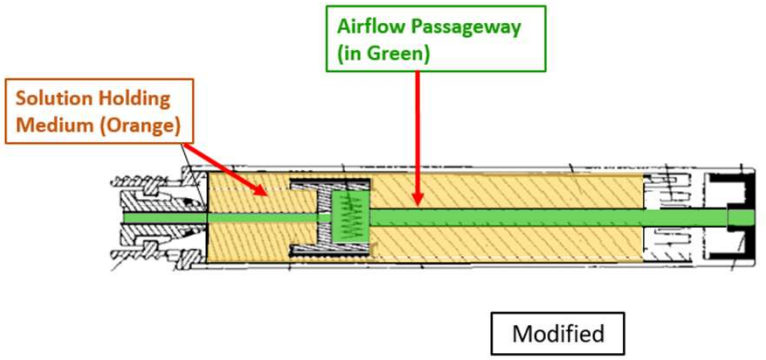
Patent Owner's Alleged Disadvantages Are Incorrect

Patent Owner Sur-Reply at 19-20

Second, the combination removes the liquid guiding mechanism and liquid blocking tank, which reabsorb or block excessive droplets. Removal would destroy Xia's leakage prevention and droplet absorption capabilities. EX2022 ¶232.

Petitioner's Expert's Declaration

149. A way to achieve the same result would be to change the shape of the liquid storage container 12 to include a central hole through which air can flow, either by using a liquid-impermeable cylinder through the center of the storage container 12 with the existing solution holding medium around it, or by using the solution holding medium of Wang, which has a hole down the middle as explained above and in Ground 2. Xia already discloses that the liquid storage container is not



Ex. 1007 at 98-99; Pet. at 38-39, 54-62; Reply at 22-25

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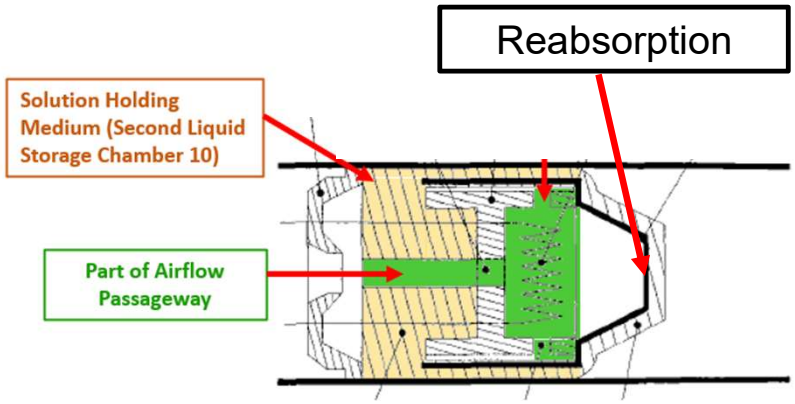
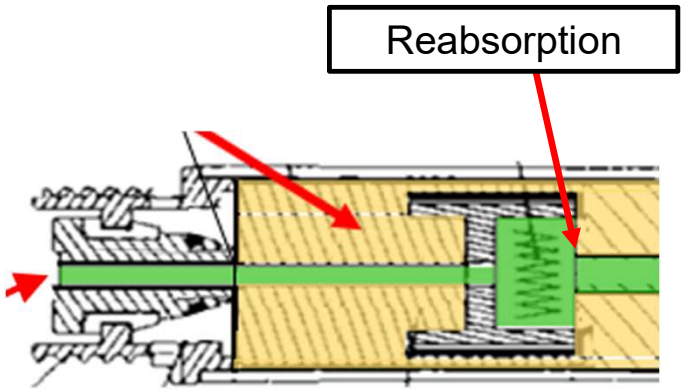
Patent Owner's Alleged Disadvantages Are Incorrect

Patent Owner Sur-Reply at 19-20

Second, the combination removes the liquid guiding mechanism and liquid blocking tank, which reabsorb or block excessive droplets. Removal would destroy Xia's leakage prevention and droplet absorption capabilities. EX2022 ¶232.





Pet. at 25; Reply at 24

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Patent Owner's Alleged Disadvantages Are Incorrect

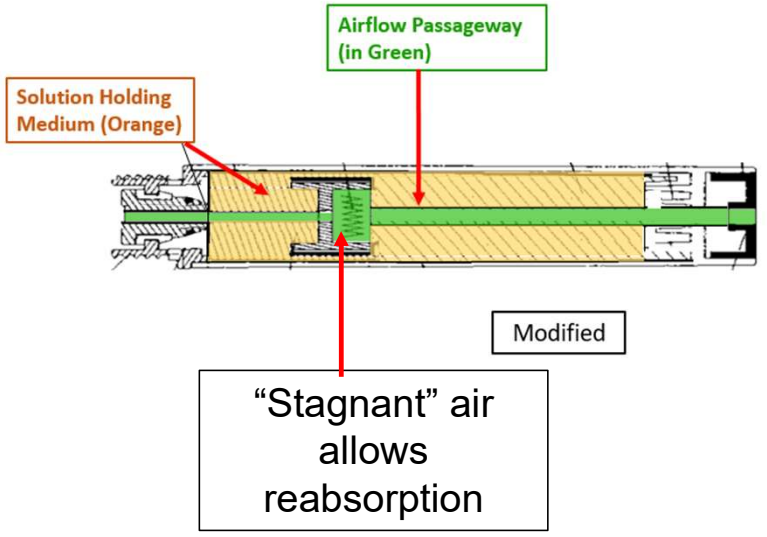
Patent Owner Sur-Reply at 19-20

Second, the combination removes the liquid guiding mechanism and liquid blocking tank, which reabsorb or block excessive droplets. Removal would destroy Xia's leakage prevention and droplet absorption capabilities. EX2022 ¶232.

Patent Owner's Expert's Declaration

198. Note that a POSITA would know from their introductory fluids class that airflow through such a cavity would produce only a small amount of flow into the top and bottom of the cavity. Essentially, most of the cavity would be stagnant and there would not be a good transfer of the heat from the top and bottom portions of the heating element. The stagnant nature of the air flow can be visualized by plotting the velocity

Reply at 24; Ex. 2022.123; Ex. 1035 at 136:11-25



Reply at 24

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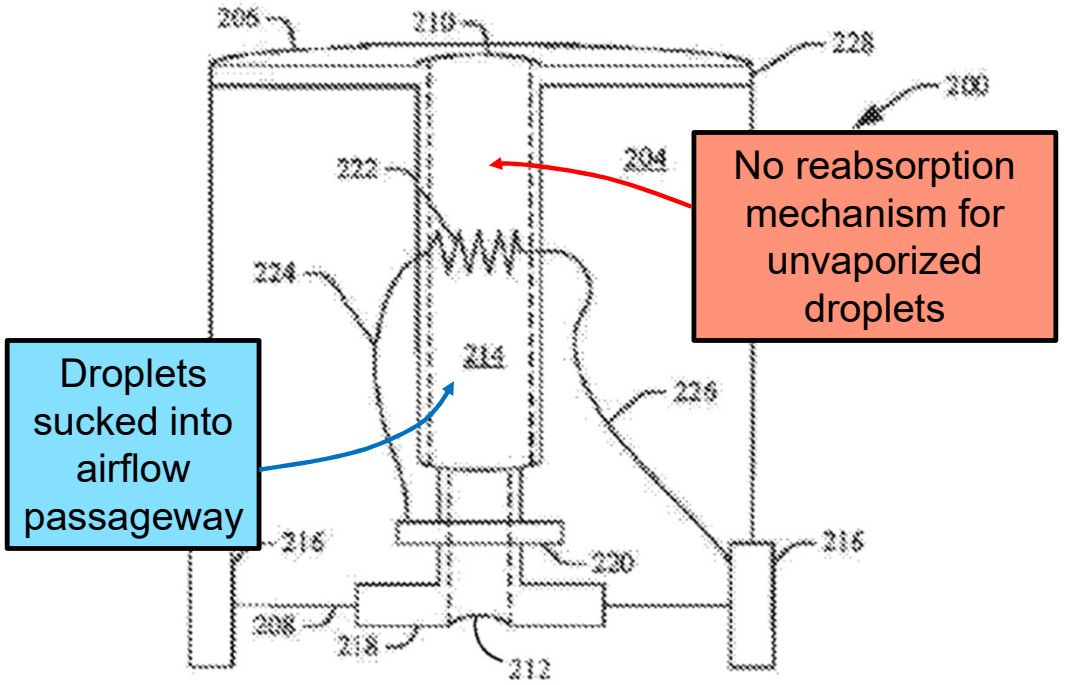
Lack Of Reabsorption Of Hypothetical Free Droplets Is Not A Significant Technological Drawback

'864 And '881 Patents Embodiments Without Wick Spray Liquid Onto Heating Element



Reply at 24; Ex. 1001, Fig. 2 (annotated)

Patent Owner Agrees No Direct Contact Between Liquid Storage And Heating Element In Figure 2

Contrary to JLI's assertion that the claims do not reduce burnt taste (Reply, 37), Fuma's device and invention eliminate burnt taste by separating the heating element and liquid storage. EX2022, ¶¶412-413. The uninsulated lead wires do not

Sur-Reply at 26

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Even If Patent Owner Is Correct, Cheaper Devices With Drawbacks Are Within The Scope Of Obviousness

Testimony Of Patent Owner's Expert

Do customers sometimes opt to purchase cheaper, worse performing products?

THE WITNESS: Yes, I think they do.

Q BY MR. DOKHANCHY: And are you aware of the proliferation of cheap, disposable e-cigarettes in the marketplace today?

A I'm generally aware that there's that option.

Reply at 21-22; Ex. 1035 at 167:6-168:5

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Patent Owner's Arguments Regarding Xia As Modified

- Design removes liquid blocking plate
- Design removes structures for leakage prevention and reabsorption
- Design impairs suction detection
- Degrades vaporization efficiency

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Patent Owner's Alleged Disadvantages Are Incorrect

Patent Owner Sur-Reply

Third, JLI's proposed modification impairs Xia's pressure sensing by removing the vibrating diaphragms. POR, 59; EX2022 ¶¶222-230. Dr. Singhose

Patent Owner Sur-Reply at 23

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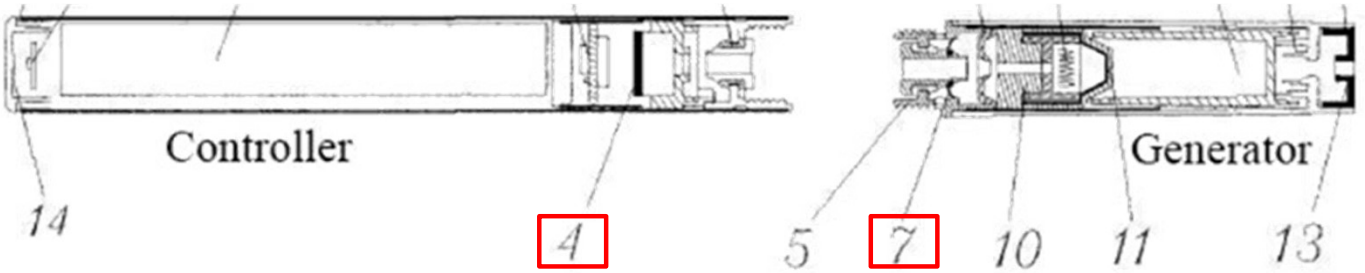
Xia's Vibration-Based Suction Detection Is Inferior

Xia

smoker, airflow enters the inside of the generator from the air inlets 702 on a side surface of the generator, under the action of the airflow, the vibrating diaphragm 7 vibrates, the electret microphone 4 also vibrates accordingly, after vibration is converted into a switching signal through a controller IC1 (see Fig. 6) on the integrated circuit board, the heater 9 starts working, the chemical liquid is instantly vaporized in an atomizing working room of the heater 9, and the vaporized chemical liquid is sucked out by the smoker from the soft suction nozzle 13.



Ex. 1007 at 68-73; Ex. 1004 at 10

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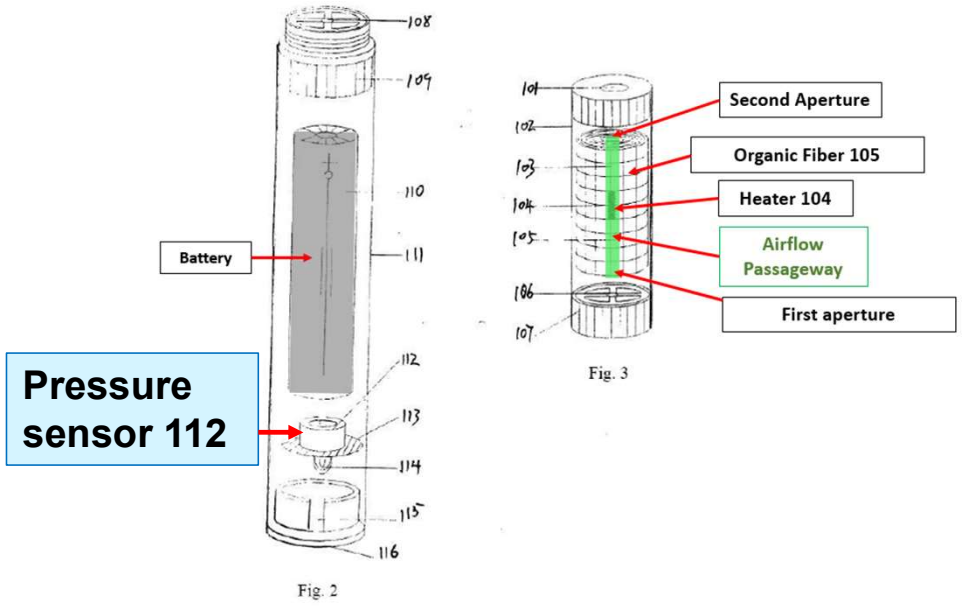
Wang's, Conventional, Simpler, And Superior Suction Detection Using Air Pressure Sensors

Wang



Wang

"The sensor 112 of the cigarette rod is a switch device that drives the circuit control board 113 and then drives the discharge output of the battery 110. The sensor is used to collect airflow and pressure changes generated by smoking motions in real time, a method of judging resistance value changes may be adopted, and a specially-made diaphragm device may also be used to sense on-off signals."

Ex. 1007 at 68-73; Ex. 1005 at 6-7

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Benefits of Modification

1. Simpler, conventional, cheaper
2. Can simply swap traditional pressure sensor in for Xia's vibration sensor
3. Reduces chance of vibration-based inadvertent activation, especially relevant in portable, pocket-carried e-cigarettes
4. Reduces number of components in the cartridge
5. Allows for more liquid storage in cartridge
6. Minor compatible change because in Xia, "the airflow passes through . . . the liquid blocking plate" already

Pet. at 38-39, Ex. 1007, ¶91-100; 137-160; 307-317

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Patent Owner's Arguments Regarding Xia As Modified

- Design removes liquid blocking plate
- Design removes structures for leakage prevention and reabsorption
- Design impairs suction detection
- Degrades vaporization efficiency

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Patent Owner's Alleged Disadvantages Are Incorrect

Patent Owner Sur-Reply

Fourth, JLI's combination degrades vaporization efficiency. As explained, airflow only contacts the center of the heating element in the combination—most of the heating element is not utilized for vaporization. EX2022 ¶¶201-210. JLI responds that "the straight flow passageway modification increases overall airflow" and compensates for the reduced vaporization efficiency. Reply, 24-25. JLI's arguments amount to attorney say-so; it cites no evidence to rebut Dr. Singhose.

Patent Owner Sur-Reply at 24

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Patent Owner's Alleged Disadvantages Are Incorrect

Testimony Of Patent Owner's Expert, Dr. Singhose

And the notion of easier draw, again, a person of skill in the art at this time would know as a basic principle of fluid dynamics that a straight path has less resistance than a contorted path, right?

A Given all the other variables are held constant, that is true.

Reply at 22; Ex. 1035, 127:15-128:9

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Ground 1: ’881-Specific Independent Claim Elements Under Xia Alone And As Modified

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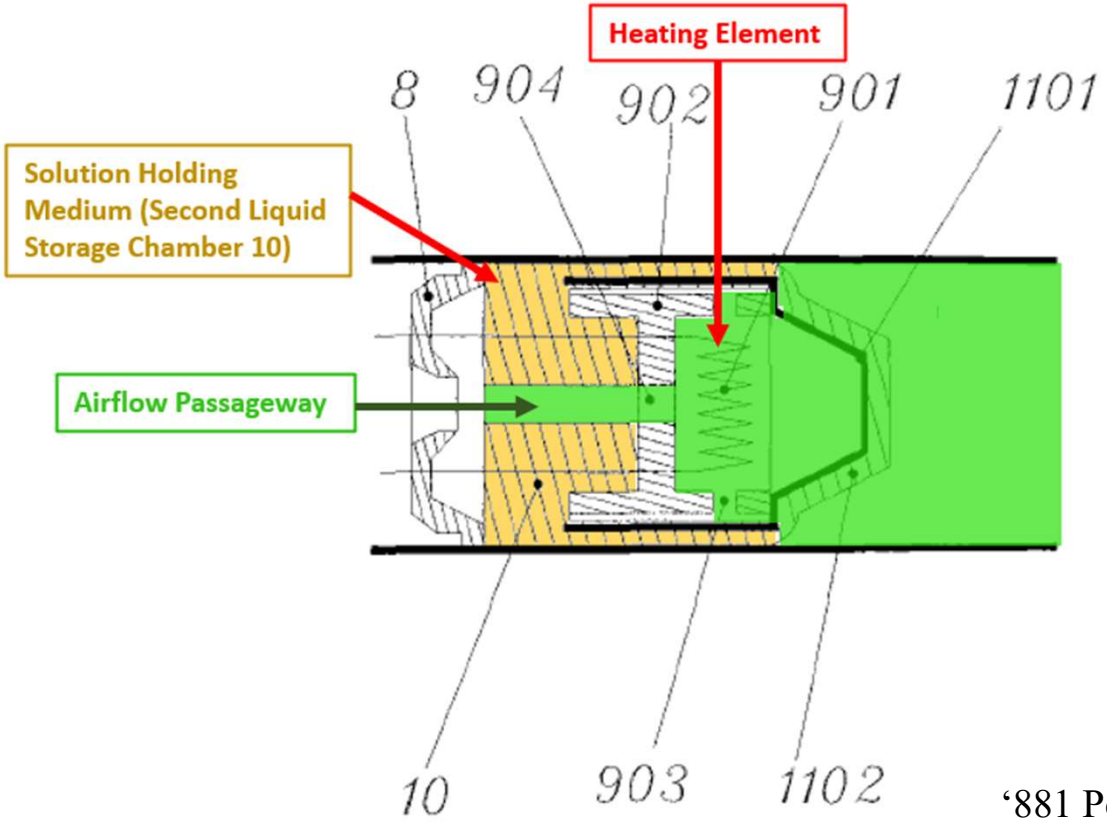
“the solution holding medium surrounds the airflow passageway and the heating element in the interior of the housing and intermediate of the first end and the second end” ’881 patent, 1[h]



‘881 Pet. at 62-64

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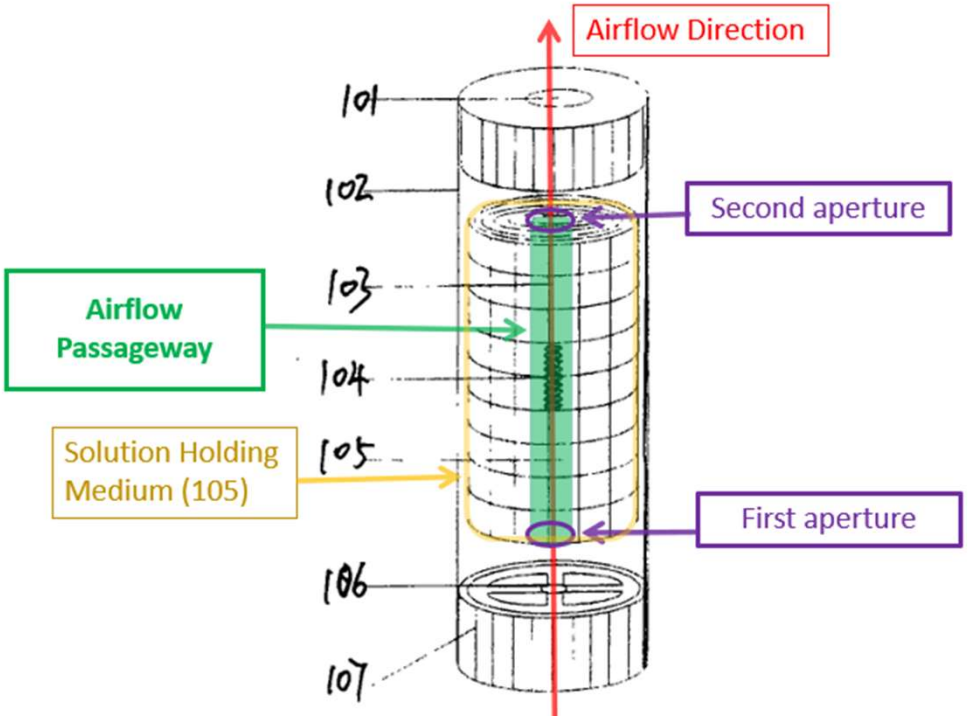
“the solution holding medium surrounds the airflow passageway and the heating element in the interior of the housing and intermediate of the first end and the second end” ’881 patent, 1[h]



Unrebutted by Patent Owner

‘881 Pet. at 62-64

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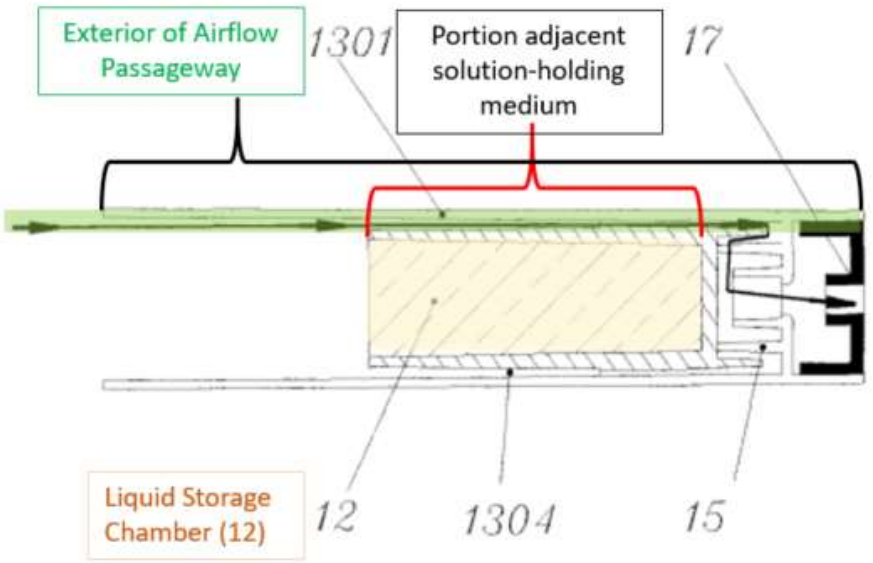
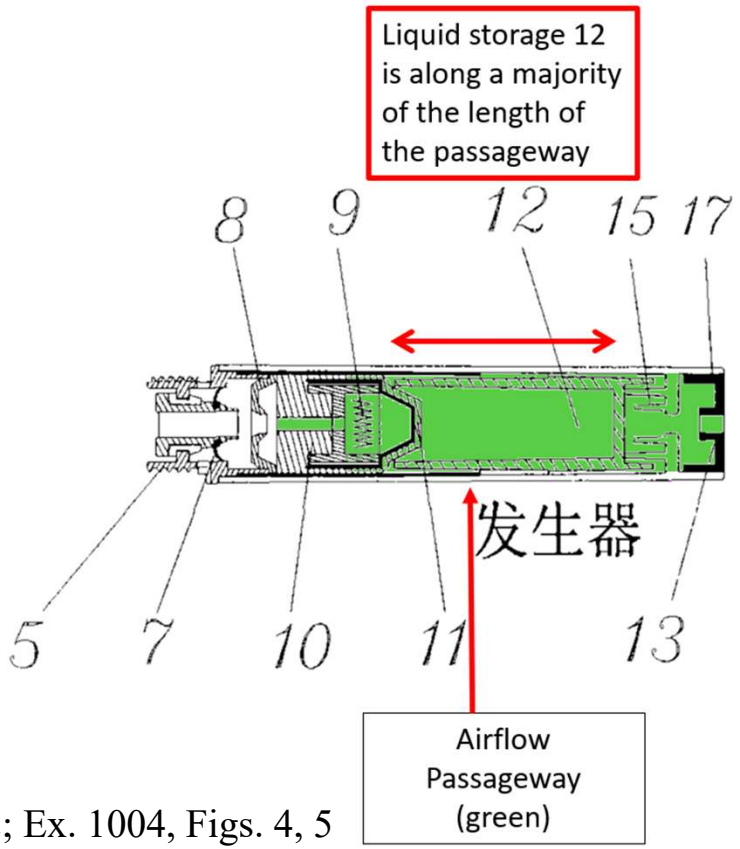
“the airflow passageway having an exterior adjacent to the solution holding medium along a majority of the length of the airflow passageway” (‘881 patent, 16[b3])





‘881 Pet. at 79-82; Ex. 1004, Figs. 4, 5

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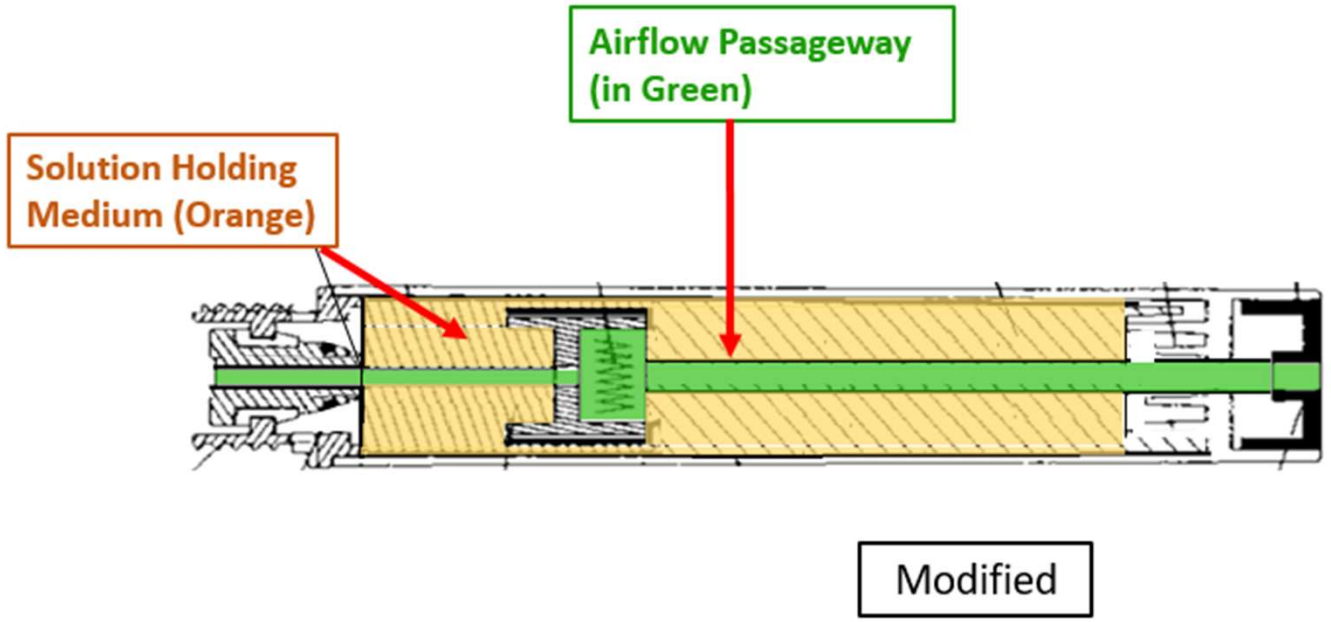

Unrebutted by Patent Owner

‘881 Pet. at 79-82

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Ground 1: ’864 Patent Dependent Claims Under Xia Alone And As Modified

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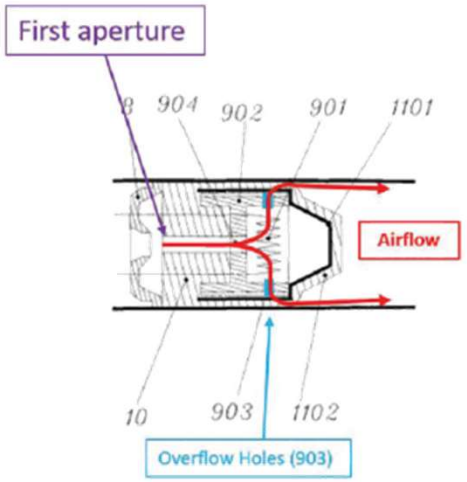
The cartridge of claim 1, further in combination with a power source adapted to be electrically coupled to the first end of the housing, the power source including a battery. (Claims 2, 9)

Patent Owner Response



Petition, 73.

Petitioner's identified "first aperture" is not a *housing* aperture. Air enters Xia's housing through side apertures on the threaded connector. The airflow path proximate these apertures is not central or axial. EX2022 ¶¶286-287.

Patent Owner Response at 72

Same argument as regarding claim 1

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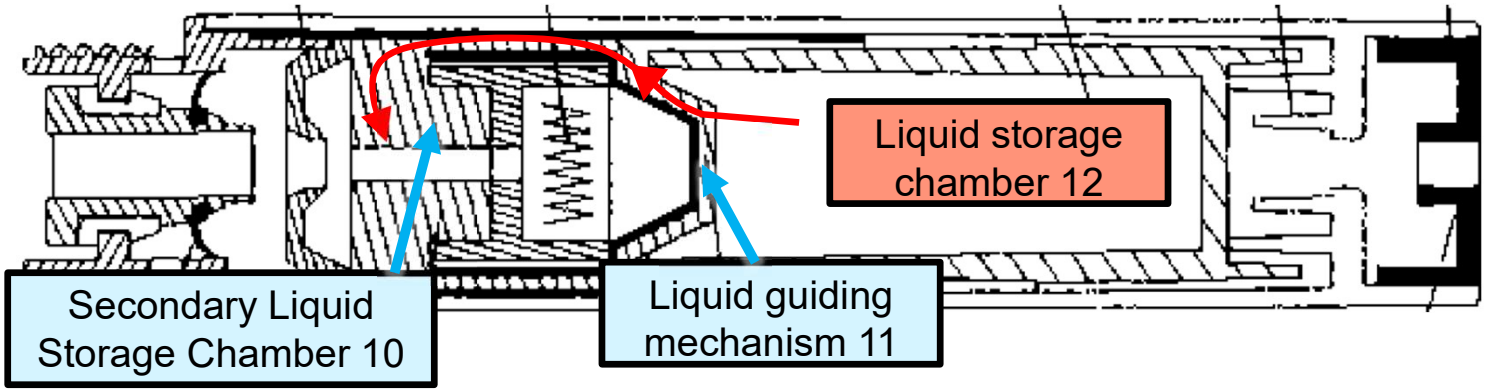
The cartridge of claim 9, wherein the heating element includes a wicking material being operative to permit at least a portion of the solution to be held in the solution holding medium to be drawn toward the heating element to be vaporized. (Claims 12, 31)

Xia



Petition

Xia discloses that "the chemical liquid flows from the liquid storage chamber 12 into the secondary liquid storage chamber 10 through the liquid-guiding mechanism 11." Ex. 1004, 10. "One end of the liquid-guiding mechanism 11 is connected with the secondary liquid storage chamber 10 through the liquid guiding body 1102, and the other end is in contact with the liquid storage chamber 12." Ex. 1004, 13. Droplets are then drawn into the area of the heater. Ex. 1004, 13.

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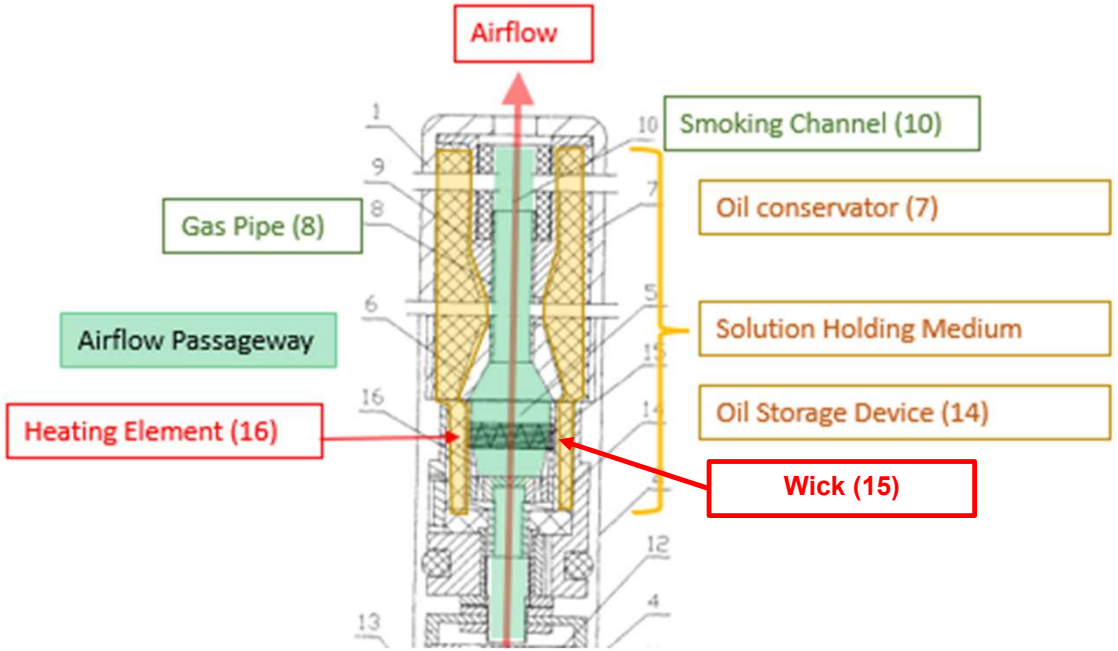
Petition at 77

The cartridge of claim 9, wherein the heating element includes a wicking material being operative to permit at least a portion of the solution to be held in the solution holding medium to be drawn toward the heating element to be vaporized. (Claims 12, 31)

Fang



Ex. 1005; Petition at 77-78

Fang (Ex. 1006) at 6

"[D]ue to the action of the capillary tubes, the temporary oil storage device 15 sucks in nicotine oil stored in the nicotine oil storage device 14, when the electric heating film wire 16 is powered on to heat, nicotine oil on the temporary oil storage device 15 is fumed to produce nicotine oil smoke."

Unrebutted by Patent Owner

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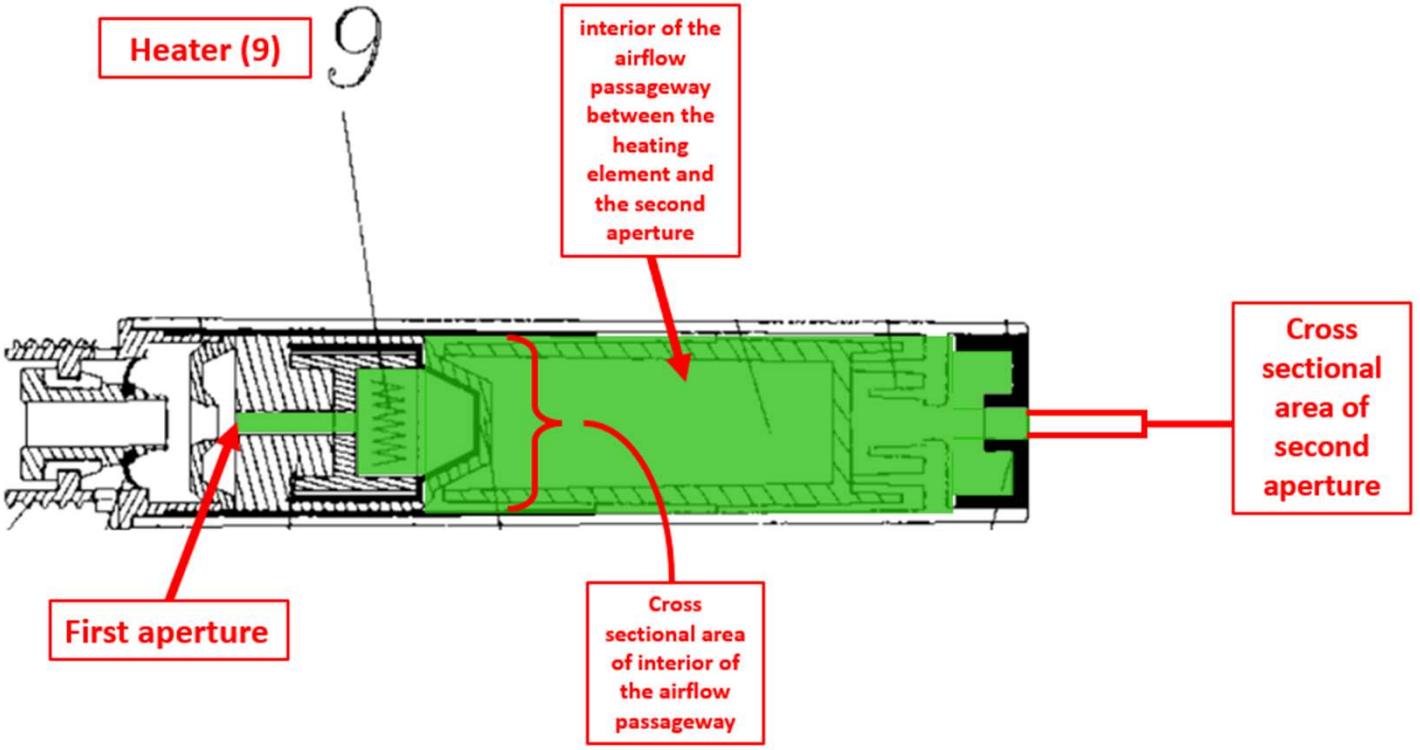
"an airflow chamber having a length extending intermediate of the heating element and the second aperture, the length of the chamber having a substantially uniform cross-sectional area along a continuous majority of the length" (Claims 19, 37, 44)

Xia's Airflow Chamber



Pet. at 83 (referring up to claims 3 and 4 for similar claim language), 67-69; Ex. 1004, Fig. 2 (partial, annotated).

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"an airflow chamber having a length extending intermediate of the heating element and the second aperture, the length of the chamber having a substantially uniform cross-sectional area along a continuous majority of the length" (Claims 19, 37, 44)

Patent Owner's ITC Infringement Arguments Treat Passageway And Chamber The Same

Claim 19

Claim 19	
19. The cartridge of claim 9, wherein the housing further comprises an airflow chamber having a length extending intermediate of the heating element and the second aperture, the length of the chamber having a substantially uniform cross-sectional area	The JUUL system comprises the cartridge of claim 9, wherein the housing further comprises an airflow chamber having a length extending intermediate of the heating element and the second aperture, the length of the chamber having a substantially uniform cross-sectional area along a continuous majority of the length, the substantially uniform cross-sectional area being measured perpendicular to the central longitudinal axis of the housing, no portion of the chamber from immediately adjacent the heating element to the second aperture having a cross-sectional area smaller than a cross-sectional area of the second aperture. *See supra* Claim 4.
along a continuous majority of the length, the substantially uniform cross-sectional area being measured perpendicular to the central longitudinal axis of the housing, no portion of the chamber from immediately adjacent the heating element to the second aperture having a cross-sectional area smaller than a cross-sectional area of the second aperture.	The airflow chamber comprises the portion of the airflow passageway between the heating element and the second aperture.

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Ex. 1033 at 42-43

"an airflow chamber having a length extending intermediate of the heating element and the second aperture, the length of the chamber having a substantially uniform cross-sectional area along a continuous majority of the length" (Claims 19, 37, 44)

Patent Owner Response Treats Passageway And Chamber The Same

> **h. Xia Does Not Render Obvious "no portion of the [airflow passageway / chamber] immediately adjacent the heating element to the second aperture having a cross-sectional area smaller than a cross-sectional area of the second aperture" (Claims 4, 8, 19, 24, 28, 37, 44, 48)**

Patent Owner Response at 76

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"an airflow chamber having a length extending intermediate of the heating element and the second aperture, the length of the chamber having a substantially uniform cross-sectional area along a continuous majority of the length" (Claims 19, 37, 44)

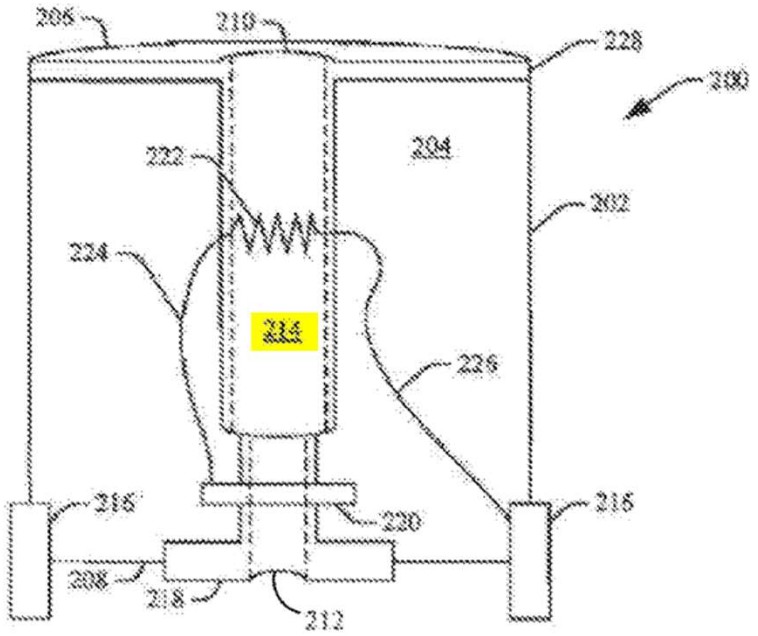
'864 Patent Specification

coupled to a positive terminal of the power source. When a user draws a breath by way of the airflow passageway **214**, a circuit is closed, thereby providing current to the heating element **222**. The heating element **222** acts to vaporize the liquid solution in the absorbent material **204**, and the result-

* * *

In another exemplary embodiment, a heating element **302** may be helical in nature and may wrap around the exterior of the airflow chamber **214**. The heating element in this case

'864 Patent, Figure 2



Ex. 1001 at 6:53-56, 8:1-3, Fig. 2

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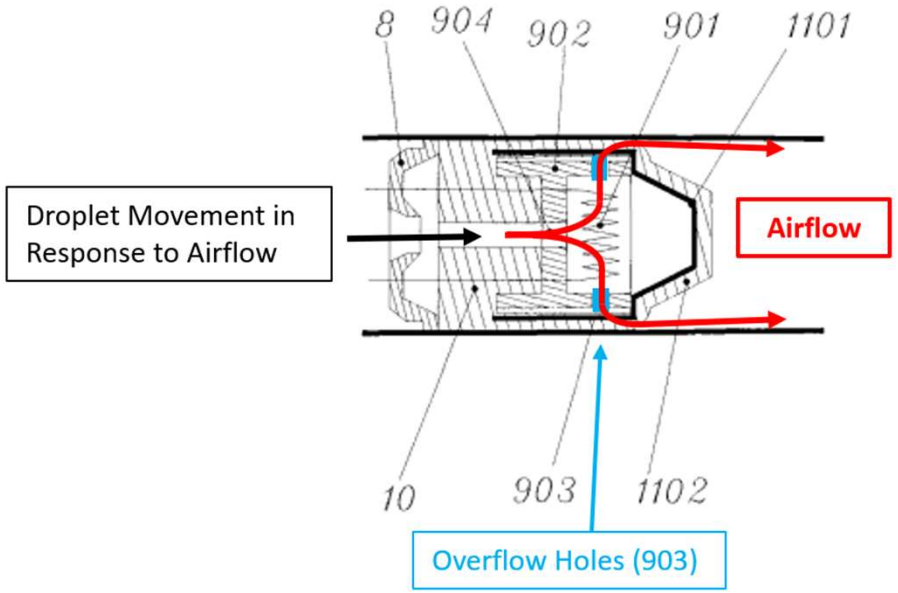
"wherein the airflow passageway extends in a straight path from the first aperture to the second aperture with only the heating element obstructing a portion of the airflow through the airflow passageway along the central longitudinal axis of the housing"

Xia



In the chamber in which the heating element sits, which is part of the passageway, only the heating element obstructs that "portion" of the airflow.

Petition at 70; Ex. 1004, Fig. 4

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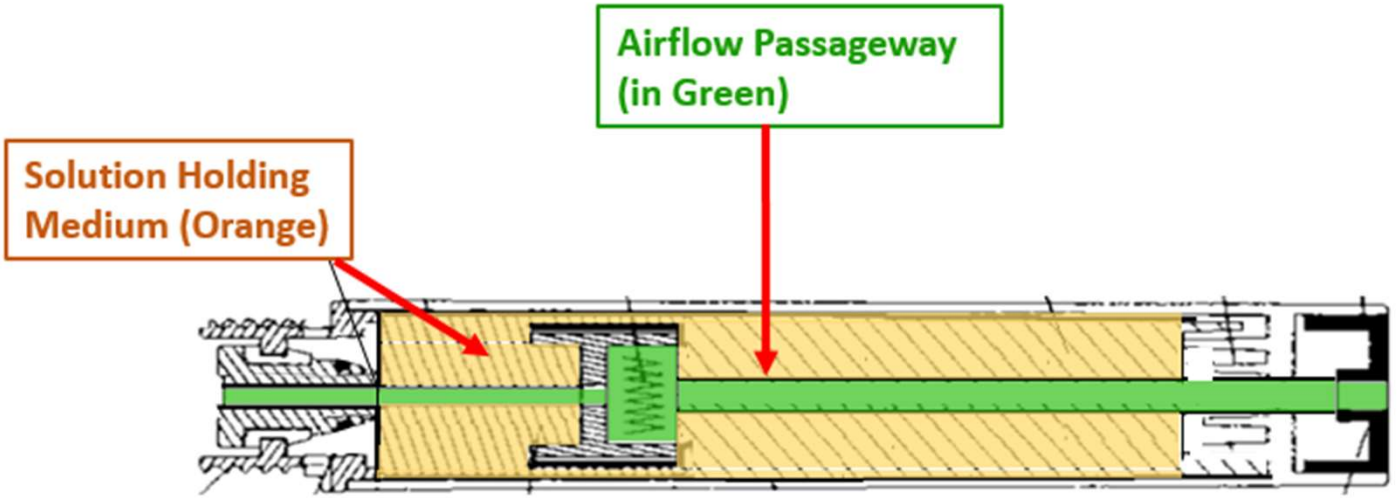
"wherein the airflow passageway extends in a straight path from the first aperture to the second aperture with only the heating element obstructing a portion of the airflow through the airflow passageway along the central longitudinal axis of the housing"

Modified Xia



Modified

Petition at 71

Unrebutted by Patent Owner

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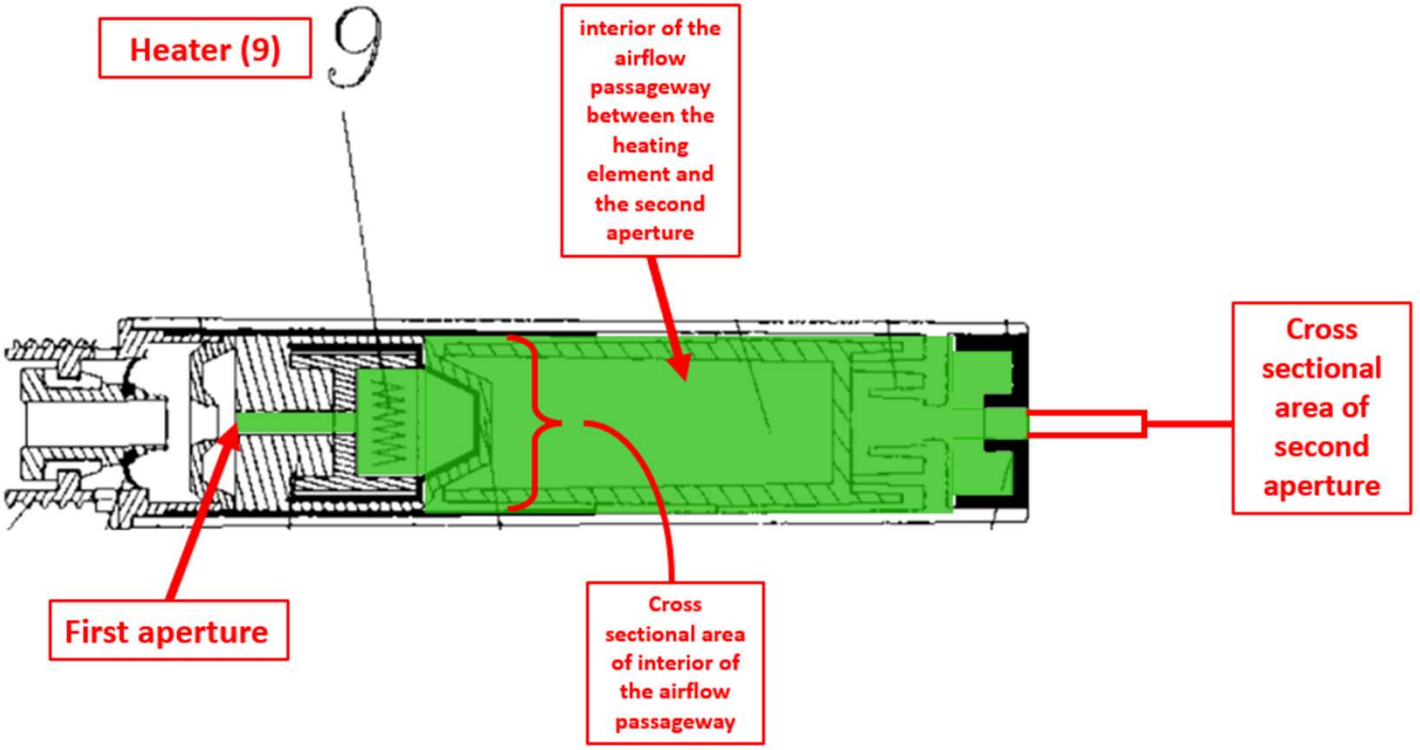
"no portion of the [airflow passageway / chamber] immediately adjacent the heating element to the second aperture having a cross-sectional area smaller than a cross-sectional area of the second aperture" (Claims 4, 8, 19, 24, 28, 37, 44, 48)

Xia



Pet. at 68-69 (referring up to claim 3); Ex. 1004, Fig. 2 (partial, annotated).

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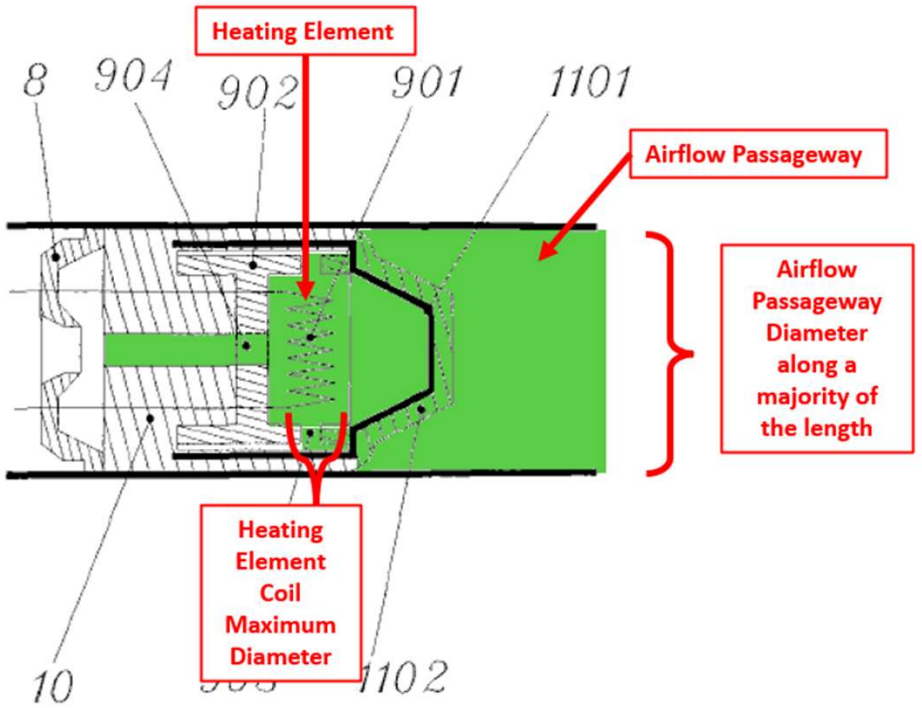
Ground 1: ’881 Patent Dependent Claims Under Xia Alone And As Modified

“the airflow passageway having a uniform circular cross section” or a “circular cross section...along the majority of the length” (Claims 2, 10, 18, 21)

Xia



‘881 Pet. at 67-69

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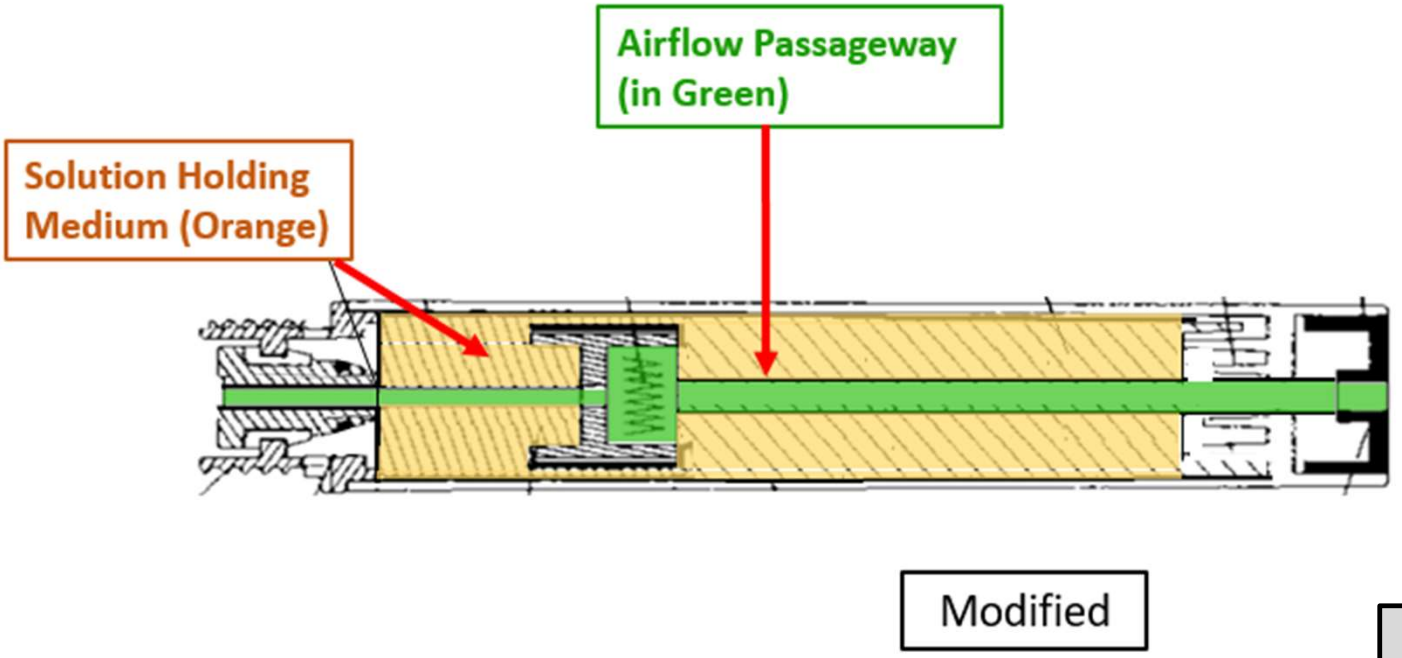
“the airflow passageway having a uniform circular cross section” or a “circular cross section...along the majority of the length” (Claims 2, 10, 18, 21)

Modified Xia



Unrebutted by Patent Owner

‘881 Pet. at 67-69

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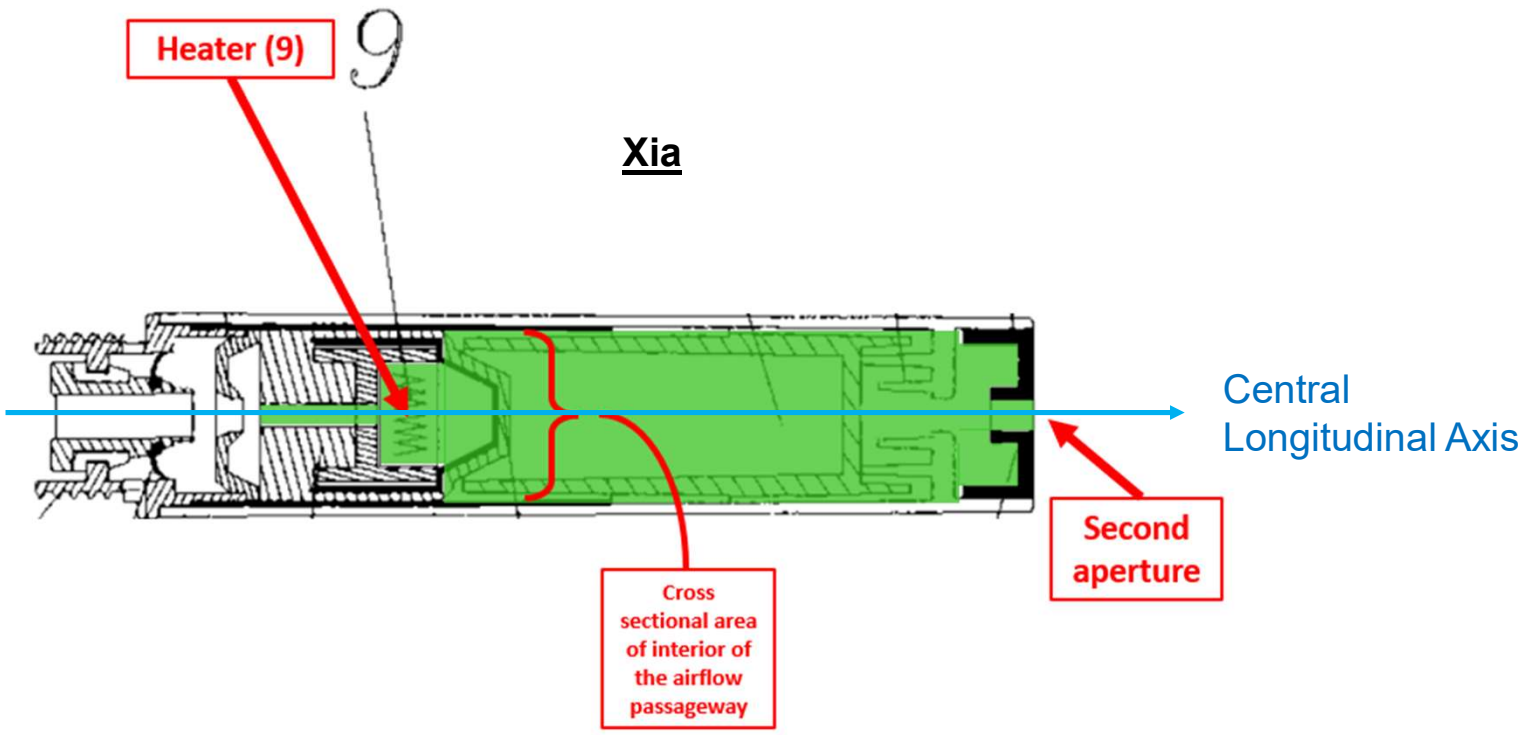
“a uniform cross-sectional area measured perpendicular to a central longitudinal axis of the housing between the heating element and the second aperture” (Claims 7, 15, 27)



‘881 Pet. at 73

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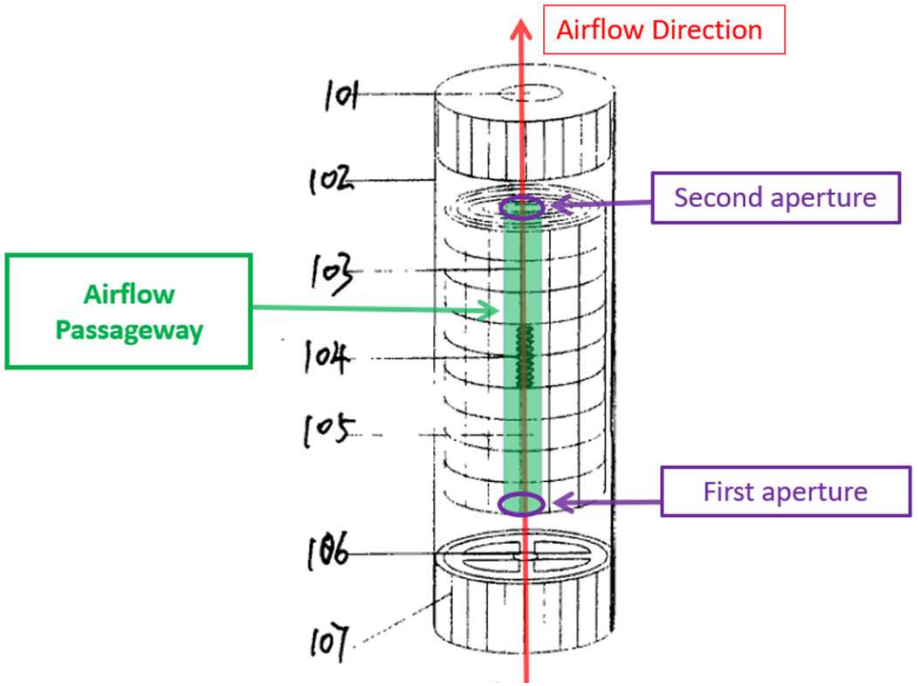
"a uniform cross-sectional area measured perpendicular to a central longitudinal axis of the housing between the heating element and the second aperture" (Claims 7, 15, 27)

Wang



'881 Pet. at 74; Ex. 1006, Fig. 3

Unrebutted by Patent Owner

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“wherein the heating element is in operative connection with a wicking material...operative to attract a portion of the solution from the solution holding medium…toward the heating element” (Claim 26)

Same dispute as in ‘864 patent

‘881 Pet. at 85-86

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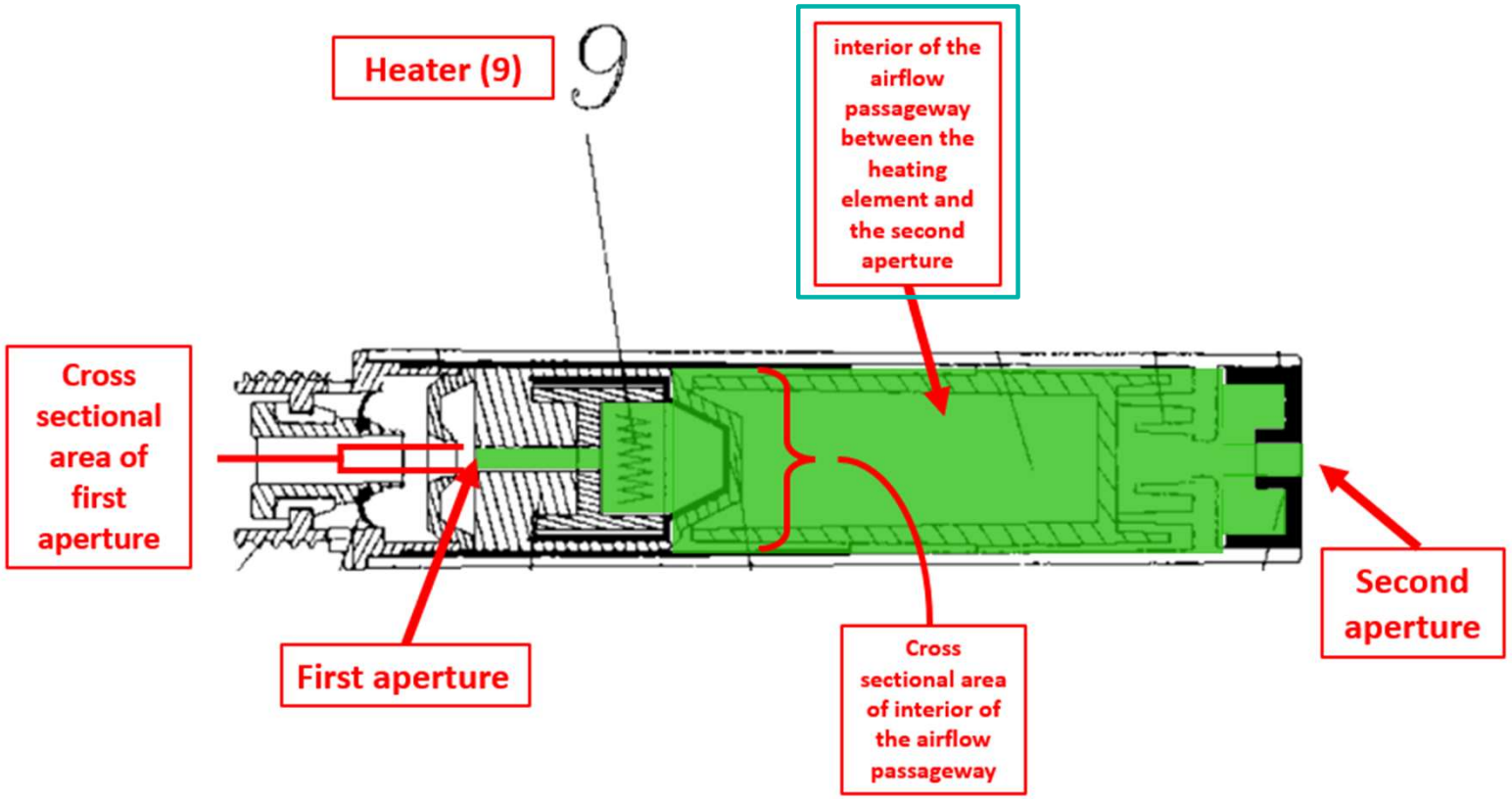
“the interior of the airflow passageway between the heating element and the second aperture being no smaller in cross-sectional area than the cross-sectional area of the first aperture” (claims 3, 11, 16)



‘881 Pet. at 69-70

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Ground 2

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Ground 2 Slide Organization

Disputed Limitations

- '864 patent, claim 1 under Wang alone: Slides 97-118
- '864 patent, claim 1 under Wang as modified with Fang: Slides 119-131
- '881-patent-specific independent claim limitations under Wang alone and as modified: Slides 132-133
- '864 patent, dependent claims under Wang alone and as modified: Slides 134-138
- '881 patent, dependent claims under Wang alone and as modified: Slides 139-141

Undisputed Limitations

- '864 patent, claim 1 undisputed limitations: Slides 152-156
- Remaining undisputed limitations: refer to briefing

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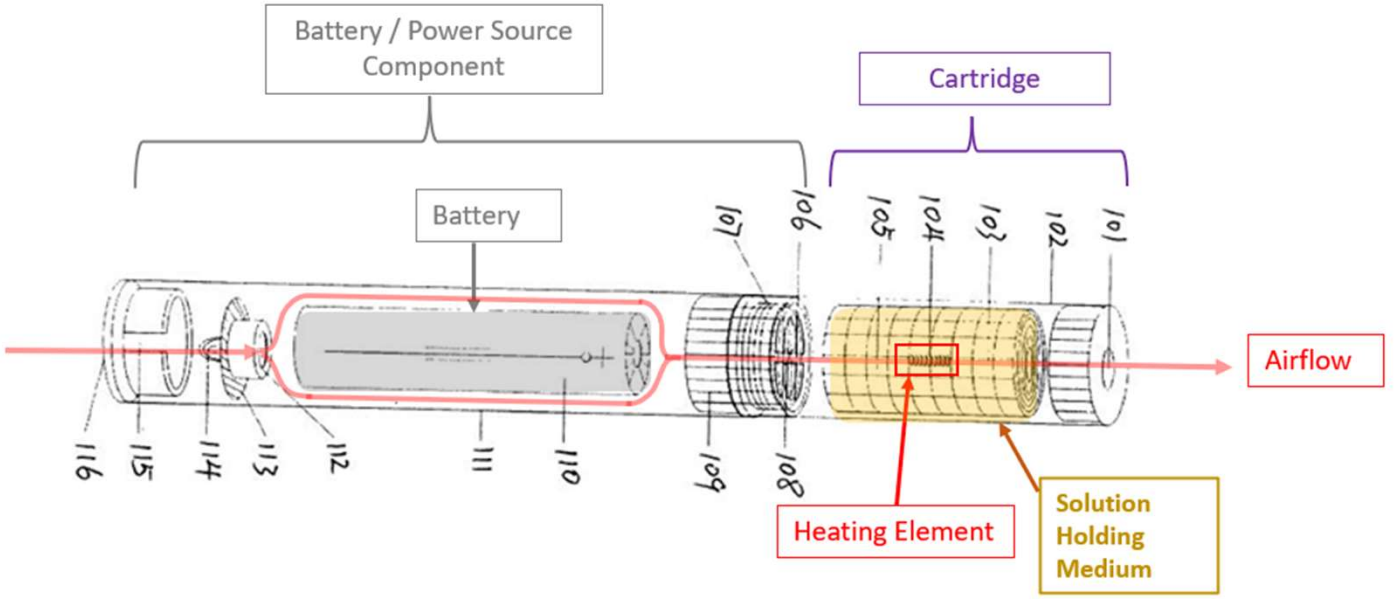
Ground 2: ‘864 Patent, Claim 1 Under Wang Alone

Wang Alone



Pet. at 91; Ex. 1005, Fig. 1 (annotated)

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Patent Owner's Disputes Regarding Wang Alone

1. First Aperture Is Not In The Housing
2. Heating Element Does Not Extend Transversely
3. No Passageway Through The Rolled Fiber

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Patent Owner's Disputes Regarding Wang Alone

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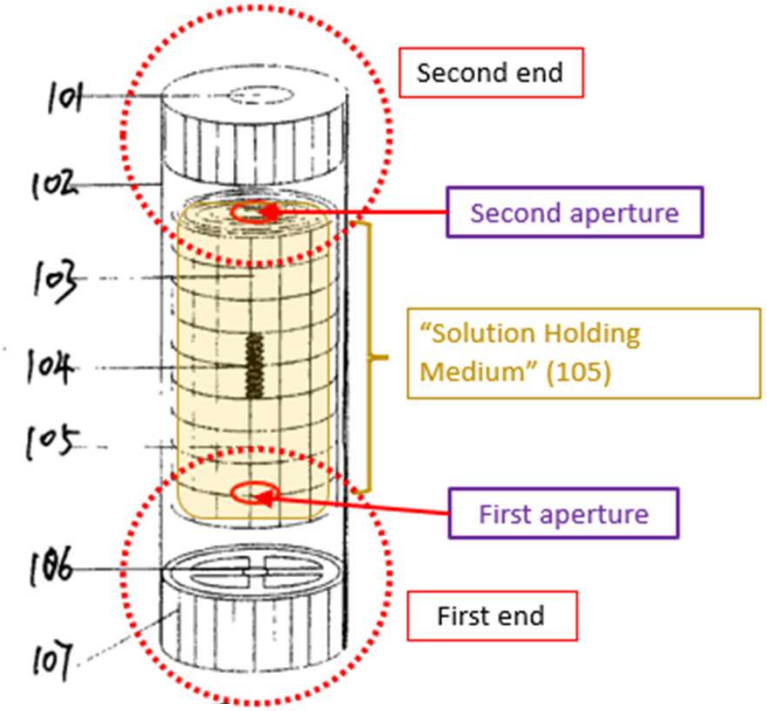
1[a2] the housing having a first end and a second end that is opposite the first end, the housing having a first aperture proximate the first end and a second aperture proximate the second end



Same Dispute As In Ground 1

Pet. at 93; Ex. 1005, Fig. 3

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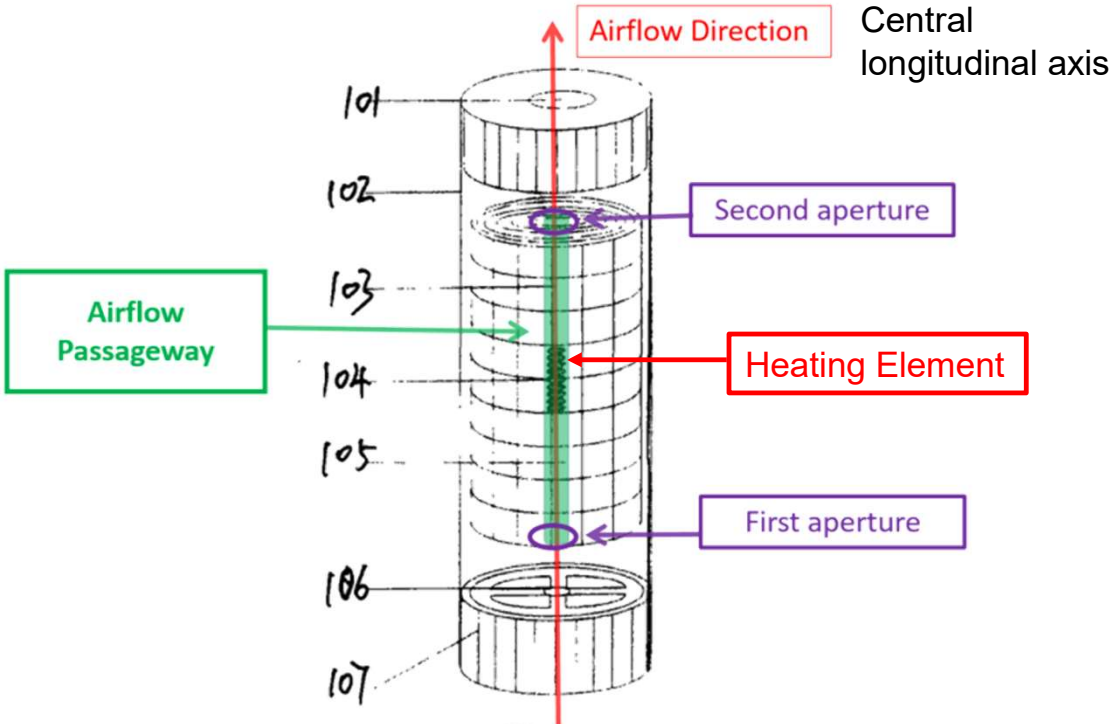
1[b1] a heating element located in the interior of the housing, the heating element extending transversely to a central longitudinal axis of the housing and being at least partially exposed to the airflow

Wang



Pet. at 96-97; Ex. 1005, Fig. 3 (annotated).

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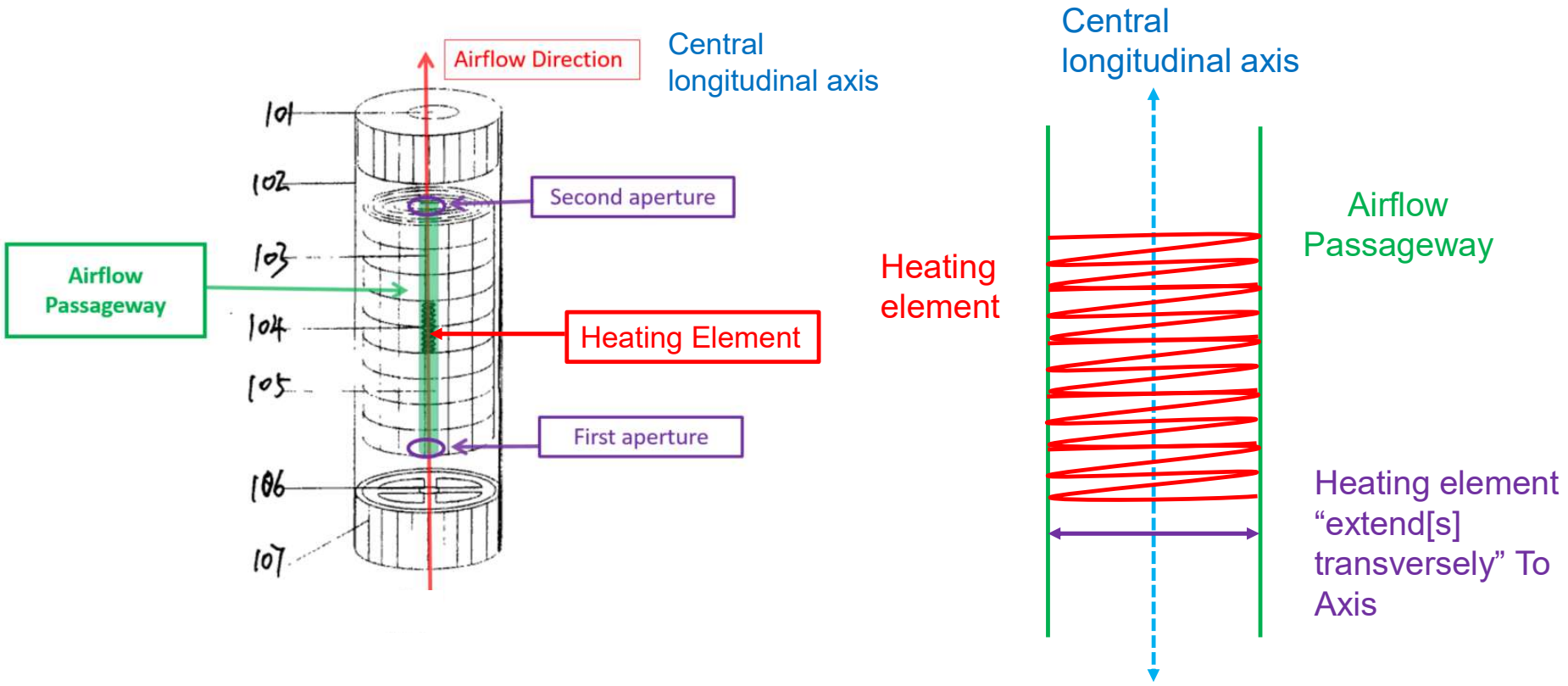
1[b1] a heating element located in the interior of the housing, the heating element extending transversely to a central longitudinal axis of the housing and being at least partially exposed to the airflow



Pet. at 96-97; Reply at 30-34; Ex. 1005, Fig. 3 (annotated).

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Patent Owner's Arguments Have No Basis In Claim Language

Patent Owner Sur-Reply

In both configurations, the major axis of a heating element extends crosswise across a passageway. In Wang, a coil encircles a purported passageway and its major axis extends *parallel to* the purported passageway.

Sur-Reply at 32

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Patent Owner's Arguments Have No Basis In Claim Language

Patent Owner Sur-Reply

In both configurations, the major axis of a heating element extends crosswise across a passageway. In Wang, a coil encircles a purported passageway and its major axis extends *parallel to* the purported passageway.

Sur-Reply at 32

1. A cartridge configured to couple to a power source of an electronic vaporizer, the cartridge comprising:

a housing having an interior and a solution holding medium adapted to hold a solution, the housing having a first end and a second end that is opposite the first end, the housing having a first aperture proximate the first end and a second aperture proximate the second end, the first end of the housing being adapted to electrically couple to the power source, the first aperture and the second aperture being in communication with one another to permit an airflow through the housing from the first aperture to the second aperture;

a heating element located in the interior of the housing, the heating element extending transversely to a central longitudinal axis of the housing and being at least partially exposed to the airflow, the heating element being configured to vaporize at least a portion of the solution for oral provision to an individual in the airflow, the heating element being responsive to electrical power received from the power source; and

an airflow passageway in the housing, at least a portion of the airflow passageway extending centrally and axially with respect to the housing,

wherein the airflow passageway extends centrally and axially from the first aperture to the second aperture.

Ex. 1001, claim 1

No "major axis" requirement

No "straight line" requirement

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1[b1] a heating element located in the interior of the housing, the heating element extending transversely to a central longitudinal axis of the housing and being at least partially exposed to the airflow

Deposition Testimony of Patent Owner's Expert, Dr. Singhose

Q BY MR. DOKHANCHY: And so the claim language says that the heating element extends transversely, right?

A Yes.

Q Can something extend in two dimensions or does something only have to extend -- can it only extend in one dimension?

A I think something could extend in three dimensions.

Q Okay.

A So, yeah, two, you could do two.

No "major axis" requirement

Reply at 32; Ex. 1035, 49:5-15.

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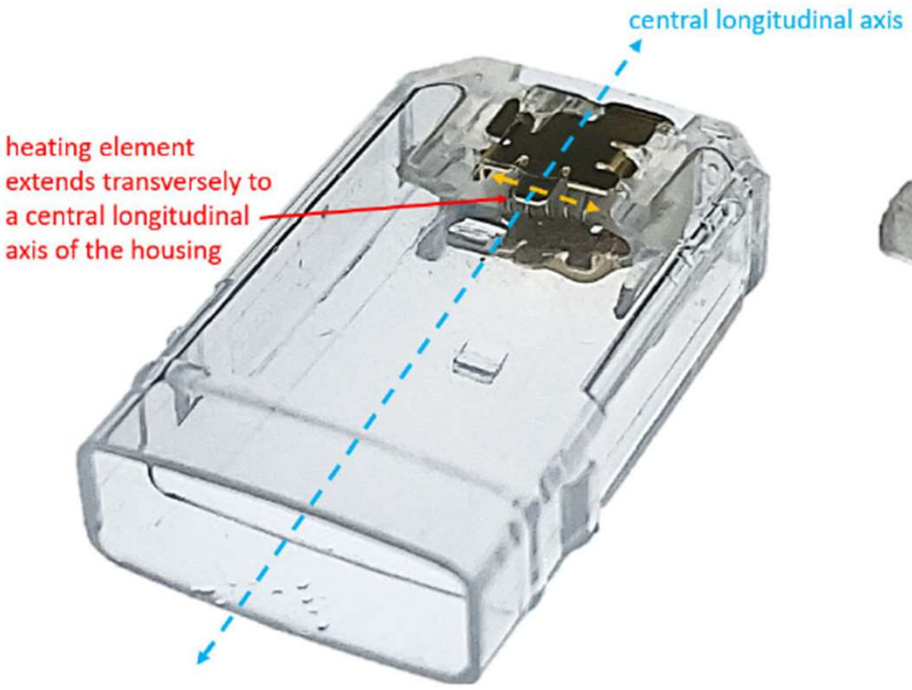
Straight Line Heating Element Not Required

Patent Owner's Infringement Arguments In ITC



No "straight line" requirement

Pet. at 96-99; Reply at 30-34; Ex. 1033 at 5

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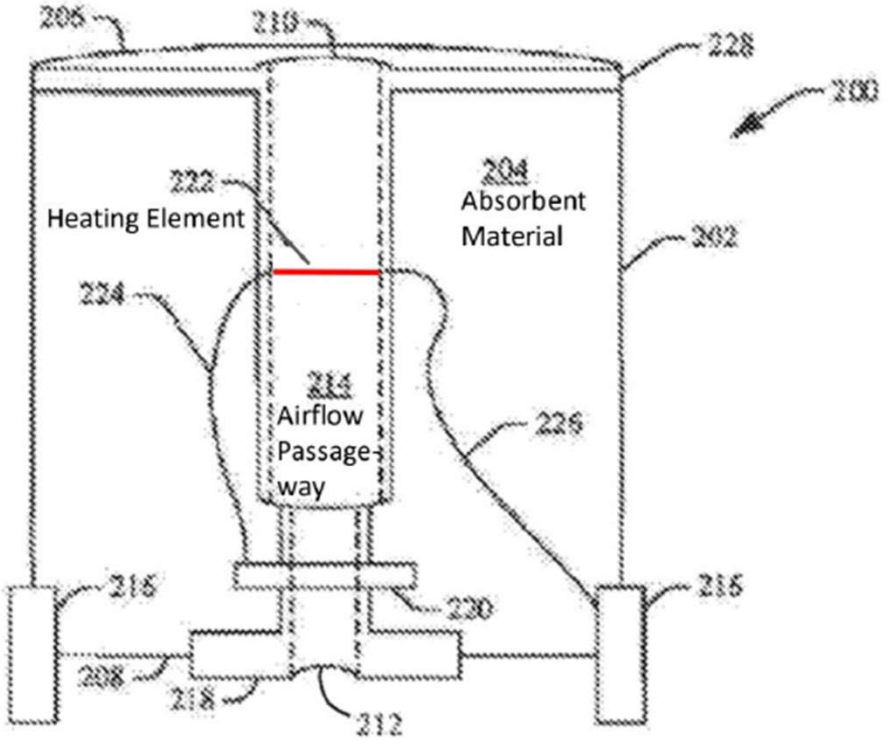
1[b1] a heating element located in the interior of the housing, the heating element extending transversely to a central longitudinal axis of the housing and being at least partially exposed to the airflow

Deposition Testimony of Inventor Daniel Hillenbrandt



20 Q. And you agree it does go transversely
21 across the passageway, right?
22 MR. SIEGER: Same objections.
23 A. That your hypothetical does look
24 transverse.

Reply at 33-36; Ex. 1040, 2; Ex. 1038, 88:16-89:24.

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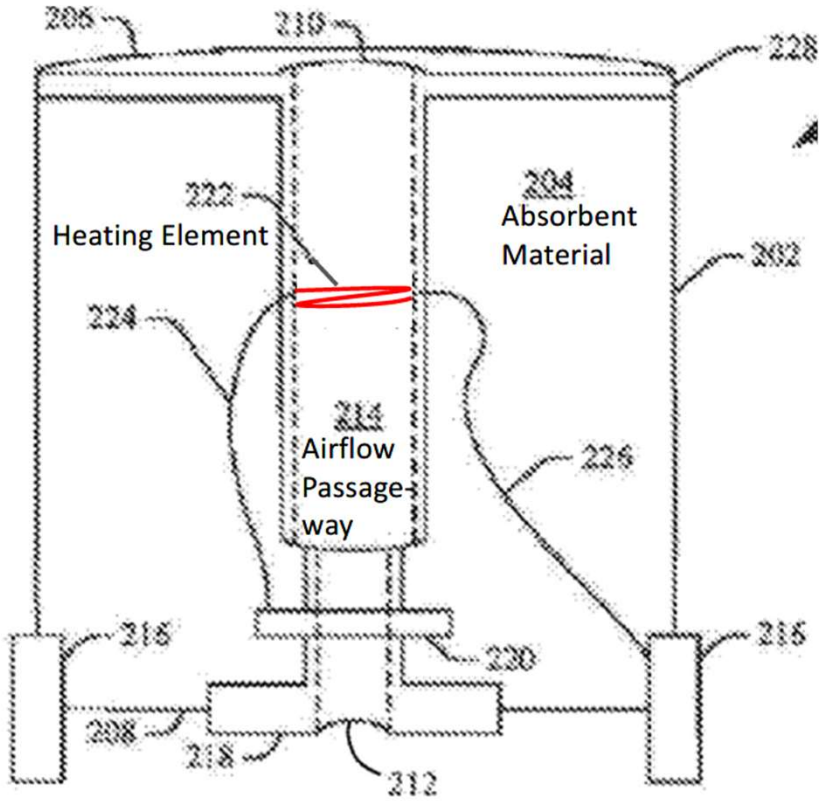
1[b1] a heating element located in the interior of the housing, the heating element extending transversely to a central longitudinal axis of the housing and being at least partially exposed to the airflow

Deposition Testimony of Inventor Daniel Hillenbrandt



15 All this wire does is go across the
16 passageway three times. So my question is, if
17 the heating element, instead of going across
18 once, goes across three times, does it still
19 extend transversely to the airflow passageway?
23 A. As you're describing it, and the way you
24 drew it horizontally, would speculate that it
1 does --
2 Q. Okay.
3 A. -- is what you're trying to achieve as
4 far as going across.

Reply at 33-36; Ex. 1040, 2; Ex. 1038, 90:1-92:1

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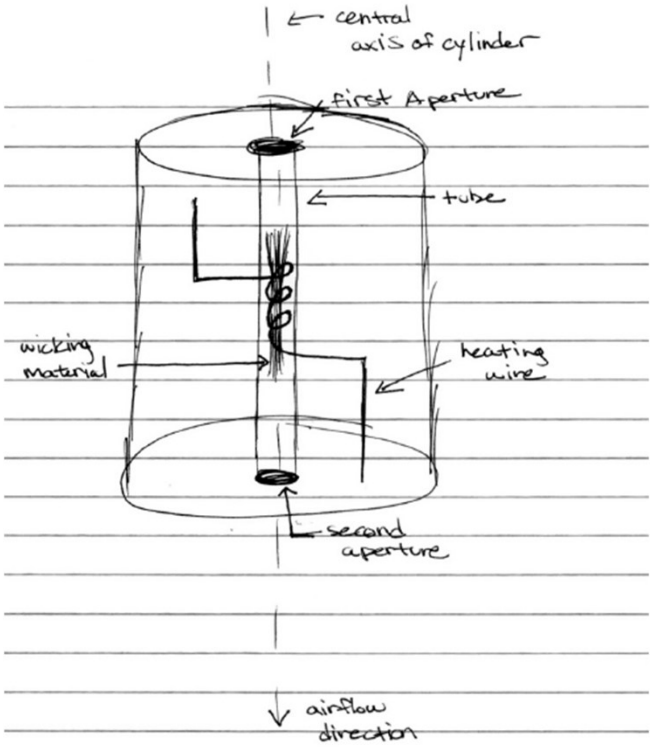
1[b1] a heating element located in the interior of the housing, the heating element extending transversely to a central longitudinal axis of the housing and being at least partially exposed to the airflow

Deposition Testimony of Inventor Daniel Hillenbrandt



"[I]t does extend transversely across the passageway; correct?
MR. PEPE: Objection to form, calls for opinion testimony.
A. I can see it can be interpreted like that.

Reply at 33-36; Ex. 1041, 240:12-242:15, Ex. 1042.

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Patent Owner's Disputes Regarding Wang Alone

1. First Aperture Is Not In The Housing
2. Heating Element Does Not Extend Transversely
3. No Passageway Through The Rolled Fiber

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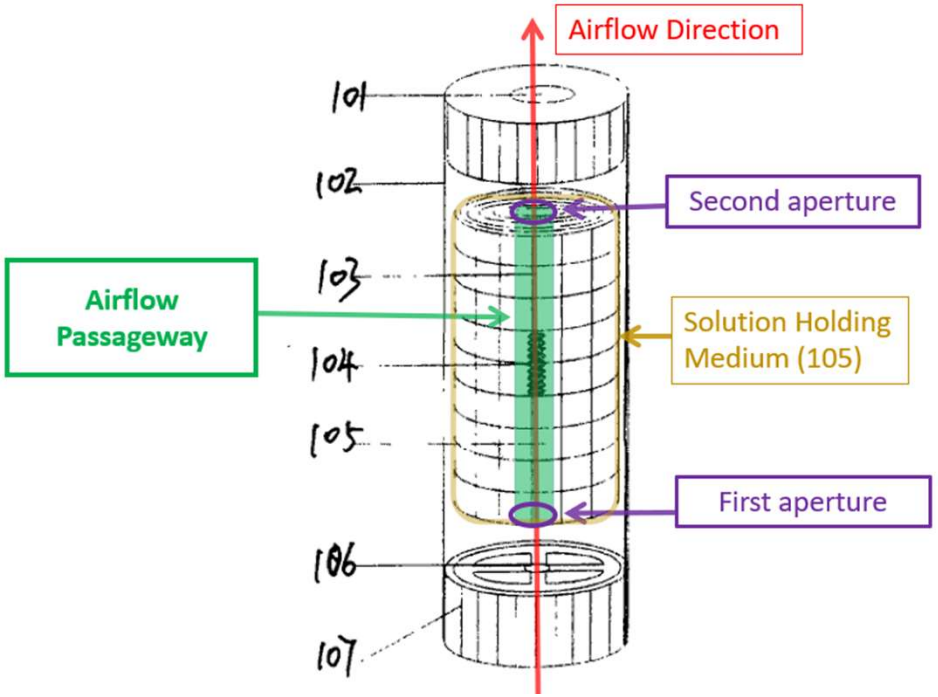
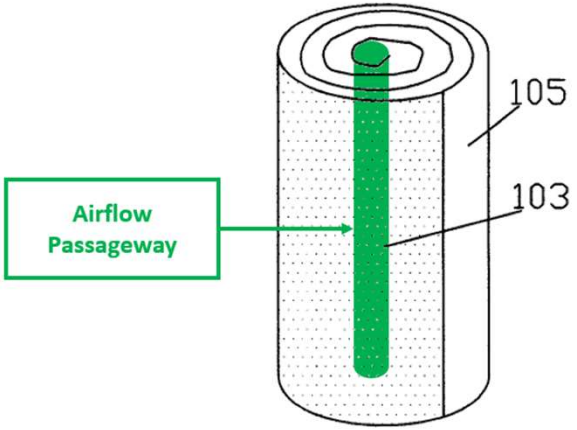
1[c] an airflow passageway in the housing, at least a portion of the airflow passageway extending centrally and axially with respect to the housing,

1[d] wherein the airflow passageway extends centrally and axially from the first aperture to the second aperture.





"The interior of the shell 102 provides a space for the **electric heater 104** and the tobacco extract 103 **and organic fiber 105 wound around it** , and also **provides a space for smoke produced** when the tobacco extract 103 in the organic fiber 105 is heated by the electric heater 104"

Pet. at 57-61, 77, 101; Reply at 25-29; Ex. 1005 at 7

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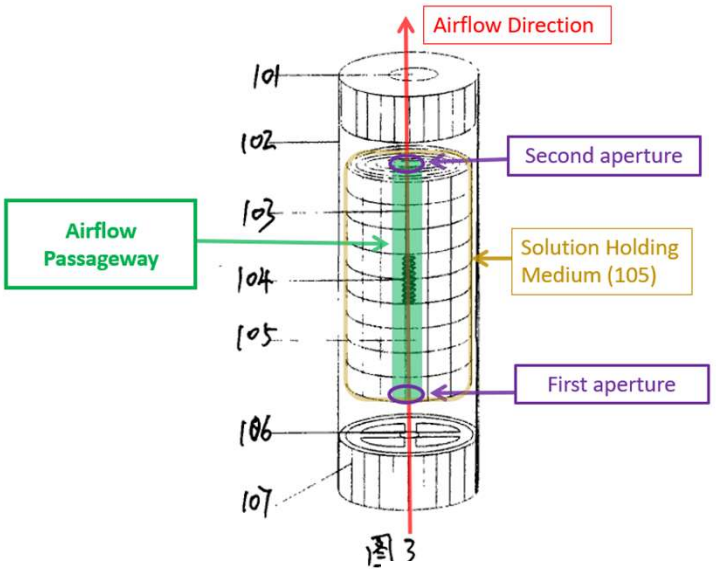
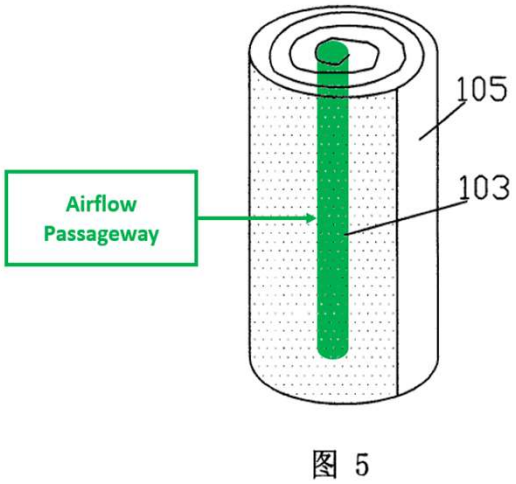
1[c] an airflow passageway in the housing, at least a portion of the airflow passageway extending centrally and axially with respect to the housing,

1[d] wherein the airflow passageway extends centrally and axially from the first aperture to the second aperture.





1. **Depicted as having a central passageway**
2. **Heating element sits in passageway; fiber is "wound" around it**
3. **Described as having "a space for smoke produced" by coil**
4. **Airflow must pick up vapor at heater in order to deliver it to the user**
5. **Cannot roll fiber without any gap or would be unnecessarily difficult to do**

Pet. at 57-61, 77, 101; Reply at 25-29; Ex. 1005 at 7

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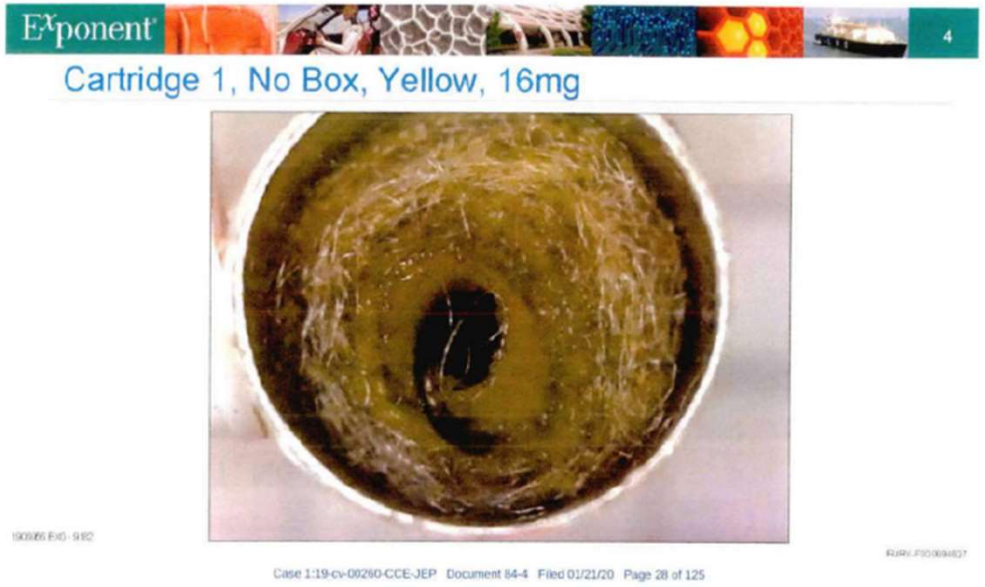
Wang Has A Central Airflow Passageway In A Fiber Just Like Other Pre-Existing Devices

Smoke 51 Duo



Reply at 30; Ex. 1039 at 28

Hillenbrandt Declaration

taste. It appeared that the burnt taste was due to the atomizer burning the absorbent material that held the e-liquid. For example, when Greg Conley took the cap off of a cartomizer-type two-piece device (Smoke Fifty-One Duo) that had a burnt taste, I noticed a scorch mark on the outer inside edge of the batting material, which I believe was caused by the heating element in the batting material.

Ex. 2023.003

Hillenbrandt Deposition

23 Q. So you've seen the Smoke Fifty-One Duo
24 cartridges, right?
1 A. I've used them, yes.
2 Q. And, in fact, you saw the internals of
3 that, didn't you?
4 A. I saw what it looked like with the
5 plastic cap popped off the top.

Reply at 32; Ex. 1038, 421:22-45:10

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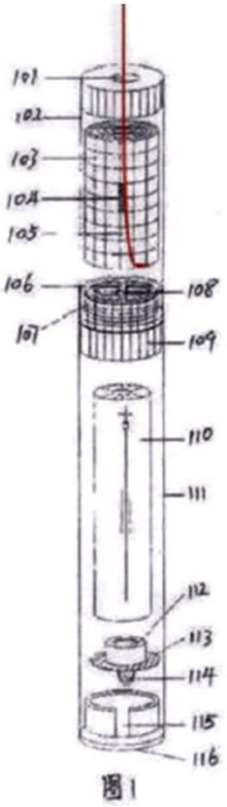
Inventor Wang Confirmed His Patent Has A Central Airflow Passageway



Deposition Testimony of Mr. Wang

Q. Can the witness draw where the air flows through this device -- through the cartridge.

* * *

THE WITNESS: No, actually I draw this line. I drew this line using my cell phone.

Q. Does that line go through the center of 101?

MR. THOMAS: Object to the form of the question.

THE WITNESS: Of course it went through the center.

Q. Does that line go through the center of 104?

MR. THOMAS: Object to the form of the question.

THE WITNESS: In this figure, yes, because it has to go through the airflow channel.

Reply at 30-31; Ex. 1036, 41, 49-55

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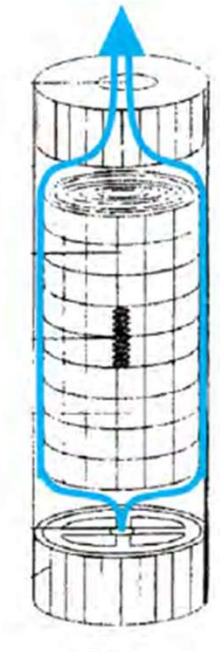
Patent Owner's Theory

Patent Owner Response



Patent Owner's theorized airflow does not pick up vapor and thus does not function as an e-cigarette

POR, 80-82

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Patent Owner's Theory

Deposition Of Patent Owner's Expert

Q Okay. So how does the vapor pass through a fiber soaked in liquid?

A Well, it's kind of like drinking a Sprite or a Coke, right? It's all liquid, but there's bubbles that form and flow through the liquid to get to the outside. So essentially it's a boiling operation, and gas can go through liquid as it's boiling outwards.

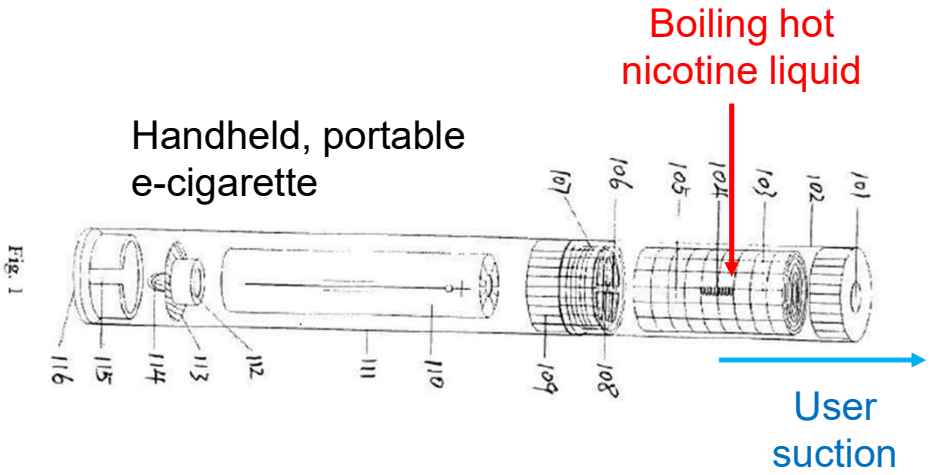
* * *

Q Does Wang describe its operation as boiling the liquid that's within the fiber?

A No, it does not use that terminology.

Ex. 1035 at 25:2-26:1

Patent Owner's Theory



POR, 80-82

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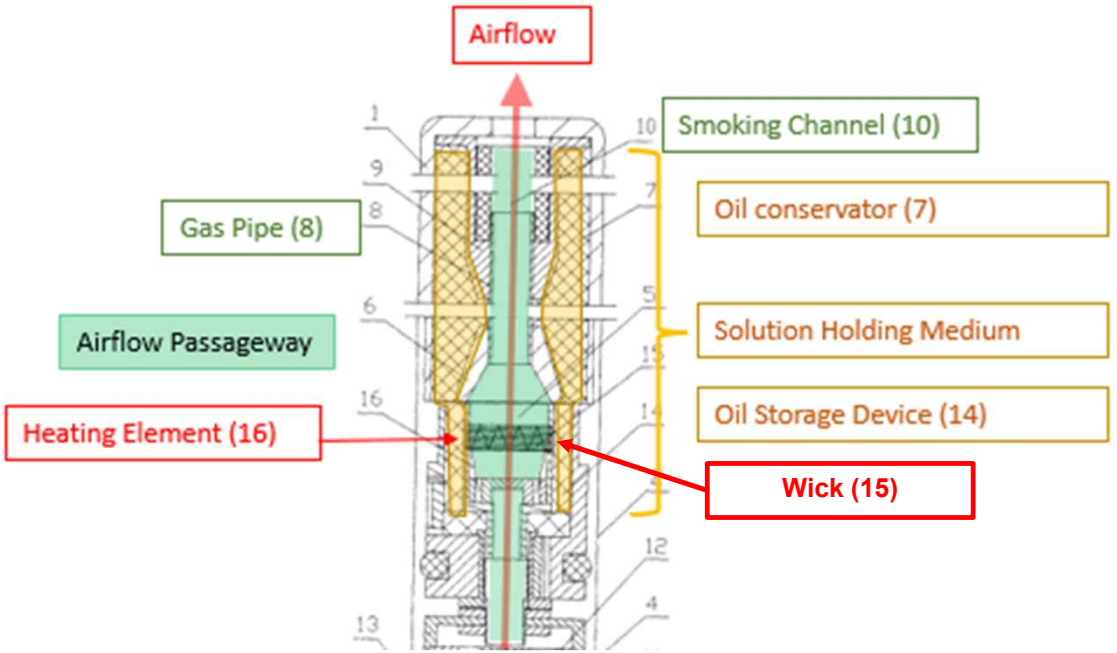
Ground 2: ‘864 Patent, Claim 1 Under Wang As Modified

Wang As Modified With Fang: (1) Coil Orientation

If Patent Owner Is Correct, A POSITA Would Use Fang's Wick And Coil Orientation



Benefits

1. Greater contact between heating element and nicotine solution, and thus better vaporization
2. Greater contact between heating element and air, thus better vaporization
3. Wick made of similar material (fiber) as in Wang's solution-holding medium

Pet. at 97-99; Reply at 35; Ex. 2007, pars. 295-300

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Wang As Modified With Fang: (1) Coil Orientation

Deposition Testimony Of Patent Owner's Expert

Q So the starting place is Wang as it is with the coil in, as you say, a longitudinal direction touching the fiber so that air only flows down the middle. And my question is, if you were to rotate that coil so that air -- my proposition is that air would flow over more of the coil; instead of just the inside, it flows around the outside also.

Do you agree with that?

* * *

A So if your question is, can the air touch more surface area of the coil, I would say given all that setup, yes.

Q Okay. And is that something that a person of skill in the art would recognize as a basic principle of fluid dynamics?

A Yes.

Reply at 37; Ex. 1035, 55:15-58:9

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Patent Owner's Arguments Are Incorrect

Patent Owner Sur-Reply

"wick." Pet., 103-104. A simple "rotation-plus-wick" combination was not asserted in the Petition and would be nonsensical. Wang's coil already directly contacts the liquid storage; rotating the coil and adding a wick without more is superfluous. POR, 64.

Patent Owner Sur-Reply at 34

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Petition Made The "Rotate-Plus-Wick" Argument

Petition

Additionally, to the extent that Wang does not disclose this limitation, Wang in view of Fang does. As explained above—in Ground 1 element 1[c]—and seen

* * *

A POSITA would know that it would have been a simple design choice to modify Wang to contain a heating element and solution holding medium as disclosed in Fang such that the heating element would be transverse to the central and longitudinal axis of the housing and partially exposed to the airflow. Ex. 1007, ¶297.

* * *

Moreover, by modifying the airflow passageway and solution holding medium as described in Fang, a POSITA would know it would be beneficial to also adopt the wick (item 15) and heating element wrapped around it (item 16) of Fang, which is a perpendicularly-oriented heating element. Ex. 1007, ¶300.

Rotate the coil

Use a wick inside rotated coil

Petition at 98-99

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Patent Owner's Arguments Are Incorrect

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Patent Owner Sur-Reply at 34

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Rotation-Plus-Wick Is Not "Superfluous"

Petitioner's Expert's Declaration

298. For example, this modification would increase heater's surface area contacting the airflow and the nicotine solution; and provide a wider airflow passageway between the heater and the mouthpiece while simultaneously helping to reduce the length of the electronic cigarette for increased portability.

Patent Owner Does Not Dispute

Ex. 1007 at 155

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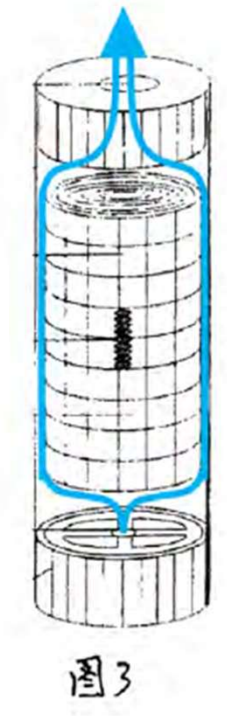
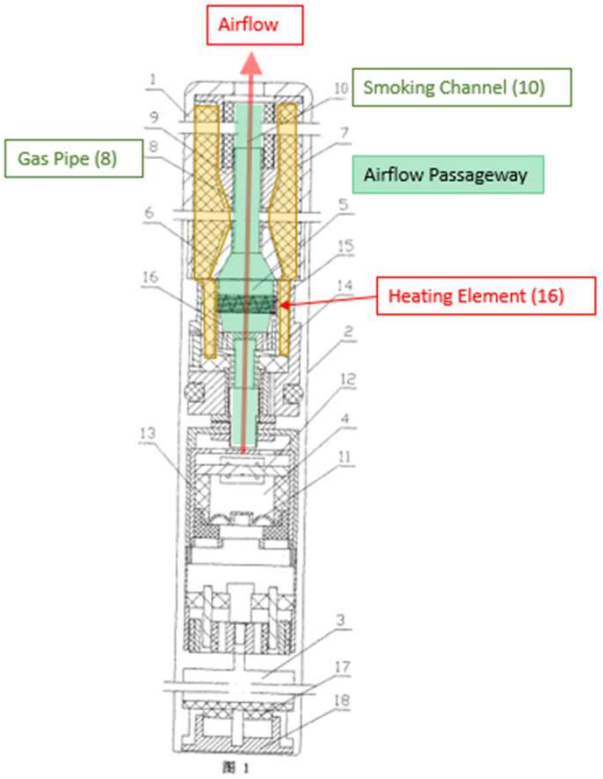
Wang As Modified With Fang: (2) Central Passageway

If Patent Owner Is Correct, A POSITA Would Modify Wang To Have A Central Airflow Passageway

Patent Owner Response





Benefits

- Improved airflow
- Passageway down the middle is a simpler design

Patent Owner Does Not Dispute These Benefits

Pet. at 102-104

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Patent Owner Mischaracterizes The Modification

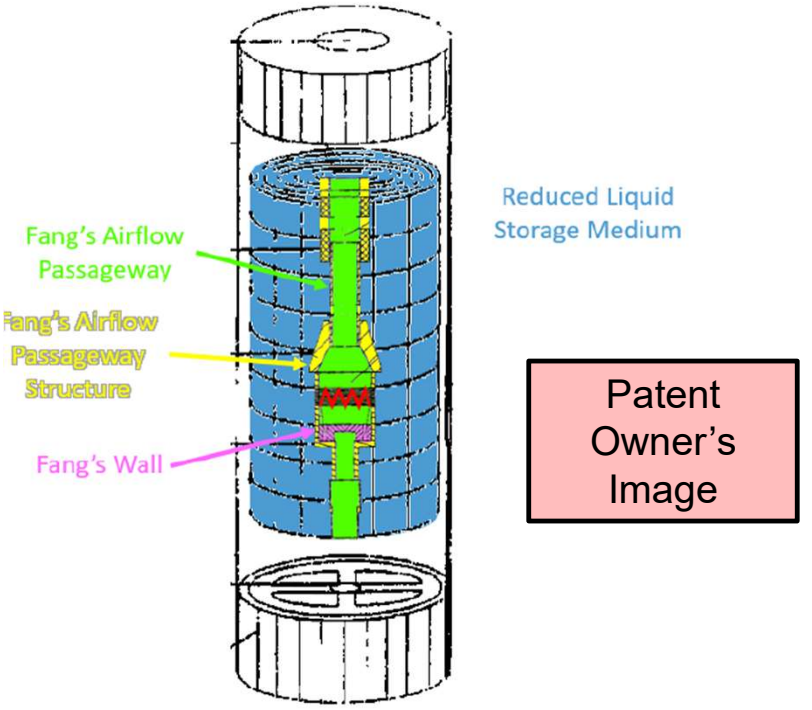
Patent Owner Response

Regarding limitation 1[c], Petitioner imports Fang's central channel into Wang—replacing Wang's internal structure. Petition, 93-94. There is no possibility

* * *

To the extent Wang has a central channel, it would be defined by the organic fiber. Fang, in contrast, is defined by a varying diameter solid cylinder. Modifying

Patent Owner Response at 62-65



Patent Owner's Image

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The Proposed Modification Is Not Importing Fang's Airflow Passageway Wholesale

Petition at 103-104

A POSITA would be motivated to modify Wang such that it had a central and axial uniform, cylindrical passageway through the solution holding medium 105 extending the passageway from one aperture to the other, with the solution holding medium around it the entire way to maximize liquid storage. Ex. 1007, ¶309. One could use the wicking material in the form of item 15 of Fang and the heating element 16 of Fang in conjunction with this change. Ex. 1007, ¶305.

A POSITA would understand the obvious benefits of a simple airflow passageway that runs central and along the housing axis, between the first and the second apertures, in creating a uniform, consistent airflow. Ex. 1007, ¶315-316. The resulting device would: (1) maintain Wang's two-piece system and first aperture, as well as, the electrical components described, but; (2) modify Wang's solution holding medium to wrap around the airflow passageway and heating element and orient the heating element horizontally across the airflow, based on Fang. Ex. 1007, ¶317.

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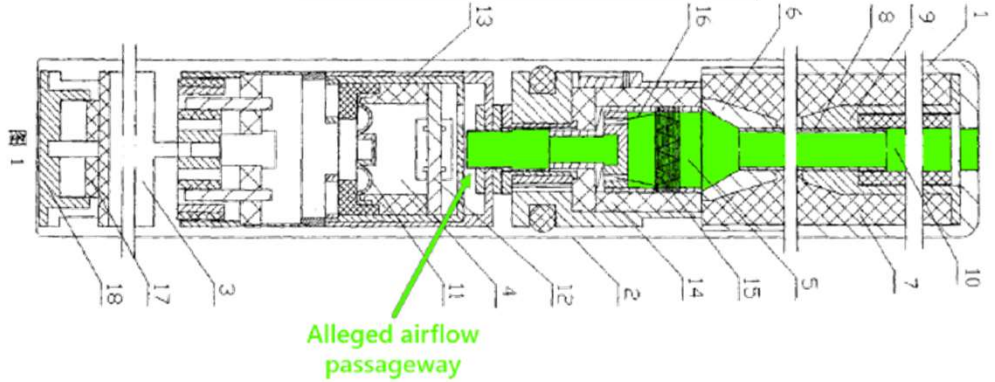
Petition at 103-104

Patent Owner Argues Fang Has A "Solid Wall" In Its Central Airflow Passageway

Patent Owner Response



EX1031, Fig. 1 (showing alleged airflow passageway)

This cannot be an airflow passageway, however, because a ***solid wall*** sits in the middle of this "passageway." Petitioner provides no explanation how air would flow through this solid wall and Fang provides no discussion of this solid wall. Fang only discloses that, "the smoking channel 10 generates a negative pressure in the atomizer control switch 4 by a suction force of a user." EX1006.0005-.0006. Generating

Patent Owner Admits Fang Does Not Describe A "Solid Wall" – Because It Is Not There

Patent Owner Resp. at 48-52, 64

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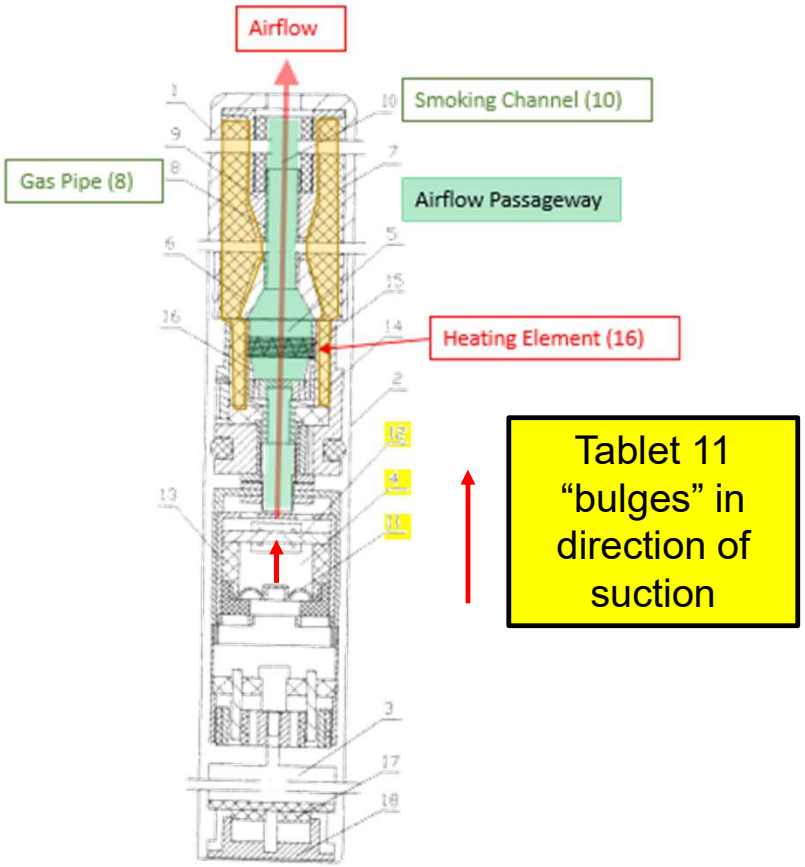
There Is No "Solid Wall" In Fang Because User Suction Reaches The Air Pressure Sensor



Fang (Ex. 1006) at 5-6

" When the utility model is in use, **the smoking channel 10 generates a negative pressure in the atomizer control switch 4** by a suction force of a user, **the silicon film-coated tablet 11 bulges in the support 13 towards the direction of the switch circuit board 12**, under the control of the Hall element and the field-effect tube, the switch circuit board 12 makes the electric heating film wire 16 be communicated with the battery 3. . .."

Reply at 22 n. 1

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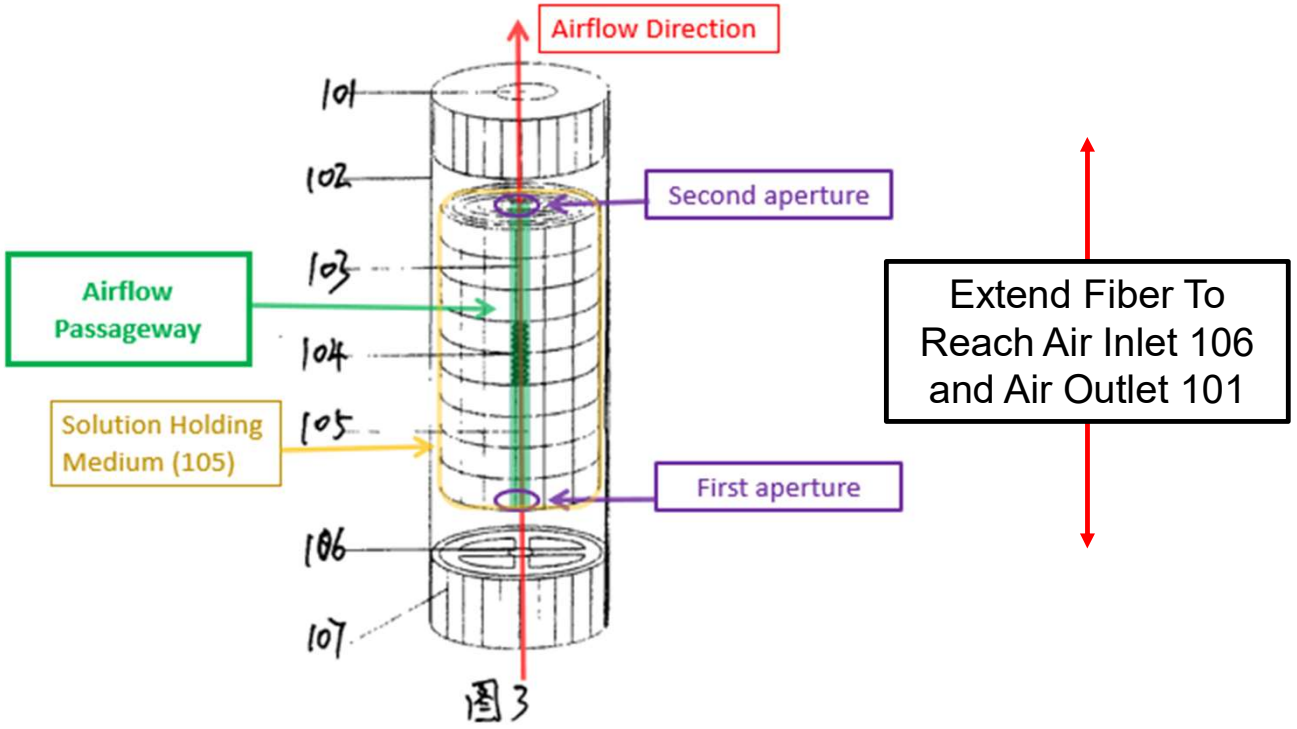
Wang As Modified With Fang: (3) Aperture Location

If Patent Owner Is Correct, A POSITA Would Modify Wang To Extend The Passageway Fully End To End With Apertures In Housing



Extend Fiber To Reach Air Inlet 106 and Air Outlet 101

Benefits

- Increases Liquid Storage

Pet. at 102; Reply at 38

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Ground 2: ’881-Specific Independent Claim Elements Under Wang Alone And As Modified

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“the solution holding medium surrounds the airflow passageway and the heating element in the interior of the housing and intermediate of the first end and the second end” (‘881 patent, 1[h])

An Airflow Passageway or Aperture with a Particular Cross-sectional Area (Claims 2-3, 7, 10-11, 15-16, 18, 21, 27)

Same as dispute regarding central and axial airflow passageway

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Ground 2: ’864 Dependent Claims Under Wang Alone And As Modified

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"heating element includes a wicking material being operative to permit at least a portion of the solution to be held in the solution holding medium to be drawn to the heating element" (claims 12, 31)

Wang

Liquid is drawn toward heating element

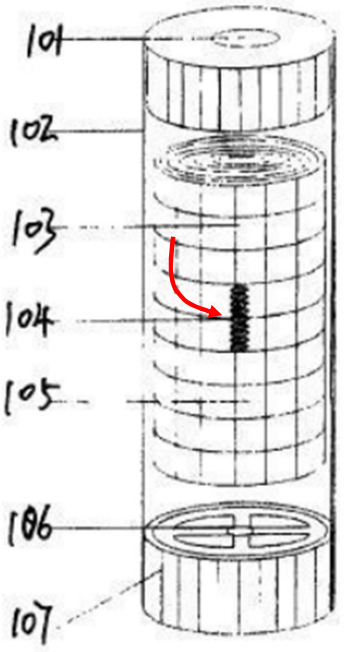

Fig. 3

Obvious Modifications

- Use Fang's wick mechanism, which has benefits as listed above (Slide 120)
- Use replaceable capsule

Pet. at 111-12

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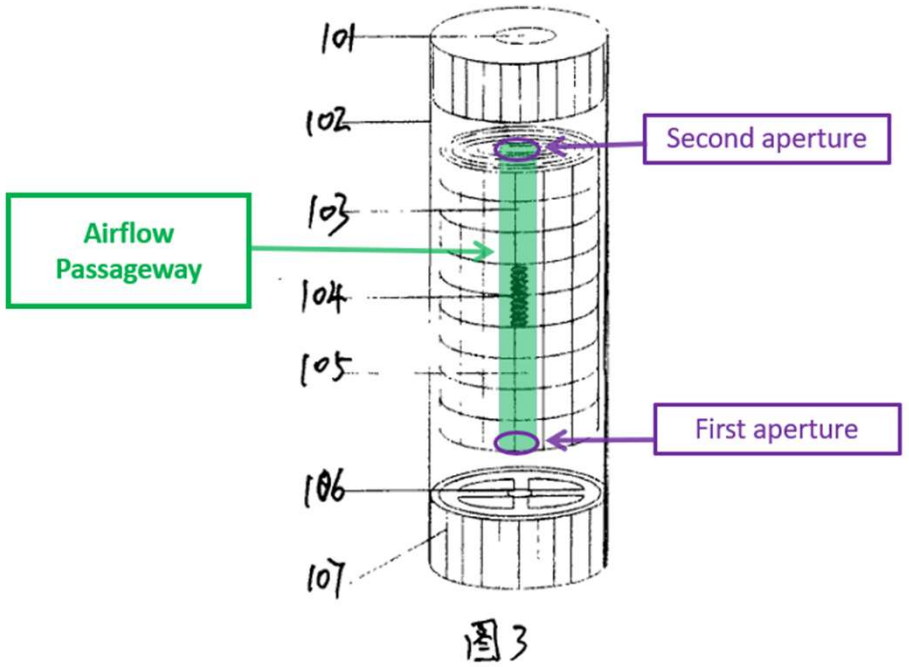
"the first aperture proximate the first end is smaller than the second aperture proximate the second end" (Claims 13, 32)

Wang



Obvious Benefits Of Increasing Second Aperture Size

- Increased airflow through device with larger exit hole

Pet. at 113; Ex. 1007 at par. 359; Ex. 1005, Fig. 3.

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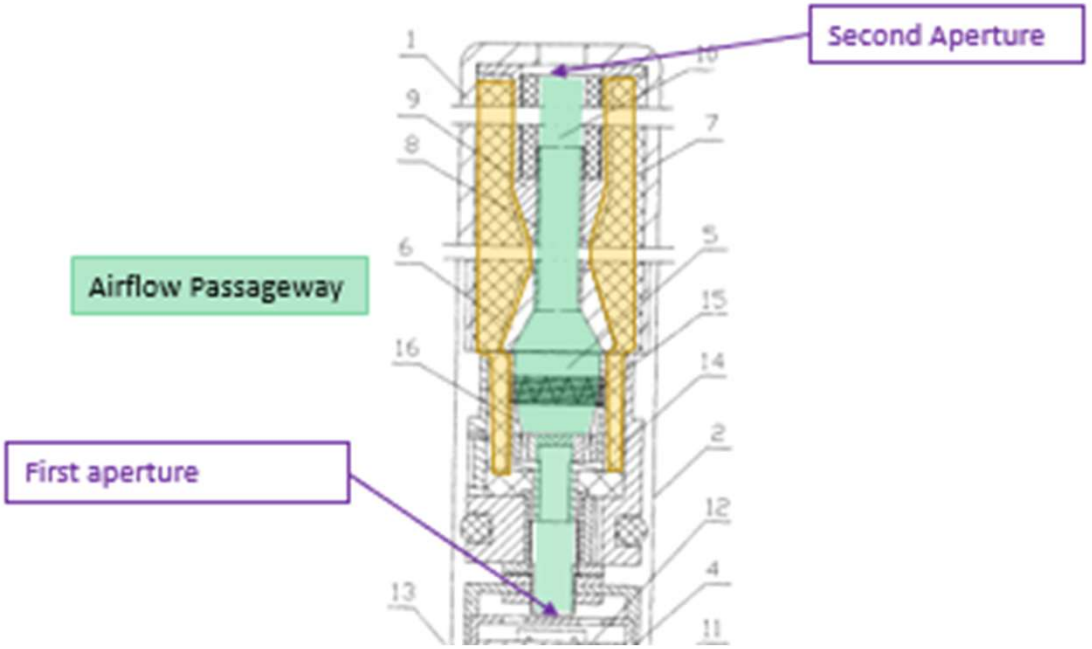
"the first aperture proximate the first end is smaller than the second aperture proximate the second end" (Claims 13, 32)

Fang



Obvious Benefits Of Increasing Second Aperture Size

- Increased airflow through device with larger exit hole

Unrebutted by Patent Owner

Reply at 36; Pet. at 113-114; Ex. 1006, Fig. 1 (partial, annotated); Ex. 1007, ¶360-361

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"the first aperture proximate the first end is smaller than the second aperture proximate the second end" (Claims 13, 32)

Testimony Of Patent Owner's Expert

Q If you were to start with an e-cigarette with apertures of the same size, first aperture and second aperture of the same size, and you have a given airflow rate for a given suction force, if you then increase the size of the second aperture, you'll get greater airflow through the passageway; is that right?

A Given all other things stay the same, yeah, you are essentially decreasing the flow resistance by opening up the aperture size.

Q And a person of skill in the art at the time would know that as a matter of fluid dynamics?

A Yes.

Pet. at 113; Ex. 1007 at par. 359; Ex. 1005, Fig. 3.

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Ground 2: ’881 Dependent Claims Under Wang Alone And As Modified

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“wherein the heating element is in operative connection with a wicking material...operative to attract a portion of the solution from the solution holding medium…toward the heating element” (Claim 26)

Same dispute as in ‘864 patent

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“the first aperture on the first end is smaller than the second aperture on the second end” (Claims 4, 12, 20, 23)

Same dispute as in ‘864 patent

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Secondary Considerations

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No Nexus Because Product Is Not Coextensive With Claims And No Praise For Claimed Features

RJR "Praise" Email, Ex. 2027, Not Only Identifies, But Exclusively Praises, The Non-Claimed Features

As claimed, the product is unique in design and operation to the e-cigarette designs based on the Chinese models we have previously seen. Taste/flavor, operating ritual and smoking experience are also different. Significant, is the absence of the sweet aftertaste commonly associated with e-cigarette and the "Ploom" product. This suggests the absence, or very low levels, of Propylene Glycol commonly used as the carrier and vapor formation material in the referenced products. I'll have R&D attempt to analyze.

Both the reusable battery/electronics device and the disposable mouth piece cartridge are made of metal. This gives the assembled device a nice balanced feel. The cartridge/mouth piece is completely sealed, so no messy pad to handle and would be difficult to re-load with fluid. The device is assembled by removing protective covers from both ends of the mouthpiece and screwing it onto the battery. While the battery/electronics section has a puff activated switch, the 'magic' is primarily in the mouth piece/aerosolizer end which obviously contains both the liquid aerosol former and some form of heating element. Use of the product requires 1 or 2 short "heat up" puffs and the instructions suggest short puffs thereafter. However, because there does not appear to be a time delay cut off (as with Chinese design), the user has considerable control over puff volume. The mouth piece becomes very slightly warm after extended use (e.g. so slight you must be looking for the difference vs. the battery end). Based on the few individuals that have evaluated the product thus far, the experience is far closer to a cigarette experience than Ploom or other e-cigarette designs we have acquired. Flavor aside, some likened it to an Eclipse.

Ex. 2027; Petitioner Reply at 36-38

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No Evidence Of Commercial Success, Nor That Sales Were Due To Claimed Features

MINTZ

Deposition Testimony Of Patent Owner's Expert

Do you know what the sales of the average e-cigarette company were in 2009, 2010, 2011?

MR. ANSLEY: Objection, vague.

THE WITNESS: No, I do not know that.

Do you know what the sales numbers were like for the leading e-cigarette company in 2009, 2010, 2011?

A No, I don't know that.

Q Okay. And you didn't analyze the sales numbers of any other e-cigarettes in rendering your opinions in this case besides those of Fuma, correct?

A I don't think I analyzed them per se, but I know about them, like I've -- because I've been involved in these cases before, I've seen a lot of sales numbers before, and I didn't forget that.

Q Did you interview any customers of Fuma and ask them why they purchased Fuma products?

A I did not.

Q Did you review any evidence that stated why a customer bought a Fuma product?

A I don't think so.

Petitioner Reply at 36-38; Ex. 1035 at 11:22-12:12, 16:1-6

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No Evidence Of Copying

- No evidence alleged copyists were aware of Fuma product or patents
- No evidence of dates of sale, whether before or after Fuma patents and products

Petitioner Reply at 36-38

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Undisputed Limitations

‘864 Patent, Claim 1 In View Of Xia

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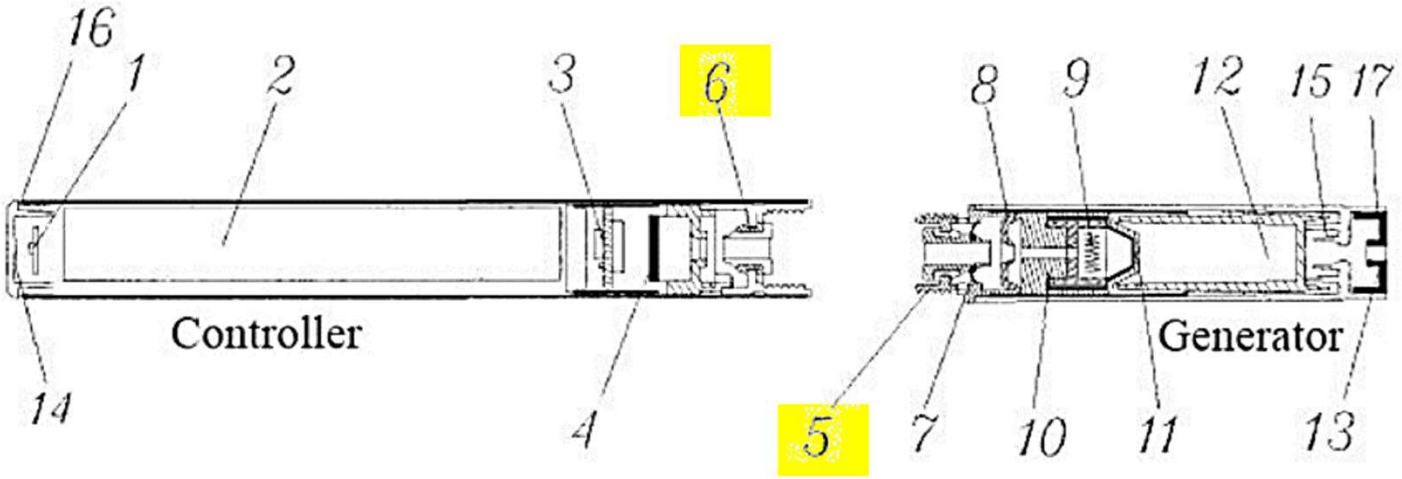
1[a3] the first end of the housing being adapted to electrically couple to the power source,

Xia at 10, Fig. 2

board 3. The heater 9 is powered by the rechargeable lithium battery 2 through the connecting conductor A5, the connecting conductor B6, and the integrated circuit board 3. The working process



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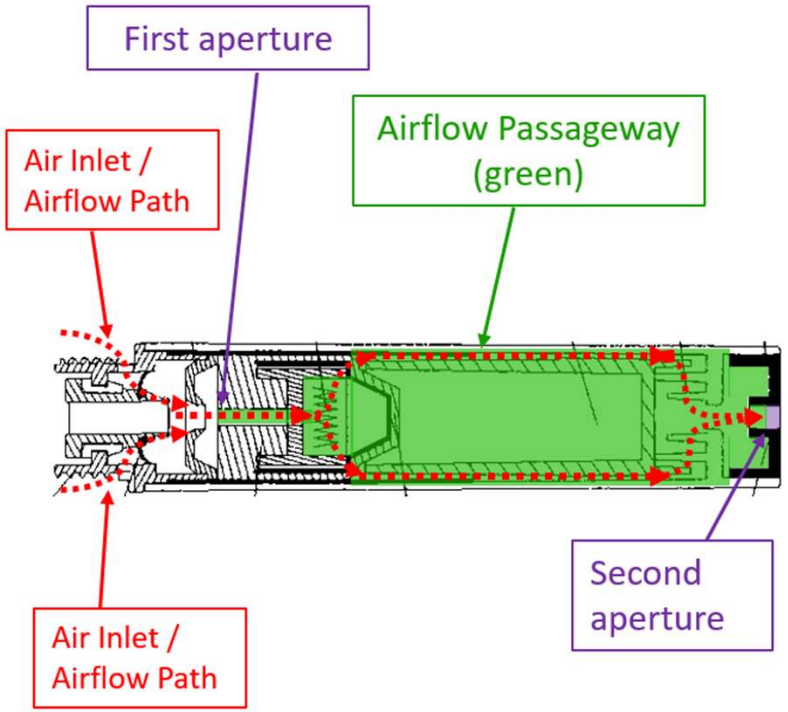
1[a4] the first aperture and the second aperture being in communication with one another to permit an airflow through the housing from the first aperture to the second aperture;



Pet. at 42; Ex. 1004, Fig. 2 (annotated); Ex. 1007, ¶107-110.

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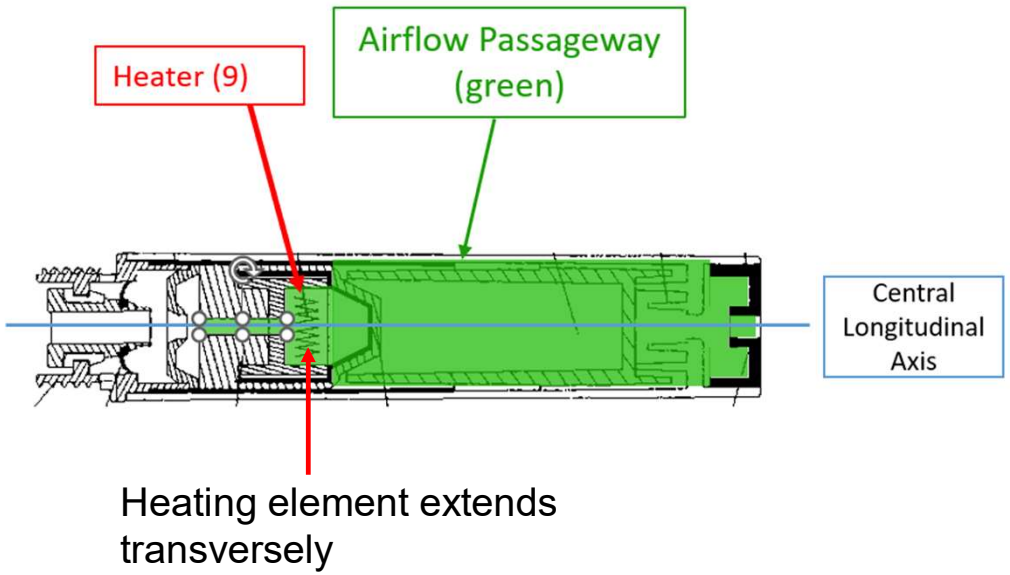
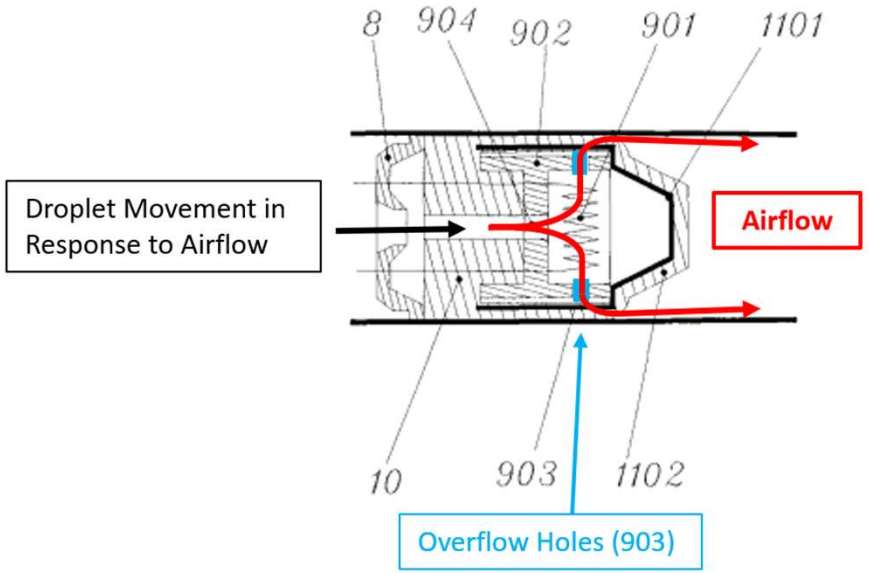
1[b1] a heating element located in the interior of the housing, the heating element extending transversely to a central longitudinal axis of the housing and being at least partially exposed to the airflow,





Pet. at 45-46; Ex. 1004, 9-10, 13-14, Fig. 2; Ex. 1007, ¶113-115.

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1[b2]: the heating element being configured to vaporize at least a portion of the solution for oral provision to an individual in the airflow, the heating element being responsive to electrical power received from the power source; and

Xia

IC1 (see Fig. 6) on the integrated circuit board, the heater 9 starts working, the chemical liquid is instantly vaporized in an atomizing working room of the heater 9, and the vaporized chemical liquid is sucked out by the smoker from the soft suction nozzle 13.

Ex. 1003 at 10

ignition is not required, and no fire risk exists. The smoke generated by smoking is actually water vapor obtained by vaporizing the chemical liquid, so there is no environmental pollution. A

Ex. 1003 at 11

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‘864 Patent, Claim 1 In View Of Wang

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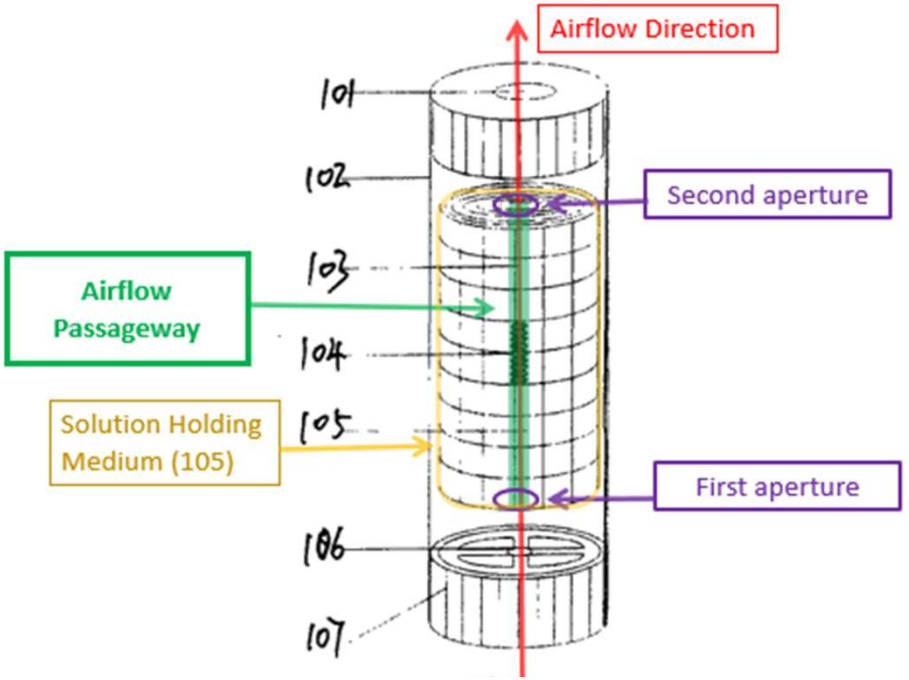
1[p] A cartridge configured to couple to a power source of an electronic vaporizer, the cartridge comprising

1[a1] a housing having an interior and a solution holding medium adapted to hold a solution



Pet. at 92; Ex. 1005, Fig. 3

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1[a3] the first end of the housing being adapted to electrically couple to the power source

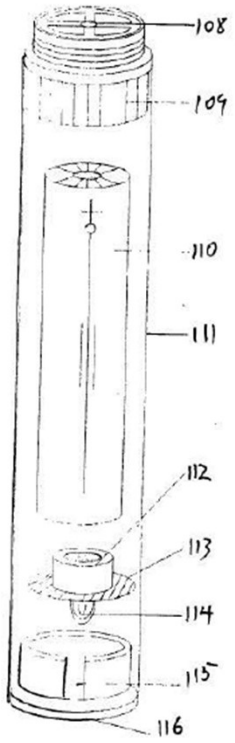

Fig. 2

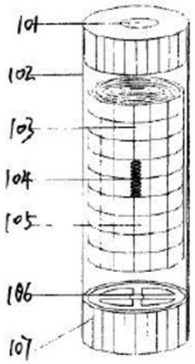

Fig. 3

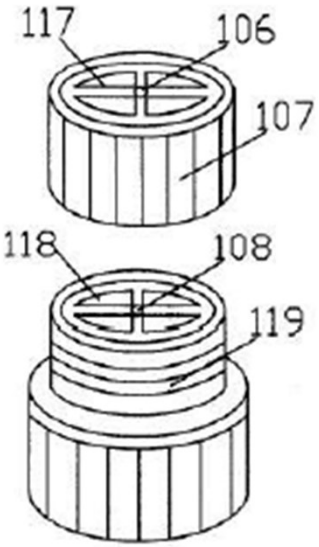

Fig. 4

"[T]he input end of the cigarette holder matches the output end of the cigarette rod, the two poles are isolated by an insulating material, and are connected with the output end of the cigarette rod, that is, the two poles are connected to the output end, respectively, an electrode 117 is in butt joint with an electrode 107, the electrode 107 is in butt joint with an electrode 119, and the air inlet 106 and the air outlet 108 are also in butt joint, thereby playing the role of fixing the cigarette holder and the cigarette rod as a whole. The input end of the cigarette holder and the output end of the cigarette rod may be of screw-fit structures, may also be of plug-fit structures." Ex. 1005 at 8.

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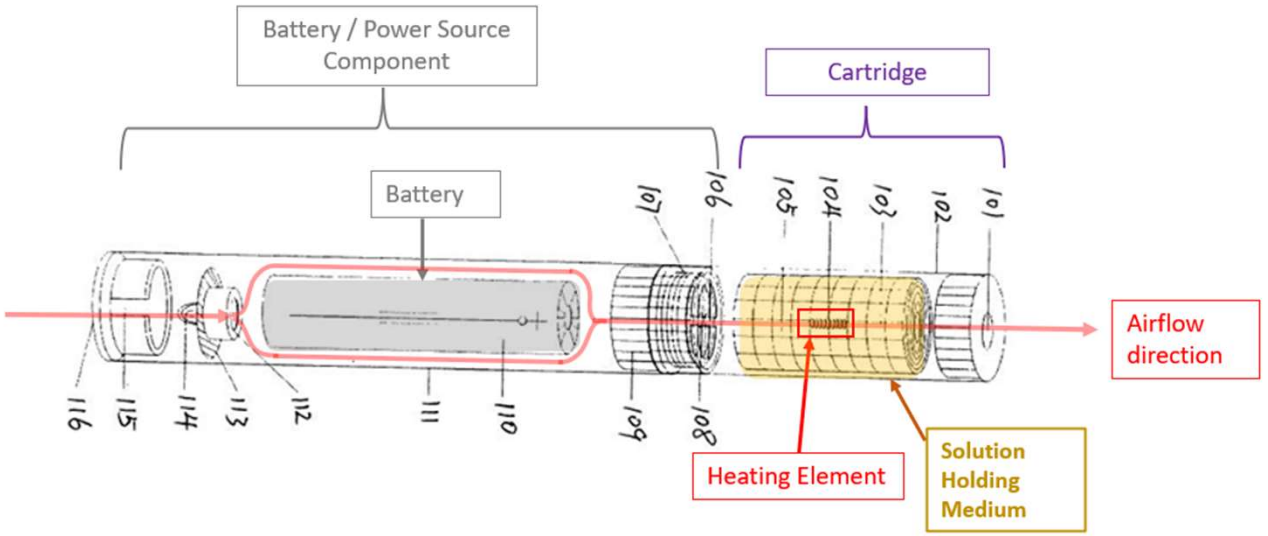
1[a4] the first aperture and the second aperture being in communication with one another to permit an airflow through the housing from the first aperture to the second aperture



Pet. at 95; Ex. 1005, Fig. 1 (annotated).

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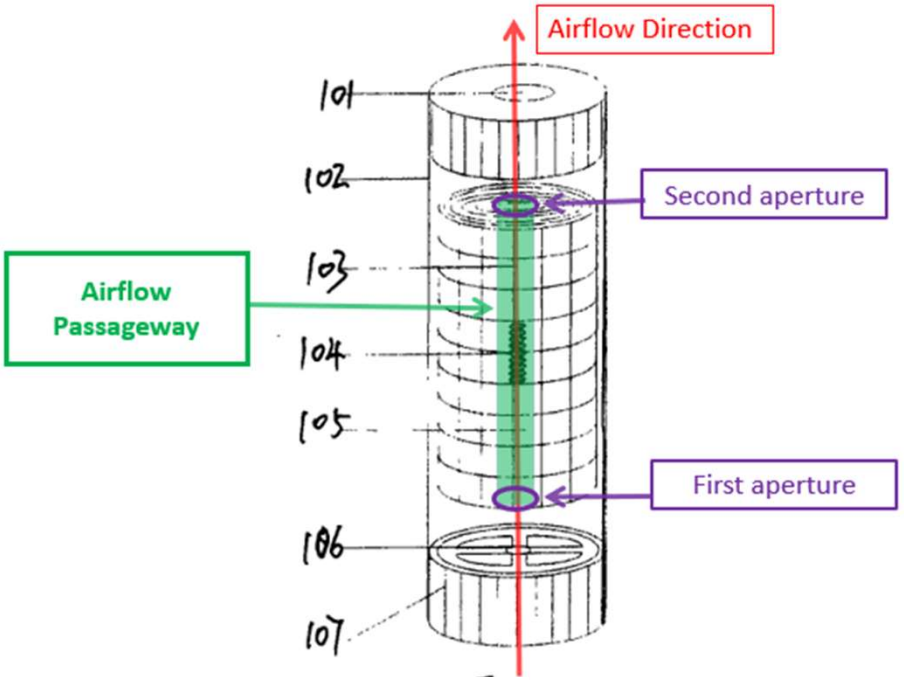
1[b2]: the heating element being configured to vaporize at least a portion of the solution for oral provision to an individual in the airflow, the heating element being responsive to electrical power received from the power source; and



Ex. 1005, Fig. 3 (annotated).

"[T]he smoke generated by the tobacco extract 103 instantly heated by the heater 104 is partially sucked out from the air outlet 101 of the cigarette holder." Ex. 1005, 8.

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Claim Listing

’864 Patent Claims

Claim 1
1[p] A cartridge configured to couple to a power source of an electronic vaporizer, the cartridge comprising:
1[a1] a housing having an interior and a solution holding medium adapted to hold a solution,
1[a2] the housing having a first end and a second end that is opposite the first end, the housing having a first aperture proximate the first end and a second aperture proximate the second end,
1[a3] the first end of the housing being adapted to electrically couple to the power source,
1[a4] the first aperture and the second aperture being in communication with one another to permit an airflow through the housing from the first aperture to the second aperture;
1[b1] a heating element located in the interior of the housing, the heating element extending transversely to a central longitudinal axis of the housing and being at least partially exposed to the airflow,
1[b2]: the heating element being configured to vaporize at least a portion of the solution for oral provision to an individual in the airflow, the heating element being responsive to electrical power received from the power source; and
1[c] an airflow passageway in the housing, at least a portion of the airflow passageway extending centrally and axially with respect to the housing,
1[d] wherein the airflow passageway extends centrally and axially from the first aperture to the second aperture.

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Claim 2
The cartridge of claim 1, further in combination with a power source adapted to be electrically coupled to the first end of the housing, the power source including a battery.
Claim 3
The cartridge of claim 1, wherein the airflow passageway has a length extending intermediate of the heating element and the second aperture, the airflow passageway having an interior between the heating element and the second aperture, the interior having no cross-sectional area measured perpendicular to the central longitudinal axis of the housing smaller in cross-sectional area than a cross-sectional area of the second aperture.
Claim 4
The cartridge of claim 1, wherein the airflow passageway has a length extending intermediate of the heating element and the second aperture, the length of the airflow passageway having a substantially uniform cross-sectional area along a continuous majority of the length, the substantially uniform cross-sectional area being measured perpendicular to the central longitudinal axis of the housing, no portion of the airflow passageway from immediately adjacent the heating element to the second aperture having a cross-sectional area smaller than a cross-sectional area of the second aperture.

Claim 5
5[p] A cartridge configured to couple to a power source of an electronic vaporizer, the cartridge comprising:
5[a] a housing having an interior and a solution holding medium adapted to hold a solution, the housing having a first end and a second end that is opposite the first end, the housing having a first aperture proximate the first end and a second aperture proximate the second end, the first end of the housing being adapted to electrically couple to the power source, the first aperture and the second aperture being in communication with one another to permit an airflow through the housing from the first aperture to the second aperture;
5[b] a heating element located in the interior of the housing, the heating element extending transversely to a central longitudinal axis of the housing and being at least partially exposed to the airflow, the heating element being configured to vaporize at least a portion of the solution for oral provision to an individual in the airflow, the heating element being responsive to electrical power received from the power source; and
5[c] an airflow passageway in the housing, at least a portion of the airflow passageway extending centrally and axially with respect to the housing,
5[d] wherein the airflow passageway extends in a straight path from the first aperture to the second aperture with only the heating element obstructing a portion of the airflow through the airflow passageway along the central longitudinal axis of the housing.

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Claim 6
The cartridge of claim 5, further in combination with a power source adapted to be electrically coupled to the first end of the housing, the power source including a battery.
Claim 7
The cartridge of claim 5, wherein the airflow passageway having a length extending intermediate of the heating element and the second aperture, the airflow passageway having an interior between the heating element and the second aperture, the interior having no cross-sectional area measured perpendicular to the central longitudinal axis of the housing smaller in cross-sectional area than a cross-sectional area of the second aperture.

Claim 8
The cartridge of claim 5, wherein the airflow passageway having a length extending intermediate of the heating element and the second aperture, the length of the airflow passageway having a substantially uniform cross-sectional area along a continuous majority of the length, the substantially uniform cross-sectional area being measured perpendicular to the central longitudinal axis of the housing, no portion of the airflow passageway from immediately adjacent the heating element to the second aperture having a cross-sectional area smaller than a cross-sectional area of the second aperture

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Claim 9
9[p] A cartridge configured to couple to a power source of an electronic vaporizer, the cartridge comprising:
9[a] a housing having an interior and a solution holding medium adapted to hold a solution, 9[a2] the housing having a first end and a second end that is opposite the first end, the housing having a first aperture proximate the first end and a second aperture proximate the second end, 9[a3] the first end of the housing being adapted to electrically couple to the power source, the first aperture and the second aperture being in communication with one another to permit an airflow through the housing from the first aperture to the second aperture; and

9[b] a heating element located in the interior of the housing, the heating element extending transversely to a central longitudinal axis of the housing and being at least partially exposed to the airflow, the heating element being configured to vaporize at least a portion of the solution for oral provision to an individual in the airflow, the heating element being responsive to electrical power received from the power source,
9[c] wherein the airflow through the housing follows an airflow path, a first portion of the airflow path proximate the first aperture being defined substantially centrally and axially with respect to the central longitudinal axis of the housing, and a second portion of the airflow path proximate to the second aperture being defined substantially centrally and axially with respect to the central longitudinal axis of the housing.

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Claim 10
The cartridge of claim 9, further in combination with a power source adapted to be electrically coupled to the first end of the housing, the power source including a battery.
Claim 11
The cartridge of claim 9, wherein the cartridge is adapted to permit the airflow to pass on both transverse sides of the heating element during use of the electronic vaporizer.
Claim 12
The cartridge of claim 9, wherein the heating element includes a wicking material being operative to permit at least a portion of the solution to be held in the solution holding medium to be drawn toward the heating element to be vaporized.

Claim 13
The cartridge of claim 9, wherein the first aperture proximate the first end is smaller than the second aperture proximate the second end.
Claim 14
The cartridge of claim 9, further comprising a solution in the solution holding medium, the solution comprising one of propylene glycol and nicotine.
Claim 15
The cartridge of claim 9, further comprising an airflow passageway in the housing, at least a portion of the airflow passageway extending centrally and axially with respect to the housing.

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Claim 16
The cartridge of claim 15, wherein a majority of the portion of the airflow passageway has a substantially uniform cross-sectional area measured perpendicular to the central longitudinal axis of the housing between the heating element and the second aperture.
Claim 17
The cartridge of claim 9, wherein the heating element includes a coil.
Claim 18
The cartridge of claim 9, wherein the housing further comprises an airflow chamber having a length extending intermediate of the heating element and the second aperture, the chamber having an interior between the heating element and the second aperture, the interior having no cross-sectional area measured perpendicular to the central longitudinal axis of the housing smaller in cross-sectional area than a cross-sectional area of the second aperture.

Claim 19
The cartridge of claim 9, wherein the housing further comprises an airflow chamber having a length extending intermediate of the heating element and the second aperture, the length of the chamber having a substantially uniform cross-sectional area along a continuous majority of the length, the substantially uniform cross-sectional area being measured perpendicular to the central longitudinal axis of the housing, no portion of the chamber from immediately adjacent the heating element to the second aperture having a cross-sectional area smaller than a cross-sectional area of the second aperture.
Claim 20
The cartridge of claim 9, wherein the heating element includes a material that when powered by the power source is adapted to vaporize the solution brought into contact with the heating element.

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Claim 21
21[p] A cartridge configured to couple to a power source of an electronic vaporizer, the cartridge comprising:
21[a] a housing having an interior and a solution holding medium adapted to hold a solution, the housing having a first end and a second end that is opposite the first end and a central longitudinal axis extending from the first end to the second end, the housing having a first aperture proximate the first end and a second aperture proximate the second end, the first end of the housing being adapted to electrically couple to the power source, the first aperture and the second aperture being in communication with one another to permit an airflow through the housing; and

21[b] a heating element located in the interior of the housing, the heating element including a coil extending transversely to the central longitudinal axis of the housing and transversely to a direction of the airflow such that the airflow passes on both transverse sides of the heating element during use of the electronic vaporizer, the heating element being configured to vaporize at least the portion of the solution drawn to the heating element for oral provision to an individual in the airflow, the heating element being responsive to electrical power received from the power source; and
21[c] an airflow passageway in the housing, at least a portion of the airflow passageway extending centrally and axially with respect to the housing,
21[d] wherein the airflow passageway extends centrally and axially from the first aperture to the second aperture.

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Claim 22
The cartridge of claim 21, further in combination with a power source adapted to be electrically coupled to the first end of the housing, the power source including a battery.
Claim 23
The cartridge of claim 21, wherein the airflow passageway has a length extending intermediate of the heating element and the second aperture, the airflow passageway having an interior between the heating element and the second aperture, the interior having no cross-sectional area measured perpendicular to the central longitudinal axis of the housing smaller in cross-sectional area than a cross-sectional area of the second aperture.

Claim 24
The cartridge of claim 21, wherein the airflow passageway has a length extending intermediate of the heating element and the second aperture, the length of the airflow passageway having a substantially uniform cross-sectional area along a continuous majority of the length, the substantially uniform cross-sectional area being measured perpendicular to the central longitudinal axis of the housing, no portion of the airflow passageway from immediately adjacent the heating element to the second aperture having a cross-sectional area smaller than a cross-sectional area of the second aperture.

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Claim 25
25[p] A cartridge configured to couple to a power source of an electronic vaporizer, the cartridge comprising:
25[a] a housing having an interior and a solution holding medium adapted to hold a solution, the housing having a first end and a second end that is opposite the first end and a central longitudinal axis extending from the first end to the second end, the housing having a first aperture proximate the first end and a second aperture proximate the second end, the first end of the housing being adapted to electrically couple to the power source, the first aperture and the second aperture being in communication with one another to permit an airflow through the housing; and
25[b] a heating element located in the interior of the housing, the heating element including a coil extending transversely to the central longitudinal axis of the housing and transversely to a direction of the airflow such that the airflow passes on both transverse sides of the heating element during use of the electronic vaporizer, the heating element being configured to vaporize at least the portion of the solution drawn to the heating element for oral provision to an individual in the airflow, the heating element being responsive to electrical power received from the power source; and
25[c] an airflow passageway in the housing, at least a portion of the airflow passageway extending centrally and axially with respect to the housing,
25[d] wherein the airflow passageway extends in a straight path from the first aperture to the second aperture with only the heating element obstructing a portion of the airflow through the airflow passageway along the central longitudinal axis of the housing.

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Claim 26
The cartridge of claim 25, further in combination with a power source adapted to be electrically coupled to the first end of the housing, the power source including a battery.
Claim 27
The cartridge of claim 25, wherein the airflow passageway has a length extending intermediate of the heating element and the second aperture, the airflow passageway having an interior between the heating element and the second aperture, the interior having no cross-sectional area measured perpendicular to the central longitudinal axis of the housing smaller in cross-sectional area than a cross-sectional area of the second aperture.

Claim 28
The cartridge of claim 25, wherein the airflow passageway has a length extending intermediate of the heating element and the second aperture, the length of the airflow passageway having a substantially uniform cross-sectional area along a continuous majority of the length, the substantially uniform cross-sectional area being measured perpendicular to the central longitudinal axis of the housing, no portion of the airflow passageway from immediately adjacent the heating element to the second aperture having a cross-sectional area smaller than a cross-sectional area of the second aperture.

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Claim 29
29[p] A cartridge configured to couple to a power source of an electronic vaporizer, the cartridge comprising:
29[a] a housing having an interior and a solution holding medium adapted to hold a solution, the housing having a first end and a second end that is opposite the first end and a central longitudinal axis extending from the first end to the second end, the housing having a first aperture proximate the first end and a second aperture proximate the second end, the first end of the housing being adapted to electrically couple to the power source, the first aperture and the second aperture being in communication with one another to permit an airflow through the housing; and

29[b] a heating element located in the interior of the housing, the heating element including a coil extending transversely to the central longitudinal axis of the housing and transversely to a direction of the airflow such that the airflow passes on both transverse sides of the heating element during use of the electronic vaporizer, the heating element being configured to vaporize at least the portion of the solution drawn to the heating element for oral provision to an individual in the airflow, the heating element being responsive to electrical power received from the power source,
29[c] wherein the airflow through the housing follows an airflow path, a first portion of the airflow path proximate the first aperture being defined substantially centrally and axially with respect to the central longitudinal axis of the housing, and a second portion of the airflow path proximate to the second aperture being defined substantially centrally and axially with respect to the central longitudinal axis of the housing.

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Claim 30
The cartridge of claim 29, further in combination with a power source adapted to be electrically coupled to the first end of the housing, the power source including a battery.
Claim 31
The cartridge of claim 29, wherein the heating element includes a wicking material being operative to permit at least a portion of the solution to be held in the solution holding medium to be drawn toward the heating element to be vaporized.
Claim 32
The cartridge of claim 29, wherein the first aperture proximate the first end is smaller than the second aperture proximate the second end.

Claim 33
The cartridge of claim 29, further comprising a solution in the solution holding medium, the solution comprising one of propylene glycol and nicotine.
Claim 34
The cartridge of claim 29, further comprising an airflow passageway in the housing, at least a portion of the airflow passageway extending centrally and axially with respect to the housing.
Claim 35
The cartridge of claim 34, wherein a majority of the portion of the airflow passageway has a substantially uniform cross-sectional area measured perpendicular to the central longitudinal axis of the housing between the heating element and the second aperture

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Claim 36
The cartridge of claim 29, wherein the housing further comprises an airflow chamber having a length extending intermediate of the heating element and the second aperture, the chamber having an interior between the heating element and the second aperture, the interior having no cross-sectional area measured perpendicular to the central longitudinal axis of the housing smaller in cross-sectional area than a cross-sectional area of the second aperture.

Claim 37
The cartridge of claim 29, wherein the housing further comprises an airflow chamber having a length extending intermediate of the heating element and the second aperture, the length of the chamber having a substantially uniform cross-sectional area along a continuous majority of the length, the substantially uniform cross-sectional area being measured perpendicular to the central longitudinal axis of the housing, no portion of the chamber from immediately adjacent the heating element to the second aperture having a cross-sectional area smaller than a cross-sectional area of the second aperture.

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Claim 38
38[p] A cartridge configured to couple to a power source of an electronic vaporizer, the cartridge comprising:
38[a] a housing having an interior and a solution holding medium adapted to hold a solution, the housing having a first end and a second end that is opposite the first end and a central longitudinal axis extending from the first end to the second end, the housing having a first aperture proximate the first end and a second aperture proximate the second end, the first end of the housing being adapted to electrically couple to the power source, the first aperture and the second aperture being in communication with one another to permit an airflow through the housing; and
38[b] a heating element located in the interior of the housing, the heating element extending transversely to the central longitudinal axis of the housing and being at least partially exposed to the airflow such that the airflow entering through the first aperture will separate and then pass on both transverse sides of the heating element and then continue along an airflow path co-axial with the central longitudinal axis of the housing toward the second aperture during use of the electronic vaporizer, the heating element being configured to vaporize at least the portion of the solution for oral provision to an individual in the airflow, the heating element being responsive to electrical power received from the power source; and
38[c] an airflow passageway in the housing, at least a portion of the airflow passageway extending centrally and axially with respect to the housing,
38[d] wherein the airflow passageway extends centrally and axially from the first aperture to the second aperture.

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Claim 39
The cartridge of claim 3, further in combination with a power source adapted to be electrically coupled to the first end of the housing, the power source including a battery.
Claim 40
The cartridge of claim 38, wherein the heating element comprises a material that when powered by the power source is adapted to vaporize the solution brought into contact with the heating element.
Claim 41
The cartridge of claim 38, further comprising a solution in the solution holding medium, the solution comprising one of propylene glycol and nicotine.

Claim 42
The cartridge of claim 38, wherein a majority of the portion of the airflow passageway has a substantially uniform cross-sectional area measured perpendicular to the central longitudinal axis of the housing between the heating element and the second aperture.
Claim 43
The cartridge of claim 38, wherein the housing further comprises an airflow chamber having a length extending intermediate of the heating element and the second aperture, the chamber having an interior between the heating element and the second aperture, the interior having no cross-sectional area measured perpendicular to the central longitudinal axis of the housing smaller in cross-sectional area than a cross-sectional area of the second aperture.

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Claim 44
The cartridge of claim 38, wherein the housing further comprises an airflow chamber having a length extending intermediate of the heating element and the second aperture, the length of the chamber having a substantially uniform cross-sectional area along a continuous majority of the length, the substantially uniform cross-sectional area being measured perpendicular to the central longitudinal axis of the housing, no portion of the chamber from immediately adjacent the heating element to the second aperture having a cross-sectional area smaller than a cross-sectional area of the second aperture

Claim 45
45[p] A cartridge configured to couple to a power source of an electronic vaporizer, the cartridge comprising:
45[a] a housing having an interior and a solution holding medium adapted to hold a solution, the housing having a first end and a second end that is opposite the first end and a central longitudinal axis extending from the first end to the second end, the housing having a first aperture proximate the first end and a second aperture proximate the second end, the first end of the housing being adapted to electrically couple to the power source, the first aperture and the second aperture being in communication with one another to permit an airflow through the housing; and

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45[b] a heating element located in the interior of the housing, the heating element extending transversely to the central longitudinal axis of the housing and being at least partially exposed to the airflow such that the airflow entering through the first aperture will separate and then pass on both transverse sides of the heating element and then continue along an airflow path co-axial with the central longitudinal axis of the housing toward the second aperture during use of the electronic vaporizer, the heating element being configured to vaporize at least the portion of the solution for oral provision to an individual in the airflow, the heating element being responsive to electrical power received from the power source; and

45[c] an airflow passageway in the housing, at least a portion of the airflow passageway extending centrally and axially with respect to the housing,
45[d] wherein the airflow passageway extends in a straight path from the first aperture to the second aperture with only the heating element obstructing a portion of the airflow through the airflow passageway along the central longitudinal axis of the housing.
Claim 46
The cartridge of claim 45, further in combination with a power source adapted to be electrically coupled to the first end of the housing, the power source including a battery.

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Claim 47
The cartridge of claim 45, wherein the airflow passageway has a length extending intermediate of the heating element and the second aperture, the airflow passageway having an interior between the heating element and the second aperture, the interior having no cross-sectional area measured perpendicular to the central longitudinal axis of the housing smaller in cross-sectional area than a cross-sectional area of the second aperture.

Claim 48
The cartridge of claim 45, wherein the airflow passageway has a length extending intermediate of the heating element and the second aperture, the length of the airflow passageway having a substantially uniform cross-sectional area along a continuous majority of the length, the substantially uniform cross-sectional area being measured perpendicular to the central longitudinal axis of the housing, no portion of the airflow passageway from immediately adjacent the heating element to the second aperture having a cross-sectional area smaller than a cross-sectional area of the second aperture.

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’881 Patent Claims

Claim 1
1[p] An apparatus comprising:
1[a1] a power source,
1[a2] wherein the power source includes a battery,
1[a3] wherein the power source includes an electrically conductive portion; and,
1[b1] a cartridge having a housing that comprises an interior,
1[b2] wherein the housing includes a first end and a second end that is opposite the first end, wherein the housing includes a first aperture on the first end and a second aperture on the second end,
1[c] wherein the housing includes an airflow passageway that extends centrally and axially with respect to the housing intermediate of the first aperture on the first end of the housing and the second aperture on the second end of the housing,
1[d] wherein the airflow passageway is configured to allow an airflow through the cartridge from the first aperture to the second aperture of the housing
1[e] wherein the first end of the housing includes an electrically conductive portion that is adapted to mechanically and electrically couple to the electrically conductive portion of the power source,
1[f] wherein the housing includes a solution holding medium adapted to hold a solution in the interior of the housing,
1[g] wherein the housing includes a heating element located in the interior of the housing, wherein the heating element extends transversely across the airflow passageway, wherein the airflow through the passageway passes on both transverse sides of the element,

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Claim 1
1[h] wherein the solution holding medium surrounds the airflow passageway and the heating element in the interior of the housing and intermediate of the first end and the second end,
1[i] wherein the heating element is electrically configured to vaporize at least a portion of the solution to be contained in the solution holding medium for oral provision to an individual in an airflow from the second aperture responsive to electrical power received from the battery through the electrically conductive portions of the cartridge and the power source.

Claim 2
[2] The cartridge of claim 1, wherein the heating element is a coil having a maximum diameter, the airflow passageway having a length having a circular cross section having a diameter along a majority of the length, the maximum diameter of the coil being smaller than the diameter of the circular cross section of the length of the airflow passageway.
Claim 3
[3] The cartridge of claim 2, wherein the first aperture on the first end is located centrally and axially with respect to the housing, the first aperture having a cross-sectional area measured perpendicular to a central longitudinal axis of the housing, the interior of the airflow passageway between the heating element and the second aperture being no smaller in cross-sectional area than the cross-sectional area of the first aperture.

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Claim 4
[4] The cartridge of claim 3, wherein the first aperture on the first end is smaller than the second aperture on the second end.
Claim 5
[5] The cartridge of claim 1, wherein the solution holding medium includes at least one of an absorbent material and a reservoir.
Claim 6
[6] The cartridge of claim 1, further comprising a solution in the solution holding medium, the solution comprising one of propylene glycol and nicotine.
Claim 7
[7] The cartridge of claim 1, wherein the airflow passageway has a uniform cross-sectional area measured perpendicular to a central longitudinal axis of the housing between the heating element and the second aperture.

Claim 8
8[p] A cartridge configured to mechanically and electrically couple to a power source of an electronic vaporizer, the cartridge comprising:
8[a1] a housing having an interior and a solution holding medium reservoir adapted to hold a solution,
8[a2] the housing having a first end and a second end that is opposite the first end, the housing having a first aperture on the first end and a second aperture on the second end,
8[a3] the first end of the housing having an electrically conductive portion adapted to mechanically and electrically couple to the electrically conductive portion of the power source;

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Claim 8
8[b1] an airflow passageway in the interior of the housing extending centrally and axially with respect to the housing intermediate of the first aperture on the first end of the housing and the second aperture on the second end of the housing,
8[b2] the airflow passageway being configured to allow an airflow through the cartridge from the first aperture to the second aperture of the housing; and
8[c1] a heating element located in the interior of the housing, the heating element being located within and extending transversely across the airflow passageway, the airflow through the passageway passing on both transverse sides of the heating element,
8[c2] both the heating element and the airflow passageway being surrounded by the solution holding medium reservoir,

8[c3] the heating element being electrically configured to vaporize at least a portion of the solution to be contained in the solution holding medium reservoir for oral provision to an individual in an airflow from the second aperture responsive to electrical power received from the battery through the electrically conductive portions of the cartridge and the power source.
Claim 9
[9] The cartridge of claim 8, further in combination with the power source including a battery and the electrically conductive portion, the electrically conductive portion of the power source being mechanically and electrically coupled to the electrically conductive portion of the first end of the housing.

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Claim 10
[10] The cartridge of claim 9, wherein the heating element is a coil having a maximum diameter, the airflow passage way having a length having a circular cross section having a diameter along a majority of the length, the maximum diameter of the coil being smaller than the diameter of the circular cross section of the length of the airflow passageway.
Claim 11
[11] The cartridge of claim 10, wherein the first aperture on the first end is located centrally and axially with respect to the housing, the first aperture having a cross-sectional area measured perpendicular to a central longitudinal axis of the housing, the interior of the airflow passageway between the heating element and the second aperture being no smaller in cross-sectional area than the cross-sectional area of the first aperture.

Claim 12
[12] The cartridge of claim 11, wherein the first aperture on the first end is smaller than the second aperture on the second end.
Claim 13
[13] The cartridge of claim 8, wherein the solution holding medium reservoir includes an absorbent material.
Claim 14
[14] The cartridge of claim 8, further comprising a solution in the solution holding medium reservoir, the solution comprising one of propylene glycol and nicotine.

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Claim 15	**16[a2] the housing having a first end and a second end that is opposite the first end, the housing having a central longitudinal axis extending through the first end and the second end, the housing having a first aperture on the first end and a second aperture on the second end,**
[15] The cartridge of claim 8, wherein the airflow passageway has a uniform cross-sectional area measured perpendicular to a central longitudinal axis of the housing between the heating element and the second aperture.	**16[a3] the first aperture having a cross-sectional area measured perpendicular to the central longitudinal axis of the housing,**
Claim 16	**16[a4] the first end of the housing having an electrically conductive portion adapted to mechanically and electrically couple to an electrically conductive portion of the power source;**
16[p] A cartridge configured to mechanically and electrically couple to a power source of an electronic vaporizer, the cartridge comprising:	**16[b1] an airflow passageway in the interior of the housing, the airflow passageway having a length extending centrally and axially with respect to the housing intermediate of the first aperture on the first end of the housing and the second aperture on the second end of the housing,**
16[a1] a housing having an interior and a solution holding medium adapted to hold a solution in the interior of the housing,	

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Claim 16
16[b2] the airflow passageway being configured to allow an airflow through the cartridge from the first aperture to the second aperture of the housing,
16[b3] the airflow passageway having an exterior adjacent to the solution holding medium along a majority of the length of the airflow passageway,
16[b4] the airflow passageway having an interior having a uniform cross-sectional area measured perpendicular to the central longitudinal axis of the housing and extending continuously along a majority of the length of the airflow passageway; and
16[c1] a heating element located in the interior of the housing and extending transversely across the airflow passageway, the airflow through the passageway passing on both transverse sides of the heating element,
16[c2] a plane perpendicular to the central longitudinal axis of the housing passing through the heating element and the solution holding medium,
16[c3] the airflow passageway having an interior between the heating element and the second aperture no smaller in cross-sectional area than the cross-sectional area of the first aperture,
16[c4] the heating element being connected to the electrically conductive portion of the first end of the housing,
16[c5] the heating element being electrically configured to vaporize at least a portion of the solution to be contained in the solution holding medium for oral provision to an individual in an airflow from the second aperture responsive to electrical power received from the power source through the electrically conductive portion of the cartridge.

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Claim 17
[17] The cartridge of claim 16, further in combination with the power source including a battery and the electrically conductive portion, the electrically conductive portion of the power source being mechanically and electrically coupled to the electrically conductive portion of the first end of the housing.
Claim 18
[18] The cartridge of claim 16, wherein the heating element is a coil having a maximum diameter and the uniform cross-sectional area of the airflow passageway is a circle having a diameter, the maximum diameter of the coil being smaller than the diameter of the circle of the uniform cross-sectional area of the airflow passageway.
Claim 19
[19] The cartridge of claim 18, wherein the first aperture on the first end is located centrally and axially with respect to the housing.

Claim 20
[20] The cartridge of claim 19, wherein the first aperture on the first end is smaller than the second aperture on the second end.
Claim 21
[21] The cartridge of claim 16, wherein the heating element is a coil having a maximum diameter and the uniform cross-sectional area of the airflow passageway is a circle having a diameter, the maximum diameter of the coil being smaller than the diameter of the circle of the uniform cross-sectional area of the airflow passageway.
Claim 22
[22] The cartridge of claim 16, wherein the first aperture on the first end is located centrally and axially with respect to the housing.

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Claim 23
[23] The cartridge of claim 16, wherein the first aperture on the first end is smaller than the second aperture on the second end.
Claim 24
[24] The cartridge of claim 16, wherein the solution holding medium includes at least one of an absorbent material and a reservoir.
Claim 25
[25] The cartridge of claim 16, further comprising a solution, wherein the solution comprises one of propylene glycol and nicotine.

Claim 26
[26] The cartridge of claim 16, wherein the heating element is in operative connection with a wicking material, and the wicking material is operative to attract a portion of the solution from the solution holding medium located immediately adjacent opposite ends of the heating element toward the heating element.
Claim 27
[27] The cartridge of claim 16, wherein the airflow passageway has a uniform cross-sectional area measured perpendicular to the central longitudinal axis of the housing between the heating element and the second aperture.

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