

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

JUUL LABS, INC.,
Petitioner,

v.

NJOY, LLC,
Patent Owner.

Inter Partes Review No.

IPR2024-00160

Patent 11,497,864 B2

Title: Electronic Vaporizer

Filing Date: June 25, 2019

Issue Date: November 15, 2022

**PATENT OWNER'S PRELIMINARY RESPONSE TO PETITION FOR
INTER PARTES REVIEW OF U.S. PATENT NO. 11,497,864**

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37 C.F.R. § 42.22(a)(2)	34
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EXHIBIT LIST

Exhibit No.	Description
2001	U.S. Patent Publication US2009/0095311A1 (“Han”)
2002	Transcript Excerpt from Case Management Conference in <i>In the Matter of Certain Vaporizer Devices, Cartridges Used Therewith, and Components Thereof</i> , ITC-337-TA-1372, dated February 16, 2024.
2003	National Academies of Sciences, Engineering, and Medicine; Health and Medicine Division; Board on Population Health and Public Health Practice; Committee on the Review of the Health Effects of Electronic Nicotine Delivery Systems; Eaton DL, Kwan LY, Stratton K, editors. Public Health Consequences of E-Cigarettes. Washington (DC): National Academies Press (US); 2018 Jan 23. Chapter 14, Injuries and Poisonings, pp. 473-479 https://www.ncbi.nlm.nih.gov/books/NBK507183/
2004	Darragh O’Carroll, MD, “Nicotine poisoning: “What are the symptoms, and can you overdose?” (Medical News Today, February 16, 2023) , https://www.medicalnewstoday.com/articles/319627
2005	<i>Fuma International LLC v. R.J. Reynolds Vapor Company</i> , Case No. 1:19-cv-260, D.I. 1 (M.D.N.C., March 6, 2019) (“Fuma Complaint”)
2006	International Application No. WO 2007/131449A1 (“Han WIPO”)

I. INTRODUCTION

Patent Owner NJOY, LLC (“NJOY” or “Patent Owner”) submits this Preliminary Response to Petitioner JUUL Labs, Inc.’s (“Petitioner”) Petition for *Inter Partes* Review of U.S. Patent 11,497,864 (“Petition”). For the reasons stated below, the Board should not institute review.

U.S. Patent No. 11,497,864 (“the ’864 Patent”) represents a novel electronic vaporizer comprising a two-piece design consisting of a power source and a disposable cartridge. The disposable cartridge comprises a heating element, a liquid storage element, a wicking element for wicking liquid to the heating element, and a channel for directing air down the center axis of the cartridge. The channel begins at a first aperture in the housing where air enters the cartridge and continues in a straight path to a second aperture in the housing where it exits the cartridge. The heating element is situated transversely across this channel.

The prior art, in contrast, used a circuitous path to direct airflow through the cartridge. This was in large part driven by the intricate design requirements of the prior art devices, which needed to accommodate air entering through apertures at the sides of the housing and accommodate other internal structures such as the liquid storage element. The prosecution history of the ’864 Patent included an extensive

back-and-forth about these features and the Examiner ultimately determined that the combination of features were neither anticipated nor obvious.

JUUL now asks the Board to institute a review of all 48 claims of the '864 Patent based on two primary references – Chinese Patent Publication No. CN201238610 (“Xia”) and Chinese Patent Publication Nos. CN101366554 (“Wang”). Ground 1 relies on Xia alone and in combination with Wang and/or Chinese Patent Publication No. CN201085044Y (“Fang”). Ground 2 relies on Wang alone and in combination with Fang.

As set forth below, the “first apertures” identified by Petitioner in the prior art are not apertures in the housing as required by the claims but are instead apertures in structures interior to the housing. Further, Petitioner’s reliance on obviousness is misplaced because the prior art does not disclose the missing limitations and Petitioner’s “motivations” rely on “simple substitutions” while ignoring the substantial differences amongst the prior art devices.

Discretionary denial under § 325(d) is also appropriate here because all three of Petitioner’s references were before the Examiner. Indeed, not only was the Examiner made aware of the references, the Examiner was provided invalidity expert reports including extensive discussion regarding these same references.

EX1002 at 457. But more importantly, the Examiner considered nearly identical arguments during prosecution.

Finally, the Petition should be denied on the basis that the Petition exceeds the word count. Petitioner certified that the Petition includes 13,994 words exclusive of the table of contents, tables of authorities, mandatory notices under 37 C.F.R. § 42.8, certificate of word count, certificate of service, or appendix of exhibits or claim listing. Petition at Certificate of Compliance. The Petition, however, includes a table providing not only a recitation of the challenged claims but also a short description of each limitation of each challenged claim. The shorthand description should count against Petitioner's word count, which is an additional 1,416 words, which, when added to the 13,994 words, exceeds the 14,000 word statutory limit.

II. BACKGROUND

A. U.S Patent 11,497,864

The '864 Patent is titled "Electronic Vaporizer" and names Gregory D. Conley and Daniel C. Hillenbrandt as inventors. NJOY owns by assignment the entire right, title, and interest to and in the '864 Patent.

Claim 1 recites (emphasis added):

1. A cartridge configured to couple to a power source of an electronic

vaporizer, ***the cartridge comprising***¹:

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.

¹ Emphasis added unless otherwise noted.

Relevant to this Petition, every challenged claim requires a “housing having a first aperture.”² The ’864 Patent specification makes clear that the “housing” is an 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 a second end 124, which may be considered as a portion of the housing 120 or apart from the housing 120. The housing 120 of the cartridge is manufactured from a non-metallic material, such as a polymer material or a ceramic material. In an example, the polymer may be a conductive polymer. As shown, the housing 120 is cylindrical in shape. It is to be understood, however, that the housing 120 may be of some other suitable shape. Moreover, the housing 120 may comprise only a cartridge wall (that can be cylindrical as well as other shapes). In another example, the housing 120 may comprise the cylindrical wall and two end-caps, all constructed of the polymer material or the ceramic material. In still yet another embodiment, the housing 120 may comprise the cartridge wall and a single end-cap. One or more end-caps described herein may be constructed from conductive material, such as metal, a conductive polymer, or the like.

² For the purposes of this preliminary response, Patent Owner is limiting itself to a narrow set of arguments. Patent Owner reserves its rights to set forth additional arguments should this Petition be instituted.

EX1001 at 3:46-64.

The “housing” is reflected in the ’864 Patent at Figure 1 (housing 120 having apertures 130 and 132) and Figure 2 (housing 202 having apertures 210 and 212).
See EX1001 at 4:30-34; 6:12-24.

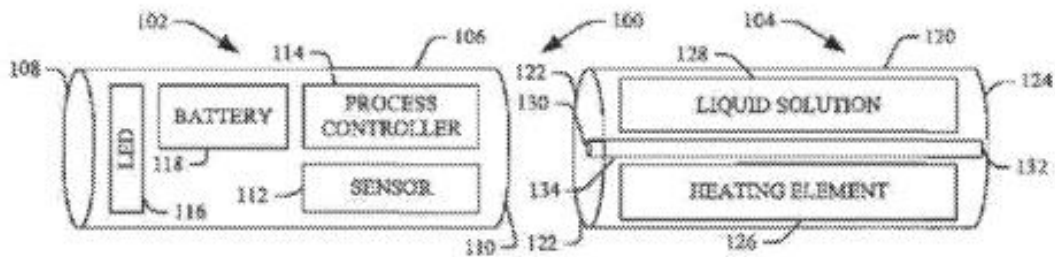


FIG. 1

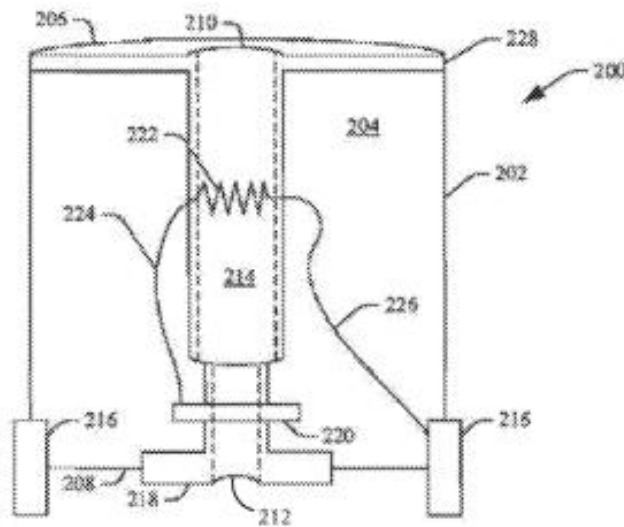


FIG. 2

EX1001, Figs. 1-2

Besides the figures above, the ’864 Patent specification also makes clear that a “**housing**” having a first aperture . . . and a second aperture” refers to first and

second apertures through the housing – *i.e.*, to provide access to the interior space of the housing:

As shown [in Fig. 1], ***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 second end 110 can comprise an aperture***, wherein the ***aperture is configured to receiver [sic] airflow from a user***.

EX1001 at 3:28-32.

The first end 122 of the cartridge 104 comprises a first aperture 130 that is located at approximately the center of the first end 122 of the cartridge 104. ***The second end 124 comprises a second aperture 132*** that is located at approximately the center of the second end 124 of the cartridge 104. An airflow passageway 134 extends between the first aperture 130 and the second aperture 132 axially proximate to the center of the housing 120.

EX1001 at 4:30-37.

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.

EX1001 at 6:12-26 (emphasis added).

The only disclosure of apertures internal to the housing is at EX1001 at 7:11-14 and 7:63-67, but in both cases the specification is clear that these apertures are not apertures in the housing, but are apertures in the wall of the airflow passageway (*i.e.*, holes through the walls of the airflow passageway). See EX1001 at 7:11-14 (“In such a design, ***the wall of the airflow passageway 214 may have apertures***, be permeable, or be conductive to heat such that the vaporized liquid solution may be provided to the user.”); EX1001 at 7:63-67 (“This gap is optional, as other designs may call for ***the walls of the airflow passageway 214 to be permeable or have apertures*** therein, to allow for vaporized solution to mix with air in the airflow passageway 214.”).

Accordingly, where the claims recite a “housing having a first aperture proximate the first end,” the claim is referring to an aperture providing access

through housing at or near the first end of the housing – *i.e.*, the aperture can be at the end of the housing or on the side of the housing near the end. As discussed more fully below, Petitioner fails to identify any such aperture in its prior art references.

B. The Level Of Ordinary Skill In The Art

For the limited purpose of this Preliminary Response, NJOY does not challenge the definition of a POSITA set forth in the Petition. NJOY reserves the right to challenge this definition should the *inter partes* review be instituted.

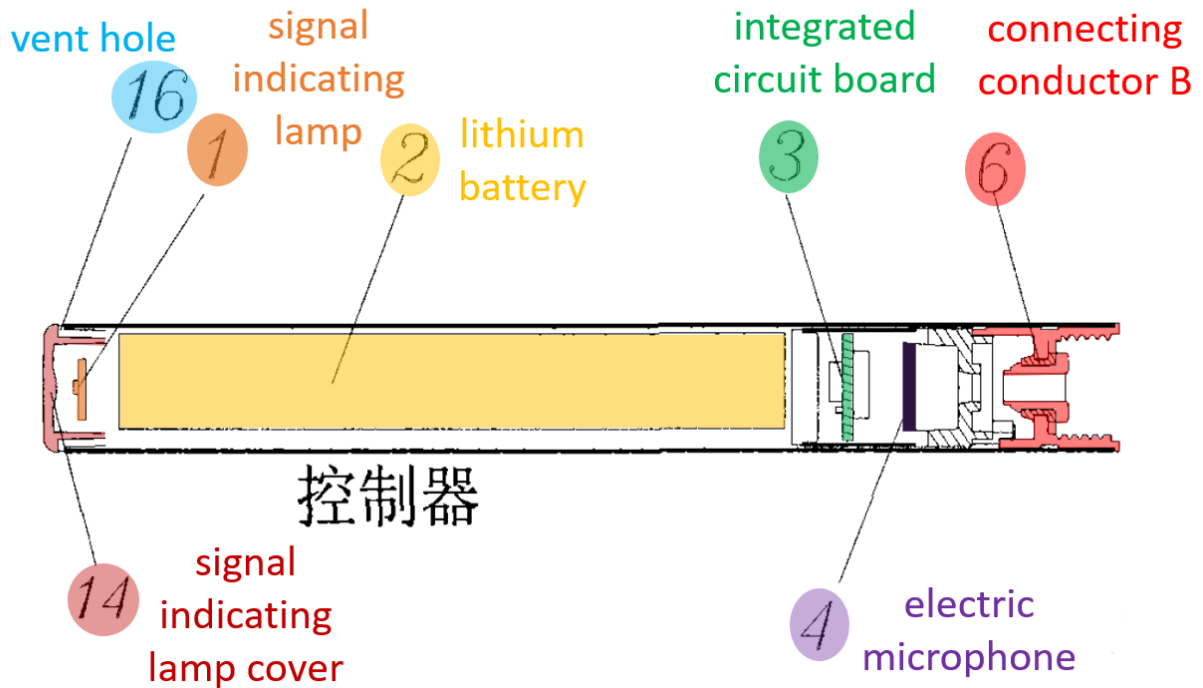
C. Prior Art Cited In The Petition

The Petition cites three references and relies on a declaration from the inventor of the Wang reference. A summary of each is provided below as relevant background.

1. Xia

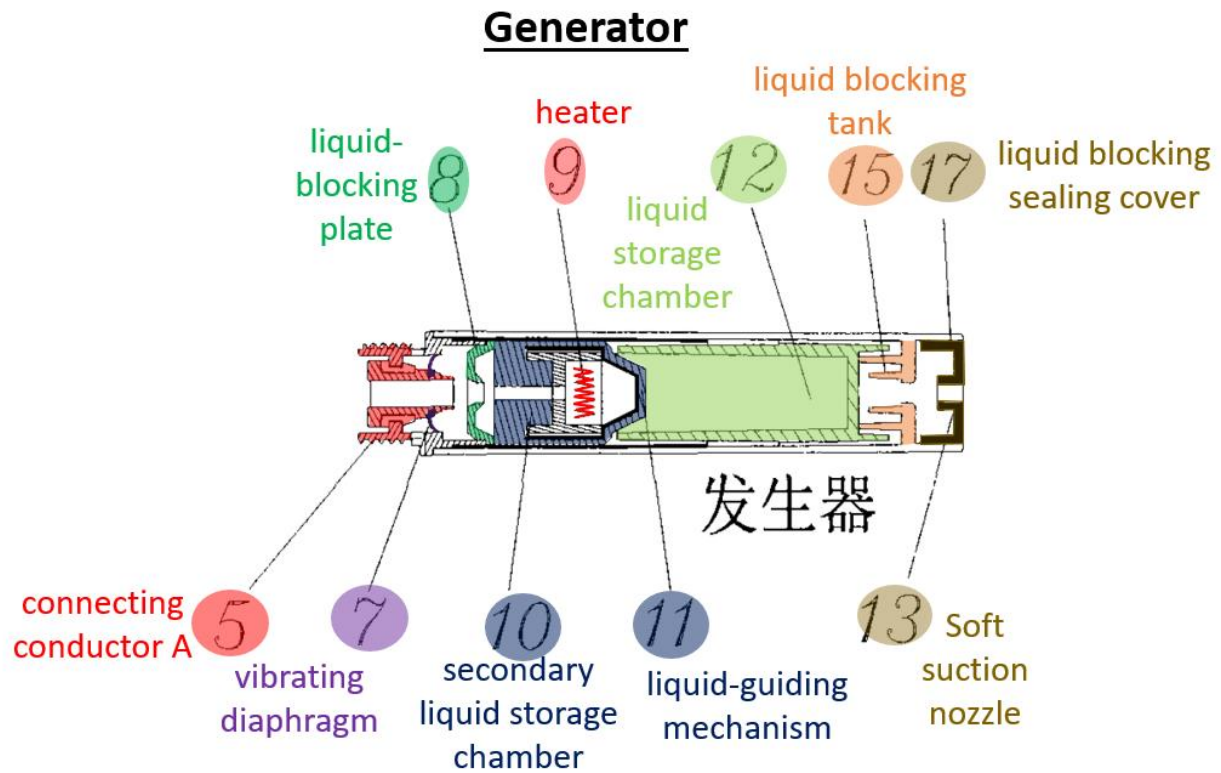
Xia is a Chinese patent titled “Environmental-protecting Type Incombustible Atomizing Electronic Cigarette with Function of Cigarette Substitute” that issued on May 20, 2009 as CN 201238610Y. *See* EX1004. The patent purports to describe a noncombustible electronic cigarette substitute consisting of a detachable controller and a generator. *Id.* at 1. The controller includes a signal indicating lamp, a signal indicating lamp cover, a vent hole, a lithium battery, an integrated circuit board, an electret microphone, and a connecting conductor. *Id.*

Controller



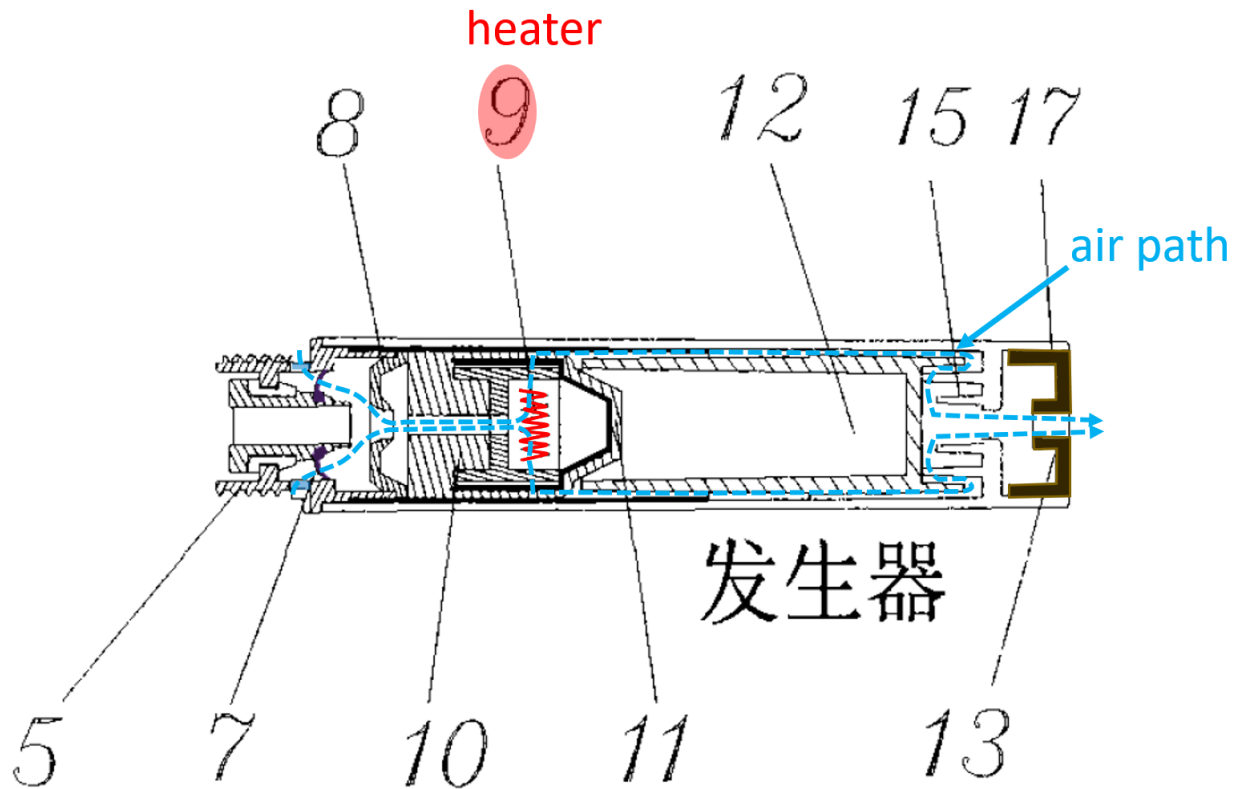
EX1027, Fig. 1; *see also* EX1004, Fig. 1

The generator includes a hollow connecting conductor, a vibrating diaphragm, a liquid-blocking plate, a liquid storage chamber, a secondary liquid storage chamber, a heater, a liquid-guiding mechanism, a liquid blocking tank, a suction nozzle, and a liquid blocking sealing cover. EX1004 at 1-2.



EX1027, Fig. 1; *see also* EX1004, Fig. 1

During inhalation by a smoker, air enters the cartridge at inlet holes at the base of the cartridge's threaded connector. The air converges and is drawn into a channel directed to a heating element. The movement of the air in this channel pulls liquid out of the secondary liquid storage chamber for vaporization by the heater. EX1004 at 13 ("Its working process is as follows: under the action of airflow, small droplets are sucked into the other side of the heat insulation seat 902 through the spray hole 904 in the heat insulation seat 902.").



EX1027, Fig. 1; see also EX1004, Fig. 1

The liquid saturated air then enters the heating chamber where the design of the chamber causes the air to vortex. The turbulent air motion is intended to shed excess liquid that has not been vaporized. EX1004 at 16 (“large-diameter droplets after atomization are attached to a wall under the action of a vortex to be reabsorbed by the liquid-guiding mechanism through the overflow holes.”). The vaporized liquid then exits the heating chamber along the periphery and travels along the sides of the device until it reaches a liquid blocking tank 15.

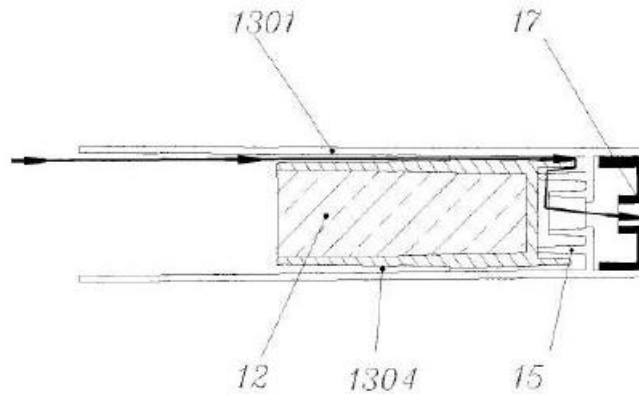
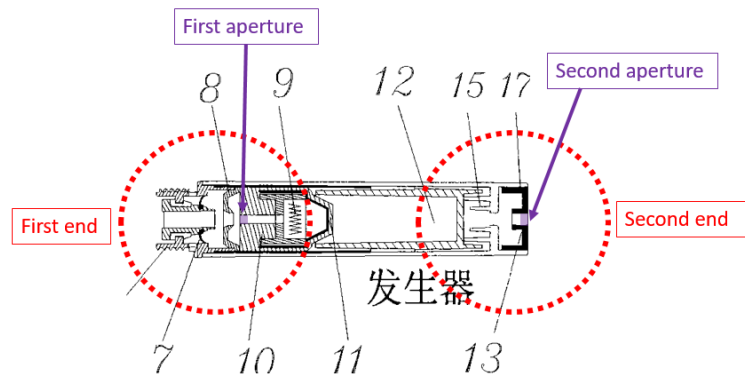


Fig. 5

EX1027, Fig. 5; *see also* EX1004, Fig. 5

The airflow passageway takes a back and forth motion through a number of “fingers” to remove additional liquid than was not fully vaporized. Finally, the liquid exits the device at a liquid blocking sealing cover 17, which also includes features that trap further excess liquid. EX1004 at 11 (“liquid blocking tank 15 and the liquid blocking sealing cover 17 are used to prevent the chemical liquid from being sucked into the mouth”).

Petitioner identifies the following as the first aperture:

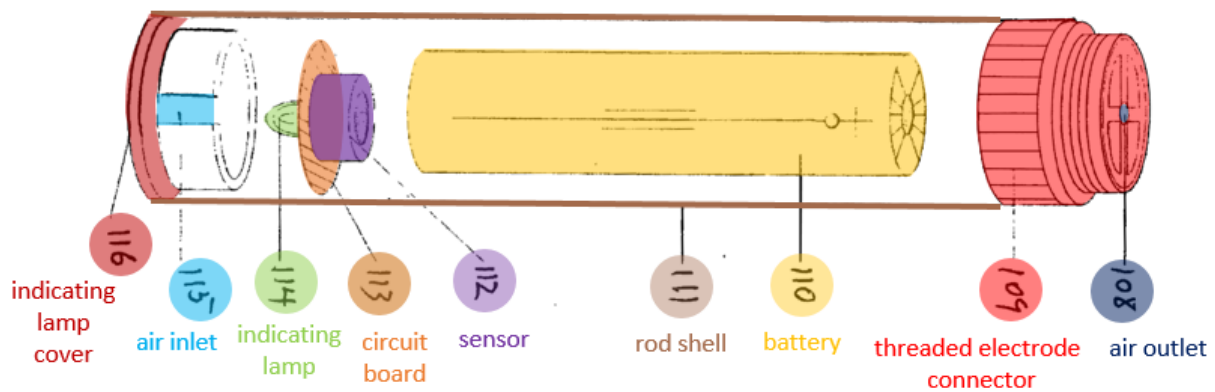


EX1027, Fig. 2; *see also* EX1004, Fig. 2

As discussed further herein, what Petitioner identifies as the “first aperture” is not a “**housing** having a first aperture” as required by the challenged claims because Petitioner’s “first aperture” is not in the housing.

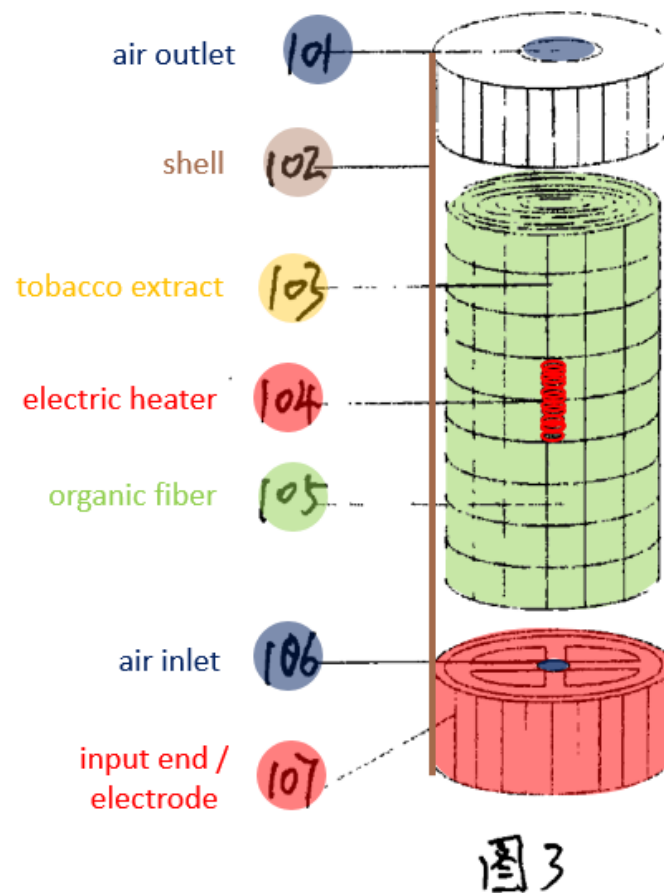
2. Wang

Wang is a Chinese patent publication titled “Electronic Pure Cigarette” that published on February 18, 2009 as CN 101366554A. The patent purports to describe “an electronic pure cigarette, which comprises a cigarette holder part and a cigarette rod part.” EX1005 at 1. Wang teaches a cigarette rod component that consists of a rod shell, a battery, a sensor, an indicating lamp and lamp cover, a circuit board control, an air inlet and outlet, and the output end.



EX1029, Fig. 2; *see also* EX1005, Fig. 2

Wang further teaches a cigarette holder component comprising a holder shell, an electric heater, a tobacco extract, an organic fiber, an air inlet and outlet, and the input end.



EX1029, Fig. 3; *see also* EX1005, Fig. 3

Interior to the cigarette holder, an organic fiber 105 soaked with tobacco extract is wound around an electric heater 104. At both ends of the organic fiber are gaps between the organic fiber and the cigarette holder for the smoke produced from heating the tobacco liquid. Wang teaches that the organic fiber is made from natural wood fiber or absorbent paper, such that it provides natural smoke aroma and taste very similar to a common cigarette. EX1005 at 7.

The parties dispute whether Wang discloses a central channel that runs through the middle of organic fiber 105. Wang discloses that the organic fiber is “wound” around the heating element and provides at Fig. 5 a close in view of the fiber:

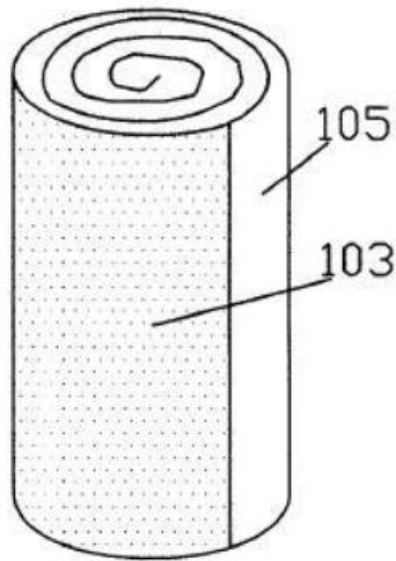


Fig. 5

EX1029, Fig. 5; *see also* EX1005, Fig. 5

Both parties contend that Fig. 5 supports its argument:

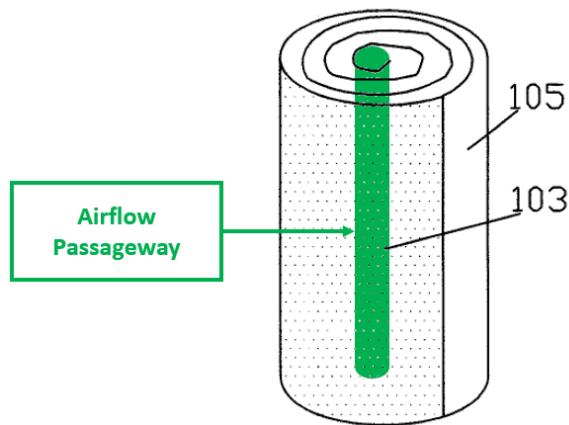


图 5

Petitioner's Argument

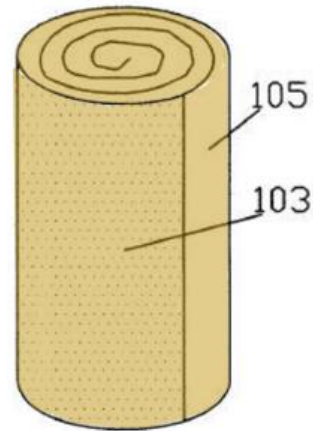
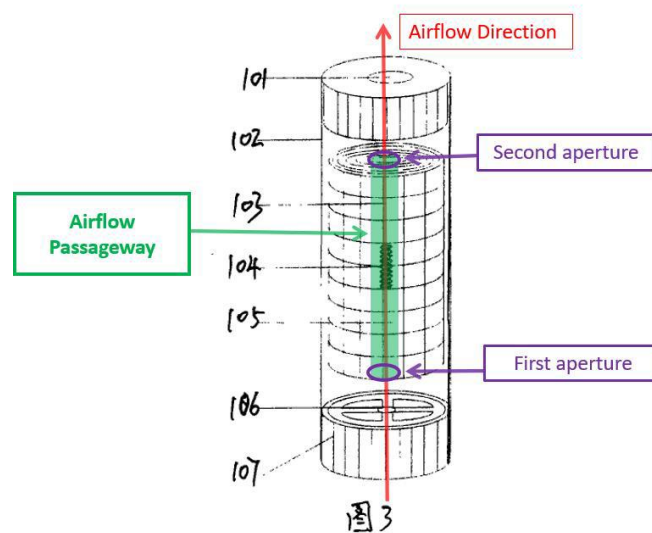


Fig. 5

Patent Owner's Argument

Petitioner's interpretation, however, cannot be correct. The white area 105 cannot be space as it would make the portion indicated by 105 nonsensical. Indeed, the patent identifies white space 105 as the organic fiber. EX1005 at 5 ("an organic fiber 105").

Based on Petitioner's understanding, it identifies first and second apertures in this organic fiber:



EX1029, Fig. 3; *see also* EX1005, Fig. 3

As discussed further herein, what Petitioner identifies as the “first aperture” and “second aperture” is not a “**housing** having a first aperture . . . and second aperture” as required by the challenged claims because these apertures are not in the housing.

3. Wang Declaration

Apparently acknowledging that Wang (the reference) provides no express disclosure of an airflow passageway through the organic fiber, Petitioner submitted the Wang Declaration, which is a declaration from Mr. Wang, the inventor on Wang (the reference).

The Wang Declaration, however, is not prior art and therefore should not be considered in the context of this petition. Moreover, Mr. Wang is used as a fact witness, not an expert witness, and the need to rely on a fact witness to explain a prior art reference is a clear concession by Petitioner that Wang (the reference) is deficient in its disclosure. Wang (the reference) speaks for itself.

But even more relevant, the Wang Declaration does not actually support the position taken by Petitioner. Petitioner argues that the Wang Declaration recites that Wang (the reference) discloses a central and axial air passageway through Wang's liquid storage. Petition at 24, 57-58. The Wang Declaration, however, describes *products* that allegedly have a central and axial airflow passageway. EX1017 at 3. Nowhere does it explicitly recite that Wang (the reference) discloses a centrally and axially located airflow passageway.

At best, the Wang declaration recites that these products purportedly “cover[] the invention disclosed in my 948 Application.” *Id.* at 3. However, there are clear structural differences between Wang (the reference) and the product exhibits attached to the Wang Declaration. Moreover, there is nothing that links “the invention” to a centrally and axially located airflow passageway through the organic fiber. The sole independent claim of the Wang (the reference) recites:

1. An electronic pure cigarette, comprising a cigarette holder part and a cigarette rod part, characterized in that the cigarette rod part consists of a cigarette rod shell, a battery, a sensor, an indicating lamp, a circuit control board, an indicating lamp cover, an air inlet, an air outlet, an output end, and the like, and the cigarette holder part consists of a cigarette holder shell, an electric heater, a tobacco extract, an organic fiber, an air inlet, an air outlet, an input end, and the like.

EX1005 at 3.

Neither this claim nor any of its dependent claims includes a mention of a centrally and axially located airflow passageway.

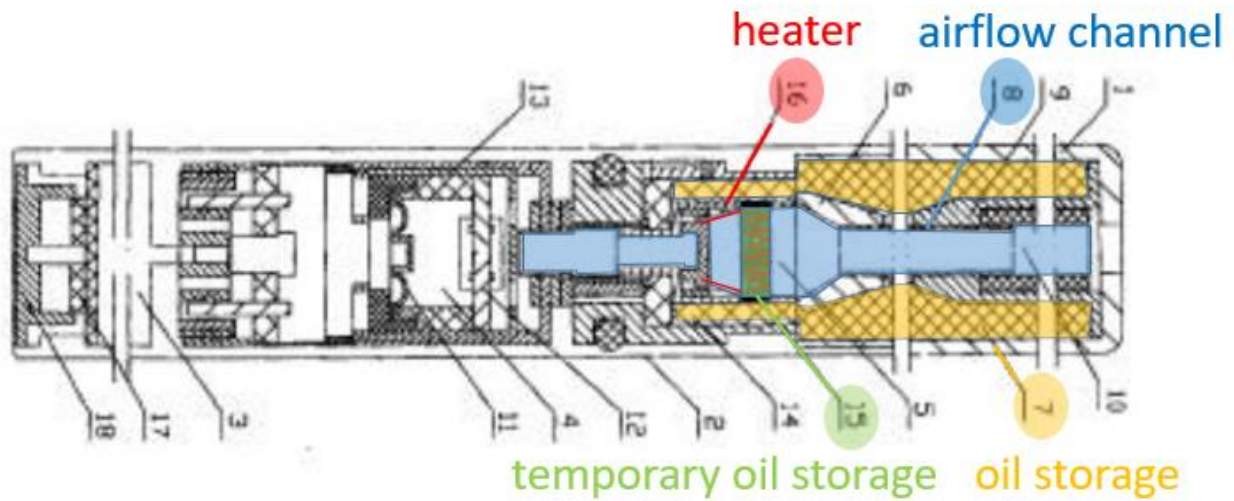
Finally, Mr. Wang is not a credible declarant. A dispute between Petitioner and the Patent Owner regarding Mr. Wang was taken before Administrative Law Judge Johnson Hines. Based on the facts she had before her, she stated, “However, I think it’s important to kind of recognize where we are and that at 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.” EX2002.006 at 85:7-13.

In view of the foregoing, the Board should disregard the Wang declaration entirely.

4. Fang

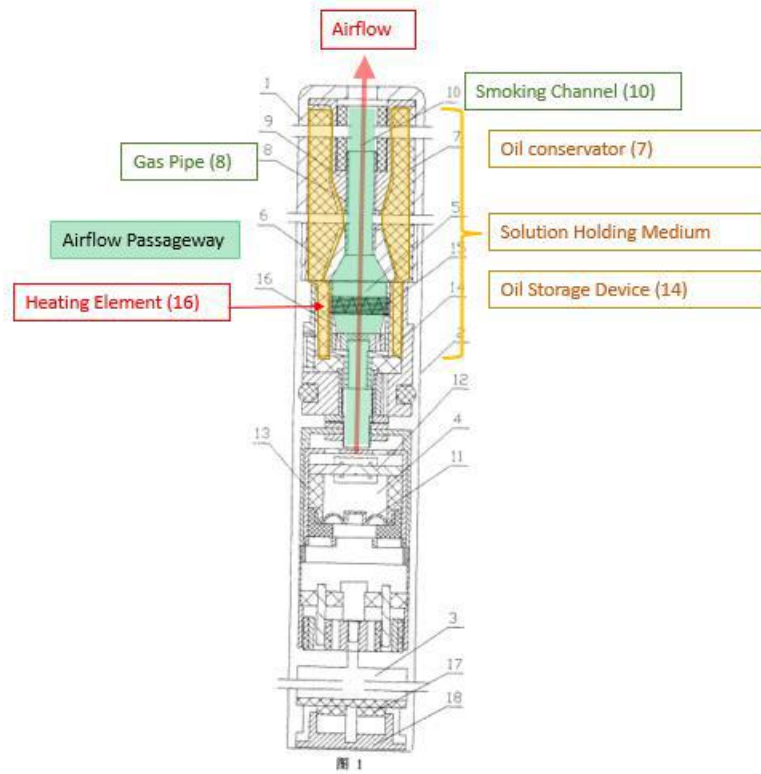
Fang is a Chinese patent titled “Electronic Cigarette” that issued on July 16, 2008 as CN 201085044Y. Fang purports to disclose an electronic cigarette that solves technical problems associated with overly complex technical structure and high manufacturing cost with a design that includes an oil conservator “nested in a sucker.” EX1006 at 1.

During operation, a gas pipe nested in the center of the oil conservator experiences a negative pressure due to the suction force of a smoker. An electric heating film wire in the oil conservator is activated in response to this negative pressure and vaporizes nicotine oil stored in a temporary oil storage to produce nicotine oil smoke. *Id.* at 6. The temporary oil storage receives nicotine oil by way of oil storage device 14, both of which are made of cotton yarn or sponge material capable of absorbing nicotine oil. *Id.*



EX1006, Fig. 1; *see also* EX1031, Fig 1

Petitioner does not expressly identify the apertures in Fang, but provides the following annotated image.



Petition at 63

Assuming the “first aperture” is the beginning point of the green channel, that aperture is a part of the internal structure of the unitary device. Therefore, the structure highlighted by Petitioner is not a “**housing** having a first aperture” as required by the challenged claims.

**III. PETITIONER’S ARGUMENTS IN GROUND 1 DO NOT
RENDER THE ’864 PATENT INVALID**

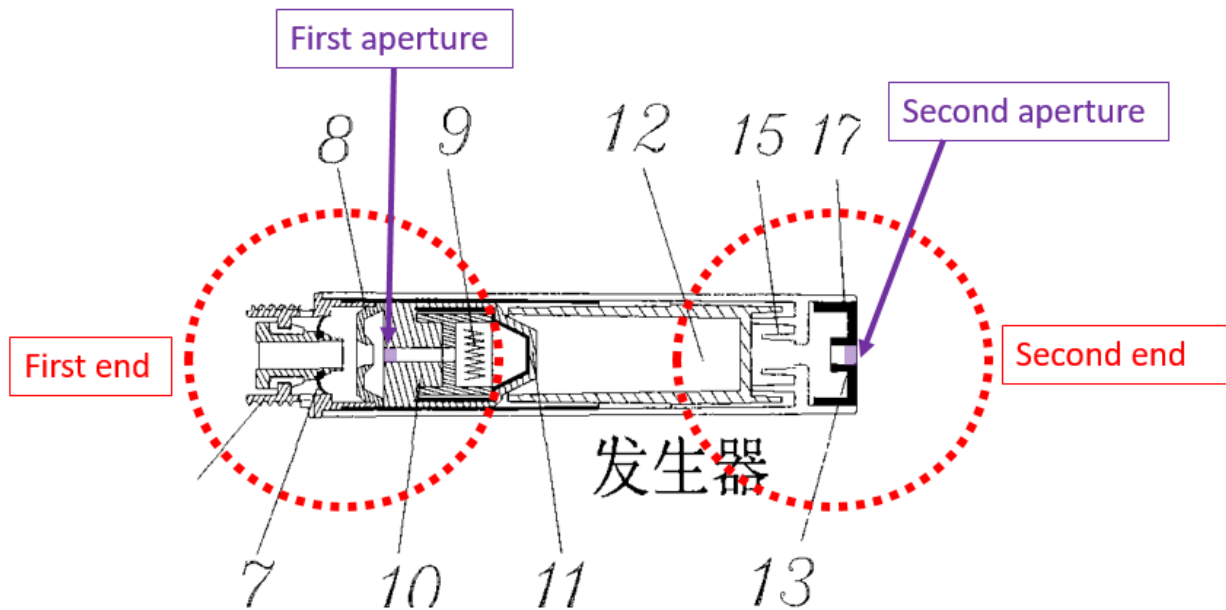
**A. Petitioner Fails To Identify In Xia Alone Or In Combination
With Wang And/Or Fang A “Housing Having A First
Aperture”**

Petitioner relies on Xia as the primary reference for Ground 1. Petitioner argues that (1) Xia anticipates the challenged claims, (2) Xia alone renders obvious the challenged claims, and (3) Xia in view of Wang and/or Fang renders obvious the challenged claims.

Yet none of Xia, Wang, or Fang discloses a “housing have a first aperture,” which is required by every challenged claim. And with regard to obviousness, Petitioner fails to articulate an adequate motivation for a POSITA to combine these references to arrive at the claimed invention.

**1. Petitioner Fails To Identify In Xia A “Housing Having
A First Aperture”**

Petitioner identifies the following “first aperture” in Xia:



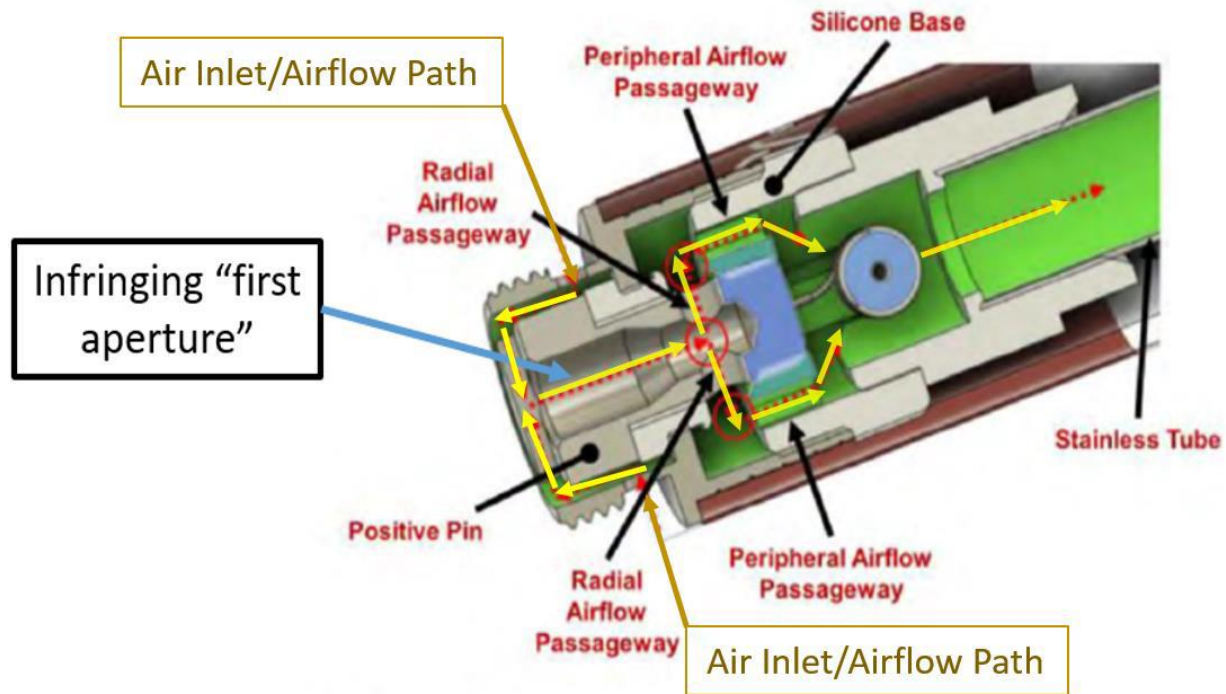
Petition at 38

Petitioner points to Xia’s stainless steel shell as the “housing” for limitation 1[a1]. Petition at 31 (“Xia’s generator has a ‘stainless steel shell.’”). Yet Petitioner points to the hole in secondary liquid storage chamber 10 for the aperture for limitation 1[a2].³ See annotated figure, above; see also EX1004 at 12 (“Fig. 4 is the schematic structural diagram of the liquid-blocking plate 8, *the secondary liquid storage chamber 10*, the heater 9 and the liquid-guiding mechanism 11.”). Thus,

³ Note, Petitioner could have relied other apertures in the Xia, but due to the interplay of other limitations, Petitioner needed to resort to this “aperture.”

Petitioner's "first aperture" is not the "first aperture" required by the claims because it is not in Xia's stainless steel shell.

Petitioner relies on arguments made in a previous litigation to suggest that the aperture can be internal to the device. Petition at 36. Specifically, Petitioner argues that the accused aperture in that litigation, *see below*, was not at the periphery of the device – it was internal.



Petition at 36

But Petitioner is incorrect in its assessment. The accused aperture can be seen clearly from outside of the cartridge (*see below*), and it continues to remain an

aperture in the *cartridge housing* even when the device is assembled with the battery portion.



EX2005.023 (annotated)

Thus, Petitioner failed to identify a “*housing* having a first aperture”, and under the theory advanced by Petitioner, Xia alone is insufficient to anticipate the ’864 Patent.

2. Petitioner Fails To Identify In Wang A “Housing Having A First Aperture”

Regarding Wang, Petitioner identifies the following as the first aperture:

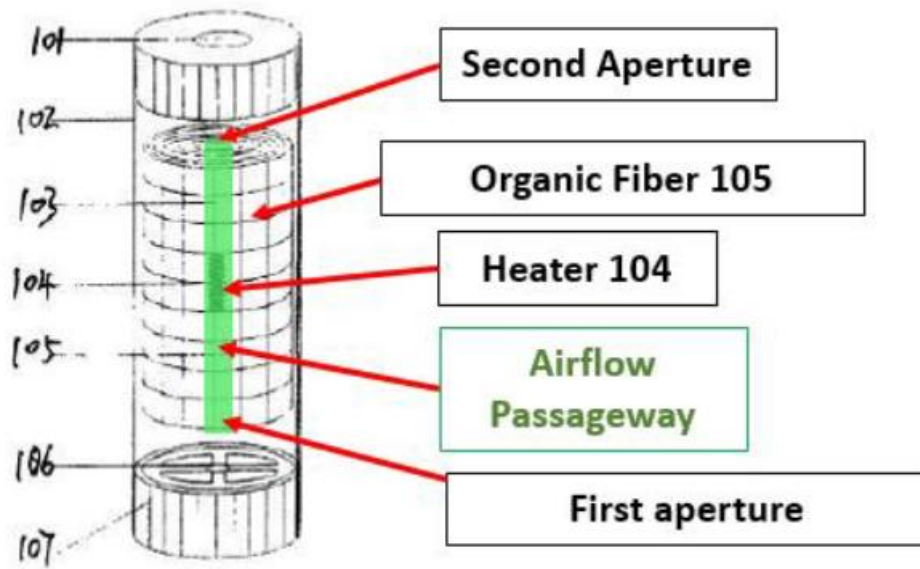


Fig. 3

Petition at 25

But again, the first (and second) “aperture” identified by Petitioner is in the liquid storage material (*i.e.*, organic fiber 105), not the housing. See Petition at 91 (identifying “cigarette holder shell 102” as the “housing”). See Petition at 93 (annotated figure identifying “first aperture” as the aperture in “solution holding medium 105”). Thus, Petitioner failed to identify a “**housing**” having a first aperture.”

Moreover, it should also be noted that what Petitioner identifies as “apertures” are not apertures. There is no disclosure in Wang that organic fiber 105 includes a central and axial airflow passageway having first and second apertures. As

discussed in the Background Section, Wang only discloses that organic fiber 105 is wound around the electric heater 104. See EX1005 at 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 [the interior of the shell] also provides a space for smoke produced when the tobacco extract 103 in organic fiber 105 is heated by the electric heater 104.”). Wang at Figure 5 confirms that there is no central and axial channel having first and second apertures.

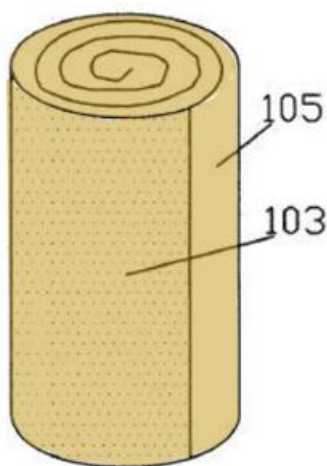


Fig. 5

EX1029, Fig. 5; *see also* EX1005, Fig. 5

The vaporized liquid can easily permeate through the organic fiber as the organic fiber is “natural wood fiber or natural absorbent paper.” EX1005 at 7. Note that if

the organic fiber was not tightly wound, it would not contact the heater, which would negatively impact vaporization.

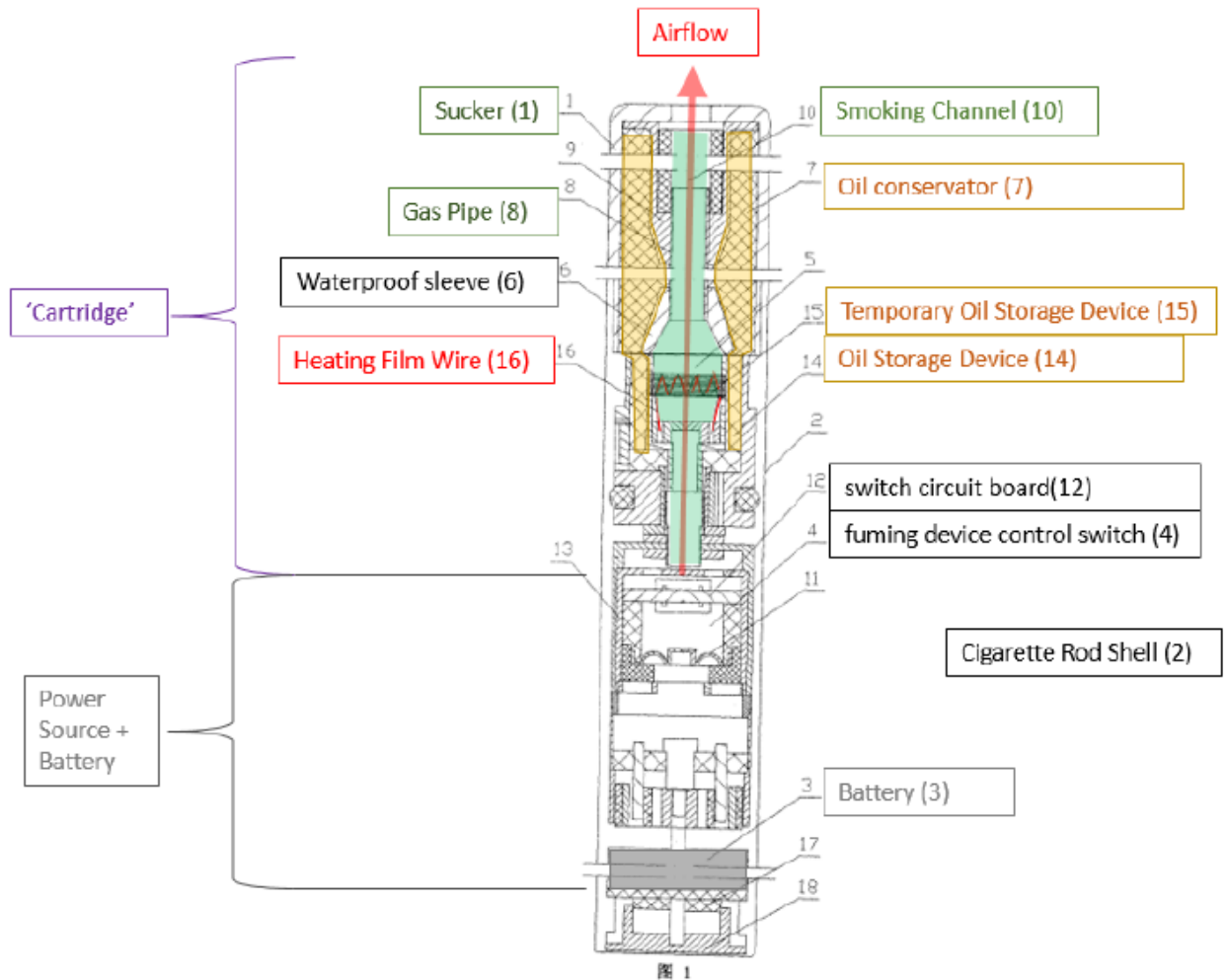
Petitioner also relies on the Wang declaration to establish a central and axial airflow passageway (which would have the first and second apertures). Petitioner argues that the Wang declaration supports that “absorbent organic fiber 105 **‘surrounds a complete central air passageway,’** in which the heater is positioned.” Petition at 24 (emphasis in original). Petitioner is incorrect. This testimony, cited by Petitioner, refers to “a liquid element 7” and not “absorbent organic fiber 105.” Liquid element 7 is a component in a *product schematic* included as Exhibit 4 to the Wang Declaration. See EX1017 at ¶ 10 (“**A liquid element 7** [of Exhibit 4] along the diameter of the electronic cigarette surrounds a complete central air passageway”). Nowhere does the Wang Declaration make a similar statement regarding Wang (the reference).

Thus, Petitioner fails to identify in Wang a “housing having a first aperture,” which is required by every challenged claim.

3. Petitioner Fails To Identify In Fang A “Housing Having A First Aperture”

Regarding Fang, Petitioner does not explicitly identify the first and second apertures. Petitioner, however, provides the following annotated figure, which

suggests, based on the green channel, that the first aperture is somewhere near the middle of the device and the second aperture is located near the mouth end of the device.



Petition at 50

Note that while Petitioner annotates the figure with “Cartridge” and “Power Source + Battery”, Fang *is not* a two-piece device. That is, Fang does not have a

cartridge – this is a unitary device. Petitioner confirms this in the Petition. *See* Petition at 28 (“Although the device is shown as a single unit, in Figure 1, it has two distinct functional areas.”).⁴ Thus, the apparent “first aperture” is buried within the device, not at some junction between two separable portions. Accordingly, Petitioner’s “first aperture” is not in the housing.

4. Xia Alone Does Not Render Obvious The Challenged Claims

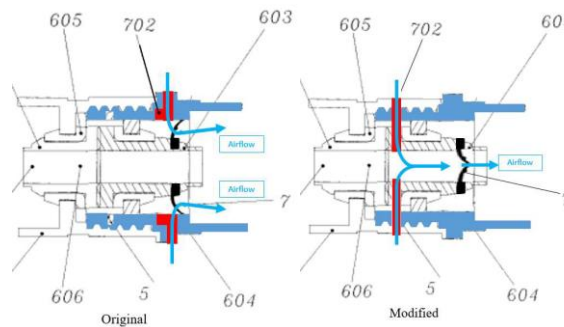
With respect to Xia alone, Petitioner includes a single sentence, “Alternatively, a POSITA would know that moving Xia’s external air intake to the battery side to have air enter centrally on the end of the cartridge was a simple and obvious modification.” Petition at 38. Petitioner’s single sentence is insufficient to demonstrate obviousness. Petitioner provides no explanation of what changes would need to be made to move the air inlet hole to the battery portion. For support, Petitioner includes a citation to its expert’s report (EX1007 at ¶ 90). Petitioner’s

⁴ Petitioner notably includes single quotation marks around “cartridge” in the figure because, structurally, it is not a cartridge.

expert includes some basis for the modification, but none of that is reflected in the Petition and therefore would be improper incorporation.⁵

Out of an abundance of caution Patent Owner addresses the argument set forth by Petitioner's expert despite that argument not appearing in the Petition. Petitioner's expert suggests modifying the reference by moving the air inlet holes in the housing closer to the end of the housing. This, however, does not remedy the deficiency in Xia.

⁵ *Instrumentation Lab'y Co., v. Hemosonics LLC*, IPR2017-00855, 2019 WL 625561, at * 8 (P.T.A.B. Feb. 13, 2019) (declining to consider “[a]rguments and information that are not presented and developed in the Petition, but instead are incorporated by reference”); *Fid. Nat'l Info. Servs., Inc. v. DataTreasury Corp.*, IPR2014-00490, 2014 WL 4059221, at *5 (P.T.A.B. Aug. 13, 2014) (“the petition must contain a ‘full statement of the reasons for the relief requested,’ including a detailed explanation of the significance of the evidence . . . [w]e, therefore, decline to consider information presented in a supporting declaration, but not discussed sufficiently in a petition . . .”) (quoting 37 C.F.R. § 42.22(a)(2)).



EX1007 at ¶ 92⁶

Moving the air inlet 702 further up the housing does not change the fact that Petitioner points to the aperture in the secondary liquid storage chamber as the “first aperture.” Petitioner did not identify air inlet 702 as the “first aperture” because it enters through the housing perpendicular to the longitudinal axis of the housing (relevant to other limitations) and moving the air inlet as directed by its expert does not fix this – the inlet remains perpendicular.

And finally, Petitioner’s expert suggests this modification because it would be “simpler, thereby making its manufacturing process easier to conduct and cheaper to fund.” EX1007 at ¶ 91. It is not clear how this modification would be simpler. Petitioner’s expert is proposing to replace one through-hole with two through-holes

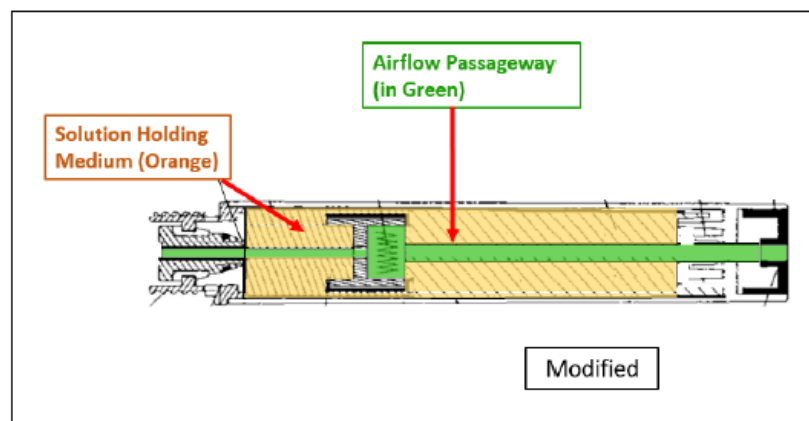
⁶ Petitioner did not include this in the Petition or make reference to this figure. Patent Owner only addresses these figures out of an abundance of caution.

that must align when the device is threadedly attached. If a smoker does not tighten the pieces to precisely the right position, no air will be able to enter the device. Moreover, the through-holes are substantially longer and thus more prone to clogging. Neither Petitioner nor Petitioner's expert points to a device in the prior art (or any teaching) that would suggest that a POSITA would be motivated to make this modification.

Accordingly, Xia alone does not render obvious the challenged claims.

5. Xia In View Of Wang And/Or Fang Does Not Render Obvious The Challenged Claims

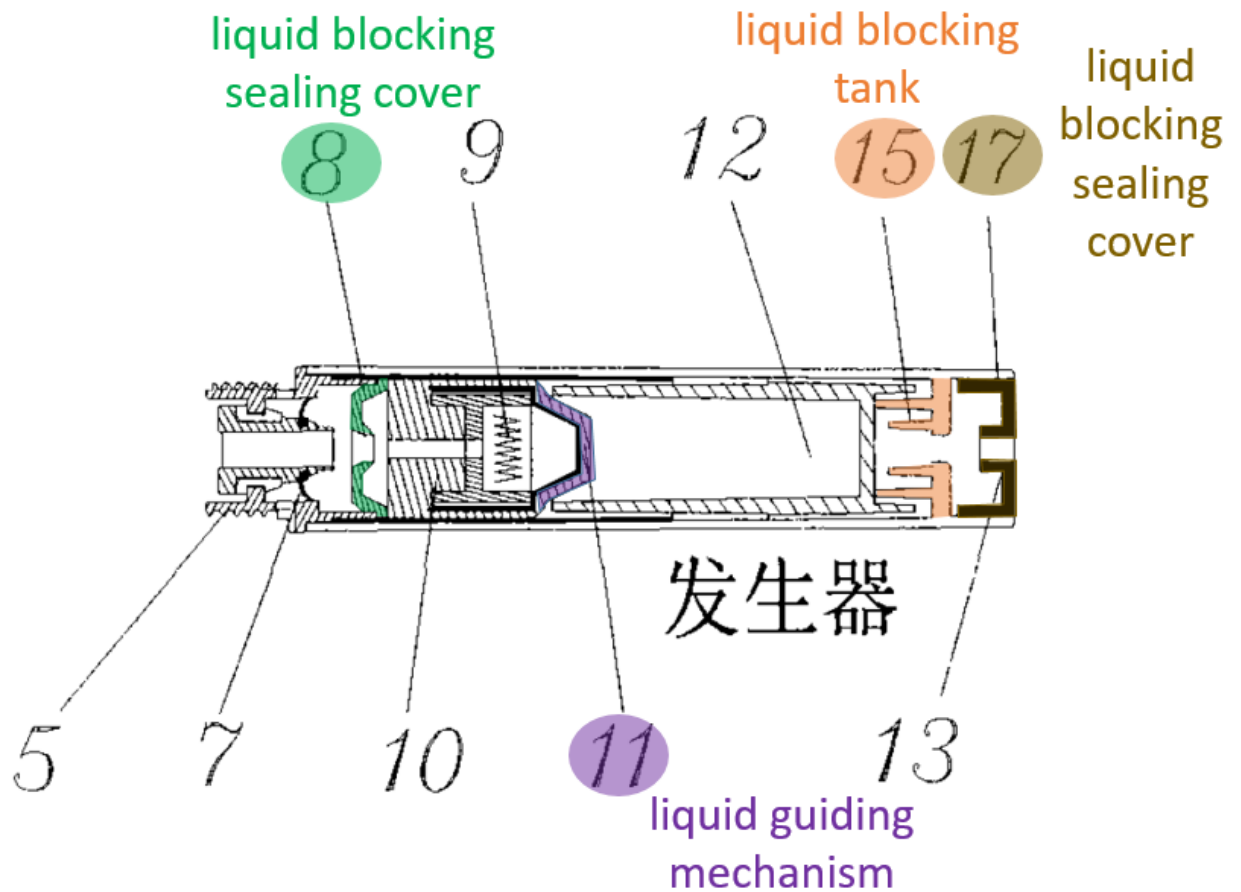
With respect to the combination of Xia, Wang, and/or Fang, Petitioner takes these three references and proposes that it would have been obvious to a POSITA to arrive at the following device:



Petition at 57

Petitioner fails to account, however, for the significant differences between these devices. Each device has substantially different mechanisms for transporting and vaporizing liquid.

As discussed at the beginning, Xia uses the smoker's own inhalation to pull liquid from the secondary liquid storage chamber into its channel for vaporization. Xia calls this "spray." EX1004 at 16. This results in significant amounts of unvaporized liquid in the airflow, which Xia addresses by using a circuitous airflow pathway specially designed to provide the device multiple opportunities to capture this free floating liquid. For example, Xia includes a liquid-blocking plate 8, a liquid-guiding mechanism 11, liquid block tank 15, and liquid blocking sealing cover 17 for capturing excess liquid.



EX10027, Fig. 2; see also EX1004, Fig. 2

Liquid-blocking plate 8 may “prevent the chemical liquid from flowing into the controller and affecting the circuit.” EX1004 at 13. While liquid-guiding mechanism 11 forces the airflow into a vortex pattern to shed liquid. *Id.* at 16 (“large-diameter droplets after atomization are attached to a wall under the action of a vortex to be reabsorbed by the liquid-guiding mechanism through the overflow holes.”). Where “liquid blocking tank 15 and the liquid blocking sealing cover 17

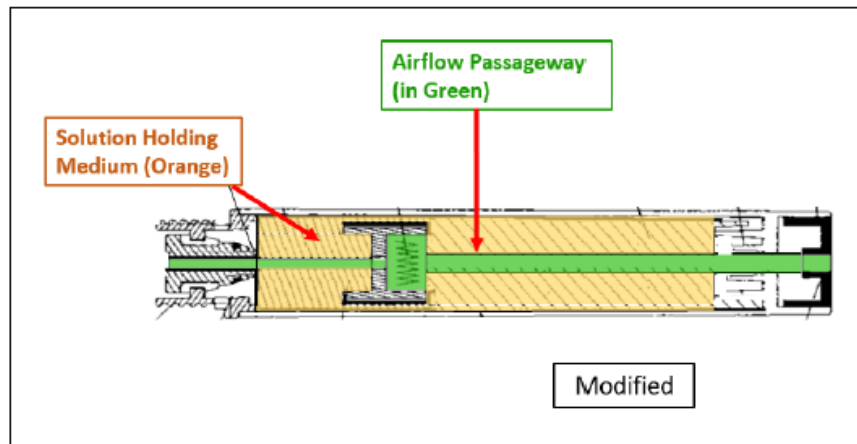
are used to prevent the chemical liquid from being sucked into the mouth.” *Id.* at 11.

Wang, in contrast, wraps a saturated fiber directly around the heater. EX1005 at 7. Thus, unlike Xia and Fang, Wang has no need of an intermediate wicking material to wick liquid from the storage material to the heater. Wang further provides a gap between the liquid storage and the housing to provide an area for the vaporized liquid to accumulate and mix. *Id.* (“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 organic fiber 105 is heated by the electric heater 104.”). The gap also provides distance between the saturated fiber and the mouth end, without which the smoker would directly inhale the liquid from the fiber. Neither Xia nor Fang require such a gap because their stored liquid is isolated from the inhalation channel.

Fang neither uses Xia’s “spray” method nor Wang’s direct contact method. Instead, Fang uses an intermediate wick (temporary oil storage device 15) that draws liquid from the primary storage (oil storage device 14) directly to the heating element (heating film wire 16). The heating element is wrapped around this intermediate wick, which contains substantially less liquid than the liquid remaining in the primary storage. According to Fang, its heating arrangement “has high

electrothermal conversion efficiency and long service life, experiments prove that it may save 40% of electricity compared with a fuming device in the prior art.” EX1006 at 6.

These different mechanisms necessitate substantially different physical arrangements. And contrary to the position taken by Petitioner, a POSITA cannot simply swap one element for another. Petitioner modifies Xia, for example, by taking Wang’s purported channel or a modified Fang channel⁷ and drops that into Xia.



Petition at 57

⁷ Petitioner cannot use Fang’s channel unmodified because of the interplay of other claim limitations requiring a channel with a uniform cross-sectional area.

But as just discussed, Xia has issues with excessive liquid in the vapor, which are combatted by a combination of structural liquid capture mechanisms. Petitioner's combination, however, eliminates many of those mechanisms. For example, Petitioner eliminated Xia's liquid-blocking plate 8, the liquid-guiding mechanism 11, and liquid block tank 15. EX1004 at 13 ("liquid-blocking plate 8 may prevent the chemical liquid . . . from flowing into the controller and affecting the circuit"); 11 ("liquid blocking tank 15 and the liquid blocking sealing cover 17 are used to prevent the chemical liquid from being sucked into the mouth"); 16 ("large-diameter droplets after atomization are attached to a wall under the action of a vortex to be reabsorbed by the liquid-guiding mechanism through the overflow holes."). Each of these are necessary to capture excess liquid. With Petitioner's modified device, smokers are more likely to choke on inhaled liquid, which medical studies suggest is dangerous to ingest.⁸

⁸ EX2003.005 ("Ingestion of nicotine-containing e-cigarette solutions can result in serious health effects, including death, due to nicotine toxicity."); EX2004.006 ("The higher a product's nicotine content, the higher its risk of producing adverse effects. Direct consumption of nicotine liquids is the most dangerous to ingest.").

Petitioner's modified device also relocates the first aperture to the first end of the housing. Petitioner argues it would have been obvious to do so because "it would merely require extension of the passageway to the very edge of the housing, with a central aperture (already present in Wang, and in Fang), which would also allow the solution holding medium to be extended to the edge of the housing as well, increasing liquid storage capacity." Petition at 39.

Petitioner fails to identify in any prior art reference a first aperture extended to the very edge of the housing. Further, pushing the solution holding medium to the edge of the housing does not transfer the aperture to the housing, which is what is required by the claims. Nor is extending the liquid storage to the edge of the housing a "mere extension." Xia discloses that air enters the device at the threaded junction. By extending the aperture to the very edge of the housing, Petitioner is altering the entire air intake system of Xia. Air would no longer enter through the cartridge portion, but would need to enter through the battery section. Petitioner provides no explanation how this would be achieved or how that would affect the design of the sensor and actuation circuit. Moreover, by including the battery portion in the airflow path, there is no a greater opportunity for vaporized liquid (in the airflow path) to enter the battery compartment, and liquid is not ideal for electrical components.

The ostensible rationale for this, “increasing liquid storage capacity,” is disingenuous. The liquid storage capacity is increased at the expense of eliminating vibrating diaphragms 7 and liquid-blocking plate 8. Vibrating diaphragm 7 is necessary for actuating the device. EX1004 at 10 (“under the action of suction by the 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...”). And liquid-blocking plate 8 prevents liquid from entering the battery portion. EX1004 at 13 (“The liquid-blocking plate 8 may prevent the chemical liquid . . . from flowing into the controller and affecting the circuit.”). Petitioner’s modification might have more liquid storage, but it results in an inoperable device that permits corrosive nicotine liquid into the battery compartment and more liquid nicotine into the mouth of the smoker.

Petitioner’s expert suggests that the above combination would be arrived at through a simple substitution of known elements. But based on the expert’s declaration, the modification requires (none of this is set forth in the Petition): a new liquid storage have a central through-passageway (EX1007 at ¶ 141), a modified liquid blocking plate (*Id.* at ¶ 150), an impermeable liquid storage barrier (*Id.* at ¶

151), an elongated secondary liquid storage chamber (*Id.* at ¶ 151), and a completely redesigned sensing and actuation system (*Id.* at ¶ 95). And despite designing an ***entirely new device***, Petitioner never argues that the “first aperture” is anywhere but in the secondary liquid storage chamber.

IV. PETITIONER’S ARGUMENTS IN GROUND 2 DO NOT RENDER THE ’864 PATENT INVALID

A. Petitioner Fails To Identify In Wang A “Housing Having A First Aperture” Nor Does Wang Render It Obvious

Petitioner relies on Wang as the primary reference for Ground 2. Petitioner argues that (1) Wang anticipates the challenged claims, (2) Wang alone renders obvious the challenged claims, and (3) Wang in view of Fang renders obvious the challenged claims.

As discussed in the context of Ground 1, Petitioner fails to identify a “***housing having a first aperture***” in either Fang or Wang. Thus, Wang cannot anticipate the challenged claims. And with regard to obviousness in view of Wang and the combination of Wang and Fang, Petitioner’s arguments are even more specious than those argued with respect to Ground 1.

1. Wang Does Not Render Obvious the Challenged Claims

While Petitioner argues Wang as single reference obviousness, Petitioner does not argue that it would have been obvious for ***the housing*** to have first or second

apertures.⁹ At most, Petitioner argues that it would have been obvious to extend the liquid storage of Wang to the cartridge ends. Petition at 102 (“A POSITA would also be motivated to modify the image above so that the solution-holding medium and passageway reached the air inlet 106 and the air outlet 101”). In other words, Petitioner suggests eliminating the gap between the liquid storage and the ends of the cartridge, but nowhere does Petitioner suggest moving its “first aperture” to the housing. Thus, Petitioner has failed to carry its burden.

Moreover, even supposing Petitioner moved the “first aperture” to the housing, Wang does not have a “heating element extending transversely to a central longitudinal axis”, which is a further requirement of the claims. Petitioner seemingly argues that every heating element has a transverse dimension, and therefore extends transverse to the central longitudinal axis (see Petition at 43-44), but this would make the limitation non-limiting and that is clearly not intended by the claim.

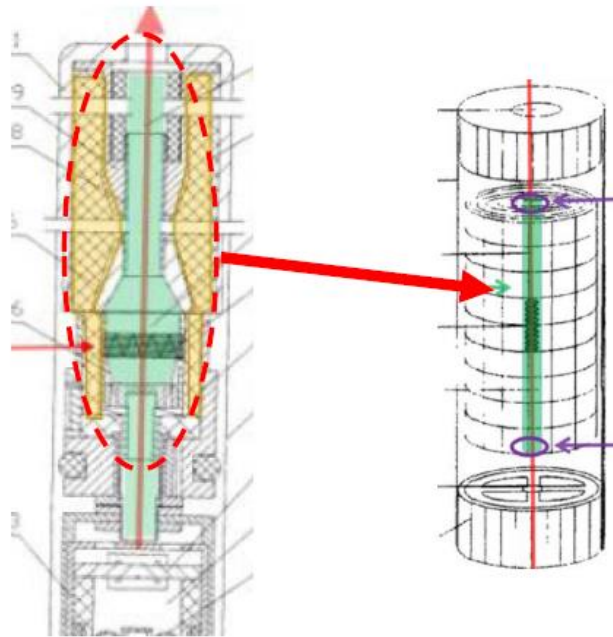
Accordingly, Wang alone does not render obvious the challenged claims.

⁹ Patent Owner again notes that Petitioner could have relied on a different aperture as the “first aperture”, but did not do so because of the interplay of the “first aperture” with the remaining limitations set forth across the claims.

2. Wang In View Of Fang Does Not Render Obvious The Challenged Claims

Petitioner further contends that Wang can be modified by Fang to invalidate the challenged claims. But as discussed above, Petitioner has failed to identify a “housing having a first aperture” in Wang or Fang and has further failed to point to anything in the prior art that provides this teaching. Moreover, Petitioner does not suggest that Wang would be modified in view of Fang for this limitation. See Petition at 93-94 (discussing this limitation at 1[a2]).

For the purposes of another limitation (1[c]), Petitioner combines Wang with Fang to import Fang’s central channel into Wang – essentially replacing Wang’s entire internal structure. Petition at 104. However, Petitioner is clear that in the combination of Wang and Fang, it would “maintain Wang’s two-piece system and first aperture.” *Id.*



See Petition at 47 and 64 (combined, annotated)

Thus, in view of the foregoing, Petitioner has failed to demonstrate that Wang in view of Fang renders the challenged claims obvious.

V. INSTITUTION SHOULD BE DENIED UNDER 35 U.S.C § 325(D)

The Petition should be denied under 35 U.S.C. § 325(d) because the Petition relies on prior art that was before the Examiner during prosecution and the Petition rehashes arguments that were overcome by the applicant during prosecution.

Petitioner concedes that Xia, Wang, and Fang were all disclosed during examination but argues that “[t]here is no indication that the examiner reviewed Xia, Fang, or Wang.” Petition at 122. But the Petition fails to note that the Examiner

also received an expert report that discussed Wang and Fang in significant detail. Furthermore, Petitioner is incorrect when it states that “the examiner did not substantially ... raise any of the arguments Petitioner has made in this petition.” In fact, nearly identical prior art was raised by the Examiner during prosecution.

During prosecution the Examiner rejected the pending claims based U.S. Patent Pub. US 2009/0095311A1 (“Han”).

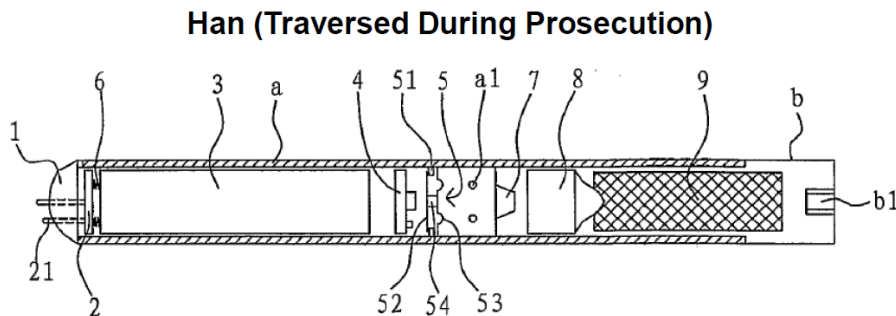


FIG. 1

EX2006 at .018¹⁰

Han is nearly identical to Xia. Air enters a peripheral aperture a1, which, during inhalation, draws air into a heater chamber 8. Air drawn into the heating

¹⁰ For clarity, the better-quality figures from WO 2007/131449 A1 (“Han WIPO”) are being used, but are identical to the figures in Han. Han is the U.S. National Phase application of Han WIPO.

compartment contains “spray” dislodged under the inhalation power of the smoker. EX2001.013 at ¶ [0071] (“Since the negative pressure cavity (83) provides the negative pressure compared with the outside, the air flow sprays into it, bringing the cigarette liquid from the porous component (81) to spray into the negative pressure cavity (83) in the form of fine drips.”). Once in the heater compartment, the liquid saturated air undergoes a vortex to capture large drops. *Id.* (“After atomization, the big-diameter fine drips are re-absorbed by the porous component (81) under the action of vortex, while the small-diameter fine drips are suspended in the airflow to form gasoloid”). Han also has the same heater arrangement from Xia:

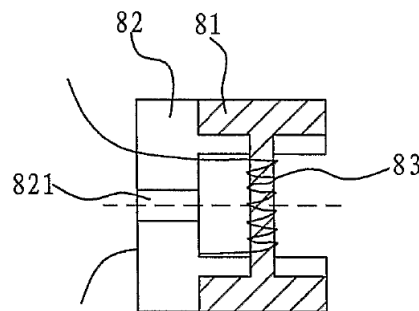


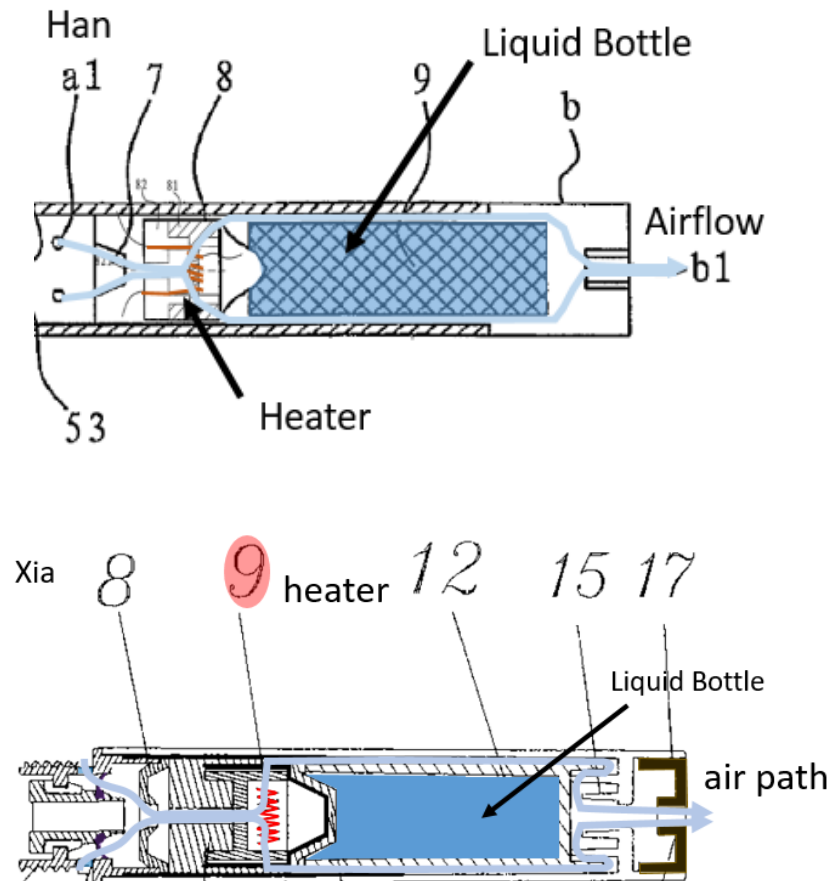
图18

EX2006 at .022

Once vapor leaves the heater chamber it flows between the bottle and the shell, which condenses fine drops that were not vaporized. These drops are reabsorbed into the liquid storage. *Id.* (“When the gasoloid enters the cigarette holder shell (b),

multiple small liquid drips are condensed into bigger ones, which fall into the clearance between the cigarette holder shell (b) and air channel (b1) without being absorbed by the air channel (b1).”). The air then exits the device.

Han is remarkably similar to Xia, including using the same words, such as “spray” to describe the liquid pulled from the secondary liquid storage chamber and “vortex” to describe the turbulent air near the heating element. In both references, a bottle is pressed up against a porous component that draws liquid around to the backside of the heating element. The described devices are functionally identical.



EX2005, Fig. 1 and EX1004, Fig. 1 (annotated)

The Examiner considered this reference in detail and concluded that the '864 Patent was patentable. Specifically, applicant argued that, “[t]hese dependent claims [subsequently rewritten in independent form] recite ‘wherein the airflow passageway extends centrally and axially from the first aperture to the second aperture.’” EX1002 at 273. Applicant argued, “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.” EX1002 at 273-274. In his response, the Examiner stated that “Applicant’s arguments with the respect to Han as previously applied under 35 U.S.C. 102, ***have been fully considered and are persuasive.***” EX1002 at 195.

This directly addresses Petitioner’s argument whether the liquid bottle is an obstruction or defines the airflow passageway. Petitioner rehashes ***exactly the same argument*** that was already decided by the Examiner in exactly the same context with respect to Xia. And if Wang does not have a center channel, which Patent Owner submits is not disclosed by Wang, Wang is also functionally the same. Air enters the cartridge body of Wang and is diverted by the tightly wound organic fiber.

Petitioner presents no reasons why the Examiner erred in the examination of the application. Beyond a short, non-argumentative recitation of the file history, Petitioner never once addresses Han.

The only remaining grounds then are the combinations with Fang. But as discussed above, Fang is a radically different device and Petitioner presents no compelling reasons to combine Fang with either Xia or Wang. Accordingly, the

totality of the § 325(d) analysis indicates that the Board should exercise its § 325(d) discretion to deny the Petition.

VI. PETITIONER IMPERMISSIBLY EXCEEDS THE STATUTORY WORD COUNT LIMIT

Per 37 C.F.R. § 42.24 Petitioner is entitled to a maximum of 14,000 words in a petition for an *inter partes* review. This word limit applies to any statement of material facts to be admitted or denied in support of the petition. On the other hand, the word limit does not apply to a table of contents, a table of authorities, mandatory notices under § 42.8, a certificate of service or word count, or appendix of exhibits or claim listing. In the Certificate of Compliance, Petitioner (referring to itself as Patent Owner presumably by mistake) states that the number of words in its Petition is 13,994. Petition at Certificate of Compliance.

On pages 7-23 of the Petition, Petitioner provides a table listing the challenged claims. Under a strict reading of 37 C.F.R. § 42.24, a listing of the challenged claims must be provided as an exhibit. Regardless, Petitioner includes with the claim listing an additional column providing a short hand description of each claim limitation.

Petitioner's shorthand column contains 1,416 words, which, when added to the 13,994 words that Petitioner contends to be in the remainder of the Petition, puts the total word count of the Petition above the statutory 14,000-word limit.

Accordingly, the Petition should be denied because the Petition exceeds the statutory 14,000-word limit.

VII. CONCLUSION

For the reasons set forth above, Petitioner's Petition for *Inter Partes* Review should be denied in its entirety.

Dated: February 29, 2024

Respectfully submitted,

/Anish R. Desai/

Anish R. Desai
Reg. No. 73,760
Lead Counsel for Patent Owner
Weil, Gotshal & Manges LLP
767 Fifth Ave.
New York, NY 10153
anish.desai@weil.com
T: 212-310-8000

Elizabeth S. Weiswasser
Reg. No. 55,721
Weil, Gotshal & Manges LLP
767 Fifth Ave.
New York, NY 10153
elizabeth.weiswasser@weil.com
T: 212-310-8022

Adrian C. Percer
Reg. No. 46,986
Weil, Gotshal & Manges LLP
201 Redwood Shores Parkway
Redwood Shores, CA 94065
adrian.percer@weil.com
T: 650-802-3124

W. Sutton Ansley
Reg. No. 67,828
Weil, Gotshal & Manges LLP
2001 M Street NW, Suite 600
Washington, DC 20036
sutton.ansley@weil.com
T: 202-682-7018

Christopher M. Pepe
Reg. No. 73,851
Weil, Gotshal & Manges LLP
2001 M Street NW, Suite 600
Washington, DC 20036
christopher.pepe@weil.com
T: 202-682-7153

CERTIFICATE OF COMPLIANCE

Pursuant to 37 C.F.R. § 42.24 et seq., the undersigned certifies that this document complies with the type-volume limitations. This document contains 8,169 words as calculated by the “Word Count” feature of Microsoft Word 2016, the word processing program used to create it.

Respectfully submitted,

WEIL, GOTSHAL AND MANGES LLP

Dated: February 29, 2024

By: /Anish R. Desai/
Anish R. Desai
Reg. No. 73,760
Lead Counsel for Patent Owner
Weil, Gotshal & Manges LLP
767 Fifth Ave.
New York, NY 10153
anish.desai@weil.com
T: 212-310-8000

CERTIFICATE OF SERVICE

I hereby certify that a true and correct copy of **PATENT OWNER'S PRELIMINARY RESPONSE TO PETITION FOR INTER PARTES REVIEW OF U.S. PATENT NO. 11,497,864 and accompanying exhibits** were served on February 29, 2024, via email pursuant to 37 C.F.R. and § 42.107 to Petitioner at the addresses below:

LEAD COUNSEL	BACK-UP COUNSEL
William A. Meunier Mintz, Levin, Cohn, Ferris, Glovsky and Popeo P.C. One Financial Center Boston, MA 02111 WAMeunier@mintz.com T: 617-542-6000	Michael T. Renaud Adam S. Rizk Mintz, Levin, Cohn, Ferris, Glovsky and Popeo P.C. One Financial Center Boston, MA 02111 MTRenaud@mintz.com ARizk@mintz.com T: 617-542-6000 Reza Dokhanchy Michael D Van Loy Mintz, Levin, Cohn, Ferris, Glovsky and Popeo P.C. 3580 Carmel Mountain Road, Suite 300 San Diego, CA 92130 RDokhanchy@mintz.com MDVanLoy@mintz.com T: 858-314-1500

Dated: February 29, 2024

By: /Ryan Sotnick/

Ryan Sotnick

IP Paralegal

Weil, Gotshal & Manges LLP

2001 M Street NW, Suite 600

Washington, DC 20036

ryan.sotnick@weil.com

T: 202-682-7000