IPR2016-01268
U.S. Patent No. 8,365,742
"Electronic Cigarette"

R.J. Reynolds Vapor Company
v.
Fontem Holdings 1 B.V.

Oral Argument
October 10, 2017

PETITIONER'S DEMONSTRATIVES

Before the Honorable Brian J. McNamara, Jeremy M. Plenzler, and Jo-Anne M. Kokoski,

Administrative Patent Judges

U.S. Patent No. 8,365,742

2. An electronic cigarette, comprising:
a battery assembly and an atomizer assembly within a housing with the battery assembly electrically connected to the atomizer assembly;
a liquid storage component in the housing;
with the housing having one or more through-air-inlets;
the atomizer assembly including a porous component supported by a frame having a run-through hole;
a heating wire wound on a part of the porous component in the path of air flowing through the run-through hole; and
the porous component substantially surrounded by the liquid storage component.

3. An electronic cigarette, comprising:
a battery assembly and an atomizer assembly within a housing with the battery assembly electrically connected to the atomizer assembly;
with the housing having one or more through-air-inlets and an outlet;
the atomizer assembly includes a frame having a run through hole, and a porous component between the frame and the outlet;
a heating wire wound on a part of the porous component which is substantially aligned with the run-through hole; and
with the porous component in contact with a liquid supply in the housing.

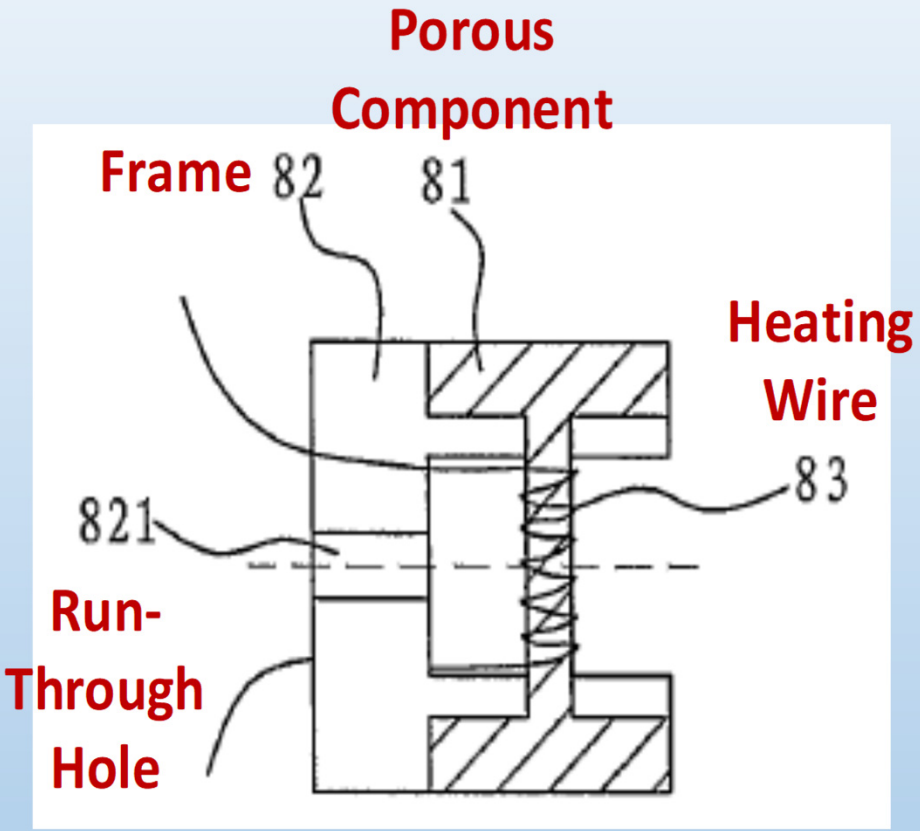
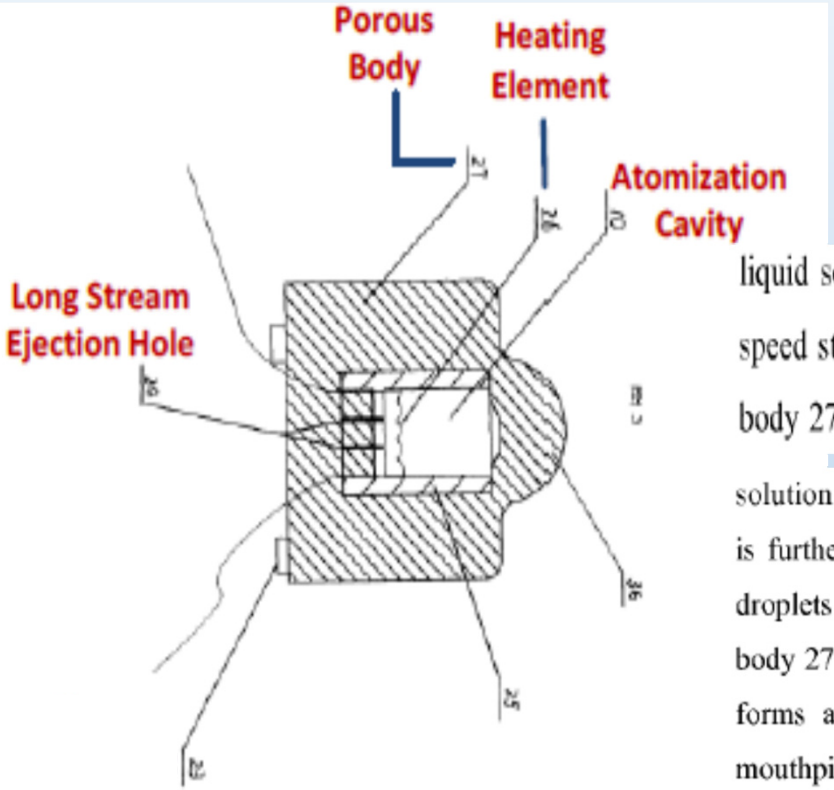


Fig. 18

(742 Patent, Ex. 1001, 6:27-52; Petition, paper 2, p. 9)

Hon 043



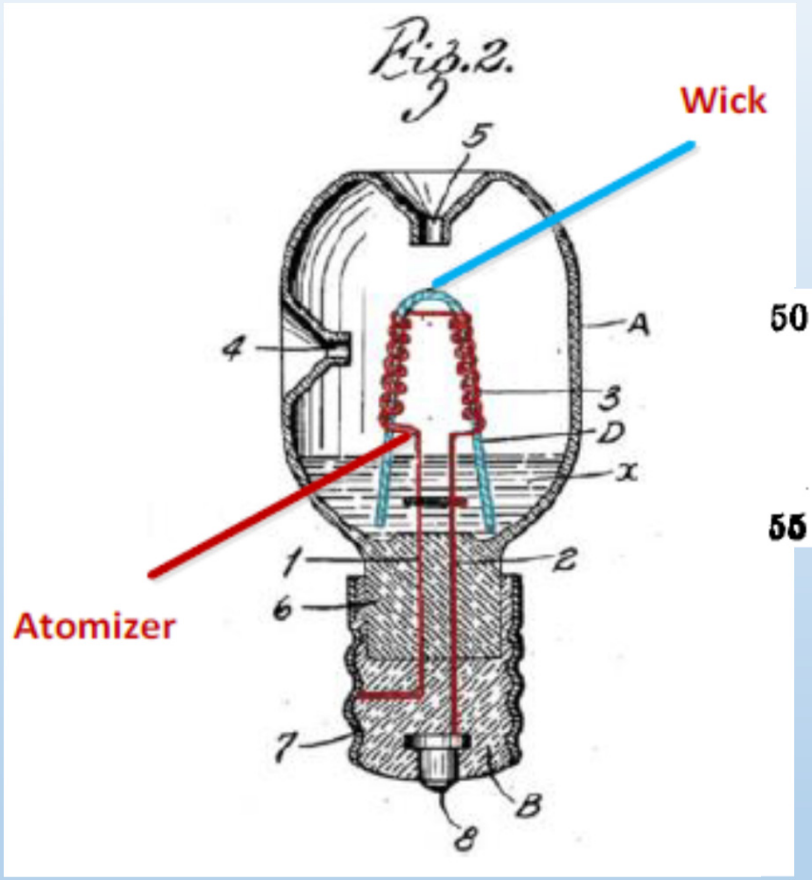
Ex. 1003, Fig. 6

liquid separator 7, and flows into the atomization cavity 10 in the atomizer 9. The high speed stream passing through the ejection hole drives the nicotine solution in the porous body 27 to eject into the atomization cavity 10 in the form of droplet, where the nicotine solution is subjected to the ultrasonic atomization by the first piezoelectric element 23 and is further atomized by the heating element 26. After the atomization, the large diameter droplets stick to the wall under the action of eddy flow and are reabsorbed by the porous body 27 via the overflow hole 29, whereas the small diameter droplets float in stream and forms aerosols, which are sucked out via the aerosol passage 12, gas vent 17 and mouthpiece 15. The solution storage porous body 28 in the liquid-supplying bottle 11 will

To simplify the design, the first piezoelectric element 23 on the atomizer 9 can be omitted, and the atomization of the nicotine solution will be made only by the heating element 26. The size of such an atomizer can be made smaller, and the structure of the

(Petition, paper 2, p. 15; Hon 043, Ex. 1003, pp. 10-11; Reply Brief, paper 30, pp. 22-23)

Whittemore

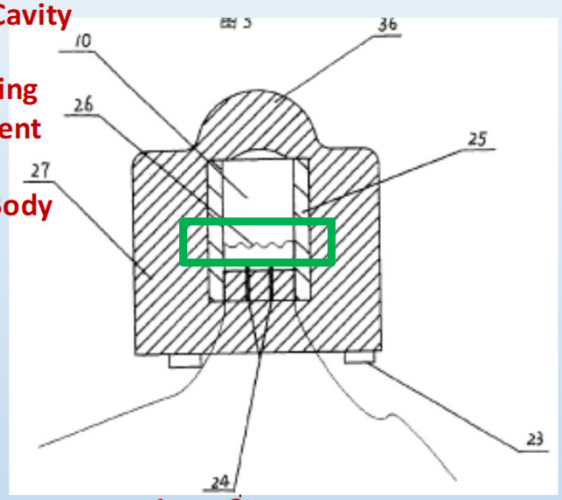


In order that the unit will function properly, even though the heating element or filament **3** is spaced a considerable distance above or away from the medicament *x*, the unit is equipped with a wick **D** made of any suitable material and combined with the heating element or filament **3** in such a way that a portion of said wick is always in contact or approximate contact with the heating element or filament **3**, and a portion of said wick is always in contact with the medicament in the vaporizing vessel, whereby said medicament will be carried by capillary action to a point where it will be vaporized by the heat from the filament **3**. In the form of my invention

Ex. 1004, Fig. 2

(Petition, paper 2, pp. 16-17; Whittemore, Ex. 1004-00002)

Hon 043 + Whittemore



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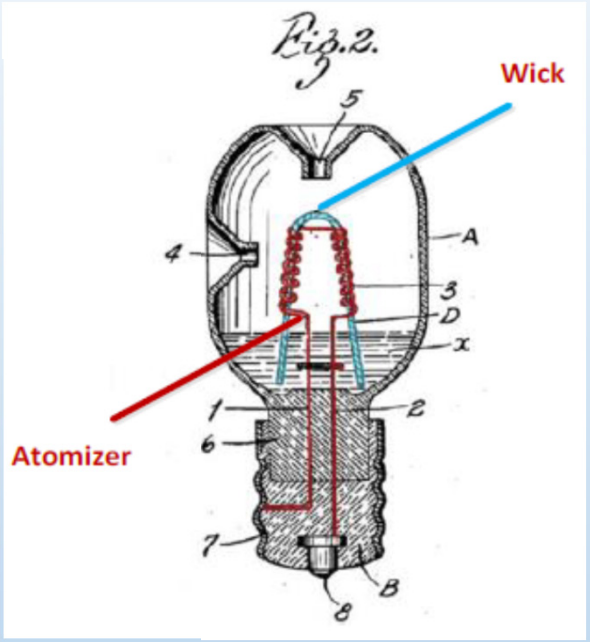
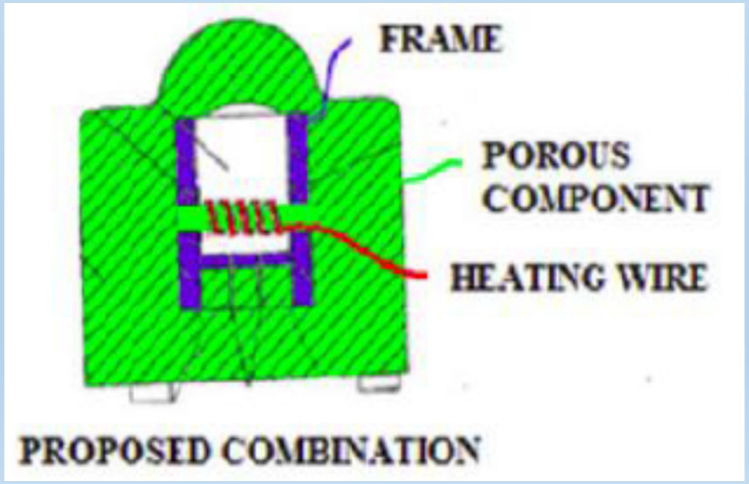




(Petition, paper 2, pp. 14, 16; Sturges Reply Decl., Ex. 1027, ¶ 50)

KSR Int'l v. Co. v. Teleflex Inc., 550 U.S. 398, 416 (2007)

Where a "patent claims a structure already known in the prior art that is altered by the mere substitution of one element for another known in the field, the combination must do more than yield predictable results."

(Petition, paper 2, pp. 4, 19; Reply Brief, paper 30, p. 22)

U.S. Patent No. 8,365,742

2. An electronic cigarette, comprising:

a battery assembly and an atomizer assembly within a housing with the battery assembly electrically connected to the atomizer assembly;

a liquid storage component in the housing;

with the housing having one or more through-air-inlets;

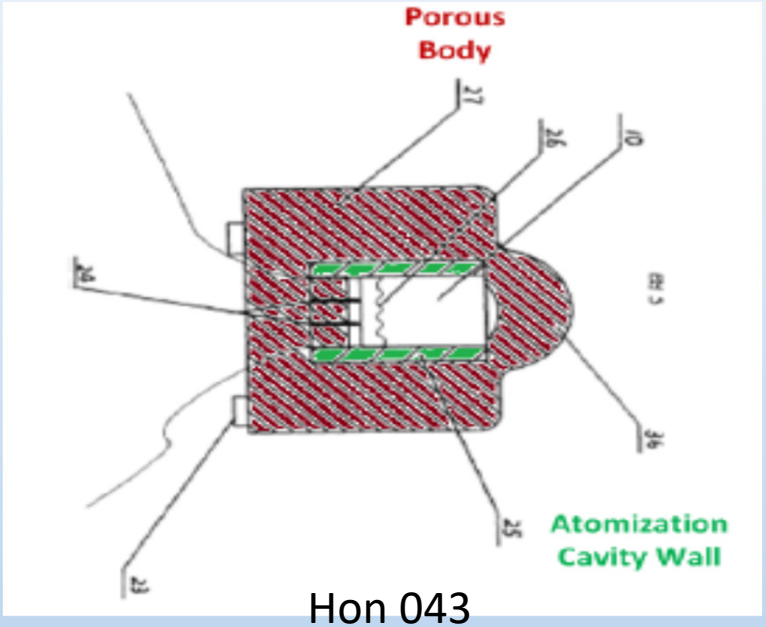
the atomizer assembly including a porous component supported by a frame having a run-through hole;

a heating wire wound on a part of the porous component in the path of air flowing through the run-through hole; and

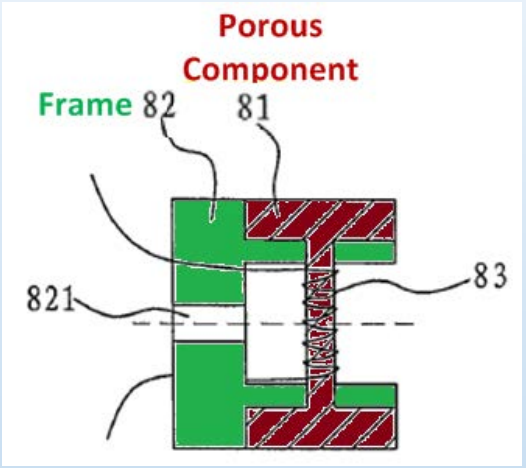
the porous component substantially surrounded by the liquid storage component.

(742 Patent, Ex. 1001, 6:27-38)

Supported By



Hon 043
Ex. 1003, Fig. 6



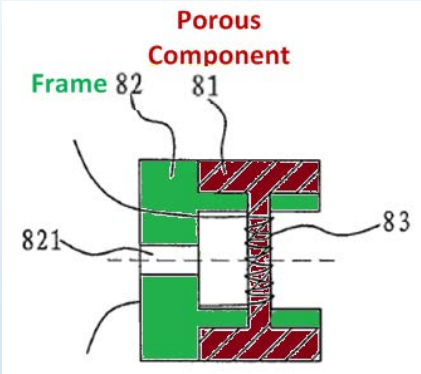
742 Patent
Ex. 1001, Fig. 18

additionally provided in the atomizer; the porous body in the atomizer is made of foam nickel, stainless fiber felt, high molecule polymer foam and foam ceramic; the heating

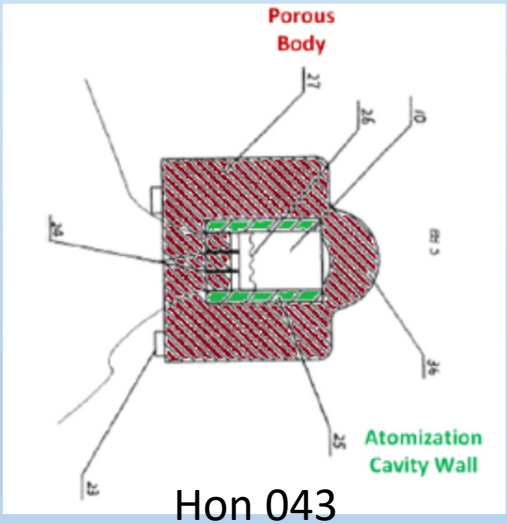
(81) fits with the cigarette bottle assembly. The porous component (81) is made of foamed nickel, stainless steel fiber felt, macromolecular polymer foam or foamed ceramics.

(Reply Brief, paper 30, p. 11; Hon 043, Ex. 1003, p. 7; 742 Patent, Ex. 1001, 5:50-52; Petitioner's Suppl. Brief, paper 51, pp. 1-2)

Meyst - Supported By



742 Patent
Ex. 1001, Fig. 18



Hon 043
Ex. 1003, Fig. 6

Q. What -- what does the rigidity of the porous component have to do with why you would have this portion of frame positioned internal to the porous component?

MR. HAMILTON: Objection. Form.

THE WITNESS: I just mentioned that it is -- it could be -- based on testimony, it could be a very soft, pliable material. It needs to be supported in that function, in that position, in that location and that construction to work. So it's part of the design.

Well, the porous component is not a rigid -- necessarily a rigid material. It could be. It could be -- have a wide range of properties.

(Reply Brief, paper 30, p. 11; Meyst 1692 IPR Dep. Tr., Ex. 1035, 18:7-17, 17:21-23; Petitioner's Suppl. Brief, paper 51, pp. 1-2)

Meyst – Supported By

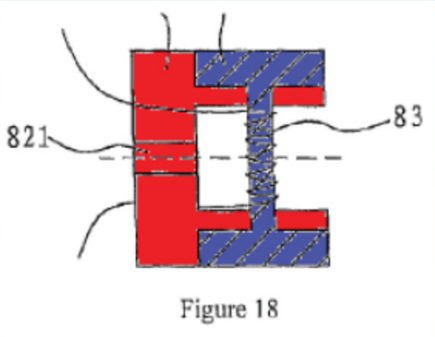
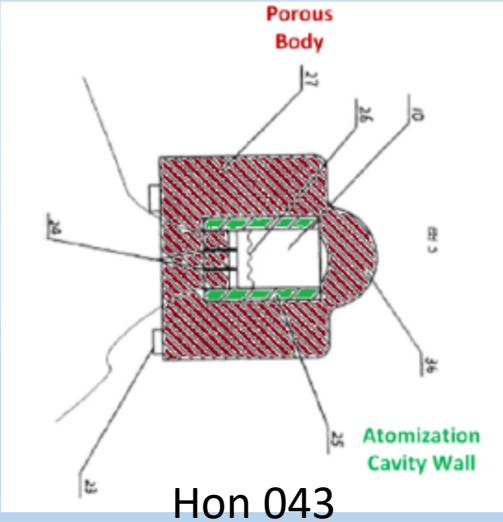


Figure 18

742 Patent
Ex. 1001, Fig. 18



Hon 043
Ex. 1003, Fig. 6

Q. Okay. And my question simply is: If the seal or the point of attachment was the blue portion, the porous component to the shell, and not the red portion, would the frame be providing any weightbearing support for the porous component?

A. Yes, in the direction of gravity.

Q. And could you explain how so?

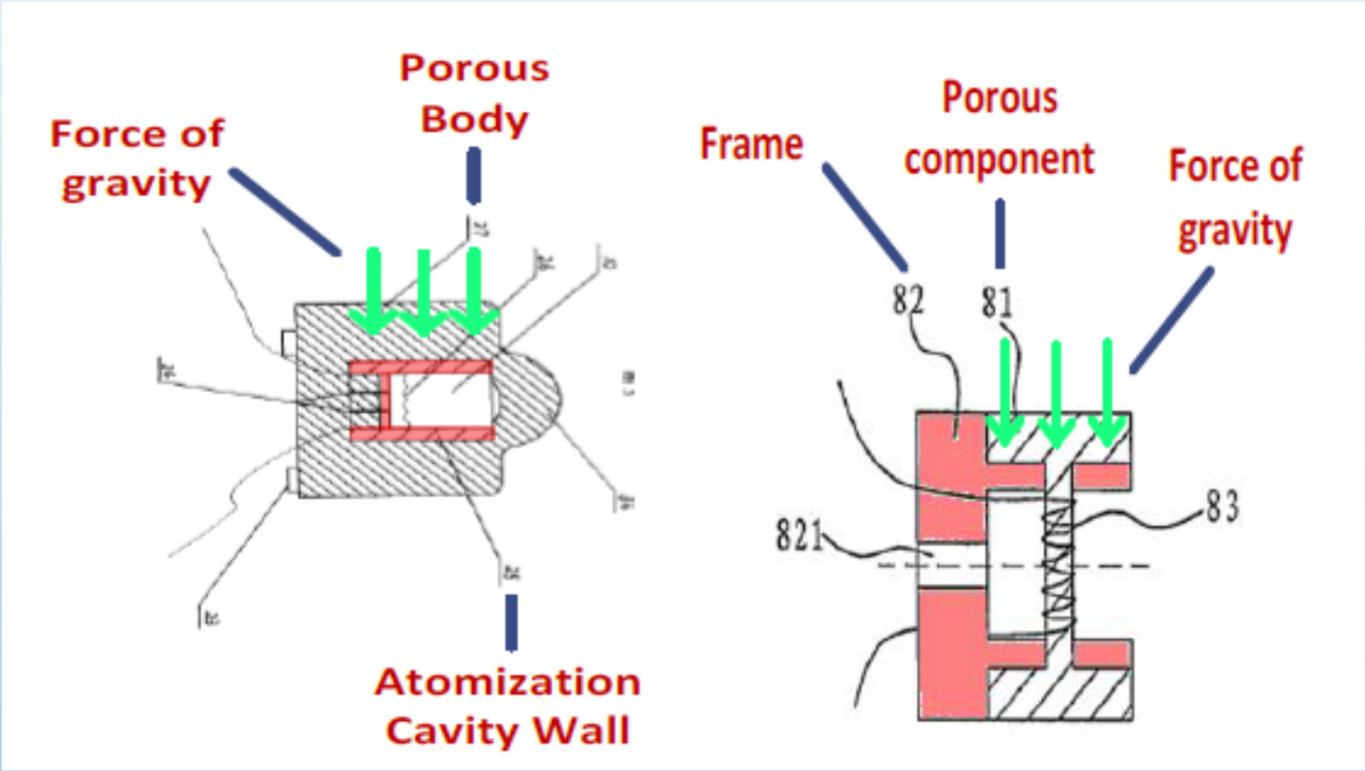
A. Well, if we look at, for instance, Figure 18, if it is inside the shell, the red component is still holding up on the -- what would be the top part, so gravity acting downward as it normally does, that would be providing a force in the downward direction due to the mass, and even though the bottom part would be in touch with the shell, but the top part is still being held up.

Q. And what portion of the frame would be providing that support you're referring to?

A. Well, I guess what we have called the horizontal component.

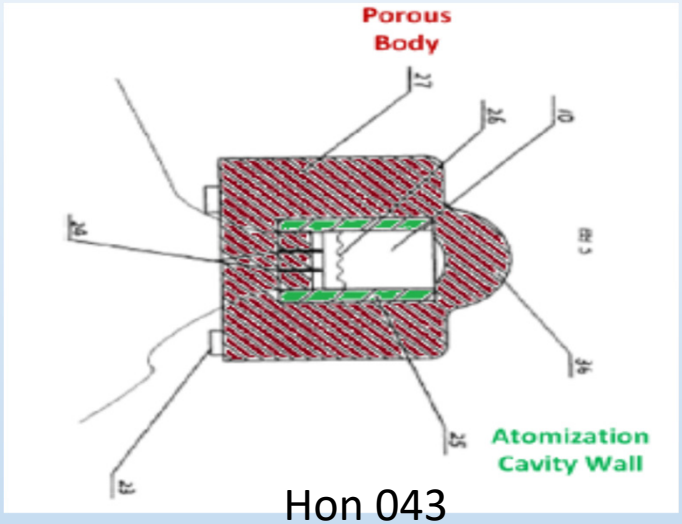
(Reply Brief, paper 30, pp. 9-11; Meyst Decl., Ex. 2015, ¶ 29; Meyst Dep. Tr., Ex. 1023, 48:21-49:14)

Weight-Bearing Support

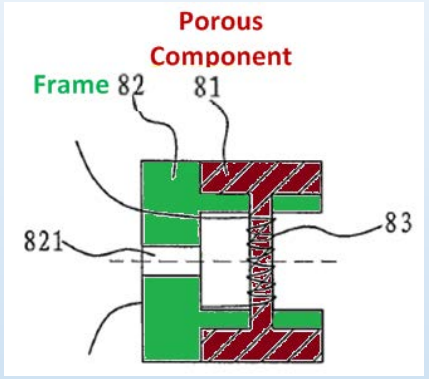


(Reply Brief, paper 30, p. 9)

Meyst – Supported By



Hon 043
Ex. 1003, Fig. 6

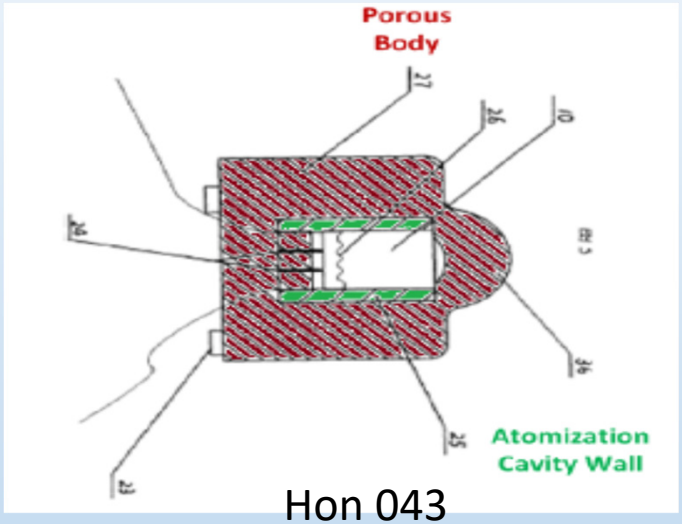


742 Patent
Ex. 1001, Fig. 18

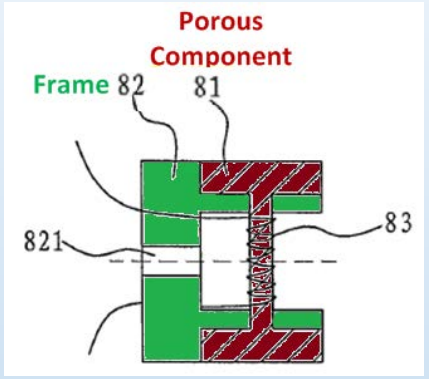
9	Q. I want to be clear, though. The frame --
10	if the porous body is set on the frame, the frame is
11	necessarily supporting the weight of the porous
12	body?
13	A. Yes.

(Reply Brief, paper 30, p. 11; Meyst Dep. Tr., Ex. 1023, 40:9-13; Sturges Reply Decl., Ex. 1027, ¶ 22)

Supported By – Weight-Bearing Support (Dr. Sturges)



Hon 043
Ex. 1003, Fig. 6

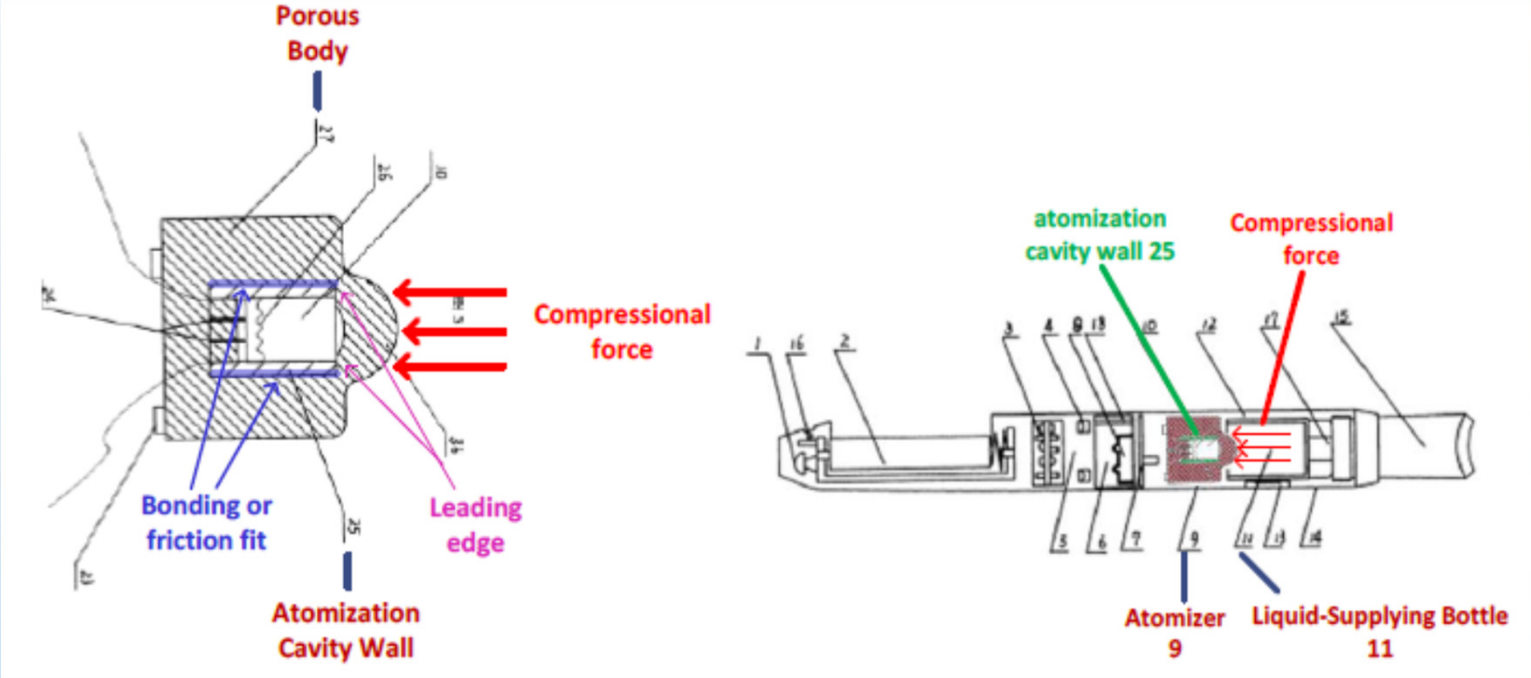


742 Patent
Ex. 1001, Fig. 18

9	A Yes. The first one may be in the -- As I	18:52:19
10	mentioned before, the case in which the porous body is	18:52:24
11	full of liquid and but for the support of the cavity	18:52:30
12	wall, it would sag rather like a horse's back under the	18:52:39
13	weight of gravity if we're holding the electronic	18:52:48
14	cigarette in the position as shown in figures 1 and 2 of	18:52:53
15	the '043 patent.	18:53:01

(Reply Brief, paper 30, pp. 8-9, 11; Sturges Dep. Tr., Ex. 2016, 187:9-15)

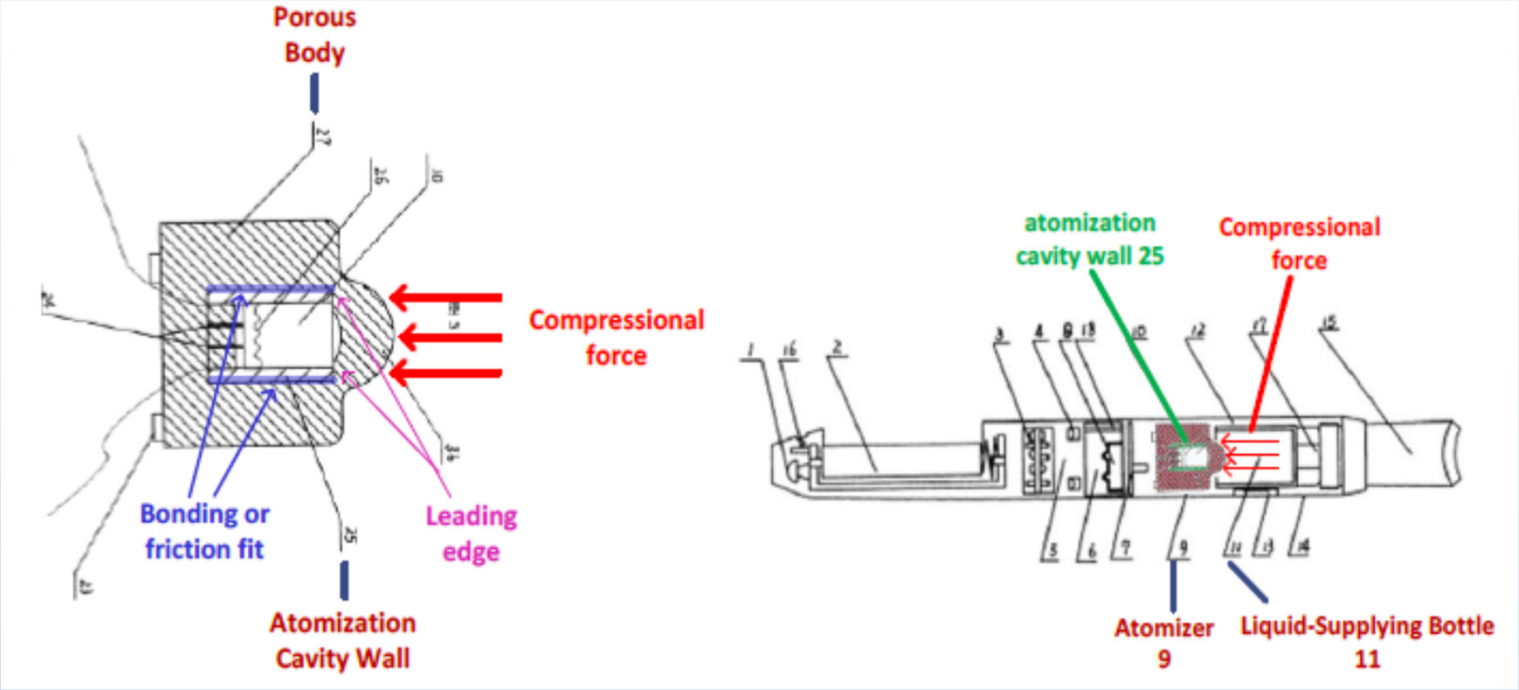
Supported By – Axial Support (Dr. Sturges)



cavity wall 25. The PHOSITA would have recognized that the porous body is attached to the cavity wall 25 via either a friction fit or through a bonding material to prevent axial displacement of the porous body under the shear forces exerted at the interface of cavity wall 25 with the porous body 27 when the porous body is inserted into the storage porous body 28. The shear forces could be particularly

(Reply Brief, paper 30, p. 12; Sturges Petition Decl., Ex. 1015, ¶ 45)

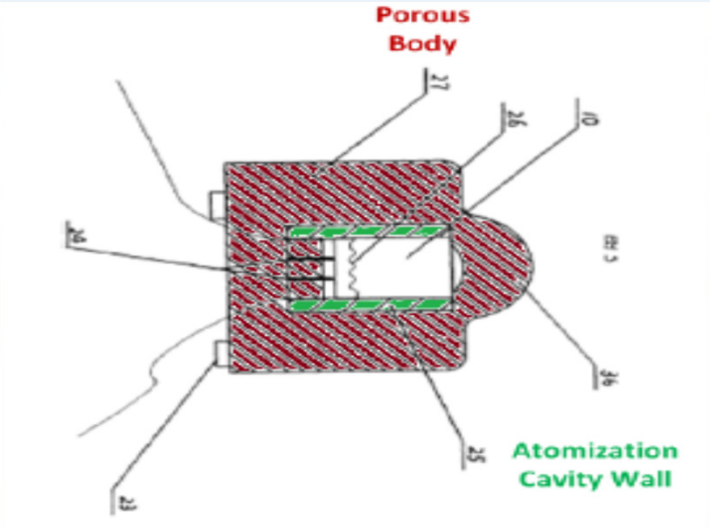
Supported By – Axial Support (Dr. Sturges)

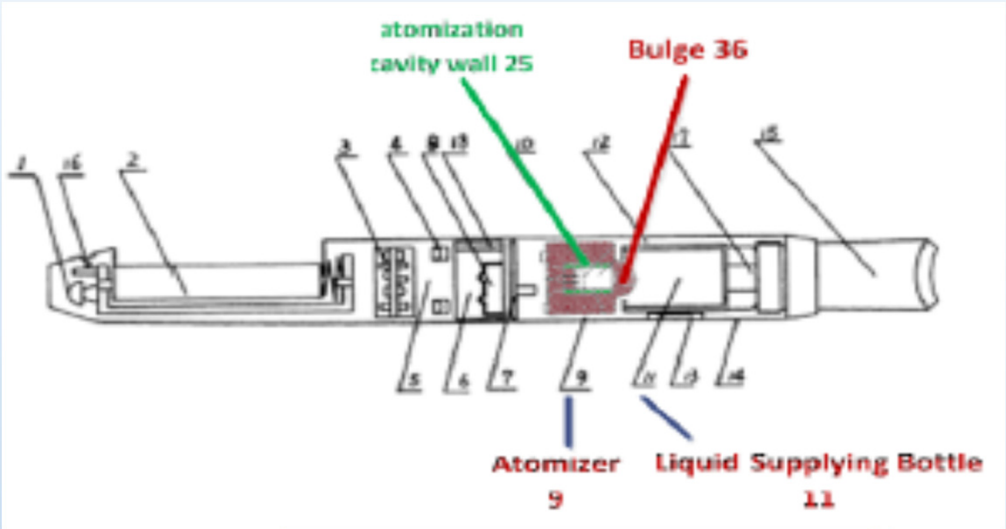


46. In addition, the PHOSITA would also have understood that the leading edge of the atomization wall 25 provides further support to the porous body 27 as it is inserted into the solution storage body 28.

(Reply Brief, paper 30, p. 12; Sturges Petition Decl., Ex. 1015, ¶ 46)

Supported By – Radial Support (Dr. Sturges)





47. The atomization cavity wall 25 also provides radial support when the low pressure area surrounding the atomizer is raised due to blowing on the mouthpiece, particularly if the porous body 27 is made from a material with relatively low rigidity. More specifically, the PHOSITA would have understood that there normally is a lower pressure region surrounding the atomizer 9 since its flat face is at a higher pressure due to the fact that the air is not moving substantially and that the area around the cylindrical part of the atomizer is very restricted.

(Sturges Petition Decl., Ex. 1015, ¶¶ 44, 47; Reply Brief, paper 30, p. 11)

Claim 3

3. An electronic cigarette, comprising:

a battery assembly and an atomizer assembly within a housing with the battery assembly electrically connected to the atomizer assembly;

with the housing having one or more through-air-inlets and an outlet;

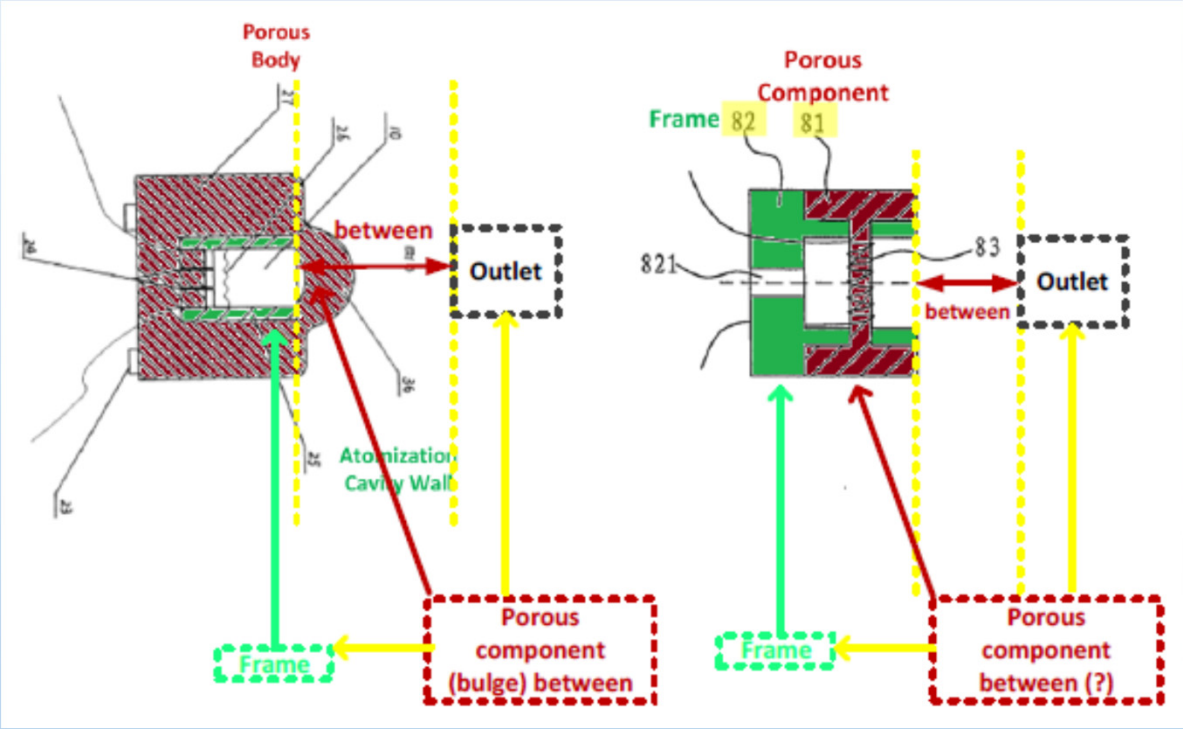
the atomizer assembly includes a frame having a run through hole, and a porous component between the frame and the outlet;

a heating wire wound on a part of the porous component which is substantially aligned with the run-through hole; and

with the porous component in contact with a liquid supply in the housing.

(742 Patent, Ex. 1001, 6:39-52)

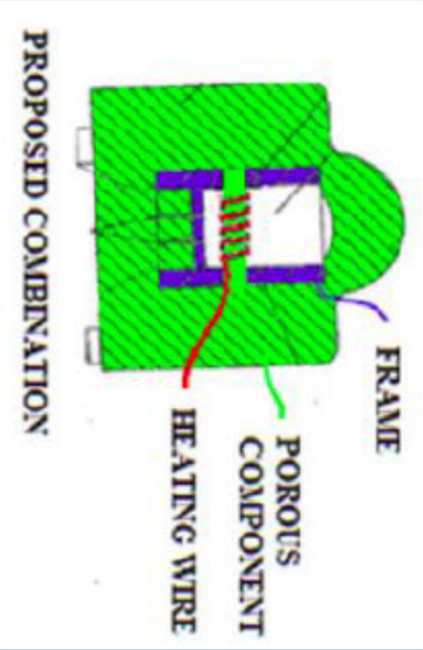
Between

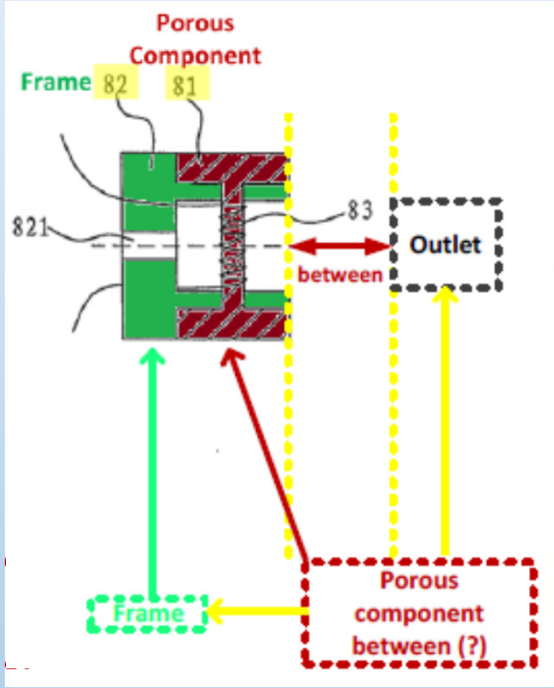


(Reply Brief, paper 30, pp. 27(f.n. 3), 28)

R.J. Reynolds Vapor Ex. 1036-00018

Between





(Reply Brief, paper 30, pp. 27 (f.n. 3), 28; Sturges Reply Decl., Ex. 1027, ¶ 50)

Motivation

59. Because of the obvious thermal inefficiencies of the "naked" heating wire disclosed in Hon, the PHOSITA would have been highly motivated to modify Hon '043 by substituting the wick/heating element configuration of Whittemore for the heating element 26 of Hon '043. As the PHOSITA would have readily understood, the thermal efficiency of Hon '043 could be improved by simply including a wick inside the windings of the heating element as disclosed in Whittemore. The wick would thus pull liquid nicotine from the porous body 27 (via capillary action) into direct contact with the heating element 26. This

(Sturges Petition Decl., Ex. 1015, ¶ 59)

Predictable Results

59. Because of the obvious thermal inefficiencies of the "naked" heating wire disclosed in Hon, the PHOSITA would have been highly motivated to modify Hon '043 by substituting the wick/heating element configuration of Whittemore for the heating element 26 of Hon '043. As the PHOSITA would have readily understood, the thermal efficiency of Hon '043 could be improved by simply including a wick inside the windings of the heating element as disclosed in Whittemore. The wick would thus pull liquid nicotine from the porous body 27 (via capillary action) into direct contact with the heating element 26. This modification would also lead to a predictable result, namely, vaporization of the liquid nicotine. Moreover, and as the PHOSITA would have readily appreciated, because Whittemore's configuration requires that the heating element operates at lower temperatures than the configuration of Hon '043, modifying Hon '043 with the wick/heating element configuration of Whittemore would reduce the temperature required at the heating element and thus require less energy from the battery to create an aerosol. This leads to another expected benefit, which the PHOSITA would have readily appreciated, lower energy demand translates into improved battery life.

(Sturges Petition Decl., Ex. 1015, ¶ 59)

Meyst – Whittemore Is “Very Similar”

Q. And my question is, with respect to Whittemore's wire-wrapped wick, does that configuration atomize liquid any differently than the wire-wrapped porous component of Figure 18?

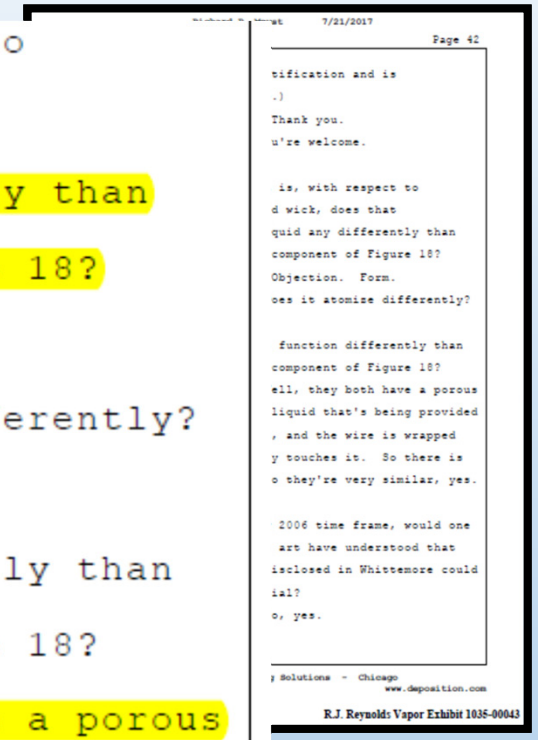
MR. HAMILTON: Objection. Form.

THE WITNESS: Does it atomize differently?

BY MR. GABRIC:

Q. Right. Does it function differently than the wire-wrapped porous component of Figure 18?

THE WITNESS: Well, they both have a porous component that contains liquid that's being provided through capillary action, and the wire is wrapped around and intermittently touches it. So there is contact between it and so they're very similar, yes.



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Page 42

tification and is
.)
Thank you.
u're welcome.

is, with respect to
d wick, does that
quid any differently than
component of Figure 18?
Objection. Form.
oes it atomize differently?

function differently than
component of Figure 18?
ell, they both have a porous
liquid that's being provided
, and the wire is wrapped
y touches it. So there is
o they're very similar, yes.

2006 time frame, would one
art have understood that
isclosed in Whittemore could
ial?
o, yes.

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R.J. Reynolds Vapor Exhibit 1035-00043

(Meyst 1692 IPR Dep. Tr., Ex. 1035, 42:6-19; Petitioner’s Suppl. Brief, paper 51, p. 5 (f.n. 5))

Meyst - Wire Wrapped Porous Component Achieves Predictable Results

Q. What, if anything -- what, if any, role does the heating wire wound on the porous component play in improving the aerosol effects or atomizing efficiency of the atomizer depicted in the '548 patent?

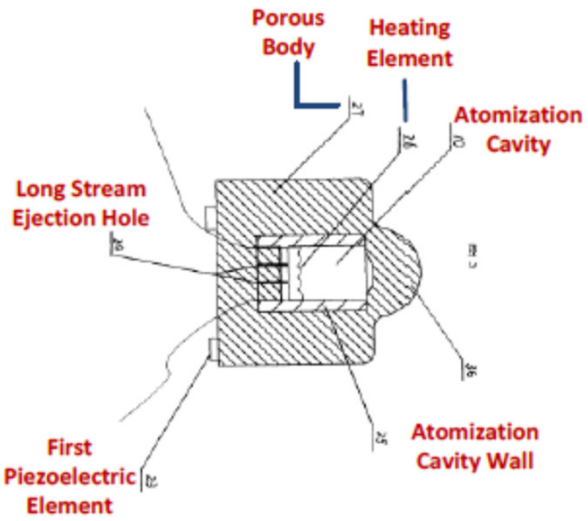
THE WITNESS: I'm comparing and contrasting this to the design in the '043 Hon patent.

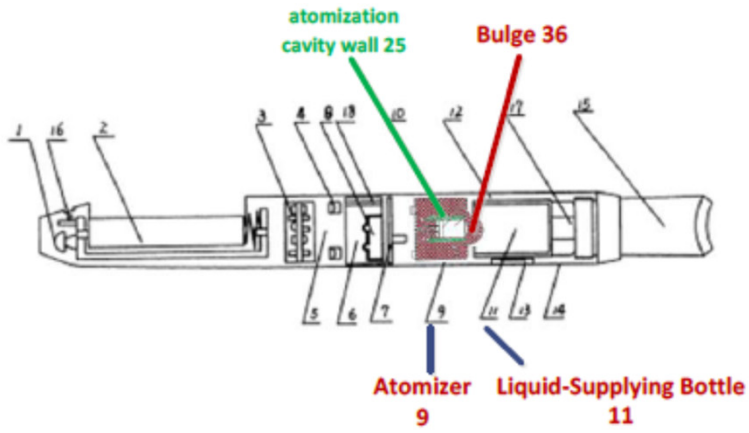
So what I was saying is that these elements help to improve the aerosol efficiency because there's direct contact, because there's a good feed of liquid to the wire. It's a consistent feed through capillary action.

(Meyst 1692 IPR Dep. Tr., Ex. 1035, 46:4-8, 10-11, 21-25; Petitioner's Suppl. Brief, paper 51, pp. 4-5)

Petition – Supported By

The Petitioner here respectfully submits that on the basis of the current record, which is more fully developed on this issue, the evidence establishes that the PHOSITA would have understood that atomization cavity wall 25 provides support for porous body 27. As explained in the accompanying declaration of Dr. Sturges, cavity wall 25 provides support for porous body 27 in several ways.





(Petition, paper 2, p. 15)

Supported By

2	Q So let's back up a little bit. We have	14:24:56
3	compression forces at the end of the cavity walls; is	14:24:57
4	that correct?	14:25:00
5	A Yes.	14:25:01
6	Q And those forces are concentrated at the end of	14:25:01
7	the cavity wall; is that correct?	14:25:04
8	A Yes.	14:25:06
9	Q And then we have shear forces along the length	14:25:08
10	of the cavity walls; is that correct?	14:25:10
11	A That's correct.	14:25:12

(Sturges Dep. Tr., Ex. 2016, 122:2-11; Reply Brief, paper 30, pp. 12, 18)

R.J. Reynolds Vapor Ex. 1036-00025

Axial Displacement And Deformation

5	Q So let's look back at paragraph 44. You state	14:19:00
6	that the cavity wall provides support for the porous	14:19:05
7	body 27 against axial displacement. Is that not the	14:19:07
8	case?	14:19:11
9	A Yes, that is the case.	14:19:11
10	Q Just a minute ago you said it's not axial	14:19:14
11	displacement, it's against collapse of the porous body.	14:19:15
12	What's the difference?	14:19:20
13	A There is no difference. The axial displacement	14:19:21
14	can cause the porous body to collapse.	14:19:27
15	Q So when you say axial displacement, what do you	14:19:30
16	mean? What is displaced axially?	14:19:32
17	A The length of the porous body under that action	14:19:36
18	may be compressed in the axial direction so that the	14:19:42
19	cavity is not the same size as it was or the pieces in	14:19:47
20	it are not where they were originally intended.	14:19:50

(Sturges Dep. Tr., Ex. 2016, 118:5-20; Reply Brief, paper 30, p. 12)

R.J. Reynolds Vapor Ex. 1036-00026

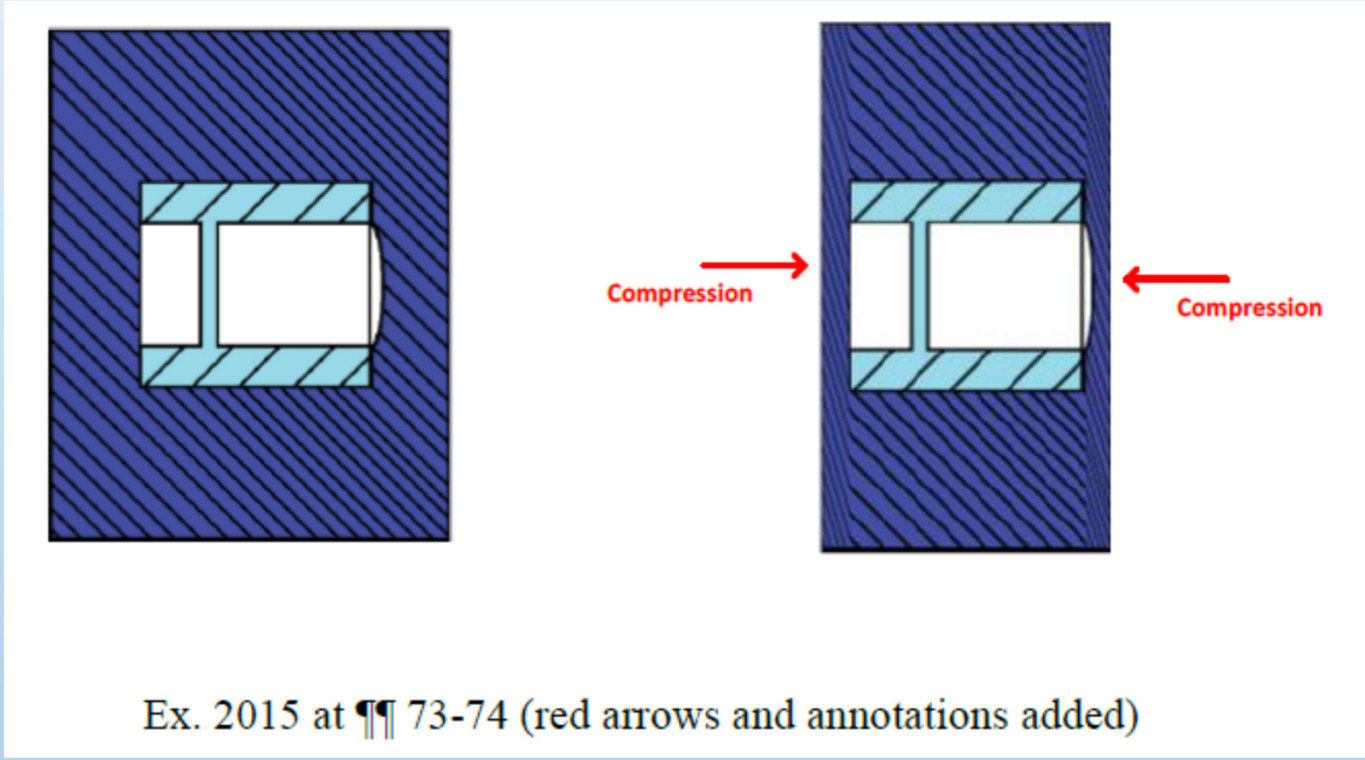
Axial Displacement And Deformation

9	Q Sure. Go ahead.	14:20:34
10	A The bulge is forcibly moved along its axis, and	14:20:36
11	that may tend to change the shape of the porous body	14:20:41
12	were it not for the cavity wall to support it.	14:20:50
13	Q And where does the cavity wall support that	14:20:55
14	bulge? Is that at the ends of the cavity wall, those	14:20:59
15	tips?	14:21:03
16	A The tip near the bulge would certainly be	14:21:06
17	involved. The reaction to that force would be taken up	14:21:09
18	preferentially by a shear force between the cavity wall	14:21:18
19	and the porous body because that area is larger and the	14:21:24
20	stress would be distributed to a lower level.	14:21:28

(Sturges Dep. Tr., Ex. 2016, 119:9-20; Reply Brief, paper 30, p. 12)

R.J. Reynolds Vapor Ex. 1036-00027

Meyst – Supported By

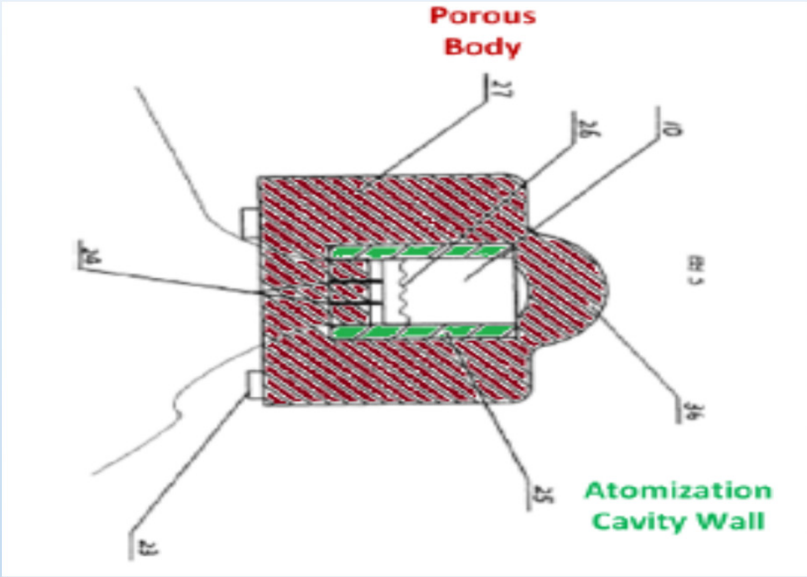


Ex. 2015 at ¶¶ 73-74 (red arrows and annotations added)

(Reply Brief, paper 30, p. 13; Meyst Decl., Ex. 2015, ¶¶ 73-74)

Meyst – Supported By

Hon 043
Ex. 1003, Fig. 6

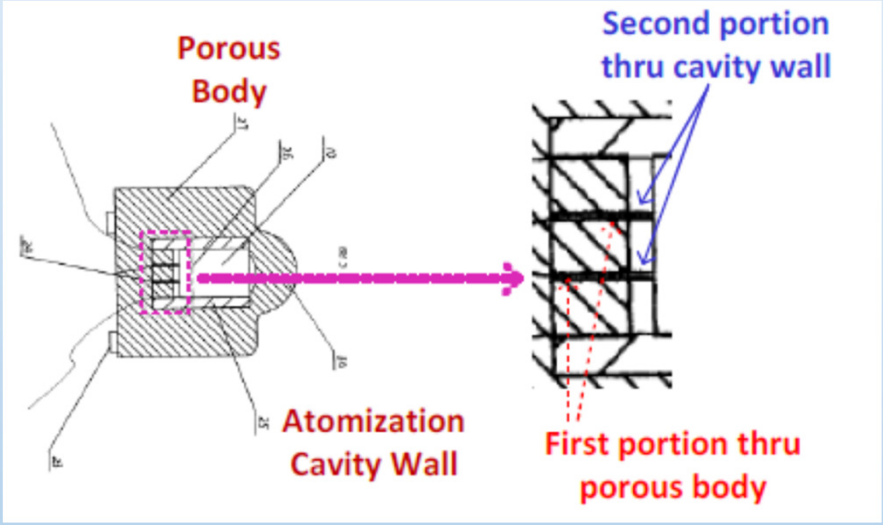


Q. Does the cavity wall play any role in preventing movement of the porous body relative to the cavity wall?

A. Well, you have a net fit, so the two parts work together in cooperation to form one part which doesn't allow for any movement.

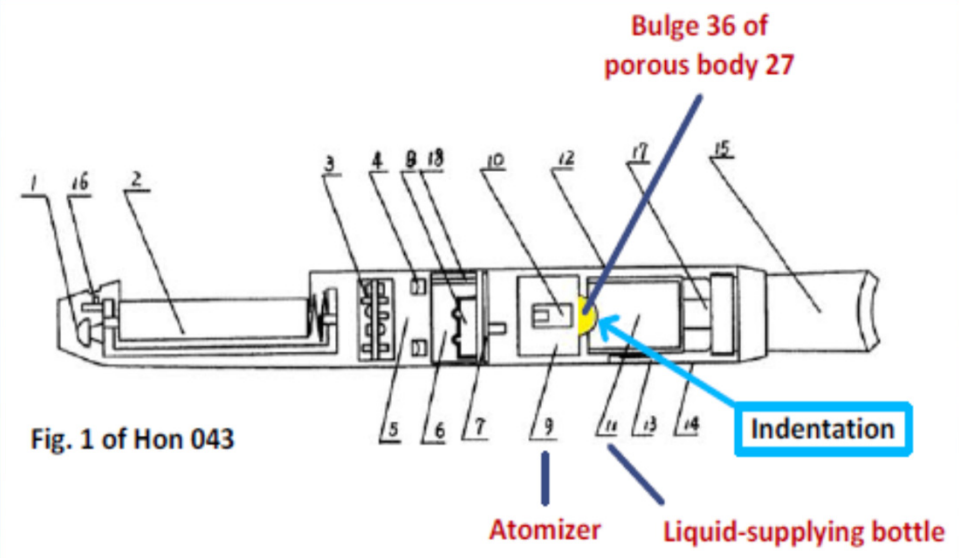
(Reply Brief, paper 30, p. 11; Meyst 1692 IPR Dep. Tr., Ex. 1035, 59:8-13; Petitioner's Suppl. Brief, paper 51, p. 4)

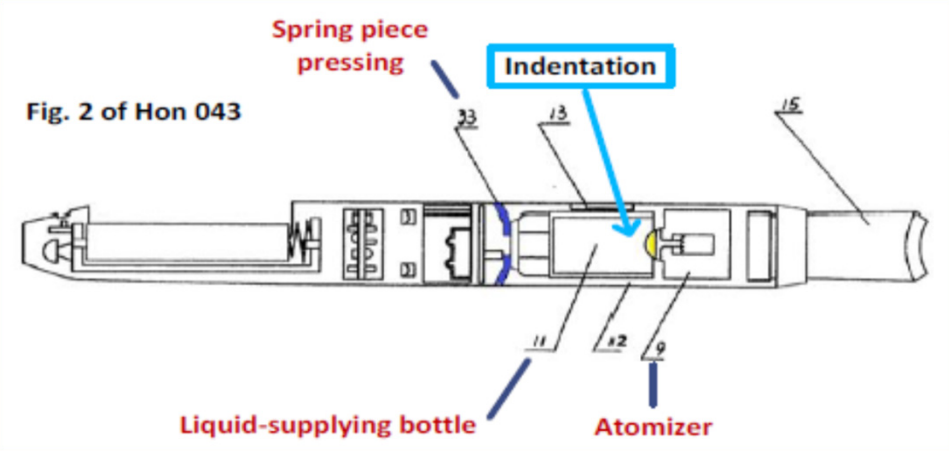
Supported By – Ejection Hole Alignment (Dr. Sturges)



(Sturges Reply Decl., Ex. 1027, ¶ 18)

Supported By – Axial Support

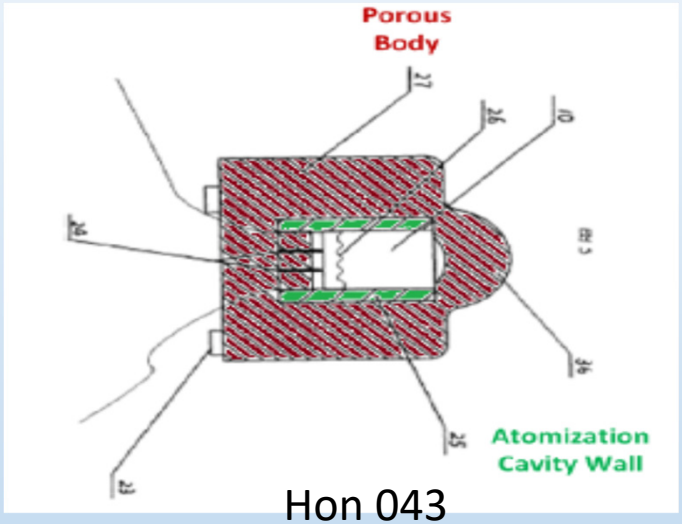




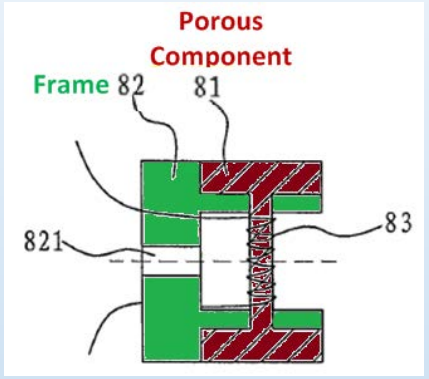
(Reply Brief, paper 30, p. 14)

R.J. Reynolds Vapor Ex. 1036-00031

Supported By – Accidental Dropping (Dr. Sturges)



Hon 043
Ex. 1003, Fig. 6

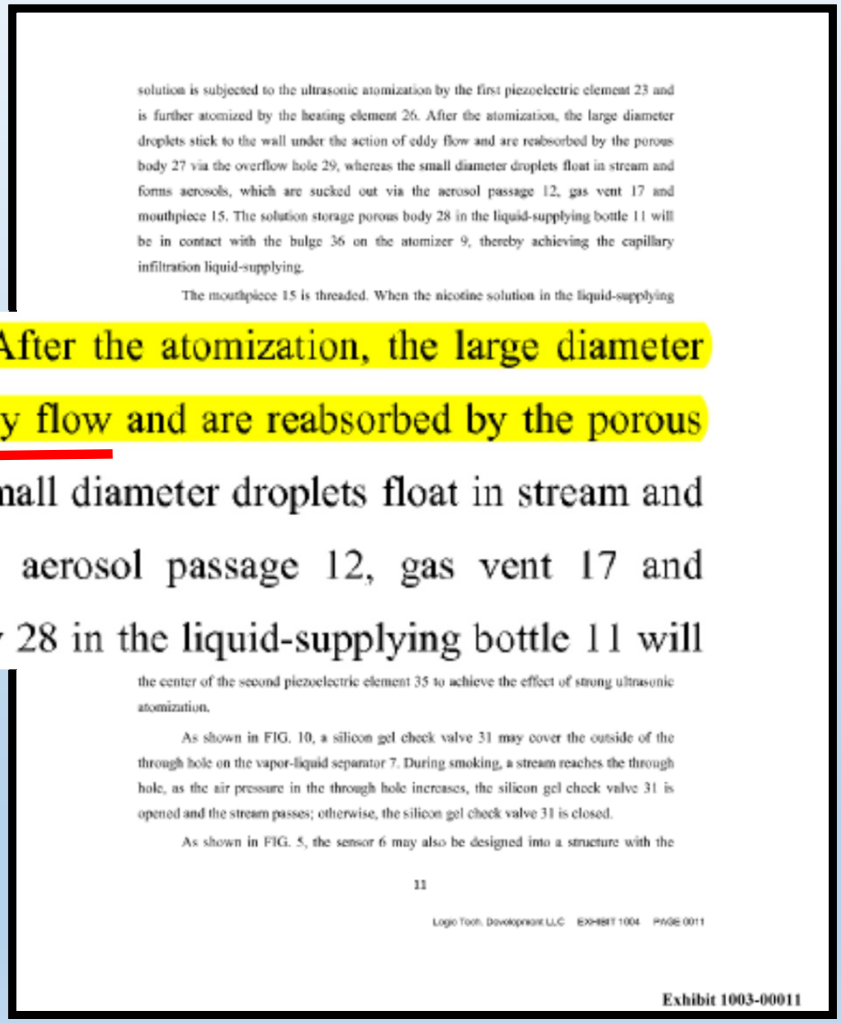


742 Patent
Ex. 1001, Fig. 18

16	Another support would be provided when the	18:53:03
17	e-cigarette may be accidentally dropped, in which case	18:53:09
18	there will be shock loadings coming from all directions,	18:53:17
19	and they would tend to move the porous body from its	18:53:20
20	usual shape but for the support of the cavity wall. And	18:53:28
21	these forces may be much larger than gravity.	18:53:36

(Reply Brief, paper 30, p. 11; Sturges Dep. Tr., Ex. 2016, 187:16-21)

Hon 043 Acknowledges Eddy Flow



solution is subjected to the ultrasonic atomization by the first piezoelectric element 23 and is further atomized by the heating element 26. After the atomization, the large diameter droplets stick to the wall under the action of eddy flow and are reabsorbed by the porous body 27 via the overflow hole 29, whereas the small diameter droplets float in stream and forms aerosols, which are sucked out via the aerosol passage 12, gas vent 17 and mouthpiece 15. The solution storage porous body 28 in the liquid-supplying bottle 11 will be in contact with the bulge 36 on the atomizer 9, thereby achieving the capillary infiltration liquid-supplying.

The mouthpiece 15 is threaded. When the nicotine solution in the liquid-supplying

is further atomized by the heating element 26. After the atomization, the large diameter droplets stick to the wall under the action of eddy flow and are reabsorbed by the porous body 27 via the overflow hole 29, whereas the small diameter droplets float in stream and forms aerosols, which are sucked out via the aerosol passage 12, gas vent 17 and mouthpiece 15. The solution storage porous body 28 in the liquid-supplying bottle 11 will

the center of the second piezoelectric element 35 to achieve the effect of strong ultrasonic atomization.

As shown in FIG. 10, a silicon gel check valve 31 may cover the outside of the through hole on the vapor-liquid separator 7. During smoking, a stream reaches the through hole, as the air pressure in the through hole increases, the silicon gel check valve 31 is opened and the stream passes; otherwise, the silicon gel check valve 31 is closed.

As shown in FIG. 5, the sensor 6 may also be designed into a structure with the

11

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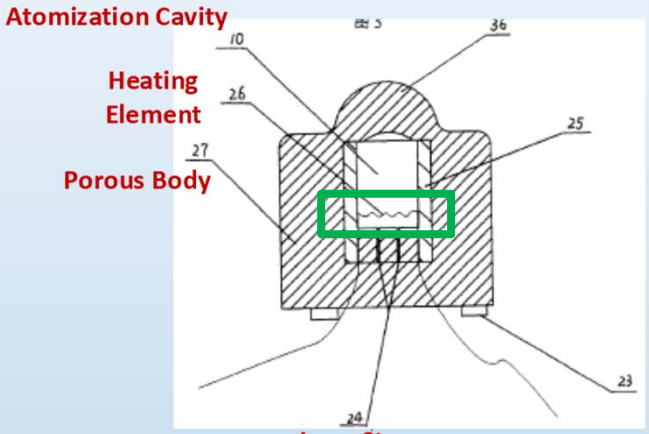
Exhibit 1003-00011

(Hon 043, Ex. 1003, p. 11; Sturges Reply Decl., Ex. 1027, ¶ 20; Meyst Decl., Ex. 2015, ¶¶ 36, 38)

Meyst – Hon 043's Heating Wire Contributes To Eddy Flow



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of the large droplets and have those removed from the air stream so that they don't go into the patient's -- or the user's mouth.

Q. What is eddy flow?

A. It's flow that -- eddys are circulating flows and flows that move around somewhat randomly.

Q. And what is causing eddy flow in the atomizer of Figure 6?

A. The air flow through the device.

Q. Why does the air flow through the device have eddy flows?

A. Well, because it's a complex structure. And as you put air through it it will move, depending on what the restrictions are in the

does that play
r?
it in here,
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play in
the cavity
the wall so

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R.J. Reynolds Vapor Exhibit 1035-00055

16 Q. Now, the heating element 26, does that play
17 any role in causing eddy flows to occur?
18 A. I don't believe it discusses it in here,
19 but I would say yes. It interrupts the flow. It
20 stops the laminar direct flow in and causes it to
21 mix up and be a very complex air pattern.

(Petition, paper 2, p. 14; Meyst 1692 IPR Dep. Tr., Ex. 1035, 54:16-21; Petitioner's Reply to P.O.'s Suppl. Brief, paper 56, pp. 2-3)

Majority of Hon 043's Droplets Will Bypass Heating Wire (Dr. Sturges)

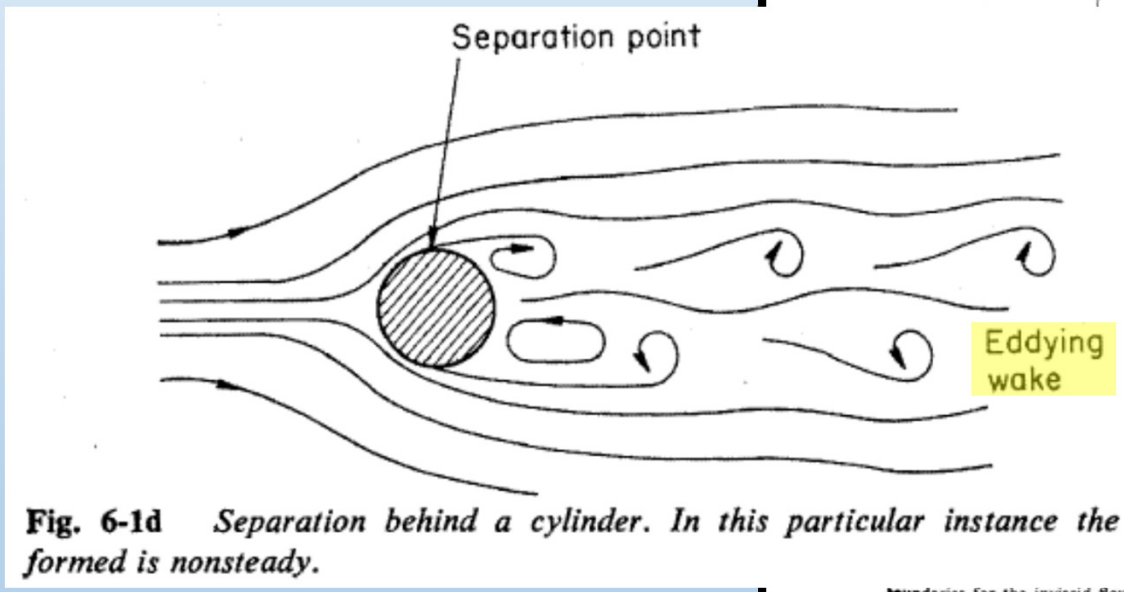

Fig. 6-1d *Separation behind a cylinder. In this particular instance the wake formed is nonsteady.*

(Sec. 6.1) *Introduction* 171

through a rapidly expanding duct—the reverse of the flow in Fig. 6-1a. Here, because of the large and rapid increase of pressure required of the low energy boundary layer (it has a lower kinetic energy than the main stream), it cannot regain pressure together with the main stream to fill completely the downstream duct. Instead the main flow, while remaining more or less unaffected by viscosity, does not follow the wall but continues into the channel as a jet. The region between the jet and the wall is filled with fluid of lower velocity that churns and eddies in an irregular way. In this way the boundary layer

Separation point

Eddying wake

is particular instance the wake

of the flow picture. When the ity) does not follow the walls of lace, it is said to *separate* or or the flow around a cylinder ion near the maximum height; which extends for many diam- f the cylinder a relatively thin nolds numbers), and the flow lered to be inviscid.

recurring importance in fluid ons and the occurrence of the bility of separation one cannot flow will conform to the shape of separation and at sufficiently oundaries may be taken as the

boundaries for the inviscid flow, because of the thinness of the boundary layer. In general these conditions are fulfilled in the forward portions of blunt bodies or along airfoil-like shapes, particularly in regions where the pressure decreases in the direction of flow.

R.J. Reynolds Vapor Exhibit 1032-00004

(Sabersky and Acosta, Ex. 1032-00004)

Substantially Increasing Size Of Hon 043's Wire Problematic (Dr. Sturges)

58. Meyst's allegation that using a heating element in sheet form instead of a wire would lead to more direct contact of droplets with the heating element and thus improve heating efficiency (Ex. 2015 at ¶¶ 100-102) is also flawed. If a sheet-form heating element is oriented with its cross section facing the ejection holes, such a heating element will likely significantly block the airflow from the ejection holes to downstream. Also, the air stream from the ejection holes will

58. Meyst's allegation that using a heating element in sheet form instead of a wire would lead to more direct contact of droplets with the heating element

olds Vapor Exhibit 1027-00040

is also flawed. If a
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jection holes will
nt cross section,
nt. Both the blocking
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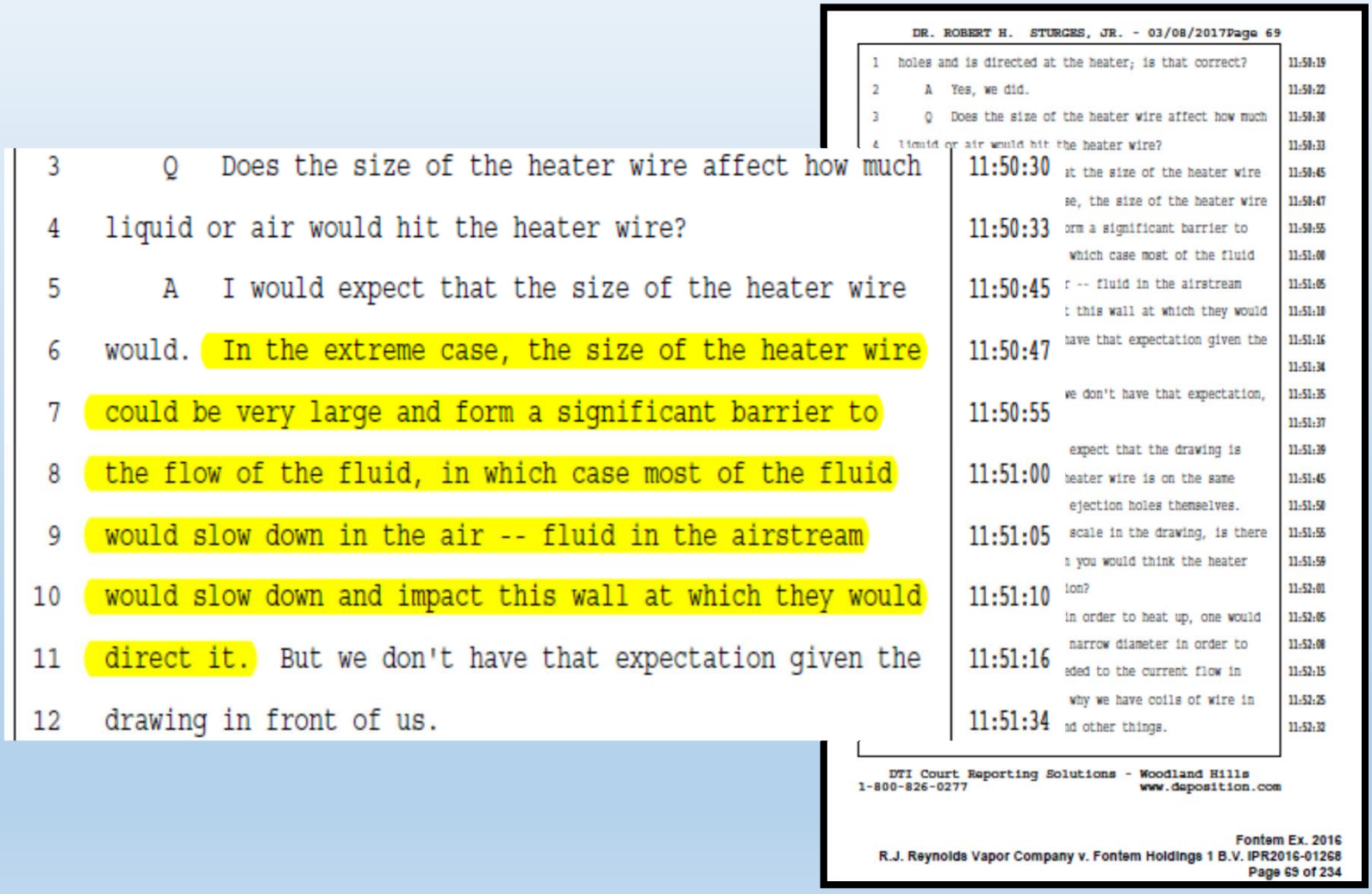
ne droplets may pass

through the space around the heating wire too quickly to be adequately heated, also leading to reduced heating efficiency. Further, as explained above, according to Meyst, blocking the airflow with a sheet could lead to other problems such as sufficient liquid for atomization.

(Sturges Reply Decl., Ex. 1027, ¶ 58)

Substantially Increasing Size Of Hon 043's Wire Problematic (Dr. Sturges)



DR. ROBERT H. STURGES, JR. - 03/08/2017Page 69

holes and is directed at the heater; is that correct?
A Yes, we did.
Q Does the size of the heater wire affect how much liquid or air would hit the heater wire?
A I would expect that the size of the heater wire would. In the extreme case, the size of the heater wire could be very large and form a significant barrier to the flow of the fluid, in which case most of the fluid would slow down in the air -- fluid in the airstream would slow down and impact this wall at which they would direct it. But we don't have that expectation given the drawing in front of us.

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R.J. Reynolds Vapor Company v. Fontem Holdings 1 B.V. IPR2016-01268
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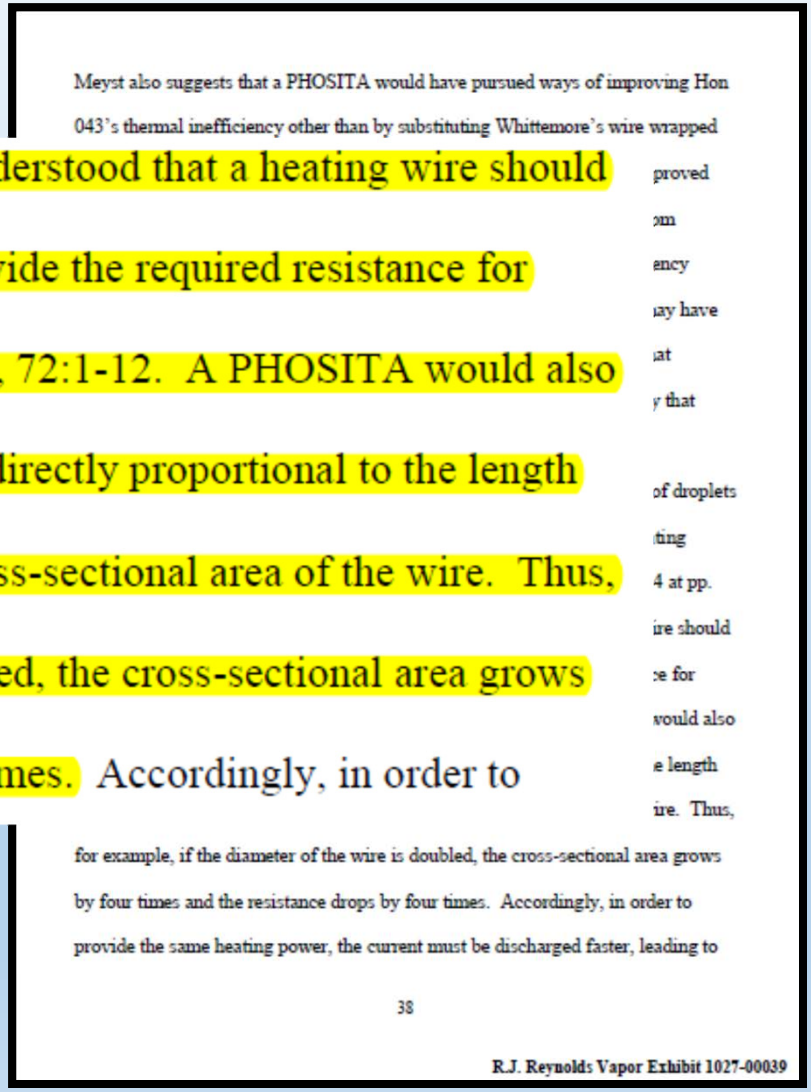
(Sturges Dep. Tr., Ex. 2016, 69:3-12; Sturges Reply Decl., Ex. 1027, ¶ 56)

Substantially Increasing Size Of Hon 043's Wire Problematic (Dr. Sturges)

48-49. I disagree. A PHOSITA would have understood that a heating wire should be sufficiently small in diameter in order to provide the required resistance for heating. Ex. 2016 (Sturges Dep. Tr.) at 69:3-25, 72:1-12. A PHOSITA would also have understood that the resistance of a wire is directly proportional to the length of the wire and inversely proportional to the cross-sectional area of the wire. Thus, for example, if the diameter of the wire is doubled, the cross-sectional area grows by four times and the resistance drops by four times. Accordingly, in order to



Meyst also suggests that a PHOSITA would have pursued ways of improving Hon 043's thermal inefficiency other than by substituting Whittemore's wire wrapped

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for example, if the diameter of the wire is doubled, the cross-sectional area grows by four times and the resistance drops by four times. Accordingly, in order to provide the same heating power, the current must be discharged faster, leading to

38

R.J. Reynolds Vapor Exhibit 1027-00039

(Sturges Reply Decl., Ex. 1027, ¶ 56)

R.J. Reynolds Vapor Ex. 1036-00038

Meyst – Increasing Size of Hon 043's Heating Element Involves Tradeoffs

Q. So it's fair to say one of ordinary skill in the art looking at Hon's Figure 6, when it comes to the heating element, they would have understood that I could increase the surface area to increase the number of droplets that strike it but there potentially are tradeoffs, such as its effect on air flow and disrupting air flow through the atomization cavity.

Is that fair?

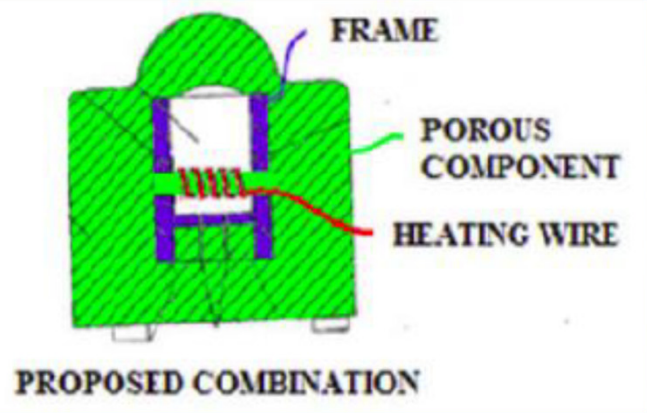
A. It's all interconnected.

Q. And one of ordinary skill in the art would have understood that, right?

A. I believe so, yes.

(Meyst 1692 IPR Dep. Tr., Ex. 1035, 62:13-25)

PHOSITA Would Retain Ejection Holes (Dr. Sturges)



51. Although I disagree with Meyst that there is an exit hole in the area of the bulge in Hon 043's atomizer, I agree that a PHOSITA would not have wrapped heating wire on the bulge part of the atomizer. *See* Ex. 2015 at ¶¶ 93-95. . I also disagree with Meyst, that the "simplest way" to combine Hon 043 with Whittemore would be to entirely discard Hon 043's atomizer and replace it with Whittemore's wire wrapped wick, instead of merely substituting Whittemore's wire wrapped wick for Hon 043's heating wire. *Id.* at ¶¶ 96-97. The PHOSITA would simply substitute Whittemore's wick/wire for the heating element in the cavity of Hon 043 at the location where the hearing element is already located in Hon 043. *See* Petition at 19, 26-29, 34; Ex. 1015 at ¶¶ 55-63; Ex. 2016 (Sturges Dep. Tr.) at 154:10-157:21; Ex. 1012 at 38. This would be the simplest and most straightforward approach. The substitution I propose retains many of the features of Hon 043, including the porous body, cavity wall, and ejection holes, which

straightforward approach. The substitution I propose retains many of the features of Hon 043, including the porous body, cavity wall, and ejection holes, which would minimize disruption of airflow through Hon 043's device as modified to have Whittemore's wire wrapped wick. Moreover, by retaining cavity wall 25 and

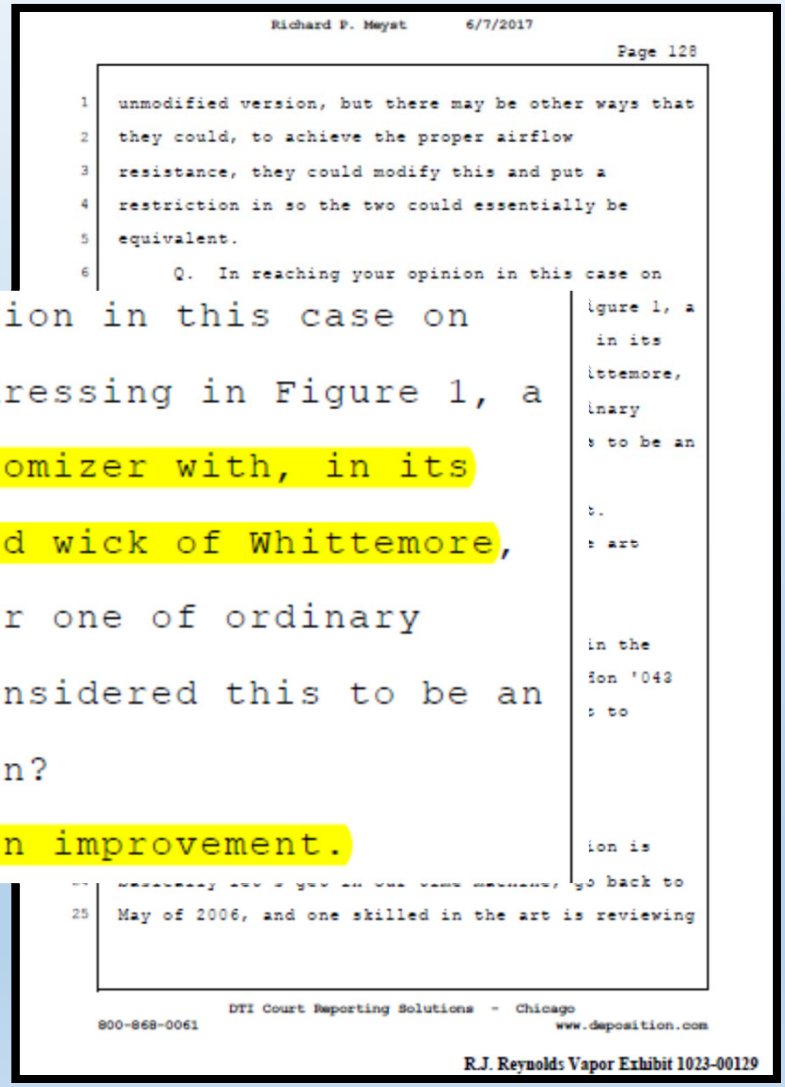
1027-00036

and
s
he
les

wick/wire. A PHOSITA would have understood that providing the needed holes to accommodate the wick/wire could be achieved in view of the fact that Hon 043 discloses several different types of holes such as the ejection holes, overflow holes and the wire holes.

(Sturges Reply Decl., Ex. 1027, ¶¶ 50-51)

Meyst – Removing Hon 043's Atomizer Not An Improvement



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unmodified version, but there may be other ways that they could, to achieve the proper airflow resistance, they could modify this and put a restriction in so the two could essentially be equivalent.

Q. In reaching your opinion in this case on the point here that you're addressing in Figure 1, a modified Hon to replace the atomizer with, in its entirety, with the wire-wrapped wick of Whittemore, did you form an opinion whether one of ordinary skill in the art would have considered this to be an improvement over unmodified Hon?

A. I don't consider it an improvement.

May of 2006, and one skilled in the art is reviewing

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R.J. Reynolds Vapor Exhibit 1023-00129

(Meyst Dep. Tr., Ex. 1023, 128:6-13; Reply Brief, paper 30, p. 26)

R.J. Reynolds Vapor Ex. 1036-00041

Supported By - Construction

P.O.'s Proposed Construction	Petitioner's Proposed Construction
"bear all or part of the weight of: hold up"	"to hold up, serve as a foundation or prop for, carry all or part of the weight of, or give strength to"

(Meyst Decl., Ex. 2015, ¶ 30; Sturges Reply Decl., Ex. 1027, ¶ 7)

Supported By - Construction

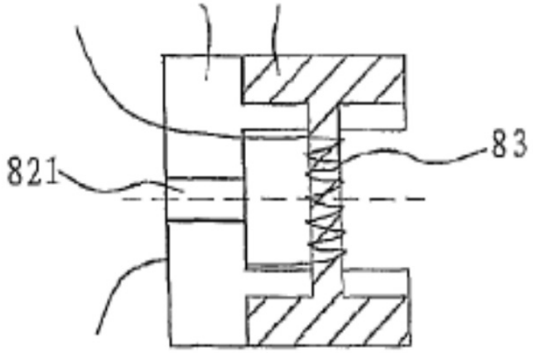


Figure 18

In the fifth preferred embodiment, as shown in FIGS. **17** and **18**, the atomizer assembly is an atomizer (**8**), which includes a frame (**82**), the porous component (**81**) set on the frame (**82**), and the heating wire (**83**) wound on the porous component (**81**). The frame (**82**) has a run-through hole (**821**) on it. The porous component (**81**) is wound with heating wire (**83**) in the part that is on the side in the axial direction of the run-through hole (**821**). One end of the porous component (**81**) fits with the cigarette bottle assembly. The porous com-

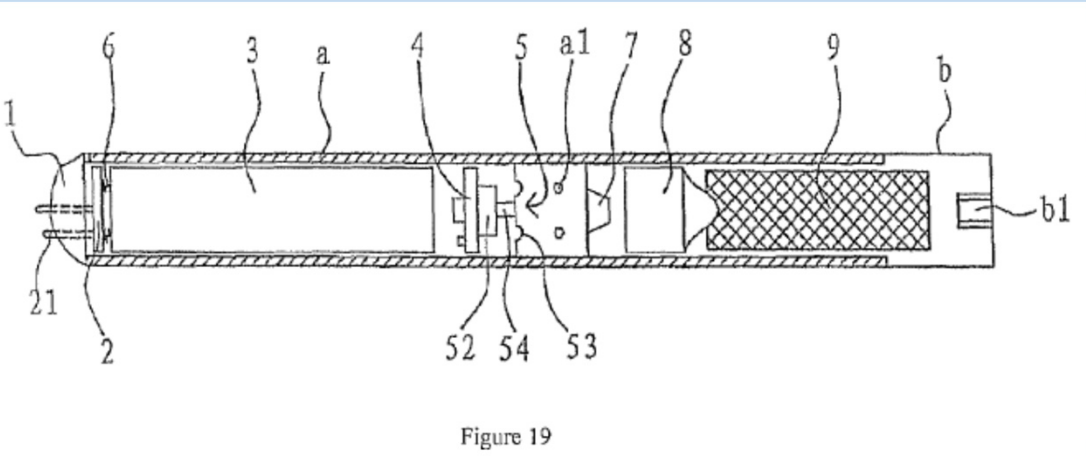
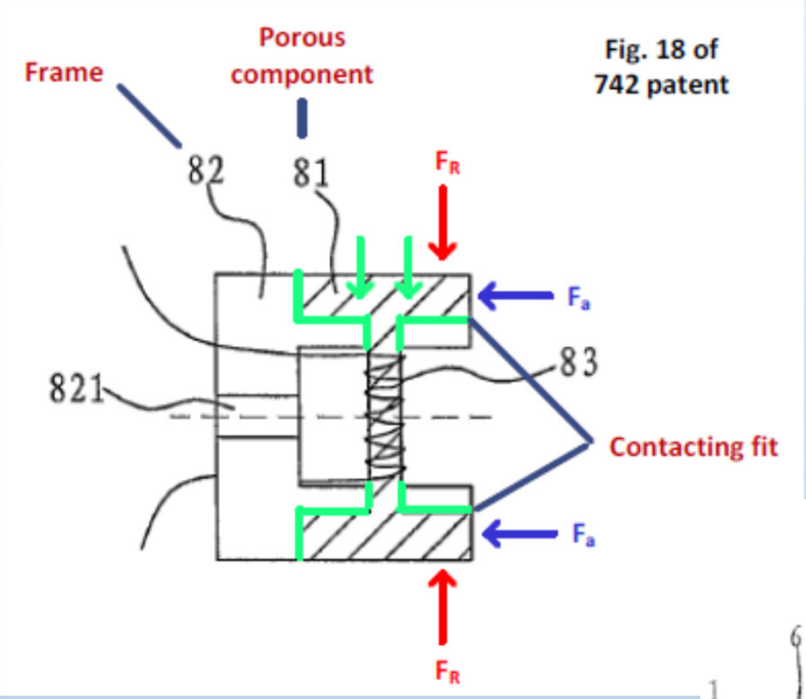
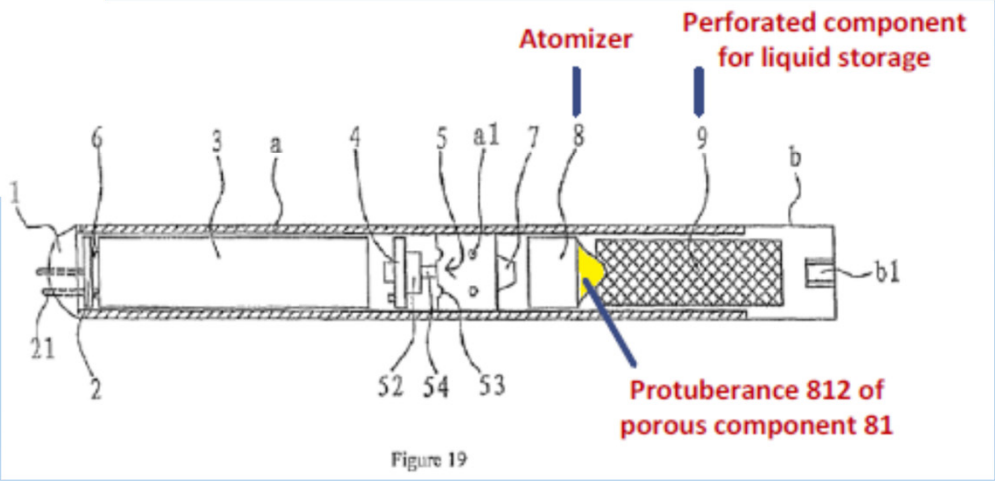


Figure 19

(742 Patent, Ex. 1001, 5:42-50, Figs. 18-19; Reply Brief, paper 30, p. 6; Sturges Reply Decl., Ex. 1027, ¶ 9)

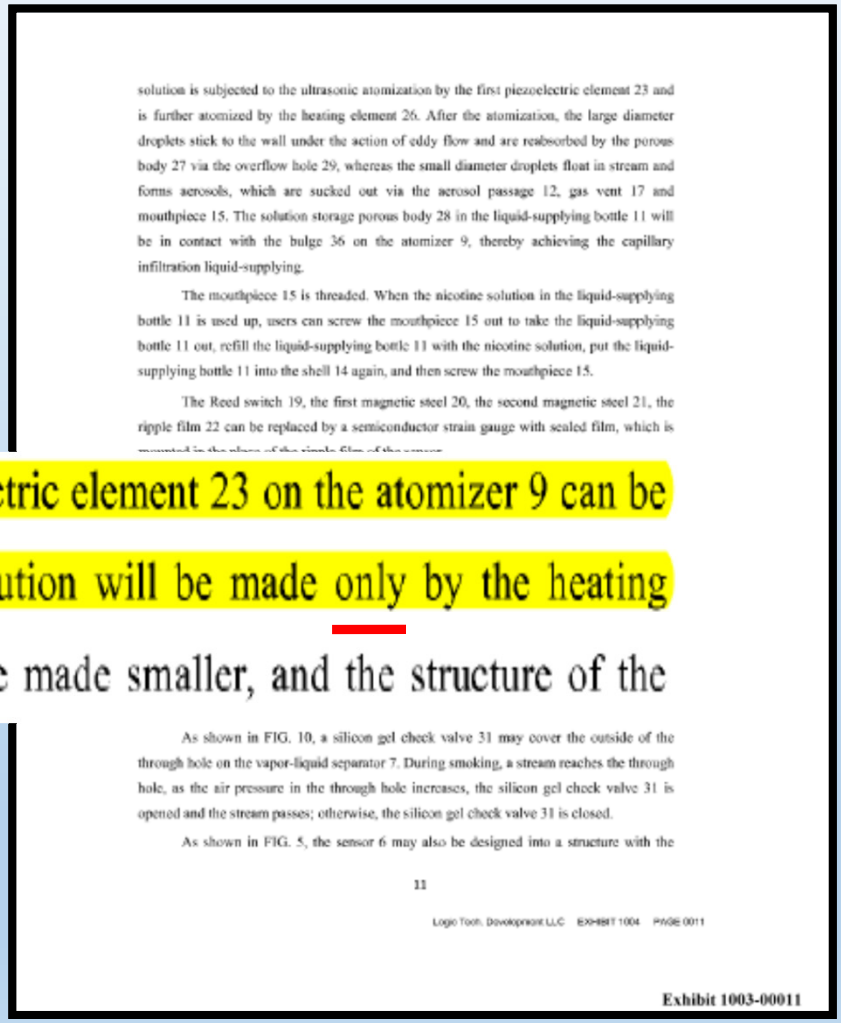
Supported By - Construction





(Reply Brief, paper 30, pp. 6-7)

Hon 043's Ejection Holes Are Not Atomizers



solution is subjected to the ultrasonic atomization by the first piezoelectric element 23 and is further atomized by the heating element 26. After the atomization, the large diameter droplets stick to the wall under the action of eddy flow and are reabsorbed by the porous body 27 via the overflow hole 29, whereas the small diameter droplets float in stream and forms aerosols, which are sucked out via the aerosol passage 12, gas vent 17 and mouthpiece 15. The solution storage porous body 28 in the liquid-supplying bottle 11 will be in contact with the bulge 36 on the atomizer 9, thereby achieving the capillary infiltration liquid-supplying.

The mouthpiece 15 is threaded. When the nicotine solution in the liquid-supplying bottle 11 is used up, users can screw the mouthpiece 15 out to take the liquid-supplying bottle 11 out, refill the liquid-supplying bottle 11 with the nicotine solution, put the liquid-supplying bottle 11 into the shell 14 again, and then screw the mouthpiece 15.

The Reed switch 19, the first magnetic steel 20, the second magnetic steel 21, the ripple film 22 can be replaced by a semiconductor strain gauge with sealed film, which is

To simplify the design, the first piezoelectric element 23 on the atomizer 9 can be omitted, and the atomization of the nicotine solution will be made only by the heating element 26. The size of such an atomizer can be made smaller, and the structure of the

As shown in FIG. 10, a silicon gel check valve 31 may cover the outside of the through hole on the vapor-liquid separator 7. During smoking, a stream reaches the through hole, as the air pressure in the through hole increases, the silicon gel check valve 31 is opened and the stream passes; otherwise, the silicon gel check valve 31 is closed.

As shown in FIG. 5, the sensor 6 may also be designed into a structure with the

11

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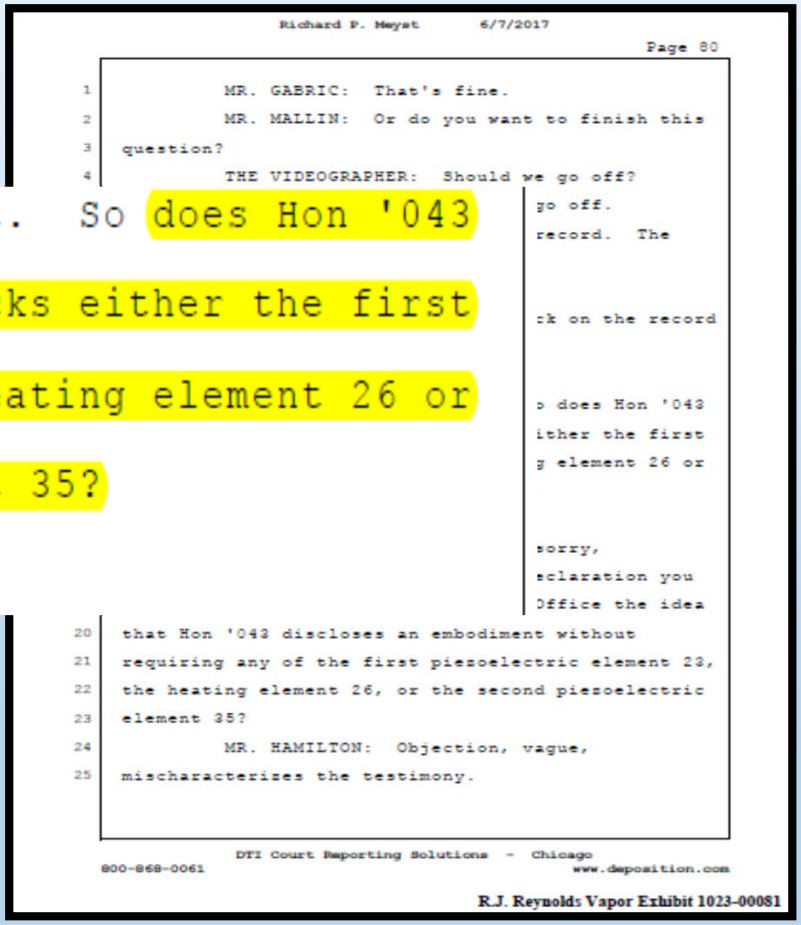
Exhibit 1003-00011

(Hon 043, Ex. 1003, p. 11; Reply Brief, paper 30, pp. 22-23)

R.J. Reynolds Vapor Ex. 1036-00045

Meyst – Hon 043's Ejection Holes Are Not Atomizers

12 Q. Welcome back, Mr. Meyst. So does Hon '043
13 disclose any embodiment that lacks either the first
14 piezoelectric element 23, the heating element 26 or
15 the second piezoelectric element 35?
16 A. I could not find one.



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MR. GABRIC: That's fine.
MR. MALLIN: Or do you want to finish this question?
THE VIDEOGRAPHER: Should we go off?
go off.
record. The
ck on the record
o does Hon '043
ither the first
g element 26 or
sorry,
eclaration you
Office the idea
that Hon '043 discloses an embodiment without requiring any of the first piezoelectric element 23, the heating element 26, or the second piezoelectric element 35?
MR. HAMILTON: Objection, vague, mischaracterizes the testimony.

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R.J. Reynolds Vapor Exhibit 1023-00081

(Meyst Dep. Tr., Ex. 1023, 80:12-16; Reply Brief, paper 30, pp. 22-23)

R.J. Reynolds Vapor Ex. 1036-00046

Meyst – Hon 043's Ejection Holes Are Not Atomizers

droplets. Hon '043 at 9–11 (Ex. 1003). The heating element and both piezoelectric elements are optional. Hon '043 at 11 (Ex. 1003).

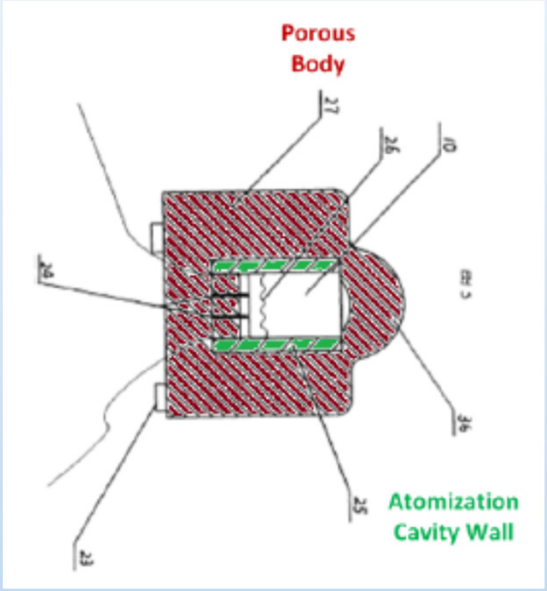
Q. And you understood the
three judges at the Patent Offi
declaration; right?
A. Yes.
Q. And were you in paragr
convey to these three judges th
'043 discloses an atomizer that

one of the first piezoelectric
the heating element 26 or the s
element 35?
MR. HAMILTON: Objecti
mischaracterizes the testimony.
THE WITNESS: That was
time.
BY MR. GABRIC:
Q. Are you changing your
A. I'd like to have more
but yes. So my answer is I'd l
to review it before I say I'm c
not.

23 Q. And were you in paragraph 37 trying to
24 convey to these three judges the notion that Hon
25 '043 discloses an atomizer that does not require any
1 one of the first piezoelectric element, the -- 23 --
2 the heating element 26 or the second piezoelectric
3 element 35?
4 MR. HAMILTON: Objection, vague and
5 mischaracterizes the testimony.
6 THE WITNESS: That was my opinion at the
7 time.
8 BY MR. GABRIC:
9 Q. Are you changing your opinion today?
10 A. I'd like to have more time to review it,
11 but yes. So my answer is I'd like to have more time
12 to review it before I say I'm changing my opinion or
13 not.

(Meyst Decl., Ex. 2015, ¶ 37; Meyst Dep. Tr., Ex. 1023, 81:23-82:13; Petitioner's Reply to P.O.'s Suppl. Brief, paper 56, pp. 1-2)

Meyst – Rigidity of Hon 043's Porous Body



Richard P. Meyst 7/21/2017

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component.

A. Well, it's all keeping it. You can't break a piece of it away. I mean, the whole thing is providing a three-dimensional structure that meets up with the form factor of the porous component such that it holds it where it needs to be to affect its function.

Q. I'm curious though, from the perspective of one skilled in the art, why is the internal portion of that frame, the portion that's internal to the porous component, why is it there? Why is it necessary?

MR. HAMILTON: Objection. Form.

THE WITNESS: When you say "the internal component," are you speaking of the cylinder with the two holes in it that is part of item 82?

BY MR. GABRIC:

Q. Correct.

21 Well, the porous component is not a

22 rigid -- necessarily a rigid material. It could be.

23 It could be -- have a wide range of properties.

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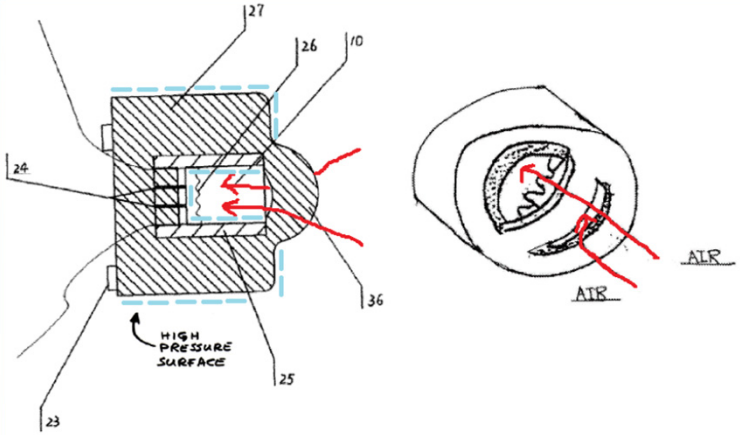
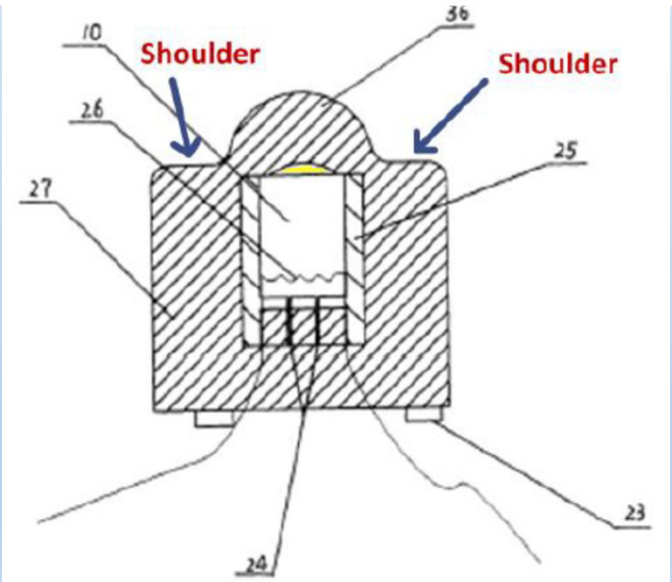
R.J. Reynolds Vapor Exhibit 1035-00018

(Reply Brief, paper 30, p. 11; Meyst 1692 IPR Dep. Tr., Ex. 1035, 17:21-23; Petitioner's Suppl. Brief, paper 51, pp. 1-2)

Hon 043 – Purported Exit Hole (Dr. Sturges)





Ex. 1003 at Fig. 6 (Annotated)

35. A PHOSITA, however, would have understood that Hon 043 does not disclose an open exit at or near the bulge 36 at the downstream end of the atomizer 9. First, Hon 043 does not describe, nor do Hon 043's drawings show, an exit hole. Figs. 6 and 8 are sectional views of atomizer 9. Figs. 6 and 8 do not show any open exit through porous body 27 at or near bulge 36 at the downstream end of atomizer 9. The small scallop-shaped space (highlighted in yellow in annotated Fig. 6 below) at the downstream top of atomization cavity 10 is an inner dome shaped cavity behind the bulge, not an opening. A PHOSITA understanding standard drawing practices would have readily discerned this fact. Moreover, the top of the dome is below the shoulder surrounding the bulge 36. As such, the dome is buried under both bulge 36 and the shoulder. The dome thus does not run through porous body 27, and cannot be an open exit as Meyst argued.

(Meyst Decl., Ex. 2015, ¶ 79; Sturges Reply Decl., Ex. 1027, ¶ 35)

Meyst - Hon 043's Purported Exit Hole

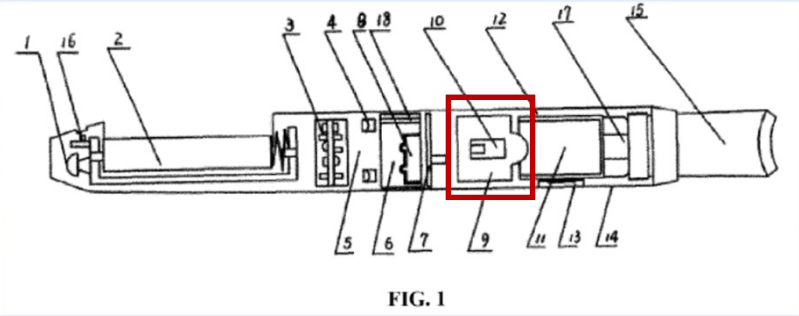


FIG. 1

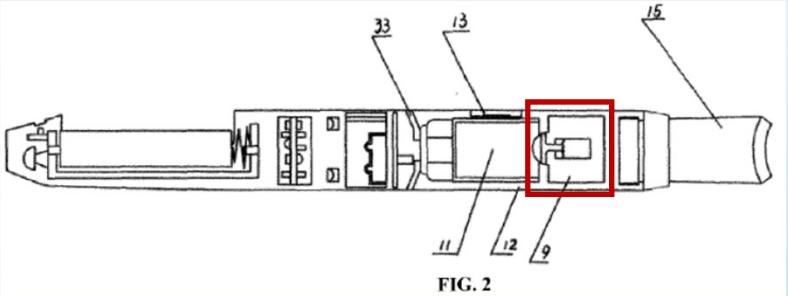


FIG. 2

19 Q. So in reaching your opinions in this case,
20 you did not study Figure 2 and whether the atomizer
21 depicted in Figure 2 has an exit hole?
22 MR. HAMILTON: Objection, mischaracterizes
23 the testimony, form.
24 THE WITNESS: I may have read through it.
25 I didn't study it. And my focus was on the other
1 embodiments.

(Hon 043, Ex. 1003, Figs. 1, 2; Meyst Dep. Tr., Ex. 1023, 122:19-123:1; Reply Brief, paper 30, p. 18)

R.J. Reynolds Vapor Ex. 1036-00050

Hon 043's Aerosol Passes Through The Porous Body

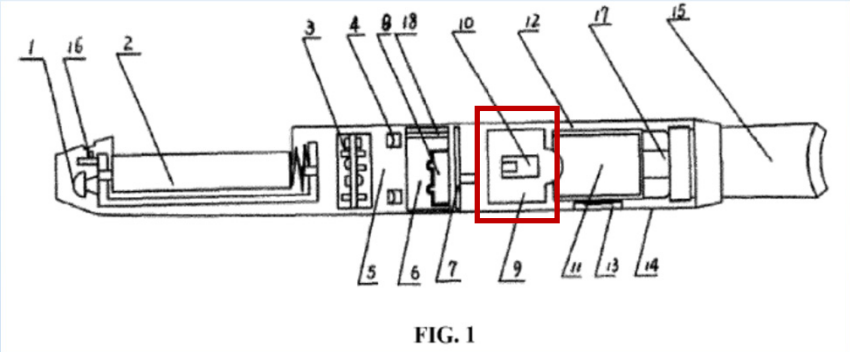


FIG. 1

solution is subjected to the ultrasonic atomization by the first piezoelectric element 23 and is further atomized by the heating element 26. After the atomization, the large diameter droplets stick to the wall under the action of eddy flow and are reabsorbed by the porous body 27 via the overflow hole 29, whereas the small diameter droplets float in stream and forms aerosols, which are sucked out via the aerosol passage 12, gas vent 17 and mouthpiece 15. The solution storage porous body 28 in the liquid-supplying bottle 11 will be in contact with the bulge 36 on the atomizer 9, thereby achieving the capillary infiltration liquid-supplying.

The mouthpiece 15 is threaded. When the nicotine solution in the liquid-supplying bottle 11 is used up, users can screw the mouthpiece 15 out to take the liquid-supplying bottle 11 out, refill the liquid-supplying bottle 11 with the nicotine solution, put the liquid-supplying bottle 11 into the shell 14 again, and then screw the mouthpiece 15.

The Reed switch 19, the first magnetic steel 20, the second magnetic steel 21, the ripple film 22 can be replaced by a semiconductor strain gauge with sealed film, which is mounted in the place of the ripple film of the sensor.

To simplify the design, the first piezoelectric element 23 on the atomizer 9 can be omitted, and the atomization of the nicotine solution will be made only by the heating

is further atomized by the heating element 26. After the atomization, the large diameter droplets stick to the wall under the action of eddy flow and are reabsorbed by the porous body 27 via the overflow hole 29, whereas the small diameter droplets float in stream and forms aerosols, which are sucked out via the aerosol passage 12, gas vent 17 and mouthpiece 15. The solution storage porous body 28 in the liquid-supplying bottle 11 will

Exhibit 1003-00011

(Hon 043, Ex. 1003, p. 11; Sturges Reply Decl., Ex. 1027, ¶ 67)

Hon 043's Aerosol Passes Through The Porous Body (Dr. Sturges)

Thus, the PHOSITA would have readily appreciated that no exit hole is required in Hon 043's device, but to the contrary, the porous body 27 is rather made from a foam materials that have pore sizes large enough to allow Hon 043's aerosol to pass without the porous body reabsorbing the atomized liquid. Thus, just as an air stream can pass through the pores of the porous body at the upstream end - which Meyst admitted, an aerosol carrying small liquid droplets particles that are magnitudes smaller than the pores of the porous body can pass through the porous body at the downstream end.

1003 at 11. As a PHOSITA would have understood, Hon's "small diameter droplets" are few microns in diameter. Ex. 1028 (Mitchell et al.) at Table 2

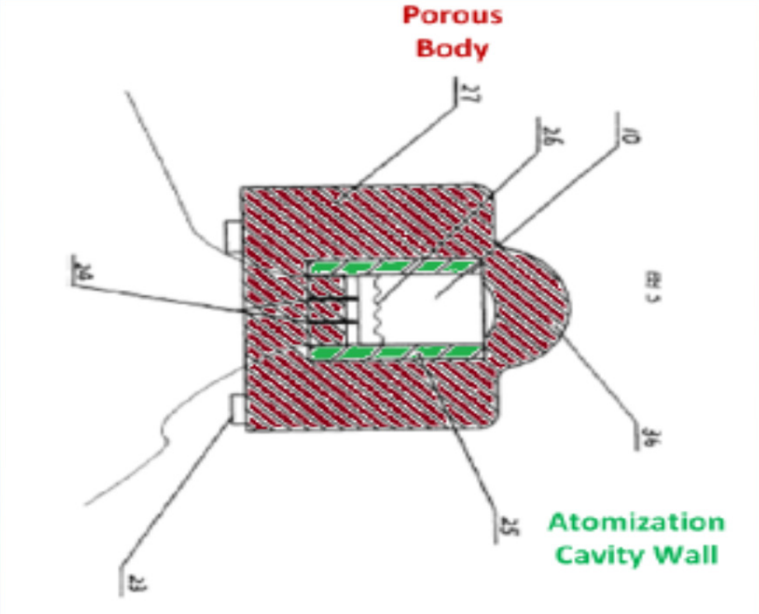
molecular weight polymer foam. Ex. 1003 at 9. A PHOSITA would have understood that these foam materials have a pore size ranging into the hundreds of microns in diameter. *See*, Ex. 1030 (U.S. Pat. No. 4,957,543) at 5:59-66 (teaching

42. Meyst alleged that without the alleged exit hole, the atomized droplets uld be reabsorbed back into the porous body. Ex. 2015 at ¶ 45. I disagree. A OSITA would have understood that pore sizes in the porous body materials templated by Hon 043 are significantly larger than the small diameter droplets Hon 043's aerosol. Specifically, Hon 043 expressly distinguishes between rge diameter droplets" which stick to the cavity wall and are ultimately bsorbed by the porous body from the atomized "small diameter droplets" that n "aerosols, which are sucked out" by the user through the mouthpiece. Ex. 3 at 11. As a PHOSITA would have understood, Hon's "small diameter plets" are few microns in diameter. Ex. 1028 (Mitchell et al.) at Table 2 ching aerosol particle size in the range of 0.9-4.3 μm); Ex. 1029 (Breon at al.) bstract (teaching cloud droplet size of 6-14 μm). Meyst similarly testified that believed a PHOSITA would have understood that aerosols "desirable and essary to get things in deep into the lung space' would have liquid droplets in range of 2-5 microns. Ex. 1023 at 97:22-98:18. Hon 043 also teaches that suitable materials for porous body 27 include foam nickel, foam ceramic, or high

lecular weight polymer foam. Ex. 1003 at 9. A PHOSITA would have erstood that these foam materials have a pore size ranging into the hundreds of rons in diameter. *See*, Ex. 1030 (U.S. Pat. No. 4,957,543) at 5:59-66 (teaching el foam with pore size between 20 – 400 μm); Ex. 1031 (U.S. Pat. No. 6,932,925) at 4:16-19 (teaching ceramic foam with pore size of 200 – 500 μm). Thus, the PHOSITA would have readily appreciated that no exit hole is required in Hon 043's device, but to the contrary, the porous body 27 is rather made from a n materials that have pore sizes large enough to allow Hon 043's aerosol to s without the porous body reabsorbing the atomized liquid. Thus, just as an air am can pass through the pores of the porous body at the upstream end - which yst admitted, an aerosol carrying small liquid droplets particles that are gnitudes smaller than the pores of the porous body can pass through the porous body at the downstream end.

(Sturges Reply Decl., Ex. 1027, ¶ 42)

Meyst – Hon 043's Cavity Wall is Permeable to Airflow



Richard P. Meyst 7/21/2017

Page 48

Q. For the record, you're being somewhat facetious.
A. Many times.
Q. Now, turn to Figure 6 of Hon '043.
A. Okay.
Q. And focus your attention to cavity wall 25. Do you see that?
A. I do.
Q. Okay. One of ordinary skill in the art reading this reference in the 2006 time frame, would they understand whether the cavity wall could be made from both air permeable or air impermeable material?
A. I believe that's the case, yes.
Q. Now Hon --
A. Excuse me.
Q. Yeah.

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apor Exhibit 1035-00049

9 Q. Okay. One of ordinary skill in the art
10 reading this reference in the 2006 time frame, would
11 they understand whether the cavity wall could be
12 made from both air permeable or air impermeable
13 material?
14 A. I believe that's the case, yes.

(Reply Brief, paper 30, p. 11; Meyst 1692 IPR Dep. Tr., Ex. 1035, 48:9-14; Petitioner's Suppl. Brief, paper 51, p. 5 (f.n. 6))

R.J. Reynolds Vapor Ex. 1036-00053

Hon 043 Airflow

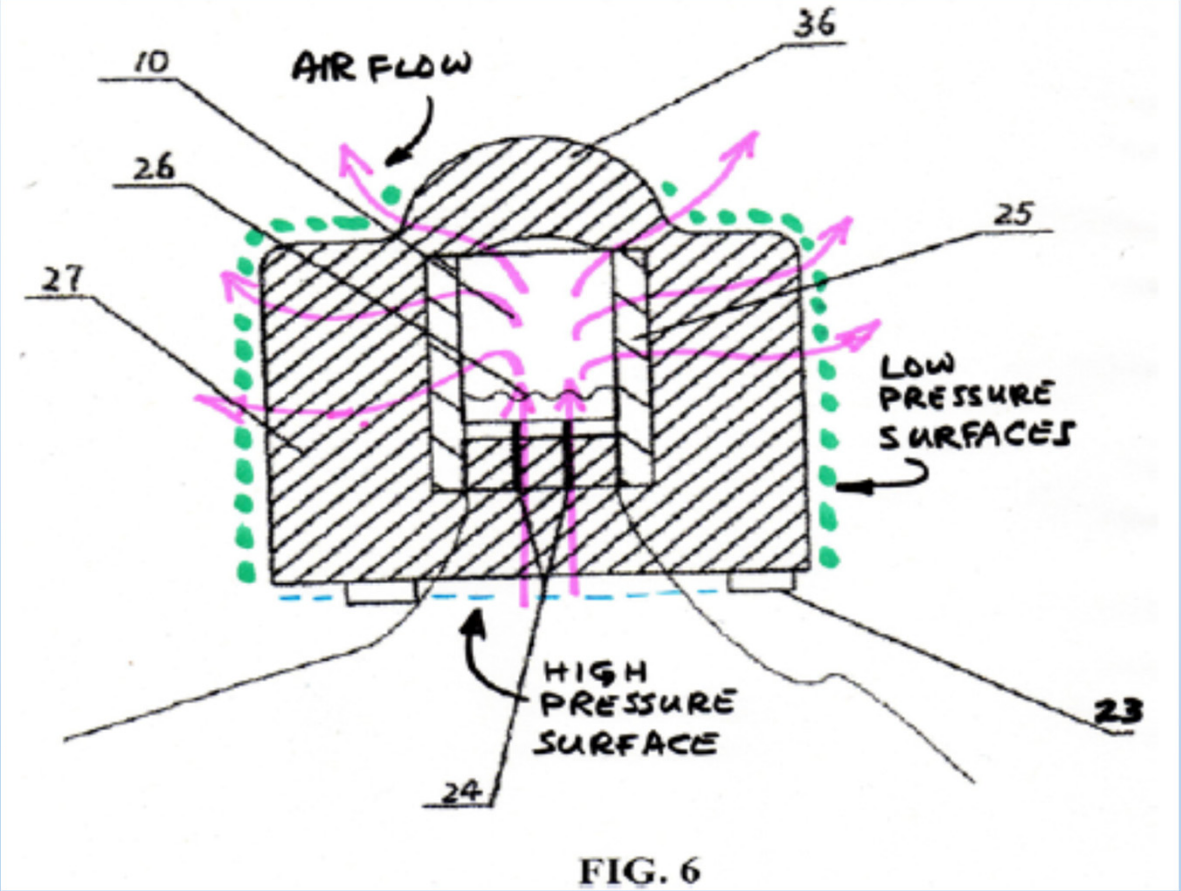
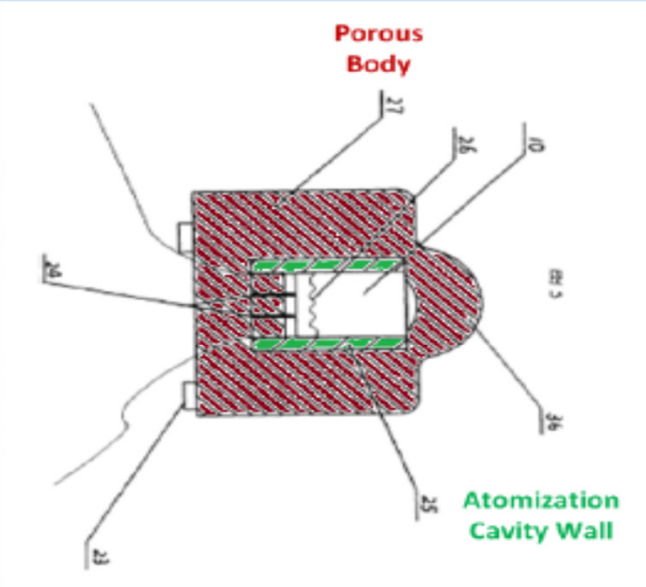


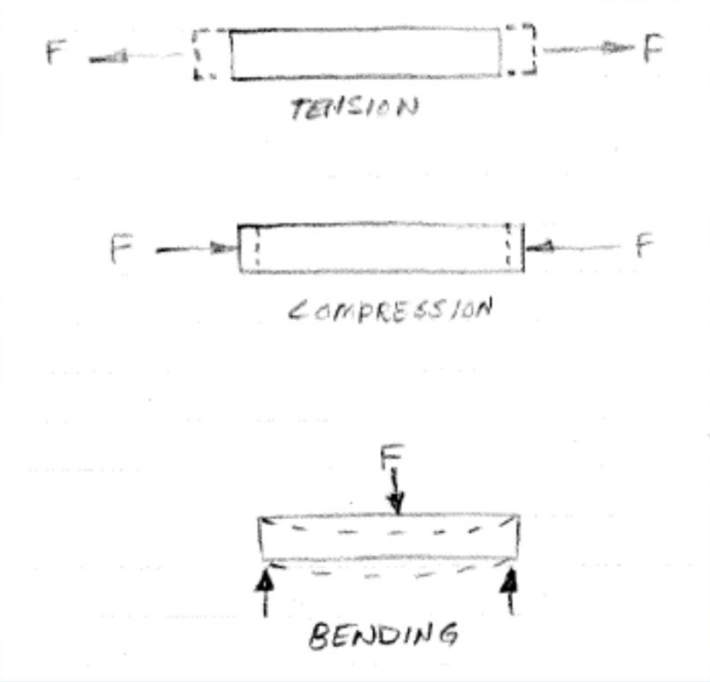
FIG. 6

(Sturges Petition Decl., Ex. 1015-00035)

Hon 043's Porous Body - 2 psi (Dr. Sturges)

the stress-strain curves and the purported tensile strengths of certain materials on which Mr. Meyst relies is not relevant to the extent to which Hon 043's porous body would bend or sag but for the presence of cavity wall 27. The term





(Sturges Suppl. Evid. Decl., Ex. 1034, ¶ 11; Reply Brief, paper 30, p. 11)

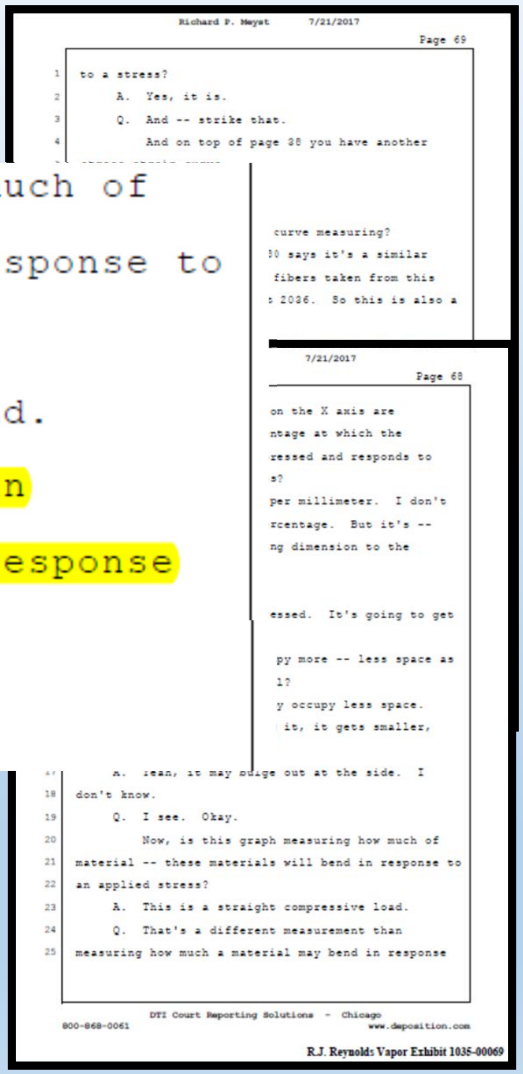
Meyst - Stress Strain Curves Are Not Relevant

Now, is this graph measuring how much of material -- these materials will bend in response to an applied stress?

A. This is a straight compressive load.

Q. That's a different measurement than measuring how much a material may bend in response to a stress?

A. Yes, it is.



(Meyst 1692 IPR Dep. Tr., Ex. 1035, 68:20-69:2; Petitioner's Suppl. Brief, paper 51, pp. 2-3)

R.J. Reynolds Vapor Ex. 1036-00056

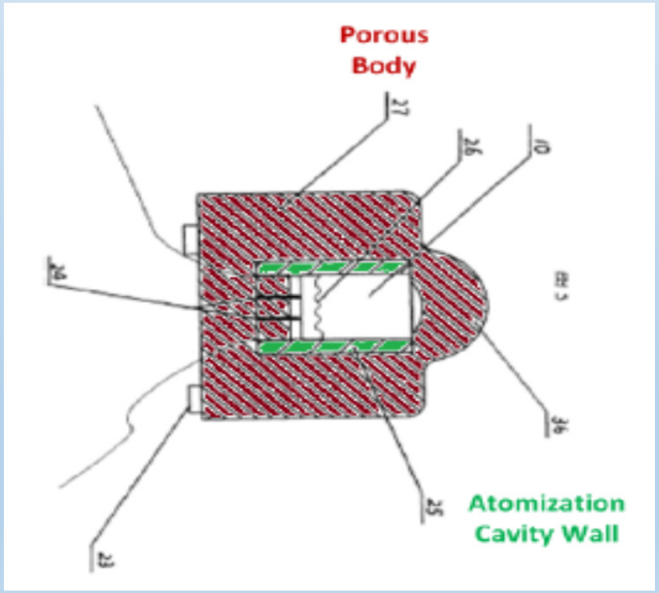
Tensile Strength Not Relevant

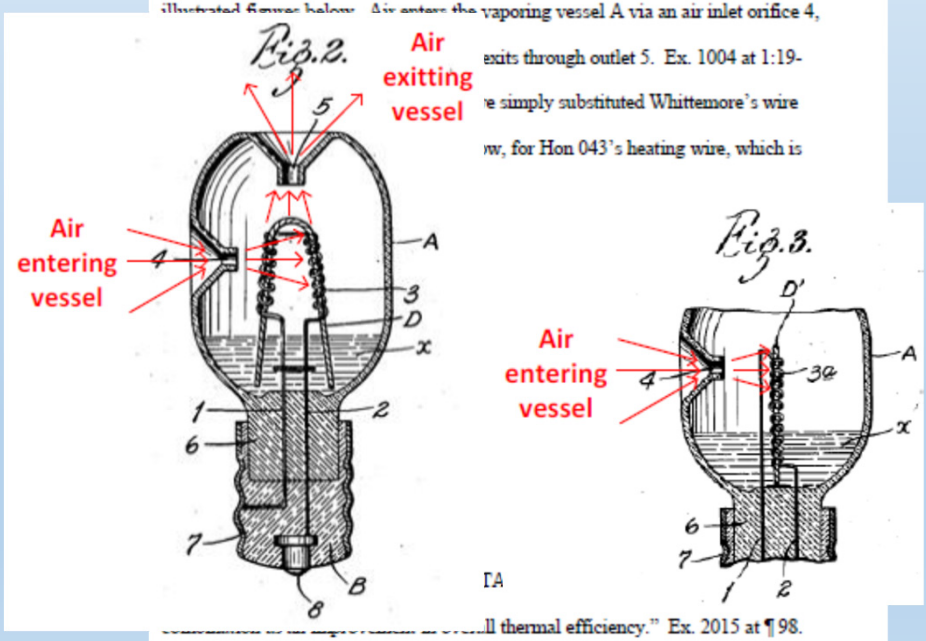
Q. What's tensile strength?
A. It's a measure of mechanical strength.
Q. And what does it -- how is this strength measured?
A. Typically it's in tension, as opposed to compression.
Q. And tension is what, pulling on the material rather than --
A. Yes.
Q. -- compressing it?
A. Yes.

(Meyst 1692 IPR Dep. Tr., Ex. 1035, 70:17-71:2; Petitioner's Suppl. Brief, paper 51, p. 3)

Path of Airflow – Whittemore (Dr. Sturges)

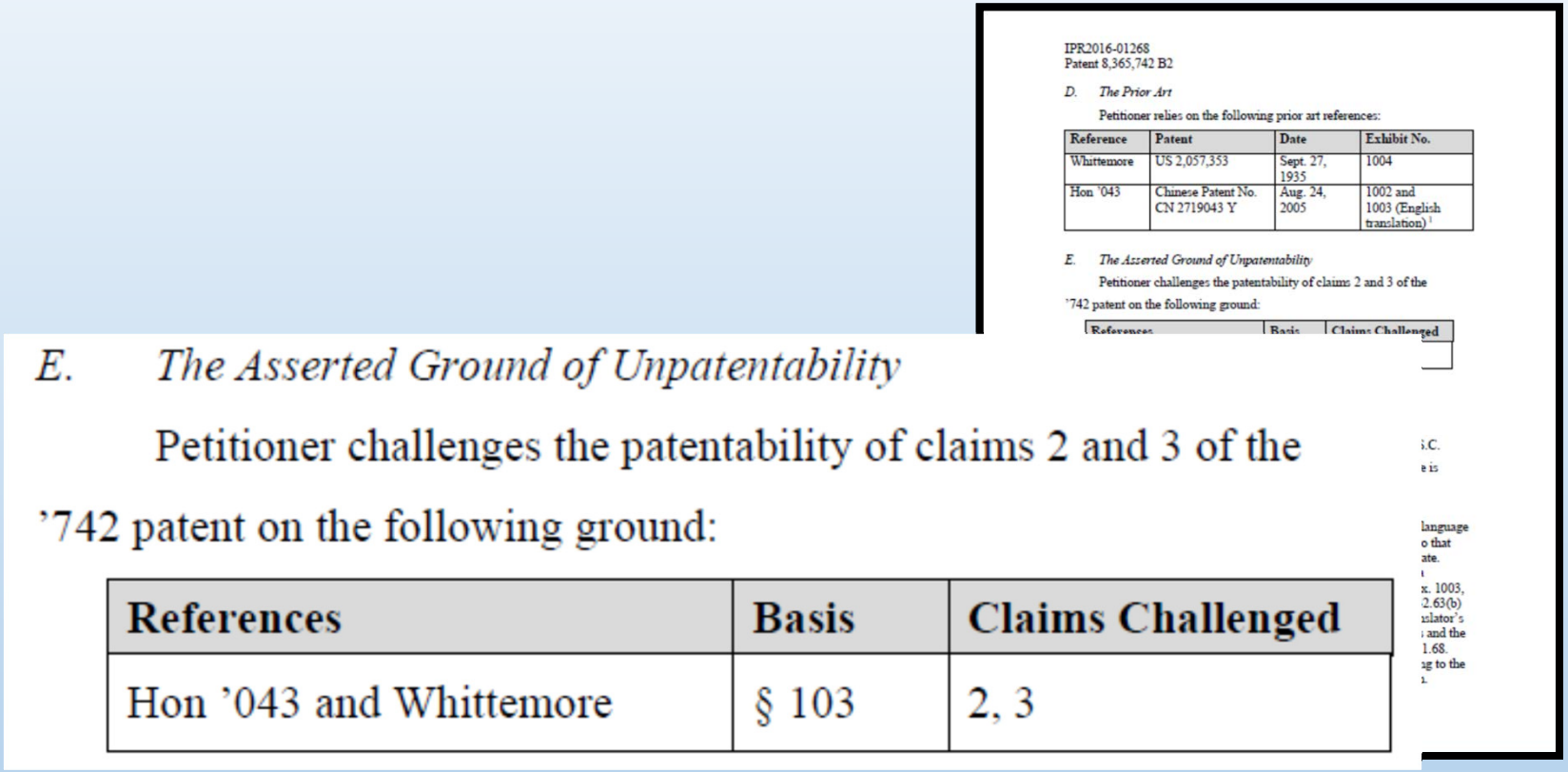
54. The PHOSITA would have understood that Hon 043's heating wire is in the path of airflow. The PHOSITA would have also understood that Whittemore's wire wrapped wick is also in the path of airflow, as shown in the illustrated figures below. Air enters the vaporing vessel A via an air inlet orifice 4,





(Sturges Reply Decl., Ex. 1027, ¶ 54; Reply Brief, paper 30, p. 11)

Institution Decision



IPR2016-01268
Patent 8,365,742 B2

D. The Prior Art

Petitioner relies on the following prior art references:

Reference	Patent	Date	Exhibit No.
Whittemore	US 2,057,353	Sept. 27, 1935	1004
Hon '043	Chinese Patent No. CN 2719043 Y	Aug. 24, 2005	1002 and 1003 (English translation)

E. The Asserted Ground of Unpatentability

Petitioner challenges the patentability of claims 2 and 3 of the '742 patent on the following ground:

References	Basis	Claims Challenged
Hon '043 and Whittemore	§ 103	2, 3

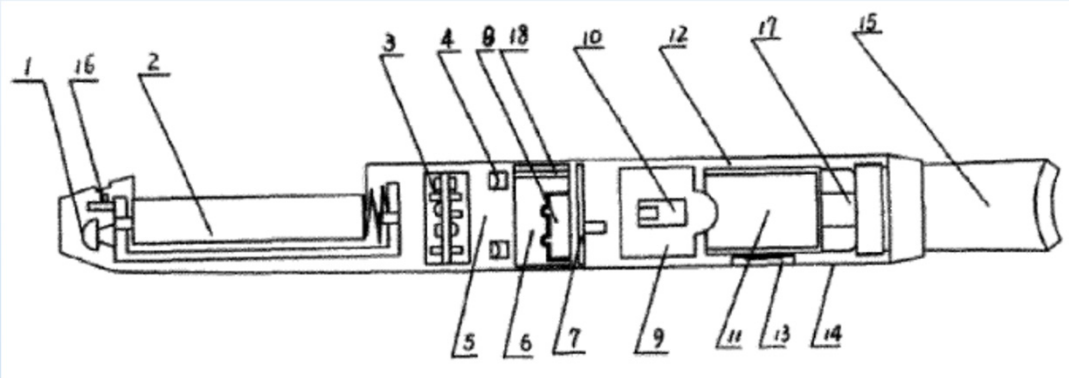
(Institution Decision, paper 10, p. 6)

Level of Skill

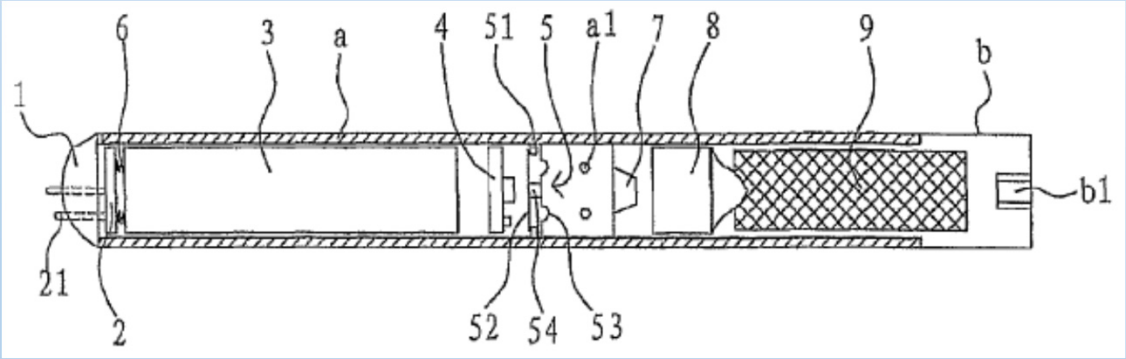
Mr. Meyst's Definition	Dr. Sturges' Definition
"a person with a mechanical or electrical engineering degree, industrial design degree, or similar technical degree, or equivalent work experience, and 5-10 years of working in the area of electromechanical devices, including medical devices"	"a person with at least the equivalent of a Bachelor's degree in electrical engineering, mechanical engineering, or biomedical engineering or related fields, along with at least 5 years of experience designing electromechanical devices, including those involving circuits, fluid mechanics and heat transfer"

(Meyst Decl., Ex. 2015, ¶ 22; Sturges Petition Decl., Ex. 1015, ¶ 30)

Axial Displacement



Hon 043, Ex. 1003, Fig. 1



742 Patent, Ex. 1001, Fig. 1

(Hon 043, Ex. 1003, Fig. 1; 742 Patent, Ex. 1001, Fig. 1)

P.O. Asked Dr. Sturges About "Other" Forces

4	Q So other than this axial displacement from the	14:32:05
5	interaction during insertion of the liquid supply into	14:32:09
6	the device between the bulge and the liquid supply, is	14:32:14
7	there anything else that would cause a shear force on	14:32:24
8	the walls of the -- between the cavity walls and the	14:32:29
9	porous body?	14:32:33
10	A Yes, there could be several reasons for that.	14:32:35
11	Several sources.	14:32:39
12	Q What other reasons?	14:32:41
13	A Well, there could be the supporting of the	14:32:43
14	porous body under its own weight when filled with	14:32:53
15	liquid. And you wouldn't want the porous body to deform	14:32:58
16	under those conditions, so you'd want it to be supported	14:33:05
17	by the cavity wall.	14:33:08
18	There's also the likelihood that the electronic	14:33:13
19	cigarette may be dropped on the ground, in which case	14:33:21
20	there would be shock forces well in excess of gravity	14:33:26
21	being felt by the porous body, and you wouldn't want it	14:33:33
22	to deform. You'd want a rigid material to support it.	14:33:36
23	And there's also the possibility that I	14:33:43
24	mentioned in my report of an inadvertent overpressure in	14:33:47
25	the cavity area tending to collapse the porous body on	14:33:55
1	itself, and you'd want the cavity wall in order to	14:34:03
2	support that.	14:34:07

(Sturges Dep. Tr., Ex. 2016, 126:4-127:2; Reply Brief, paper 30, pp. 9-10)

R.J. Reynolds Vapor Ex. 1036-00062

Dr. Sturges – Rigidity

inserted into the storage porous body 28. The shear forces could be particularly significant when the porous body and the solution storage body 28 are made from materials that have similar and relatively high rigidity. *See* Ex. 1003 at 9-10 (noting that porous body 27 may be made from "nickel, stainless steel fiber felt, high molecule polymer foam and foam ceramic," and that solution storage body 28 "can be filled with polypropylene fiber, terylene fiber, nylon fiber, or be filled with plastic that are shaped by foaming, such as polyamine resin foam column or polypropylene foam column; alternatively, it may be made of a column formed by molding polyvinyl chloride, polypropylene, polycarbonate into a stack of laminated layers."). The PHOSITA would have recognized that the foregoing materials can have a wide range of rigidities.

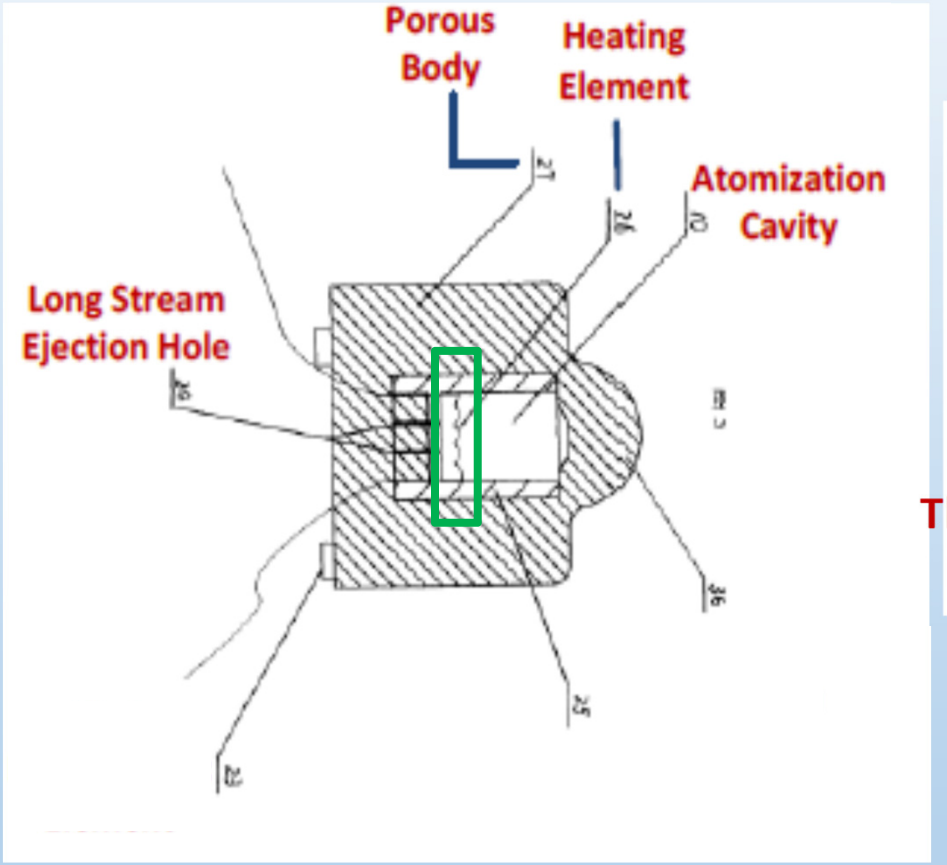
(Sturges Petition Decl., Ex. 1015, ¶ 45)

Meyst Opined About A Purported Lack Of Weight-Bearing Support

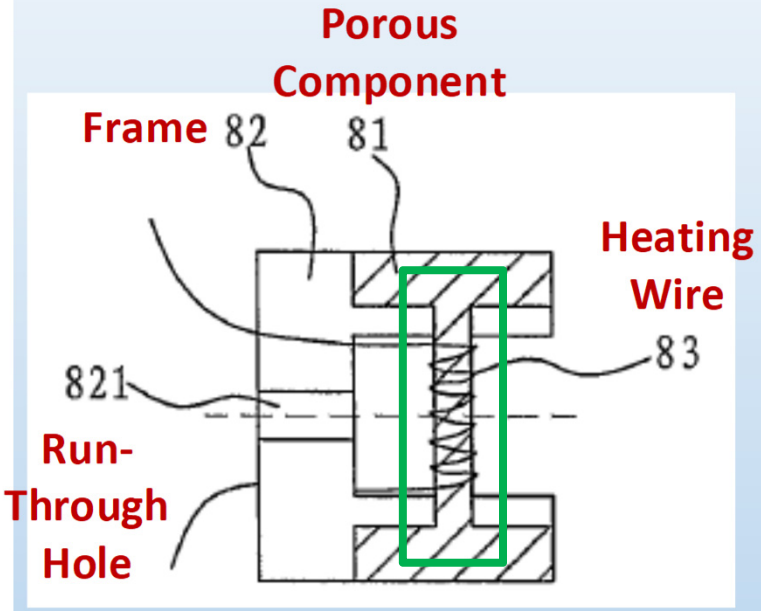
50. **Hon '043 has no Frame Supporting a Porous Component**. A person of ordinary skill in the art would not have understood Hon '043 as disclosing a frame supporting a porous component. The Board previously found that Hon '043's cavity wall 25 does not support porous body 27 according to the plain and ordinary meaning of "support." VMR Decision at 15–16 (Ex. 1011). I agree with that finding. As the cavity wall 25 is inside of the porous body 27, it does not hold up the porous body 27.

(Meyst Decl., Ex. 2015, ¶ 50)

Hon 043 Compared To 742 Patent



Hon 043, Ex. 1003, Fig. 6



742 Patent, Ex. 1001, Fig. 18

(Petition, paper 2, pp. 9, 15)

Meyst – 742 Patent's Atomizer

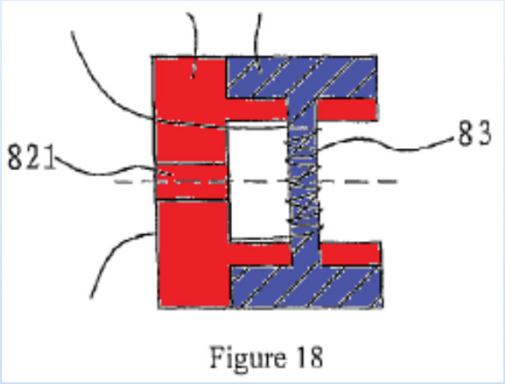


Figure 18

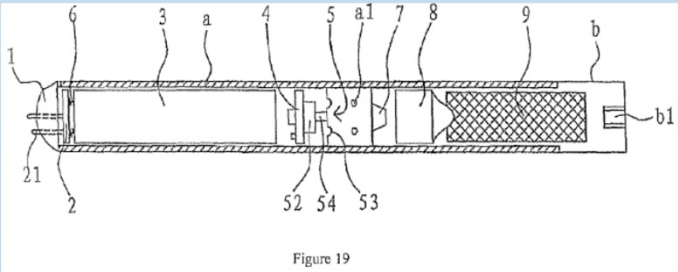


Figure 19

742 Patent,
Ex. 1001, Figs. 18-19

Q. What is the basis for that assumption, that the vertical component of the frame is being held? Where in the '742 patent is that assumption supported?

A. I think that's something that a POSITA would look at and understand that it has to be supported, because it's not just in the vapor.

Q. Well, that -- so I -- my question is where in the '742 patent does it disclose that the frame, this red piece, the frame, is attached to anything? Where is it disclosed?

MR. HAMILTON: Objection, asked and answered and vague.

THE WITNESS: The elements shown in Figure 17 and 18 are part of the atomizer, so it is inside item No. 8, which is in Figure 19, and 8 is the atomizer.

MR. GABRIC: Right.

THE WITNESS: So for this to work properly it has to be inside the atomizer and it needs to be supported. I mean, that's -- it does not say in

(Meyst Decl., Ex. 2015, ¶ 29; 742 Patent, Ex. 1001, Figs. 18-19
Meyst Dep. Tr., Ex. 1023, 21:7-22:2; Reply Brief, paper 30, pp. 9-10)