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Paper 9
Entered: September 16, 2015

UNITED STATES PATENT AND TRADEMARK OFFICE

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BEFORE THE PATENT TRIAL AND APPEAL BOARD

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VMR PRODUCTS LLC,
Petitioner,

v.

FONTEM HOLDINGS 1 B.V.,
Patent Owner.

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Case IPR2015-00859
Patent 8,365,742 B2

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Before JACQUELINE WRIGHT BONILLA, BRIAN J. McNAMARA, and JO-ANNE M. KOKOSKI, *Administrative Patent Judges.*

KOKOSKI, *Administrative Patent Judge.*

DECISION
Denying Institution of *Inter Partes* Review
*37 C.F.R. § 42.108*

# I. INTRODUCTION

VMR Products LLC ("Petitioner") filed a Petition ("Pet.") to institute an *inter partes* review of claims 1–3 of U.S. Patent No. 8,365,742 B2 ("the '742 patent," Ex. 1001). Paper 2. Fontem Holdings 1 B.V. ("Patent Owner") filed a Preliminary Response ("Prelim. Resp."). Paper 5. We have jurisdiction under 35 U.S.C. § 314.

Upon consideration of the Petition and Preliminary Response, we determine that Petitioner has not established a reasonable likelihood of prevailing with respect to claims 1–3 of the '742 patent. Accordingly, we deny the Petition, and do not institute an *inter partes* review.

## *A. Related Proceedings*

Petitioner indicates that the '742 patent is asserted in numerous cases pending in the Central District of California, including *Fontem Ventures B.V. v. VMR Products LLC*, Case No. 2:14-cv-01655 ("the District Court Action"). Pet. 1–2. Patent Owner states that the '742 patent is also the subject of IPR2015-01587, filed by JT International SA on July 14, 2015. Paper 7, 1.

## *B. The '742 Patent (Ex. 1001)*

The '742 patent, titled "Electronic Cigarette," is directed to an aerosol electronic cigarette having a battery assembly, an atomizer assembly, a cigarette bottle assembly, and a hollow, integrally-formed shell. Ex. 1001, Abstract. According to the '742 patent, prior art devices had various disadvantages, including low atomizing efficiency, being structurally complicated, and not providing ideal aerosol effects. *Id*. at 1:21–24.

Figure 1 of the ’742 patent is reproduced below:

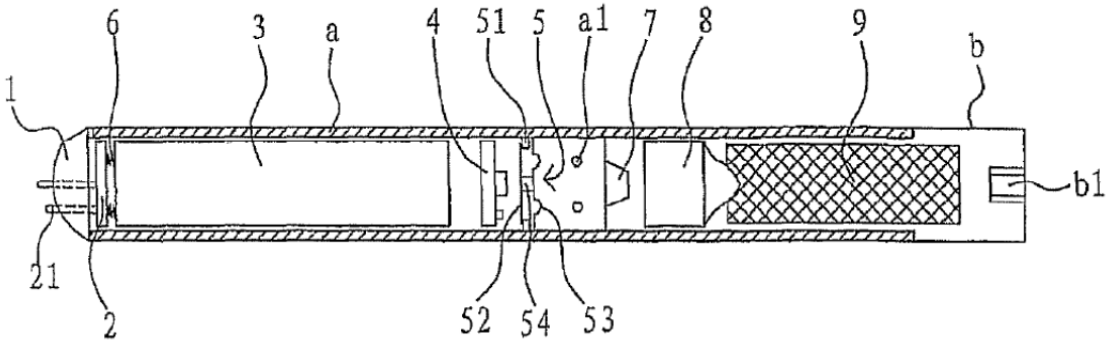


Figure 1

Figure 1 is a side section view of an electronic cigarette. *Id.* at 1:45. Hollow, integrally-formed shell “a” includes a battery assembly, atomizer assembly, and cigarette bottle assembly. *Id.* at 2:30–33. The battery assembly connects to the atomizer assembly in shell “a,” and the detachable cigarette body assembly (which fits with the atomizer assembly) is located in one end of shell “a.” *Id.* at 2:33–37. Shell “a” also includes through-air-inlets a1. *Id.* at 2:37–38. The battery assembly includes operating indicator 1, battery 3, electronic circuit board 4, and airflow sensor 5. *Id.* at 2:39–45. The atomizer assembly is atomizer 8, which includes a porous component and a heating rod. *Id.* at 3:6–8. The cigarette bottle assembly includes hollow cigarette shell holder “b,” and perforated component for liquid storage 9. *Id.* at 3:49–51. Air channel b1 is located in the center on the surface of one end of cigarette shell holder “b,” and extends inward. *Id.* at 3:59–62.

Figures 5, 6, and 7 of the ’742 patent are reproduced below:

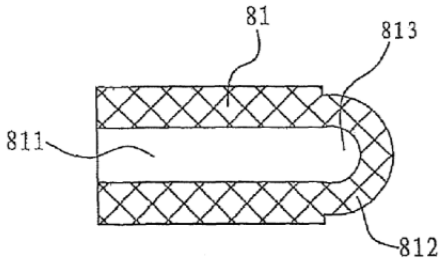


Figure 5

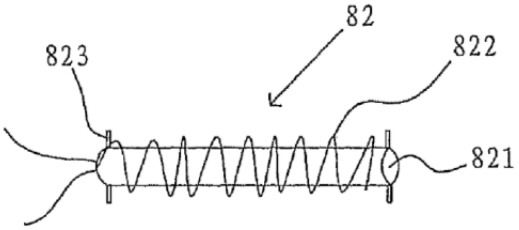


Figure 6

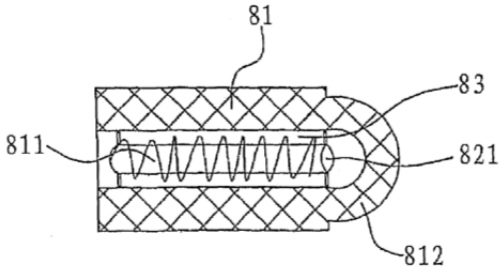


Figure 7

Figure 5 is a side-section view of the porous component of atomizer 8, Figure 6 is a diagram of the structure of a heating rod in atomizer 8, and Figure 7 is a side-section view of atomizer 8. *Id.* at 1:53–59. Atomizer 8 includes porous component 81 and heating rod 82. *Id.* at 3:6–8. Heating rod 82 includes heating wire 822 wound on the wall of cylinder 821. *Id.* at 3:28–30. Porous component 81 contains run-through atomizing chamber 811. *Id.* at 3:8–9. Heating rod 82 enters run-through atomizing chamber 811, and the space between heating rod 82 and the interior wall of run-through atomizing chamber 811 creates negative pressure cavity 83. *Id.* at 3:11–15. One end of porous component 81 fits with the cigarette bottle assembly, with protuberance 812 at the other end connecting to atomizing chamber 811 with run-through hole 813. *Id.* at 3:16–19.

*C. Illustrative Claim*

Petitioner challenges claims 1–3 of the ’742 patent. Each of claims 1–3 is independent. Claim 1 is illustrative, and recites as follows:

1. An aerosol electronic cigarette, comprising:

a battery assembly, an atomizer assembly and a cigarette bottle assembly, and a shell that is hollow and integrally formed;

the battery assembly electrically connected with the atomizer assembly, and both are located in the shell;

the cigarette bottle assembly is detachably located in one end of the shell, and fits with the atomizer assembly inside of it;

the shell has through-air-inlets;

the atomizer assembly is an atomizer, which includes a porous component and a heating body;

the heating body is a heating wire;

the atomizer includes a frame;

the porous component is supported by the frame;

the heating wire is wound on the porous component;

the frame has a run-through hole;

a heating wire wound on a part of the porous component that is substantially aligned with the run-through hole; and with the porous component also positioned substantially within the cigarette bottle assembly.

*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 | 1013 |
| Counts | US 5,144,962 | Sept. 8, 1992 | 1011 |
| Susa | EP 0 845 220 A1 | June 3, 1998 | 1010 |
| Abhulimen | WO 03/034847 A1 | May 1, 2003 | 1012 |
| Hon ’043 | Chinese Patent No. CN 2719043 Y | Aug. 24, 2005 | 1004 and 1005 (English translation) |

| Reference | Patent | Date | Exhibit No. |
|---|---|---|---|
| Hon '494[1] | WO 2005/099494 A1 | Oct. 27. 2005 | 1006 and 1007 (English translation |

*E. The Asserted Grounds of Unpatentability*

Petitioner challenges the patentability of claims 1–3 of the '742 patent on the following grounds:

| Reference(s) | Basis | Claims Challenged |
|---|---|---|
| Hon and Susa | § 103(a) | 1–3 |
| Hon and Abhulimen | § 103(a) | 1–3 |
| Hon and Whittemore | § 103(a) | 1–3 |
| Hon and Counts | § 103(a) | 1–3 |
| Susa | § 103(a) | 1–3 |
| Susa and Abhulimen | § 103(a) | 1–3 |
| Susa and Whittemore | § 103(a) | 1–3 |

[1] Hon '494 is the PCT application equivalent of Hon '043. Pet. 15. When referring to Hon '043 in the Petition, Petitioner cites the English translation of Hon '494 "because the translation [of Hon '043] does not have paragraph numbers or line numbers." *Id.* at n. 2. Petitioner also uses Hon '043 and Hon '494 interchangeably throughout the Petition. For clarity, we will refer to Hon '494 and Hon '043 collectively as "Hon," and we will cite to the English translation of Hon '494 (Ex. 1007) when referring to Hon.

## II. ANALYSIS

### *A. Claim Interpretation*

We interpret claims of an unexpired patent using the "broadest reasonable construction in light of the specification of the patent in which [the claims] appear[]." 37 C.F.R. § 42.100(b). For purposes of this Decision, based on the record before us, we make explicit the interpretation of the claim terms "frame" and "porous component," as set forth in claims 1–3.

#### *1. "frame"*

Petitioner proposes that we construe "frame" to mean "rigid structure." Pet. 8. In support of its construction, Petitioner relies on the district court's ruling on claim construction in the District Court Action. *Id.* at 7–8 (citing Ex. 1014, 5–7). Patent Owner proposes that we construe the term to mean "a firm structure designed to hold up another component." Prelim. Resp. 10. Patent Owner cites the Specification's description of the fifth preferred embodiment, which includes a frame with a run-through hole on it, and a porous component set on the frame, in support of its construction. *Id.* at 10. (citing Ex. 1001. 5:42–47). According to Patent Owner, "[i]n the context of the '742 patent, this is the better interpretation, particularly because 'supported by' means 'held up.'" *Id.* at 11.

Based on the record before us, we are persuaded that Petitioner's interpretation is the broadest reasonable interpretation in light of the Specification. The only mention of "frame" in the Specification is in the discussion of the fifth preferred embodiment, where it states, with reference to Figures 17 and 18, that "the atomizer assembly is an atomizer (8), which includes a frame (82), the porous component is set on the frame (82)," and

"[t]he frame (82) has a run-through hole (821) on it." Ex. 1001, 5:42–47. That the porous component is set on the frame in one embodiment, however, is not enough to limit "frame" to a structure that is designed to hold up another component, as suggested by Patent Owner. The language of the claims further indicates that a frame need not necessarily "hold up another component." Claims 1 and 2 require that the porous component be "supported by" the frame, but claim 3 only requires that there is "a porous component between the frame and the outlet." Petitioner's proposed interpretation of "frame" as "a rigid structure" is consistent with the use of the term in the Specification and the claims.

For purposes of this Decision, consistent with the disclosures in the Specification and its ordinary meaning, we interpret "frame" to be "a rigid structure."

2. "*porous component*"

Petitioner proposes that we construe "porous component" to mean "a component of the atomizer assembly in the electronic cigarette that includes pores and is permeable to liquid, such as cigarette solution from the cigarette solution storage area." Pet. 7. In support of this construction, Petitioner relies on the Board's interpretation of "porous component" in the Decision to Institute *Inter Partes* Review in IPR2013-00387, relating to U.S. Patent No. 8,156,944 ("the '944 patent"), because "[t]he '742 Patent is a divisional of the application that led to the '944 Patent, and therefore both patents share the same specification." *Id.*; *see CB Distributors, Inc. v. Ruyan Investment (Holdings) Limited*, Case IPR2013-00387, slip op. at 11 (PTAB Dec. 30, 2013) (Paper 7).

Patent Owner proposes that we construe the term to mean "a component of the atomizer assembly having pores or interstices and providing for absorption or diffusion of liquid." Prelim. Resp. 6–7. As support for this construction, Patent Owner states that the claims of the '742 patent include a number of recitations relating to the porous component, including that "the atomizer includes a porous component and a heating wire," "the porous component is supported by the atomizer frame having a run-through hole," "the porous component is positioned substantially within the cigarette bottle assembly," and "the porous component is substantially surrounded by the liquid storage component." *Id.* at 7–8. Patent Owner also cites to the Specification's statements that "the porous component provides 'liquid absorption and diffusion, and the ability to absorb liquid stored in the cigarette bottle assembly' . . . [a]nd that it 'absorbs the cigarette liquid from the perforated component for liquid storage.'" *Id.* at 8 (citing Ex. 1001, 3:25–26, 66–67). According to Patent Owner, "Petitioner offers no analysis why [the construction from IPR2013-00387] is proper for the claims of the '742 patent," because, "based upon the claims and the disclosure of the '742 patent, a porous component is something more than a component that simply has holes." *Id.* at 8–9.

Based on the record before us, we are persuaded that Petitioner's proposed interpretation is the broadest reasonable interpretation in light of the Specification. Petitioner's proposed interpretation is consistent with the Specification, which describes the porous component as being "made of foamed nickel, stainless steel fiber felt, macromolecular polymer foam or foamed ceramics, providing the remarkable capabilities in liquid absorption and diffusion, and the ability to absorb the liquid stored in the cigarette

bottle assembly." Ex. 1001, 3:23–27. The Specification further states that the porous component "absorbs the cigarette liquid from the perforated component for liquid storage," and, "[a]fter atomization, the big-diameter fine drips are re-absorbed by the porous component." *Id.* at 4:25–27.

Therefore, for purposes of this Decision and in accordance with the broadest reasonable interpretation in light of the Specification, we interpret "porous component" to mean "a component of the atomizer assembly in the electronic cigarette that includes pores and is permeable to liquid, such as cigarette solution from the cigarette solution storage area."

*B. Obviousness over Hon and Susa*

Petitioner contends that claims 1–3 would have been obvious under 35 U.S.C. § 103(a) over the combination of Hon and Susa. Pet. 15–32. Petitioner relies on a Declaration by Gregory Buckner, Ph.D. ("the Buckner Declaration," Ex. 1002) in support of the contentions. *Id*.

*1. Overview of Hon*

Hon is directed to an electronic atomization cigarette. Ex. 1007, 1:4–5. Figures 1 and 6 of Hon are reproduced below:

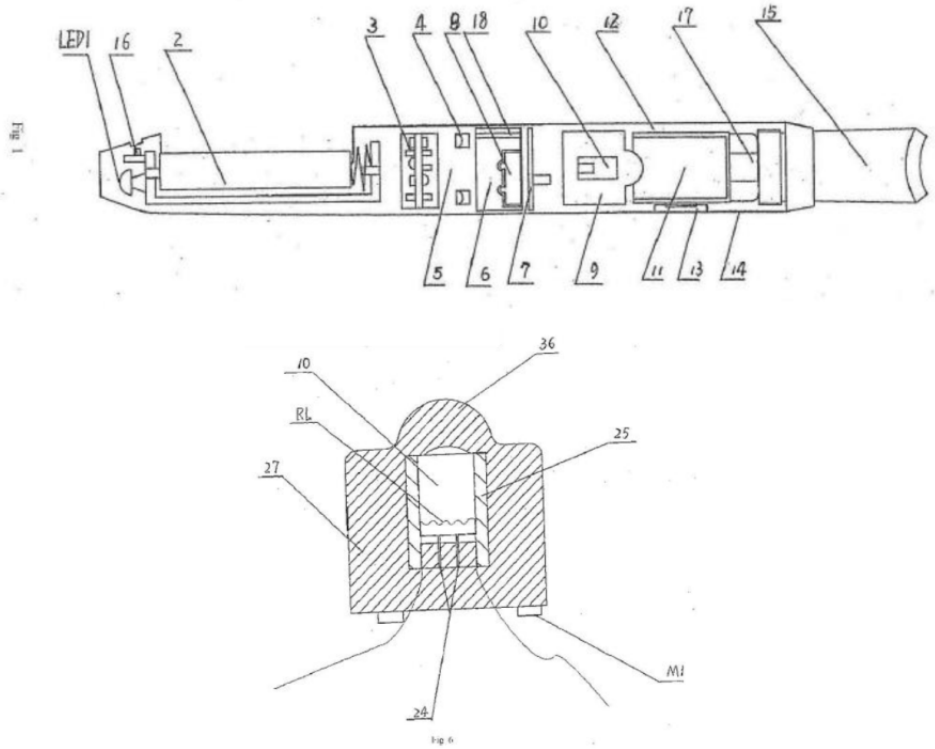


Figure 1 is a schematic diagram of the structure of an electronic cigarette that includes air inlet 4, normal pressure cavity 5, sensor 6, vapor-liquid separator 7, atomizer 9, liquid-supplying bottle 11, and mouthpiece 15 within shell 16. *Id.* at 2:40, 3:14–18. Figure 6 is a structural diagram of an atomizer, which includes atomization cavity 10, heating element RL, first piezoelectric element M1, atomization cavity wall 25, porous body 27, and bulge 36. *Id.* at 2:48, 3:24–29, 35–38.

Hon states that heating element RL "can be made of platinum wire, nickel chromium alloy or iron chromium aluminum alloy wire with rare earth element" and "can also be made into a sheet form." *Id.* at 3:27–29. Hon also states that "atomization cavity wall 25 is surrounded with the porous body 27, which can be made of foam nickel, stainless steel fiber felt, high molecule polymer foam and foam ceramic," and that "atomization cavity wall 25 can be made of aluminum oxide or ceramic." *Id.* at 3:35–38.

Hon further states that "[w]hen a smoker smokes, the mouthpiece 15 is under negative pressure, the air pressure difference or high speed stream between the normal pressure cavity 5 and the negative pressure cavity 8 will cause the sensor 6 to output an actuating signal," which causes the cigarette to begin operating. *Id.* at 4:11–14. Hon describes that air enters normal pressure cavity 5 through air inlet 4, proceeds through the through hole in vapor-liquid separator 7, and flows into atomization cavity 10 in atomizer 9. *Id.* at 4:21–24. The nicotine solution in porous body 27 is driven by the high speed stream passing through the ejection hole into atomization cavity 10 in the form of a droplet, where it "is subjected to the ultrasonic atomization by the first piezoelectric element M1 and is further atomized by the heating element RL." *Id.* at 4:26–27. After atomization, large-diameter droplets stick to the wall and are reabsorbed by porous body 27 via overflow hole 20, and small-diameter droplets form aerosols that are sucked out via aerosol passage 12, gas vent 17, and mouthpiece 15. *Id.* at 4:28–31.

*2. Overview of Susa*

Susa is directed to a flavor generation article used for simulated smoking. Ex. 1010, 1:5–7. Susa Figure 1 is reproduced below:

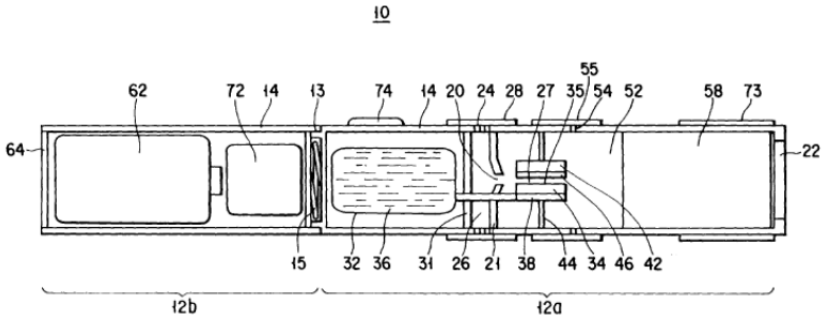


FIG. 1

Figure 1 is a schematic diagram of a flavor generation article described by Susa. *Id.* at 4:20–22. Casing 12 includes "first portion 12a to be held by the user's mouth" and "second portion 12b for incorporating a power supply and the like." *Id.* at 5:17–20. Portions 12a and 12b are detachably connected by connecting portion 13 formed on casing main body 14, and "are electrically connected to each other through a cable 15 stored in a space formed in the casing main body 14 to correspond to the connecting portion 13." *Id.* at 5:20–26. Gas flow path 26 is formed in casing 12 between air intake ports 24 and suction port 22. *Id.* at 5:36–37.

Throttle hole 20, in the center of throttle plate 21, is located in gas flow path 26 and directs air from air intake ports 24 to flow along the surface of ceramic heater 42. *Id.* at 5:46–50. Ceramic heater 42 is fixed on the inner surface of casing main body 14 by support member 44. *Id.* at 7:30–32. Air from throttle hole 20 flows through gap 27 between discharge ports 35 and ceramic heater 42. *Id.* at 7:35–38. Liquid-absorbing porous layer 46 is formed on the surface of ceramic heater 42, and can be made of an organic compound (such as natural cellulose, a cellulose derivative, or an aramid resin), or an inorganic compound (such as carbon, alumina, or silicon carbide). *Id.* at 7:50–8:5.

When a user inhales through suction port 22, sensor 73 outputs an operation signal to control circuit 72, which energizes ceramic heater 42. *Id.* at 9:41–50. After a predetermined time, discharge drive portion 38 is triggered, liquid material 36 is discharged from discharge ports 35, and is gasified with heating by ceramic heater 42. *Id.* at 9:50–55. As the user inhales, the gasified material is mixed with the suctioned air from air intake ports 24, passed through the throttle hole 20, passes between the discharge

ports 35 and ceramic heater 42, and is guided to suction port 22. *Id.* at 9:55–10:2.

Figure 13 of Susa is reproduced below:

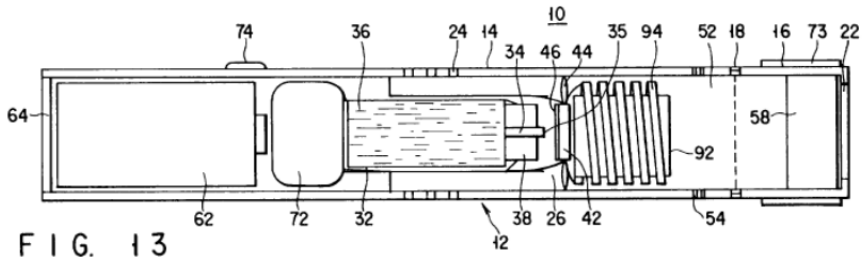


FIG. 13

Figure 13 is a schematic view of another embodiment of Susa's flavor generation article. *Id.* at 15:28–30. Formed body 92 consists "of a solid material that generates a flavor or the like to be inhaled by the user" and is detachably disposed in gas flow path 26 between ceramic heater 42 and cooling chamber 52. *Id.* at 14:57–15:4. Susa states that when formed body 92 is sized such that there is no gap between it and the inner surface of casing main body 14, formed body 92 consists of a solid material that has good air permeability, and gas flow path 26 is formed to extend through formed body 92. *Id.* at 15:13–19. When there is a gap between formed body 92 and the inner surface of casing main body 14, formed body 92 can have little or no air permeability, and gas flow path 26 is formed to extend through that gap. *Id.* at 15:19–27. Coil heater 94 "is disposed around" formed body 92, and "may be arranged in a hole formed in" formed body 92. *Id.* at 15:34–36.

*3. Analysis*

*a. Claims 1 and 2*

Petitioner contends that Hon describes porous component 27 supported by atomization cavity wall 25, and therefore teaches "the atomizer

includes a frame; the porous component is supported by the frame" limitations recited in claim 1, and "the atomizer assembly including a porous component supported by a frame having a run-through hole" limitation in claim 2. Pet. 21, 28. In particular, Petitioner contends that, in Hon, "[t]he porous component is 'arranged around the atomization cavity wall' which 'can be made of aluminum oxide or ceramic.'" *Id.* at 21 (citing Ex. 1007, 2:12, 3:38). Thus, according to Petitioner, Hon's atomization cavity wall 25 is a "frame" as recited in the challenged claims.

Patent Owner argues that Hon does not disclose a frame or any element that supports the porous body. Prelim. Resp. 23. Patent Owner argues that Hon's cylindrical atomization cavity wall 25 "is supported from below and laterally by porous body 27" and "is a liner within the porous body which forms the atomization cavity 10." *Id.* at 24. According to Patent Owner, atomization cavity wall 25 "that is entirely within porous body 27 does not support the porous body," and, instead, "the porous body 27 supports the wall 25 as the porous body will hold the wall in place." *Id.*

As discussed above, we interpret "frame" to mean "a rigid structure." *See supra* Section II.A.1. Petitioner contends Hon's atomization cavity wall 25 is this frame, at least because it can be made of aluminum oxide or ceramic. Pet. 21. We are persuaded that atomization cavity wall 25 is a rigid structure, and is therefore a frame as recited in claims 1 and 2.

We are not persuaded, however, that Petitioner has established that Hon teaches a frame that supports a porous component, as also required by claims 1 and 2. Petitioner points to Hon's description of porous component 27 as being "arranged around the atomization cavity wall" to show that porous component 27 is supported by atomization cavity wall 25. *Id.* The

ordinary meaning of "support" is "bear all or part of the weight of: hold up." Prelim. Resp. 12 (citing Ex. 2005, 1708). Petitioner does not explain adequately, nor cite to sufficient evidence of record explaining, how porous component 27 is held up by atomization cavity wall 25. The teachings in Hon on which Petitioner relies describe porous component 27 surrounding atomization cavity wall 25, but do not indicate that atomization cavity wall 25 is bearing the weight of, or holding up, porous cavity 27. Petitioner does not rely on Susa to teach this limitation.

Petitioner alternatively argues that Hon "discloses that the atomizer includes a vapor-liquid separator (7), which also constitutes a frame that supports the porous component" because it "is 'sequentially interconnected' with the atomizer and 'can be made of plastic or silicon rubber.'" Pet. 21. This argument is not persuasive.

Even if Hon's vapor-liquid separator 7 is a frame, which we need not determine for purposes of this Decision, it is not located in the atomizer as is required by claims 1 and 2. Hon consistently describes vapor-liquid separator 7 as an element separate from the atomizer. *See, e.g.*, Ex. 1007, 3:16–18 ("a vapor-liquid separator 7, an atomizer 9, a liquid-supplying bottle 11 and a mouthpiece 15 are sequentially provided within the shell 14"); 4:23–24 (air passes through "the through hole in the vapor-liquid separator 7, and flows into the atomization cavity 10 in the atomizer 9"); 5:12–14 (describing an embodiment where "the atomizer 9 is postposed within the shell 14, and the liquid-supplying bottle 11 is arranged between the vapor-liquid separator 7 and the atomizer 9"). Furthermore, the statement in Hon on which Petitioner relies regarding vapor-liquid separator 7 being "sequentially interconnected" to atomizer 9, when read in context,

describes the order in which the elements are arranged within the body of the electronic cigarette: "[T]he air inlet, normal pressure cavity, vapor-liquid separator, atomizer, aerosol passage, gas vent and mouthpiece are sequentially interconnected." Ex. 1007, 1:47–49.

Accordingly, we are not persuaded that Petitioner has established a reasonable likelihood of showing that claims 1 and 2 would have been obvious over the combination of Hon and Susa.

*b. Claims 1-3*

Claim 1 recites "the heating wire is wound on the porous component," and claims 2 and 3 recite "a heating wire wound on a part of the porous component." Petitioner contends that Susa describes that "coil heater 94 'is disposed around the formed body 92,' which is adjacent to ceramic heater 42 and porous layer 46," and that "[f]ormed body 92 has qualities and functions similar to the porous layer." Pet. 22. According to Petitioner, because Susa's coil heater 94 envelops formed body 92, "[i]t would have been obvious to one of ordinary skill in the art to wind the coil heater of Susa around the porous layer in [Hon] in order to provide [the heating wire is wound on the porous component] limitation" of claims 1–3. *Id.* at 23, 28–29, 31–32. Petitioner contends that this modification of the Hon electronic cigarette "is motivated by the interest of providing more efficient, uniform heating" and "would enhance commercial opportunities and make the product more desirable by increasing the efficiency of atomization." *Id.* at 23.

Patent Owner argues that Susa's coil heater 94 is not wound on porous layer 46, "which the Petition asserts discloses the claimed porous component." Prelim. Resp. 29. Patent Owner further argues that "[t]he

embodiment in Fig. 13 gasifies liquid in the same way as Fig. 1 discussed above, that is via liquid projected from the discharge head 34 onto a now vertical porous layer 46 on the ceramic heater 42," and that "coil heater 94 together with the formed body 92 generate flavor by heating, but presumptively without gasifying where liquid contacts a heated surface, as in Fig. 1." *Id.* at 29–30.

We are not persuaded by Petitioner's arguments. As set forth above, we interpret "porous component" to mean "a component of the atomizer assembly in the electronic cigarette that includes pores and is permeable to liquid, such as cigarette solution from the cigarette solution storage area." *See supra* Section II.A.2. Petitioner contends that Susa's formed body 92 "has qualities and functions similar to the porous layer," but does not explain sufficiently, nor direct us to adequate evidence of record indicating, that a person having ordinary skill in the art would have understood the formed body 92 to include pores and be permeable to liquid. *See* Pet. 22.

Susa describes formed body 92 as "a solid material that generates flavor or the like," that, depending on its size, can have good air permeability, or poor to no air permeability. Ex. 1010, 14:57–15:2, 15:13–27. The embodiment shown in Susa Figure 13 that shows coil heater 94 disposed around formed body 92 also includes liquid-absorbing porous layer 46 that "is formed on a surface of the ceramic heater 42 that receives the liquid splash of the material" and "stabiliz[es] gasification of the splash of material." *Id.* at 7:50–8:1. Consequently, we are not persuaded that that formed body 92 in Susa is a "porous component" as recited in the challenged claims, or that Petitioner has demonstrated that Susa teaches a heating wire wound on a porous component, as is required by claims 1–3.

A showing of obviousness must be supported by an articulated reasoning with rational underpinning to support a motivation to combine the prior art teachings. *KSR Int'l Co. v. Teleflex, Inc.*, 550 U.S. 398, 418 (2007) (citing *In re Kahn*, 441 F.3d 977, 988 (Fed. Cir. 2006)). Petitioner asserts that a person having ordinary skill in the art would be motivated to modify the Hon electronic cigarette to include a heating wire wound on a porous component "by the interest of providing more efficient, uniform heating" that "would enhance commercial opportunities and make the product more desirable by increasing the efficiency of atomization." Pet. 23. Petitioner does not provide sufficient explanation as to why a person having ordinary skill in the art would have wanted to provide "more efficient, uniform heating" in the Hon cigarette. Petitioner does not direct us to, nor do we discern, statements in Hon or Susa with respect to the efficiency—or inefficiency—of atomization within the described articles. Petitioner's unsupported, conclusory statements do not constitute articulated reasoning with rational underpinnings as to why one of ordinary skill in the art would modify Hon in view of Susa's teachings to arrive at the claimed invention.

For these reasons, Petitioner has not established a reasonable likelihood that it would prevail on the ground that claims 1–3 of the '742 patent would have been obvious over the combination of Hon and Susa.

*C. Obviousness over Hon and Abhulimen*

Petitioner contends that claims 1–3 would have been obvious under 35 U.S.C. § 103(a) over the combination of Hon and Abhulimen. Pet. 32–34. Petitioner relies on the Buckner Declaration (Ex. 1002) in support of its contentions. *Id.*

*1. Overview of Abhulimen*

Abhulimen is directed to a simulated smoking article, with a fuel element physically separated from an aerosol-generating element. Ex. 1012, 1. Figures 1 and 2 of Abhulimen are reproduced below:

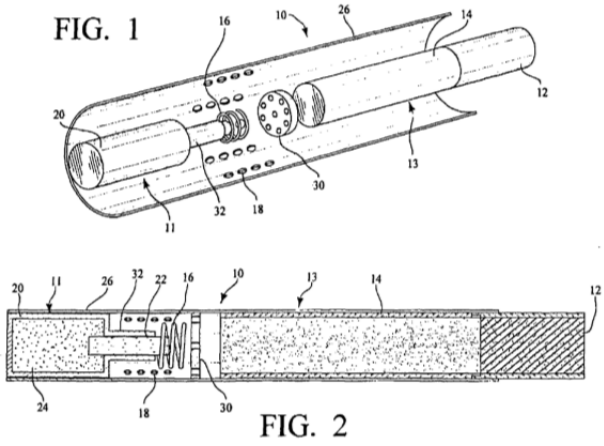


FIG. 2

Figure 1 is partially-fragmented perspective view of a simulated smoking device as described by Abhulimen, and Figure 2 is a longitudinal view of the device shown in Figure 1. *Id.* at 3–4. Simulated smoking device 10 includes fuel element 11, flavor-generating material 13 disposed within tubular wrapper 26, and tobacco rod 14 attached to filter 12. *Id.* at 4. Fuel element 11 includes fuel tank 20, which is non-permeable and non-combustible, and fuel cartridge 24 comprising a porous medium. *Id.* Fuel element 11 also includes extended wick 22 and glow element 16. *Id.* Fuel tank 20 is open-ended at its upstream end, where ceramic tube 32 surrounds wick 22. *Id.* Glow element 16 is a coil comprised of copper wire filament, or other heat-conducting or glowing materials such as brass, platinum, or metallic alloy. *Id.* Heat diffuser 30 is positioned within tubular wrapper 26 between the distal end of flavor-generating material 13 and glow element 16. *Id.* Heat diffuser 30 delivers hot gas and hot air coming into tubular member 26 through puffing air inlets 18 to vapor-generating material of tobacco rod 14,

and also blocks the flame from contact with flavor-generating material 13 when a user inhales. *Id.*

Abhulimen describes that smoking device 10 is started by lighting the metal filament of glow element 16, using a lighter placed under the article in the region of puffing air inlets 18. *Id.* Wick 22 draws fuel to the region of the metal filament, and the flame causes the fuel to vaporize. *Id.* When the user inhales, air is pulled through puffing air inlets 18 and across the metal filament of glow element 16, and the vaporized fuel combusts. *Id.*

*2. Analysis*

*a. Claims 1 and 2*

As set forth above, Petitioner has not established that Hon teaches a frame that supports a porous component, as required by claims 1 and 2. *See supra* Section II.B.3.a. Petitioner does not rely on Abhulimen as teaching this limitation of claims 1 and 2. Accordingly, we determine that the record before us does not establish a reasonable likelihood that Petitioner would prevail in establishing that claims 1 and 2 would have been obvious over the combination of Hon and Abhulimen.

*b. Claims 1–3*

Petitioner contends that Hon discloses most of the limitations of claims 1– 3, but concedes that it does not disclose "a heating wire wound on a part of the porous component." Pet. 33. Petitioner contends that Abhulimen teaches this limitation. *Id.* According to Petitioner, Abhulimen teaches that glow element 16 (which Petitioner equates to a heating wire) is wound on a part of wick 22 (which Petitioner equates to a porous component). *Id.* Petitioner contends that a person having ordinary skill in the art would have been motivated "to wind the heating wire of Abhulimen

around the porous layer in [Hon] to yield" a heating wire wound on a part of the porous component as recited in the claims because it would provide more efficient, uniform heating. *Id.* at 33–34.

As was the case with Petitioner's proposed combination of Hon and Susa as set forth above, Petitioner does not provide sufficient explanation as to why a person having ordinary skill in the art would have wanted to provide "more efficient, uniform heating" in the Hon cigarette. *See supra* Section II.B.3.a. Petitioner does not direct us to, nor do we discern, statements in Hon or Abhulimen with respect to the efficiency—or inefficiency—of atomization within the described articles. Petitioner's unsupported, conclusory statements do not constitute articulated reasoning with rational underpinnings as to why one of ordinary skill in the art would modify Hon in view of Abhulimen's teachings to arrive at the claimed invention.

Accordingly, we determine that the record before us does not establish a reasonable likelihood that Petitioner would prevail in establishing that claims 1–3 of the '742 patent would have been obvious over the combination of Hon and Abhulimen.

*D. Obviousness over Hon and Whittemore*

Petitioner contends that claims 1–3 would have been obvious under 35 U.S.C. § 103(a) over the combination of Hon and Whittemore. Pet. 34–36. Petitioner relies on the Buckner Declaration in support of its contentions. *Id.*

*1. Overview of Whittemore*

Whittemore is directed to vaporizing units for a therapeutic apparatus. Ex. 1013, 1:1–2. Whittemore Figure 2 is reproduced below:

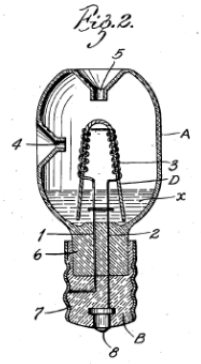


Figure 2 is an enlarged sectional view of a therapeutic apparatus with a vaporizing unit as taught by Whittemore. *Id.* at 1:15–16. Vaporizing vessel A is a hollow glass container that holds liquid medicament x. *Id.* at 1:19–23. Conductors 1 and 2 are combined with heating element 3 such that, when conductors 1 and 2 are energized, heating element 3 is heated. *Id.* at 1:24–27. Wick D is combined with heating element 3 so that a portion of wick D is always in contact, or in approximate contact, with heating element 3, and a portion of wick D is also in contact with liquid medicament x. *Id.* at 1:53–2:5.

According to Whittemore, medicament x is carried on wick D by capillary action to a point where it will be vaporized by the heat from heating element 3. *Id.* at 2:5–8. Whittemore states that "wick D consists of a thread, string or strand of some suitable wick material doubled intermediate its ends so as to form a substantially inverted V-shaped device whose side portions are encased in and surrounded by coiled or looped portions" of heating element 3, and "the lower ends or free ends of the side pieces of the wick projecting downwardly into the medicament and terminating at or in close proximity to the closed bottom 6 of the vessel." *Id.* at 2:9–18.

*2. Analysis*

*a. Claims 1 and 2*

As set forth above, Petitioner has not established that Hon teaches a frame that supports a porous component, as is required by claims 1 and 2. *See supra* Section II.B.3.a. Petitioner does not rely on Whittemore as teaching this limitation of claims 1 and 2. Accordingly, we determine that the record before us does not establish a reasonable likelihood that Petitioner would prevail in establishing that claims 1 and 2 would have been obvious over the combination of Hon and Whittemore.

*b. Claims 1–3*

Petitioner contends that Whittemore teaches "a heating wire wound on a part of the porous component" because "[a]ccording to Whittemore, the vaporizing unit is 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' whereby the 'medicament will be carried by capillary action to a point where it will be vaporized by the heat from filament 3.'" Pet. 35 (citing Ex. 1002 ¶ 88; Ex. 1013, 1:50–2:8 and Fig. 2). Petitioner contends that a person having ordinary skill in the art would have been motivated "to wind the coil heater of Whittemore around the porous layer in Hon" to provide more efficient, uniform heating. *Id.* at 36.

As set forth above with respect to the combinations of Hon and Susa, and Hon and Abhulimen, we are not persuaded that Petitioner has articulated reasoning with rational underpinnings as to why one of ordinary skill in the art would modify Hon's teachings to arrive at the claimed invention based on the asserted reasoning that it would have provided more efficient,

uniform heating. *See supra* Sections II.B.3.b, II.C.3.b. Petitioner does not point to other evidence or explanation to support its proposed combination of Hon and Whittemore. Consequently, for the reasons set forth above with respect to the modification of Hon and Susa, and Hon and Abhulimen, we determine that the record before us does not establish a reasonable likelihood that Petitioner would prevail in establishing that claims 1–3 of the '742 patent would have been obvious over the combination of Hon and Whittemore.

*E. Obviousness over Hon and Counts*

Petitioner contends that claims 1–3 would have been obvious under 35 U.S.C. § 103(a) over the combination of Hon and Counts. Pet. 36–38. Petitioner relies on the Buckner Declaration in support of its contentions. *Id.*

*1. Overview of Counts*

Counts is directed to electrically-heated flavor delivery vehicles. Ex. 1011, 1:5–6. Counts Figure 2 is reproduced below:

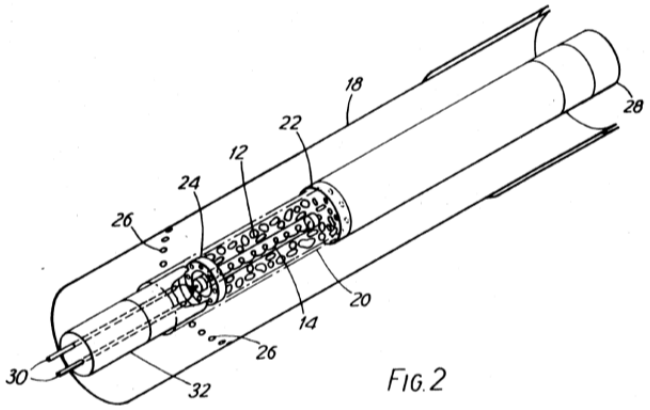

FIG. 2

Figure 2 is a perspective view of an embodiment of the Counts flavor delivery article. *Id.* at 2:38–39. Article 10 includes flavor-generating medium 12 and heating element 16 within outer tube or overwrapper 18. *Id.* at 3:16–20. Flavor-generating medium 12 may be formed in a packed bed,

or as an extruded rod disposed around heating element 14, and is located within thermally-insulating tube 20. *Id.* at 3:20–24.

According to Counts, "[f]lavor-generating medium 12 typically is placed around heating element 14," and "[a]lternatively, the heating element may surround the flavor-generating medium." *Id.* at 3:53–55. Counts teaches that flavor-generating medium 12 "may be similar to flavor pellets shown in commonly-assigned U.S. patent application Ser. No. 07/222,831, filed Jul. 22, 1988" and "may include tobacco or tobacco-derived materials." *Id.* at 3:65–4:2. Counts also teaches that heating element 14 may be formed from a variety of materials, may be a resistive wire coil (such as tungsten, tantalum, or an alloy of nickel, chromium, and iron), or may be formed with graphite or ceramics. *Id.* at 4:5–14.

Counts Figure 3 is reproduced below:

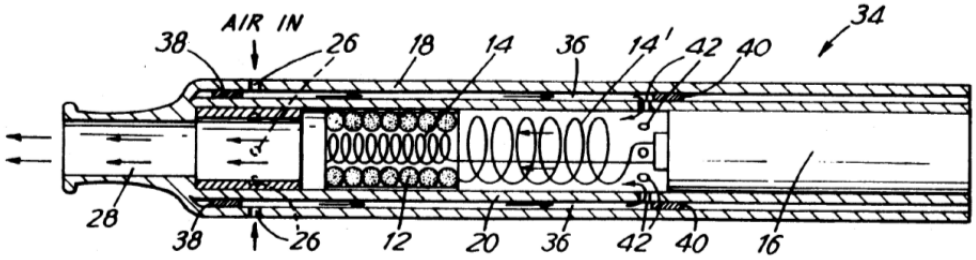


FIG. 3

Figure 3 is a longitudinal view of another embodiment of the Counts flavor delivery article. *Id.* at 2:40–42. Article 34 includes first heating element 14 in contact with flavor-generating medium 12, and second heating element 14' for preheating air drawn into tube 20 before it enters flavor-generating medium 12. *Id.* at 4:15–21. When a user puffs on filter 28, air is drawn through passageway 36, enters tube 20 through air holes 42, and is drawn past heater 14' and through heated flavor-generating medium 12. *Id.* at

4:21–28. A mixture of heated air and flavor components is then drawn through filter 28 for consumer use. *Id.* at 4:28–30.

*2. Analysis*

*a. Claims 1 and 2*

As set forth above, Petitioner has not established that Hon teaches a frame that supports a porous component, as is required by claims 1 and 2. *See supra* Section II.B.3.a. Petitioner does not rely on Counts as teaching this limitation of claims 1 and 2. Accordingly, we determine that the record before us does not establish a reasonable likelihood that Petitioner would prevail in establishing that claims 1 and 2 would have been obvious over the combination of Hon and Counts.

*b. Claims 1–3*

Petitioner asserts that Hon "discloses each limitation of claims 1, 2 and 3 with the exception of 'a heating wire wound on a part of the porous component.'" Pet. 37. Petitioner asserts that Counts teaches this limitation when it states that "the heating element may surround the flavor generating medium." *Id.* (citing Ex. 1011, 3:53–55 and Fig. 6). According to Petitioner, "heating wire (14') can be wound on a part of the porous component (12)." *Id.* Petitioner asserts that "[i]t would have been obvious to one of ordinary skill in the art to wind the heating wire of Counts around the porous layer in Hon" in order to provide more efficient, uniform heating. *Id.* at 37–38.

As set forth above with respect to the combinations of Hon and Susa, and Hon and Abhulimen, we are not persuaded that Petitioner has articulated reasoning with rational underpinnings as to why one of ordinary skill in the art would modify Hon's teachings to arrive at the claimed invention based

on the asserted reasoning that it would have provided more efficient, uniform heating. *See supra* Sections II.B.3.b, II.C.3.b. Petitioner does not point to other evidence or explanation to support its proposed combination of Hon and Counts. Consequently, for the reasons set forth above with respect to the modification of Hon and Susa, and Hon and Abhulimen, we determine that the record before us does not establish a reasonable likelihood that Petitioner would prevail in establishing that claims 1–3 of the '742 patent would have been obvious over the combination of Hon and Counts.

*F. Obviousness over Susa*

Petitioner contends that claims 1–3 would have been obvious under 35 U.S.C. § 103(a) over Susa. Pet. 38–54. Petitioner relies on the Buckner Declaration in support of its contentions. *Id.*

In particular, Petitioner contends that Susa teaches "the heating wire is wound on the porous component." Petitioner states that, "[a]lthough the coil heater 94 is 'disposed around the formed body 92,' the formed body 92 is adjacent to the ceramic heater 42 and porous layer 46." Pet. 44. Petitioner states that "[f]ormed body 92 has qualities and functions similar to the porous layer," and because "coil heater 94 works together with ceramic heater 42 (containing porous layer 46), it would have been obvious to one of ordinary skill in the art to wind the coil heater around the porous layer." *Id.* at 44–45. Petitioner argues that this "modification is motivated by the interest of providing more efficient, uniform heating." *Id.* at 45.

For the reasons set forth above with respect to the combination of Hon and Susa, Petitioner has not established that Susa teaches a heating wire wound on a porous component, as is required by claims 1–3. *See supra* Section II.B.3.b. We are also not persuaded that Petitioner has established

that it would have been obvious to modify Susa to wind coil heater 94 on porous layer 46. Petitioner argues that this modification would provide more efficient, uniform heating, and that Susa provides motivation to make the modification when it "explains that the 'characteristic features can be appropriately combined according to the object.'" Pet. 45–46 (citing Ex. 101, 17:11–19). Petitioner also relies on Susa's statement that "the present invention can be practiced in various embodiments other than those shown in the drawings within the spirit and scope of the invention." *Id.* at 46 (citing Ex. 1010, 17:11–19).

Petitioner does not provide sufficient explanation as to why a person having ordinary skill in the art would have wanted to provide "more efficient, uniform heating" in the Susa flavor-generation article. Petitioner does not direct us to, nor do we discern, statements in Susa with respect to the efficiency—or inefficiency—of atomization within the described article. Additionally, Petitioner does not explain how Susa's general statements regarding combining characteristic features "in accordance with the object" and the ability to practice embodiments other than those shown in Susa would lead a person having ordinary skill in the art to modify Susa to arrive at the claimed invention. Petitioner's unsupported, conclusory statements do not constitute articulated reasoning with rational underpinnings.

Accordingly, we determine that the record before us does not establish a reasonable likelihood that Petitioner would prevail in establishing that claims 1–3 of the '742 patent would have been obvious over Susa.

*G. Obviousness over Susa and Abhulimen*

Petitioner contends that claims 1–3 would have been obvious under 35 U.S.C. § 103(a) over the combination of Susa and Abhulimen. Pet. 54–57. Petitioner relies on the Buckner Declaration in support of its contentions. *Id.*

Petitioner argues that Abhulimen teaches "a heating wire wound on a part of the porous component" for the same reasons set forth with respect to the combination of Hon and Abhulimen. Pet. 54–55; *see supra* Section II.C.2.b. Petitioner also argues that "[i]t would have been obvious to one of ordinary skill in the art to wind the coil heater of Abhulimen around the porous layer in Susa" to yield a heating wire wound on a part of the porous component, and that "[t]he modification is motivated for the same reasons explained above regarding Susa (*e.g.*, to provide more efficient uniform heating)." Pet. 55 (citing Pet. 44–46). Petitioner does not point to other evidence or explanation to support its proposed combination of Susa and Abhulimen. Accordingly, for the reasons set forth above regarding the modification of Susa (*see supra* Section II.F), we determine that the record before us does not establish a reasonable likelihood that Petitioner would prevail in establishing that claims 1–3 of the '742 patent would have been obvious over the combination of Susa and Abhulimen.

*H. Obviousness over Susa and Whittemore*

Petitioner contends that claims 1–3 would have been obvious under 35 U.S.C. § 103(a) over the combination of Susa and Whittemore. Pet. 57–60. Petitioner relies on the Buckner Declaration in support of its contentions. *Id.*

Petitioner argues that Whittemore teaches "a heating wire wound on a part of the porous component" because,

> [a]ccording to Whittemore, the vaporizing unit is 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" whereby the "medicament will be carried by capillary action to a point where it will be vaporized by the heat from the filament 3."

Pet. 57–58 (citing Ex. 1013, 1:50–2:8, Fig. 2). Petitioner further argues that it would have been obvious to a person having skill in the art "to wind the heating wire of Whittemore around the porous layer in Susa," and that such a modification "is motivated for the same reasons explained above regarding Susa (*e.g.*, to provide a more efficient, uniform heating)." *Id.* at 58 (citing Pet. 44–46).

As set forth above with respect to Susa, we are not persuaded that Petitioner articulated reasoning with rational underpinnings as to why one of ordinary skill in the art would modify Susa's teachings to arrive at the claimed invention based on the asserted reasoning that it would have provided more efficient, uniform heating. *See supra* Section II.F. Petitioner does not point to other evidence or explanation to support its proposed combination of Susa and Whittemore. Consequently, for the reasons set forth above with respect to the modification of Susa, we determine that the record before us does not establish a reasonable likelihood that Petitioner would prevail in establishing that claims 1–3 of the '742 patent would have been obvious over the combination of Susa and Whittemore.

## III. CONCLUSION

For the foregoing reasons, we are not persuaded that Petitioner has established a reasonable likelihood that at least one of the challenged claims of the '742 patent is unpatentable based on the asserted grounds.

## IV. ORDER

In consideration of the foregoing, it is hereby:

ORDERED that the Petition is *denied*.

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