Exhibit
2001

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571-272-7822

Paper 12
Date: July 12, 2022

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

JUPITER RESEARCH, LLC,
Petitioner,

v.

VPR BRANDS, L.P.,
Patent Owner.

IPR2022-00299
Patent 8,205,622 B2

Before JO-ANNE M. KOKOSKI, WESLEY B. DERRICK, and JULIA HEANEY, *Administrative Patent Judges.*

KOKOSKI, *Administrative Patent Judge*.

DECISION
Denying Institution of *Inter Partes* Review
35 U.S.C. § 314, 37 C.F.R. § 42.4

I. INTRODUCTION

Jupiter Research, LLC ("Petitioner") filed a Petition to institute an *inter partes* review of claims 13–18 (the "challenged claims") of U.S. Patent No. 8,205,622 B2 ("the '622 patent," Ex. 1001). Paper 2 ("Pet."). VPR Brands, LP ("Patent Owner") filed a Preliminary Response. Paper 9 ("Prelim. Resp.").

Institution of an *inter partes* review is authorized by statute when "the information presented in the petition . . . and any response . . . shows that there is a reasonable likelihood that the petitioner would prevail with respect to at least 1 of the claims challenged in the petition." 35 U.S.C. § 314 (2018); *see also* 37 C.F.R. § 42.4 (2021). For the reasons discussed below, we deny the Petition and do not institute an *inter partes* review.

A. Real Parties in Interest

Each party identifies itself as the real party in interest. Pet. 1; Paper 8, 1.

B. Related Matters

The parties assert that the '622 patent is at issue in the following cases: (1) *VPR Brands, LP v. Jupiter Research, LLC*, Case No. 2:20-cv-02185 (D. Ariz.); (2) *VPR Brands, LP v. Myle Vape Inc.*, Case No. 1:21-cv-02445 (E.D. Tenn.); (3) *VPR Brands, LP v. Cool Clouds Distribution, Inc.*, Case No. 2:21-cv-01116 (C.D. Cal.); and (4) *VPR Brands, LP v. MONQ, LLC*, Case No. 3:21-cv-00172 (M.D. Tenn.). Pet. 1; Paper 8, 1–2. Petitioner further asserts that the '622 patent is at issue in *VPR Brands, LP v. PHD Marketing Inc.*, Case No. 2021-cv-03797 (C.D. Cal.) and *VPR Brands, LP v. BAE Worldwide LLC*, Case No. 2021-cv-10971 (D. Mass.). Pet. 1.

C. The '622 Patent

The '622 patent relates to an electronic cigarette that includes an electronic inhaler and an electronic atomizer, each of which "may have a metal or plastic tube, and the two tubes may have an identical or similar diameter." Ex. 1001, 2:25–30. The electronic inhaler includes an electric power source that "supplies power to the electronic inhaler and electronic atomizer and ensures that both work together like a cigarette." *Id*. at code (57). The electronic inhaler also includes an electric airflow sensor to detect air movement generated by a user's puffing action, and a single chip micyoco that control the atomization process. *Id*. The electronic atomizer includes an electric connector, electric heating wire, a liquid container, and an atomizer cap with an air-puffing hole. *Id*. The electronic inhaler and the electronic atomizer are connected by "connectors on both parts to form an entire electronic cigarette." *Id*. at 2:48–50.

The '622 patent explains that "[o]ne of the new technologies that may be used" with the described electronic cigarette is "an electric airflow sensor instead of a mechanical device in detecting airflow generated by the user's puffing and creating a signal for the microprocessor to activate the electric circuit." *Id*. at 3:23–28. According to the '622 patent, "[t]his new technology provides a solution to the problems of the current inhaling technology by eliminating aging and short-life drawbacks of the current mechanical device technology," and "makes the puffing of users on the cigarette much easier and smoother." *Id*. at 3:34–38. Electronic sensors are also "more sensitive to turning on and off the vaporizing process than the conventional mechanical system," and "can last for five years, many times longer than the mechanical device." *Id*. at 3:38–42.

The ’622 patent teaches that, “[w]hen the user puffs on the electronic cigarette through the air-puffing hole on the first end of the atomizer, the electronic sensor detects an airflow and converts it to a signal, which then wakes up the single chip micyoco to record the signal.” Ex. 1001, 2:51–54. The single chip micyoco, guided by its embedded software instructions, “turn[s] on the electric power source to supply an electricity current with a predetermined time and length.” *Id*. at 2:55–57. The magnitude of the electric current from the electric power source “depends on the magnitude of the signal detected from the airflow proportional to the strength of the user’s puffing action,” which “controls the temperature and the heat generated” in a process that “closely mimics the process of cigarette smoking.” *Id*. at 4:26–32. The electric current then “preferably flows through the electric heat wire inside the atomizer tube, which then heats up the heat equalizer with absorbed liquid from the liquid-container” and “converts the liquid into a form of vapor mist” that is “drawn into the mouth of the user.” *Id*. at 2:57–62.

D. Challenged Claims

Petitioner challenges claims 13–18 of the ’622 patent, of which claims 13, 16, and 17 are independent. Claims 13 and 16 are representative of the claimed subject matter, and are reproduced below.

> 13. An electronic cigarette comprising a tubular electronic inhaler and a tubular atomizer, wherein the electronic inhaler includes an electric power source that provides an electric current to the electronic atomizer, the electronic cigarette further comprising an electric airflow sensor that is used to turn on and off the electric power source by way of detecting an airflow and sending a signal to a Single Chip Micyoco, wherein the Single Chip Micyoco receives the signal from the electric airflow sensor, instructs the electric power source to send an

> electric current to the electronic atomizer, and a time period and a magnitude of the electric current.

Ex. 1001, 7:38–8:3.

> 16. An electronic cigarette comprising a tubular electronic inhaler and a tubular atomizer, wherein the electronic inhaler includes an electric power source that provides an electric current to the electronic atomizer, wherein the electronic inhaler includes, sequentially from a first end of the electronic inhaler to the second end, a cigarette cap, an LED indicator, the electric power source, an electric airflow sensor, a circuit board for a Single Chip Micyoco, and first electric connector.

Id. at 8:11–19.

E. Prior Art and Asserted Grounds

Petitioner asserts that claims 13–18 would have been unpatentable on the following grounds:

Claim(s) Challenged	35 U.S.C. §[1]	Reference(s)/Basis
13–15, 17, 18	102	Hon[2]
13–15	102	Cox[3]
16	103	Cox, Hon
16–18	103	Cox, Zhu[4]

Pet. 7. Petitioner relies on the Declaration of David Boehmer (Ex. 1004) in support of its contentions.

[1] The Leahy-Smith America Invents Act ("AIA"), Pub. L. No. 112-29, 125 Stat. 284 (2011), revised 35 U.S.C. § 103 effective March 16, 2013. Because the '622 patent has an effective filing date before March 16, 2013 (Ex. 1001, codes (22), (30)), we refer to the pre-AIA version of Sections 102 and 103.
[2] Hon, US 8,375,957 B2, issued Feb. 19, 2013 (Ex. 1008).
[3] Cox, US 6,234,167 B1, issued May 22, 2001 (Ex. 1007).
[4] Zhu, CN 201104488Y, published Aug. 27, 2008 (Ex. 1009, with certified English translation).

II. ANALYSIS

A. Level of Ordinary Skill in the Art

Petitioner contends that a person having ordinary skill in the art "would have had a bachelor's degree in electrical engineering, mechanical engineering, chemical engineering, or a closely related field and one to two years of experience working in the consumer electronics or computer industry in the capacity of a design, application, customer marketing or technical marketing engineer." Pet. 11 (citing Ex. 1004 ¶ 58). At this stage of the proceeding, Patent Owner neither responds to Petitioner's proposed definition, nor provides a definition of its own. *See generally*, Prelim. Resp. Petitioner's undisputed proposed definition appears to be consistent with the cited prior art and the disclosure of the '622 patent, and we adopt it for purposes of this Decision. *See Okajima v. Bourdeau*, 261 F.3d 1350, 1355 (Fed. Cir. 2001) (explaining that specific findings regarding ordinary skill level are not required "where the prior art itself reflects an appropriate level and a need for testimony is not shown" (quoting *Litton Indus. Prods., Inc. v. Solid State Sys. Corp*., 755 F.2d 158, 163 (Fed. Cir. 1985)).

B. Claim Construction

We construe each claim "in accordance with the ordinary and customary meaning of such claim as understood by one of ordinary skill in the art and the prosecution history pertaining to the patent." 37 C.F.R. § 42.100(b) (2019). Under this standard, claim terms are generally given their plain and ordinary meaning as would have been understood by a person of ordinary skill in the art at the time of the invention and in the context of the entire patent disclosure. *Phillips v. AWH Corp.*, 415 F.3d 1303, 1313 (Fed. Cir. 2005) (en banc). Only those terms in controversy need to be

construed, and only to the extent necessary to resolve the controversy. *Realtime Data LLC v. Iancu*, 912 F.3d 1368, 1375 (Fed. Cir. 2019).

The parties stipulated to the construction of many claim terms in their related litigation currently pending in the District of Arizona. Pet. 11–12; Prelim. Resp. 12; Ex. 1006. Based on the parties' apparent agreement, and considering the record before us, we adopt the parties agreed-upon claim constructions for purposes of this Decision. *See* Ex. 1006 (stipulated claim construction proposed in the district court). We provide the constructions of "electric airflow sensor" and "detecting an airflow," which are of particular relevance to this Decision, below.

"electric airflow sensor"	an electric sensor to detect air movement generated by a user's inhaling or puffing act
"detecting an airflow"	determining that a user is inducing airflow into or out of the device

Ex. 1006, 2, 3.

C. Asserted Anticipation by Hon

Petitioner contends that claims 13–15, 17, and 18 are anticipated by Hon. Pet. 18–32.

1. Overview of Hon

Hon "relates to an electronic cigarette containing nicotine but not tar" that includes a battery assembly connected at one end of an atomizer assembly, and a cigarette bottle assembly inserted into the other end of the atomizer assembly, to form "one cigarette type or cigar type body." Ex. 1008, 1:5–6, 1:46–50. Hon's Figure 5B is reproduced below:

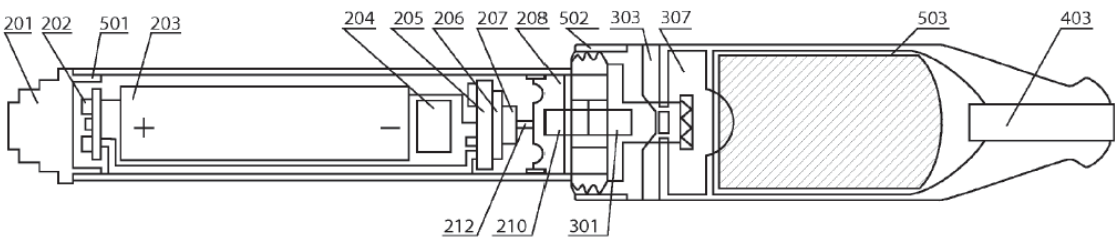

Figure 5B

Figure 5B is a diagram of the internal structure of an electronic cigarette described in Hon. *Id*. at 2:37–38. The battery assembly includes indicator cap 201 with fine hole 501, indicator 202, lithium battery 203 connected successively with MOSFET electric circuit board 205, MCU 206, sensor 207, and silica gel corrugated membrane 208 located between sensor 207 and screwthread electrode 209. *Id*. at 3:4–15, 4:65–67. Sensor 207, which "may be switch sensor made of elastic alloy slice, Hall element of linear output, semiconductor force-sensitive chip, semiconductor matrix thermoelectric bridge chip, capacitance or inductance sensor," is connected with silica gel corrugated membrane 208 through switch spring 212. *Id*. at 3:18–23. The atomizer assembly includes air-liquid separator 303 that is connected to atomizer 307 using internal electrode 307, and secondary shell 306 with air intake hole 502. *Id*. at 3:38–41. The cigarette body assembly is inserted in secondary shell 306. *Id*. at 3:34–36.

Hon teaches that when the user sucks suction nozzle 403, negative pressure forms on silica gel corrugated membrane 208 through air intake hole 503 and primary and secondary negative pressure cavities 210, 301. Ex. 1008, 5:7–11. Silica gel corrugated membrane 208, under the action of the suction pressure difference, distorts to drive switch spring 212 and sensor 207, which invokes MCU 206 and MOSFET electric circuit board

205. *Id*. at 5:11–15. Lithium ion battery 203 then electrifies the heating body inside atomizer 307 through MOSFET electric circuit board 205 as well as internal and external thread electrodes 302, 209, so that the heating body produces heat. *Id.* at 5:15–20. Air enters through air intake hole 502, passes through the run-through hole on air-liquid separator 303, and helps to form an air-liquid mixture that is then sprayed onto the heating body inside atomizer 307, vaporized, and quickly absorbed into the airflow and condensed into aerosol that passes through air intake hole 503 and suction nozzle 403 to form white mist type aerosol. *Id*. at 5:23–31.

2. Claims 13 and 17

Petitioner asserts that Hon discloses all of the limitations of independent claims 13 and 17. Pet. 18–29. Patent Owner responds that Hon does not disclose an "electric air flow sensor" or a "single chip micyoco" as required by claims 13 and 17, and "the airflow sensor is a diaphragm microphone" as required by claim 17. Prelim. Resp. 22–25. We focus our discussion on the "electric air flow sensor" limitation of claims 13 and 17, as it is dispositive for purposes of this Decision.

Claim 13 recites that "the electronic cigarette further compris[es] an electric air flow sensor that is used to turn on and off the electric power source by way of detecting an airflow and sending a signal to a Single Chip Micyoco." Ex. 1001, 7:41–44. Claim 17 recites that "the tubular electronic inhaler includes an electric air flow sensor configured to turn on and off the electric power source by way of detecting an airflow." *Id*. at 8:37–39. As set forth above, for purposes of this Decision, we construe "electric airflow sensor" as used in claims 13 and 17 to mean "an electric sensor to detect air movement generated by a user's inhaling or puffing act," and "detecting an airflow" to mean "determining that a user is inducing airflow into or out of

the device." Ex. 1006, 2, 3. Thus, Petitioner must show that Hon discloses an electric sensor that determines that a user's inhaling or puffing act is inducing airflow into or out of the device to meet the "electric air flow sensor [that is used/configured] to turn on and off the electric power source by way of detecting an airflow" limitation of claims 13 and 17. We are not persuaded, based on the current record, that Petitioner has carried its burden of doing so.

Petitioner argues that Hon's sensor 207 is an electric airflow sensor that closes the circuit with MCU 206 and MOSFET electric circuit board 205 and causes the battery to electrify the heating body in the atomizer. Pet. 22–23 (citing Ex. 1008,[5] 3:14–20), 27–28 ("Hon teaches the inhaler includes an airflow sensor (sensor (207) configured to turn on and off the electric power source (battery 203)) by way of detecting an airflow."); *see also id*. at 28 ("Hon teaches that sensor (207) can be a switch sensor made of elastic alloy slice, Hall element of linear of output, semiconductor force-sensitive chip, semiconductor matrix thermoelectric bridge chip, capacitance or inductance sensor."). Petitioner, however, does not sufficiently establish that sensor 207 determines that a user's inhaling or puffing act is inducing airflow in to or out of the device.

Hon teaches that air intake by the user causes negative pressure to form at silica gel corrugated membrane 208, which then "distorts to drive" spring switch 212 and sensor 207, "thus invoking MCU (206) and MOSFET electric circuit board 205." Ex. 1008, 5:7–15. Hon, therefore, teaches that it is the negative pressure that forms at silica gel corrugated membrane 208

[5] Although Hon is Ex. 1008, Petitioner cites to Ex. 1007 when discussing the disclosures in Hon. We understand this to be a typographical error, and refer to Ex. 1008 herein.

that drives switch spring 212 and sensor 207. Switch spring 212 and sensor 207 do not operate to turn on and off the electric power source until they are driven to invoke the MCU and MOSFET circuit board by the distortion of silica gel corrugated membrane 208. In light of these disclosures in Hon, Petitioner does not adequately explain how sensor 207 detects air movement generated by a user's inhaling or puffing act as claims 13 and 17 require. Moreover, to the extent that Petitioner is arguing that silica gel corrugated membrane 208, switch spring 212, and sensor 207 together form an airflow sensor, Petitioner does not adequately establish that such an airflow sensor would be an *electric* airflow sensor, rather than a mechanical device that detects airflow. Petitioner also does not assert that, or explain how, MCU 206 and MOSFET electric circuit board 205 would be considered part of Hon's airflow sensor. Pet. 22–23.

The '622 patent discloses "the use of an electric airflow sensor *instead of a mechanical device* in detecting an airflow generated by the user's puffing and creating a signal for the microprocessor to activate the electric circuit." Ex. 1001, 3:23–28 (emphasis added). A mechanical sensor that closes a switch (like Hon's sensor 207), therefore, appears to be outside the scope of an "electric airflow sensor" as that term is used in the challenged claims.

For these reasons, we find that Petitioner fails to meet its burden of establishing that Hon discloses the "electric air flow sensor [that is used/configured] to turn on and off the electric power source by way of detecting an airflow" limitation of claims 13 and 17. Accordingly, we determine that Petitioner does not establish a reasonable likelihood that it would prevail in showing that independent claims 13 and 17 are anticipated by Hon.

3. Claims 14, 15, and 18

Claims 14 and 15 depend from claim 13, and claim 18 depends from claim 17. Ex. 1001, 8:4–10, 8:41–45. For the same reasons set forth above with respect to claims 13 and 17, we also determine that Petitioner does not establish a reasonable likelihood that it would prevail in showing that claims 14, 15, and 18 are anticipated by Hon.

D. Asserted Anticipation by Cox

Petitioner contends that claims 13–15 are anticipated by Cox. Pet. 33–39.

1. Overview of Cox

Cox relates "to aerosol generators able to generate aerosols without compressed gas propellants." Ex. 1007, 1:7–10. Figure 1, reproduced below, illustrates one embodiment of an aerosol generator described in Cox:

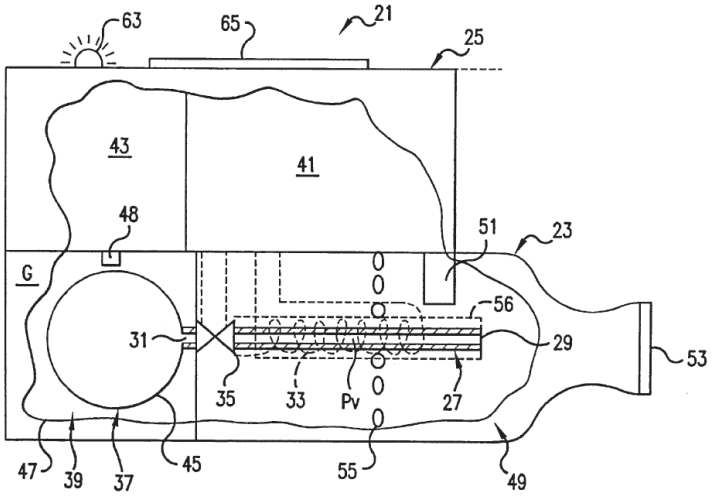

FIG.1

Figure 1 is a schematic, partially broken, side view of an aerosol generator described in Cox. *Id*. at 3:16–18. Aerosol generator 21 includes first component 23 removably attached to second component 25. *Id*. at 3:46–55. First component 23 is preferably disposable and includes the material to be

turned into an aerosol, and second component 25 includes the power source and logic circuitry, and is reusable with successive one of the first component. *Id*. "The first and second components 23 and 25 can be attachable to one another in end to end or side by side relationships." *Id*. at 3:56–58. First component 23 includes tube 27 with first and second ends 29, 31, heater 33, valve 35, and material source 37. *Id*. at 3:61–4:5. Second component 25 includes power source 41 (such as a rechargeable battery), and control device 43 (such as a microchip), "for controlling supply of power from the source of power to heater and the valve." *Id*. at 4:10–18.

Cox teaches that "[g]eneral operation of the aerosol generator 21 involves a user providing a signal," such as pressing a button or inhaling near first end 29 of tube 27 "to actuate a flow sensing detector or pressure drop sensing detector, which is received by the control device 43." Ex. 1007, 4:25–30. In response to the signal, control device 43 controls the supply of power from power source 41 to open valve 35 and supply power to heater 33 to cause it heat to its desired operating temperature. *Id*. at 4:30–34. When valve 35 is opened, pressurization arrangement 39 causes the material in material source 37 to be introduced into tube 27; the material is then heated to a vaporization temperature in tube 27, volatilized, and expanded out of first end 29. *Id*. at 4:38–42. The volatilized material then exits tube 27, where it contacts cooler air and condenses to form an aerosol. *Id*. at 4:42–44. After a predetermined time, control device 43 automatically closes valve 35 and shuts off the power supply to heater 33. *Id*. at 4:44–47.

Cox teaches that, "[b]ecause presently preferred applications for the aerosol generator 21 include use as an inhaler, the aerosol generator is preferably as small as possible." Ex. 1007, 4:51–53. Accordingly, Cox teaches that valve 35 is preferably a microvalve, and "[m]ore preferably, the

valve 35, the heater 33, and the tube 27 are a single microelectronic machine formed on a single chip." *Id*. at 4:53–56.

Cox further teaches that the signal to control device 43 to supply power to valve 35 and heater 33 "is preferably provided by a user of the aerosol generator," and, more particularly, "is based on a user causing some manner of air flow in the proximity of the free first end 29 of the tube 27, such as by inhaling on a mouthpiece section 49 of the aerosol generator." Ex. 1007, 5:42–51. Cox teaches that air flow detecting device 51 can be arranged to send a signal to control device 43 to indicate that the predetermined air flow rate exists. *Id*. at 5:51–61. As shown in Figure 1, air flow detecting device 51 "is preferably disposed transversely to and upstream of the first end 29 of the tube 27." *Id*. at 5:61–67. Cox also teaches that control device 43 may be individually programmable, such as by a pharmacist to control the administration of medication, or may be permanently programmed to prevent use after a set period of time. *Id*. at 8:5–10, 8:16–19.

2. Claims 13–15

Petitioner asserts that Cox discloses all of the limitations of independent claim 13. Pet. 18–29. We focus our discussion on the "electric air flow sensor" limitation of claim 13, as it is dispositive for purposes of this Decision.

Claim 13 recites that "the electronic cigarette further compris[es] an electric air flow sensor that is used to turn on and off the electric power source by way of detecting an airflow and sending a signal to a Single Chip Micyoco." Ex. 1001, 7:41–44. As set forth above, for purposes of this Decision we construe "electric air flow sensor" to mean "an electric sensor to detect air movement generated by a user's inhaling or puffing act."

Ex. 1006, 2. Petitioner contends that Cox's air flow detecting device 51 is an electric airflow sensor that "is used to turn on and off the electric power source (41) by way of detecting an airflow and sending a single [*sic*, signal] to a Single Chip Micyoco (control device (43))." Pet. 35 (citing Ex. 1007,[6] 5:50–60, 6:32–35). Patent Owner responds that Cox does not disclose "an electric airflow sensor" because "the only sensors described and enabled by Cox, are 'pressure drop detecting devices'" that "merely detected a negative pressure." Prelim. Resp. 25–26 (citing Ex. 1007, 6:46–53; Ex. 1017).

Cox teaches that the aerosol generator can include "air flow detecting device 51 for determining when a predetermined air flow rate exists proximate the first end 29 of the tube 37." Ex. 1007, 5:51–54; *see also id*. at 5:47–51 ("[A] preferred arrangement for providing a signal is based on a user causing some manner of air flow in the proximity of the free first end 29 of the tube 27, such as by inhaling on a mouthpiece section 49 of the aerosol generator."). Cox also teaches that air flow detecting device 51 can be arranged to send a signal to control device 43 to indicate that the existence of the predetermined air flow rate, and that control device 43 can in turn be "arranged to control the power source to supply power to the valve 35 and the heater 33, and any other components, in response to a signal from the air flow detecting device." *Id*. at 5:54–61. These disclosures in Cox indicate that air flow detecting device 51 is a sensor that detects air movement generated by a user's inhaling or puffing act.

We are not persuaded, however, that Petitioner sufficiently establishes that air flow detecting device 51 is an *electric* airflow sensor as required by

[6] Although Cox is Ex. 1007, Petitioner cites to Ex. 1008 when discussing the disclosures in Cox. We understand this to be a typographical error, and we refer to Ex. 1007 herein.

claim 13. In that regard, Petitioner points to Cox's statement that "air flow detecting device 51 is preferably arranged to send a signal to control device 43 to indicate that the predetermined air flow rate exists" to support its contention that "Cox teaches that the electronic cigarette includes an electric airflow sensor (air flow detecting device (51))." Pet. 35 (citing Ex. 1007, 5:50–60, 6:32–35). We understand Petitioner to be arguing that Cox's air flow detecting device 51 is an electric airflow sensor simply because it outputs an electric signal.

The '622 patent specifically distinguishes electric airflow sensors from mechanical airflow sensors, and sets forth the advantages of the former over the latter. *See* Ex. 1001, 3:43–28 (explaining that "[o]ne of the new technologies that may be used with an electronic cigarette of the present invention is the use of an electric airflow sensor instead of a mechanical device in detecting airflow . . ."). In particular, the '622 patent explains that electric airflow sensors provide "a solution to the problems of current inhaling technology by eliminating aging and short-life drawbacks of the current mechanical device technology" and "makes the puffing of users on the cigarette much easier and smoother." *Id*. at 3:34–38. The '622 patent also explains that "[t]he life of an electric sensor can last for five years, many times longer than the mechanical device." *Id*. at 3:41–43. Considering these disclosures in the '622 patent, Petitioner does not explain how a mechanical sensor that outputs an electric signal is different from a mechanical airflow sensor without such an electric output. For example, Petitioner does not address whether a mechanical sensor with an electric output would have the "aging or short life drawbacks of the current mechanical device technology" or provide the advantages of an electric airflow sensor, such as making the user's puffing action easier or smoother,

and being "more sensitive in turning on and off the vaporizing process than the conventional mechanical system." *Id*. at 3:34–38. Moreover, Cox does not provide detail as to how air flow detecting device 51 operates, or describe how air flow detecting device 51 interacts with control device 43 other than sending it a signal. In contrast, Cox teaches that a pressure drop detecting device can be used as an alternative, or in addition, to air flow detecting device 51, and provides a specific example of a puff-actuated pressure drop sensing device. *See* Ex. 1001, 6:46–58.

To establish anticipation, each and every element in a claim, arranged as recited in the claim, must be found in a single prior art reference. *Net MoneyIN, Inc. v. VeriSign, Inc.*, 545 F.3d 1359, 1369 (Fed. Cir. 2008); *Karsten Mfg. Corp. v. Cleveland Golf Co.*, 242 F.3d 1376, 1383 (Fed. Cir. 2001). Here, Petitioner neither directs us to an express disclosure in Cox that air flow detecting device 51 is an electric airflow sensor as required by claim 13, nor adequately explains that a person of ordinary skill in the art would have understood Cox as disclosing an electric airflow sensor, and could have combined Cox's disclosures with their own knowledge to make the claimed invention. *See Helifix Ltd. v. Bloc-Loc, Ltd.*, 208 F.3d 1339, 1347 (Fed. Cir. 2000) (A reference that does not expressly disclose a claimed limitation "might nevertheless be anticipating if a person of ordinary skill in the art would understand [the reference] as disclosing [the limitation] and if such a person could have combined the [reference's] description of the invention with his own knowledge to make the claimed invention."). We also do not understand Petitioner to be arguing that Cox inherently discloses an electric airflow sensor. *See In re Montgomery*, 667 F.3d 1375, 1379 (Fed. Cir. 2012) ("A reference may anticipate inherently if a claim limitation that is not expressly disclosed is 'necessarily present, or

inherent, in the single anticipating reference.'" (quoting *Verizon Servs. Corp. v. Fibernet Va., Inc.*, 602 F.3d 1325, 1337 (Fed. Cir. 2010))).

For these reasons, we are not persuaded that Petitioner sufficiently establishes that Cox discloses "an electric air flow sensor that is used to turn on and off the electric power source by way of detecting an airflow" as recited in independent claim 13. Accordingly, we determine that the Petition does not establish a reasonable likelihood that Petitioner will prevail in showing that claim 13, and claims 14 and 15 that depend therefrom, are anticipated by Cox.

E. Asserted Obviousness Over Cox and Hon

Petitioner contends that independent claim 16 would have been obvious over the combined teachings of Cox and Hon. Pet. 40–43. Claim 16, like independent claims 13 and 17, requires that the electronic inhaler includes an electric airflow sensor. Ex. 1001, 8:15–19. Petitioner contends that Hon discloses an electric airflow sensor, relying on its contentions with respect to its anticipation challenge of claim 13 based on Hon. Pet. 41 (citing *id*. at 21–23 (Section V.A.4 and 5)); *see also id*. at 42 ("Annotated Figure 5B of Hon teaches every element of claim 16 including a cigarette cap (201))."). For the reasons set forth above with respect to Petitioner's allegation that Hon anticipates claim 13, we determine that the Petition does not establish a reasonable likelihood that Petitioner will prevail in showing that claim 16 would have been obvious over the combined teachings of Cox and Hon. *See* Section II.C.2, *supra*; *see also* Section II.D.2, *supra* (determining that Petitioner does not sufficiently establish that Cox discloses an electric airflow sensor).

F. Alleged Obviousness Over Cox and Zhu

Petitioner contends that claims 16–18 would have been obvious over the combined teachings of Cox and Zhu. Pet. 44–62.

1. *Overview of Zhu*

Zhu is directed to a non-combusted mist electronic cigarette that includes a control assembly sequentially provided with "[a]n indicator light cover, a power supply device, an integrated circuit board, a miniature gas transmission switch, and a connecting conductor," and a generator sequentially provided with "[a] connecting conductor, secondary air pressure holding chamber, a liquid blocking piece, a secondary liquid storage chamber, and a suction mouthpiece." Ex. 1009, 5.[7]

Figure 1 of Zhu is reproduced below:

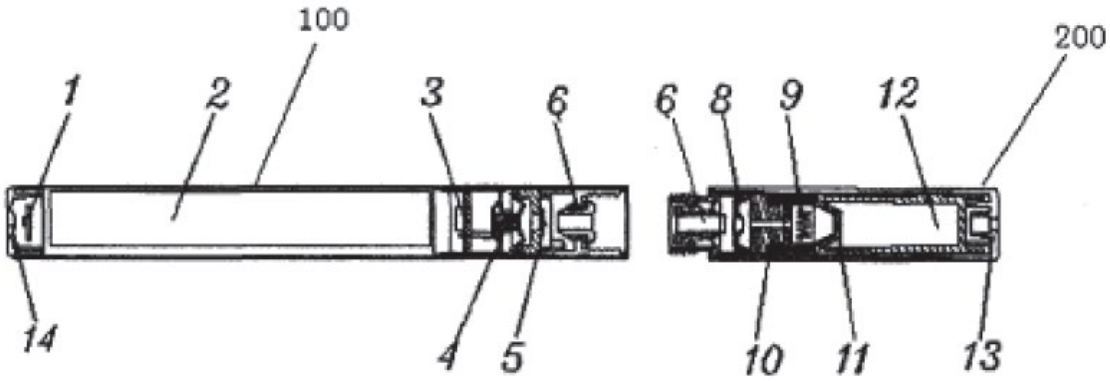

Figure 1

Figure 1 is a schematic view of the disassembled structure of one embodiment of the electronic cigarette described in Zhu. *Id*. at 6. Controller 100 includes transparent indicator light cover 14 with a pair of concealed vent holes on the side and an LED underneath, rechargeable

[7] We refer to the page numbers added by Petitioner on the bottom right-hand corner of the page.

lithium battery 2, integrated circuit board 3, miniature gas transmission switch 4, and negative pressure chamber 5 sequentially arranged from indicator light cover 14 to connecting conductor 6. *Id*. at 7. Generator 200 includes electric connector 6, liquid-blocking piece 8, liquid storage chamber 10, a heater 9, liquid guiding mechanism 11, liquid storage chamber 12, and mouthpiece 13. *Id.* at 8.

Figure 3 of Zhu is reproduced below:

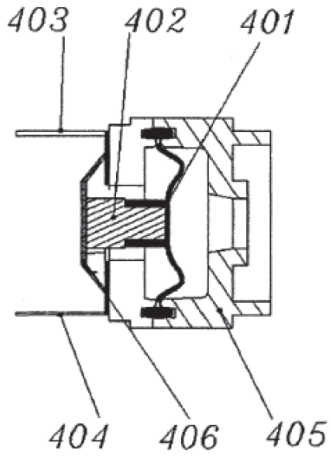

Figure 3 is a schematic view of the structure of the miniature gas transmission switch located within Zhu's controller. Ex. 1009, 6. Elastic ring 401, which is fixed in plastic base 405, has a W-shaped cross section "to open the miniature gas transmission switch into two independent chambers." *Id*. at 8. An extending soft rubber piece is connected to elastic ring 401, and plastic rod 402 is installed in the soft rubber piece to connect elastic ring 401 and moving contact piece 406. *Id*. Integrated circuit board 3 (not shown) "is provided with two fixed contact pieces 403 and 404 that extend toward" elastic ring 401 and are fixed outside plastic base 405. *Id*.

Zhu teaches that controller 100 and generator 200 are connected through connecting conductor 6 "to form an environmentally friendly non-

combusted mist electronic cigarette." Ex. 1009, 11. In describing the use of the electronic cigarette, Zhu teaches that when the user inhales,

> air flow inside controller 100 flows to generator 200, thereby driving the free-standing cavity on the right side of the elastic ring 401 of the controller 100 to be lower than the normal atmospheric pressure; in addition, a vent hole is also opened on the side of the indicator light cover, which is on the other side of the generator 200, and connects the cavity of the battery with the atmospheric pressure so that the switch air nozzle is extended towards the side of connecting conductor 6 under the actions of negative pressure on one side of generator 200, thereby driving the moving contact piece and the static contact piece on it to conduct [*sic*] and conduct current. At this time, the indicator light slowly lights up under the control of the [integrated circuit], and current flows through the connecting conductor to make the heater work.

Id. at 11.

2. Analysis

Independent claims 16 and 17 both require that the electric inhaler include an electric airflow sensor. Ex. 1001, 8:12–19, 8:37–40. Petitioner contends that Cox discloses an electric airflow sensor, relying on its contentions with respect to its anticipation challenge of claim 13 based on Cox. Pet. 46 (citing Pet. 35–36 (Section VI.A.4 and 5)), 54 (same). As set forth above with respect to Petitioner's anticipation challenge based on Cox, we are not persuaded that Petitioner sufficiently establishes that Cox discloses an electric airflow sensor as required by claims 16 and 17. *See* Section II.D.2, *supra*.

Petitioner also contends that "Zhu discloses an airflow sensor having elements (401), (403), (404), (405), and (406)." Pet. 54 (citing Ex. 1009, 8). In particular, Petitioner contends that elastic ring 401 "moves responsive to negative pressure created adjacent to it by airflow of a user inhaling on the

device." *Id*. (citing Ex. 1009, 8). Petitioner also contends that "Zhu discloses the sensor as being electronic at least in that it includes contact piece (404) and piece (403) that is connected to the integrated circuit board (3)." *Id*. at 47–48 (citing Ex. 1009, 8), 54–55 (same).

We are not persuaded, based on the current record, that Petitioner adequately establishes that Zhu teaches an electric airflow sensor (i.e., an electric sensor to detect air movement generated by a user's inhaling or puffing act). Zhu teaches that when the user sucks or inhales, the airflow "forms a negative pressure chamber 5 between the right side of elastic ring 401 and the connecting conductor 6." Ex. 1009, 8. Zhu further teaches that "[u]nder the action of negative pressure, the elastic ring 401 moves to the right and drives the moving contact piece 406 connected to the plastic rod 402 to move to the right at the same time so as to be connected to the fixed piece 403 that is connected to the integrated circuit board 3." *Id*. Zhu also teaches that when the user stops sucking or inhaling, the negative pressure drops, elastic ring 401

> returns to its original position under the action of the elastic force, and the plastic rod moves to the left, so that the contact piece 406 is disconnected from the fixed contact piece 403, which can realize the connection and disconnection of the switch under the action of a small amount of airflow, thereby controlling the real-time heating of the heater 9.

Id. at 9. Zhu, therefore, teaches that negative pressure created by the airflow causes elastic ring 401 to move, which causes plastic rod 402 (and moving contact piece 406 that is attached thereto) to move, and ultimately results in moving contact piece 406 connecting with fixed piece 403 on integrated circuit board 3. *Id*. at 8–9. Petitioner does not explain how the sequence of events that occur in response to the negative pressure created by the user's

airflow are an electric sensor, when the movement of each component appears to be mechanical, not electric.

It is the petitioner's burden from the outset to show with particularity why a challenged claim is unpatentable. *Harmonic Inc. v. Avid Tech. Inc.*, 815 F.3d 1356, 1363 (Fed. Cir. 2016). In that regard, a petition for *inter partes* review must identify how the challenged claims are unpatentable, and must specify where each element of the claim is found in the relied-upon prior art. 37 C.F.R. § 42.104(b); *see also* 35 U.S.C. § 312(a)(3) (a petition must identify "with particularity, each claim challenged, the grounds on which the challenge to each claim is based, and the evidence that supports the grounds for challenge to each claim"). A petition must also include "a detailed explanation of the significance of the evidence including material facts, and the governing laws, rules, and precedent." 37 C.F.R. § 42.22(a)(2).

Here, Petitioner contends that the "airflow sensor having elements (401), (403), (404), (405), and (406)" is "electronic at least in that it includes contact piece (404) and piece (403) that is connected to the integrated circuit board (3)," but does not provide a detailed explanation of the significance of the location of contact pieces 403 and 404, or how elements 401, 403, 404, 405, and 406 form an electric airflow sensor. Pet. 47–48 (citing Ex. 1009, 8), 54–55 (same). Zhu teaches that "integrated circuit board 3 is provided with two fixed contact pieces 403 and 404 that extend toward the elastic ring 401." Ex. 1009, 8. Zhu further teaches that elastic ring 401 is fixed in plastic base 405, and that "fixed contact pieces 403 and 404 are fixed outside the plastic base 405." *Id*. Considering the disclosures in Zhu regarding the arrangement and operation of these elements, Petitioner's conclusory statement that Zhu teaches an electric airflow sensor simply because contact

pieces 403 and 404 are provided on integrated circuit board 3 does not explain sufficiently, let alone with particularity, how or why Zhu discloses an "electric airflow sensor." To the contrary, Zhu teaches sensing airflow using mechanical technology, which the '622 patent distinguishes from an electric airflow sensor. *See* Ex. 1001, 3:23–28, 3:34–38.

For these reasons, we are not persuaded that Petitioner sufficiently establishes that Zhu discloses "an electric air flow sensor" as recited in independent claims 16 and 17. Because we determine that Petitioner does not adequately establish that either Cox or Zhu discloses the claimed electric airflow sensor, we determine that the Petition does not establish a reasonable likelihood that Petitioner will prevail in showing that independent claims 16 and 17, and claim 18 that directly depends from claim 17, would have been obvious over the combined teachings of Cox and Zhu.

III. CONCLUSION

Based on the arguments in the Petition and the Preliminary Response, and the evidence of record, we determine that Petitioner has not established a reasonable likelihood that it would prevail on its challenge that claims 13–18 the '622 patent are unpatentable.

IV. ORDER

In consideration of the foregoing, it is hereby:

ORDERED that the Petition is *denied* and no trial is instituted.

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