NJOY

Patent Owner's Demonstratives

February 25, 2025

PTAB Oral Argument

JUUL LABS, INC. v. NJOY, LLC

IPR2024-00160 (U.S. 11,497,864)

IPR2024-00161 (U.S. 10,334,881)

NJOY Exhibit 2045.0001
Juul v. NJOY
IPR2024-00160

E-Cigarette Configurations

a. E-Cigarette and Separable Power Source and Cartridge

Despite the various models and designs of e-cigarettes, e-cigarettes in the market in or around 2009 can be generally categorized into three configurations – one-piece, two-piece, and three-piece e-cigarettes.

EX2008.0437 (JLI's ITC Pre-Hearing Brief)

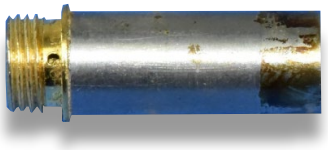
-160: POR at 7-8 | -161: POR at 8-9 | EX2007.0089

NJOY Exhibit 2045.0002
Juul v. NJOY
IPR2024-00160

Three-Piece E-Cigarette Configurations

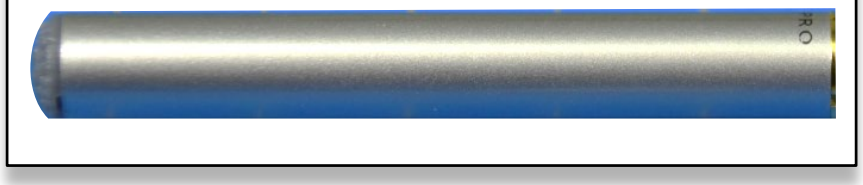
NPRO/Xia

First Cartridge with Heating Element



Second Cartridge with Liquid Solution

Battery Portion



EX2015 (cropped); EX2016

JLI's ITC Pre-Hearing Brief

solution in the cartridge had been consumed. In known three-piece designs, the cartomizer portions of the devices also included the solution holding means and the atomizer, but the atomizer could be separated from and reused with fresh solution holding cartridges. As the solution in the solution holding means was typically consumed faster than the atomizer needed to be replaced, companies in the industry sold replacement "cartridges" containing the solution holding means, and an empty cavity for the end-user to insert an existing atomizer to form a fully assembled cartomizer portion.

EX2008.0438

element to form a fully assembled cartridge. This helped reduce the waste associated with discarding the heating element with each refill, but did not address the issues with burning or clogging of heating elements with repeated use. Additionally, three-piece designs meant the users

EX2008.087

-160: POR at 8-9, 41-42 | -161: POR at 9-11; 42-43

NJOY Exhibit 2045.0003
Juul v. NJOY
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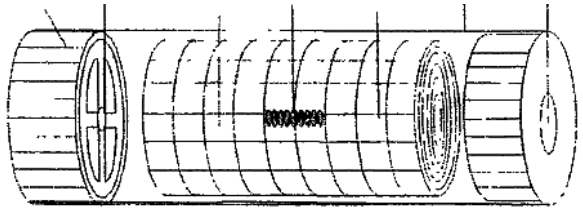
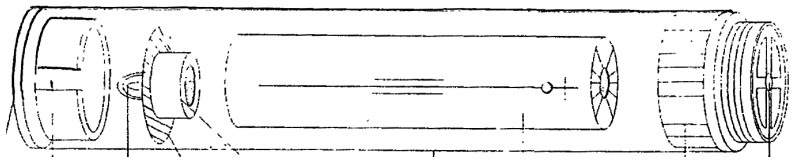
Two-Piece E-Cigarette Configurations

Wang

Disposable Cartridge



Battery Portion



Ex2029, Figs. 2, 3

JLI's ITC Pre-Hearing Brief

"cartridge" portion that is separable from the portion of the device containing the battery. Known "cartridge" portions contained an absorbent material and/or other solution holding means that held the e-liquid and a means for heating and vaporizing the e-liquid by fluid/heat transfer, called an "atomizer." In known two-piece cartridge designs the cartridges are sometimes referred to as

EX2008.0438

"atomizer." In known two-piece cartridge designs the cartridges are sometimes referred to as "cartomizers," and contain both the solution holding means and atomizer components in a non-separable component. As the two cartomizer components could not be separated, in the two-piece design, every new cartridge came with a fresh atomizer, which would be discarded once the solution in the cartridge had been consumed. In known three-piece designs, the cartomizer

EX2008.00438

-160: POR at 8 | -161: POR at 8-9

NJOY Exhibit 2045.0004
Juul v. NJOY
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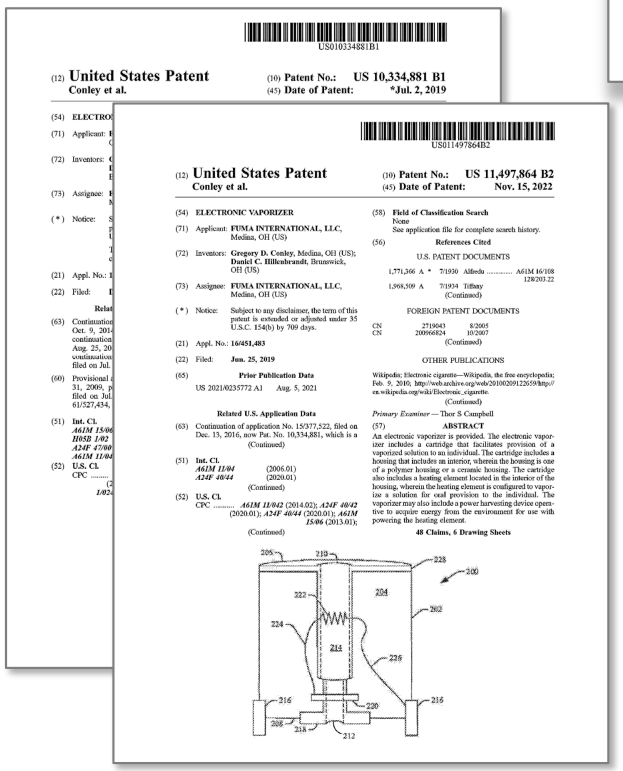
The Challenged Patents



Patent No.: US 11,497,864 B2
Date of Patent: Nov. 15, 2022

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

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

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 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.

-160: POR at 3; EX1001 (864 Patent) | -161: POR at 3; EX1001 (881 Patent)

NJOY Exhibit 2045.0005
Juul v. NJOY
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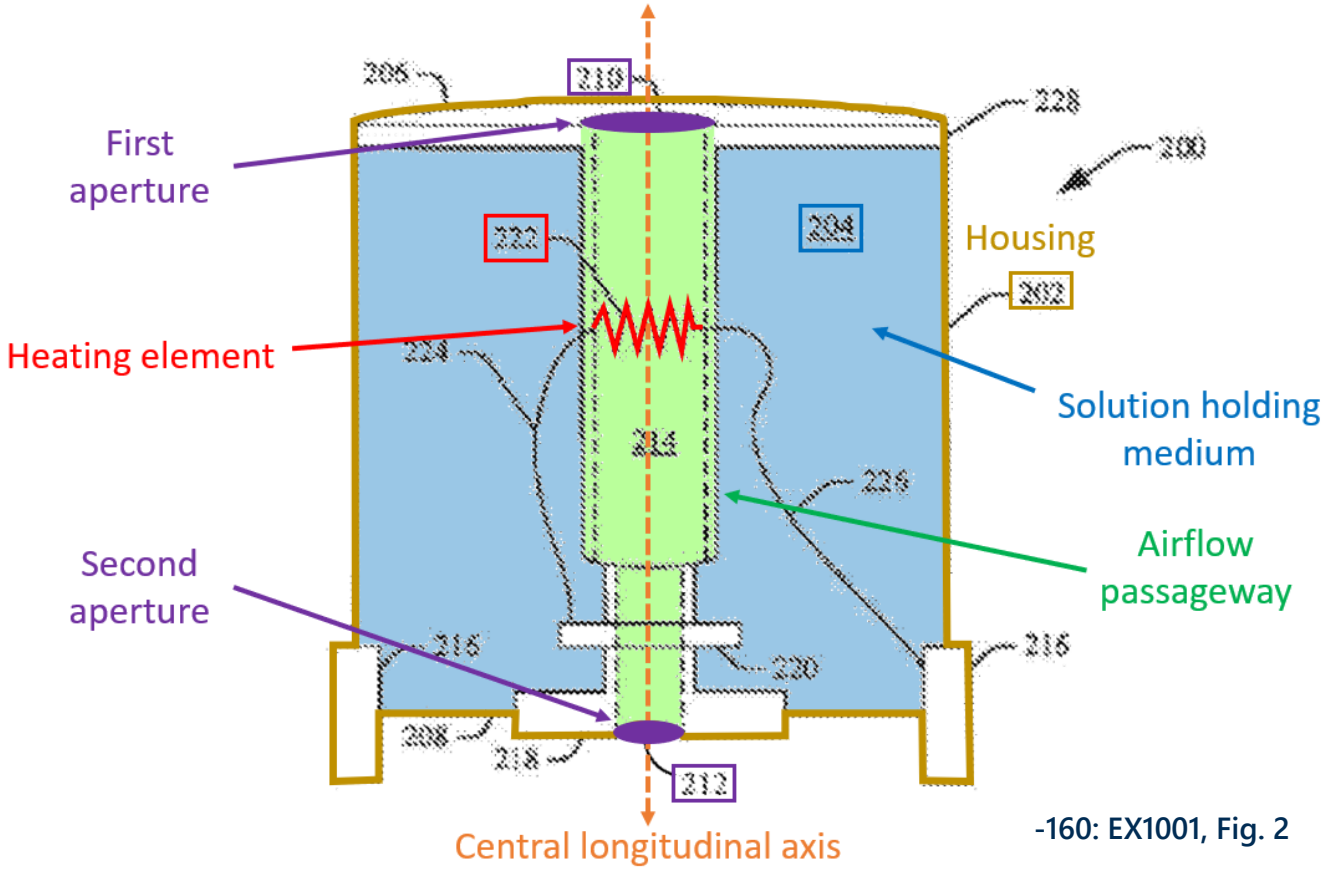
The Claimed Invention of the Challenged Patents



-160: EX1001, Fig. 2

-160: POR at 3-7; EX2022 ¶¶37-42 | -161: POR at 3-8; EX2022 ¶¶37, 40-41

NJOY Exhibit 2045.0006
Juul v. NJOY
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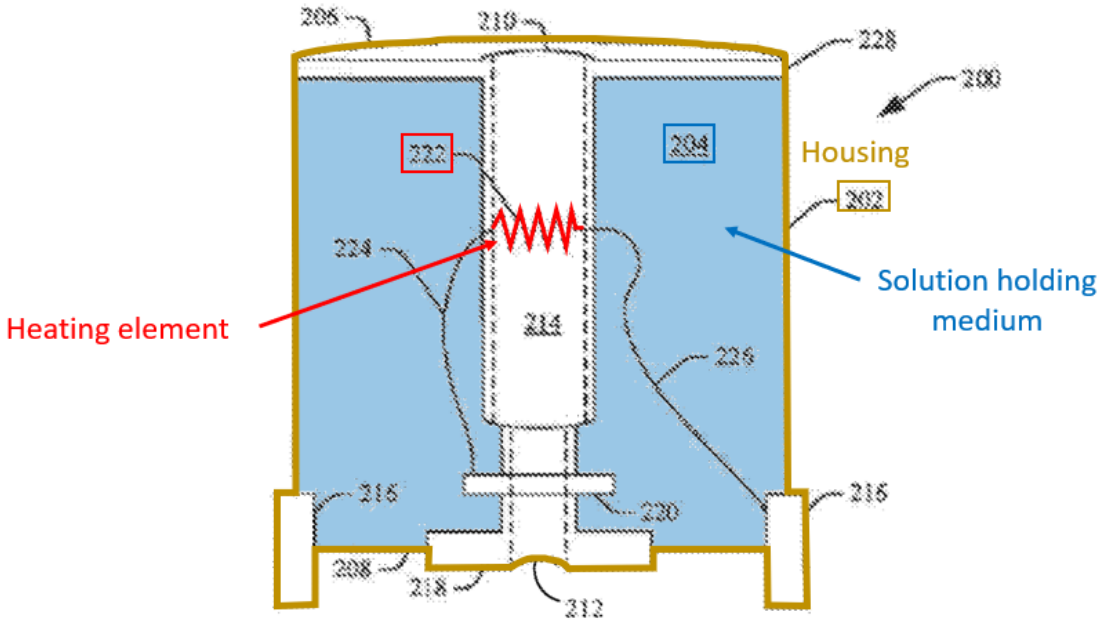
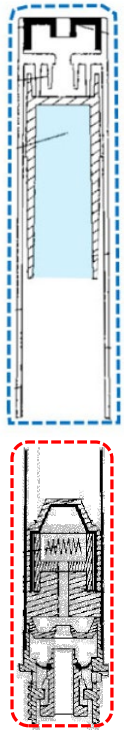
The Claimed Invention vs. the Prior Art



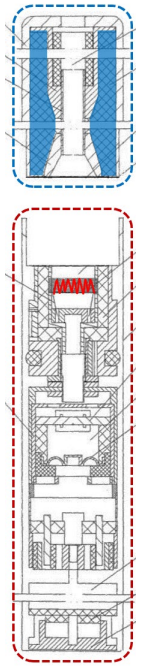
-160: EX1001, Fig. 2

Xia



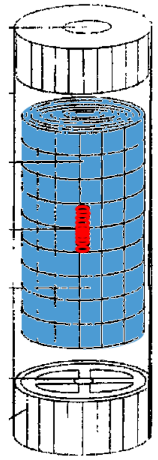
EX1027, Fig. 2 (modified)

Fang



EX1031, Fig. 1 (modified)

Wang



EX1029, Fig. 3

-160: POR at 5-6, 36-49, 51-53; EX2022 at ¶¶ 37-50, 60-61, 111-112, 139-141, 152-154
| -161: POR at 4-6, 37-52; EX2022 ¶¶37-50, 109-110, 135-138, 148-150

NJOY Exhibit 2045.0007
Juul v. NJOY
IPR2024-00160

Statutory Grounds for Challenges

Ground	Challenged Claims	35 U.S.C. §	Reference(s)/Basis
1	864 Patent: 1-48 881 Patent: 1-27	103	Xia, Wang, Fang
2	864 Patent: 1-48 881 Patent: 1-27	103	Wang, Fang

-160: Petition at 7 | -161: Petition at 7

NJOY Exhibit 2045.0008
Juul v. NJOY
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Claim Construction

Term	NJOY's Proposed Construction
"proximate"	"at, near, or close to," which, in the context of the 864 Patent claims, identifies relative positioning.
"transversely"	plain and ordinary meaning, i.e., "crosswise,"
"housing"	"outside structure containing the device internals"
"end"	the extreme part of an object / the extrema of an object
"housing having a first aperture proximate the first end"	plain and ordinary meaning, i.e., "a hole in the housing structure at a location proximate the first end of the housing"
"wherein the airflow passageway extends centrally and axially from the first aperture to the second aperture"	The proper construction encompasses central, axial airflow passageways that may include small obstructions (i.e., heating element and corresponding structures that do not alter the direction of airflow any more than the heating element) but excludes large obstructions that define the airflow passageway

-160: POR at 11-36; Surreply at 1-12; EX2022 ¶¶ 55-58, 61, 68, 78, 100

NJOY Exhibit 2045.0009
Juul v. NJOY
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NJOY

Ground 1: Xia with Wang and/or Fang

1A: Xia Alone

1B-D: Xia with Wang and/or Fang

NJOY Exhibit 2045.0010
Juul v. NJOY
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Ground 1A Fails

Xia Alone Does Not Teach or Render Obvious the Challenged Claims:	864 Patent Claims	-160 Support
cartridge comprising a housing having both a solution holding medium and heating element	1, 5, 9, 21, 25, 29, 38, 45	POR, 65-66, Surreply, 13-14
central and axial airflow passageway	1, 5, 21, 25, 38, 45	POR, 69-71; Surreply , 11-12, 14
housing having a first aperture proximate the first end	1, 5, 9, 21, 25, 29, 38, 45	POR, 20-21, 31-35, 66-69; Surreply, 7-11, 14
Additional Limitations* Xia Alone Does Not Teach or Render Obvious:		
first airflow path portion proximate first aperture is substantially central and axial	9, 29	POR, 71-72; Surreply, 33
airflow passageway extends in straight path with only heating element obstructing airflow	5, 25, 45	POR, 75-76; Surreply, 33
heating element includes a wicking material	12, 31	POR, 73-74; Surreply, 33
airflow chamber having substantially uniform cross-sectional area between heating element and second aperture	19, 37, 44	POR, 75; Surreply, 33
no portion of the [airflow passageway / chamber] between heating element and second aperture having a cross-sectional area smaller than the second aperture	4, 8, 19, 24, 28, 37, 44, 48	POR, 76-78; Surreply, 33

* JLI does not address these additional limitations in its Petitioner's Reply

NJOY Exhibit 2045.0011
Juul v. NJOY
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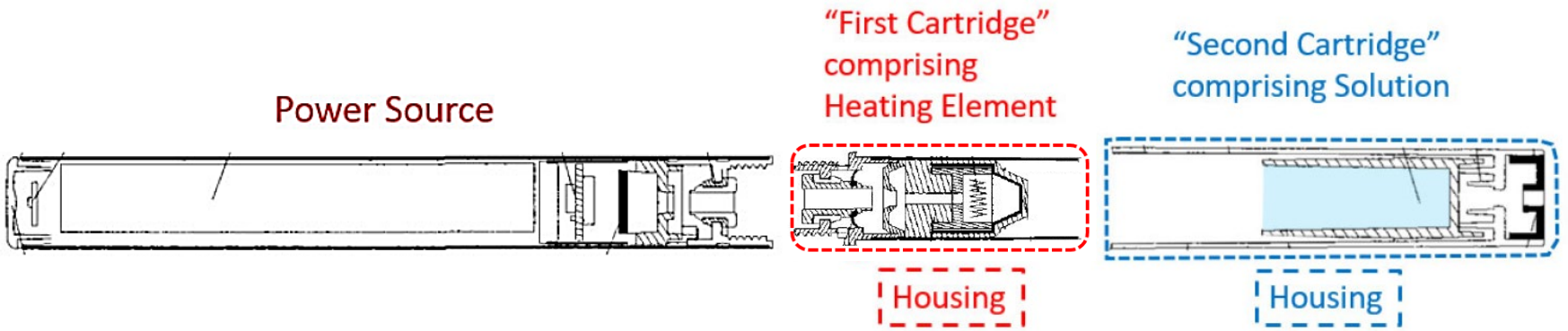
Xia – Three-Piece E-Cigarette



EX1027, Figs. 2-5 (modified)

-160: POR at 36-38, 65-66; EX2022 ¶¶111-112, 116, 129-133 |
-161: POR at 38-40; EX2022 ¶¶ 109-112; 126-132

NJOY Exhibit 2045.0012
Juul v. NJOY
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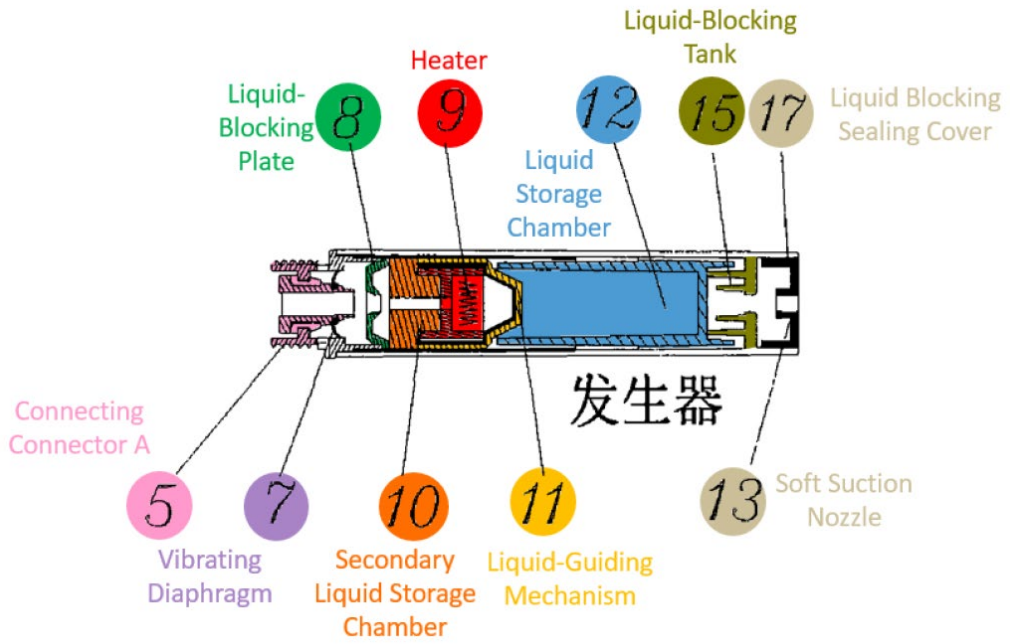
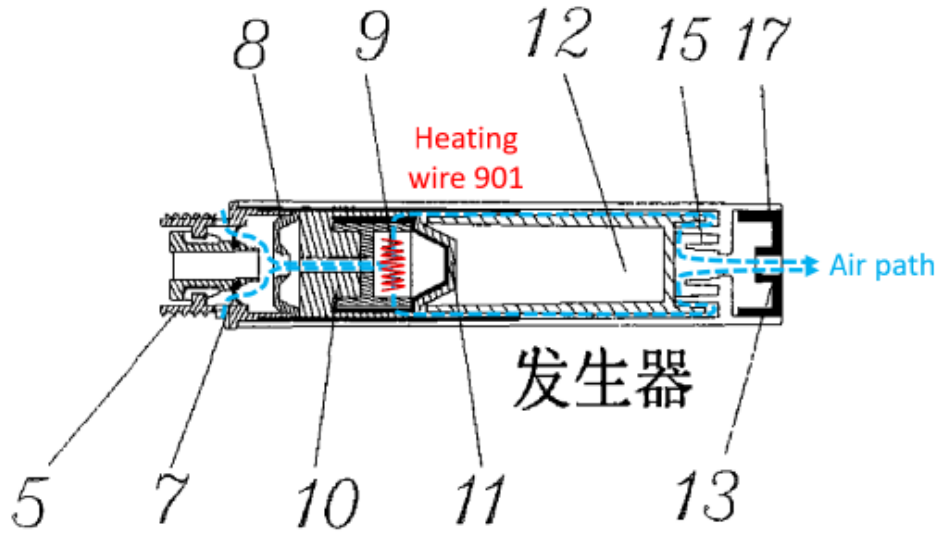
Xia's "Generator" – Components and Airflow



EX2027, Fig. 1



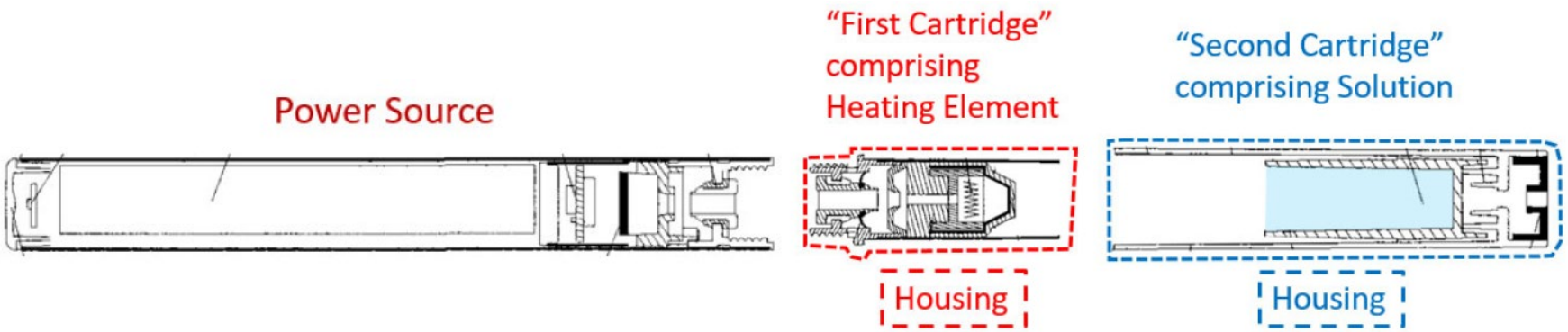
EX2027, Fig. 1

-160: POR at 38-40; EX2022 ¶¶114-123 | -161: POR at 39-41; EX2022 ¶¶113-120

NJOY Exhibit 2045.0013
Juul v. NJOY
IPR2024-00160

Xia and NPRO – Three-Piece E-Cigarettes

Xia



EX1027, Figs. 2-5 (modified)

NPRO

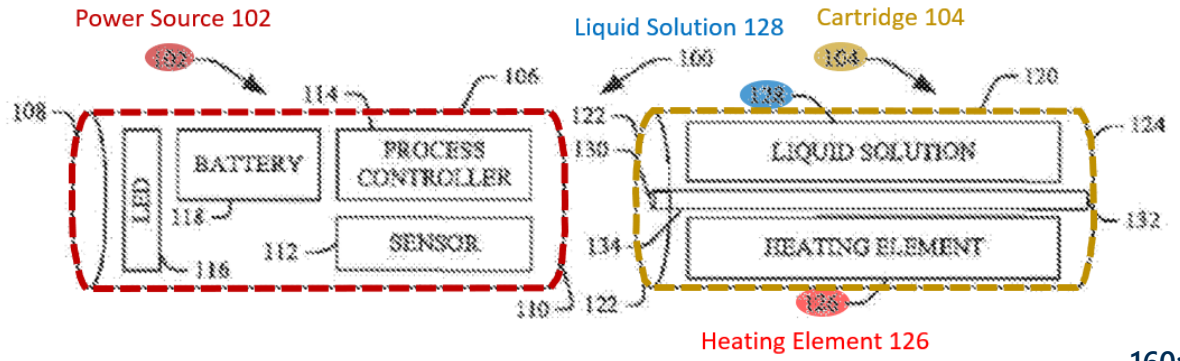
EX2015 (cropped); EX2016

-160: POR at 36-37, 65-66; EX2022 ¶¶111-112; 129-133 | -161: POR at 38-40; EX2022 ¶¶ 109-112; 126-132

NJOY Exhibit 2045.0014
Juul v. NJOY
IPR2024-00160

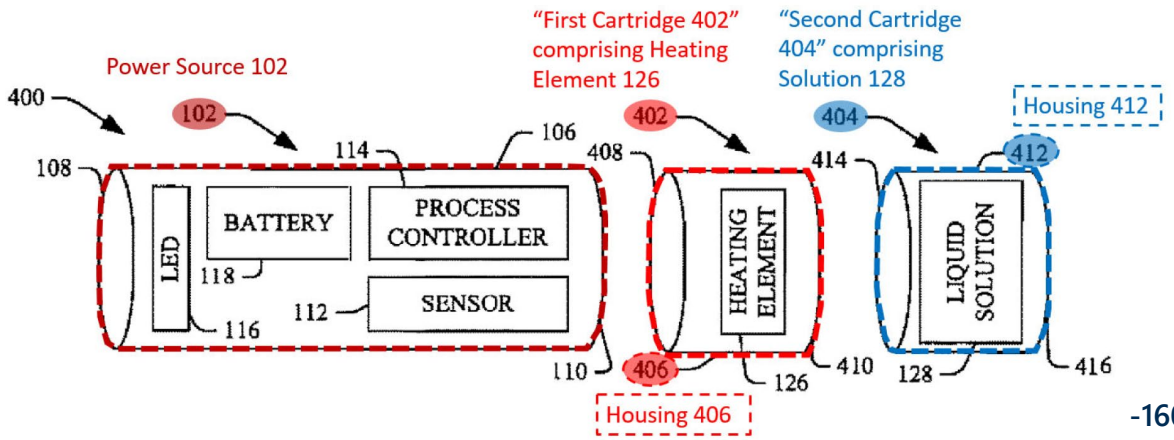
The Patents Distinguish Two-Piece and Three-Piece Designs

Two-piece design (claimed)



-160: EX1001, Fig. 1

Three-piece design (not claimed)



-160: EX1001, Fig. 4

-160: POR at 9-10; EX2022, ¶¶ 236-239 | -161: POR at 9-11; EX2022, ¶¶228-231

NJOY Exhibit 2045.0015
Juul v. NJOY
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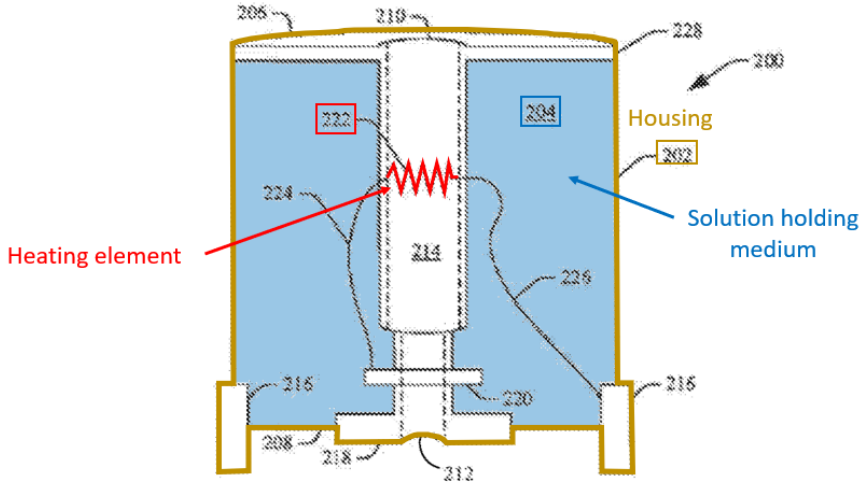
The Claims Do Not Cover Xia's Three-Piece Design

a cartridge comprising . . . the **housing** having . . . a **solution holding medium** . . . a **heating element** located in the interior of the **housing**

-160: EX1001, Claims 1, 5, 9, 21, 25, 29, 38, 45



-160: EX1001, Fig. 2

NJOY's Expert Dr. Singhose

239. In view of the teachings of the 864 Patent, a POSITA would understand that the limitation "the cartridge comprising: a housing having an interior and a solution holding medium… [and] a heating element located in the interior of the housing" encompasses the two-piece design but not the three-piece design. In other words, the claim requires a cartridge comprising a housing for both a solution holding medium and a heating element. A POSITA would not understand a

-160: EX2022, ¶239

-160: POR at 10; EX2022, ¶239 | -161: POR at 11; EX2022 ¶ 230

NJOY Exhibit 2045.0016
Juul v. NJOY
IPR2024-00160

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

NJOY’s Position

NJOY proposes that the Board revise its construction to clarify that, “wherein the airflow passageway extends centrally and axially from the first aperture to the second aperture” encompasses small obstructions (*i.e.*, heating element and corresponding structures that do not alter the direction of airflow any more than the heating element) but excludes large obstructions that define the airflow passageway.

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.

-160: POR at 30 (top), Surreply at 11 (bottom)

JLI’s Position

There is no principled distinction between large and small obstacles. Nothing in the claims, specification, or other intrinsic evidence precludes large obstacles that deflect airflow a large amount while permitting (as NJOY concedes) small obstacles that deflect airflow a small amount. Nor is there any evidence supporting a way to identify which obstacles are large or small.

-160: JLI Reply at 15

-160: POR at 30-36; Surreply at 11-12; EX2022, ¶¶100-101
| - 161: POR at 22-28; Surreply at 11-12; EX2022, ¶¶72-74

NJOY Exhibit 2045.0017
Juul v. NJOY
IPR2024-00160

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

The Prosecution History Supports NJOY's Construction

Applicant's Arguments

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

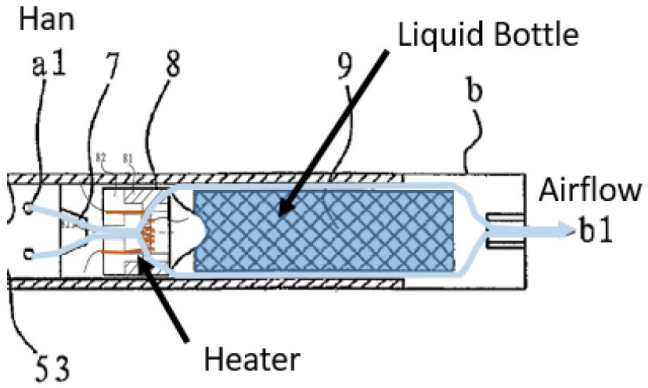
EX1002.273-.274

Examiner's Response

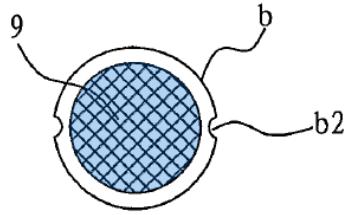
Response to Arguments

Applicant's arguments with respect to Hon as previously applied under 35 U.S.C. 102, have been fully considered and are persuasive. Applicant's arguments with respect to claim(s) 41-80 have been

EX1002.195



EX2006, Fig. 1



EX2006, Fig. 3

-160: POR at 31-35; EX2022 ¶¶102-110, 136-138 | -161 POR at 23-27; EX2022 ¶¶75-81

NJOY Exhibit 2045.0018
Juul v. NJOY
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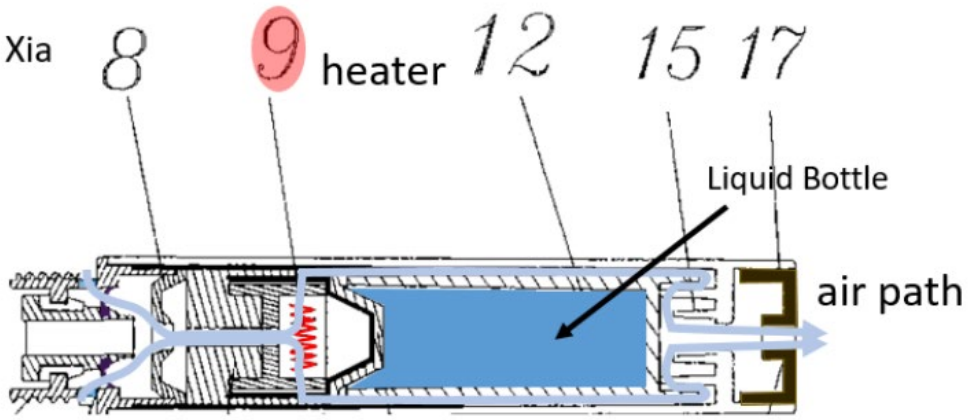
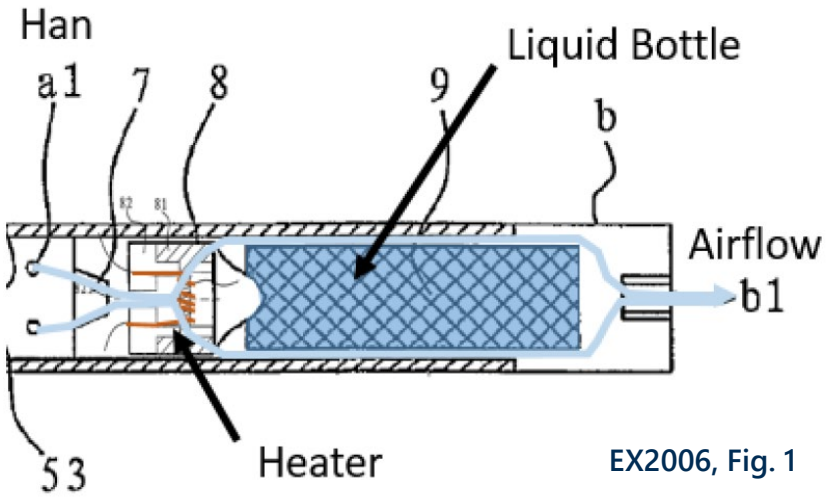
Xia Does Not Disclose the Claimed Airflow Passageway

Xia



EX1027, Fig. 2

Han



EX2006, Fig. 1

-160: POR at 32-35; EX2022 ¶¶135-138 | -161: POR at 24-27; EX2022 ¶¶133-134

NJOY Exhibit 2045.0019
Juul v. NJOY
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“wherein the airflow passageway extends centrally and axially from the first aperture to the second aperture”

The M.D.N.C. Decision Supports NJOY’s Construction: The patents allow for obstructions that do not alter the airflow passageway direction any more than the heating element.

through the passageway passing on both transverse sides of the heating element”). The “airflow passageway” described in the ’604 claims and described in the patents remains straight even when the “airflow” goes around an obstacle placed in the airflow passageway, such as the heating element. *See* Doc. 120-7 at ¶¶ 65, 67 (showing a 2D and 3D view of the air flow inside the Ciro).

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 opening at the base of the positive pin and travels straight until it hits a closed end on the opposite side. *See* Doc. 120-1 at ¶¶ 88–89; Doc. 120-7 at ¶¶ 64–65. The closed end

EX1015.0016

-160: POR at 35-36; Surreply at 11-12 | -161: POR at 36-37; Surreply at 11-12

NJOY Exhibit 2045.0020
Juul v. NJOY
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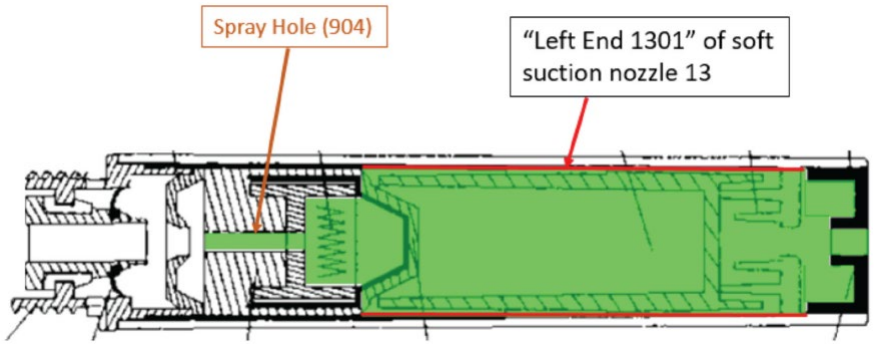
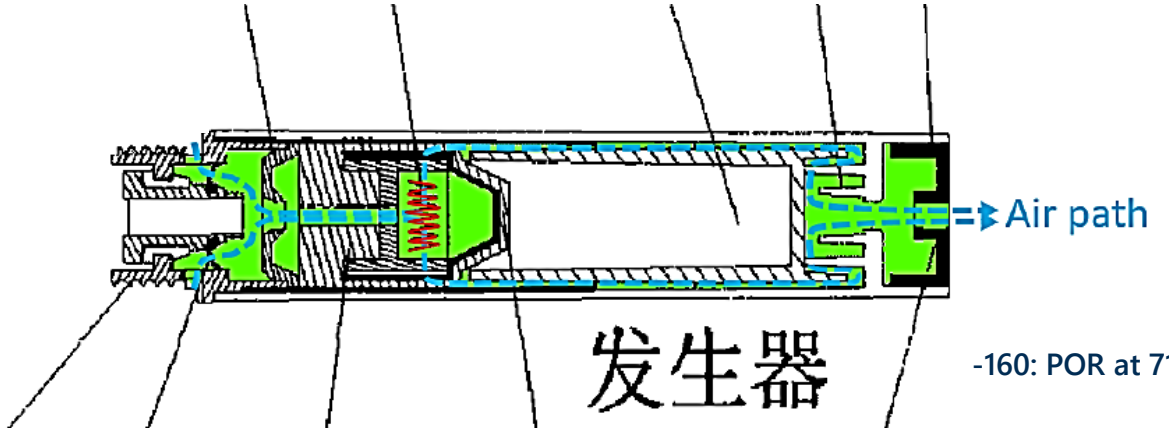
Xia Does Not Disclose the Claimed Airflow Passageway

JLI's Annotations



Petition, 50

Correct Airflow Passageway



-160: POR at 71

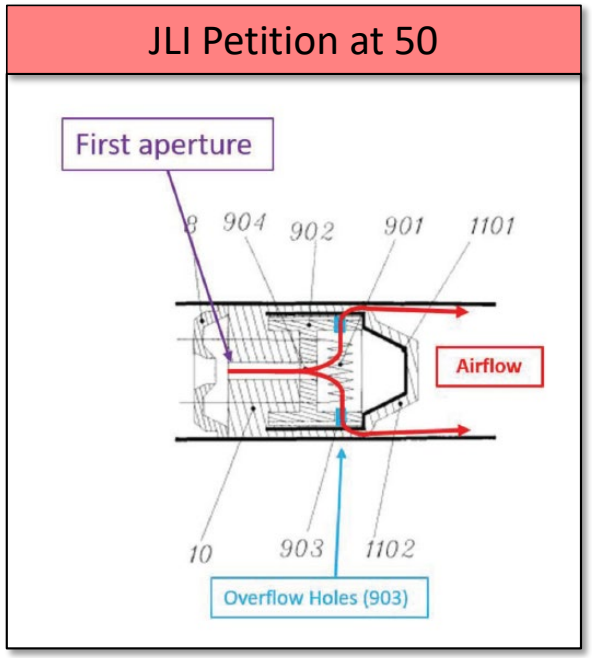
-160: POR at 69-71; EX2022 ¶¶188-191 | -161: POR at 71-73; EX2022 ¶¶ 175-186

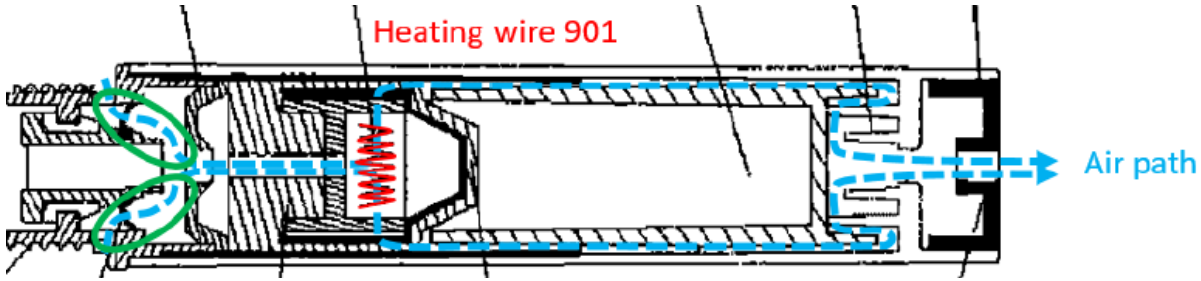
NJOY Exhibit 2045.0021
Juul v. NJOY
IPR2024-00160

Xia Does Not Render Obvious Claims 9 and 29

Xia Does Not Render Obvious "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"

JLI Petition at 50





EX1027, Fig. 1

-160: POR at 71-72; EX2022 ¶¶286-287

NJOY Exhibit 2045.0022
Juul v. NJOY
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"**housing** having a first aperture proximate the first end"

"housing"	"outside structure containing the device internals"

The cartridge **104** comprises a housing **120** that has an interior. The cartridge **104** also comprises a first end **122** and

-160: EX1001, 3:46-47

A liquid, gelatin, frozen or solid solution (solution) **128** also resides in the interior of the housing **120**, wherein the

-160: EX1001, 4:7-8

A heating element **126** resides in the interior of the housing **120**. The heating element **126** may be or include any

-160: EX1001, 3:65-66

The cartridge **200** further comprises a conductive element **216**, at least a portion of which resides in the interior of the housing **202**. For instance, the conductive element may be

-160: EX1001, 6:27-29

-160: POR at 16-18; EX2022 ¶¶63-67 | -161: POR at 16-19; EX2022 ¶¶59-63

NJOY Exhibit 2045.0023
Juul v. NJOY
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"housing having a first aperture proximate the first end"

"housing having a first aperture proximate the first end"	plain and ordinary meaning, i.e., "a hole in the housing structure at a location proximate the first end of the housing"

NJOY's Expert Dr. Singhose

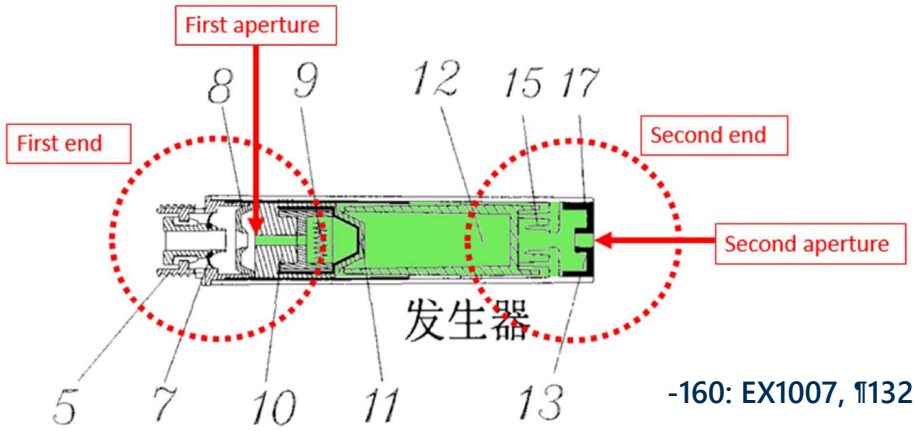
90. Therefore, it is my opinion that the when considering the context of the claim, teachings of the specification, and the nature of an aperture, it would be clear to a POSITA that "a housing having a first aperture" means an aperture located in, or otherwise defined by, the external walls of the housing, just as an external surface finish must be on the exterior walls of the housing.

-160: EX2022, ¶90

-160: POR at 21-30; EX2022, ¶¶83-90; Surreply at 7-11 | -161: POR at 28-37; EX2022, ¶¶86-99; Surreply 7-11

NJOY Exhibit 2045.0024
Juul v. NJOY
IPR2024-00160

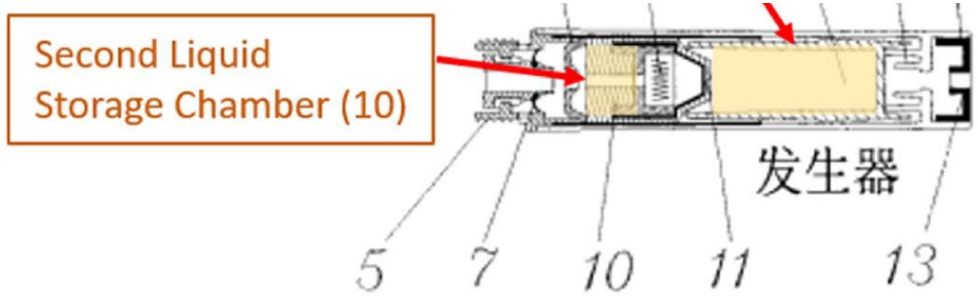
“**housing having a first aperture** proximate the first end”



-160: EX1007, ¶132

> 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,

-160: EX1001, Claim 1



-160: EX1007, ¶78

> a housing having an interior and a solution holding medium adapted to hold a solution, the housing having

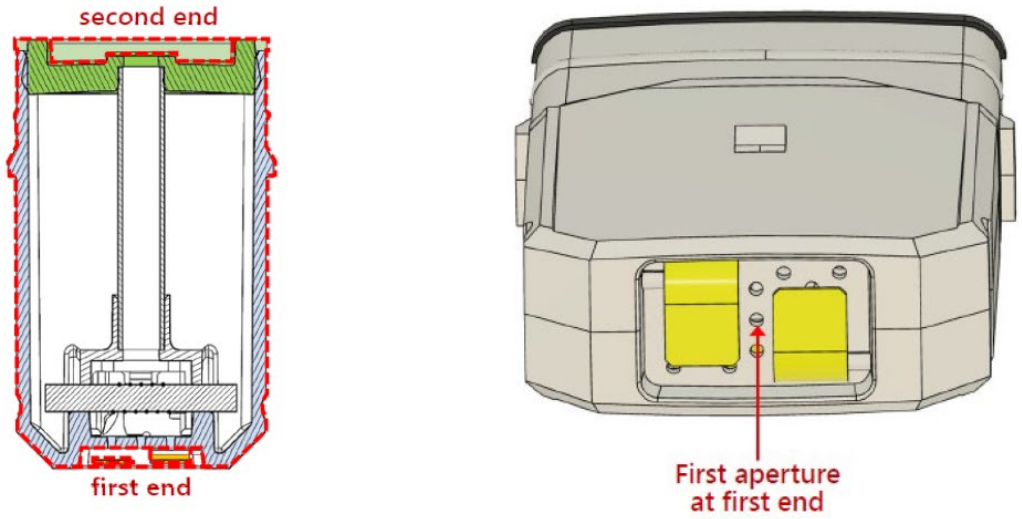
-160: EX1001, Claim 1

-160: POR at 21-25 | -161: POR at 28-32

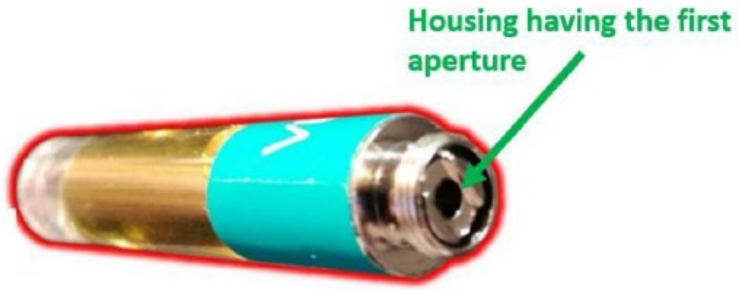
NJOY Exhibit 2045.0025
Juul v. NJOY
IPR2024-00160

“**housing having a first aperture** proximate the first end”

NJOY’s ITC Contentions Are Consistent with its Proposed Construction



-160: 1043.002 (left); EX2043.002 (right)



EX2005.0023

-160: POR at 25-30; Surreply at 8-9, EX2022, ¶¶92-99; Surreply at 7-11 | -161: POR at 32-37; EX2022, ¶¶100-107

NJOY Exhibit 2045.0026
Juul v. NJOY
IPR2024-00160

“housing having a **first aperture proximate the first end**”

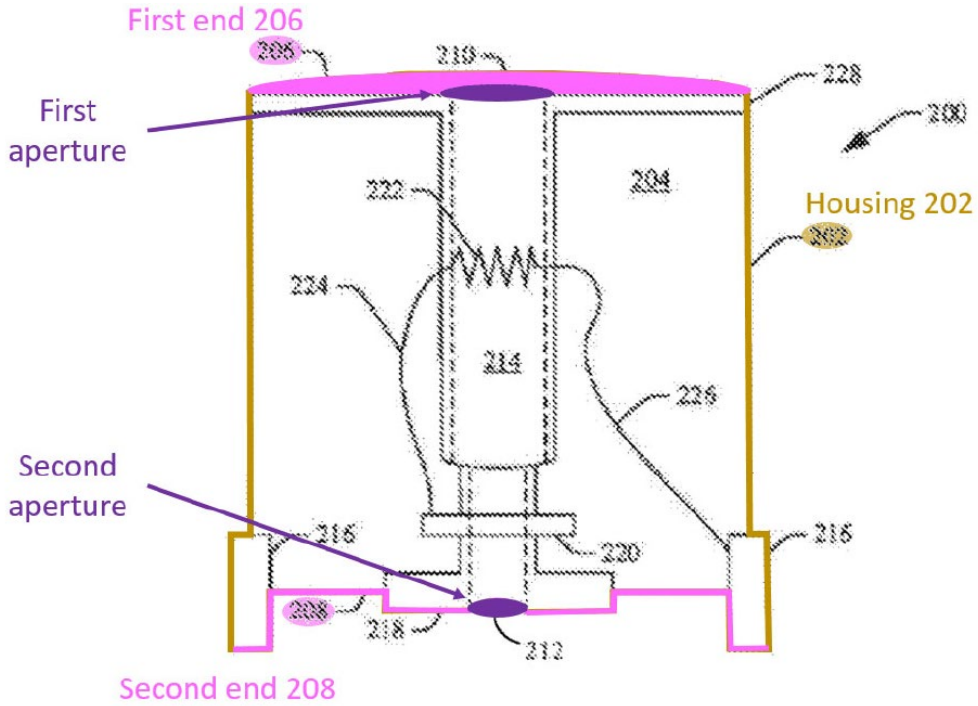
“end”	the extreme part of an object / the extrema of an object

dose. The cartridge **200** includes a first end **206** and a second end **208** that is opposite the first end **206**, wherein the first

-160: EX1001, 6:5-6

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**

-160: EX1001, 6:12-18



-160: POR at 18-21; EX2022 ¶¶68-75 | -161: POR at 19-22; EX2022 ¶¶ 64-71

NJOY Exhibit 2045.0027
Juul v. NJOY
IPR2024-00160

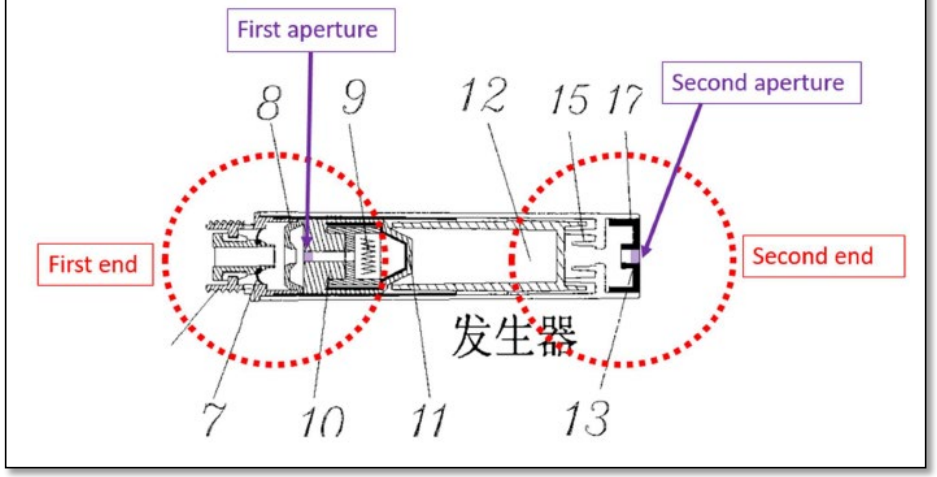
JLI's Position is Inconsistent with the Specification

"end" ≠ end region

suitable shape. As shown, the housing **106** comprises a first end **108** and a second end **110** that is opposite the first end **108**, and also includes an interior. While not shown, the

-160: EX1001, 3:28-30

JLI's End Regions



-160: EX1007, ¶49

-160: POR at 18-21; EX2022 ¶¶73-74 | -161: POR at 19-22; EX2022 ¶¶69-70

NJOY Exhibit 2045.0028
Juul v. NJOY
IPR2024-00160

JLI's Position of End is Inconsistent with Dictionaries

"end" ≠ end region

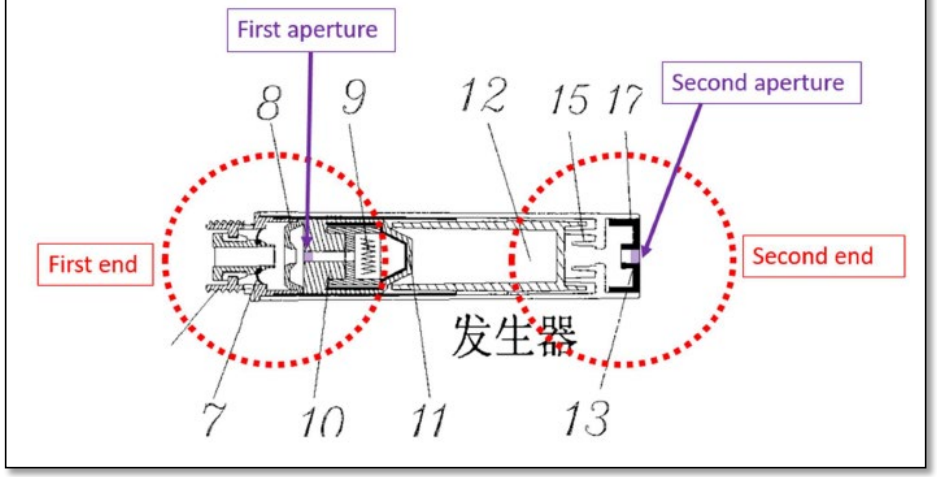
where something ceases to exist ⟨world without ~⟩ **c : the extreme or last part lengthwise** : TIP d : the terminal unit of something spatial

EX2019.003 (Merriam-Webster's Collegiate Dictionary)

end (ĕnd) *n.* 1. Either extremity of something that has length: *the end of the pier.* **2.** The outside or extreme edge or physical limit; a boundary: *the end of town.* 3. The point in time when an action, an event, or a

EX2020.004 (American Heritage Dictionary)

JLI's End Regions



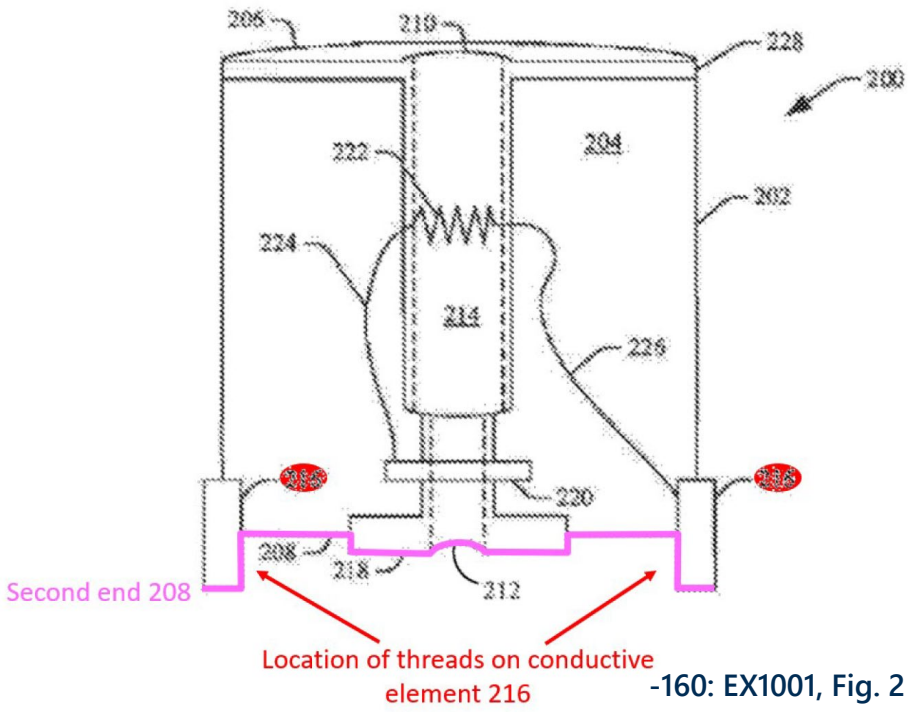
-160: EX1007, ¶49

-160: POR at 18-21; EX2022 ¶¶72-74 | -161: POR at 19-22; EX2022 ¶¶68-70

NJOY Exhibit 2045.0029
Juul v. NJOY
IPR2024-00160

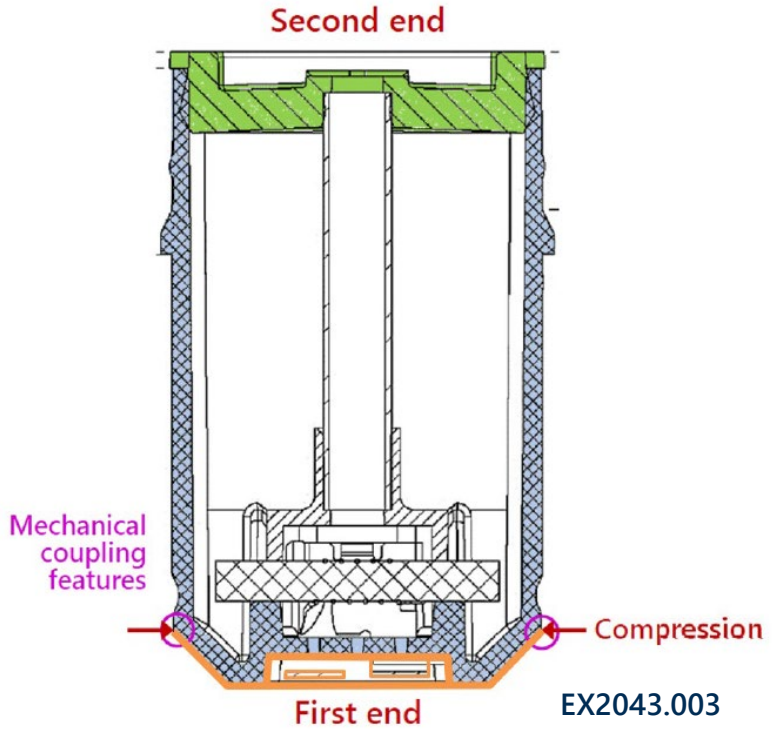
NJOY's Position is Consistent with its ITC Contentions

"end" can be non-planar surface



-160: EX1001, Fig. 2

≈



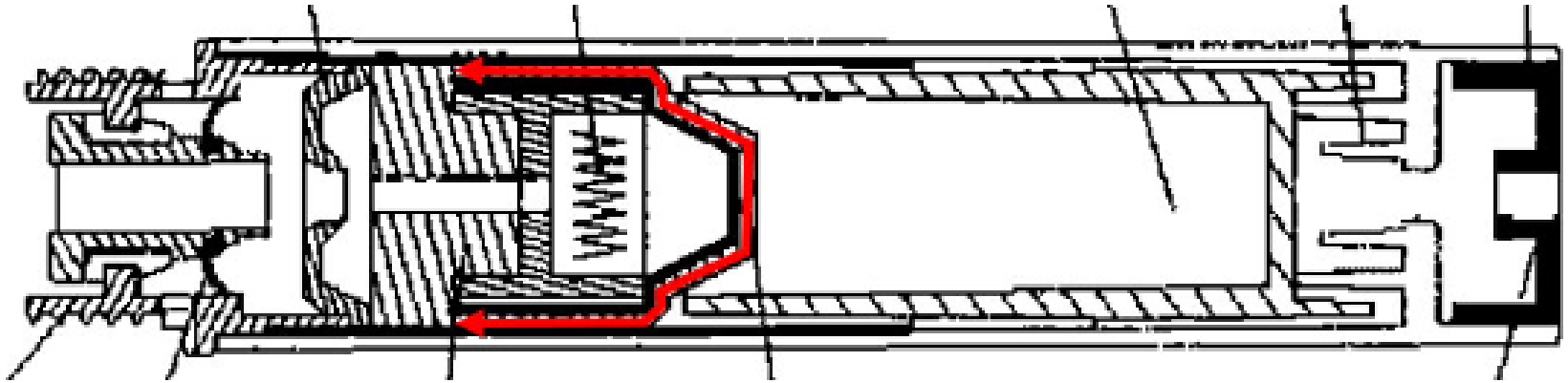
EX2043.003

-160: Surreply at 1, 3-6; EX2022 ¶¶70, 364; EX2035 at 95:1-6
| -161: Surreply at 1, 3-6; EX2022 ¶66; EX2035 at 95:1-6

NJOY Exhibit 2045.0030
Juul v. NJOY
IPR2024-00160

Xia Does Not Render Obvious Claims 12 and 31

Xia does not disclose or render obvious "the heating element includes a wicking material being operative to permit at least a portion of the solution . . . to be drawn toward the heating element"



EX1027, Fig. 1

-160: POR at 73-74; EX2022 ¶¶118, 292-298

NJOY Exhibit 2045.0031
Juul v. NJOY
IPR2024-00160

Xia Does Not Render Obvious Claims 19, 37, and 44

JLI Has Failed to Articulate an Invalidity Theory For "Airflow Chamber"

JLI Petition

19. Claim 19:

See claims 3-4.

37. Claim 37:

See claims 3-4.

44. Claim 44:

See claims 3-4.

-160: Petition, 83, 86, 90

Petitioner refers to its analysis for claims 3, 4. Petition, 83. But claims 19, 37, and 44 are directed to an "airflow chamber," not an "airflow passageway" as claimed in claims 3, 4. Petitioner provides no explanation as to why its analysis of claims 3 and 4 should apply to claims 19, 37, and 44. EX2022 ¶¶303-304. Indeed, the 864 Patent's specification does not use the terms "passageway" and "chamber" interchangeably. The specification explains that "[a]n airflow passageway 214 begins at the first aperture 210 and extends to the second aperture 212." EX1001, 6:21–24. Yet the specification recites for chamber that it is a space through which airflow may pass "that is proximate to the heating element." *Id.*, 7:18–21. Petitioner has failed to articulate an invalidity theory for airflow chamber.

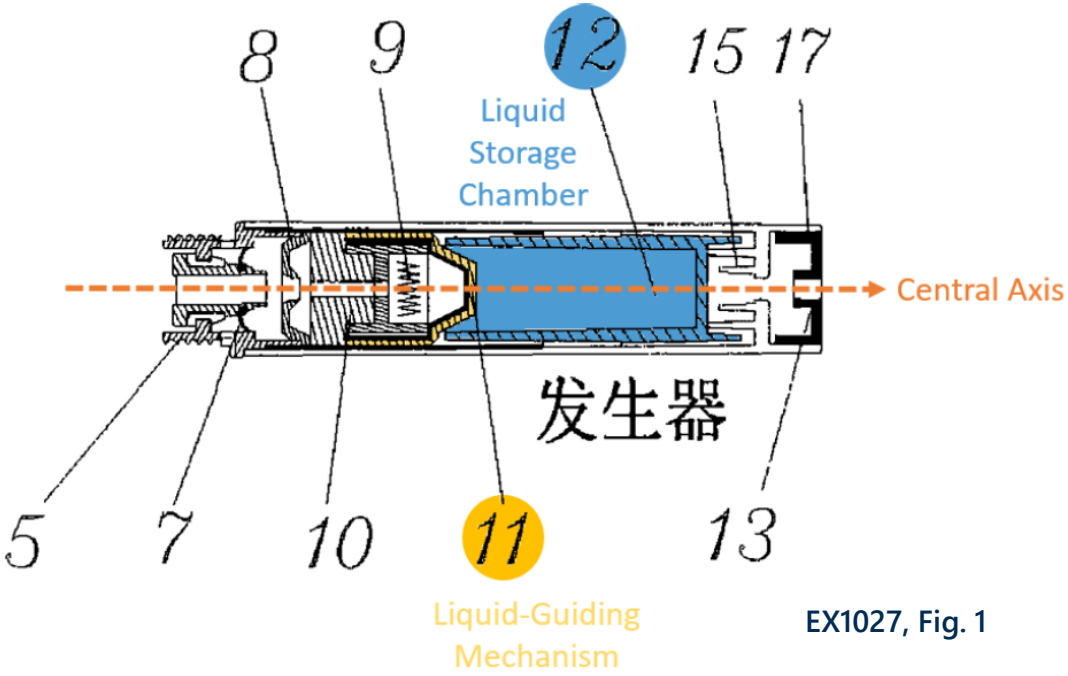
-160: POR at 75

-160: POR at 75; EX2022 ¶¶303-304

NJOY Exhibit 2045.0032
Juul v. NJOY
IPR2024-00160

Xia Does Not Render Obvious Claims 5, 25, and 45

Xia does not disclose or render obvious an "airflow passageway [that] 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"



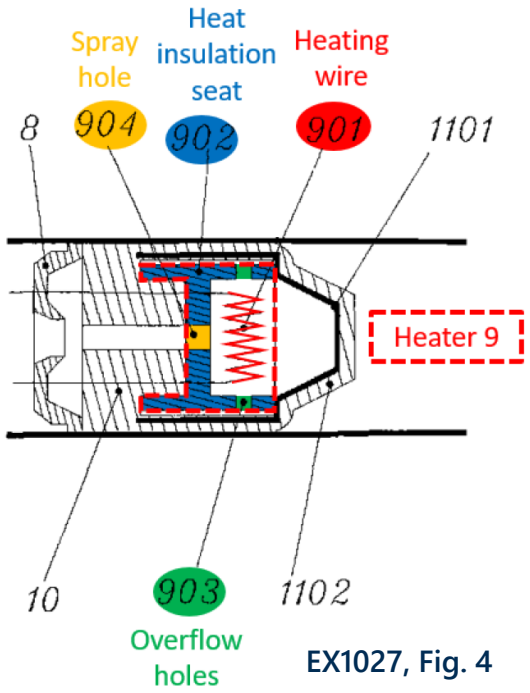
EX1027, Fig. 1

-160: POR at 75-76; EX2022 ¶¶266-267

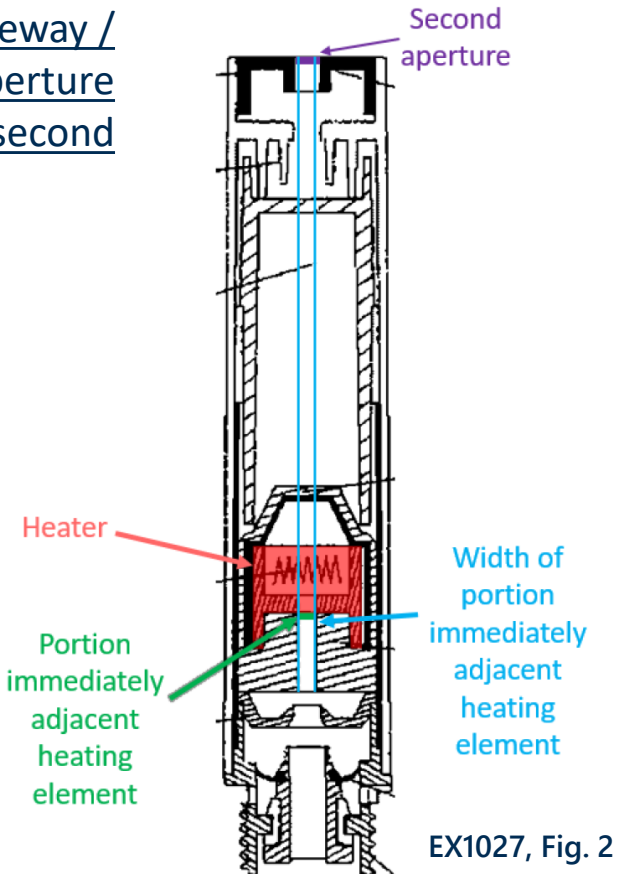
NJOY Exhibit 2045.0033
Juul v. NJOY
IPR2024-00160

Xia Does Not Render Obvious Claims 4, 8, 19, 24, 28, 37, 44, and 48

Xia does not disclose or 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"



EX1027, Fig. 4



EX1027, Fig. 2

-160: POR at 76-78; EX2022 ¶¶ 262-263

NJOY Exhibit 2045.0034
Juul v. NJOY
IPR2024-00160

NJOY

Ground 1: Xia with Wang and/or Fang

1A: Xia Alone

1B-D: Xia with Wang and/or Fang

NJOY Exhibit 2045.0035
Juul v. NJOY
IPR2024-00160

Grounds 1B-D Fail

Xia in view of Wang and/or Fang Do Not Render Obvious the Challenged Claims

	864 Patent Claims	-160 Support
A POSITA would not have been motivated to combine Xia with Wang and/or Fang	All Challenged Claims	POR, 50-60, 78-79; Surreply, 15-24
JLI has failed to find in any reference:		
housing having a first aperture proximate the first end	1, 5, 9, 21, 25, 29, 38, 45	POR, 66-69, 79; Surreply, 7-11, 14, 29
airflow passageway extending centrally and axially from the first aperture to the second aperture	1, 5, 21, 25, 38, 45	POR, 45,47-50, 69-71, 79
airflow chamber having “a substantially uniform cross-sectional area” between the heating element and the second aperture	19, 37, 44	POR, 75, 79
only the heating element obstructing a portion of the airflow through the airflow passageway	5, 25, 45	POR, 75-76, 79

NJOY Exhibit 2045.0036
Juul v. NJOY
IPR2024-00160

Wang is Simple Cartomizer Design with Disposable Heating Element

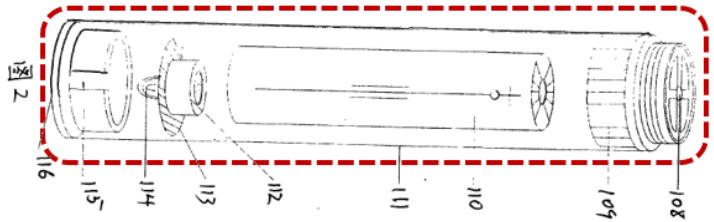
NJOY's Expert Dr. Singhose

Wang is a very simple, inexpensive heating coil surrounding by an organic fiber.

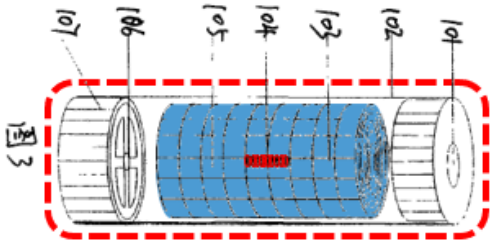
element. Finally, Wang is a simple, inexpensive, disposable cartridge. Modifying

-160: EX2022, ¶¶ 369, 379

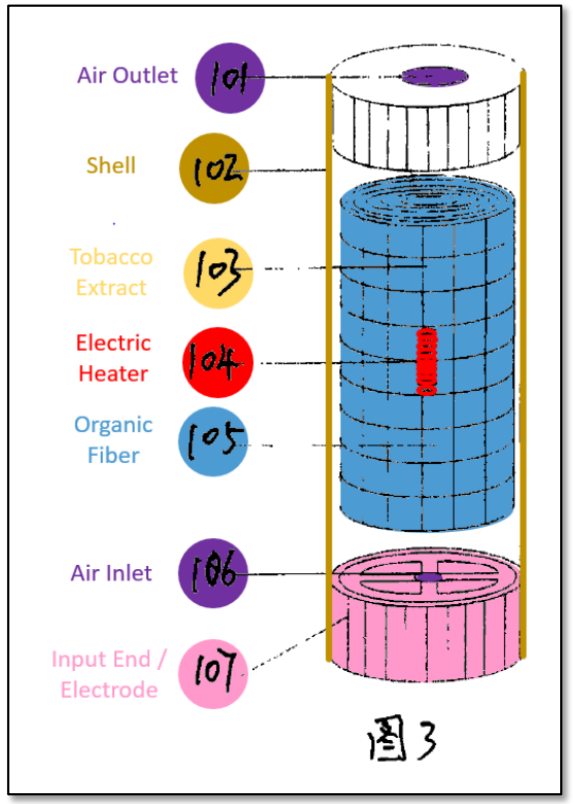
Power Source



Cartomizer



EX2029, Fig. 2, 3



EX2029, Fig. 3

-160: POR at 42-43, 52, 84-85; EX2022 ¶139-142 | -161: POR at 43-45, 53; EX2022 ¶138

NJOY Exhibit 2045.0037
Juul v. NJOY
IPR2024-00160

Wang – No Central and Axial Airflow Passageway

NJOY's Expert Dr. Singhose

145. Dr. Sturges' annotation, however, is deceptive. I have reproduced the original Wang Figure 5 below. It simply does not depict a central airflow passageway. A POSITA would not have understood that just because Figure 5 depicts fiber or paper that is rolled up, it must contain a central airflow passageway. A piece of fiber or paper can be rolled up without leaving a channel in the middle. Furthermore, the spiral on the top surface of the fiber 105 indicates it is rolled up tightly without a gap in the middle.

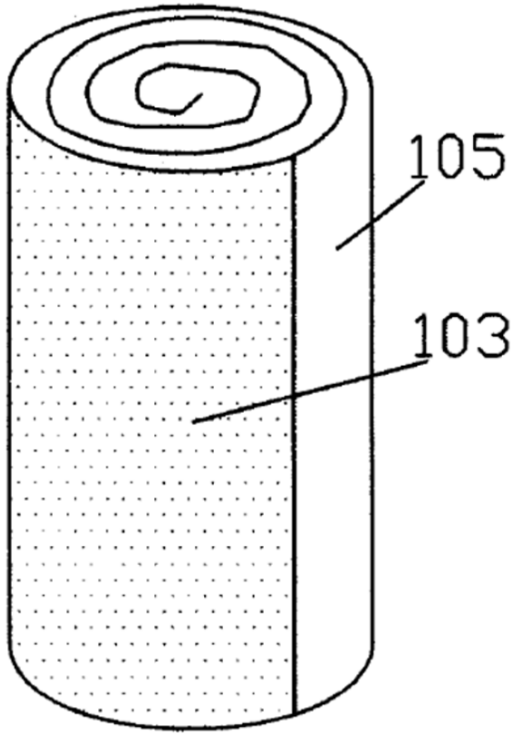
EX2022, ¶145

JLI's Expert Dr. Sturges

Q. Now, does the text in Wang describe that there's a circular opening in the center that you believe is there in figure 5?

A. No, but Mr. Wang confirmed that his solution-holding medium surrounds a complete central air passageway.

EX2017 (Sturges Tr.), 51:23-52:3

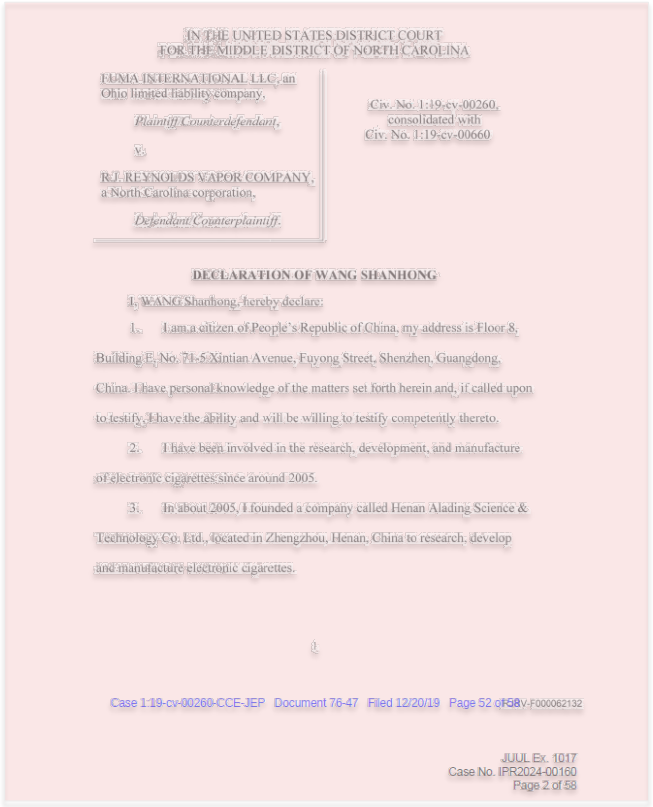


EX1029, Fig. 5

-160: POR at 44-46, 80-81; Surreply at 24-28; EX2022, ¶¶143-146 |
-161: POR at 46-47, 87-89; Surreply at 24-28; EX2022, ¶¶ 139-142

NJOY Exhibit 2045.0038
Juul v. NJOY
IPR2024-00160

The Wang Declaration Should be Excluded



IN THE UNITED STATES DISTRICT COURT
FOR THE MIDDLE DISTRICT OF NORTH CAROLINA

FUMA INTERNATIONAL LLC, an Ohio limited liability company,

Plaintiff Counterdefendant,

v.

R.J. REYNOLDS VAPOR COMPANY, a North Carolina corporation,

Defendant Counterplaintiff.

Civ. No. 1:19-cv-00260, consolidated with Civ. No. 1:19-cv-00660

DECLARATION OF WANG SHANHONG

I, WANG Shanhong, hereby declare:

1. I am a citizen of People's Republic of China, my address is Floor 8, Building E, No. 71-5 Xintian Avenue, Fuyong Street, Shenzhen, Guangdong, China. I have personal knowledge of the matters set forth herein and, if called upon to testify, I have the ability and will be willing to testify competently thereto.

2. I have been involved in the research, development, and manufacture of electronic cigarettes since around 2005.

3. In about 2005, I founded a company called Henan Alading Science & Technology Co. Ltd., located in Zhengzhou, Henan, China to research, develop and manufacture electronic cigarettes.

1

Case 1:19-cv-00260-CCE-JEP Document 76-47 Filed 12/20/19 Page 52 of 58 F-SRV-F000062132

JUUL Ex. 1017
Case No. IPR2024-00160
Page 2 of 58

EX1017 (Wang Declaration)

- **Not** prior art
- **Not** providing expert testimony
- Concerns certain products, **not** Wang reference

ALJ Johnson-Hines

However, I think it's important to kind of recognize where we are and that at least from the information that's been presented to me so far, it doesn't appear that Mr. Wang is necessarily completely truthful. So I would take with a grain of salt what he has said with respect to the prior art. I don't believe from what I have seen it is necessarily true.

EX2002, 85:7-13

-160: POR at 45-46, 82; Paper 31 (Motion to Exclude) at 3-6; EX2022 ¶¶148-151

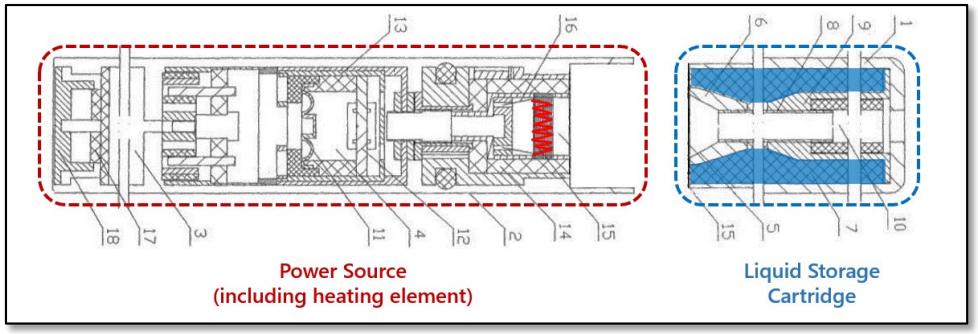
NJOY Exhibit 2045.0039
Juul v. NJOY
IPR2024-00160

Fang is Complex Two-Piece Design with Expensive Reusable Components

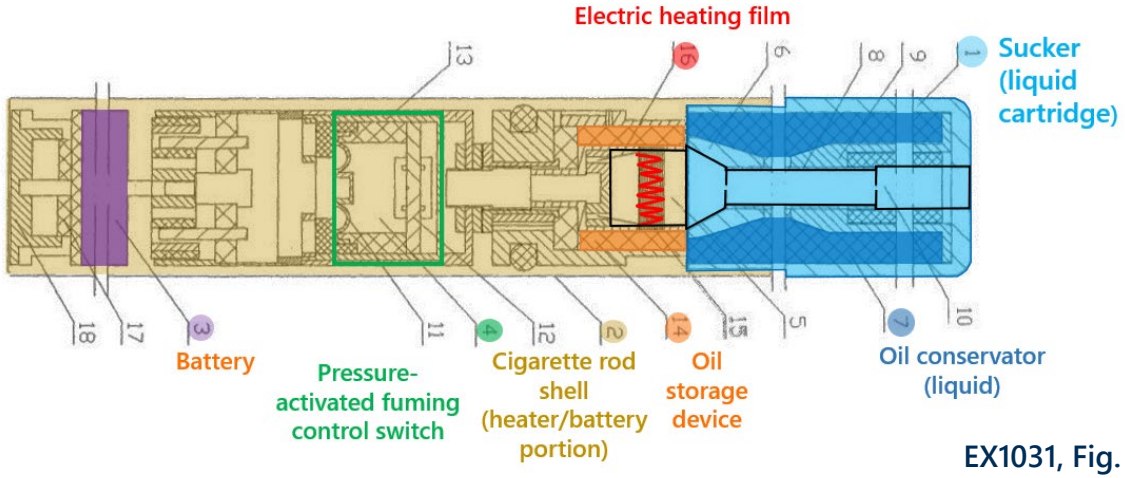
NJOY's Expert Dr. Singhose

Fang's use of a liquid cartridge, instead of a cartomizer, justifies its complex and expensive design—most of its components (e.g., wicking structure, heating element, supporting structure) are reusable. When Fang's liquid needs replacement, only the liquid cartridge (called a sucker) would need to be replaced. However, if Wang is

-160: EX2022, ¶396



EX1031, Fig. 1 (modified)



EX1031, Fig. 1

-160: POR at 53, 61; EX2022, ¶396

NJOY Exhibit 2045.0040
Juul v. NJOY
IPR2024-00160

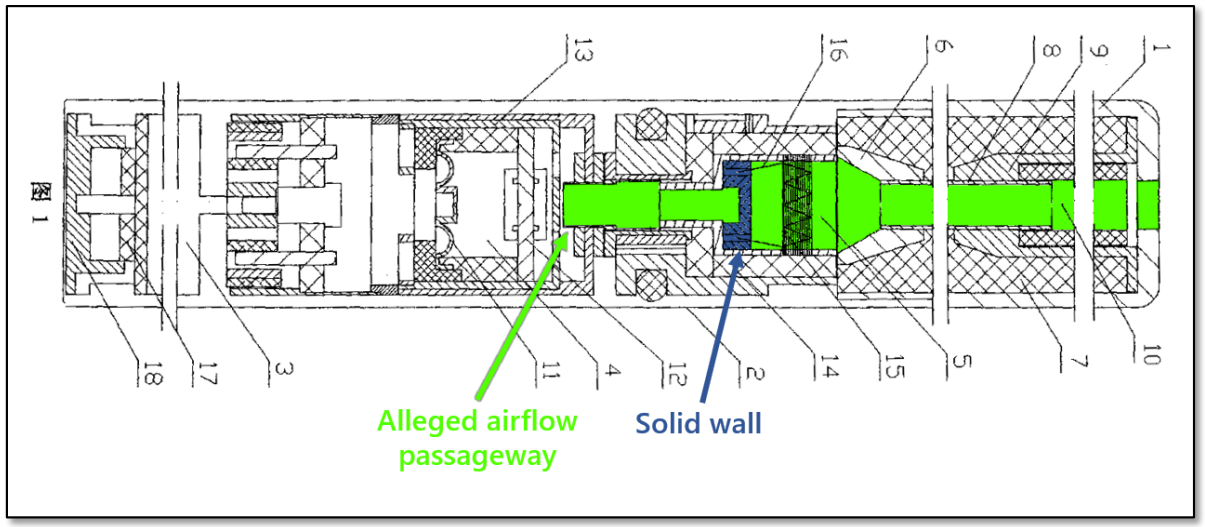
Fang – No Central Airflow Passageway

JLI's Expert Dr. Sturges

Q. And the text of Fang doesn't explicitly describe where the air enters the device; correct?

A. Correct.

EX2017 (Sturges Tr.), 70:24-71:1



EX1031, Fig. 1

-160: POR at 47-48; EX2022, ¶¶ 157-162 | -161: POR at 49-52; EX2022 ¶¶ 153-157

NJOY Exhibit 2045.0041
Juul v. NJOY
IPR2024-00160

JLI's Alleged Motivation

JLI's Expert Dr. Sturges

61. A person of ordinary skill in the art ("POSITA") would have been motivated to combine Xia with Wang and/or Fang as they are all directed to the design and operation of handheld, cylindrical, cigarette-like, electronic cigarettes that use a heating element within the device, powered by a battery, to vaporize liquid held within the device, for delivery via airflow to a user's mouth via suction from the user, through a mouthpiece at the end of the device.

62. Each of Xia, Wang, and Fang (and the '864 patent) use very similar structures and internal components to achieve very similar functions. Moreover, Xia, Wang, and Fang were also all published within the same eleven-month period and were all from Chinese inventors.

63. Additionally, a combination of these references would merely result in the substitution of known elements from Wang or Fang for elements in Xia (Ground 1) or of known elements from Fang for elements in Wang (Ground 2).

64. Xia with Wang and Fang are very similar and relate to a predictable subject matter, so a POSITA would have been motivated to combine their teachings and would have understood that there would be a high likelihood of success when making these modifications. For example, altering the physical arrangement of the known components of the device in Xia, such as a heater or a battery, with similar components such as those in Wang and Fang, would not result in unpredictable results.

65. Any arguable distinctions between any individual one of the prior art references discussed in this petition and the '864 patent that Patent Owner may argue for are basic design choices that any POSITA would consider.

66. Any of the references are anticipatory or at least individually render all claims of the '864 invalid through rather obvious, simple variations of the disclosures. However, multiple references, including combinations, are discussed here, solely to address arguments that Patent Owner may make, although Petitioner does not agree with them.

EX1007, ¶¶61-66

NJOY Exhibit 2045.0042
Juul v. NJOY
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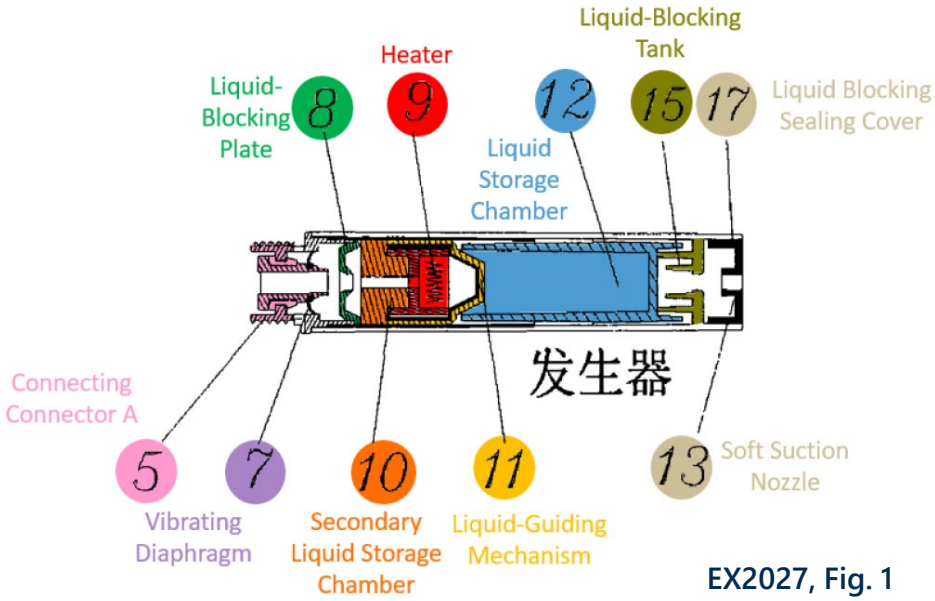
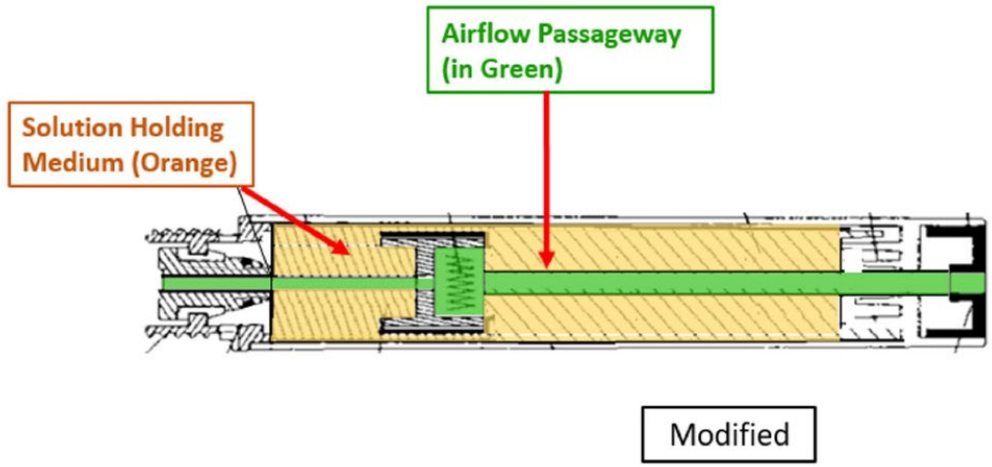
JLI's Proposed Combination

Xia



EX2027, Fig. 1

JLI's Modified Xia



EX1007, ¶180; Petition at 57

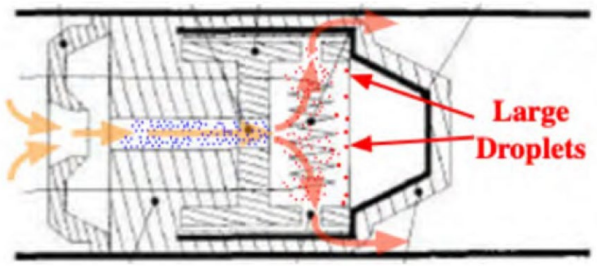
-160: POR at 39, 57; EX2022 ¶114-115

NJOY Exhibit 2045.0043
Juul v. NJOY
IPR2024-00160

JLI Fails to Consider Significant Differences

Xia

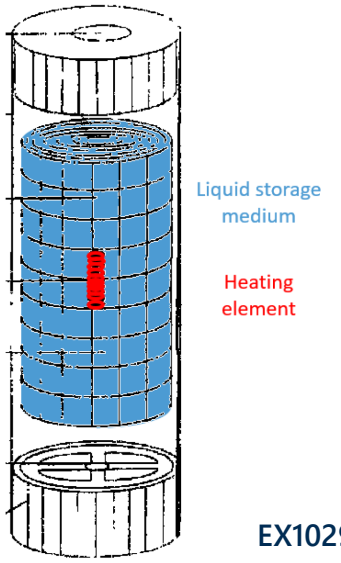
"Spray" Method – inhalation pulls liquid to heater



EX2022, ¶202

Wang

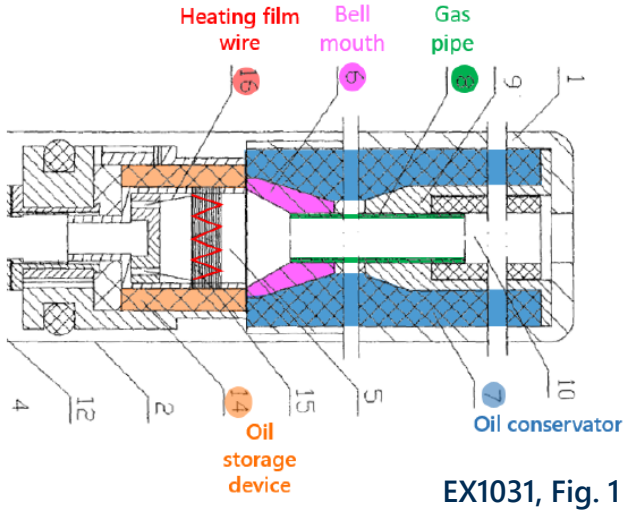
Saturated fiber wrapped directly against heating coil



EX1029, Fig. 3

Fang

Multiple liquid storage components and bell mouth to absorb liquid



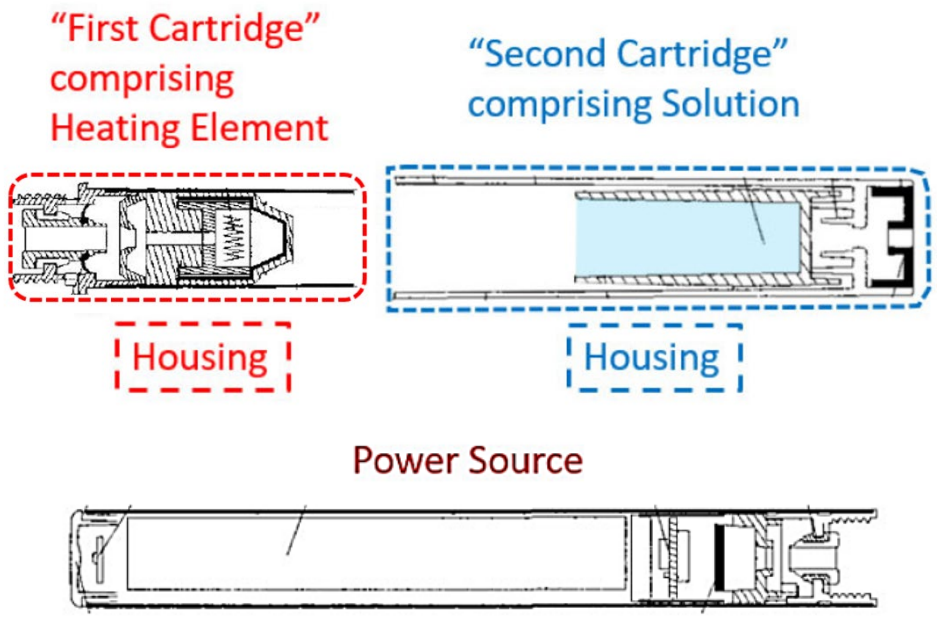
EX1031, Fig. 1

-160: POR, 51-60, 81-82; Surreply at 17-24; EX1004.0016; EX2022 ¶¶ 142, 147, 155, 234, 211-214 |
-161: POR, 52-58; Surreply at 17-24, EX2022 ¶¶ 138-142, 188-225

NJOY Exhibit 2045.0044
Juul v. NJOY
IPR2024-00160

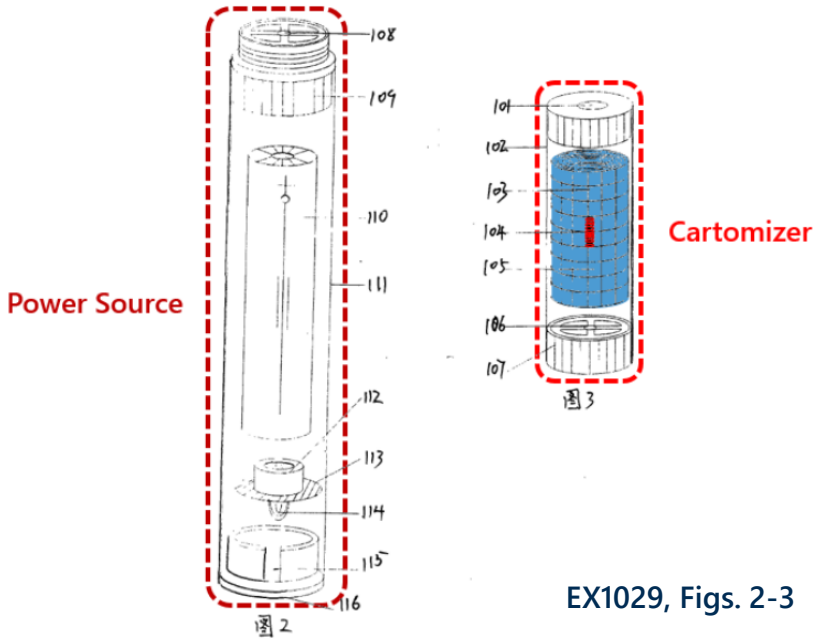
No Motivation to Combine Xia in View of Wang and/or Fang

Xia – Three-Piece Device with Reusable First Cartridge with Heating Element and Disposable Second Cartridge with Liquid Storage



EX1027, Figs. 2-5 (modified)

Wang – Simple Cartomizer Design with Disposable Heating Element; No Central and Axial Airflow Passageway



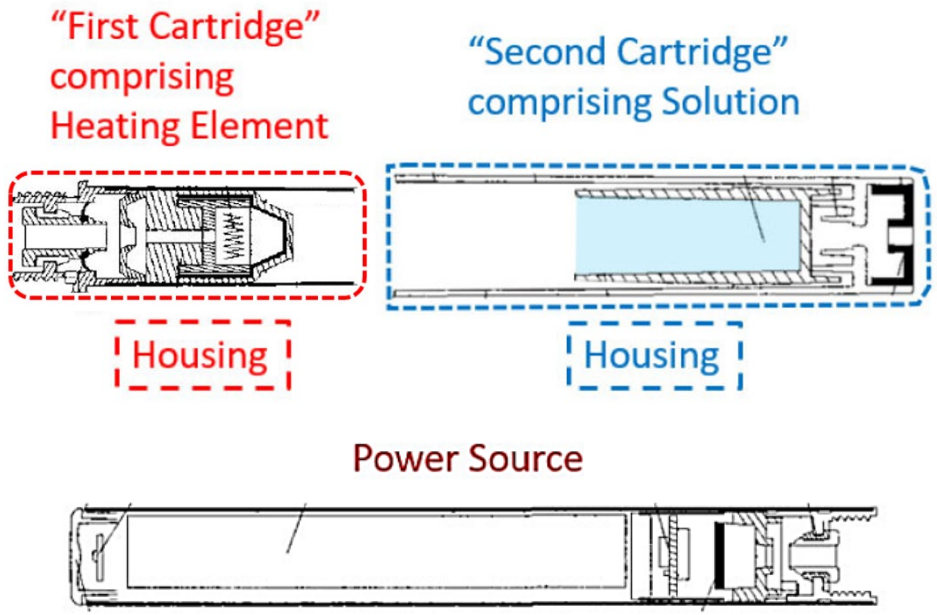
EX1029, Figs. 2-3

-160: POR, 51-55, 57-60; Surreply at 17-24; EX2022 ¶¶ 112-113, 147
-161: POR, 52-58; EX2022 ¶¶ 138-142, 188-225

NJOY Exhibit 2045.0045
Juul v. NJOY
IPR2024-00160

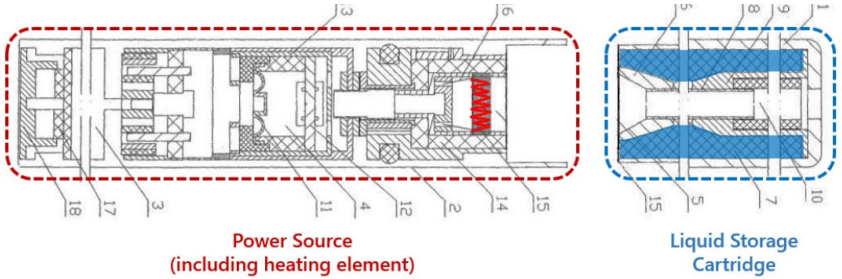
No Motivation to Combine Xia in View of Wang and/or Fang

Xia – Three-Piece Device with Reusable First Cartridge with Heating Element and Disposable Second Cartridge with Liquid Storage

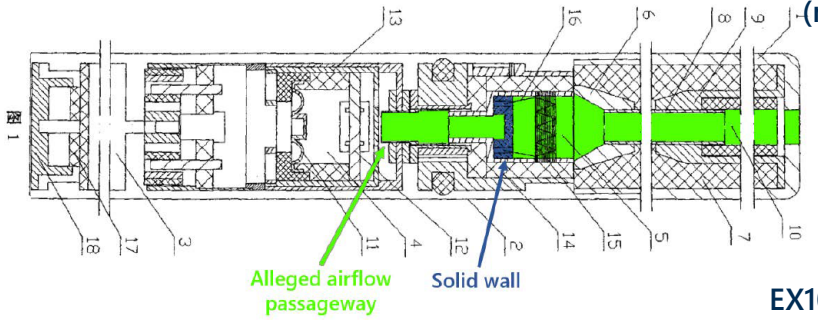


EX1027, Figs. 2-5 (modified)

Fang –Complex Two-Piece Design with Expensive Components and Reusable Heating Element



EX1031, Fig. 1 (modified)



EX1031, Fig. 1

-160: POR, 51-55, 57-60; Surreply at 17-24; EX2022 ¶¶ 152-155
| -161: POR, 52-58; EX2022 ¶¶ 138-142, 188-225

NJOY Exhibit 2045.0046
Juul v. NJOY
IPR2024-00160

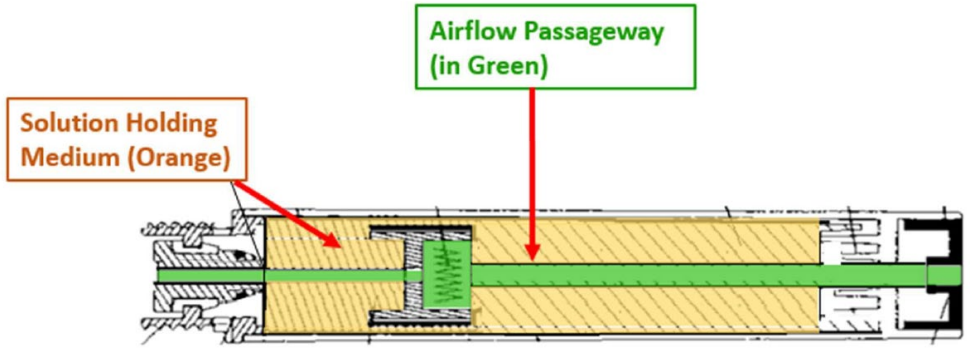
JLI's Alleged Motivation: Simple Substitution

JLI's Expert Dr. Sturges

140. As Wang shows, in this field, the use of a cartridge with the claimed central and axial airflow passageway was well known. And, as established above and below, using such a cartridge in the Xia apparatus was obvious because, for example, it was the substitution of a known element for another that yields predictable results and it is the use of a known technique to improve a similar item in the same way to yield predictable results.

153. In discussing the history of electronic cigarettes, Fang confirms that in this field, the use of the claimed central and axial airflow passageway was well known. Using Fang's claimed airflow passageway in place of Xia's or Wang's airflow passageway was obvious because, for example, it was the substitution of a known element for another that yields predictable results, and it is the use of a known technique to improve a similar item in the same way to yield predictable results.

EX1007, ¶¶140, 153



EX1007, ¶180

NJOY Exhibit 2045.0047
Juul v. NJOY
IPR2024-00160

Combination requires ***several*** modifications

Not a simple substitution of known elements

- Dr. Sturges acknowledges the proposed combination requires ***several*** modifications, including:

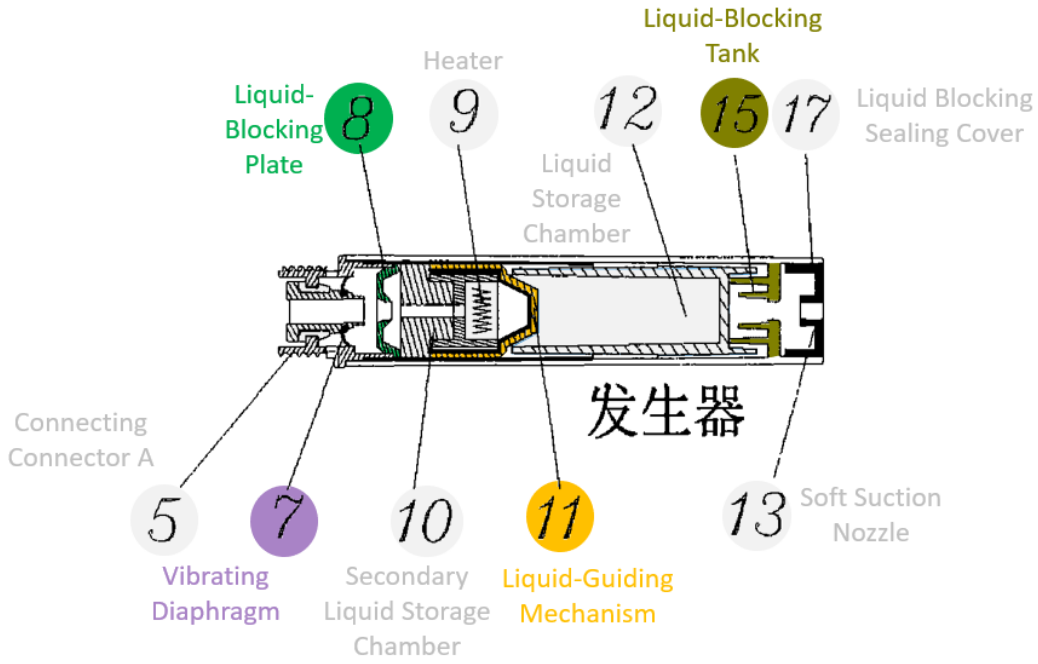
1. new liquid storage with a central air passageway therethrough;
2. modified liquid-blocking plate;
3. impermeable liquid storage barrier;
4. elongated secondary liquid storage chamber; and
5. completely redesigned sensing and actuation system

-160: EX1007 at ¶¶95, 141, 150, 151

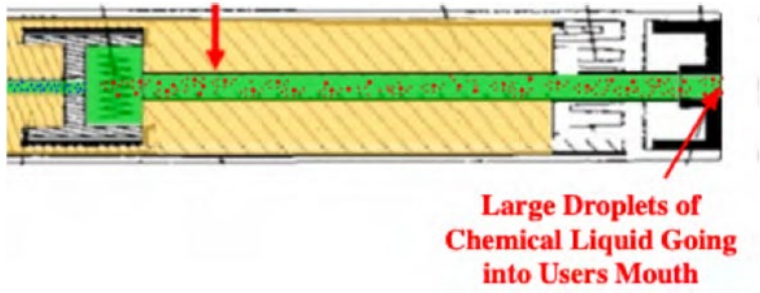
-160: POR, 54-55, 57-60; Surreply at 17-24; EX1006.0006; EX2022 ¶¶ 197-234
| -161: POR at 56-62; Surreply at 17-24 EX2022 ¶¶188-225

NJOY Exhibit 2045.0048
Juul v. NJOY
IPR2024-00160

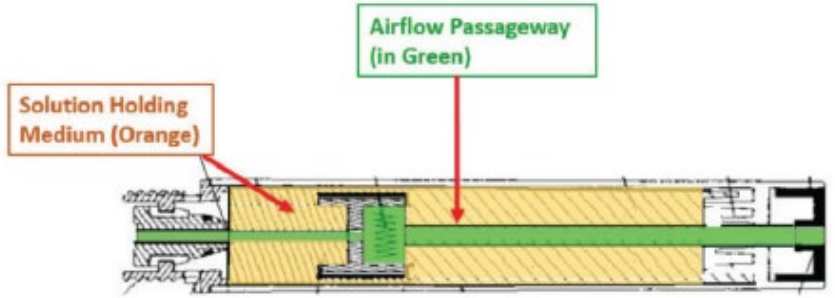
JLI's Proposed "Redesign" Removes Xia's Critical Components



EX2027, Fig. 1



-160: EX2022, ¶198



-160: EX1007, ¶180

-160: POR, 54-55, 57-60; Surreply at 17-24; EX1006.0006; EX2022 ¶¶ 197-234 |
-161: POR at 56-62; Surreply at 17-24 EX2022 ¶¶188-225

NJOY Exhibit 2045.0049
Juul v. NJOY
IPR2024-00160

JLI's Proposed Combinations Creates **Significant** Drawbacks

JLI's proposed modifications to Xia result in **i)** essential functions of the device being eliminated, or **ii)** greatly degraded functioning, including:

1. Large-Diameter Droplets Ejected into the User's Mouth (EX2022, ¶¶197-200);
2. Degraded Vaporization Process (EX2022, ¶¶201-210);
3. Elimination of Leakage Protection (EX2022, ¶¶211-213);
4. Loss of Liquid Storage Capacity (EX2022, ¶¶214-221);
5. Disablement of the Heater Control System (EX2022, ¶¶222-227);
6. Degradation of the Liquid-Guiding Mechanism (EX2022, ¶¶228-232);

-160: POR at 50-60; EX2022, ¶¶197-234; Surreply at 17-24 |
-161: POR at 52-62; EX2022 ¶¶188-225; Surreply at 17-24

NJOY Exhibit 2045.0050
Juul v. NJOY
IPR2024-00160

NJOY

Ground 2: Wang with Fang

2A: Wang Alone

2B: Wang with Fang

NJOY Exhibit 2045.0051
Juul v. NJOY
IPR2024-00160

Ground 2A Fails

Wang Alone Does Not Teach or Render Obvious the Challenged Claims:	864 Patent Claims	-160 Support
heating element extending transversely	1, 5, 9, 21, 25, 29, 38, 45	POR, 13-14, 83-84, Surreply, 29-33
central and axial airflow passageway	1, 5, 21, 25, 38, 45	POR, 44-45, 80-82; Surreply, 24-28
housing having a first aperture proximate the first end	1, 5, 9, 21, 25, 29, 38, 45	POR, 82-83; Surreply, 7-11, 28-29

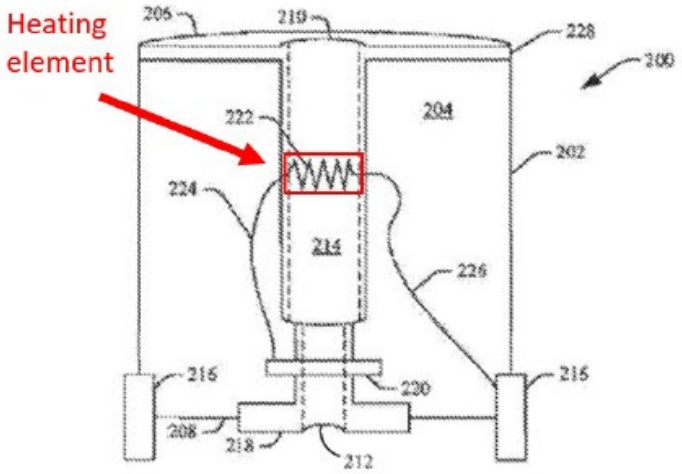
Additional Limitations* Wang Alone Does Not Teach or Render Obvious:		
heating element includes a wicking material	12, 31	POR, 84; Surreply, 33
first aperture proximate the first end is smaller than the second aperture proximate the second end	13, 32	POR, 85-86; Surreply, 33
airflow passageway/chamber with a particular cross-sectional area	3-4, 7-8, 16, 18-19, 23-24, 27-28, 35-37, 42-44, 47-48	POR, 86-87; Surreply, 33

* JLI does not address these additional limitations in its Petitioner's Reply

NJOY Exhibit 2045.0052
Juul v. NJOY
IPR2024-00160

"the heating element extending **transversely**"

The correct construction of "transversely" is "crosswise"



-160: EX1001, Fig. 2

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

-160: EX1001, 17:32-34 (claim 1); *see also id.* at Fig. 2

transverse (trænz'vɜːs) *adj* **1** crossing from side to side; athwart; crossways **2** *geometry* denoting the

EX2010.005 (Collins Dictionary)

transverse /'tranzvɜːs, traːnz-/ ▸ *adj* placed, lying, built, etc in a crosswise direction. [17c: from Latin *transvertere*, from *vertere* to turn]
• **transversely** *adv.*

EX2011.004 (Chambers Concise Dictionary)

-160: POR at 12-16; Surreply, 29-33; EX2022 ¶¶58-61 | -161: POR at 12-16; EX2022 ¶¶54-55

NJOY Exhibit 2045.0053
Juul v. NJOY
IPR2024-00160

“the heating element extending **transversely**”

JLI’s Position

JLI’s Reply

The coils of Wang’s heating element 104 extend transversely to the longitudinal axis, to contact the fiber at either side of the airflow passageway to vaporize the liquid contained therein:

That the heating element is longer in the longitudinal direction is irrelevant, as neither the specification nor the claims impose a relative length requirement.

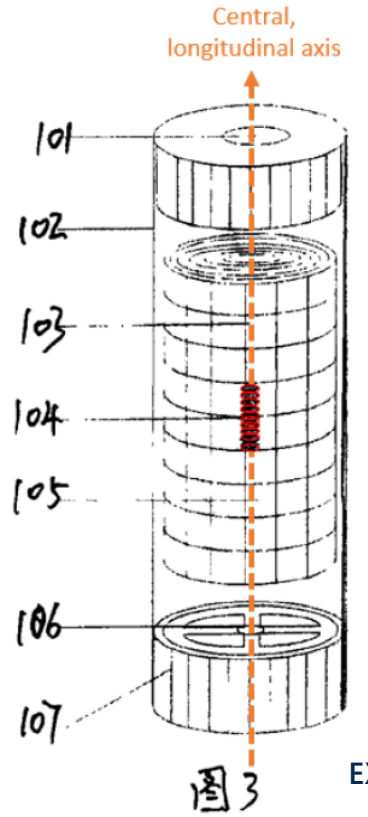
-160: JLI’s Reply, 30, 31

JLI’s Expert Dr. Sturges

Q. Okay. What's your understanding what it means for the heating element to extend transversely?

A. That it have a dimension across from the -- at 90 degrees to the longitudinal axis.

EX2017 (Sturges Tr.), 32:23-33:2



EX1029, Fig. 3

-160: POR at 12-16; EX2022 ¶62 | -161: POR at 12-16; EX2022 ¶58

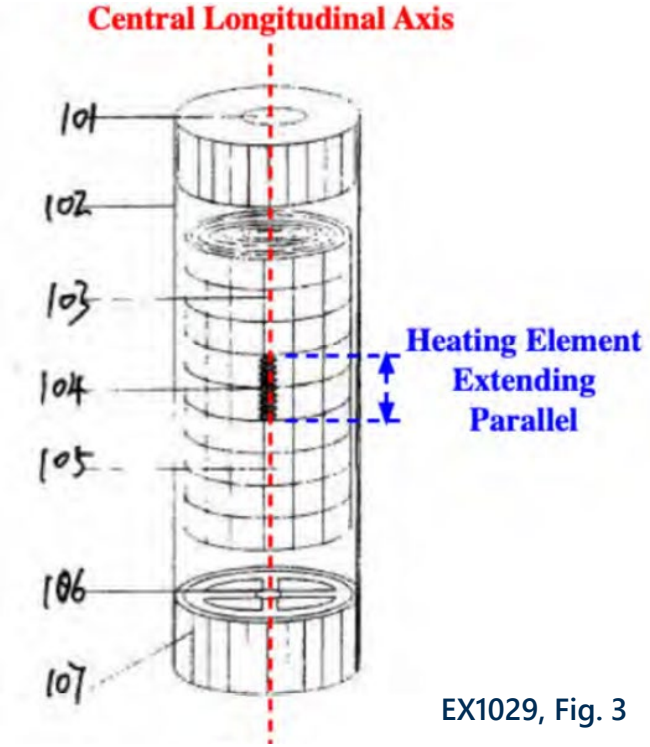
NJOY Exhibit 2045.0054
Juul v. NJOY
IPR2024-00160

Wang Does Not Disclose a Transverse Heating Element

NJOY's Expert Dr. Singhose

367. The heating element disclosed in Wang does not extend transversely to a central longitudinal axis of the housing. It is actually arranged orthogonal to this required configuration. That is, it is parallel to the central longitudinal axis, as shown below in an annotated version of Wang Figure 3.

-160: EX2022, ¶367



EX1029, Fig. 3

-160: POR at 83-84; EX2022, ¶¶ 367-369 | -161: POR at 90-91; EX2022 ¶¶304-305, 307

NJOY Exhibit 2045.0055
Juul v. NJOY
IPR2024-00160

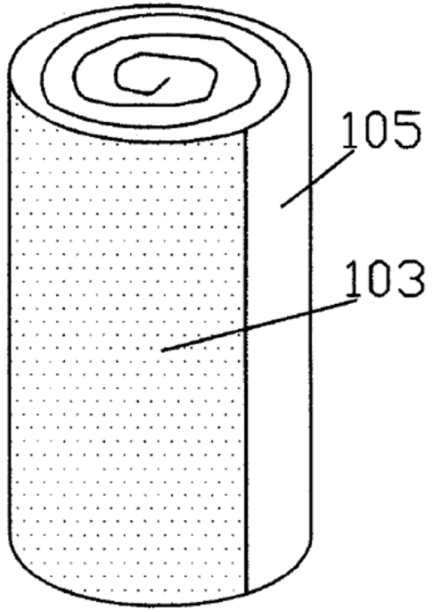
Wang Does Not Disclose a Central and Axial Airflow Passageway

JLI's Expert Dr. Sturges

Q. Now, does the text in Wang describe that there's a circular opening in the center that you believe is there in figure 5?

A. No, but Mr. Wang confirmed that his solution-holding medium surrounds a complete central air passageway.

EX2017 (Sturges Tr.), 51:23-52:3



EX1029 (Wang), Fig. 5

JLI's Reply

Though Wang does not state in text that there is a central gap in the fiber, it is shown in the figures, it would be known by a POSITA, and there is nothing in the text of Wang to support NJOY's position. Ex. 1035, 20:11-23, 22:13-17.

-160: JLI's Reply, 29

-160: POR at 44-46, 80-81; Surreply at 24-28; EX2022, ¶¶143-146 |
-161: POR at 46-47, 87-89; Surreply at 24-28; EX2022, ¶¶139-142

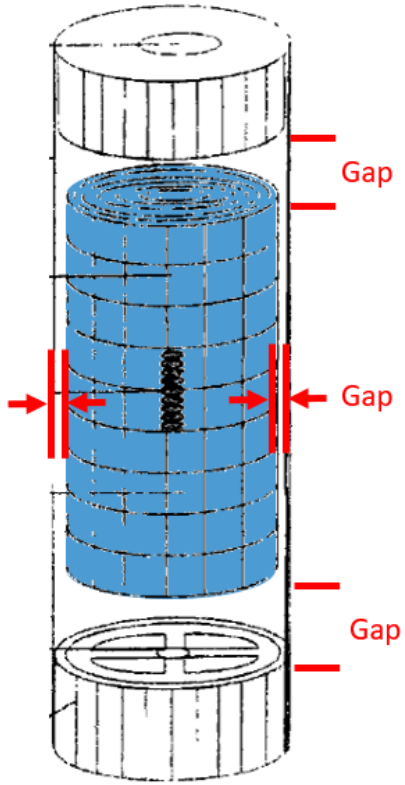
NJOY Exhibit 2045.0056
Juul v. NJOY
IPR2024-00160

Wang Does Not Disclose a Central and Axial Airflow Passageway

NJOY's Expert Dr. Singhose

142. The organic fiber 105 is soaked with tobacco extract 103 and is wound around the electric heater 104. [Wang, 7 ("The tobacco extract 103 of the cigarette holder is natural tobacco absolute oil, a certain proportion of nicotine is mixed in after the tobacco extract is diluted with alcohols in a certain proportion, and then a mixture quantitatively soaked in the organic fiber 105.").] As shown in Wang Fig. 3, the organic fiber is positioned within the shell 102 such that gaps form between the fiber and the shell to allow air and vapor to travel from the air inlet 106 to the air outlet 101. [Wang, 7 ("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.").] These air gaps are shown below in an annotated version of Wang Fig. 3.

-160: EX2022, ¶142



EX1029 at Fig. 3

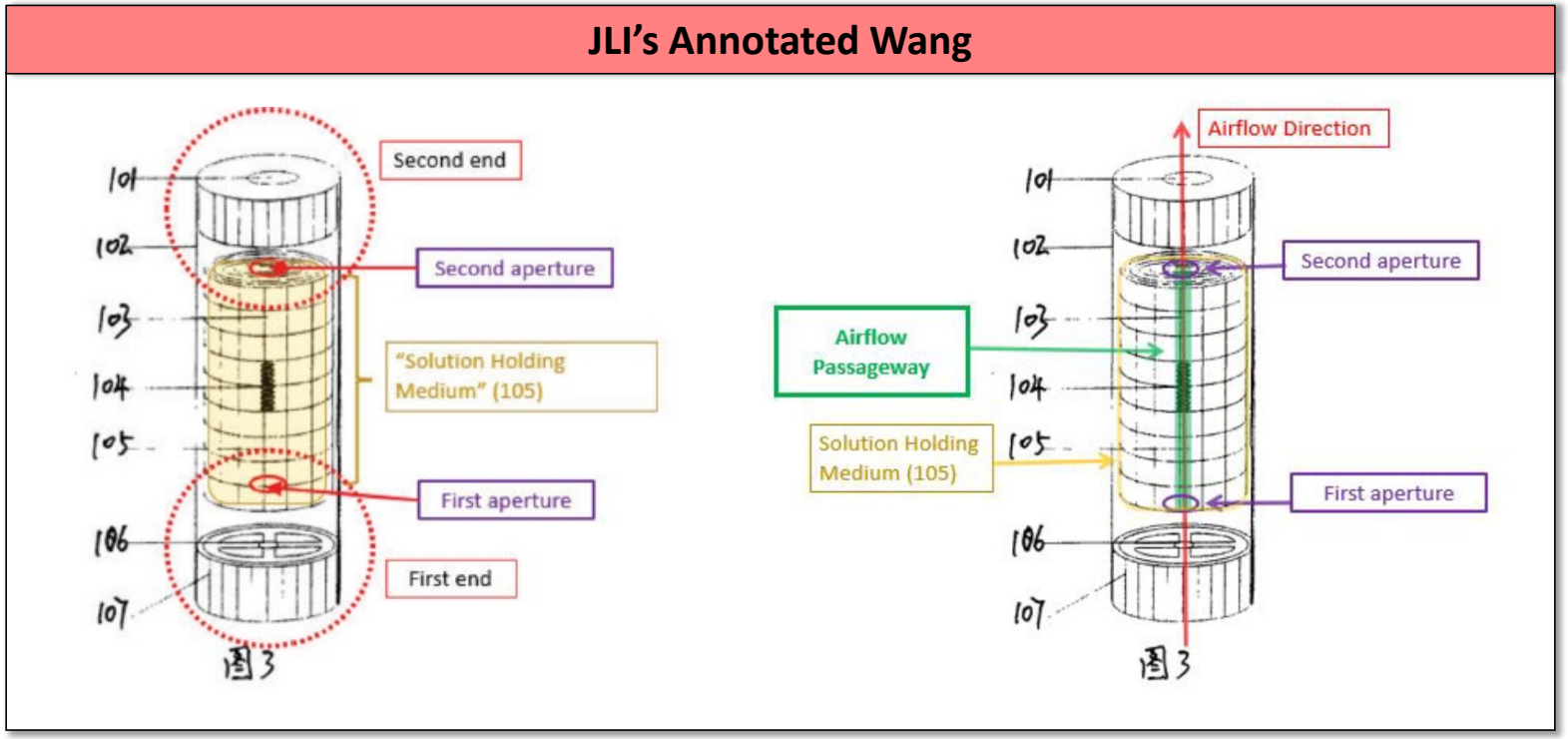
-160: POR at 43-44, 80-82; EX2022, ¶¶142-146 | -161: POR at 87-89; EX2022 ¶¶139-142

NJOY Exhibit 2045.0057
Juul v. NJOY
IPR2024-00160

Wang Does Not Disclose a Housing Having A First Aperture Proximate the First End

The apertures identified by JLI are in the solution holding medium, **not** the housing.

JLI's Annotated Wang



Petition, 38, 113

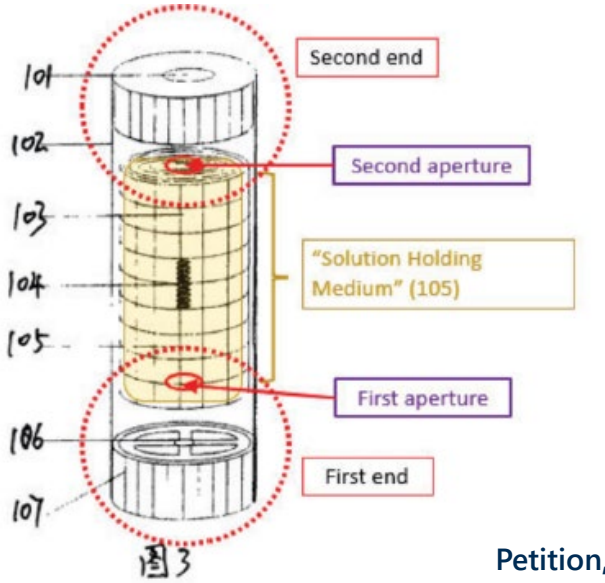
-160: POR at 82-83; EX2022, ¶¶362-364 | -161: POR at 89-90; EX2022, ¶¶293-296

NJOY Exhibit 2045.0058
Juul v. NJOY
IPR2024-00160

Wang Does Not Disclose a Housing Having A First Aperture Proximate the First End

- The "apertures" are **not** at or proximate the housing ends, when "ends" is properly construed.

JLI's Annotated Wang



Petition, 38

-160: POR at 82-83; EX2022, ¶¶362-364 | -161: POR at 89-90; EX2022, ¶¶293-296

NJOY Exhibit 2045.0059
Juul v. NJOY
IPR2024-00160

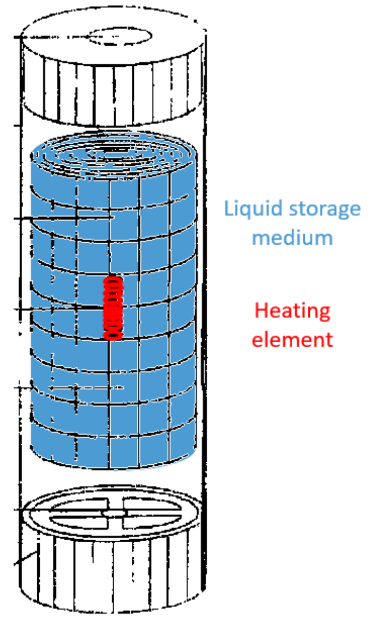
Wang Does Not Render Obvious Claims 12 and 31

Wang does not disclose or render obvious "the heating element includes a wicking material being operative to permit at least a portion of the solution . . . to be drawn toward the heating element"

NJOY's Expert Dr. Singhose

> different in this regard to justify Dr. Sturges' proposed modification. Wang does not use a wicking material to transfer liquid to the heating element. Instead, the heating element is in direct contact with the liquid storage medium. Fang's liquid

-160: EX2022, ¶400



EX1029 at Fig. 3

-160: POR at 64, 84-85; EX2022, ¶¶378-379, 399-400

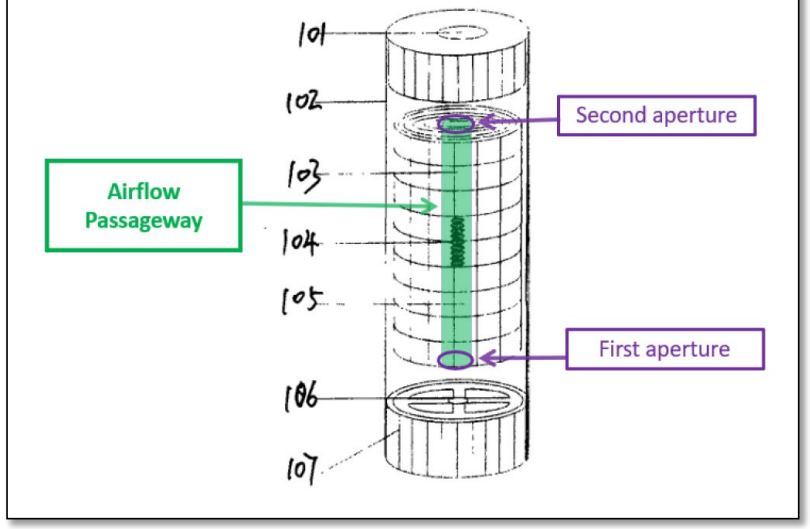
NJOY Exhibit 2045.0060
Juul v. NJOY
IPR2024-00160

Wang Does Not Render Obvious Claims 13 and 32

Wang does not disclose or render obvious "the first aperture proximate the first end is smaller than the second aperture proximate the second end"

- JLI does **not** argue Wang discloses this limitation.
- No evidence that a POSITA would want to ensure first aperture is smaller than second aperture
- Increasing the pressure drop will increase the necessary suction force, which makes using the device uncomfortable. EX2022 ¶¶383-386.
- JLI fails to articulate a reasonably expectation of success or explain how apertures in organic fiber would be maintained

JLI's Annotated Wang



Petition, 113

-160: POR at 85-86; EX2022 ¶¶383-387 | -161: POR at 92-93; EX2022 ¶312

NJOY Exhibit 2045.0061
Juul v. NJOY
IPR2024-00160

Wang Does Not Render Obvious Claims 3-4, 7-8, 16, 18-19, 23-24, 27-28, 35-37, 42-44, 47-48

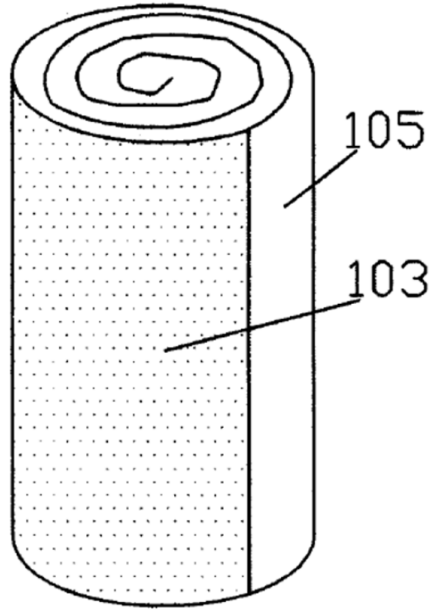
Wang does not disclose or render obvious the Challenged Claims directed to the cross-sectional area of the airflow passageway or chamber.

JLI's Expert Dr. Sturges

Q. Now, does the text in Wang describe that there's a circular opening in the center that you believe is there in figure 5?

A. No, but Mr. Wang confirmed that his solution-holding medium surrounds a complete central air passageway.

EX2017 (Sturges Tr.), 51:23-52:3



EX1029 (Wang), Fig. 5

-160: POR at 86-87; EX2022 ¶¶389-391 | -161: POR at 95-96; EX2002 ¶¶317-320

NJOY Exhibit 2045.0062
Juul v. NJOY
IPR2024-00160

NJOY

Ground 2: Wang with Fang

2A: Wang Alone

2B: Wang with Fang

NJOY Exhibit 2045.0063
Juul v. NJOY
IPR2024-00160

Ground 2B Fails

Wang in view of Fang Do Not Render Obvious the Challenged Claims

	864 Patent Claims	-160 Support
A POSITA would not have been motivated to combine Wang with Fang	All Challenged Claims	POR, 60-64, 87-88; Surreply, 33-35
JLI has failed to find in any reference:		
housing having a first aperture proximate the first end	1, 5, 9, 21, 25, 29, 38, 45	POR, 87; Surreply, 35
airflow passageway extending centrally and axially from the first aperture to the second aperture	1, 5, 21, 25, 38, 45	POR, 87; Surreply, 35
airflow passageway having “a substantially uniform cross-sectional area along a continuous majority” between the heating element and the second aperture	4, 8, 16, 24, 28, 35	POR, 87; Surreply, 35
airflow chamber having “a substantially uniform cross-sectional area” between the heating element and the second aperture	19, 37, 44	POR, 87; Surreply, 35

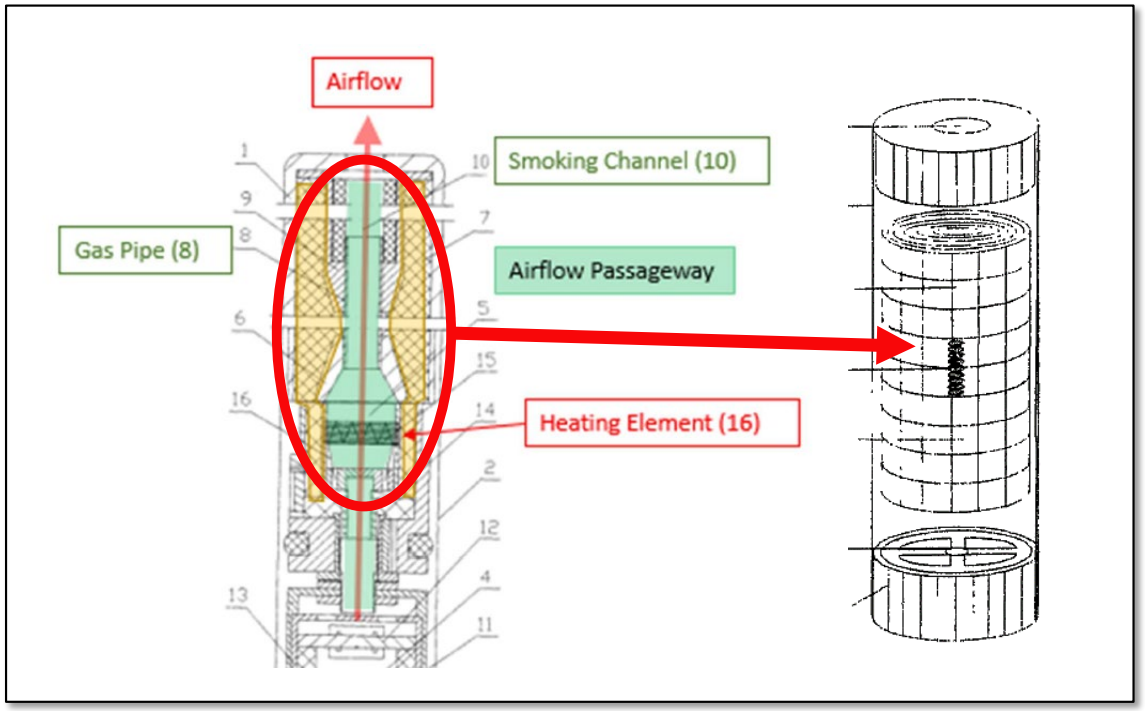
NJOY Exhibit 2045.0064
Juul v. NJOY
IPR2024-00160

JLI's Proposed Modification

JLI's Expert Dr. Sturges

317. 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 the architecture of these elements in Fang.

EX1007, ¶317



EX1007, ¶312, EX1029, Fig. 3 (annotated)

-160: POR, 61-63; EX2022 ¶¶392-404

NJOY Exhibit 2045.0065
Juul v. NJOY
IPR2024-00160

JLI's Alleged Motivation

JLI's Expert Dr. Sturges

61. A person of ordinary skill in the art ("POSITA") would have been motivated to combine Xia with Wang and/or Fang as they are all directed to the design and operation of handheld, cylindrical, cigarette-like, electronic cigarettes that use a heating element within the device, powered by a battery, to vaporize liquid held within the device, for delivery via airflow to a user's mouth via suction from the user, through a mouthpiece at the end of the device.

62. Each of Xia, Wang, and Fang (and the '864 patent) use very similar structures and internal components to achieve very similar functions. Moreover, Xia, Wang, and Fang were also all published within the same eleven-month period and were all from Chinese inventors.

63. Additionally, a combination of these references would merely result in the substitution of known elements from Wang or Fang for elements in Xia (Ground 1) or of known elements from Fang for elements in Wang (Ground 2).

64. Xia with Wang and Fang are very similar and relate to a predictable subject matter, so a POSITA would have been motivated to combine their teachings and would have understood that there would be a high likelihood of success when making these modifications. For example, altering the physical arrangement of the known components of the device in Xia, such as a heater or a battery, with similar components such as those in Wang and Fang, would not result in unpredictable results.

65. Any arguable distinctions between any individual one of the prior art references discussed in this petition and the '864 patent that Patent Owner may argue for are basic design choices that any POSITA would consider.

66. Any of the references are anticipatory or at least individually render all claims of the '864 invalid through rather obvious, simple variations of the disclosures. However, multiple references, including combinations, are discussed here, solely to address arguments that Patent Owner may make, although Petitioner does not agree with them.

EX1007, ¶¶61-66

NJOY Exhibit 2045.0066
Juul v. NJOY
IPR2024-00160

A POSITA Would Not Combine Wang with Fang

NJOY's Expert Dr. Singhose

passageway. [*See* Section V.C, *supra*.] Moreover, Fang's cartridge design, including design of its airflow system, is significantly different from, and not compatible with, Wang. Wang discloses a liquid storing medium directly wound

396. Dr. Sturges failed to provide any discussion regarding these significant structural differences. Putting Fang's airflow channel into Wang—which is a simple device—would, for example, greatly increase manufacturing cost, result in a completely different airflow, and have different power consumption requirements.

-160: EX2022, ¶¶ 395-396

-160: POR at 60-64; EX2022, ¶¶392-402, 409; Surreply at 33-35
| -161: POR at 62-67; EX2022 ¶¶321-331; Surreply at 33-35

NJOY Exhibit 2045.0067
Juul v. NJOY
IPR2024-00160

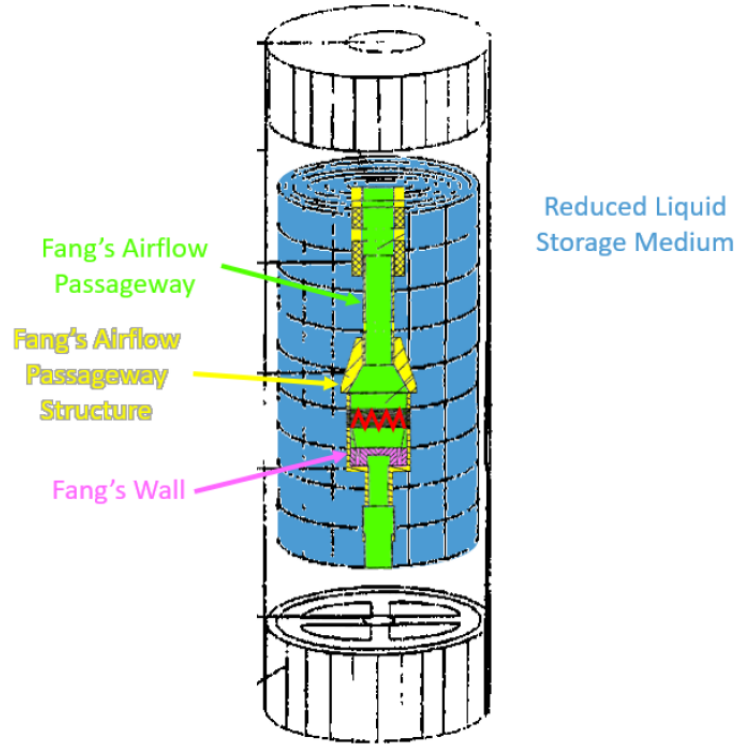
Numerous Issues with JLI's Proposed Combination

NJOY's Expert Dr. Singhose

liquid cartridge (called a sucker) would need to be replaced. However, if Wang is modified in the manner suggested by Dr. Sturges by importing all the components making up Wang's airflow channel into Wang's disposable cartomizer, then those components now must be replaced each time the liquid is depleted.

397. Furthermore, importing Fang's airflow passageway into Wang's cartomizer would greatly decrease the liquid storing capacity of Wang, which is undesirable. In Wang, the liquid-storing organic fiber directly wraps around the

-160: EX2022, ¶¶ 396-397



-160: POR at 63 (EX1029, Fig. 3 (modified, annotated); EX1031, Fig. 1 (modified, annotated).)

-160: POR at 60-64, 84; EX2022 ¶369, 392-402 | -161: POR at 62-67; EX2022 ¶¶307, 321-331

NJOY Exhibit 2045.0068
Juul v. NJOY
IPR2024-00160

JLI: Simple Design Choice to Include Transverse Heating Element in Wang

JLI's Expert Dr. Sturges

297. 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.

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.

299. Designing the heater in this manner is as equally simplistic of a design as placing the heating in the orientation of the heater in Wang.

-160: EX1007, ¶¶297-299

NJOY Exhibit 2045.0069
Juul v. NJOY
IPR2024-00160

Not a Simple Modification

Fang

- Complex wicking mechanism – liquid drawn from oil conservator 7, through oil storage device 14, to temporary oil storage 15
- Robust, expensive, reusable heating element structure

Wang

- No wick – heating element brought into direct contact with the liquid storage
- No structure for mounting transverse heating element
- Maximizes space for liquid storage

JLI fails to account for how this modification would affect the air flow, vaporization rate, power requirements, liquid storage, and cost.

-160: POR at 60-64, 84; EX2022, ¶369, 392-402 | -161: POR at 62-67; EX2022, ¶¶307, 321-331

NJOY Exhibit 2045.0070
Juul v. NJOY
IPR2024-00160

There are Numerous Issues and Drawbacks with JLI's Proposed Combination

NJOY's Expert Dr. Singhose

399. In addition, a POSITA would not have been motivated to import Fang's transverse heating element into Wang. Note that a POSITA would have understood that simply rotating Wang's heating coil 90 degrees would result in an inoperable device because the coil will be prone to deformation and damage when the organic fiber is wound around the heating element. [Section VII.A.1.b, *supra*.] Moreover, doing so means that only the two ends of the heating coil are in contact with the liquid holding medium, which would lead to poor vaporization. Recall that Wang's heating element does not include a wicking component, while Fang's heating element is not just a coil, it is an electric heating film wire in combination with a temporary oil storage device (wicking material). [Fang at 3.]

-160: EX2022, ¶399

- Minimizes heating element contact with fiber
- Reduces liquid storage
- Decreases heating efficiency
- Damages the heating element
- Increases manufacturing costs.

-160: EX2022, ¶369

-160: POR at 60-64, 83-84; EX2022, ¶¶367-369, 392-402 |
-161: POR at 62-67, 90-91; EX2022, ¶¶304-305, 307, 321-331

NJOY Exhibit 2045.0071
Juul v. NJOY
IPR2024-00160

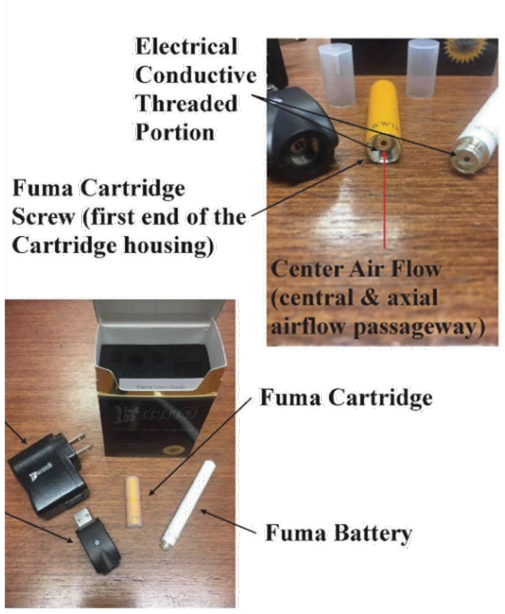
NJOY

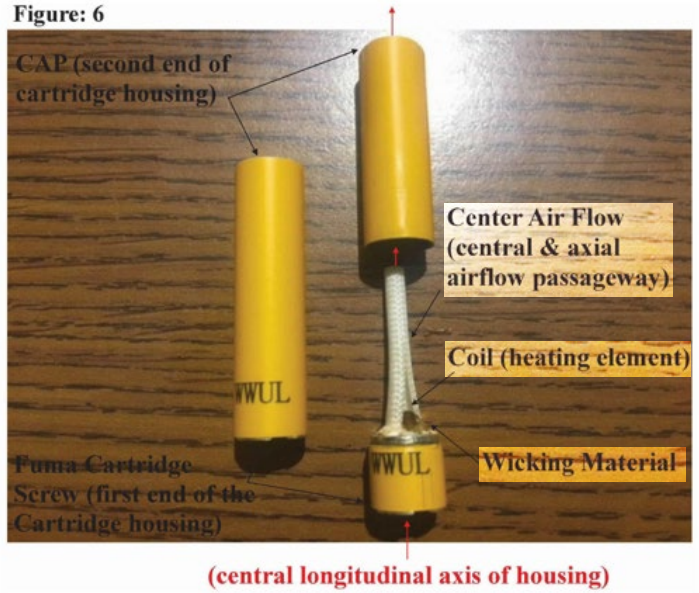
Secondary Considerations

NJOY Exhibit 2045.0072
Juul v. NJOY
IPR2024-00160

Presumption of Nexus – Fuma E-Cigarette Coextensiveness

JLI does **not** dispute that the Fuma e-cigarette embodies and is coextensive with the claims





EX2030.014, .016
EX2029.017, .019

-160: POR at 88-90; EX2022 ¶¶413-487; JLI Reply at 36-39
-161: POR at 97-99; EX2022 ¶¶347-401; JLI Reply at 36-38

NJOY Exhibit 2045.0073
Juul v. NJOY
IPR2024-00160

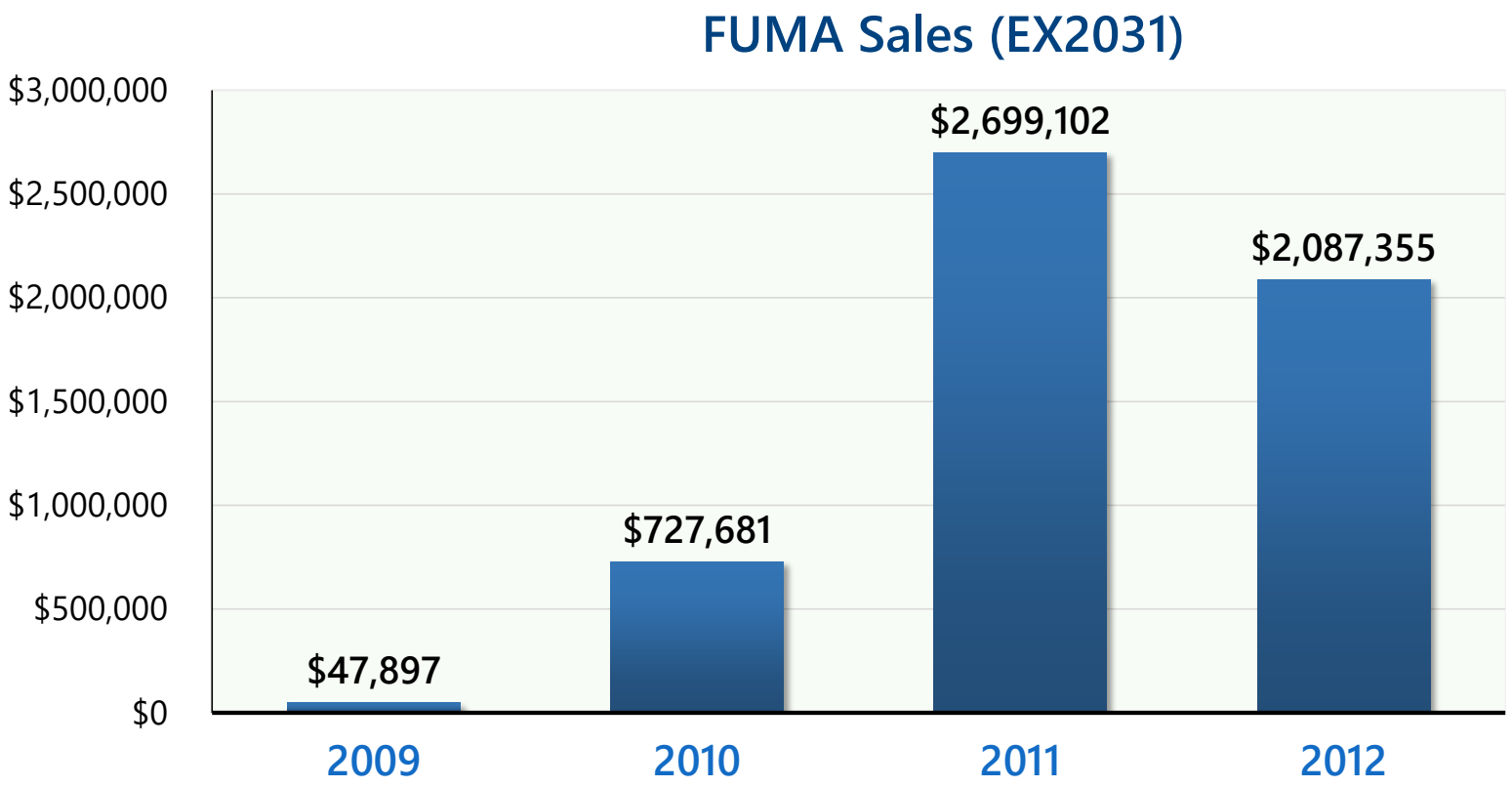
Secondary Considerations Confirm Validity

1. Commercial Success
2. Industry Praise
3. Copying
4. Licensing

-160: POR at 88-110; Surreply at 36-38 | -161: POR at 97-119; Surreply at 36-38

NJOY Exhibit 2045.0074
Juul v. NJOY
IPR2024-00160

Fuma's Commercial Success



-160: POR at 90-91; EX2022, ¶¶489-490 | -161: POR at 99-100; EX2022, ¶403 | EX2024, ¶¶3-4

NJOY Exhibit 2045.0075
Juul v. NJOY
IPR2024-00160

Praise of the Patented Invention

RJReynolds Vapor

From: Potter, Dennis (Denny) L [POTTERD@RJRT.com]
Sent: 6/29/2010 1:46:25 PM
To: Borschke, August J. [BORSCHG@RJRT.com]; Gentry, Jeff S. [GENTRYJ@RJRT.com]; Herko, Daniel (Danny) J. [HERKOD@RJRT.com]; Figlar, James N [FiglarJ@RJRT.com]; Whitehurst, E. Kenan (Ken) [WHITEHK@RJRT.com]; Holton, Mark L. [HOLTONM@RJRT.com]; Lewis, Lincoln [LewisL@RJRT.com]
Subject: Fuma Innernational LLC
Attachments: 20100629114616.pdf; 20100629113602.pdf

Follow up to earlier email: Re: Electronic Cigarette supplier.

Fuma International LLC has followed up with the additional information and sample product as promised. Attached is a copy the informational brochure and a bar coaster included in the package.
The product sample consisted of packaging containing 2 Fuma batteries, 3 flavor cartridges, usb and wall rechargers.
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.

Overall, the Fuma product is simple, clean and very close to intuitive to use. Personally, I see more potential in this product design than any of the others we have assessed to date. Based on the strength of initial observations I have requested Procurement start the CA process so that we can arrange more detailed discussions.
Please advise if you have any questions or would like to see the product. The web site is www.myfuma.com

EX2027.0001

-160: POR at 91-93; EX2022, ¶¶491-494 | -161: POR at 100-102; EX2022, ¶¶405-407

NJOY Exhibit 2045.0076
Juul v. NJOY
IPR2024-00160

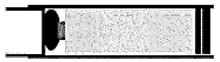
Praise of the Patented Invention

- Leading into a discussion of the technology associated with Fuma International LLC's product and why we currently believe it may present one of the best ways forward for a Horizon 3 Platform.

Fuma two piece e-cig

Best viewed in "slide show"

- Unique heavier gauge heating element may enable alternate aerosol formers for control of droplet size
- New central flow design
- Instructed to take 2 short puffs to pre-heat at start (also suggest a new aerosol type)
- Perceptibly increased aerosol volume
- Does not appear to have timed cut off



EX2032.002, .018

-160: POR at 91-93; EX2022, ¶¶491-494 | -161: POR at 100-102; EX2022, ¶¶405-407

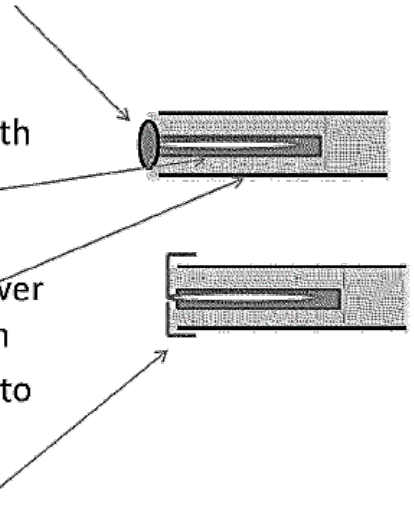
NJOY Exhibit 2045.0077
Juul v. NJOY
IPR2024-00160

Copying – VUSE Solo

Potential for Tobacco e-cig based on FUMA

Concept

- Incorporate a heating element similar to the one found in Fuma brand e-cig
- Surround the heating element with a tobacco based substrate
- Insulate with low efficiency tow
- Utilize an e-cig battery as the power source with flow activating switch
- Each plug = one use, so continue to sell in 20's
- Need quick connector mods



EX2032.020

-160: POR at 91-93; EX2022, ¶¶491-494 | -161: POR at 100-102; EX2022, ¶¶405-407

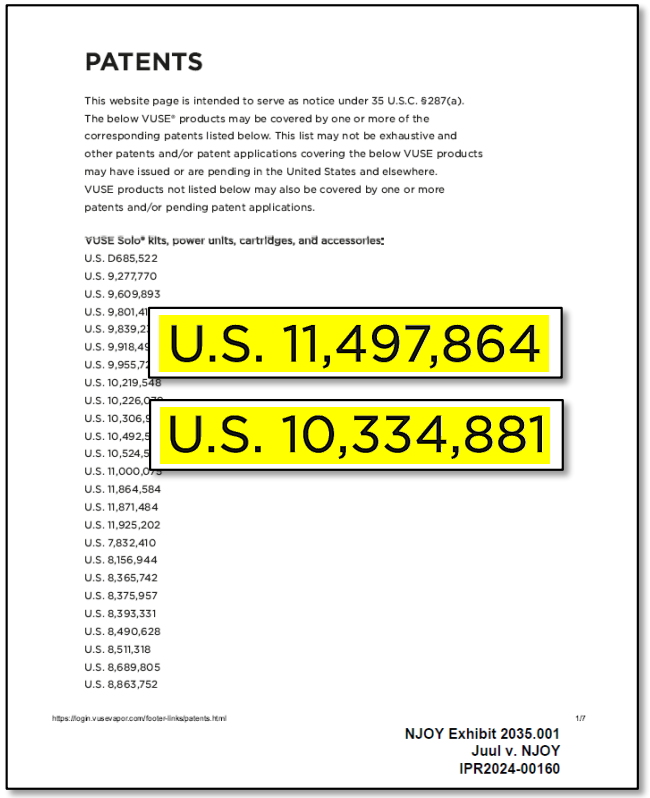
NJOY Exhibit 2045.0078
Juul v. NJOY
IPR2024-00160

Licensing – VUSE Solo and Ciro

DECLARATION OF REBECCA MOORE

5. In 2019, Fuma brought two lawsuits against R.J. Reynolds Vapor Company ("RJRV") for patent infringement. *Fuma Int'l LLC v. R.J. Reynolds Vapor Co.*, 1:19-cv-00260 (M.D.N.C.); *Fuma Int'l LLC v. R.J. Reynolds Vapor Co.*, 1:19-cv-00660 (M.D.N.C.). Fuma and RJRV later entered into a Settlement and License Agreement under which Fuma licensed numerous patents, including but not limited to, U.S. Patent No. 11,497,864.

EX2024, ¶5



PATENTS

This website page is intended to serve as notice under 35 U.S.C. §287(a). The below VUSE® products may be covered by one or more of the corresponding patents listed below. This list may not be exhaustive and other patents and/or patent applications covering the below VUSE products may have issued or are pending in the United States and elsewhere. VUSE products not listed below may also be covered by one or more patents and/or pending patent applications.

VUSE Solo® kits, power units, cartridges, and accessories:

U.S. D685,522
U.S. 9,277,770
U.S. 9,609,893
U.S. 9,801,41
U.S. 9,839,2
U.S. 9,918,49
U.S. 9,955,7
U.S. 10,219,548
U.S. 10,226,0
U.S. 10,306,9
U.S. 10,492,9
U.S. 10,524,9
U.S. 11,000,0
U.S. 11,864,584
U.S. 11,871,484
U.S. 11,925,202
U.S. 7,832,410
U.S. 8,156,944
U.S. 8,365,742
U.S. 8,375,957
U.S. 8,393,331
U.S. 8,490,628
U.S. 8,511,318
U.S. 8,689,805
U.S. 8,863,752

U.S. 11,497,864

U.S. 10,334,881

https://login.vusevapor.com/footer-links/patents.html 1/7

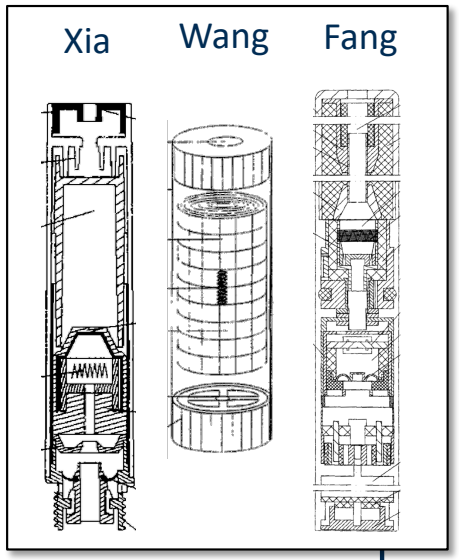
NJOY Exhibit 2035.001
Juul v. NJOY
IPR2024-00160

EX2035.001, .003, .004, .006

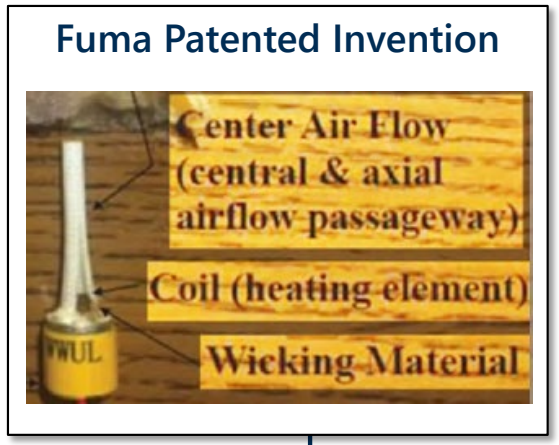
-160: POR at 93; EX2022, ¶¶494-498 | -161: POR at 102; EX2022, ¶¶408-410

NJOY Exhibit 2045.0079
Juul v. NJOY
IPR2024-00160

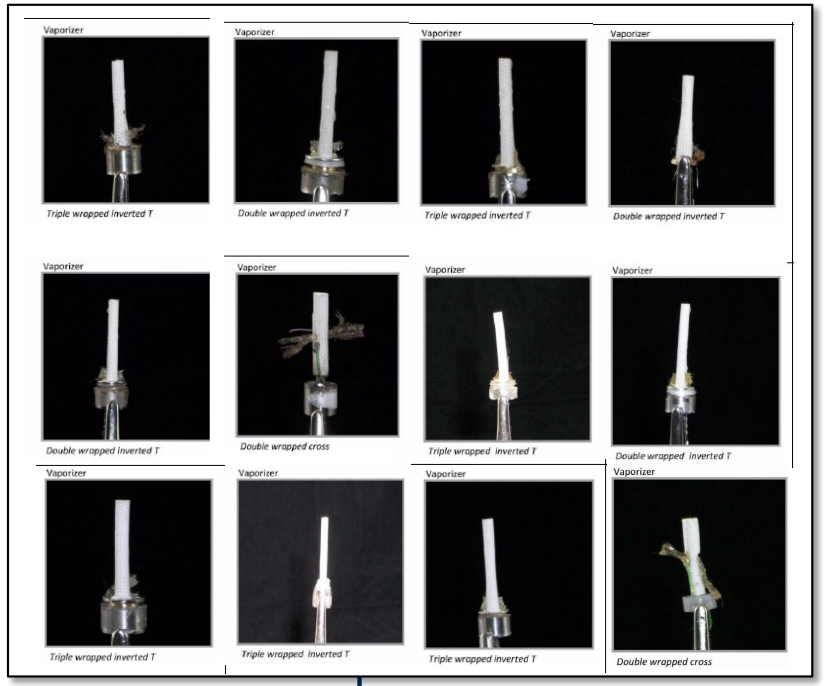
Copying of the Fuma Patented Invention



EX1029; EX1027; EX1031



EX2030; EX2029



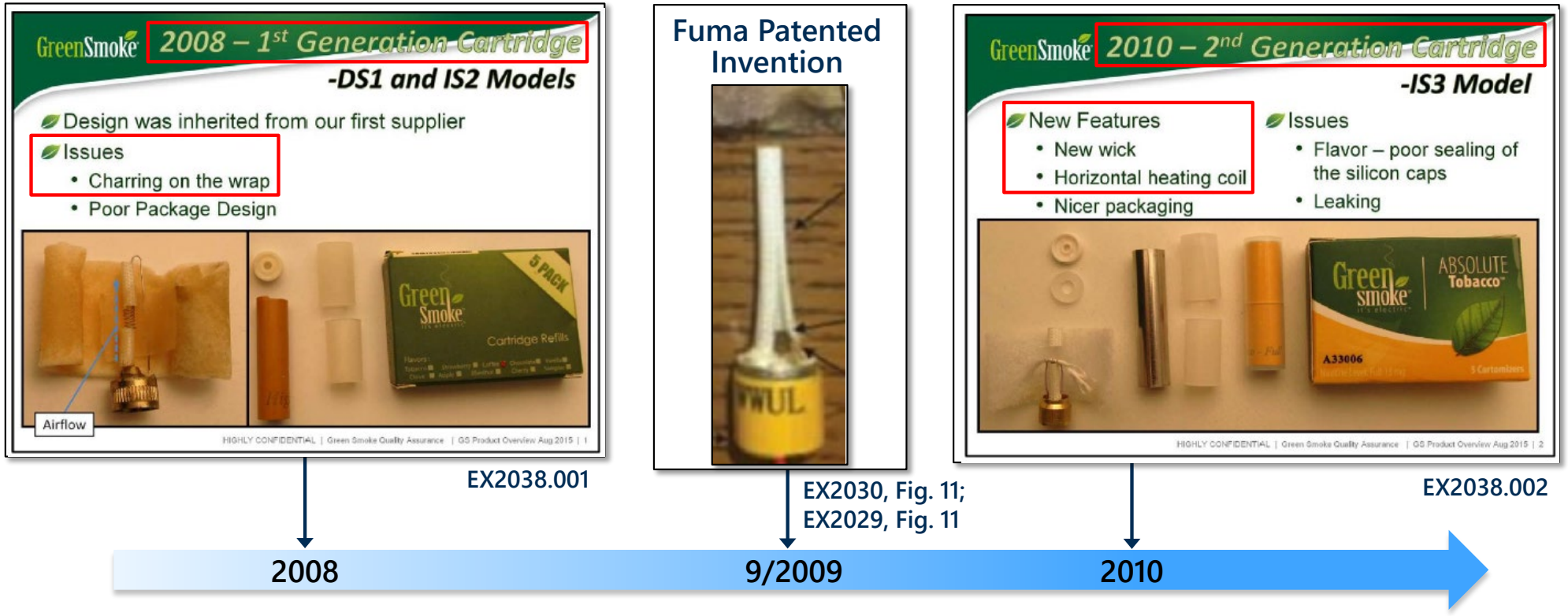
EX2039

9/2009 → 2013

-160: POR at 91, 93-107; EX2022, ¶¶412, 499-500 | -161: POR at 99-100, 102-115; EX2022, ¶¶346, 412

NJOY Exhibit 2045.0080
Juul v. NJOY
IPR2024-00160

Copying of the Fuma Patented Invention



-160: POR at 107-110; EX2022, ¶¶501-502 | -161: POR at 115-119; EX2022, ¶¶414-415

NJOY Exhibit 2045.0081
Juul v. NJOY
IPR2024-00160

Fuma's Success Directly Resulted From the Claimed Features

NJOY's Expert Dr. Singhose

413. Fuma's E-Cigarette cartridge and the claimed invention of the 864 Patent is a complete, operative device (as I explained above), and it eliminated issues with pre-existing cartomizers and provided a better adult consumer experience. The claimed features of a cartomizer that places the heating element directly in the airflow, and not the solution holding medium, reduced the amount of suction required to draw a vapor by providing a low-resistance path for the airflow, decreased leaking, and a reduction in excess droplets by separating the airflow from the solution holding medium. It also eliminated the burnt taste by separating the heating element from the solution holding medium. [EX2023 at ¶ 6.]

-160: EX2022, ¶413

-160: Surreply at 36-37; POR 88-110; EX2022, ¶¶412-487, 489-490 |
-161: Surreply at 36-37; POR at 97-119; EX2022, ¶¶ 345-401, 403, 405-412, 414-415 | EX2023, ¶¶6, 8.

NJOY Exhibit 2045.0082
Juul v. NJOY
IPR2024-00160

NJOY

Questions?

NJOY Exhibit 2045.0083
Juul v. NJOY
IPR2024-00160