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

FONTEM VENTURES B.V., a Netherlands company; and FONTEM HOLDINGS 1 B.V., a Netherlands company, Plaintiffs, v. R.J. REYNOLDS VAPOR COMPANY, a North Carolina corporation, Defendant.	Civil Action No. 1:17-cv-175 **DEMAND FOR JURY TRIAL**

COMPLAINT FOR PATENT INFRINGEMENT

For their Complaint against Defendant R.J. Reynolds Vapor Company ("Reynolds Vapor" or "Defendant"), Plaintiff Fontem Ventures B.V. ("Fontem Ventures") and Plaintiff Fontem Holdings 1 B.V. ("Fontem Holdings") (together, "Plaintiffs") allege as follows:

JURISDICTION AND VENUE

1. This is a civil action for patent infringement arising under Title 35 of the United States Code, and in particular 35 U.S.C. §§ 271, 282, 283, 284, and 285.

2. This Court has subject matter jurisdiction over this patent infringement action under 28 U.S.C. §§ 1331 and 1338(a).

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3. This Court has personal jurisdiction over Defendant because it resides in North Carolina and this judicial district, solicits and conducts business in North Carolina, including the provision of goods, derives revenue from goods sold in North Carolina and within this judicial district, and has committed acts of infringement in this judicial district, including, but not limited to, offering to sell and selling the accused products in this judicial district.

4. Venue lies in this judicial district pursuant to 28 U.S.C. §§ 1391(b) and (c), and 1400(b).

PARTIES

5. Plaintiff Fontem Ventures is a company organized and existing under the laws of the Netherlands, with its principal place of business at Barbara Strozzilaan 101, 12th Floor, 1083 HN Amsterdam, The Netherlands. Fontem Ventures is in the business of developing and selling innovative non-tobacco products, including electronic cigarettes.

6. Plaintiff Fontem Holdings is a company organized and existing under the laws of The Netherlands, with its principal place of business at Barbara Strozzilaan 101, 12th Floor, 1083 HN Amsterdam, The Netherlands.

7. Upon information and belief, Defendant Reynolds Vapor is a corporation organized and existing under the laws of the State of North Carolina, having its principal place of business at 401 North Main Street, Winston-Salem,

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North Carolina 27101. Reynolds Vapor is doing business in this judicial district related to the claims asserted in this Complaint.

FIRST CLAIM FOR RELIEF

(Infringement of U.S. Patent No. 8,375,957)

8. Plaintiffs incorporate by reference the allegations contained in paragraphs 1–7 above.

9. Plaintiff Fontem Holdings is the owner of the entire right, title, and interest in and to United States Patent No. 8,375,957 ("the '957 Patent") (Exhibit A). Fontem Holdings has granted Fontem Ventures an exclusive license to the '957 Patent, including the right to sublicense the '957 Patent. The '957 Patent was duly and legally issued by the United States Patent and Trademark Office (USPTO) on February 19, 2013, and is valid, subsisting, and in full force and effect.

10. Upon information and belief, Defendant has had knowledge of the '957 Patent and of Plaintiffs' rights therein.

11. Plaintiffs have previously asserted infringement of seven of its United States patents (*i.e.*, United States Patent No. 8,365,742 ("the '742 Patent"); United States Patent No. 8,490,628 ("the '628 Patent"); United States Patent No. 8,893,726 ("the '726 Patent"); United States Patent No. 8,899,239 ("the '239 Patent"); United States Patent No. 9,326,548 ("the '548 Patent"); United States

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Patent No. 9,326,549 ("the '549 Patent"); and United States Patent No. 9,370,205 ("the '205 Patent")) against Defendant in three patent infringement cases (*i.e.*, *Fontem Ventures BV et al. v. R.J. Reynolds Vapor Company*, Case No. 1:16-cv-01255 (M.D.N.C. April 4, 2016), *Fontem Ventures BV et al. v. R.J. Reynolds Vapor Company*, Case No. 1:16-cv-01257 (M.D.N.C. May 3, 2016) and *Fontem Ventures BV et al. v. R.J. Reynolds Vapor Company*, Case No. 1:16-cv-01258 (M.D.N.C. June 22, 2016) (collectively, the "Reynolds Vapor Patent Infringement Cases"), all consolidated under Case No. 1:16-cv-01255).

12. In its Answer to Fontem's Interrogatory No. 10 regarding "when and how [Defendant] first became aware of [the '742 Patent, the '628 Patent, the '726 Patent, the '239 Patent, the '548 Patent, the '549 Patent, and the '205 Patent] or any U.S. or foreign patent or patent application related thereto," Defendant admitted that "it first became aware of the existence of [the '742 Patent, the '628 Patent, the '726 Patent, the '239 Patent, the '548 Patent, the '549 Patent, and the '205 Patent] at or shortly after their respective issue dates."[1]

13. Accordingly, upon information and belief, Defendant, through its admitted monitoring of Plaintiffs' patents, has had knowledge or should have had

[1] *Fontem Ventures BV et al. v. R.J. Reynolds Vapor Company*, Case No. 1:16-cv-01255, Defendant R.J. Reynolds Vapor Company's Responses to Fontem's First Set of Interrogatories at 10–11, served Jan. 18, 2017 (Exhibit I).

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knowledge about the existence of the ’957 Patent at or shortly after its issue date of February 19, 2013.

14. Defendant also had knowledge of the ’957 Patent because Defendant was aware that Plaintiffs previously asserted infringement of sixteen of its United States patents, including the ’957 Patent, against third party Nu Mark LLC (“Nu Mark”) in two patent infringement cases (*i.e.*, *Fontem Ventures BV et al. v. Nu Mark LLC*, Case No. 1:16-cv-01259 (M.D.N.C. June 22, 2016) and *Fontem Ventures BV et al. v. Nu Mark LLC*, Case No. 1:16-cv-01261 (M.D.N.C. April 4, 2016) (collectively, the “Nu Mark Patent Infringement Cases”) consolidated under Case No. 1:16-cv-01261).

15. On July 12, 2016, in an effort to manage and coordinate the Reynolds Patent Infringement Cases and the Nu Mark Patent Infringement Cases, Plaintiffs’ counsel emailed Defendant’s counsel and Nu Mark’s counsel a draft Joint Scheduling Conference Report Pursuant to Rule 26(f), which identified the ’957 Patent as one of the sixteen patents that Nu Mark allegedly infringed (“Nu Mark Rule 26(f) Report”).[2]

[2] *See* July 12, 2016 Email Exchange Between Plaintiffs’ Counsel (*i.e.*, Lara Dueppen, Michael Wise, Joseph Hamilton) and Defendant’s Counsel (*i.e.*, Mark A. Finkelstein (mafinkelstein@jonesday.com), Oluwafemi Masha (omasha@brinksgilson.com), Ralph Gabric (rgabric@brinksgilson.com), and Robert Mallin (rmallin@brinksgilson.com)) at 1 (Exhibit J); Draft Joint Scheduling Conference Report Pursuant to Rule 26(f) at 1 (Exhibit K).

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16. Defendant's counsel participated in subsequent email exchanges and joint meet and confers related to the Nu Mark Rule 26(f) Report that identified the '957 Patent.

17. Accordingly, Defendant has had knowledge of the '957 Patent since at least July 12, 2016.

18. Upon information and belief, Defendant has also had knowledge of the '957 Patent through its affiliate companies.

19. R.J. Reynolds Tobacco Company ("Reynolds Tobacco"), is the original assignee of at least two U.S. patents related to electronic cigarettes that reference or cite the '957 Patent.

20. Upon information and belief, Defendant and Reynolds Tobacco are both wholly owned subsidiaries of Reynolds American, Inc. ("RAI"). Defendant, therefore, is and has been aware, through its relationship with RAI and Reynolds Tobacco, of the '957 Patent while continuing to infringe that patent.

21. The '957 Patent is cited by at least the following Reynolds Tobacco patents: (1) U.S. Patent No. 9,220,302 ("the '302 Patent"), which was filed on March 15, 2013 and issued on December 29, 2015; and (2) U.S. Patent No. 9,095,175 ("the '175 Patent"), which was filed on May 15, 2010 and issued on August 4, 2015.

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22. Upon information and belief, Defendant has a license to the ’302 Patent and the ’175 Patent.

23. During prosecution of the ’302 Patent before the USPTO, Reynolds Tobacco identified the ’957 Patent to the USPTO on June 26, 2014.

24. During prosecution of the ’175 Patent, Reynolds Tobacco identified the ’957 Patent to the USPTO on March 18, 2015.

25. Accordingly, Defendant, at least through Reynolds Tobacco, has had knowledge of the ’957 Patent since at least June 26, 2014.

26. Upon information and belief, Defendant also had knowledge of the ’957 Patent by way of information from its parent company, RAI.

27. On May 12, 2015, third party Vapor Corp. served a subpoena identifying the ’957 Patent on RAI.[3]

28. In response to that subpoena, RAI acknowledged the existence of the ’957 Patent in a motion to quash filed in the Middle District of North Carolina on June 1, 2015 by RAI.[4]

29. Accordingly, Defendant, at least through RAI, has had knowledge of the ’957 Patent since at least May 12, 2015.

[3] *See Fontem Ventures B.V., et al. v. Njoy, Inc., et al.*, Case No. 1:15-mc-00022-UA-JLW, Dkt No. 2-2 at 10–11, ¶ 8 (Exhibit L); Dkt No. 2-1 at 12, ¶ 17 (M.D.N.C. June 1, 2015) (Exhibit M).

[4] *See id.*, Dkt No. 1 at 1 (Exhibit N); Dkt No. 2 at 5 (Exhibit O); Dkt No. 2-4 at 7 (Exhibit P).

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30. At all relevant times, Defendant and the public in general have had notice of the ’957 Patent because Plaintiffs have marked the packaging of their products embodying the ’957 Patent in accordance with 35 U.S.C. § 287.

31. Defendant has directly infringed the ’957 Patent in violation of at least 35 U.S.C. § 271(a) by, itself and/or through its agents, unlawfully and wrongfully making, using, importing, offering to sell, and/or selling electronic cigarette products embodying one or more of the inventions claimed in the ’957 Patent, within, from and/or into the United States without permission or license from Plaintiffs, and will continue to do so unless enjoined by this Court.

32. An example of the electronic cigarette products that directly infringe the ’957 Patent includes, but is not limited to, the VUSE Vibe Pre-filled Vapor Tank System (“VUSE Vibe”).

33. The photographs of the VUSE Vibe set forth herein accurately show the features of the product.

34. The VUSE Vibe infringes the ’957 Patent literally and/or under the doctrine of equivalents.

35. The VUSE Vibe infringes at least claims 1–2, 4, 6–11, 15–18, and 21–24 of the ’957 Patent.

36. As shown in the photographs of paragraphs 37 through 44 below, the VUSE Vibe meets every limitation recited in claim 1 of the ’957 Patent.

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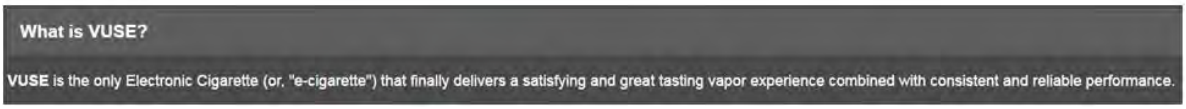
37. The VUSE Vibe is an electronic cigarette as recited in claim 1 of the ’957 Patent.



https://vusevapor.com/FooterLinks/ProductFAQs (last visited March 1, 2017)

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38. The VUSE Vibe includes "a battery assembly [200] comprising a battery assembly housing [120b] having a first end and a second end, with a battery [210], a micro-controller unit (MCU) [221] and a sensor [230] electrically connected to a circuit board [220] within the battery assembly housing [120b]" as recited in claim 1 of the '957 Patent.

39. The VUSE Vibe includes "a primary screwthread electrode [160b] located on the first end of the battery assembly housing [120b] and having a hole through its center [161b]" as recited in claim 1 of the '957 Patent.

40. The VUSE Vibe includes "an atomizer assembly [300]" as recited in claim 1 of the '957 Patent.

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41. The VUSE Vibe includes "an atomizer assembly housing [120a] having a first end and a second end" as recited in claim 1 of the '957 Patent.

42. The VUSE Vibe includes "an atomizer [320], and a solution storage area [330] in the atomizer assembly housing [120a]" as recited in claim 1 of the '957 Patent.

43. The VUSE Vibe includes "a secondary screwthread electrode [160a] located on the second end of the atomizer assembly housing [120a] and having a hole through its center [161a], the battery assembly [200] and the atomizer assembly [300] connected through the primary and secondary screwthread electrodes [160b, 160a]" as recited in claim 1 of the '957 Patent.

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44. The VUSE Vibe includes "the atomizer [320] including a heater coil [323] wound around a porous component [324]" as recited in claim 1 of the '957 Patent.

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45. As shown in the photographs of paragraph 46 below, the VUSE Vibe meets every limitation recited in claim 2 of the ’957 Patent.

46. The VUSE Vibe includes “the solution storage area [330] in the solution assembly [332] having a first end and a second end, and the second end of the solution assembly [332] is inserted into the first end of the atomizer assembly housing [120a]” as recited in claim 2 of the ’957 Patent.

47. As shown in the photographs of paragraph 48 below, the VUSE Vibe meets every limitation recited in claim 4 of the ’957 Patent.

48. The VUSE Vibe includes “the battery assembly [200] further comprises a membrane [250] located between the primary screwthread electrode [160b] and the sensor [230]” as recited in claim 4 of the ’957 Patent.

49. As shown in the photographs of paragraph 50 below, the VUSE Vibe meets every limitation recited in claim 6 of the ’957 Patent.

50. The VUSE Vibe includes “the sensor [230] compris[ing] a switch sensor, a Hall element, a semiconductor force-sensitive chip, a semiconductor matrix thermoelectric bridge chip, a capacitance sensor or an inductance sensor” as recited in claim 6 of the ’957 Patent.

51. As shown in the photographs of paragraph 52 below, the VUSE Vibe meets every limitation recited in claim 7 of the ’957 Patent.

52. The VUSE Vibe includes “the atomizer assembly [300] ha[ving] an air intake hole [140] at the secondary screwthread electrode [160a]” as recited in claim 7 of the ’957 Patent.

53. As shown in the photographs of paragraph 54 below, the VUSE Vibe meets every limitation recited in claim 8 of the ’957 Patent.

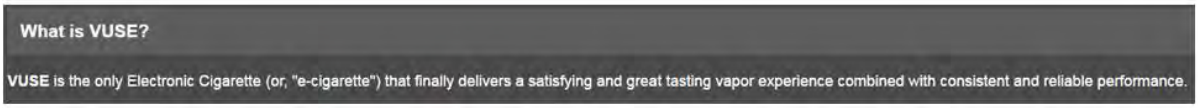
54. The VUSE Vibe includes “a fiber material [335] within the solution storage area [330]” as recited in claim 8 of the ’957 Patent.

55. As shown in the photographs of paragraph 56 below, the VUSE Vibe meets every limitation recited in claim 9 of the ’957 Patent.

56. The VUSE Vibe includes “the porous component [324] that the heater coil [323] is wound around comprising a fiber material” as recited in claim 9 of the ’957 Patent.

57. As shown in the photographs of paragraphs 58 through 66 below, the VUSE Vibe meets every limitation recited in claim 10 of the ’957 Patent.

58. The VUSE Vibe is an electronic cigarette as recited in claim 10 of the ’957 Patent.



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59. The VUSE Vibe includes “a battery assembly housing [120b] having a first end and a second end” as recited in claim 10 of the ’957 Patent.

60. The VUSE Vibe includes "a battery [210] connected to a circuit board [220] within the battery assembly housing [120b]" as recited in claim 10 of the '957 Patent.

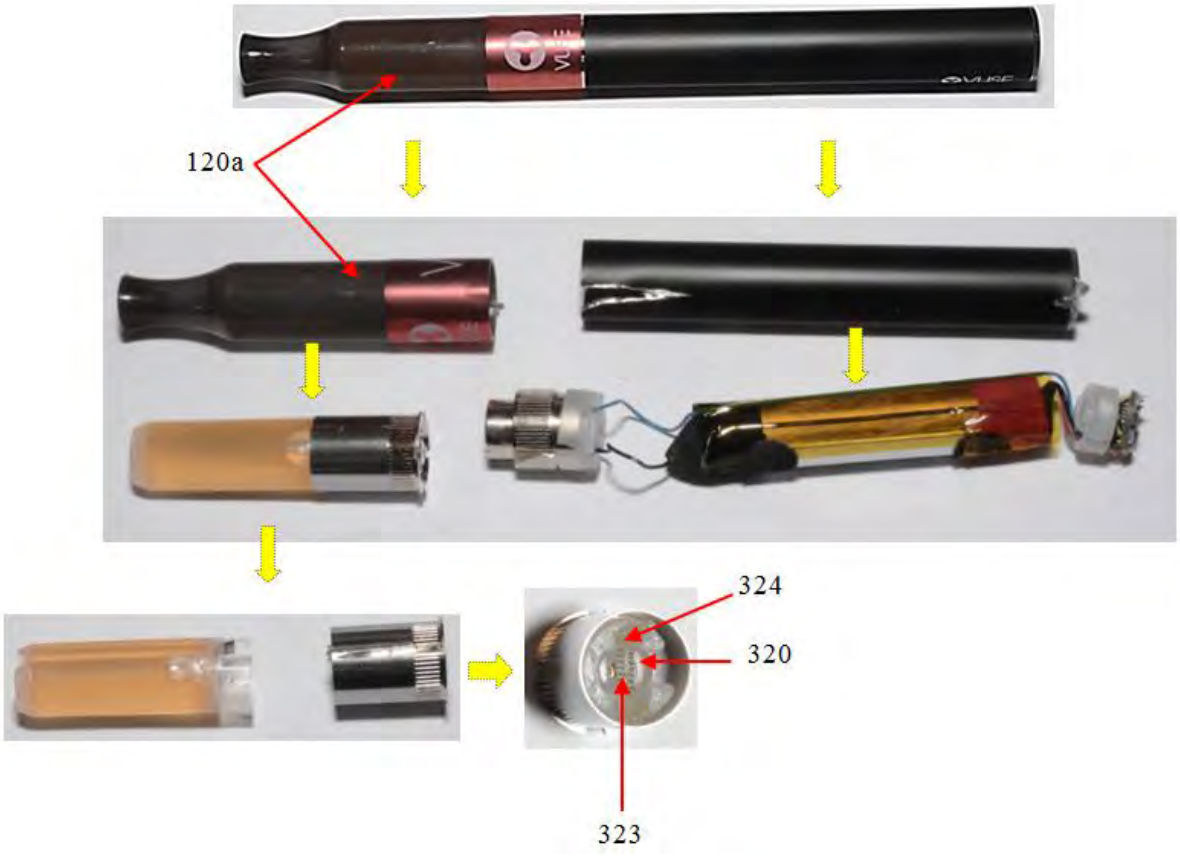
61. The VUSE Vibe includes "a primary screwthread [160b] electrode located on the first end of the battery assembly housing [120b]" as recited in claim 10 of the '957 Patent.

62. The VUSE Vibe includes "an atomizer assembly [300]" as recited in claim 10 of the '957 Patent.

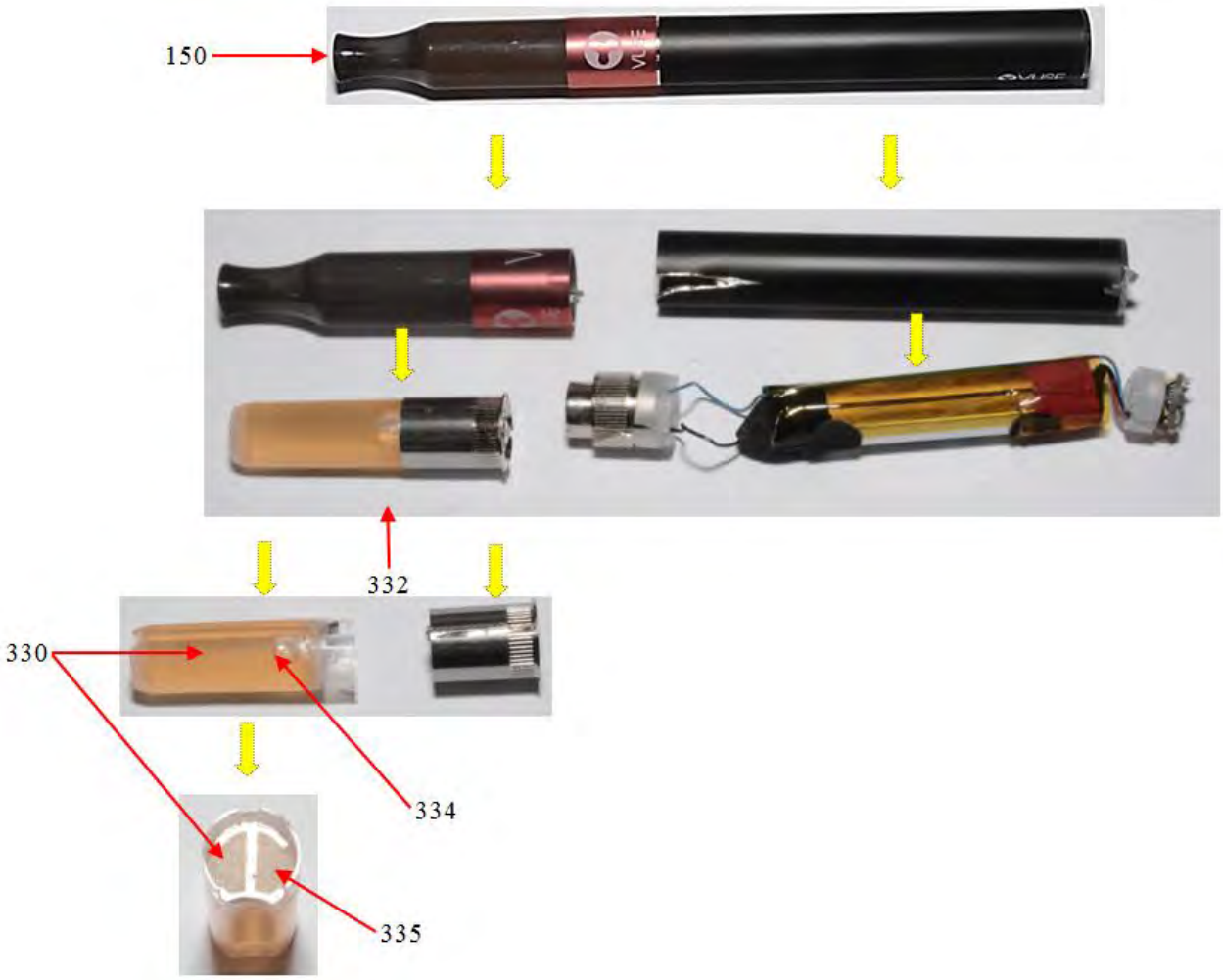
63. The VUSE Vibe includes "an atomizer assembly housing [120a] having a first end and a second end" as recited in claim 10 of the '957 Patent.

64. The VUSE Vibe includes "a secondary screwthread electrode [160a] located on the second end of the atomizer assembly housing [120a] with the battery assembly [200] and the atomizer assembly [300] connected through the primary and secondary screwthread electrodes [160b, 160a]" as recited in claim 10 of the '957 Patent.

65. The VUSE Vibe includes "an atomizer [320] in the atomizer assembly housing [120a], with atomizer [320] including a heater coil [323] wound around a porous component [324]" as recited in claim 10 of the '957 Patent.



66. The VUSE Vibe includes "a solution assembly [332], which comprises, a suction nozzle [150] at a first end of the solution assembly [332], and a solution storage area [330] with a liquid [334] containing fiber material [335] in the solution storage area [330]" as recited in claim 10 of the '957 Patent.



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67. As shown in the photographs of paragraph 68 below, the VUSE Vibe meets every limitation recited in claim 11 of the ’957 Patent.

68. The VUSE Vibe includes “the porous component [324] that the heater coil [323] is wound around comprising a fiber material” as recited in claim 11 of the ’957 Patent.

69. As shown in the photographs of paragraph 70 below, the VUSE Vibe meets every limitation recited in claim 15 of the ’957 Patent.

70. The VUSE Vibe includes “the battery assembly [200] further compris[ing] a membrane [250] located between the primary screwthread electrode [160b] and the sensor [230]” as recited in claim 15 of the ’957 Patent.

71. As shown in the photographs of paragraph 72 below, the VUSE Vibe meets every limitation recited in claim 16 of the ’957 Patent.

72. The VUSE Vibe includes “the battery assembly [200] further compris[ing] a micro controller unit (MCU) [221] electrically connected to the circuit board [220]” as recited in claim 16 of the ’957 Patent.

73. As shown in the photographs of paragraph 74 below, the VUSE Vibe meets every limitation recited in claim 17 of the ’957 Patent.

74. The VUSE Vibe includes “the atomizer assembly [300] ha[ving] an air intake hole [140]” as recited in claim 17 of the ’957 Patent.

75. As shown in the photographs of paragraph 76 below, the VUSE Vibe meets every limitation recited in claim 18 of the ’957 Patent.

76. The VUSE Vibe includes “the air intake hole [140] is at the secondary screwthread [160a]” as recited in claim 18 of the ’957 Patent.

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77. As shown in the photographs of paragraph 78 below, the VUSE Vibe meets every limitation recited in claim 21 of the ’957 Patent.

78. The VUSE Vibe includes “the primary screwthread electrode [160b] connects to a charger [400]” as recited in claim 21 of the ’957 Patent.

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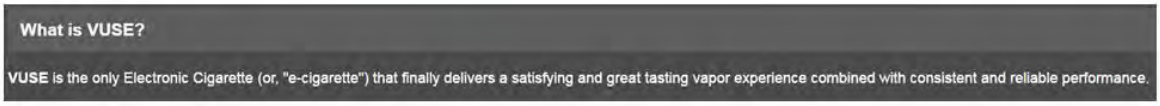
79. As shown in the photographs of paragraph 80 below, the VUSE Vibe meets every limitation recited in claim 22 of the ’957 Patent.

80. The VUSE Vibe includes “at least one of the primary and the secondary screwthread electrodes [160b, 160a] having a hole [161b, 161a] through its center” as recited in claim 22 of the ’957 Patent.

81. As shown in the photographs of paragraphs 82 through 89 below, the VUSE Vibe meets every limitation recited in claim 23 of the ’957 Patent.

82. The VUSE Vibe is an electronic cigarette as recited in claim 23 of the ’957 Patent.



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83. The VUSE Vibe includes "a battery assembly [200] including a battery assembly housing [120b] having a front end and a back end, with a battery [210], a micro-controller unit (MCU) [221] and a sensor [230] electrically connected to a circuit board [220] within the battery assembly housing [120b]" as recited in claim 23 of the '957 Patent.

84. The VUSE Vibe includes "a first screwthread electrode [160b] located on the back end of the battery assembly housing [120b]" as recited in claim 23 of the '957 Patent.

85. The VUSE Vibe includes "an atomizer assembly [300]" as recited in claim 23 of the '957 Patent.

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86. The VUSE Vibe includes "an atomizer assembly housing [120a] having a front end and a back end" as recited in claim 23 of the '957 Patent.

87. The VUSE Vibe includes "an atomizer [320], and a solution storage area [330] in the atomizer assembly housing [120a]" as recited in claim 23 of the '957 Patent.

88. The VUSE Vibe includes "a second screwthread electrode [160a] located on the front end of the atomizer assembly housing [120a], the battery assembly [200] and the atomizer assembly [300] connected through the first and second screwthread electrodes [160b, 160a]" as recited in claim 23 of the '957 Patent.

89. The VUSE Vibe includes "the atomizer [320] including a heater coil [323] wound around a porous component [324]" as recited in claim 23 of the '957 Patent.

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90. As shown in the photographs of paragraph 91 below, the VUSE Vibe meets every limitation recited in claim 24 of the ’957 Patent.

91. The VUSE Vibe includes “the solution storage area [330] within a solution assembly [332], and with a front end of the solution assembly inserted into the back end of the atomizer assembly [300]” as recited in claim 24 of the ’957 Patent.

92. Defendant has also contributed to the infringement of the ’957 Patent in violation of 35 U.S.C. § 271(c) by, itself and/or through its agents, contributing to the direct infringement of the ’957 Patent by its customers by unlawfully and wrongfully making, using, importing, offering to sell, and/or selling electronic cigarette components constituting a material part of the invention of the ’957 Patent and having no substantially non-infringing use, which, when used by its customers, result in direct infringement of the ’957 Patent, in this judicial district and within, from and/or into the United States without permission or license from Plaintiffs, and will continue to do so unless enjoined by this Court.

93. Examples of electronic cigarette components that constitute a material part of the invention of the ’957 Patent, have no substantial non-infringing uses, and contribute to the direct infringement of the ’957 Patent include, but are not limited to, the VUSE Vibe and (1) VUSE Vibe Pre-Filled Tanks, (2) VUSE Vibe Rechargeable Batteries, and (3) VUSE Vibe Chargers (collectively, “components of the VUSE Vibe”).

94. Upon information and belief, having knowledge of the ’957 Patent, Defendant is aware that the purchase and use of the VUSE Vibe and components of the VUSE Vibe by Defendant’s customers result in direct infringement of the ’957 Patent.

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95. Defendant instructs users on how to use the VUSE Vibe and components of the VUSE Vibe.[5]

96. Defendant instructs users to purchase and use a replacement VUSE Vibe Pre-Filled Tank when a VUSE Vibe Pre-Filled Tank is depleted.[6]

97. Defendant further instructs users that the VUSE Vibe Pre-Filled Tanks should only be used with a VUSE Vibe Rechargeable Battery such that VUSE Vibe Pre-Filled Tanks are only compatible with the VUSE Vibe.[7]

98. Defendant further instructs users that the VUSE Vibe Rechargeable Battery should only be used with a VUSE Vibe Charger such that VUSE Rechargeable Batteries and VUSE Vibe Chargers are only compatible with the VUSE Vibe.[8]

[5] *See, e.g.*, VUSE Vibe Package Insert ("Get started 1. Charge battery 2. Attach tank 3. Vape 4. Enjoy!") (Exhibit Q).

[6] *See, e.g.*, *id.* ("Don't vape an empty tank"). *See also* VUSE VIBE Store Locator (providing information for users on where to purchase replacement VUSE Vibe Pre-Filled Tanks and VUSE Vibe Pre-Filled Tank Systems including VUSE Vibe Pre-Filled Tanks, VUSE Vibe Rechargeable Battery, and VUSE Vibe Charger), https://prod.vusevapor.com/products/vibe/?/locate (last visited March 1, 2017) (Exhibit R).

[7] *See e.g.*, VUSE Vibe Package Insert ("Only use VUSE VIBE pre-filled tanks with a VUSE VIBE battery") (Exhibit Q).

[8] *See e.g.*, VUSE Vibe Package Insert ("Only use VUSE VIBE battery with the VUSE Vibe charger") (Exhibit Q).

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99. Defendant instructs users to purchase and use a replacement VUSE Vibe Rechargeable Battery.[9]

100. As such, Defendant knows that the VUSE Vibe and components of the VUSE Vibe, including, but not limited to, the VUSE Vibe Pre-Filled Tanks, VUSE Vibe Rechargeable Batteries, and VUSE Vibe Chargers when sold separately, have no substantial non-infringing uses other than to provide users with the ability to assemble and use an electronic cigarette that infringes the ’957 Patent, and, therefore, that they are especially made or adapted for use in infringement of the ’957 Patent.

101. As a direct and proximate result of the foregoing acts of Defendant, Plaintiffs have suffered, and are entitled to, monetary damages in an amount not yet determined, which include, but are not limited to, lost profits on the infringing sales Plaintiffs may have made and reasonable royalties on sales not made. Plaintiffs are also entitled to their costs of suit and interest.

102. Defendant’s continuing infringement has inflicted and, unless restrained by this Court, will continue to inflict irreparable harm upon Plaintiffs, such as reduction of Plaintiffs’ proper market share and deprivation of Plaintiffs’

[9] *See, e.g.*, VUSE VIBE Store Locator (providing information for users on where to purchase replacement VUSE Vibe Pre-Filled Tanks and VUSE Vibe Pre-Filled Tank Systems including VUSE Vibe Pre-Filled Tanks, VUSE Vibe Rechargeable Battery, and VUSE Vibe Charger), https://prod.vusevapor.com/products/vibe/?/locate (last visited March 1, 2017) (Exhibit R).

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rights to exclude others. Plaintiffs have no adequate remedy at law. Plaintiffs are entitled to injunctive relief enjoining Defendant from engaging in further acts of infringement.

103. In view of Defendant's knowledge of the '957 Patent, Defendant has proceeded to infringe the '957 Patent despite a high probability that its actions constituted infringement of a valid patent. Thus, Defendant's infringement of the '957 Patent is willful and deliberate. That egregious infringement behavior entitles Plaintiffs to increased damages under 35 U.S.C. § 284, and to attorneys' fees and costs incurred in prosecuting this action under 35 U.S.C. § 285.

SECOND CLAIM FOR RELIEF

(Infringement of U.S. Patent No. 8,393,331)

104. Plaintiffs incorporate by reference the allegations contained in paragraphs 1–103 above.

105. Plaintiff Fontem Holdings is the owner of the entire right, title, and interest in and to United States Patent No. 8,393,331 ("the '331 Patent") (Exhibit B). Fontem Holdings has granted Fontem Ventures an exclusive license to the '331 Patent, including the right to sublicense the '331 Patent. The '331 Patent was duly and legally issued by the USPTO on March 12, 2013, and is valid, subsisting, and in full force and effect.

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106. Upon information and belief, Defendant has had knowledge of the ’331 Patent and of Plaintiffs’ rights therein.

107. Plaintiffs have previously asserted infringement of seven of its United States patents (*i.e.*, the ’742 Patent, the ’628 Patent, the ’726 Patent, the ’239 Patent, the ’548 Patent, the ’549 Patent, and the ’205 Patent) against Defendant in three patent infringement cases (*i.e., Fontem Ventures BV et al. v. R.J. Reynolds Vapor Company*, Case No. 1:16-cv-01255 (M.D.N.C. April 4, 2016), *Fontem Ventures BV et al. v. R.J. Reynolds Vapor Company*, Case No. 1:16-cv-01257 (M.D.N.C. May 3, 2016) and *Fontem Ventures BV et al. v. R.J. Reynolds Vapor Company*, Case No. 1:16-cv-01258 (M.D.N.C. June 22, 2016) (collectively, the “Reynolds Vapor Patent Infringement Cases”), all consolidated under Case No. 1:16-cv-01255).

108. In its Answer to Fontem’s Interrogatory No. 10 regarding “when and how [Defendant] first became aware of [the ’742 Patent, the ’628 Patent, the ’726 Patent, the ’239 Patent, the ’548 Patent, the ’549 Patent, and the ’205 Patent] or any U.S. or foreign patent or patent application related thereto,” Defendant admitted that “it first became aware of the existence of [the ’742 Patent, the ’628

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Patent, the ’726 Patent, the ’239 Patent, the ’548 Patent, the ’549 Patent, and the ’205 Patent] at or shortly after their respective issue dates.”[10]

109. Accordingly, upon information and belief, Defendant, through its admitted monitoring of Plaintiffs’ patents, has had knowledge or should have had knowledge about the existence of the ’331 Patent at or shortly after its issue date of March 12, 2013.

110. Defendant also had knowledge of the ’331 Patent because Defendant was aware that Plaintiffs previously asserted infringement of sixteen of its United States patents, including the ’331 Patent, against third party Nu Mark LLC (“Nu Mark”) in two patent infringement cases (*i.e.*, *Fontem Ventures BV et al. v. Nu Mark LLC*, Case No. 1:16-cv-01259 (M.D.N.C. June 22, 2016) and *Fontem Ventures BV et al. v. Nu Mark LLC*, Case No. 1:16-cv-01261 (M.D.N.C. April 4, 2016) (collectively, the “Nu Mark Patent Infringement Cases”) consolidated under Case No. 1:16-cv-01261).

111. On July 12, 2016, in an effort to manage and coordinate the Reynolds Patent Infringement Cases and the Nu Mark Patent Infringement Cases, Plaintiffs’ counsel emailed Defendant’s counsel and Nu Mark’s counsel a draft Joint Scheduling Conference Report Pursuant to Rule 26(f), which identified the ’331

[10] *Fontem Ventures BV et al. v. R.J. Reynolds Vapor Company*, Case No. 1:16-cv-01255, Defendant R.J. Reynolds Vapor Company’s Responses to Fontem’s First Set of Interrogatories at 10–11, served Jan. 18, 2017 (Exhibit I).

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Patent as one of the sixteen patents that Nu Mark allegedly infringed ("Nu Mark Rule 26(f) Report").[11]

112. Defendant's counsel participated in subsequent email exchanges and joint meet and confers related to the Nu Mark Rule 26(f) Report that identified the '331 Patent.

113. Accordingly, Defendant has had knowledge of the '331 Patent since at least July 12, 2016.

114. Upon information and belief, Defendant has also had knowledge of the '331 Patent through its affiliate companies.

115. R.J. Reynolds Tobacco Company ("Reynolds Tobacco"), is the original assignee of at least two U.S. patents related to electronic cigarettes that reference or cite the '331 Patent.

116. Upon information and belief, Defendant and Reynolds Tobacco are both wholly owned subsidiaries of Reynolds American, Inc. ("RAI"). Defendant, therefore, is and has been aware, through its relationship with RAI and Reynolds Tobacco, of the '331 Patent while continuing to infringe that patent.

[11] *See* July 12, 2016 Email Exchange Between Plaintiffs' Counsel (*i.e.*, Lara Dueppen, Michael Wise, Joseph Hamilton) and Defendant's Counsel (*i.e.*, Mark A. Finkelstein (mafinkelstein@jonesday.com), Oluwafemi Masha (omasha@brinksgilson.com), Ralph Gabric (rgabric@brinksgilson.com), and Robert Mallin (rmallin@brinksgilson.com)) at 1 (Exhibit J); Draft Joint Scheduling Conference Report Pursuant to Rule 26(f) at 1 (Exhibit K).

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117. The ’331 Patent is cited by at least the following Reynolds Tobacco patents: (1) U.S. Patent No. 9,220,302 (“the ’302 Patent”), which was filed on March 15, 2013 and issued on December 29, 2015; and (2) U.S. Patent No. 9,095,175 (“the ’175 Patent”), which was filed on May 15, 2010 and issued on August 4, 2015.

118. Upon information and belief, Defendant has a license to the ’302 Patent and the ’175 Patent.

119. During prosecution of the ’302 Patent before the USPTO, Reynolds Tobacco identified the ’331 Patent to the USPTO on June 26, 2014.

120. During prosecution of the ’175 Patent, Reynolds Tobacco identified the ’331 Patent to the USPTO on March 18, 2015.

121. Accordingly, Defendant, at least through Reynolds Tobacco, has had knowledge of the ’331 Patent since at least June 26, 2014.

122. Upon information and belief, Defendant also had knowledge of the ’331 Patent by way of information from its parent company, RAI.

123. On May 12, 2015, third party Vapor Corp. served a subpoena identifying the ’331 Patent on RAI.[12]

[12] *See Fontem Ventures B.V., et al. v. Njoy, Inc., et al.*, Case No. 1:15-mc-00022-UA-JLW, Dkt No. 2-2 at 10–11, ¶ 8 (Exhibit L); Dkt No. 2-1 at 12, ¶ 17 (M.D.N.C. June 1, 2015) (Exhibit M).

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124. In response to that subpoena, RAI acknowledged the existence of the ’331 Patent in a motion to quash filed in the Middle District of North Carolina on June 1, 2015 by RAI.[13]

125. Accordingly, Defendant, at least through RAI, has had knowledge of the ’331 Patent since at least May 12, 2015.

126. At all relevant times, Defendant and the public in general have had notice of the ’331 Patent because Plaintiffs have marked the packaging of their products embodying the ’331 Patent in accordance with 35 U.S.C. § 287.

127. Defendant has directly infringed the ’331 Patent in violation of at least 35 U.S.C. § 271(a) by, itself and/or through its agents, unlawfully and wrongfully making, using, importing, offering to sell, and/or selling electronic cigarette products embodying one or more of the inventions claimed in the ’331 Patent, within, from and/or into the United States without permission or license from Plaintiffs, and will continue to do so unless enjoined by this Court.

128. An example of the electronic cigarette products that directly infringe the ’331 Patent includes, but is not limited to, the VUSE Vibe.

129. The VUSE Vibe infringes the ’331 Patent literally and/or under the doctrine of equivalents.

[13] *See id.*, Dkt No. 1 at 1 (Exhibit N); Dkt No. 2 at 5 (Exhibit O); Dkt No. 2-4 at 10 (Exhibit P).

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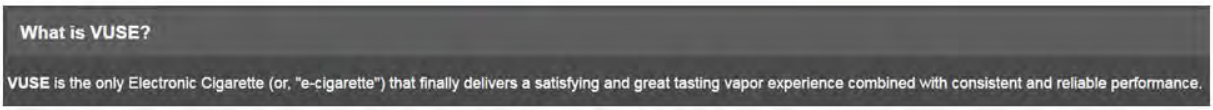
130. The VUSE Vibe infringes at least claims 1–2 and 4–5 of the ’331 Patent.

131. As shown in the photographs of paragraphs 132 through 145 below, the VUSE Vibe meets every limitation recited in claim 1 of the ’331 Patent.

132. The VUSE Vibe is an electronic cigarette as recited in claim 1 of the ’331 Patent.



https://vusevapor.com/FooterLinks/ProductFAQs (last visited March 1, 2017)

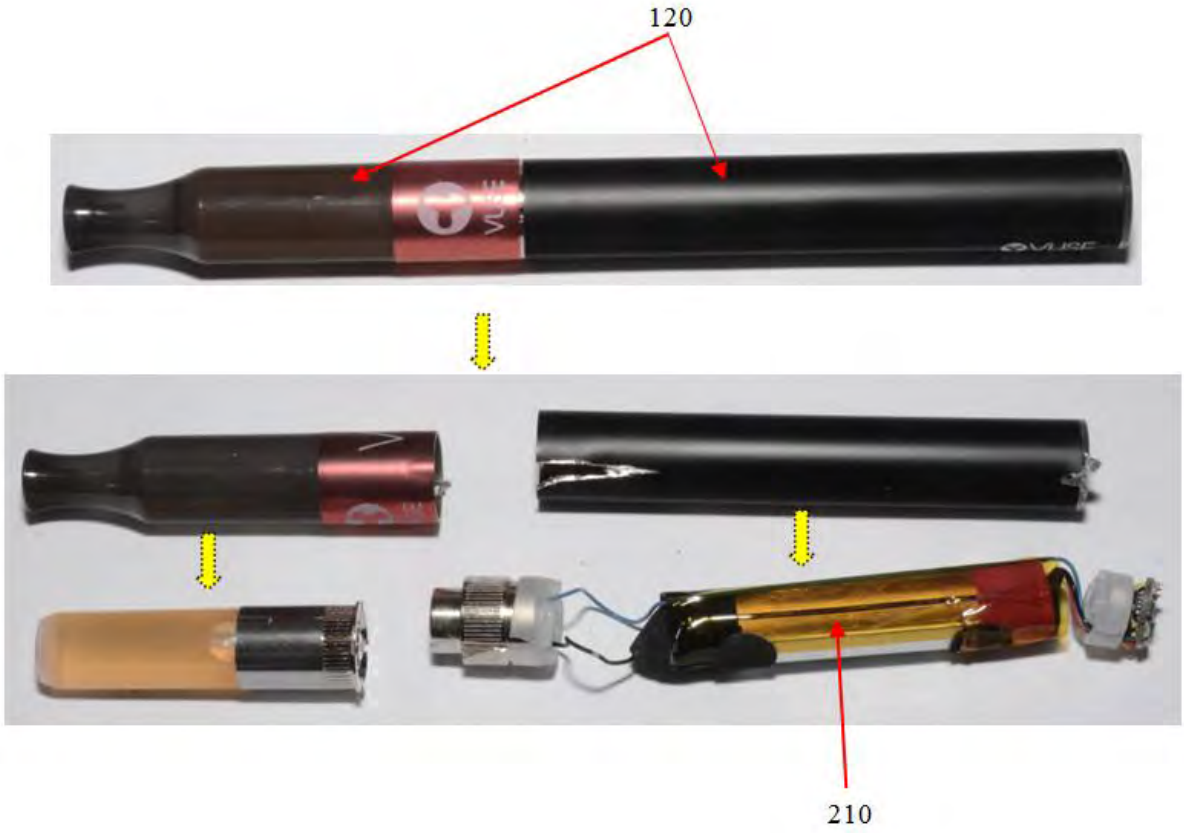
133. The VUSE Vibe includes “a housing [120]” as recited in claim 1 of the ’331 Patent.

134. The VUSE Vibe includes "a mouth piece [110] on the housing [120]" as recited in claim 1 of the '331 Patent.

135. The VUSE Vibe includes "an LED [240] at a first end of the housing [120]" as recited in claim 1 of the '331 Patent.

136. The VUSE Vibe includes "an air inlet [140] leading into the housing [120]" as recited in claim 1 of the '331 Patent.

137. The VUSE Vibe includes "a battery [210] within the housing [120]" as recited in claim 1 of the '331 Patent.



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138. The VUSE Vibe includes "an electronic circuit board [220] within the housing [120]" as recited in claim 1 of the '331 Patent.

139. The VUSE Vibe includes "a sensor [230] within the housing [120]" as recited in claim 1 of the '331 Patent.

140. The VUSE Vibe includes "an atomizer [320] within the housing [120]" as recited in claim 1 of the '331 Patent.

141. The VUSE Vibe includes "a stream passage within the housing [120] leading from the inlet [140] to the atomizer [320]" as recited in claim 1 of the '331 Patent.

142. The VUSE Vibe includes "a cavity [321] arranged in the atomizer [320]" as recited in claim 1 of the '331 Patent.

143. The VUSE Vibe includes "a liquid-supply [330] within the housing [120]" as recited in claim 1 of the '331 Patent.

144. The VUSE Vibe includes "an aerosol passage leading from the atomizer [320] to the mouthpiece [110]" as recited in claim 1 of the '331 Patent.

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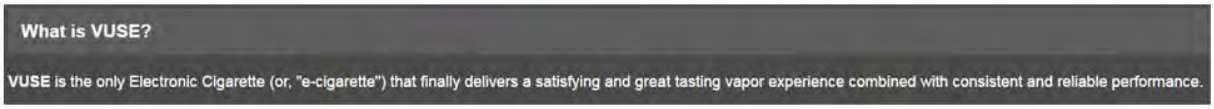
145. The VUSE Vibe includes "the liquid-supply [330] in physical contact with the atomizer [320]; and a heating element [323] within the cavity [321]" as recited in claim 1 of the '331 Patent.

146. As shown in the photographs of paragraphs 147 through 154 below, the VUSE Vibe meets every limitation recited in claim 2 of the ’331 Patent.

147. The VUSE Vibe is an electronic cigarette as recited in claim 2 of the ’331 Patent.



https://vusevapor.com/FooterLinks/ProductFAQs (last visited March 1, 2017)

148. The VUSE Vibe includes “a housing [120]” as recited in claim 2 of the ’331 Patent.

149. The VUSE Vibe includes “a mouthpiece [110] on the housing [120]” as recited in claim 2 of the ’331 Patent.

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150. The VUSE Vibe includes "an LED [240] at a first end of the housing [120]" as recited in claim 2 of the '331 Patent.

151. The VUSE Vibe includes "an air inlet [140] for providing air into the housing [120]" as recited in claim 2 of the '331 Patent.

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152. The VUSE Vibe includes "a battery [210] and a sensor [230] electrically connected to an electronic circuit board [220] within the housing [120], with the sensor [230] in a stream passage in the housing [120]" as recited in claim 2 of the '331 Patent.

153. The VUSE Vibe includes "an atomizer [320] within the housing [120], with the atomizer [320] having a heating element [323] within a cavity [321], and with the atomizer [320] making contact with a liquid-supply [330], to provide for movement of liquid to the atomizer [320] via capillary action" as recited in claim 2 of the '331 Patent.

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154. The VUSE Vibe includes "an aerosol passage extending from the atomizer [320] to the mouthpiece [110]" as recited in claim 2 of the '331 Patent.

155. As shown in the photographs of paragraph 156 below, the VUSE Vibe meets every limitation recited in claim 4 of the ’331 Patent.

156. The VUSE Vibe includes “the heating element [323] compris[ing] a wire coil” as recited in claim 4 of the ’331 Patent.

157. As shown in the photographs of paragraph 158 below, the VUSE Vibe meets every limitation recited in claim 5 of the ’331 Patent.

158. The VUSE Vibe includes “the liquid-supply [330] comprising a porous body” as recited in claim 5 of the ’331 Patent.

159. Defendant has also contributed to the infringement of the ’331 Patent in violation of 35 U.S.C. § 271(c) by, itself and/or through its agents, contributing to the direct infringement of the ’331 Patent by its customers by unlawfully and wrongfully making, using, importing, offering to sell, and/or selling electronic

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cigarette components constituting a material part of the invention of the ’331 Patent and having no substantially non-infringing use, which, when used by its customers, result in direct infringement of the ’331 Patent, in this judicial district and within, from and/or into the United States without permission or license from Plaintiffs, and will continue to do so unless enjoined by this Court.

160. Examples of electronic cigarette components that constitute a material part of the invention of the ’331 Patent, have no substantial non-infringing uses, and contribute to the direct infringement of the ’331 Patent include, but are not limited to, the VUSE Vibe and (1) VUSE Vibe Pre-Filled Tanks and (2) VUSE Vibe Rechargeable Batteries (collectively, “components of the VUSE Vibe”).

161. Upon information and belief, having knowledge of the ’331 Patent, Defendant is aware that the purchase and use of the VUSE Vibe and components of the VUSE Vibe by Defendant’s customers result in direct infringement of the ’331 Patent.

162. Defendant instructs users on how to use the VUSE Vibe and components of the VUSE Vibe.[14]

163. Defendant instructs users to purchase and use a replacement VUSE Vibe Pre-Filled Tank when a VUSE Vibe Pre-Filled Tank is depleted.[15]

[14] *See, e.g.*, VUSE Vibe Package Insert (“Get started 1. Charge battery 2. Attach tank 3. Vape 4. Enjoy!”) (Exhibit Q).

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164. Defendant further instructs users that the VUSE Vibe Pre-Filled Tanks should only be used with a VUSE Vibe Rechargeable Battery such that VUSE Vibe Pre-Filled Tanks are only compatible with the VUSE Vibe.[16]

165. Defendant instructs users to purchase and use a replacement VUSE Vibe Rechargeable Battery.[17]

166. As such, Defendant knows that the VUSE Vibe and components of the VUSE Vibe, including, but not limited to, the VUSE Vibe Pre-Filled Tank and VUSE Vibe Rechargeable Battery when sold separately, have no substantial non-infringing uses other than to provide users with the ability to assemble and use an electronic cigarette that infringes the ’331 Patent, and, therefore, that they are especially made or adapted for use in infringement of the ’331 Patent.

167. As a direct and proximate result of the foregoing acts of Defendant, Plaintiffs have suffered, and are entitled to, monetary damages in an amount not

[15] *See, e.g.*, *id.* (“Don’t vape an empty tank”). *See also* VUSE VIBE Store Locator (providing information for users on where to purchase replacement VUSE Vibe Pre-Filled Tanks and VUSE Vibe Pre-Filled Tank Systems including VUSE Vibe Pre-Filled Tanks and VUSE Vibe Rechargeable Battery), https://prod.vusevapor.com/products/vibe/?/locate (last visited March 1, 2017) (Exhibit R).

[16] *See, e.g.*, VUSE Vibe Package Insert (“Only use VUSE VIBE pre-filled tanks with a VUSE VIBE battery”) (Exhibit Q).

[17] *See, e.g.*, VUSE VIBE Store Locator (providing information for users on where to purchase replacement VUSE Vibe Pre-Filled Tanks and VUSE Vibe Pre-Filled Tank Systems including VUSE Vibe Pre-Filled Tanks and VUSE Vibe Rechargeable Battery), https://prod.vusevapor.com/products/vibe/?/locate (last visited March 1, 2017) (Exhibit R).

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yet determined, which include, but are not limited to, lost profits on the infringing sales Plaintiffs may have made and reasonable royalties on sales not made. Plaintiffs are also entitled to their costs of suit and interest.

168. Defendant's continuing infringement has inflicted and, unless restrained by this Court, will continue to inflict irreparable harm upon Plaintiffs, such as reduction of Plaintiffs' proper market share and deprivation of Plaintiffs' rights to exclude others. Plaintiffs have no adequate remedy at law. Plaintiffs are entitled to injunctive relief enjoining Defendant from engaging in further acts of infringement.

169. In view of Defendant's knowledge of the '331 Patent, Defendant has proceeded to infringe the '331 Patent despite a high probability that its actions constituted infringement of a valid patent. Thus, Defendant's infringement of the '331 Patent is willful and deliberate. That egregious infringement behavior entitles Plaintiffs to increased damages under 35 U.S.C. § 284, and to attorneys' fees and costs incurred in prosecuting this action under 35 U.S.C. § 285.

THIRD CLAIM FOR RELIEF

(Infringement of U.S. Patent No. 8,863,752)

170. Plaintiffs incorporate by reference the allegations contained in paragraphs 1–169 above.

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171. Plaintiff Fontem Holdings is the owner of the entire right, title, and interest in and to United States Patent No. 8,863,752 ("the '752 Patent") (Exhibit C). Fontem Holdings has granted Fontem Ventures an exclusive license to the '752 Patent, including the right to sublicense the '752 Patent. The '752 Patent was duly and legally issued by the USPTO on October 21, 2014, and is valid, subsisting, and in full force and effect.

172. Upon information and belief, Defendant has had knowledge of the '752 Patent and of Plaintiffs' rights therein.

173. Plaintiffs have previously asserted infringement of seven of its United States patents (*i.e.*, the '742 Patent, the '628 Patent, the '726 Patent, the '239 Patent, the '548 Patent, the '549 Patent, and the '205 Patent) against Defendant in three patent infringement cases (*i.e., Fontem Ventures BV et al. v. R.J. Reynolds Vapor Company*, Case No. 1:16-cv-01255 (M.D.N.C. April 4, 2016), *Fontem Ventures BV et al. v. R.J. Reynolds Vapor Company*, Case No. 1:16-cv-01257 (M.D.N.C. May 3, 2016) and *Fontem Ventures BV et al. v. R.J. Reynolds Vapor Company*, Case No. 1:16-cv-01258 (M.D.N.C. June 22, 2016) (collectively, the "Reynolds Vapor Patent Infringement Cases"), all consolidated under Case No. 1:16-cv-01255).

174. In its Answer to Fontem's Interrogatory No. 10 regarding "when and how [Defendant] first became aware of [the '742 Patent, the '628 Patent, the '726

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Patent, the ’239 Patent, the ’548 Patent, the ’549 Patent, and the ’205 Patent] or any U.S. or foreign patent or patent application related thereto,” Defendant admitted that “it first became aware of the existence of [the ’742 Patent, the ’628 Patent, the ’726 Patent, the ’239 Patent, the ’548 Patent, the ’549 Patent, and the ’205 Patent] at or shortly after their respective issue dates.”[18]

175. Accordingly, upon information and belief, Defendant, through its admitted monitoring of Plaintiffs’ patents, has had knowledge or should have had knowledge about the existence of the ’752 Patent at or shortly after its issue date of October 21, 2014.

176. Defendant also had knowledge of the ’752 Patent because Defendant was aware that Plaintiffs previously asserted infringement of sixteen of its United States patents, including the ’752 Patent, against third party Nu Mark LLC (“Nu Mark”) in two patent infringement cases (*i.e.*, *Fontem Ventures BV et al. v. Nu Mark LLC*, Case No. 1:16-cv-01259 (M.D.N.C. June 22, 2016) and *Fontem Ventures BV et al. v. Nu Mark LLC*, Case No. 1:16-cv-01261 (M.D.N.C. April 4, 2016) (collectively, the “Nu Mark Patent Infringement Cases”) consolidated under Case No. 1:16-cv-01261).

[18] *Fontem Ventures BV et al. v. R.J. Reynolds Vapor Company*, Case No. 1:16-cv-01255, Defendant R.J. Reynolds Vapor Company’s Responses to Fontem’s First Set of Interrogatories at 10–11, served Jan. 18, 2017 (Exhibit I).

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177. On July 12, 2016, in an effort to manage and coordinate the Reynolds Patent Infringement Cases and the Nu Mark Patent Infringement Cases, Plaintiffs' counsel emailed Defendant's counsel and Nu Mark's counsel a draft Joint Scheduling Conference Report Pursuant to Rule 26(f), which identified the '752 Patent as one of the sixteen patents that Nu Mark allegedly infringed ("Nu Mark Rule 26(f) Report").[19]

178. Defendant's counsel participated in subsequent email exchanges and joint meet and confers related to the Nu Mark Rule 26(f) Report that identified the '752 Patent.

179. Accordingly, Defendant has had knowledge of the '752 Patent since at least July 12, 2016.

180. Upon information and belief, Defendant also had knowledge of the '752 Patent by way of information from its parent company, RAI.

181. On May 12, 2015, third party Vapor Corp. served a subpoena identifying the '752 Patent on RAI.[20]

[19] *See* July 12, 2016 Email Exchange Between Plaintiffs' Counsel (*i.e.*, Lara Dueppen, Michael Wise, Joe Hamilton) and Defendant's Counsel (*i.e.*, Mark A. Finkelstein (mafinkelstein@jonesday.com), Oluwafemi Masha (omasha@brinksgilson.com), Ralph Gabric (rgabric@brinksgilson.com), and Robert Mallin (rmallin@brinksgilson.com)) at 1 (Exhibit J); Draft Joint Scheduling Conference Report Pursuant to Rule 26(f) at 1 (Exhibit K).

[20] *See Fontem Ventures B.V., et al. v. Njoy, Inc., et al.*, Case No. 1:15-mc-00022-UA-JLW, Dkt No. 2-2 at 10–11, ¶ 8 (Exhibit L); Dkt No. 2-1 at 12, ¶ 17 (M.D.N.C. June 1, 2015) (Exhibit M).

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182. In response to that subpoena, RAI acknowledged the existence of the ’752 Patent in a motion to quash filed in the Middle District of North Carolina on June 1, 2015 by RAI.[21]

183. Accordingly, Defendant, at least through RAI, has had knowledge of the ’752 Patent since at least May 12, 2015.

184. At all relevant times, Defendant and the public in general have had notice of the ’752 Patent because Plaintiffs have marked the packaging of their products embodying the ’752 Patent in accordance with 35 U.S.C. § 287.

185. Defendant has directly infringed the ’752 Patent in violation of at least 35 U.S.C. § 271(a) by, itself and/or through its agents, unlawfully and wrongfully making, using, importing, offering to sell, and/or selling electronic cigarette products embodying one or more of the inventions claimed in the ’752 Patent, within, from and/or into the United States without permission or license from Plaintiffs, and will continue to do so unless enjoined by this Court.

186. An example of the electronic cigarette products that directly infringe the ’752 Patent includes, but is not limited to, the VUSE Vibe and VUSE Vibe Pre-Filled Tanks.

187. The VUSE Vibe infringes the ’752 Patent literally and/or under the doctrine of equivalents.

[21] *See id.*, Dkt No. 1 at 1 (Exhibit N); Dkt No. 2 at 5 (Exhibit O).

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188. The VUSE Vibe infringes at least claims 1–20 of the ’752 Patent.

189. As shown in the photographs of paragraphs 190 through 194 below, the VUSE Vibe meets every limitation recited in claim 1 of the ’752 Patent.

190. The VUSE Vibe includes an “atomizer assembly [300] for an electronic cigarette” as recited in claim 1 of the ’752 Patent.

What is VUSE?

VUSE is the only Electronic Cigarette (or, "e-cigarette") that finally delivers a satisfying and great tasting vapor experience combined with consistent and reliable performance.

https://vusevapor.com/FooterLinks/ProductFAQs (last visited March 1, 2017)

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191. The atomizer assembly [300] of the VUSE Vibe includes "an atomizer assembly housing [120a] containing an atomizer [320], liquid storage [330], and a screw thread electrode [160a] on one end of the atomizer assembly housing [120a]" as recited in claim 1 of the '752 Patent.

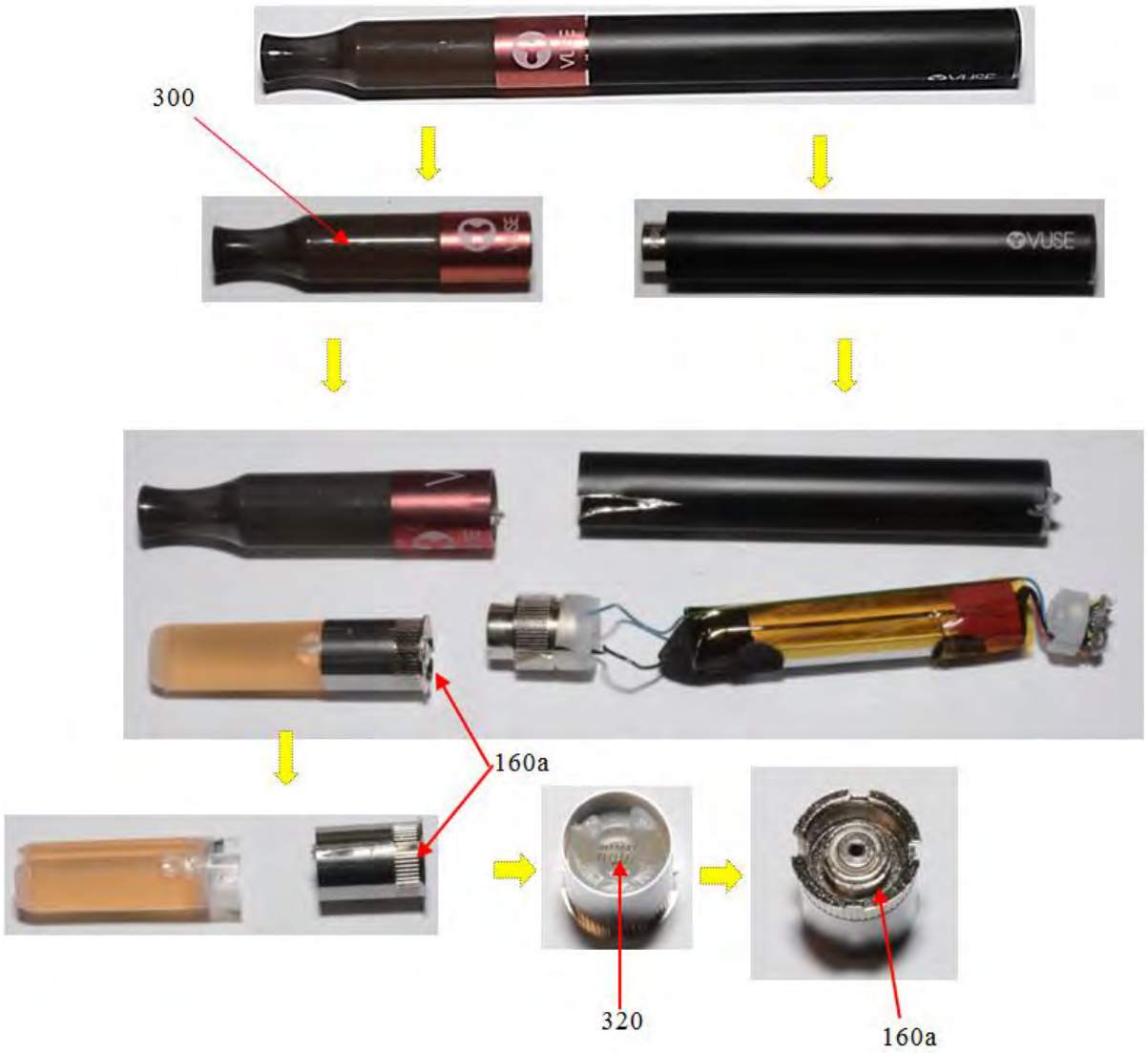
192. The atomizer assembly [300] of the VUSE Vibe includes "the screw thread electrode [160a] having a through hole [161a] centered on the screw thread electrode [160a]" as recited in claim 1 of the '752 Patent.

193. The atomizer assembly [300] of the VUSE Vibe includes "the atomizer [320] in physical contact with the liquid storage [330]" as recited in claim 1 of the '752 Patent.

194. The atomizer assembly [300] of the VUSE Vibe includes "a flow passageway leading from the atomizer [320] to an outlet [150] of the atomizer assembly housing [120a]" as recited in claim 1 of the '752 Patent.

195. As shown in the photographs of paragraph 196 below, the VUSE Vibe meets every limitation recited in claim 2 of the ’752 Patent.

196. The atomizer assembly [300] of the VUSE Vibe includes “the atomizer [320] electrically connected to the screw thread electrode [160a]” as recited in claim 2 of the ’752 Patent.



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197. As shown in the photographs of paragraph 198 below, the VUSE Vibe meets every limitation recited in claim 3 of the ’752 Patent.

198. The atomizer assembly [300] of the VUSE Vibe includes “the atomizer [320] comprising a heater coil [323]” as recited in claim 3 of the ’752 Patent.

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199. As shown in the photographs of paragraph 200 below, the VUSE Vibe meets every limitation recited in claim 4 of the ’752 Patent.

200. The atomizer assembly [300] of the VUSE Vibe includes “the atomizer [320] including a heater coil [323] wound around a porous component [324]” as recited in claim 4 of the ’752 Patent.

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201. As shown in the photographs of paragraph 202 below, the VUSE Vibe meets every limitation recited in claim 5 of the ’752 Patent.

202. The atomizer assembly [300] of the VUSE Vibe includes “the porous component [324] includ[ing] a fiber material” as recited in claim 5 of the ’752 Patent.

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203. As shown in the photographs of paragraph 204 below, the VUSE Vibe meets every limitation recited in claim 6 of the ’752 Patent.

204. The atomizer assembly [300] of the VUSE Vibe includes “the screw thread electrode [160a] on a first end of the atomizer assembly housing [120a] and the liquid storage [330] inserted into a second end of the atomizer assembly [300] opposite from the first end” as recited in claim 6 of the ’752 Patent.

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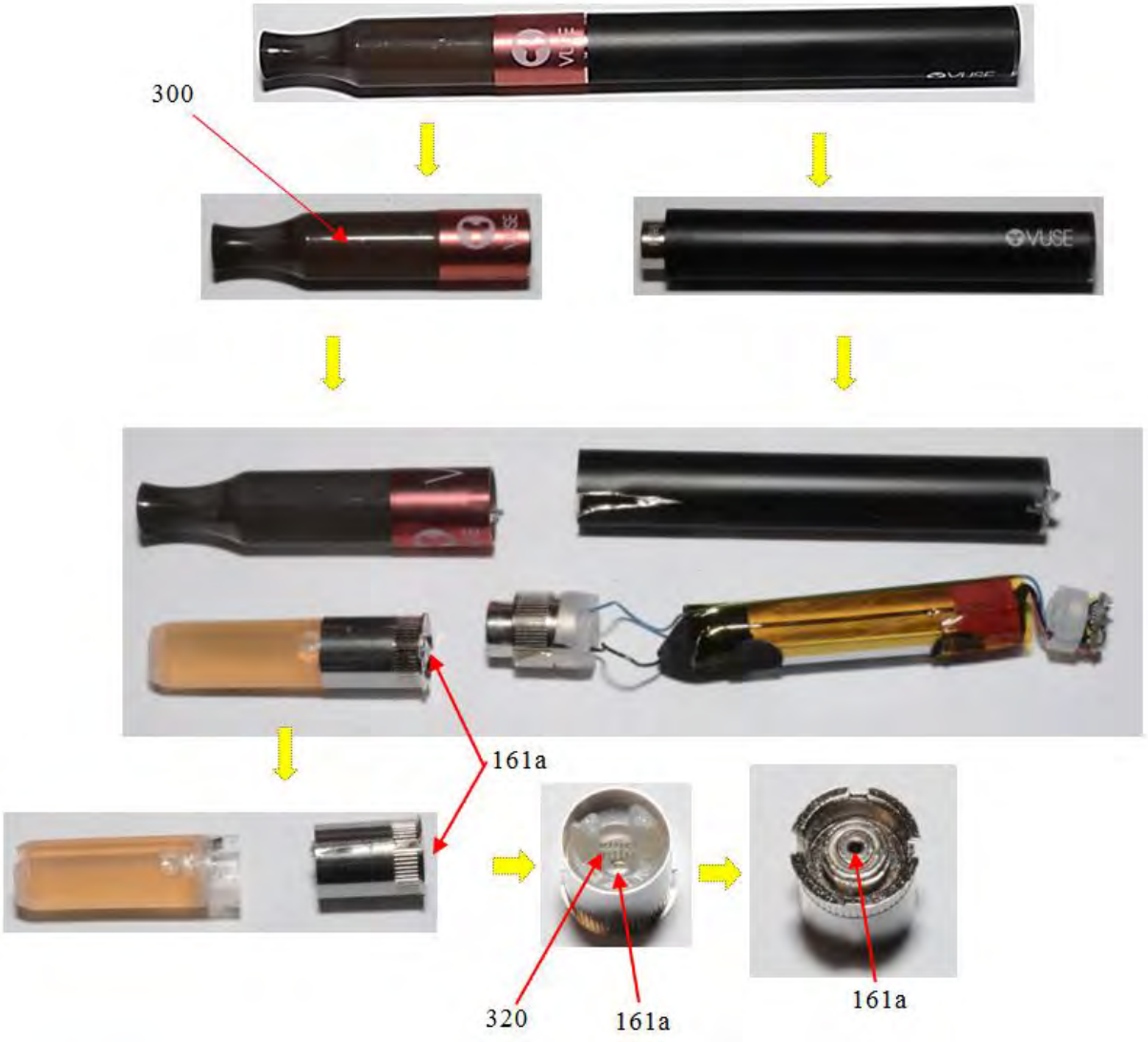
205. As shown in the photographs of paragraph 206 below, the VUSE Vibe meets every limitation recited in claim 7 of the ’752 Patent.

206. The atomizer assembly [300] of the VUSE Vibe includes “the through hole [161a] substantially aligned with the atomizer [320]” as recited in claim 7 of the ’752 Patent.



207. As shown in the photographs of paragraph 208 below, the VUSE Vibe meets every limitation recited in claim 8 of the ’752 Patent.

208. The atomizer assembly [300] of the VUSE Vibe includes “the through hole [161a] in the screw thread electrode [160a], the passageway and the outlet [150] comprising a flow path through the atomizer assembly housing [120a] passing through the atomizer [320]” as recited in claim 8 of the ’752 Patent.

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209. As shown in the photographs of paragraph 210 below, the VUSE Vibe meets every limitation recited in claim 9 of the ’752 Patent.

210. The atomizer assembly [300] of the VUSE Vibe includes “part of the flow passageway between the liquid storage [330] and an inside wall of the housing [120]” as recited in claim 9 of the ’752 Patent.

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211. As shown in the photographs of paragraph 212 below, the VUSE Vibe meets every limitation recited in claim 10 of the ’752 Patent.

212. The atomizer assembly [300] of the VUSE Vibe includes “the through-hole [161a] aligned with the atomizer [320]” as recited in claim 10 of the ’752 Patent.

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213. As shown in the photographs of paragraphs 214 through 219 below, the VUSE Vibe meets every limitation recited in claim 11 of the ’752 Patent.

214. The VUSE Vibe includes an “atomizer assembly [300] for an electronic cigarette” as recited in claim 11 of the ’752 Patent.

What is VUSE?

VUSE is the only Electronic Cigarette (or, "e-cigarette") that finally delivers a satisfying and great tasting vapor experience combined with consistent and reliable performance.

https://vusevapor.com/FooterLinks/ProductFAQs (last visited March 1, 2017)

215. The atomizer assembly [300] of the VUSE Vibe includes "an atomizer assembly housing [120a] containing an atomizer [320] and liquid storage [330]" as recited in claim 11 of the '752 Patent.

216. The atomizer assembly [300] of the VUSE Vibe includes "a screw thread electrode [160a] on one end of the atomizer assembly housing [120a]" as recited in claim 11 of the '752 Patent.

217. The atomizer assembly [300] of the VUSE Vibe includes "a through-hole [161a] in the screw thread electrode [160a] substantially aligned with the atomizer [320]" as recited in claim 11 of the '752 Patent.

218. The atomizer assembly [300] of the VUSE Vibe includes "the atomizer [320] electrically connected to the screw thread electrode [160a] and with the atomizer [320] in physical contact with the liquid storage [330]" as recited in claim 11 of the '752 Patent.

219. The atomizer assembly [300] of the VUSE Vibe includes "a flow passageway leading from the atomizer [320] to an outlet [150] of the atomizer assembly housing [120a]" as recited in claim 11 of the '752 Patent.

220. As shown in the photographs of paragraph 221 below, the VUSE Vibe meets every limitation recited in claim 12 of the ’752 Patent.

221. The atomizer assembly [300] of the VUSE Vibe includes “the atomizer [320] including a heater coil [323] wound around a porous component [324]” as recited in claim 12 of the ’752 Patent.

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222. As shown in the photographs of paragraph 223 below, the VUSE Vibe meets every limitation recited in claim 13 of the ’752 Patent.

223. The atomizer assembly [300] of the VUSE Vibe includes “the through-hole [161a] centered in the screw thread electrode [160a]” as recited in claim 13 of the ’752 Patent.

224. As shown in the photographs of paragraphs 225 through 230 below, the VUSE Vibe meets every limitation recited in claim 14 of the ’752 Patent.

225. The VUSE Vibe includes an “atomizer assembly [300] for an electronic cigarette” as recited in claim 14 of the ’752 Patent.

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226. The atomizer assembly [300] of the VUSE Vibe includes "an atomizer assembly housing [120a] containing an atomizer [320] and liquid storage [330]" as recited in claim 14 of the '752 Patent.

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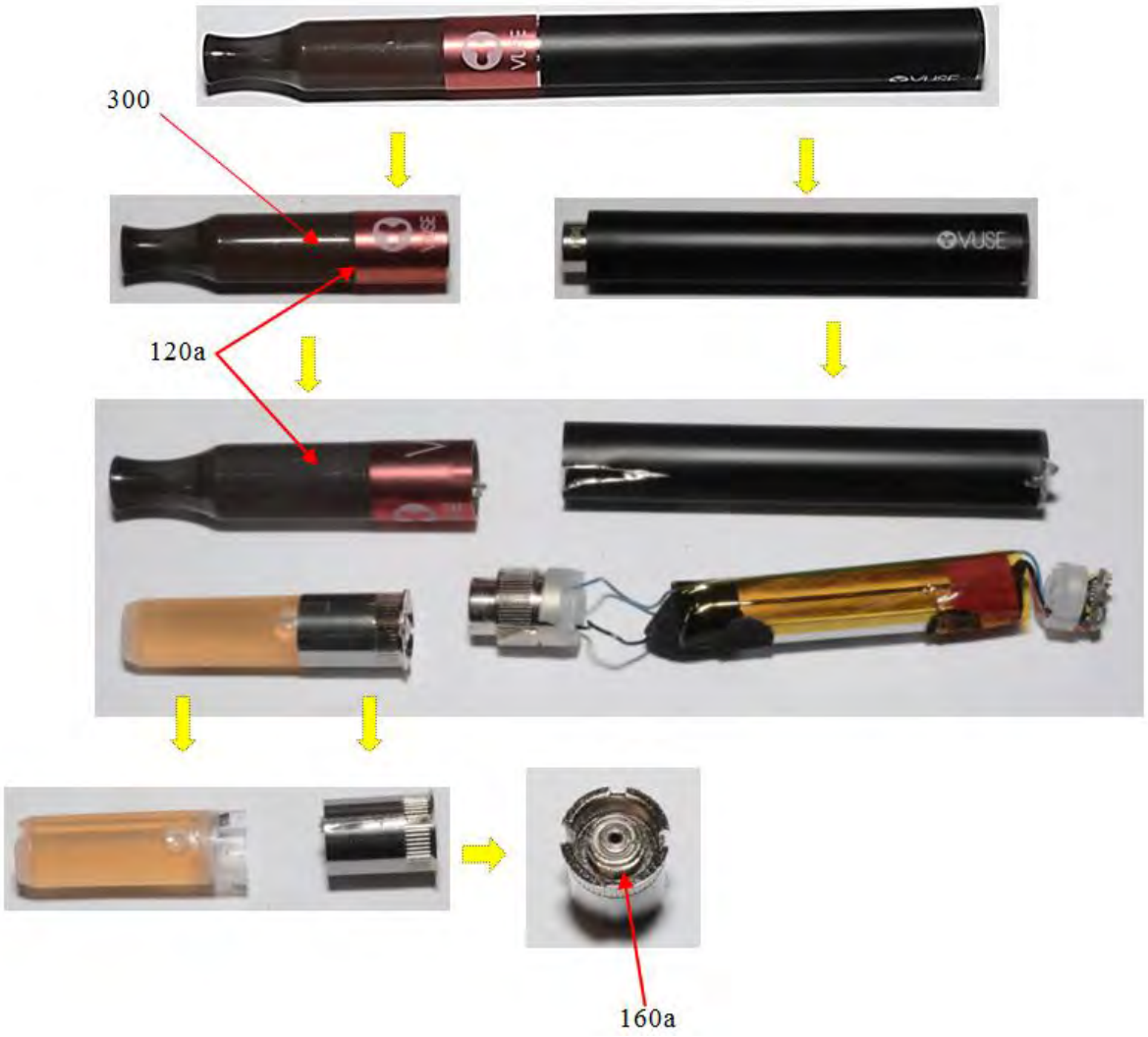
227. The atomizer assembly [300] of the VUSE Vibe includes "a screw thread electrode [160a] on one end of the atomizer assembly housing [120a]" as recited in claim 14 of the '752 Patent.



228. The atomizer assembly [300] of the VUSE Vibe includes "the atomizer [320] electrically connected to the screw thread electrode [160a]" as recited in claim 14 of the '752 Patent.

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229. The atomizer assembly [300] of the VUSE Vibe includes "a through-hole [161a] in the screw thread electrode [160a] substantially aligned with the atomizer [320]" as recited in claim 14 of the '752 Patent.

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230. The atomizer assembly [300] of the VUSE Vibe includes "a flow passageway from the atomizer [320] to an outlet [150] of the atomizer assembly housing [120a]" as recited in claim 14 of the '752 Patent.

231. As shown in the photographs of paragraph 232 below, the VUSE Vibe meets every limitation recited in claim 15 of the ’752 Patent.

232. The atomizer assembly [300] of the VUSE Vibe includes “the through-hole [161a] centered in the screw thread electrode [160a]” as recited in claim 15 of the ’752 Patent.

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233. As shown in the photographs of paragraphs 234 through 236 below, the VUSE Vibe meets every limitation recited in claim 16 of the ’752 Patent.

234. The VUSE Vibe includes an “atomizer assembly [300] for an electronic cigarette” as recited in claim 16 of the ’752 Patent.

What is VUSE?

VUSE is the only Electronic Cigarette (or, "e-cigarette") that finally delivers a satisfying and great tasting vapor experience combined with consistent and reliable performance.

https://vusevapor.com/FooterLinks/ProductFAQs (last visited March 1, 2017)

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235. The atomizer assembly [300] of the VUSE Vibe includes "an atomizer assembly housing [120a] containing an atomizer [320], liquid storage [330], and a screw thread electrode [160a] on a first end of the atomizer assembly housing [120a], the atomizer [320] in physical contact with the liquid storage [330], and the liquid storage [330] inserted into a second end of the atomizer assembly [300] opposite from the first end" as recited in claim 16 of the '752 Patent.

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236. The atomizer assembly [300] of the VUSE Vibe includes "a flow passageway leading from the atomizer [320] to an outlet [150] of the atomizer assembly housing [120a]" as recited in claim 16 of the '752 Patent.

237. As shown in the photographs of paragraph 238 below, the VUSE Vibe meets every limitation recited in claim 17 of the ’752 Patent.

238. The atomizer assembly [300] of the VUSE Vibe includes “a through-hole [161a] centered in the screw thread electrode [160a]” as recited in claim 17 of the ’752 Patent.

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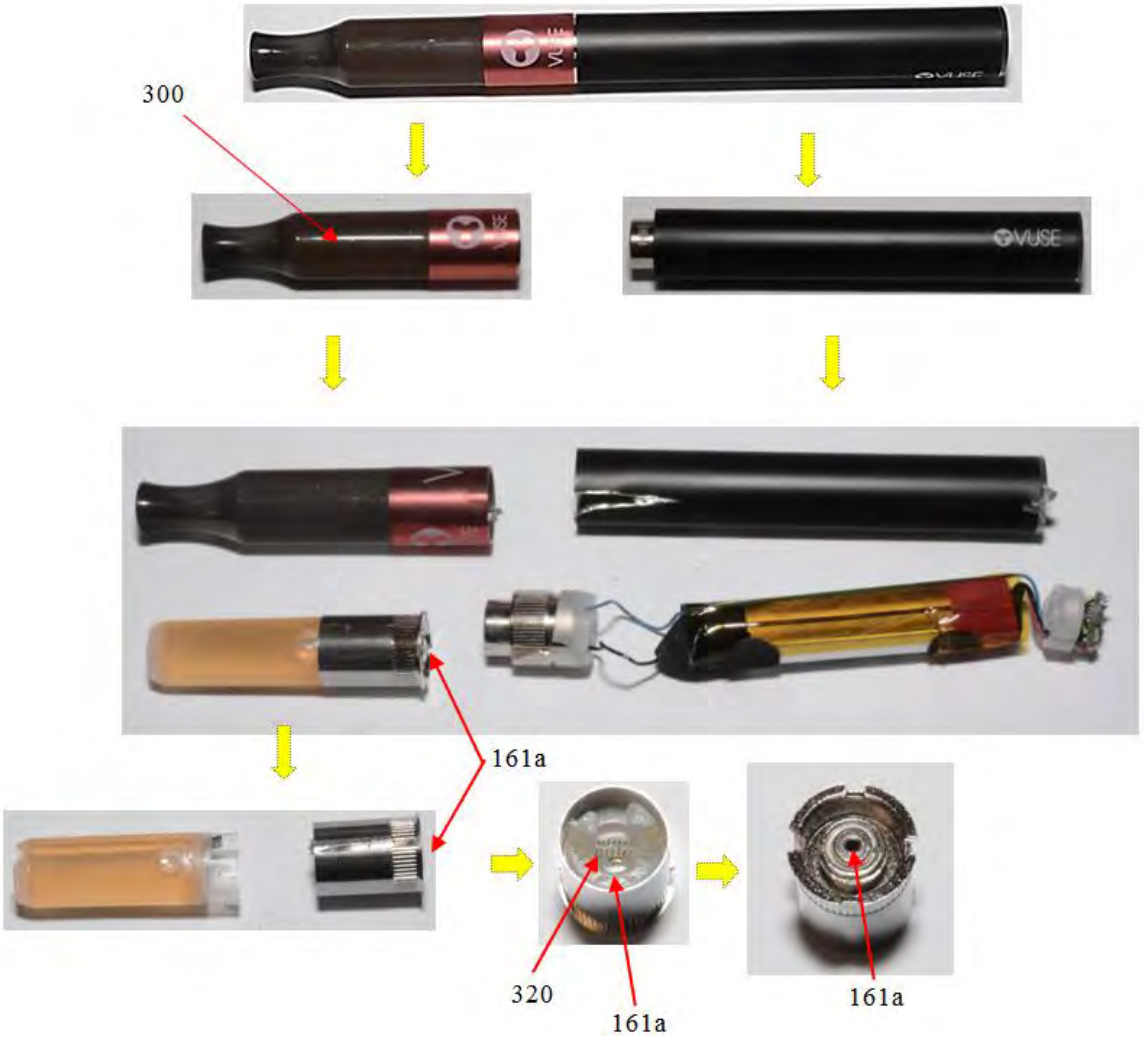
239. As shown in the photographs of paragraph 240 below, the VUSE Vibe meets every limitation recited in claim 18 of the ’752 Patent.

240. The atomizer assembly [300] of the VUSE Vibe includes “the through-hole [161a] aligned with the atomizer [320]” as recited in claim 18 of the ’752 Patent.



241. As shown in the photographs of paragraphs 242 through 246 below, the VUSE Vibe meets every limitation recited in claim 19 of the ’752 Patent.

242. The VUSE Vibe includes an “atomizer assembly [300] for an electronic cigarette” as recited in claim 19 of the ’752 Patent.

What is VUSE?

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https://vusevapor.com/FooterLinks/ProductFAQs (last visited March 1, 2017)

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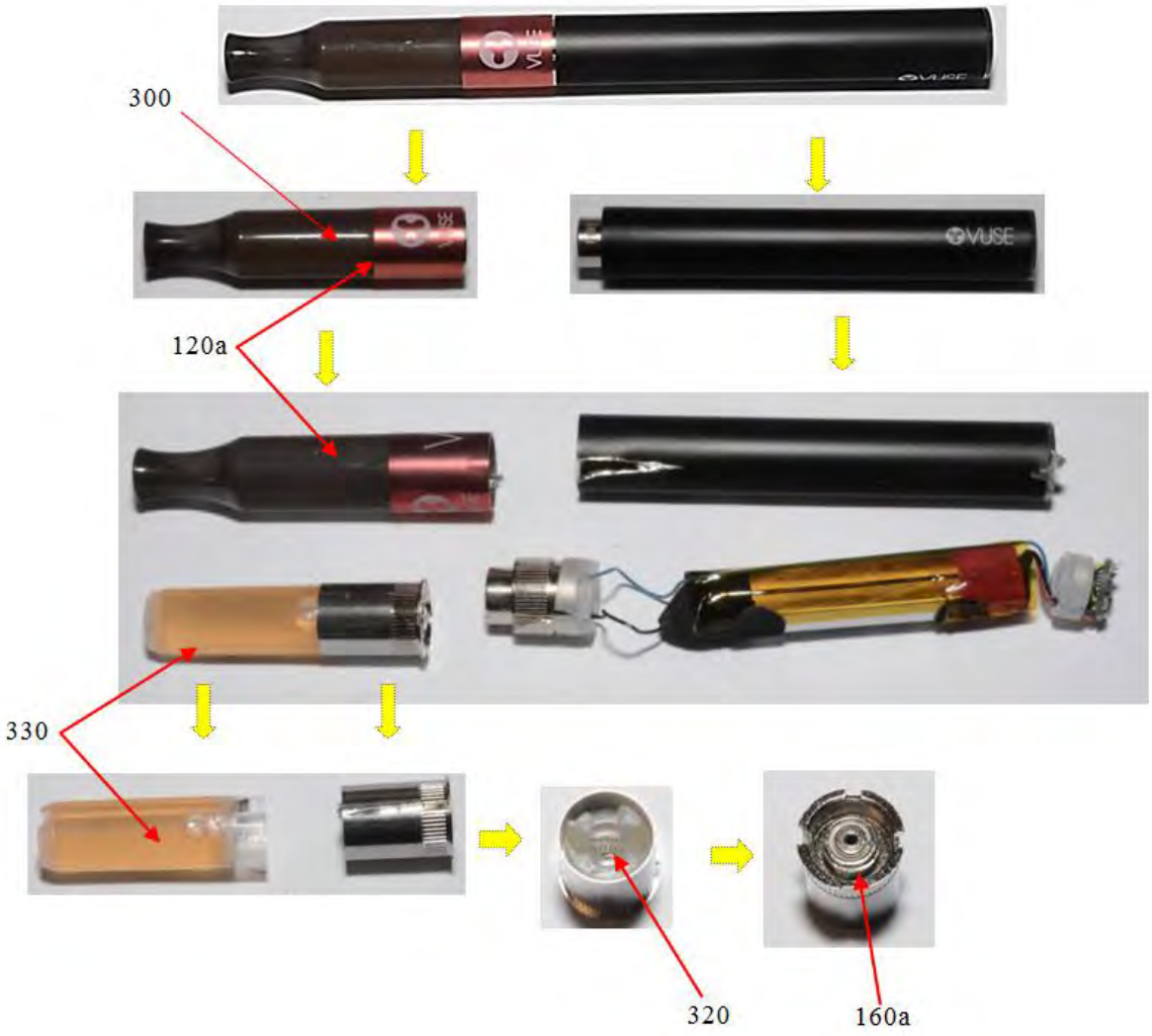
243. The atomizer assembly [300] of the VUSE Vibe includes "an atomizer assembly housing [120a] containing an atomizer [320], liquid storage [330], and a screw thread electrode [160a] on one end of the atomizer assembly housing [120a]" as recited in claim 19 of the '752 Patent.



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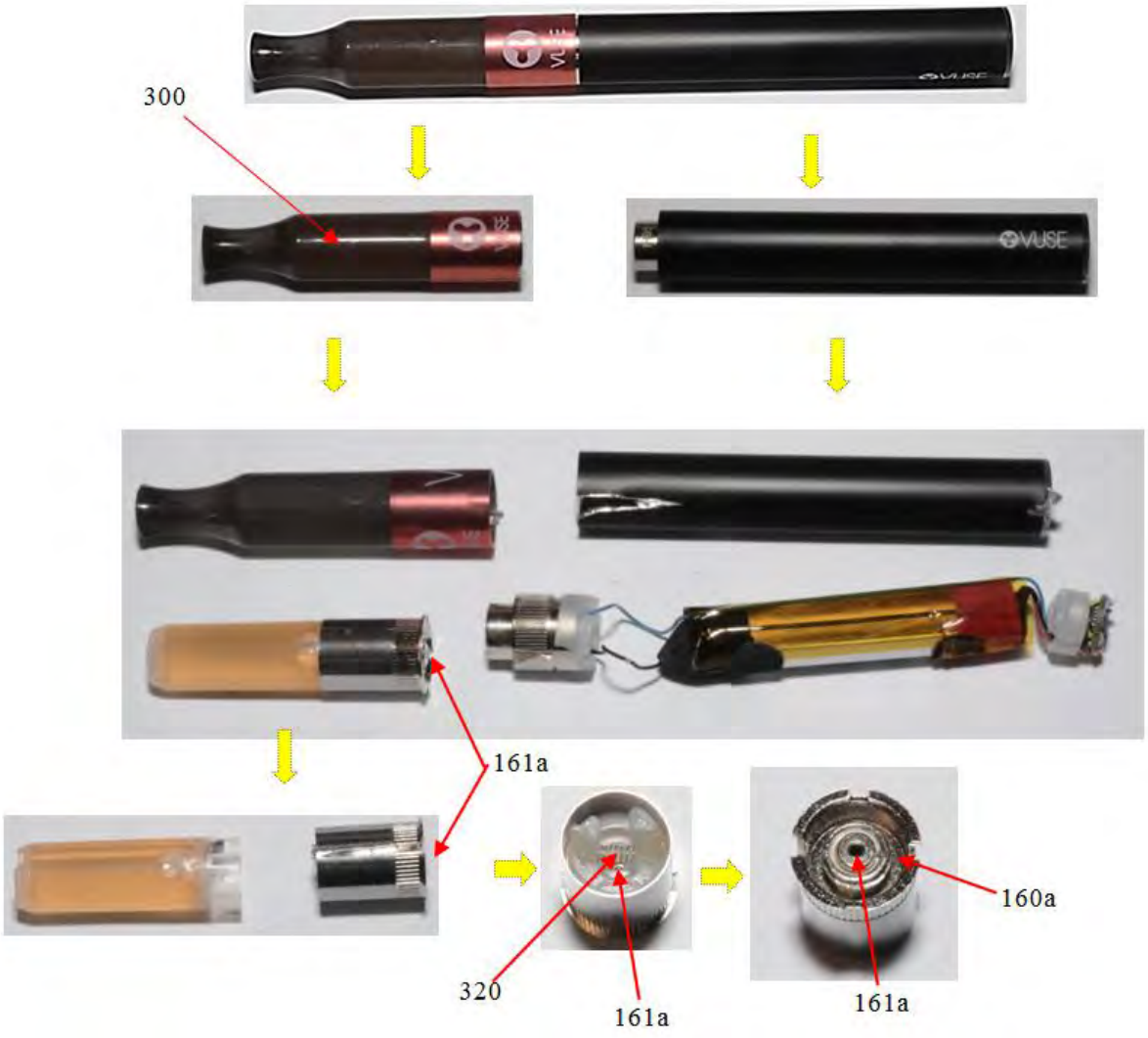
244. The atomizer assembly [300] of the VUSE Vibe includes "the screw thread electrode [160a] having a through hole [161a] substantially aligned with the atomizer [320]" as recited in claim 19 of the '752 Patent.



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245. The atomizer assembly [300] of the VUSE Vibe includes "the atomizer [320] in physical contact with the liquid storage [330]" as recited in claim 19 of the '752 Patent.

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246. The atomizer assembly [300] of the VUSE Vibe includes "a flow passageway leading from the atomizer [320] to an outlet [150] of the atomizer assembly housing [120a]" as recited in claim 19 of the '752 Patent.

247. As shown in the photographs of paragraph 248 below, the VUSE Vibe meets every limitation recited in claim 20 of the ’752 Patent.

248. The atomizer assembly [300] of the VUSE Vibe includes “the through-hole [161a] centered in the screw thread electrode [160a]” as recited in claim 20 of the ’752 Patent.

249. Defendant has also contributed to the infringement of the ’752 Patent in violation of 35 U.S.C. § 271(c) by, itself and/or through its agents, contributing

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to the direct infringement of the ’752 Patent by its customers by unlawfully and wrongfully making, using, importing, offering to sell, and/or selling electronic cigarette components constituting a material part of the invention of the ’752 Patent and having no substantially non-infringing use, which, when used by its customers, result in direct infringement of the ’752 Patent, in this judicial district and within, from and/or into the United States without permission or license from Plaintiffs, and will continue to do so unless enjoined by this Court.

250. Examples of electronic cigarette components that constitute a material part of the invention of the ’752 Patent, have no substantial non-infringing uses, and contribute to the direct infringement of the ’752 Patent include, but are not limited to, the VUSE Vibe and (1) VUSE Vibe Pre-Filled Tanks and (2) VUSE Vibe Rechargeable Batteries (collectively, “components of the VUSE Vibe”).

251. Upon information and belief, having knowledge of the ’752 Patent, Defendant is aware that the purchase and use of the VUSE Vibe and components of the VUSE Vibe by Defendant’s customers result in direct infringement of the ’752 Patent.

252. Defendant instructs users on how to use the VUSE Vibe and components of the VUSE Vibe.[22]

[22] *See, e.g.*, VUSE Vibe Package Insert (“Get started 1. Charge battery 2. Attach tank 3. Vape 4. Enjoy!”) (Exhibit Q).

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253. Defendant instructs users to purchase and use a replacement VUSE Vibe Pre-Filled Tank when a VUSE Vibe Pre-Filled Tank is depleted.[23]

254. Defendant further instructs users that the VUSE Vibe Pre-Filled Tanks should only be used with a VUSE Vibe Rechargeable Battery such that VUSE Vibe Pre-Filled Tanks are only compatible with the VUSE Vibe.[24]

255. Defendant instructs users to purchase and use a replacement VUSE Vibe Rechargeable Battery.[25]

256. As such, Defendant knows that the VUSE Vibe and components of the VUSE Vibe, including, but not limited to, the VUSE Vibe Pre-Filled Tank and VUSE Vibe Rechargeable Battery when sold separately, have no substantial non-infringing uses other than to provide users with the ability to assemble and use an electronic cigarette that infringes the '752 Patent, and, therefore, that they are especially made or adapted for use in infringement of the '752 Patent.

[23] *See, e.g.*, *id.* ("Don't vape an empty tank"). *See also* VUSE VIBE Store Locator (providing information for users on where to purchase replacement VUSE Vibe Pre-Filled Tanks and VUSE Vibe Pre-Filled Tank Systems including VUSE Vibe Pre-Filled Tanks and VUSE Vibe Rechargeable Battery), https://prod.vusevapor.com/products/vibe/?/locate (last visited March 1, 2017) (Exhibit R).

[24] *See, e.g.*, VUSE Vibe Package Insert ("Only use VUSE VIBE pre-filled tanks with a VUSE VIBE battery") (Exhibit Q).

[25] *See, e.g.*, VUSE VIBE Store Locator (providing information for users on where to purchase replacement VUSE Vibe Pre-Filled Tanks and VUSE Vibe Pre-Filled Tank Systems including VUSE Vibe Pre-Filled Tanks and VUSE Vibe Rechargeable Battery), https://prod.vusevapor.com/products/vibe/?/locate (last visited March 1, 2017) (Exhibit R).

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257. As a direct and proximate result of the foregoing acts of Defendant, Plaintiffs have suffered, and are entitled to, monetary damages in an amount not yet determined, which include, but are not limited to, lost profits on the infringing sales Plaintiffs may have made and reasonable royalties on sales not made. Plaintiffs are also entitled to their costs of suit and interest.

258. Defendant's continuing infringement has inflicted and, unless restrained by this Court, will continue to inflict irreparable harm upon Plaintiffs, such as reduction of Plaintiffs' proper market share and deprivation of Plaintiffs' rights to exclude others. Plaintiffs have no adequate remedy at law. Plaintiffs are entitled to injunctive relief enjoining Defendant from engaging in further acts of infringement.

259. In view of Defendant's knowledge of the '752 Patent, Defendant has proceeded to infringe the '752 Patent despite a high probability that its actions constituted infringement of a valid patent. Thus, Defendant's infringement of the '752 Patent is willful and deliberate. That egregious infringement behavior entitles Plaintiffs to increased damages under 35 U.S.C. § 284, and to attorneys' fees and costs incurred in prosecuting this action under 35 U.S.C. § 285.

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FOURTH CLAIM FOR RELIEF

(Infringement of U.S. Patent No. 9,364,027)

260. Plaintiffs incorporate by reference the allegations contained in paragraphs 1–259 above.

261. Plaintiff Fontem Holdings is the owner of the entire right, title, and interest in and to United States Patent No. 9,364,027 ("the '027 Patent") (Exhibit D). Fontem Holdings has granted Fontem Ventures an exclusive license to the '027 Patent, including the right to sublicense the '027 Patent. The '027 Patent was duly and legally issued by the USPTO on June 14, 2016, and is valid, subsisting, and in full force and effect.

262. Upon information and belief, Defendant has had knowledge of the '027 Patent and of Plaintiffs' rights therein.

263. Plaintiffs have previously asserted infringement of seven of its United States patents (*i.e.*, the '742 Patent, the '628 Patent, the '726 Patent, the '239 Patent, the '548 Patent, the '549 Patent, and the '205 Patent) against Defendant in three patent infringement cases (*i.e., Fontem Ventures BV et al. v. R.J. Reynolds Vapor Company*, Case No. 1:16-cv-01255 (M.D.N.C. April 4, 2016), *Fontem Ventures BV et al. v. R.J. Reynolds Vapor Company*, Case No. 1:16-cv-01257 (M.D.N.C. May 3, 2016) and *Fontem Ventures BV et al. v. R.J. Reynolds Vapor Company*, Case No. 1:16-cv-01258 (M.D.N.C. June 22, 2016) (collectively, the

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"Reynolds Vapor Patent Infringement Cases"), all consolidated under Case No. 1:16-cv-01255).

264. In its Answer to Fontem's Interrogatory No. 10 regarding "when and how [Defendant] first became aware of [the '742 Patent, the '628 Patent, the '726 Patent, the '239 Patent, the '548 Patent, the '549 Patent, and the '205 Patent] or any U.S. or foreign patent or patent application related thereto," Defendant admitted that "it first became aware of the existence of [the '742 Patent, the '628 Patent, the '726 Patent, the '239 Patent, the '548 Patent, the '549 Patent, and the '205 Patent] at or shortly after their respective issue dates."[26]

265. Accordingly, upon information and belief, Defendant, through its admitted monitoring of Plaintiffs' patents, has had knowledge or should have had knowledge about the existence of the '027 Patent at or shortly after its issue date of June 14, 2016.

266. Defendant also had knowledge of the'027 Patent because Defendant was aware that Plaintiffs previously asserted infringement of sixteen of its United States patents, including the '027 Patent, against third party Nu Mark LLC ("Nu Mark") in two patent infringement cases (*i.e.*, *Fontem Ventures BV et al. v. Nu Mark LLC*, Case No. 1:16-cv-01259 (M.D.N.C. June 22, 2016) and *Fontem*

[26] *Fontem Ventures BV et al. v. R.J. Reynolds Vapor Company*, Case No. 1:16-cv-01255, Defendant R.J. Reynolds Vapor Company's Responses to Fontem's First Set of Interrogatories at 10–11, served Jan. 18, 2017 (Exhibit I).

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Ventures BV et al. v. Nu Mark LLC, Case No. 1:16-cv-01261 (M.D.N.C. April 4, 2016) (collectively, the "Nu Mark Patent Infringement Cases") consolidated under Case No. 1:16-cv-01261).

267. On July 12, 2016, in an effort to manage and coordinate the Reynolds Patent Infringement Cases and the Nu Mark Patent Infringement Cases, Plaintiffs' counsel emailed Defendant's counsel and Nu Mark's counsel a draft Joint Scheduling Conference Report Pursuant to Rule 26(f), which identified the '027 Patent as one of the sixteen patents that Nu Mark allegedly infringed ("Nu Mark Rule 26(f) Report").[27]

268. Defendant's counsel participated in subsequent email exchanges and joint meet and confers related to the Nu Mark Rule 26(f) Report that identified the '027 Patent.

269. Accordingly, Defendant has had knowledge of the '027 Patent since at least July 12, 2016.

270. At all relevant times, Defendant and the public in general have had notice of the '027 Patent because Plaintiffs have marked the packaging of their products embodying the '027 Patent in accordance with 35 U.S.C. § 287.

[27] *See* July 12, 2016 Email Exchange Between Plaintiffs' Counsel (*i.e.*, Lara Dueppen, Michael Wise, Joseph Hamilton) and Defendant's Counsel (*i.e.*, Mark A. Finkelstein (mafinkelstein@jonesday.com), Oluwafemi Masha (omasha@brinksgilson.com), Ralph Gabric (rgabric@brinksgilson.com), and Robert Mallin (rmallin@brinksgilson.com)) at 1 (Exhibit J); Draft Joint Scheduling Conference Report Pursuant to Rule 26(f) at 1 (Exhibit K).

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271. Defendant has directly infringed the ’027 Patent in violation of at least 35 U.S.C. § 271(a) by, itself and/or through its agents, unlawfully and wrongfully making, using, importing, offering to sell, and/or selling electronic smoking devices or electronic cigarette products embodying one or more of the inventions claimed in the ’027 Patent, within, from and/or into the United States without permission or license from Plaintiffs, and will continue to do so unless enjoined by this Court.

272. An example of the electronic smoking devices or electronic cigarette products that directly infringe the ’027 Patent includes, but is not limited to, the VUSE Vibe.

273. The VUSE Vibe infringes the ’027 Patent literally and/or under the doctrine of equivalents.

274. The VUSE Vibe infringes at least claims 1–2, 6–7, 12, 14, and 16–17 of the ’027 Patent.

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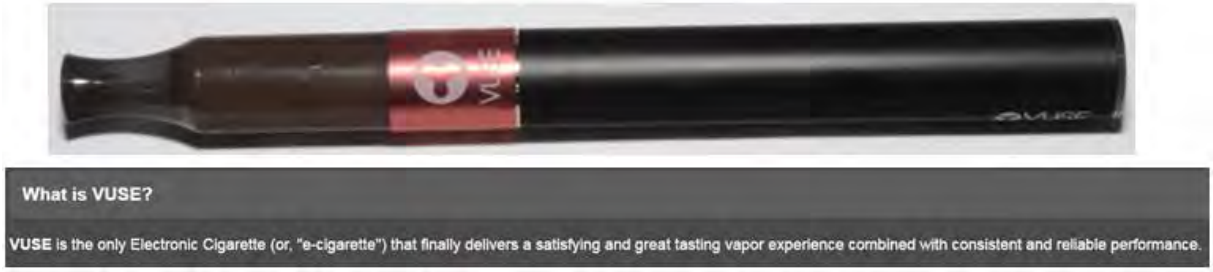
275. As shown in the photographs of paragraphs 276 through 282 below, the VUSE Vibe meets every limitation recited in claim 1 of the ’027 Patent.

276. The VUSE Vibe is an “electronic smoking device” as recited in claim 1 of the ’027 Patent.



https://vusevapor.com/FooterLinks/ProductFAQs (last visited March 1, 2017)

277. The VUSE Vibe includes “a tubular housing [120] having a first end and a second end” as recited in claim 1 of the ’027 Patent.

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278. The VUSE Vibe includes "an outlet [150] on the second end of the tubular housing [120]" as recited in claim 1 of the '027 Patent.

279. The VUSE Vibe includes "a wire coil [323] in a tube [327], with the tube [327] within the housing [120], and the wire coil [323] configured to vaporize liquid moving from outside of the tube [327] into the tube [327] and contacting the wire coil [323]" as recited in claim 1 of the '027 Patent.

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280. The VUSE Vibe includes "a control circuit [221] in the tubular housing [120] electrically connected to the wire coil [323] and to a sensor [230]" as recited in claim 1 of the '027 Patent.

281. The VUSE Vibe includes "at least one air opening [140] leading into the tubular housing [120], with the wire coil [323] in between the at least one air opening [140] and the second end of the tubular housing [120]" as recited in claim 1 of the '027 Patent.

282. The VUSE Vibe includes "an LED [240] at the first end of the tubular housing [120], with the LED [240] electrically connected to the control circuit [221], and the LED [240] configured to provide a gradual change in luminance to imitate a conventional cigarette" as recited in claim 1 of the '027 Patent.

283. As shown in the photographs of paragraph 284 below, the VUSE Vibe meets every limitation recited in claim 2 of the ’027 Patent.

284. The VUSE Vibe includes “screw threads [160b] at the first end of the tubular housing [120]” as recited in claim 2 of the ’027 Patent.

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285. As shown in the photographs of paragraph 286 below, the VUSE Vibe meets every limitation recited in claim 6 of the ’027 Patent.

286. The VUSE Vibe includes “the LED [240] configured to provide luminance that changes based on an output of the sensor [230]” as recited in claim 6 of the ’027 Patent.

287. As shown in the photographs of paragraph 288 below, the VUSE Vibe meets every limitation recited in claim 7 of the ’027 Patent.

288. The VUSE Vibe includes “the tube [327] attached to a first side of a base [180] in the housing [120] and further including screw threads [160a] on a second side of the base [180], opposite from the first side of the base [180]” as recited in claim 7 of the ’027 Patent.

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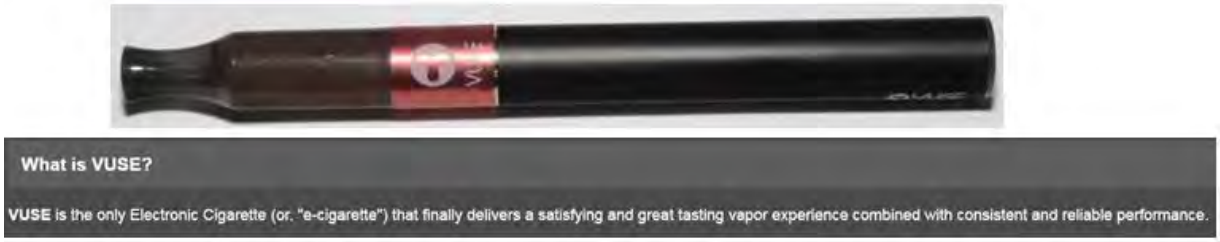
289. As shown in the photographs of paragraphs 290 through 296 below, the VUSE Vibe meets every limitation recited in claim 12 of the ’027 Patent.

290. The VUSE Vibe is an “electronic smoking device” as recited in claim 12 of the ’027 Patent.



https://vusevapor.com/FooterLinks/ProductFAQs (last visited March 1, 2017)

291. The VUSE Vibe includes “an electronic cigarette having a housing [120] having a first end and a second end” as recited in claim 12 of the ’027 Patent.

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292. The VUSE Vibe includes "an outlet [150] on a second end of the housing [120]" as recited in claim 12 of the '027 Patent.

293. The VUSE Vibe includes "a wire coil [323] in a tube [327], with the tube [327] in the housing [120] and attached to a base [180] in the housing [120]" as recited in claim 12 of the '027 Patent.

294. The VUSE Vibe includes "a control circuit [221] in the housing [120] electrically connected to the wire coil [323] and to a sensor [230] and a battery [210] in the housing [120]" as recited in claim 12 of the '027 Patent.

295. The VUSE Vibe includes "an LED [240] at the first end of the housing [120], with the LED [240] electrically connected to the control circuit [221], and the LED [240] configured to provide a gradual change in luminance via the control circuit [221]" as recited in claim 12 of the '027 Patent.

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296. The VUSE Vibe includes "at least one air opening [140] leading into the housing [120], with the wire coil [323] in between the at least one air opening [140] and the second end of the housing [120]" as recited in claim 12 of the '027 Patent.

297. As shown in the photographs of paragraph 298 below, the VUSE Vibe meets every limitation recited in claim 14 of the ’027 Patent.

298. The VUSE Vibe includes “the LED [240] configured to provide a gradual change in luminance via the control unit [221] that changes based on an output of the sensor [230]” as recited in claim 14 of the ’027 Patent.

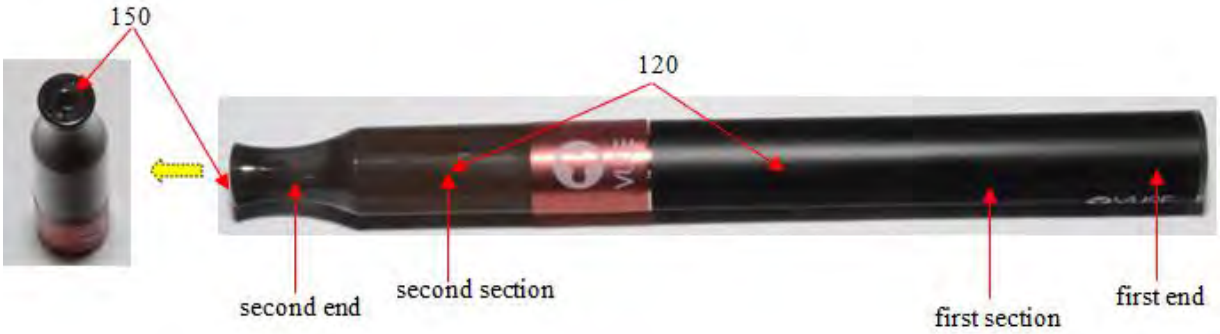
299. As shown in the photographs of paragraphs 300 through 306 below, the VUSE Vibe meets every limitation recited in claim 16 of the ’027 Patent.

300. The VUSE Vibe is an “electronic cigarette” as recited in claim 16 of the ’027 Patent.

https://vusevapor.com/FooterLinks/ProductFAQs (last visited March 1, 2017)

301. The VUSE Vibe includes “a housing [120] having a first section having a first end and a second section having a second end, with the first section attached to the second section” as recited in claim 16 of the ’027 Patent.

302. The VUSE Vibe includes "an outlet [150] at the second end of the second section of the housing [120]" as recited in claim 16 of the '027 Patent.



303. The VUSE Vibe includes "a wire heating coil [323] in a tube [327] in the second section of the housing [120]" as recited in claim 16 of the '027 Patent.

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304. The VUSE Vibe includes "a control circuit [221] electrically connected to the wire heating coil [323] and to a sensor [230], and to a battery [210] in the first section of the housing [120]" as recited in claim 16 of the '027 Patent.

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305. The VUSE Vibe includes "an LED [240] at the first end of the first section of the housing [120], with the LED [240] electrically connected to the control circuit [221], and the LED [240] configured to provide luminance that changes based on an output of the sensor [230], to imitate a conventional cigarette" as recited in claim 16 of the '027 Patent.

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306. The VUSE Vibe includes "at least one air opening [140] leading into at least one of the first and second sections of the housing [120], with the wire heating coil [323] in between the at least one air opening [140] and the second end of the second section of the housing [120]" as recited in claim 16 of the '027 Patent.

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307. As shown in the photographs of paragraph 308 below, the VUSE Vibe meets every limitation recited in claim 17 of the ’027 Patent.

308. The VUSE Vibe includes “the housing [120] has a tubular first section attached to a tubular second section, and with the battery [210] in the first section” as recited in claim 17 of the ’027 Patent.

309. Defendant has also contributed to the infringement of the ’027 Patent in violation of 35 U.S.C. § 271(c) by, itself and/or through its agents, contributing to the direct infringement of the ’027 Patent by its customers by unlawfully and wrongfully making, using, importing, offering to sell, and/or selling electronic

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cigarette components constituting a material part of the invention of the ’027 Patent and having no substantially non-infringing use, which, when used by its customers, result in direct infringement of the ’027 Patent, in this judicial district and within, from and/or into the United States without permission or license from Plaintiffs, and will continue to do so unless enjoined by this Court.

310. Examples of electronic cigarette components that constitute a material part of the invention of the ’027 Patent, have no substantial non-infringing uses, and contribute to the direct infringement of the ’027 Patent include, but are not limited to, the VUSE Vibe and (1) VUSE Vibe Pre-Filled Tanks and (2) VUSE Vibe Rechargeable Batteries (collectively, “components of the VUSE Vibe”).

311. Upon information and belief, having knowledge of the ’027 Patent, Defendant is aware that the purchase and use of the VUSE Vibe and components of the VUSE Vibe by Defendant’s customers result in direct infringement of the ’027 Patent.

312. Defendant instructs users on how to use the VUSE Vibe and components of the VUSE Vibe.[28]

313. Defendant instructs users to purchase and use a replacement VUSE Vibe Pre-Filled Tank when a VUSE Vibe Pre-Filled Tank is depleted.[29]

[28] *See, e.g.*, VUSE Vibe Package Insert (“Get started 1. Charge battery 2. Attach tank 3. Vape 4. Enjoy!”) (Exhibit Q).

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314. Defendant further instructs users that the VUSE Vibe Pre-Filled Tanks should only be used with a VUSE Vibe Rechargeable Battery such that VUSE Vibe Pre-Filled Tanks are only compatible with the VUSE Vibe.[30]

315. Defendant instructs users to purchase and use a replacement VUSE Vibe Rechargeable Battery.[31]

316. As such, Defendant knows that the VUSE Vibe and components of the VUSE Vibe, including, but not limited to, the VUSE Vibe Pre-Filled Tank and VUSE Vibe Rechargeable Battery when sold separately, have no substantial non-infringing uses other than to provide users with the ability to assemble and use an electronic cigarette that infringes the '027 Patent, and, therefore, that they are especially made or adapted for use in infringement of the '027 Patent.

317. As a direct and proximate result of the foregoing acts of Defendant, Plaintiffs have suffered, and are entitled to, monetary damages in an amount not

[29] *See, e.g.*, *id.* ("Don't vape an empty tank"). *See also* VUSE VIBE Store Locator (providing information for users on where to purchase replacement VUSE Vibe Pre-Filled Tanks and VUSE Vibe Pre-Filled Tank Systems including VUSE Vibe Pre-Filled Tanks and VUSE Vibe Rechargeable Battery), https://prod.vusevapor.com/products/vibe/?/locate (last visited March 1, 2017) (Exhibit R).

[30] *See, e.g.*, VUSE Vibe Package Insert ("Only use VUSE VIBE pre-filled tanks with a VUSE VIBE battery") (Exhibit Q).

[31] *See, e.g.*, VUSE VIBE Store Locator (providing information for users on where to purchase replacement VUSE Vibe Pre-Filled Tanks and VUSE Vibe Pre-Filled Tank Systems including VUSE Vibe Pre-Filled Tanks and VUSE Vibe Rechargeable Battery), https://prod.vusevapor.com/products/vibe/?/locate (last visited March 1, 2017) (Exhibit R).

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yet determined, which include, but are not limited to, lost profits on the infringing sales Plaintiffs may have made and reasonable royalties on sales not made. Plaintiffs are also entitled to their costs of suit and interest.

318. Defendant's continuing infringement has inflicted and, unless restrained by this Court, will continue to inflict irreparable harm upon Plaintiffs, such as reduction of Plaintiffs' proper market share and deprivation of Plaintiffs' rights to exclude others. Plaintiffs have no adequate remedy at law. Plaintiffs are entitled to injunctive relief enjoining Defendant from engaging in further acts of infringement.

319. In view of Defendant's knowledge of the '027 Patent, Defendant has proceeded to infringe the '027 Patent despite a high probability that its actions constituted infringement of a valid patent. Thus, Defendant's infringement of the '027 Patent is willful and deliberate. That egregious infringement behavior entitles Plaintiffs to increased damages under 35 U.S.C. § 284, and to attorneys' fees and costs incurred in prosecuting this action under 35 U.S.C. § 285.

FIFTH CLAIM FOR RELIEF

(Infringement of U.S. Patent No. 9,339,062)

320. Plaintiffs incorporate by reference the allegations contained in paragraphs 1–319 above.

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321. Plaintiff Fontem Holdings is the owner of the entire right, title, and interest in and to United States Patent No. 9,339,062 ("the '062 Patent") (Exhibit E). Fontem Holdings has granted Fontem Ventures an exclusive license to the '062 Patent, including the right to sublicense the '062 Patent. The '062 Patent was duly and legally issued by the USPTO on May 17, 2016, and is valid, subsisting, and in full force and effect.

322. Upon information and belief, Defendant has had knowledge of the '062 Patent and of Plaintiffs' rights therein.

323. Plaintiffs have previously asserted infringement of seven of its United States patents (*i.e.*, the '742 Patent, the '628 Patent, the '726 Patent, the '239 Patent, the '548 Patent, the '549 Patent, and the '205 Patent) against Defendant in three patent infringement cases (*i.e., Fontem Ventures BV et al. v. R.J. Reynolds Vapor Company*, Case No. 1:16-cv-01255 (M.D.N.C. April 4, 2016), *Fontem Ventures BV et al. v. R.J. Reynolds Vapor Company*, Case No. 1:16-cv-01257 (M.D.N.C. May 3, 2016) and *Fontem Ventures BV et al. v. R.J. Reynolds Vapor Company*, Case No. 1:16-cv-01258 (M.D.N.C. June 22, 2016) (collectively, the "Reynolds Vapor Patent Infringement Cases"), all consolidated under Case No. 1:16-cv-01255).

324. In its Answer to Fontem's Interrogatory No. 10 regarding "when and how [Defendant] first became aware of [the '742 Patent, the '628 Patent, the '726

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Patent, the ’239 Patent, the ’548 Patent, the ’549 Patent, and the ’205 Patent] or any U.S. or foreign patent or patent application related thereto,” Defendant admitted that “it first became aware of the existence of [the ’742 Patent, the ’628 Patent, the ’726 Patent, the ’239 Patent, the ’548 Patent, the ’549 Patent, and the ’205 Patent] at or shortly after their respective issue dates.”[32]

325. Accordingly, upon information and belief, Defendant, through its admitted monitoring of Plaintiffs’ patents, has had knowledge or should have had knowledge about the existence of the ’062 Patent at or shortly after its issue date of May 17, 2016.

326. Defendant also had knowledge of the ’062 Patent because Defendant was aware that Plaintiffs previously asserted infringement of sixteen of its United States patents, including the ’062 Patent, against third party Nu Mark LLC (“Nu Mark”) in two patent infringement cases (*i.e.*, *Fontem Ventures BV et al. v. Nu Mark LLC*, Case No. 1:16-cv-01259 (M.D.N.C. June 22, 2016) and *Fontem Ventures BV et al. v. Nu Mark LLC*, Case No. 1:16-cv-01261 (M.D.N.C. April 4, 2016) (collectively, the “Nu Mark Patent Infringement Cases”) consolidated under Case No. 1:16-cv-01261).

[32] *Fontem Ventures BV et al. v. R.J. Reynolds Vapor Company*, Case No. 1:16-cv-01255, Defendant R.J. Reynolds Vapor Company’s Responses to Fontem’s First Set of Interrogatories at 10–11, served Jan. 18, 2017 (Exhibit I).

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327. On July 12, 2016, in an effort to manage and coordinate the Reynolds Patent Infringement Cases and the Nu Mark Patent Infringement Cases, Plaintiffs' counsel emailed Defendant's counsel and Nu Mark's counsel a draft Joint Scheduling Conference Report Pursuant to Rule 26(f), which identified the '062 Patent as one of the sixteen patents that Nu Mark allegedly infringed ("Nu Mark Rule 26(f) Report").[33]

328. Defendant's counsel participated in subsequent email exchanges and joint meet and confers related to the Nu Mark Rule 26(f) Report that identified the '062 Patent.

329. Accordingly, Defendant has had knowledge of the '062 Patent since at least July 12, 2016.

330. At all relevant times, Defendant and the public in general have had notice of the '062 Patent because Plaintiffs have marked the packaging of their products embodying the '062 Patent in accordance with 35 U.S.C. § 287.

331. Defendant has directly infringed the '062 Patent in violation of at least 35 U.S.C. § 271(a) by, itself and/or through its agents, unlawfully and wrongfully making, using, importing, offering to sell, and/or selling electronic cigarette

[33] *See* July 12, 2016 Email Exchange Between Plaintiffs' Counsel (*i.e.*, Lara Dueppen, Michael Wise, Joseph Hamilton) and Defendant's Counsel (*i.e.*, Mark A. Finkelstein (mafinkelstein@jonesday.com), Oluwafemi Masha (omasha@brinksgilson.com), Ralph Gabric (rgabric@brinksgilson.com), and Robert Mallin (rmallin@brinksgilson.com)) at 1 (Exhibit J); Draft Joint Scheduling Conference Report Pursuant to Rule 26(f) at 1 (Exhibit K).

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products embodying one or more of the inventions claimed in the ’062 Patent, within, from and/or into the United States without permission or license from Plaintiffs, and will continue to do so unless enjoined by this Court.

332. An example of the electronic cigarette products that directly infringe the’062 Patent includes, but is not limited to, the VUSE Vibe.

333. The VUSE Vibe infringes the ’062 Patent literally and/or under the doctrine of equivalents.

334. The VUSE Vibe infringes at least claims 1–5, 8–10, 12–13, 16, and 18–19 of the ’062 Patent.

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335. As shown in the photographs of paragraphs 336 through 346 below, the VUSE Vibe meets every limitation recited in claim 1 of the ’062 Patent.

336. The VUSE Vibe is a “combination of an electronic cigarette, and a battery charger [400]” as recited in claim 1 of the ’062 Patent.

What is VUSE?

VUSE is the only Electronic Cigarette (or, "e-cigarette") that finally delivers a satisfying and great tasting vapor experience combined with consistent and reliable performance.

https://vusevapor.com/FooterLinks/ProductFAQs (last visited March 1, 2017)

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337. The VUSE Vibe includes "a battery assembly [200] comprising a tubular battery assembly housing [120b] having a first end and a second end, with a battery [210] and a micro-controller unit [221] electrically connected to a circuit board [220] within the battery assembly housing [120b]" as recited in claim 1 of the '062 Patent.

338. The VUSE Vibe includes "a first screw thread electrode [160b] on the first end of the battery assembly housing [120b], with a first through hole [161b] at a center of the first screw thread electrode [160b]" as recited in claim 1 of the '062 Patent.

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339. The VUSE Vibe includes "an atomizer assembly [300]" as recited in claim 1 of the '062 Patent.

340. The VUSE Vibe includes "a tubular atomizer assembly housing [120a] having a first end and a second end" as recited in claim 1 of the '062 Patent.

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341. The VUSE Vibe includes "an atomizer [320] and a liquid supply [330] in the tubular atomizer assembly housing [120a]" as recited in claim 1 of the '062 Patent.

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342. The VUSE Vibe includes "a second screw thread electrode [160a] on the second end of the atomizer assembly housing [120a], with a second through hole [161a] at a center of the second screw thread electrode [160a]" as recited in claim 1 of the '062 Patent.

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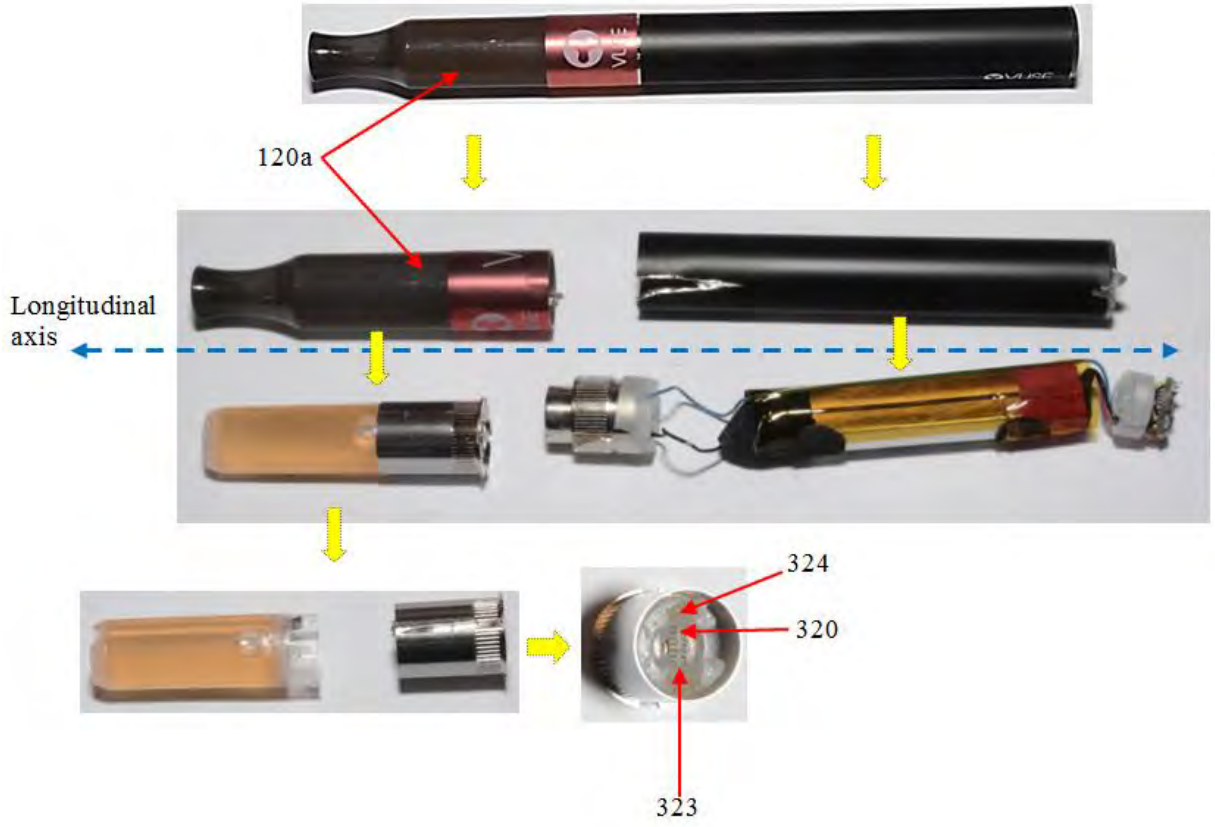
343. The VUSE Vibe includes "the atomizer [320] including a heater wire [323] and a porous body [324], with the heater wire [323] wound on a part of the porous body [324] which is perpendicular to a longitudinal axis of the tubular atomizer assembly housing [120a]" as recited in claim 1 of the '062 Patent.



344. The VUSE Vibe includes "an airflow path from an air inlet [140] through an opening [163] in the atomizer [320], to an outlet [150] at the second end of the tubular atomizer assembly housing [120a]" as recited in claim 1 of the '062 Patent.

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345. The VUSE Vibe includes "the battery assembly [200] mechanically and electrically connectable to the atomizer assembly [300] to form the electronic cigarette by engagement of the first screw thread electrode [160b] with the second screw thread electrode [160a], and with electricity conducted from the battery [210] to the heater wire [323] through the first and second screw thread electrodes [160b/160a] for heating the heater wire [323]" as recited in claim 1 of the '062 Patent.

346. The VUSE Vibe includes "a battery charger [400] having a third screw thread electrode [160c] mechanically and electrically engageable with the first screw thread electrode [160b], for charging the battery [210] by conducting electricity from the battery charger [400] through the third and first screw thread electrodes [160c/160b] to the battery [210]" as recited in claim 1 of the '062 Patent.

347. As shown in the photographs of paragraph 348 below, the VUSE Vibe meets every limitation recited in claim 2 of the ’062 Patent.

348. The VUSE Vibe includes “a sensor [230] in the battery assembly housing [120b], with the sensor [230] electrically connected to the micro-controller unit [221]” as recited in claim 2 of the ’062 Patent.

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349. As shown in the photograph of paragraph 350 below, the VUSE Vibe meets every limitation recited in claim 3 of the ’062 Patent.

350. The VUSE Vibe includes “a pressure balancing hole [170] in the battery assembly housing [120b]” as recited in claim 3 of the ’062 Patent.

351. As shown in the photograph of paragraph 352 below, the VUSE Vibe meets every limitation recited in claim 4 of the ’062 Patent.

352. The VUSE Vibe includes “the pressure balancing hole [170] at the second end of the battery assembly housing [120b]” as recited in claim 4 of the ’062 Patent.

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353. As shown in the photographs of paragraph 354 below, the VUSE Vibe meets every limitation recited in claim 5 of the ’062 Patent.

354. The VUSE Vibe includes “the pressure balancing hole [170] on a first side of the sensor [230] and the air inlet [140] on a second side of the sensor [230], opposite from the first side of the sensor [230]” as recited in claim 5 of the ’062 Patent.

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355. As shown in the photographs of paragraph 356 below, the VUSE Vibe meets every limitation recited in claim 8 of the ’062 Patent.

356. The VUSE Vibe includes “the porous body [324] comprising a fiber material” as recited in claim 8 of the ’062 Patent.

357. As shown in the photographs of paragraph 358 below, the VUSE Vibe meets every limitation recited in claim 9 of the ’062 Patent.

358. The VUSE Vibe includes “the air inlet [140] at the second screw thread electrode [160a]” as recited in claim 9 of the ’062 Patent.

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359. As shown in the photographs of paragraph 360 below, the VUSE Vibe meets every limitation recited in claim 10 of the ’062 Patent.

360. The VUSE Vibe includes “a liquid supply [330] in the tubular atomizer assembly housing [120a], with the liquid supply [330] containing a liquid [334], and the liquid [334] in contact with the porous body [324]” as recited in claim 10 of the ’062 Patent.

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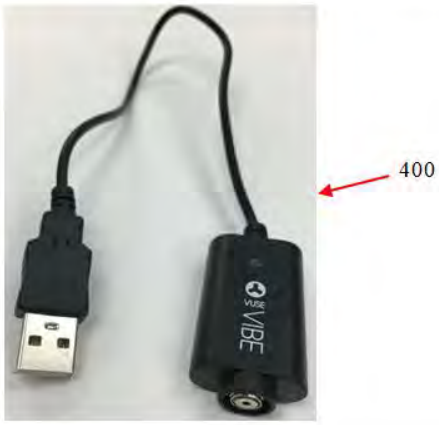
361. As shown in the photographs of paragraphs 362 through 374 below, the VUSE Vibe meets every limitation recited in claim 12 of the ’062 Patent.

362. The VUSE Vibe is a “combination of an electronic cigarette, and a battery charger [400]” as recited in claim 12 of the ’062 Patent.



What is VUSE?

VUSE is the only Electronic Cigarette (or, "e-cigarette") that finally delivers a satisfying and great tasting vapor experience combined with consistent and reliable performance.

https://vusevapor.com/FooterLinks/ProductFAQs (last visited March 1, 2017)

363. The VUSE Vibe includes "a battery assembly [200] comprising a tubular battery assembly housing [120b] having a first end and a second end, and a pressure balancing hole [170]" as recited in claim 12 of the '062 Patent.

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364. The VUSE Vibe includes "a battery [210], a sensor [230] and a micro-controller unit [221] electrically connected to a circuit board [220] within the battery assembly housing [120b], with the pressure balancing hole [170] on a first side of the sensor [230] and an air inlet [140] on a second side of the sensor [230], opposite from the first side of the sensor [230]" as recited in claim 12 of the '062 Patent.

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365. The VUSE Vibe includes "a first screw thread electrode [160b] on the first end of the battery assembly housing [120b], with a first through hole [161b] at a center of the first screw thread electrode [160b]" as recited in claim 12 of the '062 Patent.

366. The VUSE Vibe includes "an atomizer assembly [300]" as recited in claim 12 of the '062 Patent.

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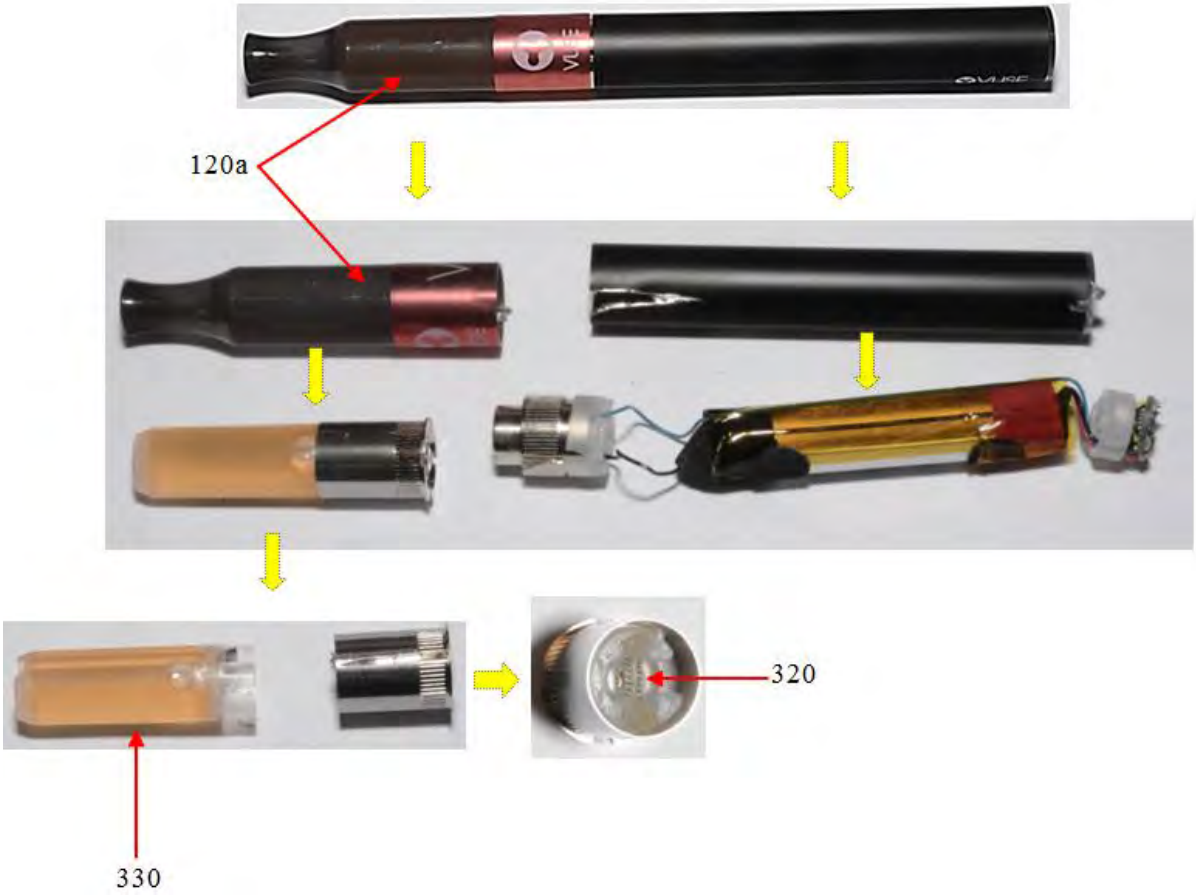
367. The VUSE Vibe includes "a tubular atomizer assembly housing [120a] having a first end and a second end" as recited in claim 12 of the '062 Patent.

368. The VUSE Vibe includes "an atomizer [320] and a liquid supply [330] in the tubular atomizer assembly housing [120a]" as recited in claim 12 of the '062 Patent.



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369. The VUSE Vibe includes "a second screw thread electrode [160a] on the second end of the atomizer assembly housing [120a], with a second through hole [161a] at a center of the second screw thread electrode [160a]" as recited in claim 12 of the '062 Patent.

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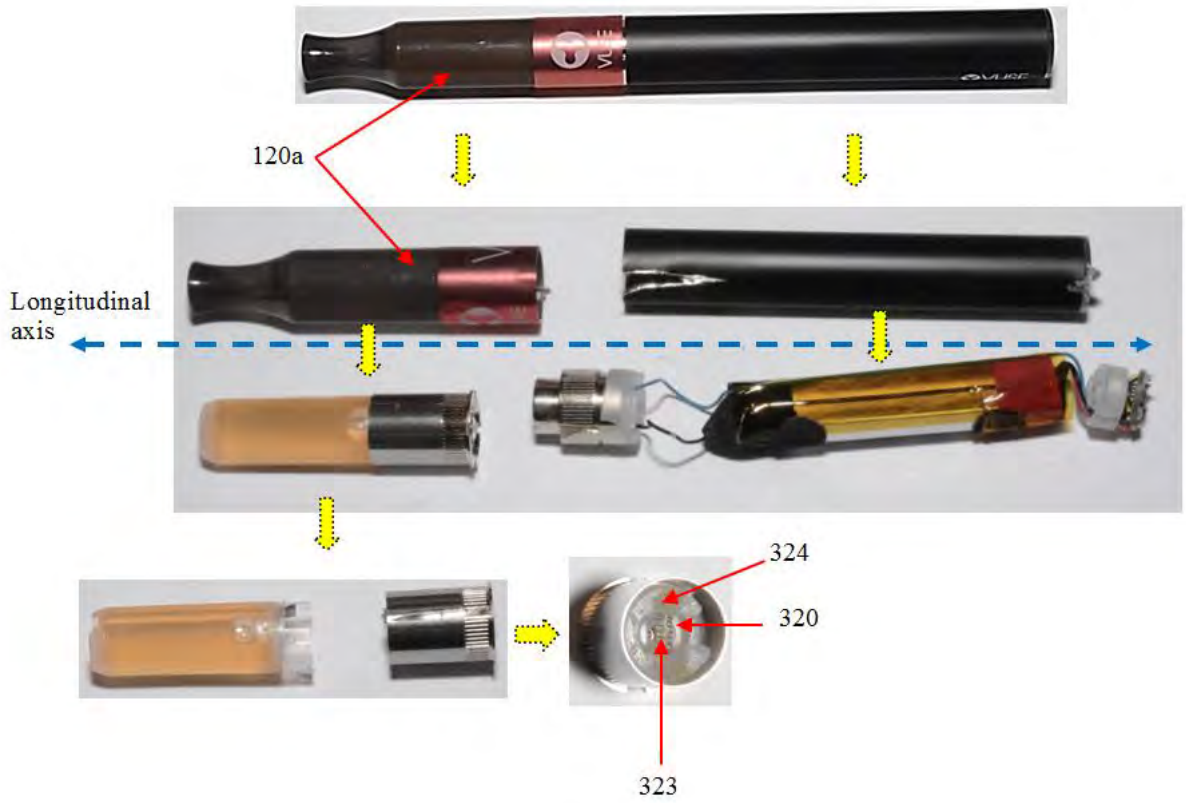
370. The VUSE Vibe includes "the atomizer [320] including a heater wire [323] and a porous body [324] comprising a fiber material, with the heater wire [323] wound on a part of the porous body [324] which is perpendicular to a longitudinal axis of the tubular atomizer assembly housing [120a]" as recited in claim 12 of the '062 Patent.



371. The VUSE Vibe includes "a liquid supply [330] in the tubular atomizer assembly housing [120a], with the liquid supply [330] holding a liquid [334], and the liquid [334] in contact with the porous body [324]" as recited in claim 12 of the '062 Patent.

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372. The VUSE Vibe includes "an airflow path from an air inlet [140] through an opening [163] in the atomizer [320], to an outlet [150] at the second end of the tubular atomizer assembly housing [120a]" as recited in claim 12 of the '062 Patent.

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373. The VUSE Vibe includes "the battery assembly [200] mechanically and electrically connectable to the atomizer assembly [300] to form the electronic cigarette by engagement of the first screw thread electrode [160b] with the second screw thread electrode [160a], and with electricity conducted from the battery [210] to the heater wire [323] through the first [160b] and second screw thread electrodes [160a] for heating the heater wire [323]" as recited in claim 12 of the '062 Patent.

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374. The VUSE Vibe includes "a battery charger [400] having a third screw thread electrode [160c] mechanically and electrically engageable with the first screw thread electrode [160b], for charging the battery [210] by conducting electricity from the battery charger [400] through the third [160c] and first screw thread electrodes [160b] to the battery [210]" as recited in claim 12 of the '062 Patent.

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375. As shown in the photograph of paragraph 376 below, the VUSE Vibe meets every limitation recited in claim 13 of the ’062 Patent.

376. The VUSE Vibe includes “the pressure balancing hole [170] at the second end of the battery assembly housing [120b]” as recited in claim 13 of the ’062 Patent.

377. As shown in the photographs of paragraph 378 below, the VUSE Vibe meets every limitation recited in claim 16 of the ’062 Patent.

378. The VUSE Vibe includes “the air inlet [140] at the second screw thread electrode [160a]” as recited in claim 16 of the ’062 Patent.

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379. As shown in the photographs of paragraphs 380 through 393 below, the VUSE Vibe meets every limitation recited in claim 18 of the ’062 Patent.

380. The VUSE Vibe is a “combination of an electronic cigarette, and a battery charger [400]” as recited in claim 18 of the ’062 Patent.

What is VUSE?

VUSE is the only Electronic Cigarette (or, "e-cigarette") that finally delivers a satisfying and great tasting vapor experience combined with consistent and reliable performance.

https://vusevapor.com/FooterLinks/ProductFAQs (last visited March 1, 2017)

381. The VUSE Vibe includes "a battery assembly [200] comprising a tubular battery assembly housing [120b] having a first end and a second end, and a pressure balancing hole [170]" as recited in claim 18 of the '062 Patent.

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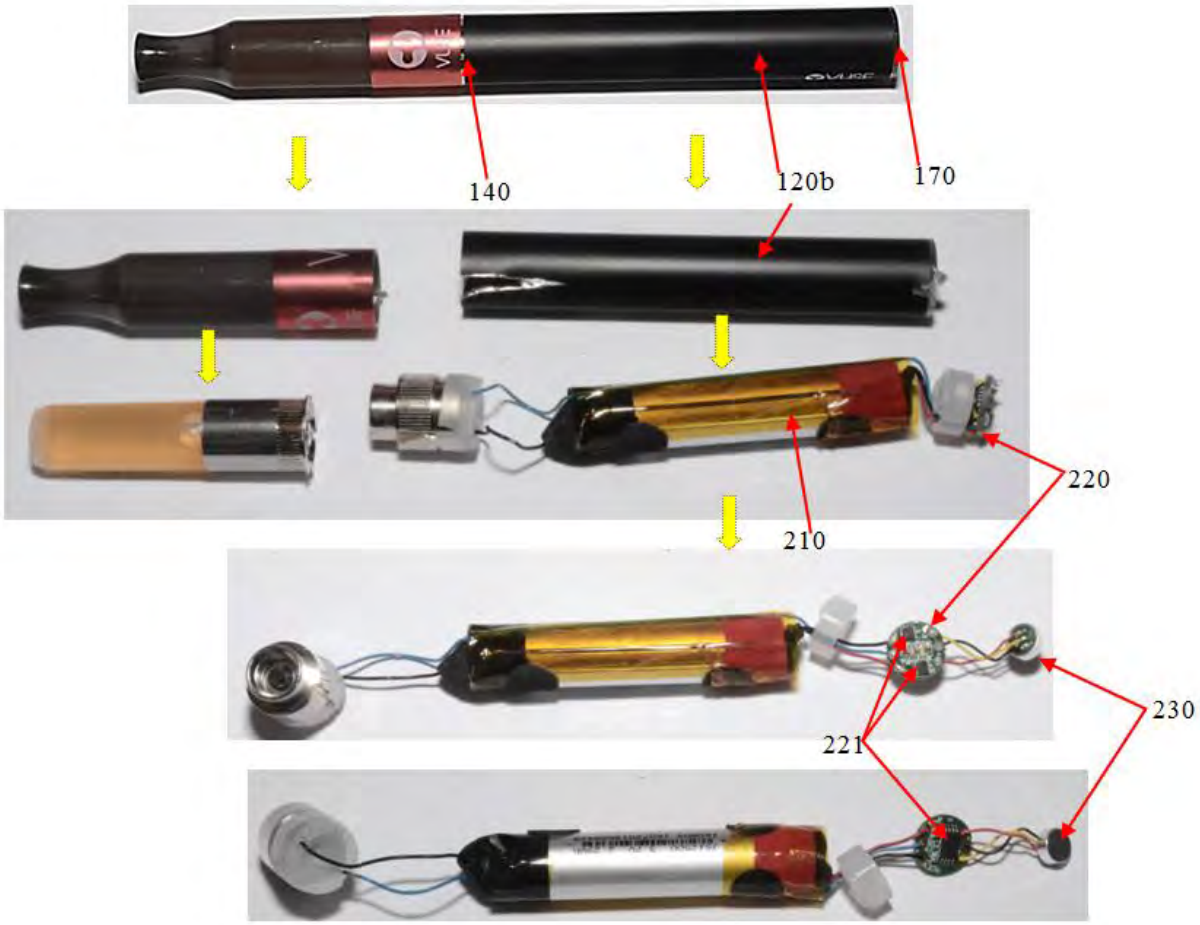
382. The VUSE Vibe includes "a battery [210], a sensor [230] and a micro-controller unit [221] electrically connected to a circuit board [220] within the battery assembly housing [120b], with the pressure balancing hole [170] on a first side of the sensor [230] and an air inlet [140] on a second side of the sensor [230], opposite from the first side of the sensor [230]" as recited in claim 18 of the '062 Patent.



383. The VUSE Vibe includes "a first screw thread electrode [160b] on the first end of the battery assembly housing [120b], with a first through hole [161b] at a center of the first screw thread electrode [160b]" as recited in claim 18 of the '062 Patent.

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384. The VUSE Vibe includes "an atomizer assembly [300]" as recited in claim 18 of the '062 Patent.

385. The VUSE Vibe includes "a tubular atomizer assembly housing having [120a] a first end and a second end" as recited in claim 18 of the '062 Patent.

386. The VUSE Vibe includes "an atomizer [320] and a liquid supply [330] in the tubular atomizer assembly housing [120a]" as recited in claim 18 of the '062 Patent.

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387. The VUSE Vibe includes "a second screw thread electrode [160a] on the second end of the atomizer assembly housing [120a], with a second through hole [161a] at a center of the second screw thread electrode, and with the air inlet [140] at the second screw thread electrode [160a]" as recited in claim 18 of the '062 Patent.

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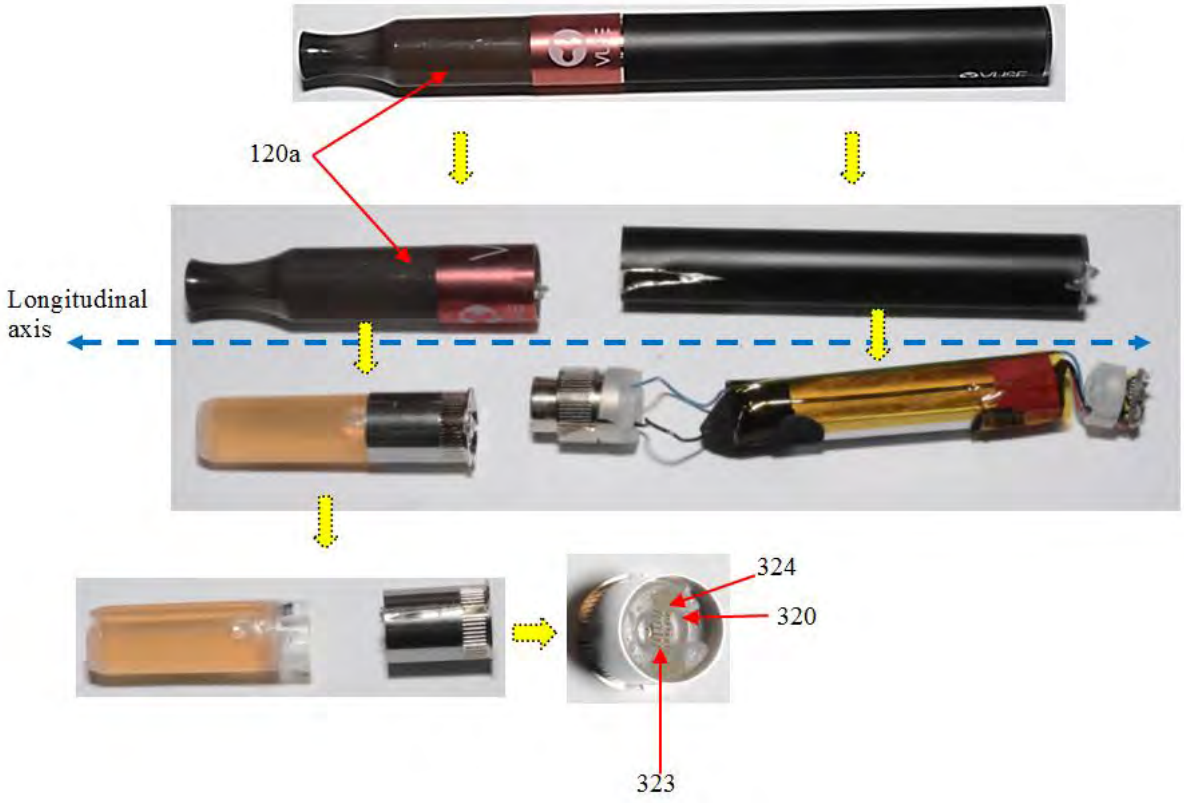
388. The VUSE Vibe includes "the atomizer [320] including a heater wire [323] and a porous body [324] comprising a fiber material, with the heater wire [323] wound on a part of the porous body [324] which is perpendicular to a longitudinal axis of the tubular atomizer assembly housing [120a]" as recited in claim 18 of the '062 Patent.



389. The VUSE Vibe includes "a liquid supply [330] in the tubular atomizer assembly housing [120a], and the liquid supply [330] having a liquid [334] in contact with the porous body [324]" as recited in claim 18 of the '062 Patent.

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390. The VUSE Vibe includes "an airflow path from an air inlet [140] through an opening [163] in the atomizer [320], to an outlet [150] at the second end of the tubular atomizer assembly housing [120a]" as recited in claim 18 of the '062 Patent.

391. The VUSE Vibe includes "a separator [500] between the air inlet [140] and the atomizer [320], with the separator [500] having a run-through hole [161], and with the air flow path passing through the run-through hole [161]" as recited in claim 18 of the '062 Patent.

392. The VUSE Vibe includes "the battery assembly [200] mechanically and electrically connectable to the atomizer assembly [300] to form the electronic cigarette by engagement of the first screw thread electrode [160b] with the second screw thread electrode [160a], and with electricity conducted from the battery [210] to the heater wire [323] through the first and second screw thread electrodes [160b/160a] for heating the heater wire [323]" as recited in claim 18 of the '062 Patent.

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393. The VUSE Vibe includes "a battery charger [400] having a third screw thread electrode [160c] mechanically and electrically engageable with the first screw thread electrode [160b], for charging the battery [210] by conducting electricity from the battery charger [400] through the third and first screw thread electrodes [160c/160b] to the battery [210]" as recited in claim 18 of the '062 Patent.

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394. As shown in the photographs of paragraph 395 below, the VUSE Vibe meets every limitation recited in claim 19 of the ’062 Patent.

395. The VUSE Vibe includes “the air inlet [140] at the second screw thread electrode [160a]” as recited in claim 19 of the ’062 Patent.

396. Defendant has also contributed to the infringement of the ’062 Patent in violation of 35 U.S.C. § 271(c) by, itself and/or through its agents, contributing to the direct infringement of the ’062 Patent by its customers by unlawfully and wrongfully making, using, importing, offering to sell, and/or selling electronic cigarette components constituting a material part of the invention of the ’062 Patent and having no substantially non-infringing use, which, when used by its

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customers, result in direct infringement of the ’062 Patent, in this judicial district and within, from and/or into the United States without permission or license from Plaintiffs, and will continue to do so unless enjoined by this Court.

397. Examples of electronic cigarette components that constitute a material part of the invention of the ’062 Patent, have no substantial non-infringing uses, and contribute to the direct infringement of the ’062 Patent include, but are not limited to, the VUSE Vibe and (1) VUSE Vibe Pre-Filled Tanks, (2) VUSE Vibe Rechargeable Batteries, and (3) VUSE Vibe Chargers (collectively, “components of the VUSE Vibe”).

398. Upon information and belief, having knowledge of the ’062 Patent, Defendant is aware that the purchase and use of the VUSE Vibe and components of the VUSE Vibe by Defendant’s customers result in direct infringement of the ’062 Patent.

399. Defendant instructs users on how to use the VUSE Vibe and components of the VUSE Vibe.[34]

400. Defendant instructs users to purchase and use a replacement VUSE Vibe Pre-Filled Tank when a VUSE Vibe Pre-Filled Tank is depleted.[35]

[34] *See, e.g.*, VUSE Vibe Package Insert (“Get started 1. Charge battery 2. Attach tank 3. Vape 4. Enjoy!”) (Exhibit Q).

[35] *See, e.g.*, *id.* (“Don’t vape an empty tank”). *See also* VUSE VIBE Store Locator (providing information for users on where to purchase replacement VUSE Vibe Pre-Filled Tanks and VUSE Vibe Pre-Filled Tank Systems including VUSE

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401. Defendant further instructs users that the VUSE Vibe Pre-Filled Tanks should only be used with a VUSE Vibe Rechargeable Battery such that VUSE Vibe Pre-Filled Tanks are only compatible with the VUSE Vibe.[36]

402. Defendant further instructs users that the VUSE Vibe Rechargeable Battery should only be used with a VUSE Vibe Charger such that VUSE Rechargeable Batteries and VUSE Vibe Chargers are only compatible with the VUSE Vibe.[37]

403. Defendant instructs users to purchase and use a replacement VUSE Vibe Rechargeable Battery.[38]

404. As such, Defendant knows that the VUSE Vibe and components of the VUSE Vibe, including, but not limited to, the VUSE Vibe Pre-Filled Tanks, VUSE Vibe Rechargeable Batteries, and VUSE Vibe Chargers when sold separately, have no substantial non-infringing uses other than to provide users with

Vibe Pre-Filled Tanks, VUSE Vibe Rechargeable Battery, and VUSE Vibe Charger), https://prod.vusevapor.com/products/vibe/?/locate (last visited March 1, 2017) (Exhibit R).

[36] *See e.g.*, VUSE Vibe Package Insert ("Only use VUSE VIBE pre-filled tanks with a VUSE VIBE battery") (Exhibit Q).

[37] *See e.g.*, VUSE Vibe Package Insert ("Only use VUSE VIBE battery with the VUSE Vibe charger") (Exhibit Q).

[38] *See, e.g.*, VUSE VIBE Store Locator (providing information for users on where to purchase replacement VUSE Vibe Pre-Filled Tanks and VUSE Vibe Pre-Filled Tank Systems including VUSE Vibe Pre-Filled Tanks, VUSE Vibe Rechargeable Battery, and VUSE Vibe Charger), https://prod.vusevapor.com/products/vibe/?/locate (last visited March 1, 2017) (Exhibit R).

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the ability to assemble and use an electronic cigarette that infringes the ’062 Patent, and, therefore, that they are especially made or adapted for use in infringement of the ’062 Patent.

405. As a direct and proximate result of the foregoing acts of Defendant, Plaintiffs have suffered, and are entitled to, monetary damages in an amount not yet determined, which include, but are not limited to, lost profits on the infringing sales Plaintiffs may have made and reasonable royalties on sales not made. Plaintiffs are also entitled to their costs of suit and interest.

406. Defendant’s continuing infringement has inflicted and, unless restrained by this Court, will continue to inflict irreparable harm upon Plaintiffs, such as reduction of Plaintiffs’ proper market share and deprivation of Plaintiffs’ rights to exclude others. Plaintiffs have no adequate remedy at law. Plaintiffs are entitled to injunctive relief enjoining Defendant from engaging in further acts of infringement.

407. In view of Defendant’s knowledge of the ’062 Patent, Defendant has proceeded to infringe the ’062 Patent despite a high probability that its actions constituted infringement of a valid patent. Thus, Defendant’s infringement of the ’062 Patent is willful and deliberate. That egregious infringement behavior entitles Plaintiffs to increased damages under 35 U.S.C. § 284, and to attorneys’ fees and costs incurred in prosecuting this action under 35 U.S.C. § 285.

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SIXTH CLAIM FOR RELIEF

(Infringement of U.S. Patent No. 9,326,550)

408. Plaintiffs incorporate by reference the allegations contained in paragraphs 1–407 above.

409. Plaintiff Fontem Holdings is the owner of the entire right, title, and interest in and to United States Patent No. 9,326,550 ("the '550 Patent") (Exhibit F). Fontem Holdings has granted Fontem Ventures an exclusive license to the '550 Patent, including the right to sublicense the '550 Patent. The '550 Patent was duly and legally issued by the USPTO on May 3, 2016, and is valid, subsisting, and in full force and effect.

410. Upon information and belief, Defendant has had knowledge of the '550 Patent and of Plaintiffs' rights therein.

411. Plaintiffs have previously asserted infringement of seven of its United States patents (*i.e.*, the '742 Patent, the '628 Patent, the '726 Patent, the '239 Patent, the '548 Patent, the '549 Patent, and the '205 Patent) against Defendant in three patent infringement cases (*i.e., Fontem Ventures BV et al. v. R.J. Reynolds Vapor Company*, Case No. 1:16-cv-01255 (M.D.N.C. April 4, 2016), *Fontem Ventures BV et al. v. R.J. Reynolds Vapor Company*, Case No. 1:16-cv-01257 (M.D.N.C. May 3, 2016) and *Fontem Ventures BV et al. v. R.J. Reynolds Vapor Company*, Case No. 1:16-cv-01258 (M.D.N.C. June 22, 2016) (collectively, the

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"Reynolds Vapor Patent Infringement Cases"), all consolidated under Case No. 1:16-cv-01255).

412. In its Answer to Fontem's Interrogatory No. 10 regarding "when and how [Defendant] first became aware of [the '742 Patent, the '628 Patent, the '726 Patent, the '239 Patent, the '548 Patent, the '549 Patent, and the '205 Patent] or any U.S. or foreign patent or patent application related thereto," Defendant admitted that "it first became aware of the existence of [the '742 Patent, the '628 Patent, the '726 Patent, the '239 Patent, the '548 Patent, the '549 Patent, and the '205 Patent] at or shortly after their respective issue dates."[39]

413. Accordingly, upon information and belief, Defendant, through its admitted monitoring of Plaintiffs' patents, has had knowledge or should have had knowledge about the existence of the '550 Patent at or shortly after its issue date of May 3, 2016.

414. Defendant also had knowledge of the '550 Patent because Defendant was aware that Plaintiffs previously asserted infringement of sixteen of its United States patents, including the '550 Patent, against third party Nu Mark LLC ("Nu Mark") in two patent infringement cases (*i.e.*, *Fontem Ventures BV et al. v. Nu Mark LLC*, Case No. 1:16-cv-01259 (M.D.N.C. June 22, 2016) and *Fontem*

[39] *Fontem Ventures BV et al. v. R.J. Reynolds Vapor Company*, Case No. 1:16-cv-01255, Defendant R.J. Reynolds Vapor Company's Responses to Fontem's First Set of Interrogatories at 10–11, served Jan. 18, 2017 (Exhibit I).

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Ventures BV et al. v. Nu Mark LLC, Case No. 1:16-cv-01261 (M.D.N.C. April 4, 2016) (collectively, the "Nu Mark Patent Infringement Cases") consolidated under Case No. 1:16-cv-01261).

415. On July 12, 2016, in an effort to manage and coordinate the Reynolds Patent Infringement Cases and the Nu Mark Patent Infringement Cases, Plaintiffs' counsel emailed Defendant's counsel and Nu Mark's counsel a draft Joint Scheduling Conference Report Pursuant to Rule 26(f), which identified the '550 Patent as one of the sixteen patents that Nu Mark allegedly infringed ("Nu Mark Rule 26(f) Report").[40]

416. Defendant's counsel participated in subsequent email exchanges and joint meet and confers related to the Nu Mark Rule 26(f) Report that identified the '550 Patent.

417. Accordingly, Defendant has had knowledge of the '550 Patent since at least July 12, 2016.

418. At all relevant times, Defendant and the public in general have had notice of the '550 Patent because Plaintiffs have marked the packaging of their products embodying the '550 Patent in accordance with 35 U.S.C. § 287.

[40] *See* July 12, 2016 Email Exchange Between Plaintiffs' Counsel (*i.e.*, Lara Dueppen, Michael Wise, Joseph Hamilton) and Defendant's Counsel (*i.e.*, Mark A. Finkelstein (mafinkelstein@jonesday.com), Oluwafemi Masha (omasha@brinksgilson.com), Ralph Gabric (rgabric@brinksgilson.com), and Robert Mallin (rmallin@brinksgilson.com)) at 1 (Exhibit J); Draft Joint Scheduling Conference Report Pursuant to Rule 26(f) at 1 (Exhibit K).

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419. Defendant has directly infringed the ’550 Patent in violation of at least 35 U.S.C. § 271(a) by, itself and/or through its agents, unlawfully and wrongfully making, using, importing, offering to sell, and/or selling vaporizing device products embodying one or more of the inventions claimed in the ’550 Patent, within, from and/or into the United States without permission or license from Plaintiffs, and will continue to do so unless enjoined by this Court.

420. An example of the vaporizing device products that directly infringe the’550 Patent includes, but is not limited to, the VUSE Vibe.

421. The VUSE Vibe infringes the ’550 Patent literally and/or under the doctrine of equivalents.

422. The VUSE Vibe infringes at least claims 1–7 and 10–12 of the ’550 Patent.

423. As shown in the photographs of paragraphs 424 through 433 below, the VUSE Vibe meets every limitation recited in claim 1 of the ’550 Patent.

424. The VUSE Vibe is a vaporizing device comprising an electronic cigarette as recited in claim 1 of the ’550 Patent.

What is VUSE?

VUSE is the only Electronic Cigarette (or, "e-cigarette") that finally delivers a satisfying and great tasting vapor experience combined with consistent and reliable performance.

https://vusevapor.com/FooterLinks/ProductFAQs (last visited March 1, 2017)

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425. The VUSE Vibe includes "a battery assembly [200] comprising a tubular battery assembly housing [120b] having a first end and a second end, with a battery [210] and a micro-controller unit [221] electrically connected to a circuit board [220] within the battery assembly housing [120b]" as recited in claim 1 of the '550 Patent.

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426. The VUSE Vibe includes "a first screw thread electrode [160b] on the first end of the battery assembly housing [120b], with a first through hole [161b] at a center of the first screw thread electrode [160b]" as recited in claim 1 of the '550 Patent.

427. The VUSE Vibe includes "an atomizer assembly [300]" as recited in claim 1 of the '550 Patent.

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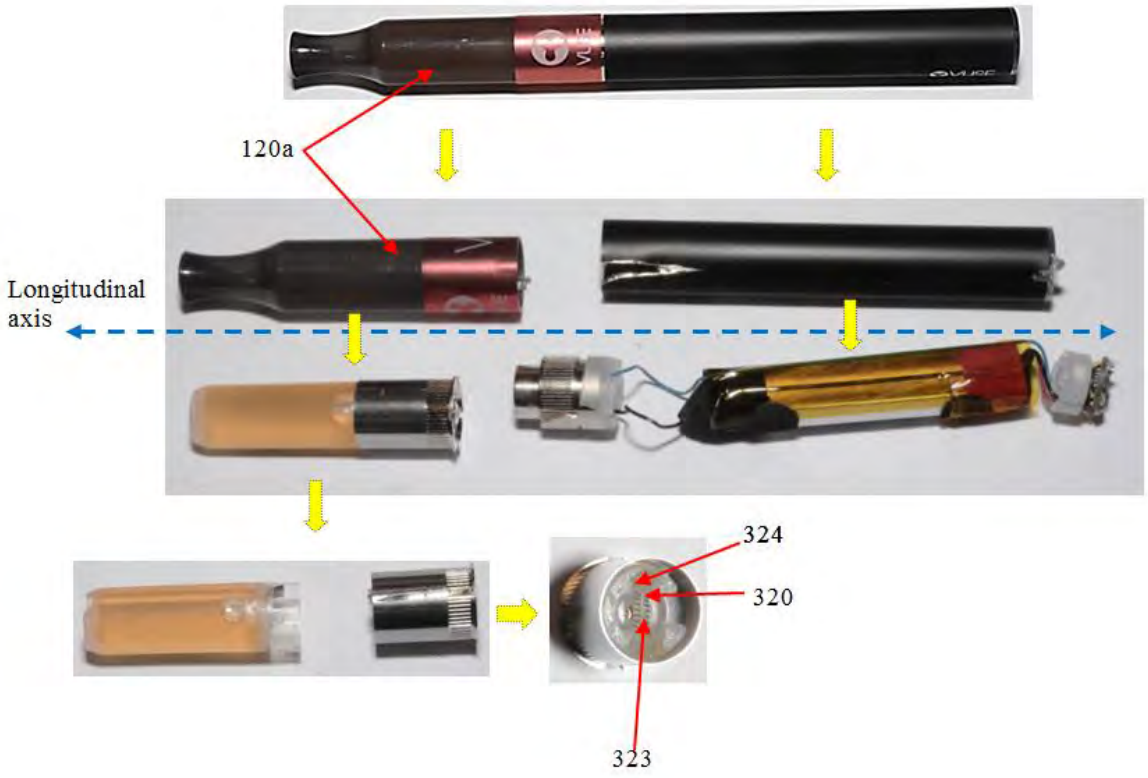
428. The VUSE Vibe includes "a tubular atomizer assembly housing [120a] having a first end and a second end" as recited in claim 1 of the '550 Patent.

429. The VUSE Vibe includes "an atomizer [320] having a porous body [324], and a liquid supply [330] in the tubular atomizer assembly housing [120a]" as recited in claim 1 of the '550 Patent.

430. The VUSE Vibe includes "the atomizer [320] including a heater wire [323] wound on a part of the porous body [324] which is perpendicular to a longitudinal axis of the tubular atomizer assembly housing [120a]" as recited in claim 1 of the '550 Patent.



431. The VUSE Vibe includes "an airflow path through an opening [163] in the atomizer [320] to a suction nozzle [150] at the second end of the tubular atomizer assembly housing [120a]" as recited in claim 1 of the '550 Patent.

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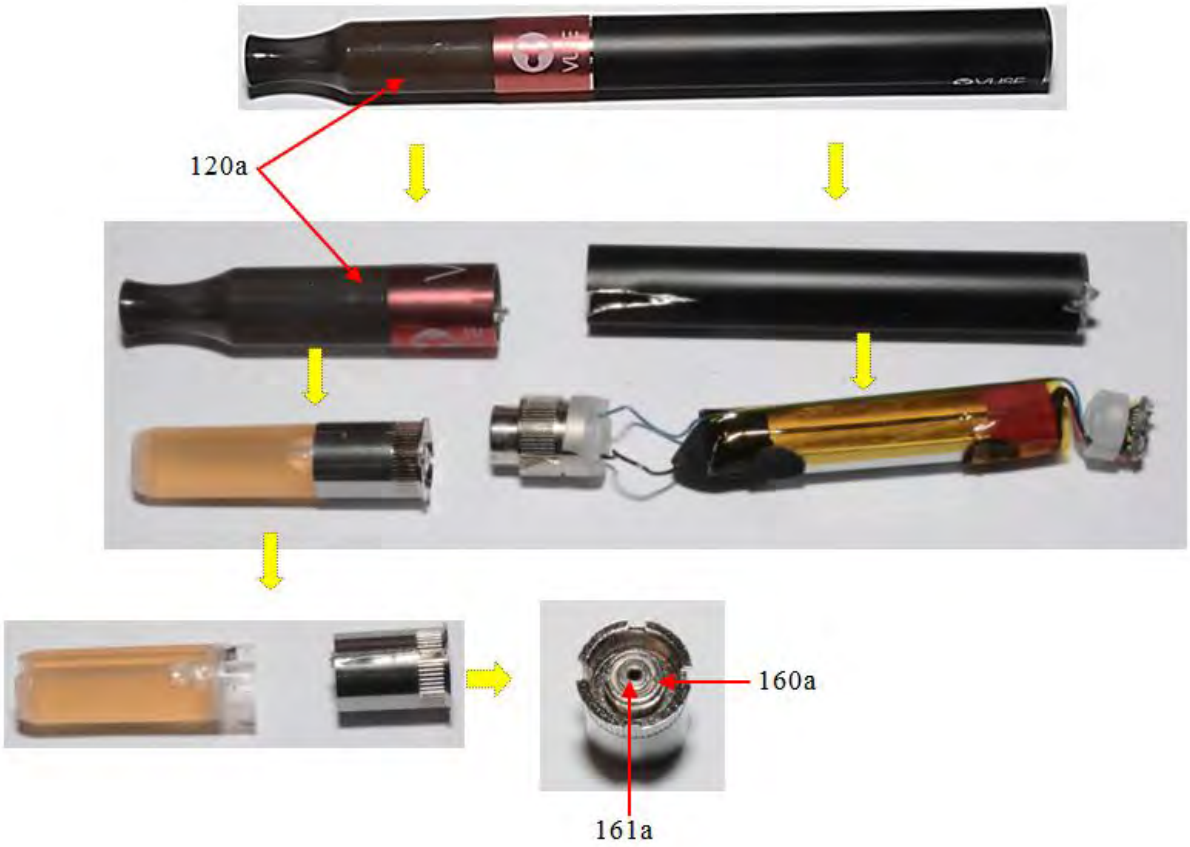
432. The VUSE Vibe includes "a second screw thread electrode [160a] on the second end of the atomizer assembly housing [120a], with a second through hole [161a] at a center of the second screw thread electrode [160a]" as recited in claim 1 of the '550 Patent.



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433. The VUSE Vibe includes "the battery assembly [200] and the atomizer assembly [300] mechanically connected to form the electronic cigarette by engagement of the first screw thread electrode [160b] with the second screw thread electrode [160a], and with electricity conducted from the battery [210] to the heater wire [323] through the first and second screw thread electrodes [160b/160a] for heating the heater wire [323]" as recited in claim 1 of the '550 Patent.

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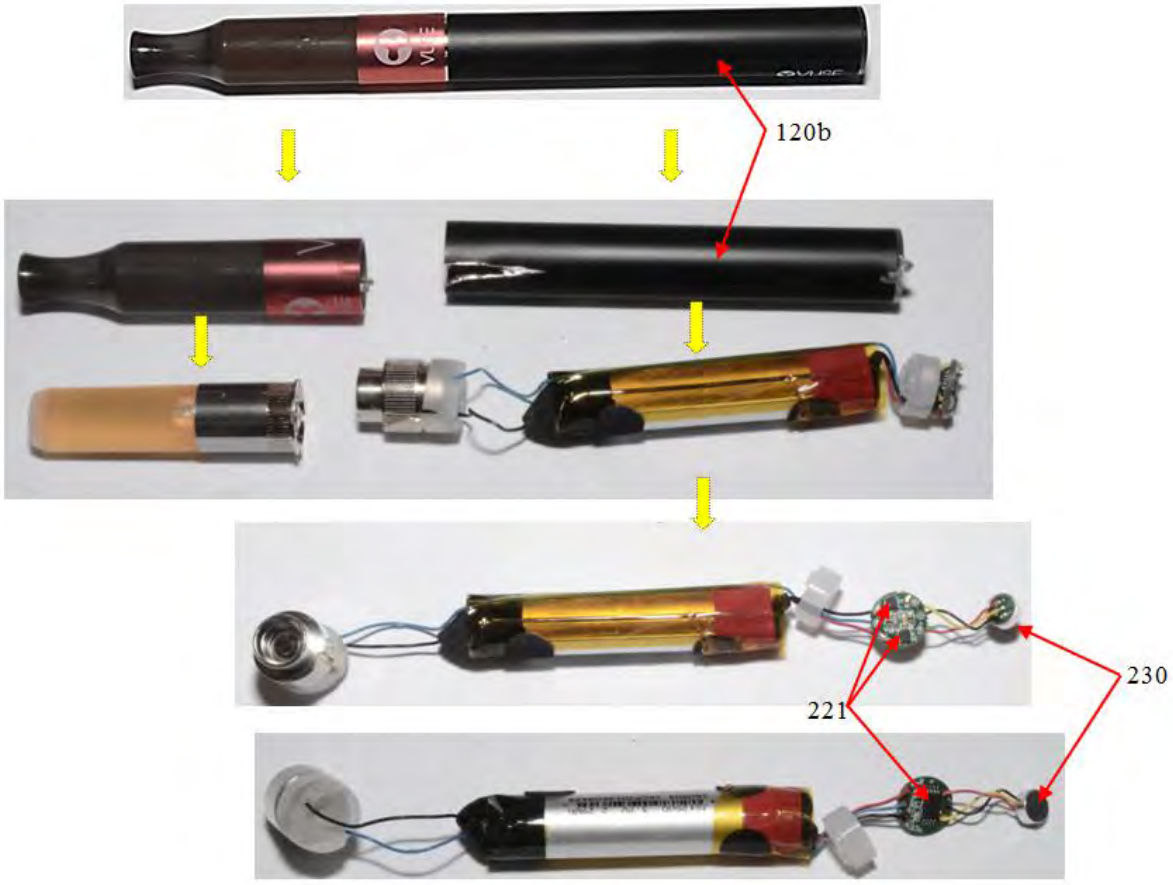
434. As shown in the photographs of paragraph 435 below, the VUSE Vibe meets every limitation recited in claim 2 of the ’550 Patent.

435. The VUSE Vibe includes “a sensor [230] in the battery assembly housing [120b], with the sensor [230] electrically connected to the micro-controller unit [221]” as recited in claim 2 of the ’550 Patent.



436. As shown in the photograph of paragraph 437 below, the VUSE Vibe meets every limitation recited in claim 3 of the ’550 Patent.

437. The VUSE Vibe includes “a pressure balancing hole [170] in the battery assembly housing [120b]” as recited in claim 3 of the ’550 Patent.

438. As shown in the photograph of paragraph 439 below, the VUSE Vibe meets every limitation recited in claim 4 of the ’550 Patent.

439. The VUSE Vibe includes “the pressure balancing hole [170] at the second end of the battery assembly housing [120b]” as recited in claim 4 of the ’550 Patent.

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440. As shown in the photographs of paragraph 441 below, the VUSE Vibe meets every limitation recited in claim 5 of the ’550 Patent.

441. The VUSE Vibe includes “an air inlet [140] at the second screw thread electrode [160a]” as recited in claim 5 of the ’550 Patent.

442. As shown in the photographs of paragraph 443 below, the VUSE Vibe meets every limitation recited in claim 6 of the ’550 Patent.

443. The VUSE Vibe includes “the pressure balancing hole [170] on a first side of the sensor [230] and the air inlet [140] on a second side of the sensor [230], opposite from the first side of the sensor [230]” as recited in claim 6 of the ’550 Patent.

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444. As shown in the photographs of paragraph 445 below, the VUSE Vibe meets every limitation recited in claim 7 of the ’550 Patent.

445. The VUSE Vibe includes “the porous body [324] comprising a fiber material” as recited in claim 7 of the ’550 Patent.

446. As shown in the photographs of paragraph 447 below, the VUSE Vibe meets every limitation recited in claim 10 of the ’550 Patent.

447. The VUSE Vibe includes “the first screw thread electrode [160b] surrounds and is concentric with the second screw thread electrode [160a]” as recited in claim 10 of the ’550 Patent.

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448. As shown in the photographs of paragraph 449 below, the VUSE Vibe meets every limitation recited in claim 11 of the ’550 Patent.

449. The VUSE Vibe includes “the heater wire [323] having a first lead [322a^1] connected to the inner electrode [162a^1] and a second lead [322a^2] connected to the outer electrode [162a^2]” as recited in claim 11 of the ’550 Patent.

450. As shown in the photographs of paragraph 451 below, the VUSE Vibe meets every limitation recited in claim 12 of the ’550 Patent.

451. The VUSE Vibe includes “the first and second through holes [161b/161a] leading into the airflow path” as recited in claim 12 of the ’550 Patent.

452. Defendant has also contributed to the infringement of the ’550 Patent in violation of 35 U.S.C. § 271(c) by, itself and/or through its agents, contributing to the direct infringement of the ’550 Patent by its customers by unlawfully and

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wrongfully making, using, importing, offering to sell, and/or selling electronic cigarette components constituting a material part of the invention of the ’550 Patent and having no substantially non-infringing use, which, when used by its customers, result in direct infringement of the ’550 Patent, in this judicial district and within, from and/or into the United States without permission or license from Plaintiffs, and will continue to do so unless enjoined by this Court.

453. Examples of electronic cigarette components that constitute a material part of the invention of the ’550 Patent, have no substantial non-infringing uses, and contribute to the direct infringement of the ’550 Patent include, but are not limited to, the VUSE Vibe and (1) VUSE Vibe Pre-Filled Tanks and (2) VUSE Vibe Rechargeable Batteries (collectively, “components of the VUSE Vibe”).

454. Upon information and belief, having knowledge of the ’550 Patent, Defendant is aware that the purchase and use of the VUSE Vibe and components of the VUSE Vibe by Defendant’s customers result in direct infringement of the ’550 Patent.

455. Defendant instructs users on how to use the VUSE Vibe and components of the VUSE Vibe.[41]

456. Defendant instructs users to purchase and use a replacement VUSE Vibe Pre-Filled Tank when a VUSE Vibe Pre-Filled Tank is depleted.[42]

[41] *See, e.g.*, VUSE Vibe Package Insert (“Get started 1. Charge battery 2. Attach tank 3. Vape 4. Enjoy!”) (Exhibit Q).

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457. Defendant further instructs users that the VUSE Vibe Pre-Filled Tanks should only be used with a VUSE Vibe Rechargeable Battery such that VUSE Vibe Pre-Filled Tanks are only compatible with the VUSE Vibe.[43]

458. Defendant instructs users to purchase and use a replacement VUSE Vibe Rechargeable Battery.[44]

459. As such, Defendant knows that the VUSE Vibe and components of the VUSE Vibe, including, but not limited to, the VUSE Vibe Pre-Filled Tank and VUSE Vibe Rechargeable Battery when sold separately, have no substantial non-infringing uses other than to provide users with the ability to assemble and use an electronic cigarette that infringes the '550 Patent, and, therefore, that they are especially made or adapted for use in infringement of the '550 Patent.

460. As a direct and proximate result of the foregoing acts of Defendant, Plaintiffs have suffered, and are entitled to, monetary damages in an amount not

[42] *See, e.g.*, *id.* ("Don't vape an empty tank"). *See also* VUSE VIBE Store Locator (providing information for users on where to purchase replacement VUSE Vibe Pre-Filled Tanks and VUSE Vibe Pre-Filled Tank Systems including VUSE Vibe Pre-Filled Tanks and VUSE Vibe Rechargeable Battery), https://prod.vusevapor.com/products/vibe/?/locate (last visited March 1, 2017) (Exhibit R).

[43] *See, e.g.*, VUSE Vibe Package Insert ("Only use VUSE VIBE pre-filled tanks with a VUSE VIBE battery") (Exhibit Q).

[44] *See, e.g.*, VUSE VIBE Store Locator (providing information for users on where to purchase replacement VUSE Vibe Pre-Filled Tanks and VUSE Vibe Pre-Filled Tank Systems including VUSE Vibe Pre-Filled Tanks and VUSE Vibe Rechargeable Battery), https://prod.vusevapor.com/products/vibe/?/locate (last visited March 1, 2017) (Exhibit R).

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yet determined, which include, but are not limited to, lost profits on the infringing sales Plaintiffs may have made and reasonable royalties on sales not made. Plaintiffs are also entitled to their costs of suit and interest.

461. Defendant's continuing infringement has inflicted and, unless restrained by this Court, will continue to inflict irreparable harm upon Plaintiffs, such as reduction of Plaintiffs' proper market share and deprivation of Plaintiffs' rights to exclude others. Plaintiffs have no adequate remedy at law. Plaintiffs are entitled to injunctive relief enjoining Defendant from engaging in further acts of infringement.

462. In view of Defendant's knowledge of the '550 Patent, Defendant has proceeded to infringe the '550 Patent despite a high probability that its actions constituted infringement of a valid patent. Thus, Defendant's infringement of the '550 Patent is willful and deliberate. That egregious infringement behavior entitles Plaintiffs to increased damages under 35 U.S.C. § 284, and to attorneys' fees and costs incurred in prosecuting this action under 35 U.S.C. § 285.

SEVENTH CLAIM FOR RELIEF

(Infringement of U.S. Patent No. 9,326,551)

463. Plaintiffs incorporate by reference the allegations contained in paragraphs 1–462 above.

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464. Plaintiff Fontem Holdings is the owner of the entire right, title, and interest in and to United States Patent No. 9,326,551 ("the '551 Patent") (Exhibit G). Fontem Holdings has granted Fontem Ventures an exclusive license to the '551 Patent, including the right to sublicense the '551 Patent. The '551 Patent was duly and legally issued by the USPTO on May 3, 2016 and is valid, subsisting, and in full force and effect.

465. Upon information and belief, Defendant has had knowledge of the '551 Patent and of Plaintiffs' rights therein.

466. Plaintiffs have previously asserted infringement of seven of its United States patents (*i.e.*, the '742 Patent, the '628 Patent, the '726 Patent, the '239 Patent, the '548 Patent, the '549 Patent, and the '205 Patent) against Defendant in three patent infringement cases (*i.e., Fontem Ventures BV et al. v. R.J. Reynolds Vapor Company*, Case No. 1:16-cv-01255 (M.D.N.C. April 4, 2016), *Fontem Ventures BV et al. v. R.J. Reynolds Vapor Company*, Case No. 1:16-cv-01257 (M.D.N.C. May 3, 2016) and *Fontem Ventures BV et al. v. R.J. Reynolds Vapor Company*, Case No. 1:16-cv-01258 (M.D.N.C. June 22, 2016) (collectively, the "Reynolds Vapor Patent Infringement Cases"), all consolidated under Case No. 1:16-cv-01255).

467. In its Answer to Fontem's Interrogatory No. 10 regarding "when and how [Defendant] first became aware of [the '742 Patent, the '628 Patent, the '726

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Patent, the ’239 Patent, the ’548 Patent, the ’549 Patent, and the ’205 Patent] or any U.S. or foreign patent or patent application related thereto,” Defendant admitted that “it first became aware of the existence of [the ’742 Patent, the ’628 Patent, the ’726 Patent, the ’239 Patent, the ’548 Patent, the ’549 Patent, and the ’205 Patent] at or shortly after their respective issue dates.”[45]

468. Accordingly, upon information and belief, Defendant, through its admitted monitoring of Plaintiffs’ patents, has had knowledge or should have had knowledge about the existence of the ’551 Patent at or shortly after its issue date of May 3, 2016.

469. Defendant also had knowledge of the ’551 Patent because Defendant was aware that Plaintiffs previously asserted infringement of sixteen of its United States patents, including the ’551 Patent, against third party Nu Mark LLC (“Nu Mark”) in two patent infringement cases (*i.e.*, *Fontem Ventures BV et al. v. Nu Mark LLC*, Case No. 1:16-cv-01259 (M.D.N.C. June 22, 2016) and *Fontem Ventures BV et al. v. Nu Mark LLC*, Case No. 1:16-cv-01261 (M.D.N.C. April 4, 2016) (collectively, the “Nu Mark Patent Infringement Cases”) consolidated under Case No. 1:16-cv-01261).

[45] *Fontem Ventures BV et al. v. R.J. Reynolds Vapor Company*, Case No. 1:16-cv-01255, Defendant R.J. Reynolds Vapor Company’s Responses to Fontem’s First Set of Interrogatories at 10–11, served Jan. 18, 2017 (Exhibit I).

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470. On July 12, 2016, in an effort to manage and coordinate the Reynolds Patent Infringement Cases and the Nu Mark Patent Infringement Cases, Plaintiffs' counsel emailed Defendant's counsel and Nu Mark's counsel a draft Joint Scheduling Conference Report Pursuant to Rule 26(f), which identified the '551 Patent as one of the sixteen patents that Nu Mark allegedly infringed ("Nu Mark Rule 26(f) Report").[46]

471. Defendant's counsel participated in subsequent email exchanges and joint meet and confers related to the Nu Mark Rule 26(f) Report that identified the '551 Patent.

472. Accordingly, Defendant has had knowledge of the '551 Patent since at least July 12, 2016.

473. At all relevant times, Defendant and the public in general have had notice of the '551 Patent because Plaintiffs have marked the packaging of their products embodying the '551 Patent in accordance with 35 U.S.C. § 287.

474. Defendant has directly infringed the '551 Patent in violation of at least 35 U.S.C. § 271(a) by, itself and/or through its agents, unlawfully and wrongfully making, using, importing, offering to sell, and/or selling electronic cigarette

[46] *See* July 12, 2016 Email Exchange Between Plaintiffs' Counsel (*i.e.*, Lara Dueppen, Michael Wise, Joseph Hamilton) and Defendant's Counsel (*i.e.*, Mark A. Finkelstein (mafinkelstein@jonesday.com), Oluwafemi Masha (omasha@brinksgilson.com), Ralph Gabric (rgabric@brinksgilson.com), and Robert Mallin (rmallin@brinksgilson.com)) at 1 (Exhibit J); Draft Joint Scheduling Conference Report Pursuant to Rule 26(f) at 1 (Exhibit K).

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products embodying one or more of the inventions claimed in the ’551 Patent, within, from and/or into the United States without permission or license from Plaintiffs, and will continue to do so unless enjoined by this Court.

475. An example of the electronic cigarette products that directly infringe the ’551 Patent includes, but is not limited to, the VUSE Vibe and VUSE Vibe Pre-Filled Tanks.

476. The VUSE Vibe infringes the ’551 Patent literally and/or under the doctrine of equivalents.

477. The VUSE Vibe Products infringe at least claims 1–5, 7–9, 11–13, and 15 of the ’551 Patent.

478. As shown in the photographs of paragraphs 479 through 484 below, the VUSE Vibe meets every limitation recited in claim 1 of the ’551 Patent.

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479. The VUSE Vibe includes an "atomizer assembly [300] used with a battery assembly [200] to provide an electronic cigarette" as recited in claim 1 of the '551 Patent.

What is VUSE?

VUSE is the only Electronic Cigarette (or, "e-cigarette") that finally delivers a satisfying and great tasting vapor experience combined with consistent and reliable performance.

https://vusevapor.com/FooterLinks/ProductFAQs (last visited March 1, 2017)

480. The VUSE Vibe includes "a tubular atomizer assembly housing [120a] having a first end and a second end" as recited in claim 1 of the '551 Patent.

481. The VUSE Vibe includes "an atomizer [320] and a liquid supply [330] in the tubular atomizer assembly housing [120a]" as recited in claim 1 of the '551 Patent.

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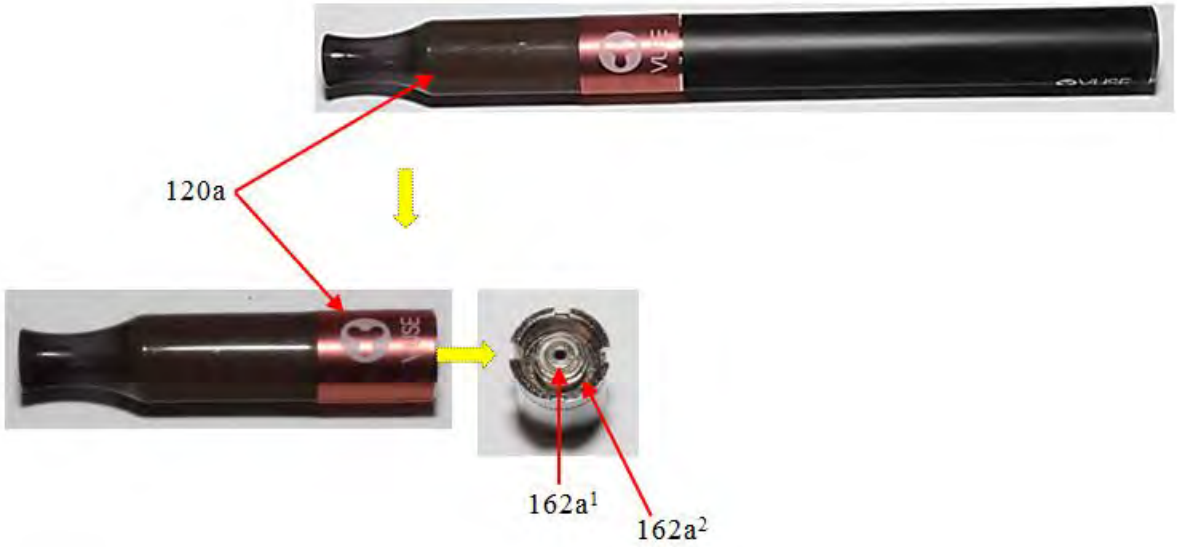
482. The VUSE Vibe includes "an inner electrode [162a^1] and an outer electrode [162a^2] at the first end of the tubular atomizer assembly housing [120a], with the inner electrode [162a^1] concentric with the outer electrode [162a^2]" as recited in claim 1 of the '551 Patent.



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483. The VUSE Vibe includes "the atomizer [320] including a heater wire [323] wound on a porous body [324] and the porous body [324] perpendicular to a central longitudinal axis of the tubular atomizer assembly housing [120a], with the heater wire [323] having a first lead [322a^1] connected to the inner electrode [162a^1] and a second lead [322a^2] connected to the outer electrode [162a^2]" as recited in claim 1 of the '551 Patent.

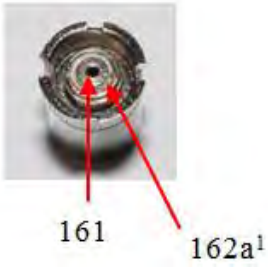
484. The VUSE Vibe includes "an airflow path through the tubular atomizer assembly housing [120a] from the atomizer [320] to an outlet [150] at the second end of the tubular atomizer assembly housing [120a]" as recited in claim 1 of the '551 Patent.

485. As shown in the photographs of paragraph 486 below, the VUSE Vibe meets every limitation recited in claim 2 of the ’551 Patent.

486. The VUSE Vibe includes “a through hole [161] centered on the central longitudinal axis of the tubular atomizer assembly housing [120a], and with the through hole [161] leading to the airflow path” as recited in claim 2 of the ’551 Patent.

487. As shown in the photograph of paragraph 488 below, the VUSE Vibe meets every limitation recited in claim 3 of the ’551 Patent.

488. The VUSE Vibe includes “the through hole [161] at a center of the inner electrode [162a^{1}]” as recited in claim 3 of the ’551 Patent.



489. As shown in the photographs of paragraph 490 below, the VUSE Vibe meets every limitation recited in claim 4 of the ’551 Patent.

490. The VUSE Vibe includes “the porous body [324] comprising a fiber material” as recited in claim 4 of the ’551 Patent.

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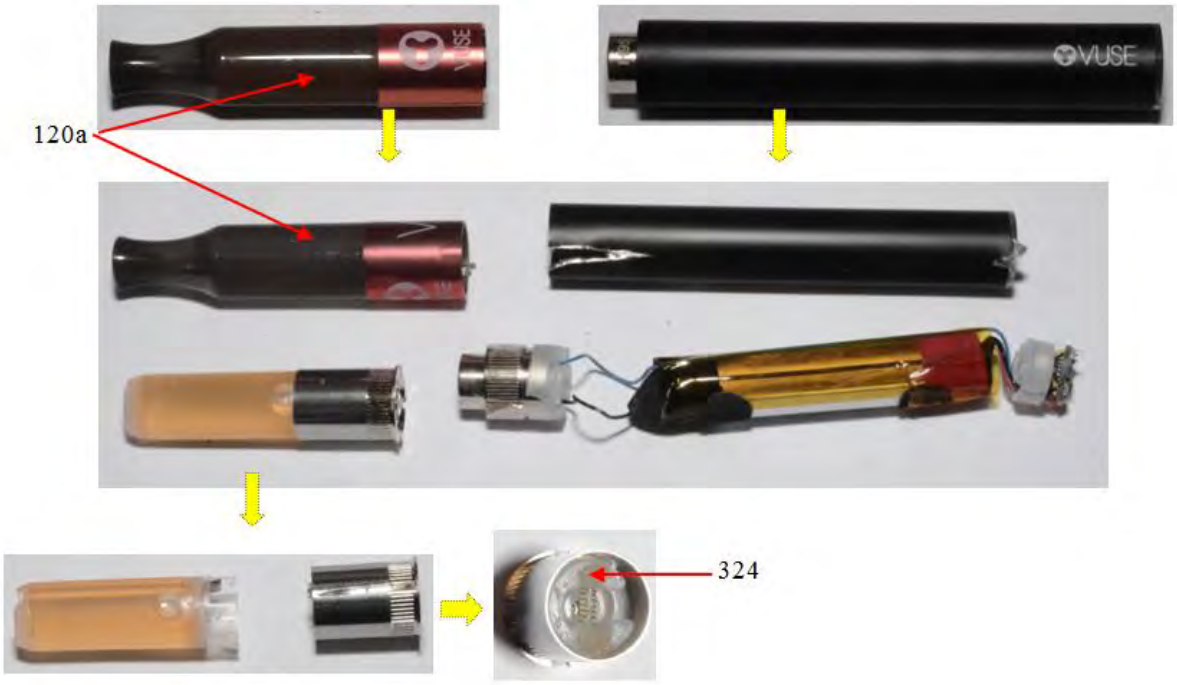
491. As shown in the photographs of paragraph 492 below, the VUSE Vibe meets every limitation recited in claim 5 of the ’551 Patent.

492. The VUSE Vibe includes “a liquid supply [330] in the tubular atomizer assembly housing [120a] in contact with the porous body [324]” as recited in claim 5 of the ’551 Patent.

493. As shown in the photographs of paragraph 494 below, the VUSE Vibe meets every limitation recited in claim 7 of the ’551 Patent.

494. The VUSE Vibe includes “the fiber material [324] confined within inner cylindrical walls of the tubular atomizer assembly housing [120a]” as recited in claim 7 of the ’551 Patent.



495. As shown in the photographs of paragraph 496 below, the VUSE Vibe meets every limitation recited in claim 8 of the ’551 Patent.

496. The VUSE Vibe includes “an air passageway within the tubular atomizer assembly housing [120a] around the liquid supply [330]” as recited in claim 8 of the ’551 Patent.

497. As shown in the photographs of paragraph 498 below, the VUSE Vibe meets every limitation recited in claim 9 of the ’551 Patent.

498. The VUSE Vibe includes “a mouthpiece [110] at the second end of the tubular atomizer assembly housing [120a], and with the outlet [150] in the mouthpiece [110]” as recited in claim 9 of the ’551 Patent.

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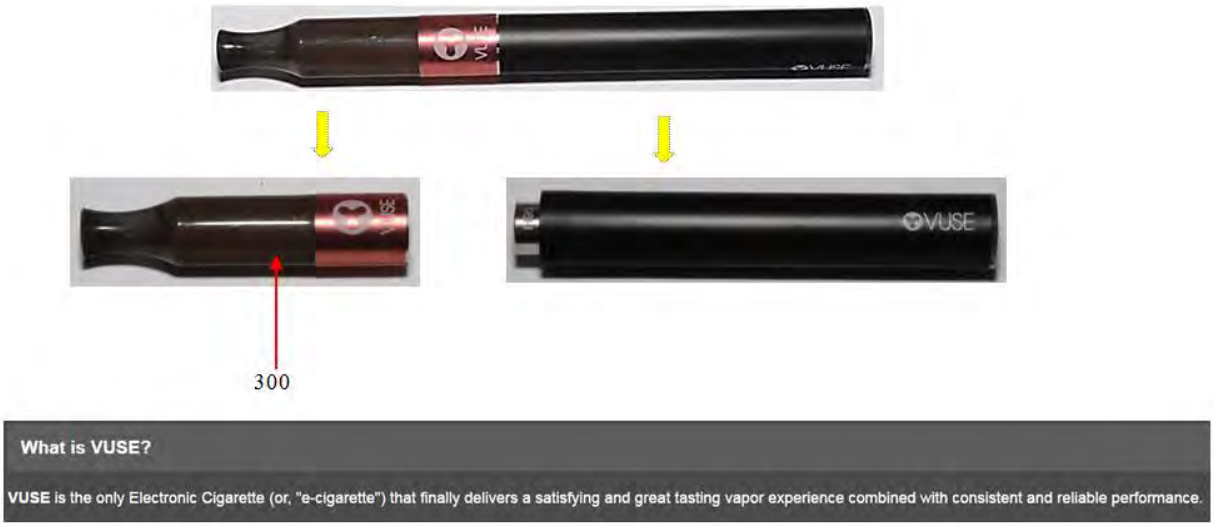
499. As shown in the photographs of paragraphs 500 through 507 below, the VUSE Vibe meets every limitation recited in claim 11 of the ’551 Patent.

500. The VUSE Vibe includes an “atomizer assembly [300] component of an electronic cigarette” as recited in claim 11 of the ’551 Patent.

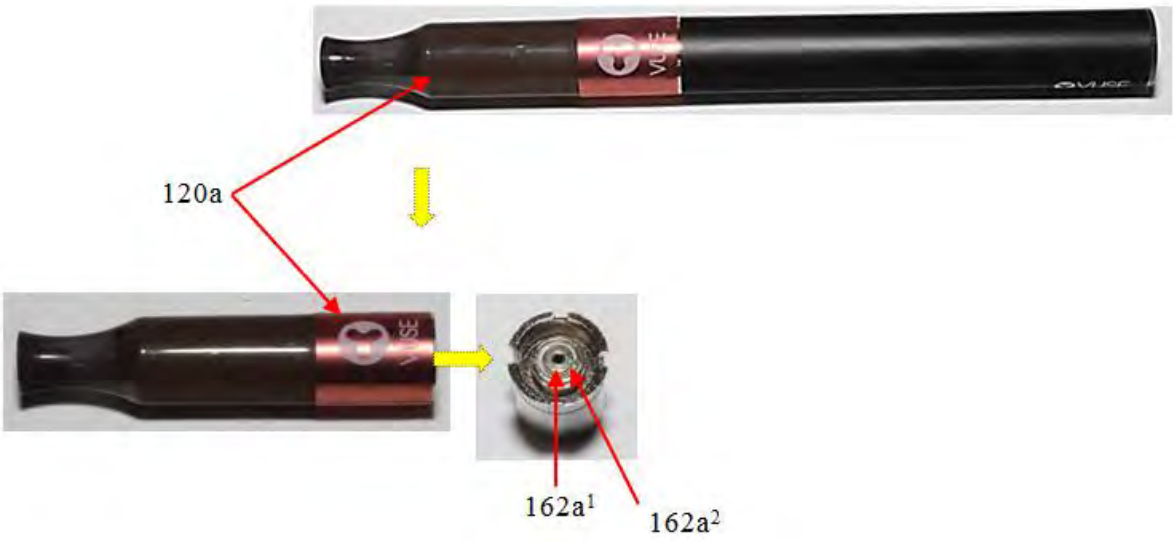


https://vusevapor.com/FooterLinks/ProductFAQs (last visited March 1, 2017)

501. The VUSE Vibe includes “a tubular atomizer assembly housing [120a] having a first end and a second end” as recited in claim 11 of the ’551 Patent.

502. The VUSE Vibe includes "an atomizer [320] and a liquid supply [330] in the tubular atomizer assembly housing [120a]" as recited in claim 11 of the '551 Patent.

503. The VUSE Vibe includes "an inner electrode [162a^1] and an outer electrode [162a^2] at the first end of the tubular atomizer assembly housing [120a], with the inner electrode [162a^1] concentric with the outer electrode [162a^2]" as recited in claim 11 of the '551 Patent.



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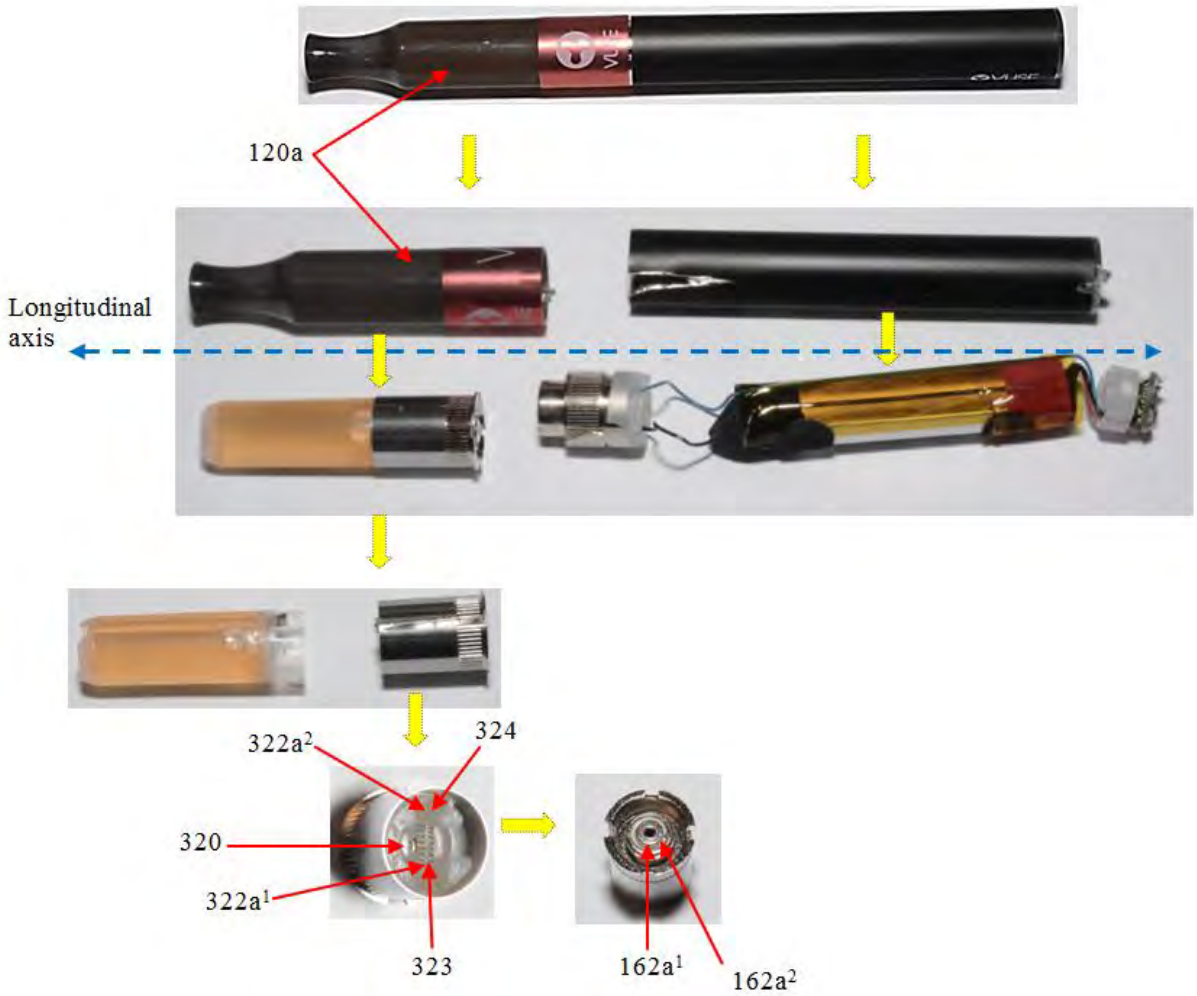
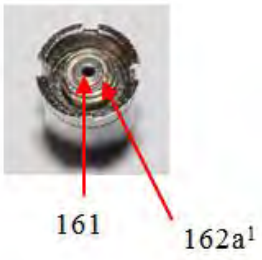
504. The VUSE Vibe includes "the atomizer [320] including a heater wire [323] wound on a porous body [324] comprising a fiber material, and the porous body [324] perpendicular to a central longitudinal axis of the tubular atomizer assembly housing [120a], with the heater wire [323] having a first lead [$322a^1$] connected to the inner electrode [$162a^1$] and a second lead [$322a^2$] connected to the outer electrode [$162a^2$]" as recited in claim 11 of the '551 Patent.



505. The VUSE Vibe includes "an airflow path through the tubular atomizer assembly housing [120a] from the atomizer [320] to an outlet [150] at the second end of the tubular atomizer assembly housing [120a]" as recited in claim 11 of the '551 Patent.

506. The VUSE Vibe includes "a through hole [161] at a center of the inner electrode [$162a^1$] leading into the airflow path" as recited in claim 11 of the '551 Patent.



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507. The VUSE Vibe includes "a liquid supply [330] in the tubular atomizer assembly housing [120a] in contact with the porous body [324], with the liquid supply [330] containing a liquid [334] including nicotine" as recited in claim 11 of the '551 Patent.

Not for sale to minors. VUSE contains nicotine extracted from the tobacco plant. Nicotine is addictive and no tobacco product has been shown to be safe.

https://prod.vusevapor.com/products/vibe/?/locate (last visited March 1, 2017)

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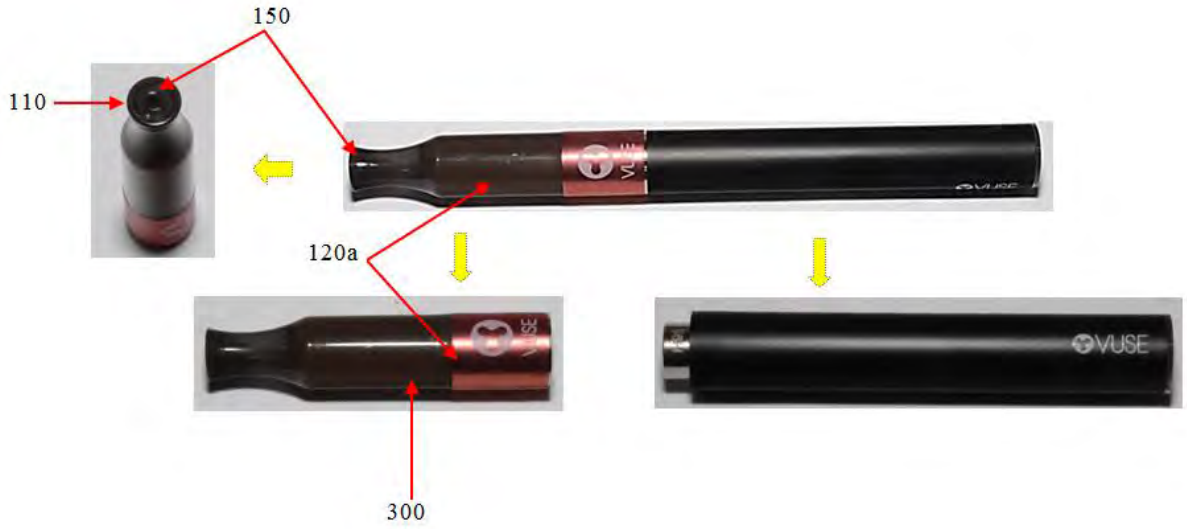
508. As shown in the photographs of paragraph 509 below, the VUSE Vibe meets every limitation recited in claim 12 of the ’551 Patent.

509. The VUSE Vibe includes “an air passageway within the tubular atomizer assembly housing [120a] around the liquid supply [330]” as recited in claim 12 of the ’551 Patent.

510. As shown in the photographs of paragraph 511 below, the VUSE Vibe meets every limitation recited in claim 13 of the ’551 Patent.

511. The VUSE Vibe includes “a mouthpiece [110] at the second end of the tubular atomizer assembly housing [120a], and with the outlet [150] in the mouthpiece [110]” as recited in claim 13 of the ’551 Patent.



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512. As shown in the photographs of paragraphs 513 through 521 below, the VUSE Vibe meets every limitation recited in claim 15 of the ’551 Patent.

513. The VUSE Vibe includes an “atomizer assembly [300] component of an electronic cigarette” as recited in claim 15 of the ’551 Patent.

What is VUSE?

VUSE is the only Electronic Cigarette (or, "e-cigarette") that finally delivers a satisfying and great tasting vapor experience combined with consistent and reliable performance.

https://vusevapor.com/FooterLinks/ProductFAQs (last visited March 1, 2017)

514. The VUSE Vibe includes “a tubular atomizer assembly housing [120a] having a first end and a second end” as recited in claim 15 of the ’551 Patent.

515. The VUSE Vibe includes "a mouthpiece [110] having an outlet [150] at the second end of the tubular atomizer assembly housing [120a]" as recited in claim 15 of the '551 Patent.

516. The VUSE Vibe includes "an atomizer [320] and a liquid supply [330] in the tubular atomizer assembly housing [120a]" as recited in claim 15 of the '551 Patent.

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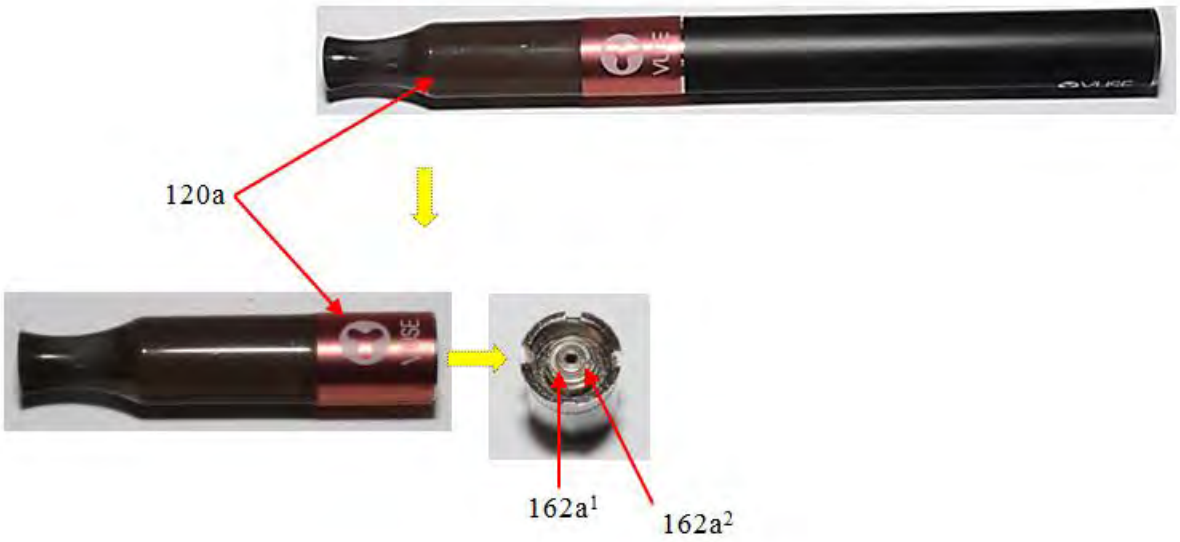
517. The VUSE Vibe includes "an inner electrode [162a^1] and an outer electrode [162a^2] at the first end of the tubular atomizer assembly housing [120a], with the inner electrode [162a^1] concentric with the outer electrode [162a^2]" as recited in claim 15 of the '551 Patent.



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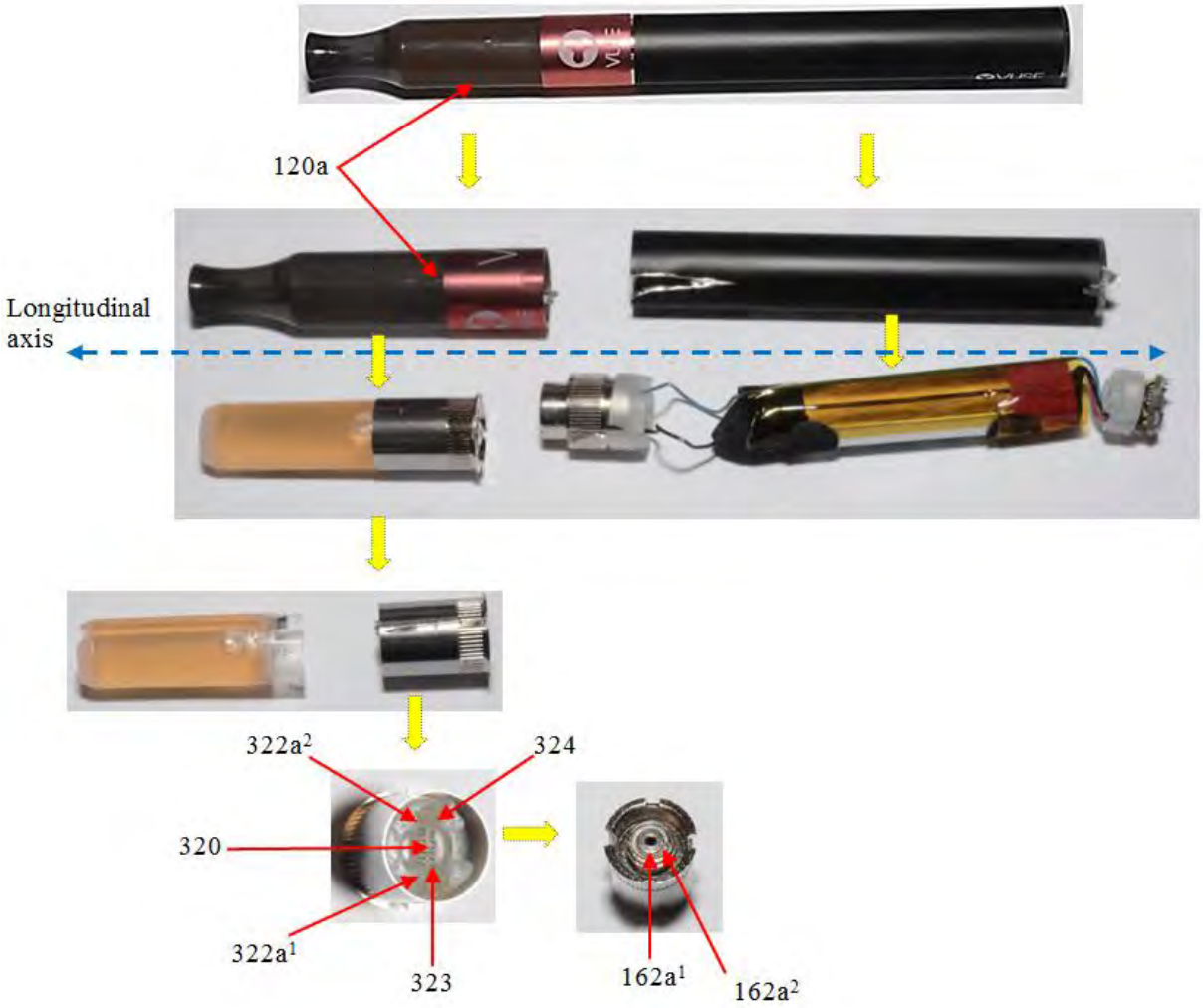
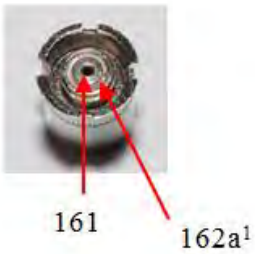
518. The VUSE Vibe includes "the atomizer [320] including a heater wire [323] wound on a porous body [324] comprising a fiber material, and the porous body [324] perpendicular to a central longitudinal axis of the tubular atomizer assembly housing [120a], with the heater wire [323] having a first lead [$322a^1$] connected to the inner electrode [$162a^1$] and a second lead [$322a^2$] connected to the outer electrode [$162a^2$]" as recited in claim 15 of the '551 Patent.



519. The VUSE Vibe includes "an airflow path through the tubular atomizer assembly housing [120a] from the atomizer [320] to an outlet [150] at the second end of the tubular atomizer assembly housing [120a]" as recited in claim 15 of the '551 Patent.

520. The VUSE Vibe includes "a through hole [161] at a center of the inner electrode [162a[1]] leading into the airflow path" as recited in claim 15 of the '551 Patent.



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521. The VUSE Vibe includes "a liquid supply [330] in the tubular atomizer assembly housing [120a] in contact with the porous body [324], with the liquid supply [330] containing a liquid [334] including nicotine" as recited in claim 15 of the '551 Patent.

Not for sale to minors. VUSE contains nicotine extracted from the tobacco plant. Nicotine is addictive and no tobacco product has been shown to be safe.

https://prod.vusevapor.com/products/vibe/?/locate (last visited March 1, 2017)

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522. Defendant has also contributed to the infringement of the ’551 Patent in violation of 35 U.S.C. § 271(c) by, itself and/or through its agents, contributing to the direct infringement of the ’551 Patent by its customers by unlawfully and wrongfully making, using, importing, offering to sell, and/or selling electronic cigarette components constituting a material part of the invention of the ’551 Patent and having no substantially non-infringing use, which, when used by its customers, result in direct infringement of the ’551 Patent, in this judicial district and within, from and/or into the United States without permission or license from Plaintiffs, and will continue to do so unless enjoined by this Court.

523. Examples of electronic cigarette components that constitute a material part of the invention of the ’551 Patent, have no substantial non-infringing uses, and contribute to the direct infringement of the ’551 Patent include, but are not limited to, the VUSE Vibe and (1) VUSE Vibe Pre-Filled Tanks and (2) VUSE Vibe Rechargeable Batteries (collectively, “components of the VUSE Vibe”).

524. Upon information and belief, having knowledge of the ’551 Patent, Defendant is aware that the purchase and use of the VUSE Vibe and components of the VUSE Vibe by Defendant’s customers result in direct infringement of the ’551 Patent.

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525. Defendant instructs users on how to use the VUSE Vibe and components of the VUSE Vibe.[47]

526. Defendant instructs users to purchase and use a replacement VUSE Vibe Pre-Filled Tank when a VUSE Vibe Pre-Filled Tank is depleted.[48]

527. Defendant further instructs users that the VUSE Vibe Pre-Filled Tanks should only be used with a VUSE Vibe Rechargeable Battery such that VUSE Vibe Pre-Filled Tanks are only compatible with the VUSE Vibe.[49]

528. Defendant instructs users to purchase and use a replacement VUSE Vibe Rechargeable Battery.[50]

529. As such, Defendant knows that the VUSE Vibe and components of the VUSE Vibe, including, but not limited to, the VUSE Vibe Pre-Filled Tank and VUSE Vibe Rechargeable Battery when sold separately, have no substantial non-

[47] *See, e.g.*, VUSE Vibe Package Insert ("Get started 1. Charge battery 2. Attach tank 3. Vape 4. Enjoy!") (Exhibit Q).

[48] *See, e.g.*, *id.* ("Don't vape an empty tank"). *See also* VUSE VIBE Store Locator (providing information for users on where to purchase replacement VUSE Vibe Pre-Filled Tanks and VUSE Vibe Pre-Filled Tank Systems including VUSE Vibe Pre-Filled Tanks and VUSE Vibe Rechargeable Battery), https://prod.vusevapor.com/products/vibe/?/locate (last visited March 1, 2017) (Exhibit R).

[49] *See, e.g.*, VUSE Vibe Package Insert ("Only use VUSE VIBE pre-filled tanks with a VUSE VIBE battery") (Exhibit Q).

[50] *See, e.g.*, VUSE VIBE Store Locator (providing information for users on where to purchase replacement VUSE Vibe Pre-Filled Tanks and VUSE Vibe Pre-Filled Tank Systems including VUSE Vibe Pre-Filled Tanks and VUSE Vibe Rechargeable Battery), https://prod.vusevapor.com/products/vibe/?/locate (last visited March 1, 2017) (Exhibit R).

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infringing uses other than to provide users with the ability to assemble and use an electronic cigarette that infringes the ’551 Patent, and, therefore, that they are especially made or adapted for use in infringement of the ’551 Patent.

530. As a direct and proximate result of the foregoing acts of Defendant, Plaintiffs have suffered, and are entitled to, monetary damages in an amount not yet determined, which include, but are not limited to, lost profits on the infringing sales Plaintiffs may have made and reasonable royalties on sales not made. Plaintiffs are also entitled to their costs of suit and interest.

531. Defendant’s continuing infringement has inflicted and, unless restrained by this Court, will continue to inflict irreparable harm upon Plaintiffs, such as reduction of Plaintiffs’ proper market share and deprivation of Plaintiffs’ rights to exclude others. Plaintiffs have no adequate remedy at law. Plaintiffs are entitled to injunctive relief enjoining Defendant from engaging in further acts of infringement.

532. In view of Defendant’s knowledge of the ’551 Patent, Defendant has proceeded to infringe the ’551 Patent despite a high probability that its actions constituted infringement of a valid patent. Thus, Defendant’s infringement of the ’551 Patent is willful and deliberate. That egregious infringement behavior entitles Plaintiffs to increased damages under 35 U.S.C. § 284, and to attorneys’ fees and costs incurred in prosecuting this action under 35 U.S.C. § 285.

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EIGHTH CLAIM FOR RELIEF

(Infringement of U.S. Patent No. 9,456,632)

533. Plaintiffs incorporate by reference the allegations contained in paragraphs 1–532 above.

534. Plaintiff Fontem Holdings is the owner of the entire right, title, and interest in and to United States Patent No. 9,456,632 ("the '632 Patent") (Exhibit H). Fontem Holdings has granted Fontem Ventures an exclusive license to the '632 Patent, including the right to sublicense the '632 Patent. The '632 Patent was duly and legally issued by the USPTO on October 4, 2016, and is valid, subsisting, and in full force and effect.

535. Upon information and belief, Defendant has had knowledge of the '632 Patent and of Plaintiffs' rights therein.

536. Plaintiffs have previously asserted infringement of seven of its United States patents (*i.e.*, the '742 Patent, the '628 Patent, the '726 Patent, the '239 Patent, the '548 Patent, the '549 Patent, and the '205 Patent) against Defendant in three patent infringement cases (*i.e., Fontem Ventures BV et al. v. R.J. Reynolds Vapor Company*, Case No. 1:16-cv-01255 (M.D.N.C. April 4, 2016), *Fontem Ventures BV et al. v. R.J. Reynolds Vapor Company*, Case No. 1:16-cv-01257 (M.D.N.C. May 3, 2016) and *Fontem Ventures BV et al. v. R.J. Reynolds Vapor Company*, Case No. 1:16-cv-01258 (M.D.N.C. June 22, 2016) (collectively, the

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"Reynolds Vapor Patent Infringement Cases"), all consolidated under Case No. 1:16-cv-01255).

537. In its Answer to Fontem's Interrogatory No. 10 regarding "when and how [Defendant] first became aware of [the '742 Patent, the '628 Patent, the '726 Patent, the '239 Patent, the '548 Patent, the '549 Patent, and the '205 Patent] or any U.S. or foreign patent or patent application related thereto," Defendant admitted that "it first became aware of the existence of [the '742 Patent, the '628 Patent, the '726 Patent, the '239 Patent, the '548 Patent, the '549 Patent, and the '205 Patent] at or shortly after their respective issue dates."[51]

538. Accordingly, upon information and belief, Defendant, through its admitted monitoring of Plaintiffs' patents, has had knowledge or should have had knowledge about the existence of the '632 Patent at or shortly after its issue date of October 4, 2016.

539. Defendant has directly infringed the '632 Patent in violation of at least 35 U.S.C. § 271(a) by, itself and/or through its agents, unlawfully and wrongfully making, using, importing, offering to sell, and/or selling vaporizing device products embodying one or more of the inventions claimed in the '632 Patent,

[51] *Fontem Ventures BV et al. v. R.J. Reynolds Vapor Company*, Case No. 1:16-cv-01255, Defendant R.J. Reynolds Vapor Company's Responses to Fontem's First Set of Interrogatories at 10–11, served Jan. 18, 2017 (Exhibit I).

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within, from and/or into the United States without permission or license from Plaintiffs, and will continue to do so unless enjoined by this Court.

540. Examples of vaporizing device products that directly infringe the ’632 Patent include, but are not limited to, (1) VUSE Solo Rechargeable Digital Vapor Cigarettes (“VUSE Solo”) and (2) VUSE Connect Power Units when used with the VUSE Cartridges (“VUSE Connect”) (collectively, “the VUSE Solo/Connect Products”); and (3) the VUSE Vibe.

541. The photographs of the VUSE Solo/Connect Products set forth herein accurately show the features of those products.

542. The VUSE Solo/Connect Products and the VUSE Vibe infringe the ’632 Patent literally and/or under the doctrine of equivalents.

543. The VUSE Vibe infringes at least claims 14, 16, and 18 of the ’632 Patent, and the VUSE Solo/Connect Products infringe at least claims 14–16 of the ’632 Patent.

VUSE Vibe

544. As shown in the photographs of paragraphs 545 through 550 below, the VUSE Vibe meets every limitation recited in claim 14 of the ’632 Patent.

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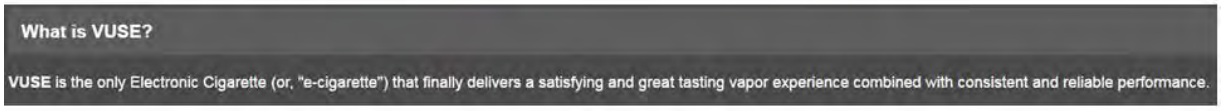
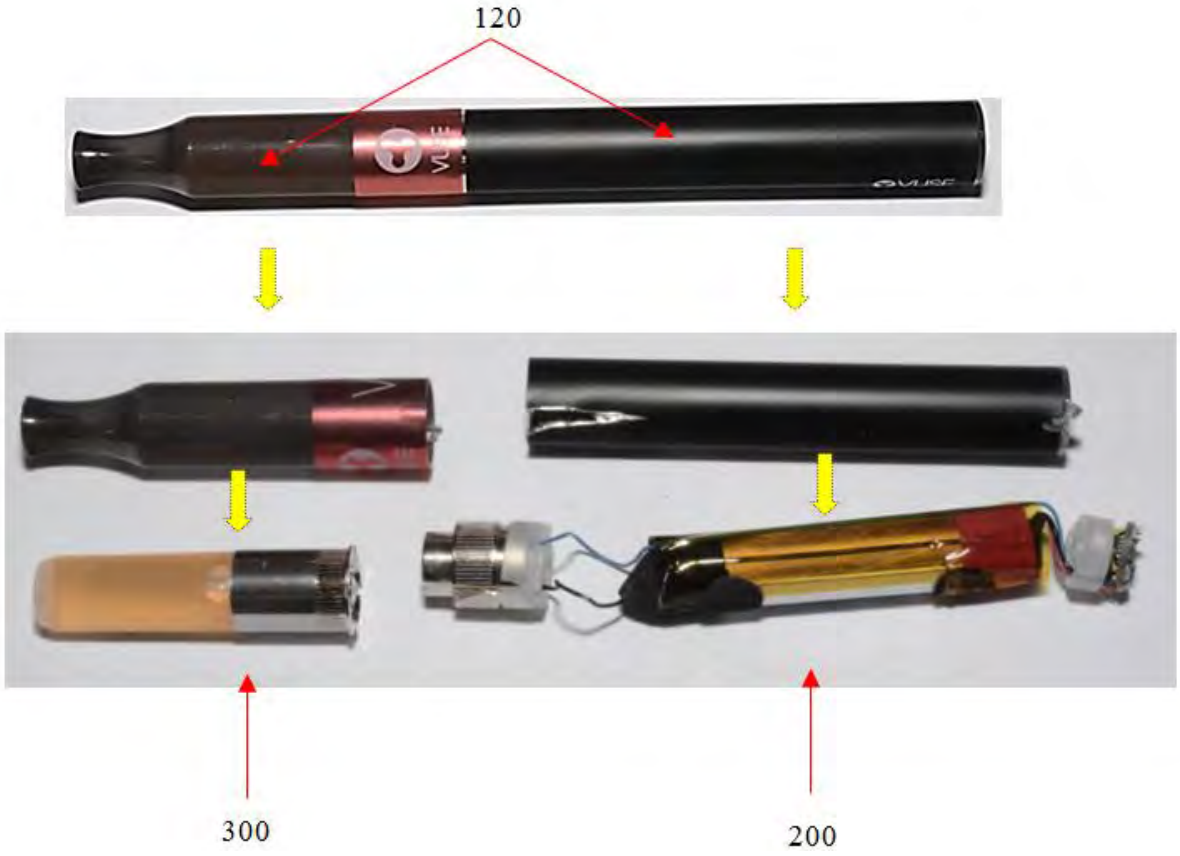
545. The VUSE Vibe is a vaporizing device as recited in claim 14 of the ’632 Patent.



https://vusevapor.com/FooterLinks/ProductFAQs (last visited March 1, 2017)

546. The VUSE Vibe includes "a battery assembly [200] and an atomizer assembly [300] within an elongated cylindrical housing [120] with the battery assembly [200] electrically connected to the atomizer assembly [300]" as recited in claim 14 of the '632 Patent.



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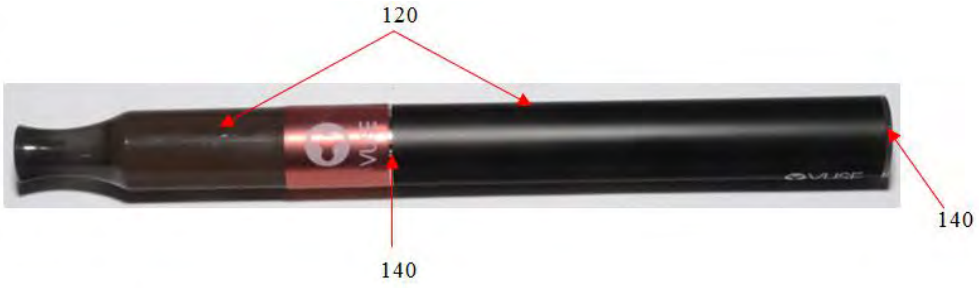
547. The VUSE Vibe includes "a liquid storage component [330] in the elongated cylindrical housing [120]" as recited in claim 14 of the '632 Patent.

548. The VUSE Vibe includes "the elongated cylindrical housing [120] having one or more air inlets [140]" as recited in claim 14 of the '632 Patent.



549. The VUSE Vibe includes "the atomizer assembly [300] including an atomization chamber [328] having a front end opening [163] and a back end opening [163] to allow air to flow into the atomization chamber [328] from the front end opening and out from the back end opening" as recited in claim 14 of the '632 Patent.

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550. The VUSE Vibe includes "a heating wire coil [323] wound on a porous component [324] that is perpendicular to a longitudinal axis of the elongated cylindrical housing [120], with the heating wire coil [323] in an air flow path between the front end opening [163] and the back end opening [163] of the atomization chamber [328]" as recited in claim 14 of the '632 Patent.

551. As shown in the photograph of paragraph 552 below, the VUSE Vibe meets every limitation recited in claim 16 of the ’632 Patent.

552. The VUSE Vibe includes “the heating wire coil [323] having an outer diameter less than an inner diameter of the atomizing chamber [328]” as recited in claim 16 of the ’632 Patent.

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553. As shown in the photographs of paragraph 554 below, the VUSE Vibe meets every limitation recited in claim 18 of the ’632 Patent.

554. The VUSE Vibe includes “a restriction component [424] between the hollow cylindrical component and the at least one air inlet [140], with the restriction component [424] having a restriction hole smaller than the open front end of the hollow cylindrical component” as recited in claim 18 of the ’632 Patent.

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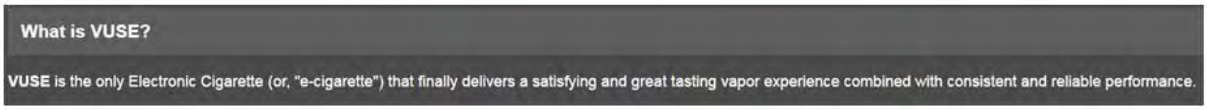
VUSE Solo

555. As shown in the photographs of paragraphs 556 through 561 below, the VUSE Solo meets every limitation recited in claim 14 of the ’632 Patent.

556. The VUSE Solo devices are vaporizing devices as recited in claim 14 of the ’632 Patent.



https://vusevapor.com/FooterLinks/ProductFAQs (last visited March 1, 2017)

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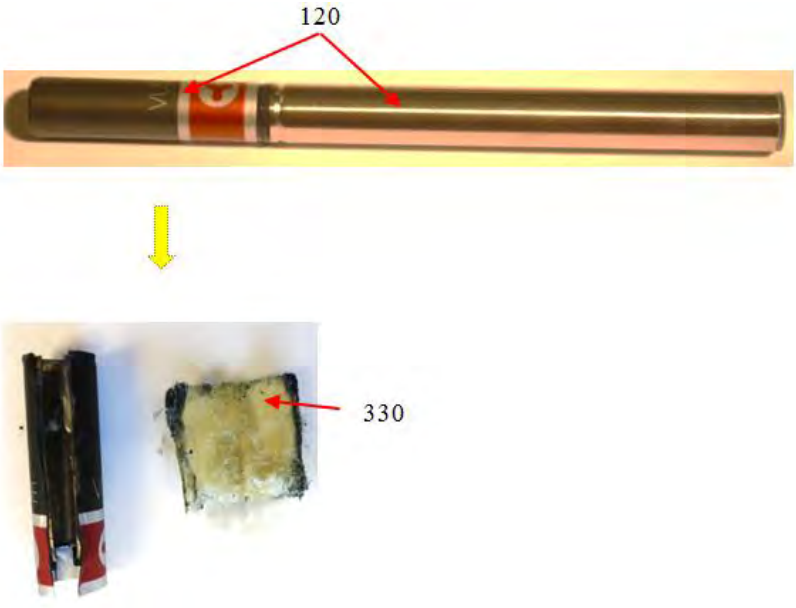
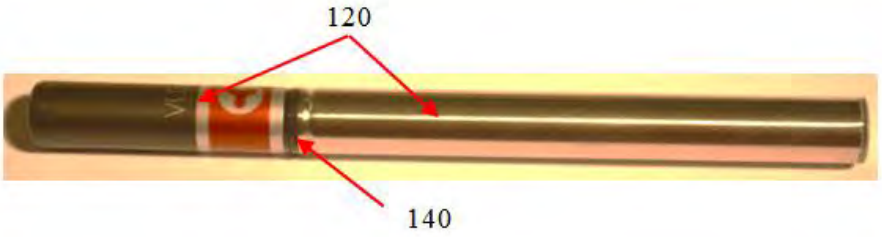
557. The VUSE Solo includes "a battery assembly [200] and an atomizer assembly [300] within an elongated cylindrical housing [120] with the battery assembly [200] electrically connected to the atomizer assembly [300]" as recited in claim 14 of the '632 Patent.

558. The VUSE Solo includes "a liquid storage component [330] in the elongated cylindrical housing [120]" as recited in claim 14 of the '632 Patent.



559. The VUSE Solo includes "the elongated cylindrical housing [120] having one or more air inlets [140]" as recited in claim 14 of the '632 Patent.



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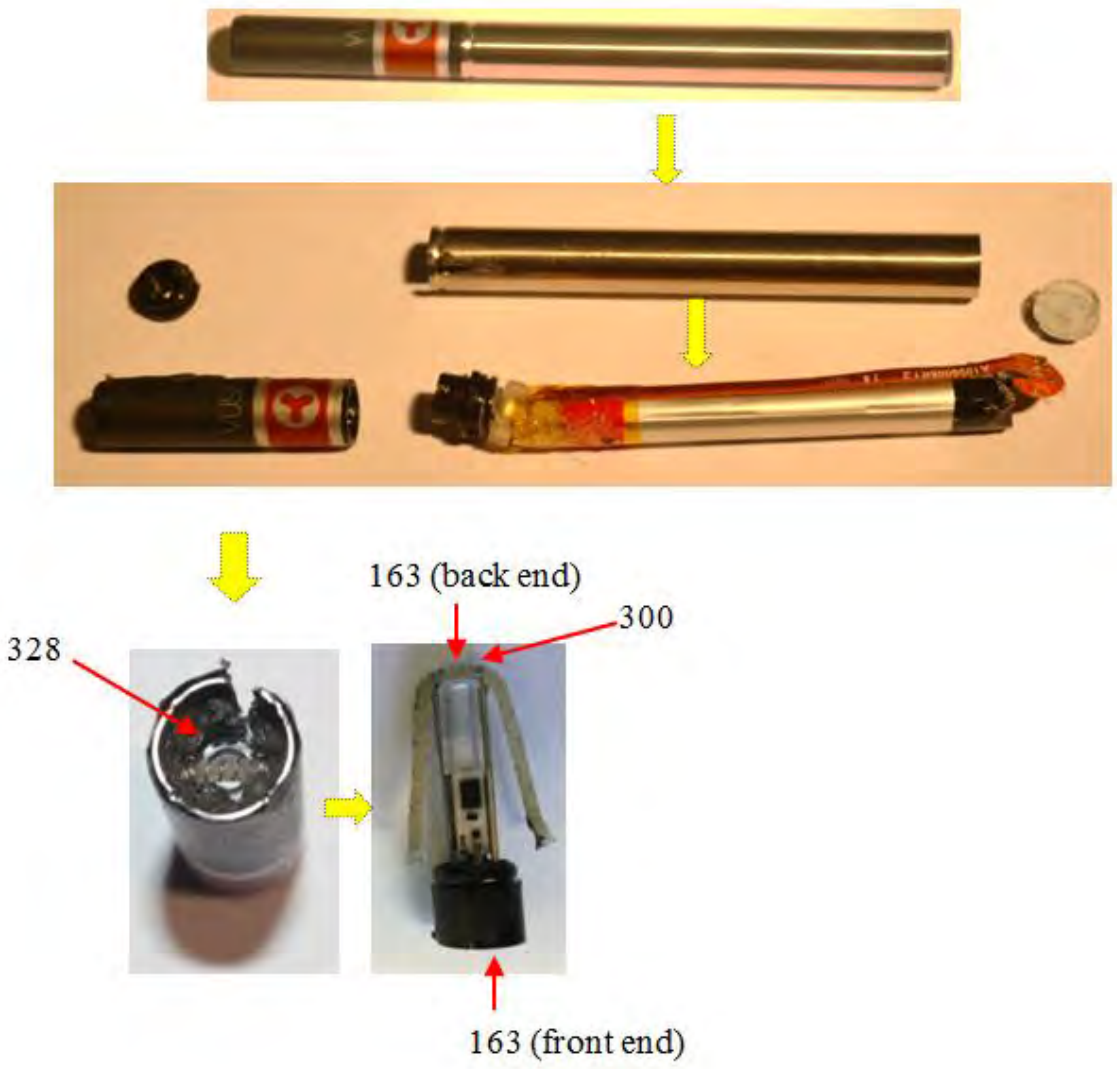
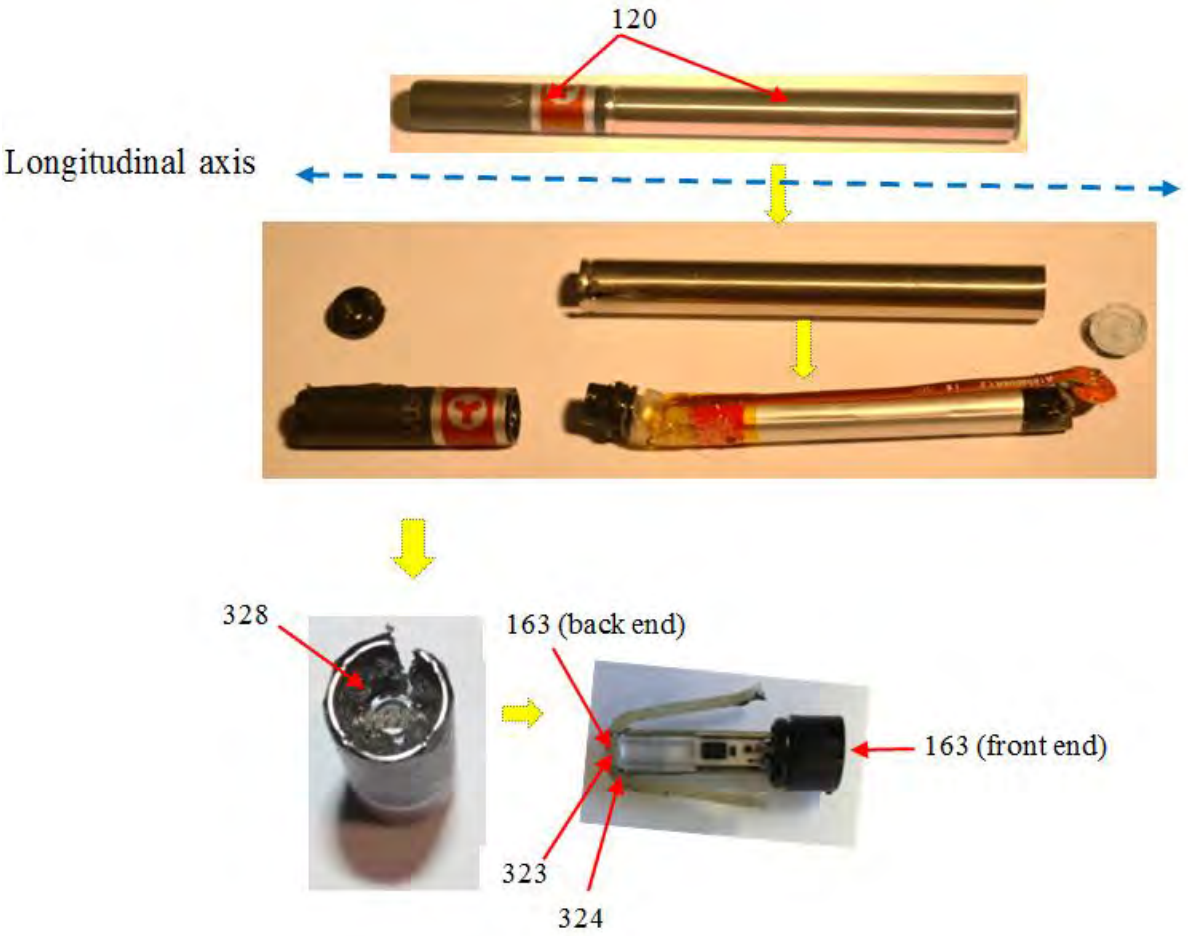
560. The VUSE Solo includes "the atomizer assembly [300] including an atomization chamber [328] having a front end opening [163] and a back end opening [163] to allow air to flow into the atomization chamber [328] from the front end opening and out from the back end opening" as recited in claim 14 of the '632 Patent.



561. The VUSE Solo includes "a heating wire coil [323] wound on a porous component [324] that is perpendicular to a longitudinal axis of the elongated cylindrical housing [120], with the heating wire coil [323] in an air flow path between the front end opening [163] and the back end opening [163] of the atomization chamber [328]" as recited in claim 14 of the '632 Patent.

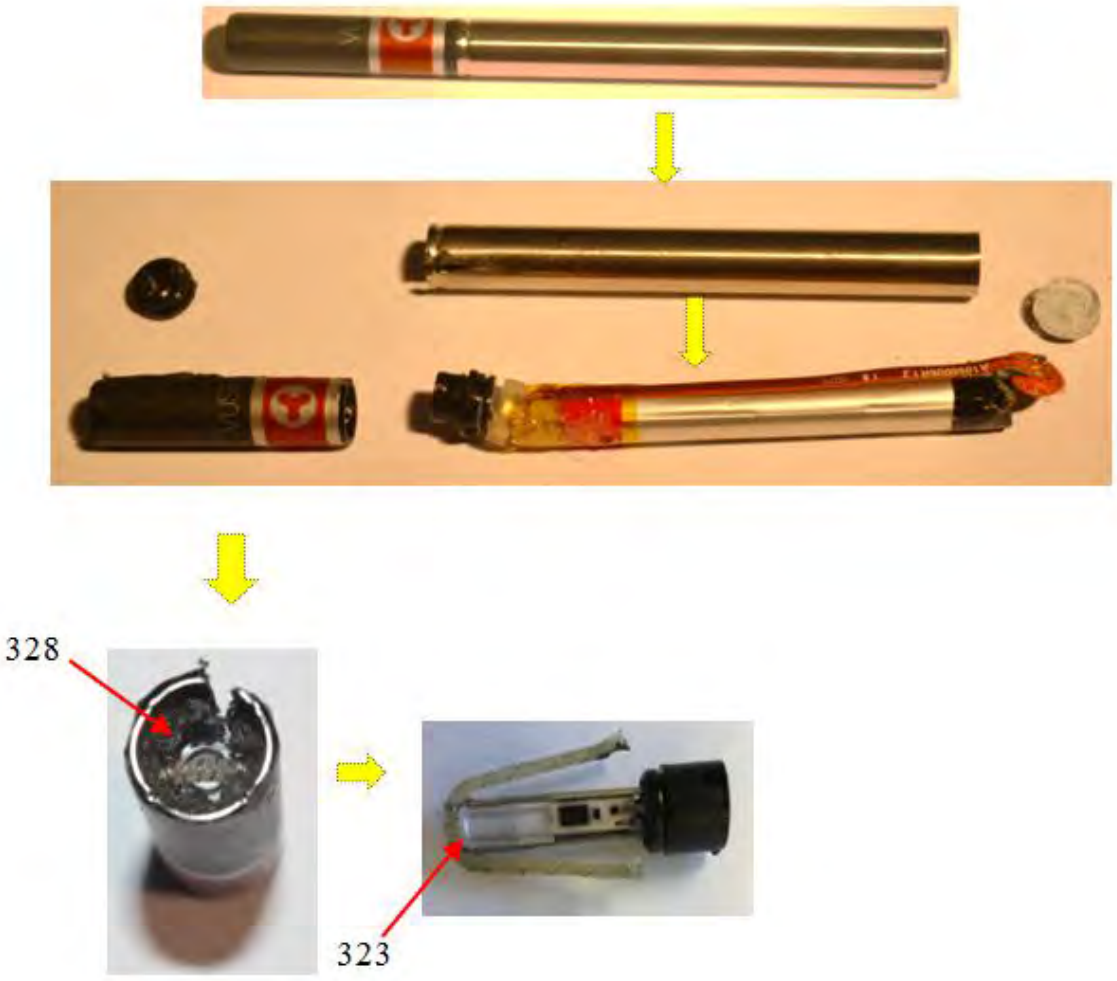


562. As shown in the photograph of paragraph 563 below, the VUSE Solo meets every limitation recited in claim 15 of the ’632 Patent.

563. The VUSE Solo includes “the atomization chamber [328] having a uniform diameter along the length of the atomization chamber [328]” as recited in claim 15 of the ’632 Patent.

564. As shown in the photographs of paragraph 565 below, the VUSE Solo meets every limitation recited in claim 16 of the ’632 Patent.

565. The VUSE Solo includes “the heating wire coil [323] having an outer diameter less than an inner diameter of the atomizing chamber [328]” as recited in claim 16 of the ’632 Patent.



566. The VUSE Connect is similar in structure and operation to the battery portion of the VUSE Solo except that the VUSE Connect includes compatibility with Bluetooth wireless technology.

567. Thus, the VUSE Connect infringes the ’632 Patent for the same reasons as the VUSE Solo, as alleged in paragraphs 555 through 565 above, when used with a VUSE Cartridge as instructed by Defendant.

568. Defendant has also contributed to the infringement of the ’632 Patent in violation of 35 U.S.C. § 271(c) by, itself and/or through its agents, contributing to the direct infringement of the ’632 Patent by its customers by unlawfully and wrongfully making, using, importing, offering to sell, and/or selling vaporizing device components constituting a material part of the invention of the ’632 Patent and having no substantially non-infringing use, which, when used by its customers, result in direct infringement of the ’632 Patent, in this judicial district and within, from and/or into the United States without permission or license from Plaintiffs, and will continue to do so unless enjoined by this Court.

569. Examples of vaporizing device components that constitute a material part of the invention of the ’632 Patent, have no substantial non-infringing uses, and contribute to the direct infringement of the ’632 Patent include, but are not limited to, the VUSE Vibe and VUSE Solo/Connect Products and (1) VUSE Vibe Pre-Filled Tanks and (2) VUSE Vibe Rechargeable Batteries (collectively,

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"components of the VUSE Vibe"); and (3) VUSE Cartridges, (4) VUSE Power Units, and (5) VUSE Connect Power Units (collectively, "components of the VUSE Solo/Connect Products").

570. Upon information and belief, having knowledge of the '632 Patent, Defendant is aware that the purchase and use of the VUSE Vibe, components of the VUSE Vibe, the VUSE Solo/Connect Products, and components of the VUSE Solo/Connect Products by Defendant's customers result in direct infringement of the '632 Patent.

571. Defendant instructs users on how to use the VUSE Vibe and components of the VUSE Vibe.[52]

572. Defendant instructs users to purchase and use a replacement VUSE Vibe Pre-Filled Tank when a VUSE Vibe Pre-Filled Tank is depleted.[53]

573. Defendant further instructs users that the VUSE Vibe Pre-Filled Tanks should only be used with a VUSE Vibe Rechargeable Battery such that VUSE Vibe Pre-Filled Tanks are only compatible with the VUSE Vibe.[54]

[52] *See, e.g.*, VUSE Vibe Package Insert ("Get started 1. Charge battery 2. Attach tank 3. Vape 4. Enjoy!") (Exhibit Q).

[53] *See, e.g.*, *id.* ("Don't vape an empty tank"). *See also* VUSE VIBE Store Locator (providing information for users on where to purchase replacement VUSE Vibe Pre-Filled Tanks and VUSE Vibe Pre-Filled Tank Systems including VUSE Vibe Pre-Filled Tanks and VUSE Vibe Rechargeable Battery), https://prod.vusevapor.com/products/vibe/?/locate (last visited March 1, 2017) (Exhibit R).

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574. Defendant instructs users to purchase and use a replacement VUSE Vibe Rechargeable Battery.[55]

575. As such, Defendant knows that the VUSE Vibe and components of the VUSE Vibe, including, but not limited to, the VUSE Vibe Pre-Filled Tank and VUSE Vibe Rechargeable Battery when sold separately, have no substantial non-infringing uses other than to provide users with the ability to assemble and use a vaporizing device that infringes the '632 Patent, and, therefore, that they are especially made or adapted for use in infringement of the '632 Patent.

576. Defendant instructs users on how to use the VUSE Solo/Connect Products and components of the VUSE Solo/Connect Products.[56]

577. Defendant instructs users to purchase and use a replacement VUSE Cartridge when a VUSE Cartridge is depleted.[57]

578. Defendant further instructs users that the VUSE Cartridges include technology that does not permit any other e-cigarette to be used with VUSE

[54] *See, e.g.*, VUSE Vibe Package Insert ("Only use VUSE VIBE pre-filled tanks with a VUSE VIBE battery") (Exhibit Q).

[55] *See, e.g.*, VUSE VIBE Store Locator (providing information for users on where to purchase replacement VUSE Vibe Pre-Filled Tanks and VUSE Vibe Pre-Filled Tank Systems including VUSE Vibe Pre-Filled Tanks and VUSE Vibe Rechargeable Battery), https://prod.vusevapor.com/products/vibe/?/locate (last visited March 1, 2017) (Exhibit R).

[56] *See, e.g.*, Frequently Asked Product Related Questions, https://vusevapor.com/FooterLinks/ProductFAQs (last visited March 1, 2017) (Exhibit S).

[57] *See id.* (Why doesn't VUSE offer disposable styles? How will I know when it is time to change the Cartridge or recharge the PowerUnit?)

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Cartridges such that VUSE Cartridges are only compatible with VUSE Solo/Connect Products.[58]

579. Defendant instructs users to purchase and use a replacement VUSE Power Unit or VUSE Connect Power Unit.[59]

580. Defendant further instructs users that the VUSE Digital Vapor Cigarettes include proprietary encryption technology that does not permit any non-VUSE Cartridges to be used with the VUSE Power Unit or VUSE Connect Power Unit.[60]

581. As such, Defendant knows that the VUSE Solo/Connect Products and components of the VUSE Solo/Connect Products, including, but not limited to, the VUSE Cartridge, VUSE Power Unit, and VUSE Connect Power Unit when sold separately, have no substantial non-infringing uses other than to provide users with the ability to assemble and use a vaporizing device that infringes the ’632 Patent, and, therefore, that they are especially made or adapted for use in infringement of the ’632 Patent.

582. As a direct and proximate result of the foregoing acts of Defendant, Plaintiffs have suffered, and are entitled to, monetary damages in an amount not

[58] *See id.* (Can I use non-VUSE Cartridges with the VUSE PowerUnit? Can I use VUSE Cartridges with non-VUSE power units?)
[59] *See id.* (Why doesn’t VUSE offer disposable styles? How will I know when it is time to change the Cartridge or recharge the PowerUnit?)
[60] *See id.* (Can I use non-VUSE Cartridges with the VUSE PowerUnit? Can I use VUSE Cartridges with non-VUSE power units?)

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yet determined, which include, but are not limited to, lost profits on the infringing sales Plaintiffs may have made and reasonable royalties on sales not made. Plaintiffs are also entitled to their costs of suit and interest.

583. Defendant's continuing infringement has inflicted and, unless restrained by this Court, will continue to inflict irreparable harm upon Plaintiffs, such as reduction of Plaintiffs' proper market share and deprivation of Plaintiffs' rights to exclude others. Plaintiffs have no adequate remedy at law. Plaintiffs are entitled to injunctive relief enjoining Defendant from engaging in further acts of infringement.

584. In view of Defendant's knowledge of the '632 Patent, Defendant has proceeded to infringe the '632 Patent despite a high probability that its actions constituted infringement of a valid patent. Thus, Defendant's infringement of the '632 Patent is willful and deliberate. That egregious infringement behavior entitles Plaintiffs to increased damages under 35 U.S.C. § 284, and to attorneys' fees and costs incurred in prosecuting this action under 35 U.S.C. § 285.

PRAYER FOR RELIEF

Plaintiffs request entry of judgment as follows:

A. Entry of judgment that Defendant is liable for infringement of the '957 Patent, the '331 Patent, the '752 Patent, the '027 Patent, the '062 Patent, the '550 Patent, the '551 Patent and the '632 Patent under at least the provisions of 35

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U.S.C. § 271(a) and/or (c);

B. An order enjoining Defendant and all affiliates, subsidiaries, officers, employees, agents, representatives, licensees, successors, assigns, and all those acting in concert with, or for or on behalf of Defendant, from infringing the ’957 Patent, the ’331 Patent, the ’752 Patent, the ’027 Patent, the ’062 Patent, the ’550 Patent, the ’551 Patent and the ’632 Patent pursuant to 35 U.S.C. § 283;

C. An order awarding Plaintiffs damages resulting from Defendant’s patent infringement together with prejudgment and post-judgment interest;

D. Trebling of damages under 35 U.S.C. § 284 in view of the willful and deliberate nature of Defendant’s infringement of the patents at issue in this litigation;

E. An order awarding Plaintiffs their costs and attorney’s fees under 35 U.S.C. § 285.

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F. Any and all other relief, in law or in equity, as the Court deems just, equitable or appropriate.

Dated: March 1, 2017

Respectfully submitted by,

WILSON & HELMS LLP

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/s/ Stuart H. Russell
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FONTEM HOLDINGS 1 B.V.

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DEMAND FOR JURY TRIAL

Plaintiffs Fontem Ventures B.V. and Fontem Holdings 1 B.V. hereby demand a trial by jury on all issues triable by a jury.

DATED: March 1, 2017

WILSON & HELMS LLP

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EXHIBIT A

U 7616329

THE UNITED STATES OF AMERICA

TO ALL TO WHOM THESE PRESENTS SHALL COME:

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office

December 21, 2016

THIS IS TO CERTIFY THAT ANNEXED HERETO IS A TRUE COPY FROM THE RECORDS OF THIS OFFICE OF:

U.S. PATENT: ***8,375,957***
ISSUE DATE: ***February 19, 2013***

By Authority of the
Under Secretary of Commerce for Intellectual Property
and Director of the United States Patent and Trademark Office

R. BLAKENEY
Certifying Officer

US008375957B2

(12) **United States Patent**
Hon

(10) **Patent No.: US 8,375,957 B2**
(45) **Date of Patent: Feb. 19, 2013**

(54) **ELECTRONIC CIGARETTE**

(75) Inventor: **Lik Hon**, Hong Kong (CN)

(73) Assignee: **Ruyan Investment (Holdings) Limited**, North Point (HK)

(*) Notice: Subject to any disclaimer, the term of this patent is extended or adjusted under 35 U.S.C. 154(b) by 0 days.

(21) Appl. No.: **12/226,819**

(22) PCT Filed: **May 15, 2007**

(86) PCT No.: **PCT/CN2007/001576**

§ 371 (c)(1),
(2), (4) Date: **Jan. 15, 2009**

(87) PCT Pub. No.: **WO2007/131450**

PCT Pub. Date: **Nov. 22, 2007**

(65) **Prior Publication Data**

US 2009/0126745 A1 May 21, 2009

(51) **Int. Cl.**
A24F 1/22 (2006.01)

(52) **U.S. Cl.** **131/194**; 131/271; 131/273; 128/202.21

(58) **Field of Classification Search** 131/194, 131/273, 271; 128/202.21
See application file for complete search history.

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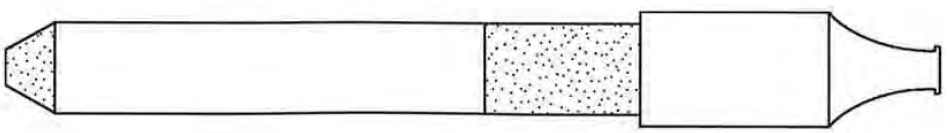
(Continued)

Primary Examiner — Richard Crispino
Assistant Examiner — Dionne Walls Mayes
(74) *Attorney, Agent, or Firm* — Perkins Coie LLP

(57) **ABSTRACT**

An emulation aerosol sucker includes a battery assembly, an atomizer assembly and a cigarette bottle assembly. An external thread electrode is located in one end of battery assembly. An internal thread electrode is located in one end of atomizer assembly. Said battery assembly and said atomizer assembly are connected by the screwthread electrode. Said cigarette bottle assembly is inserted into the other end of said atomizer assembly and both form one cigarette type or cigar type body.

24 Claims, 10 Drawing Sheets



Copy provided by USPTO from the PIRS Image Database on 12/21/2016

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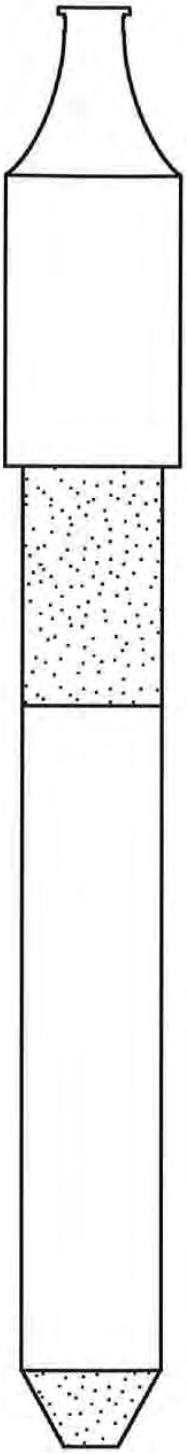

Figure 1

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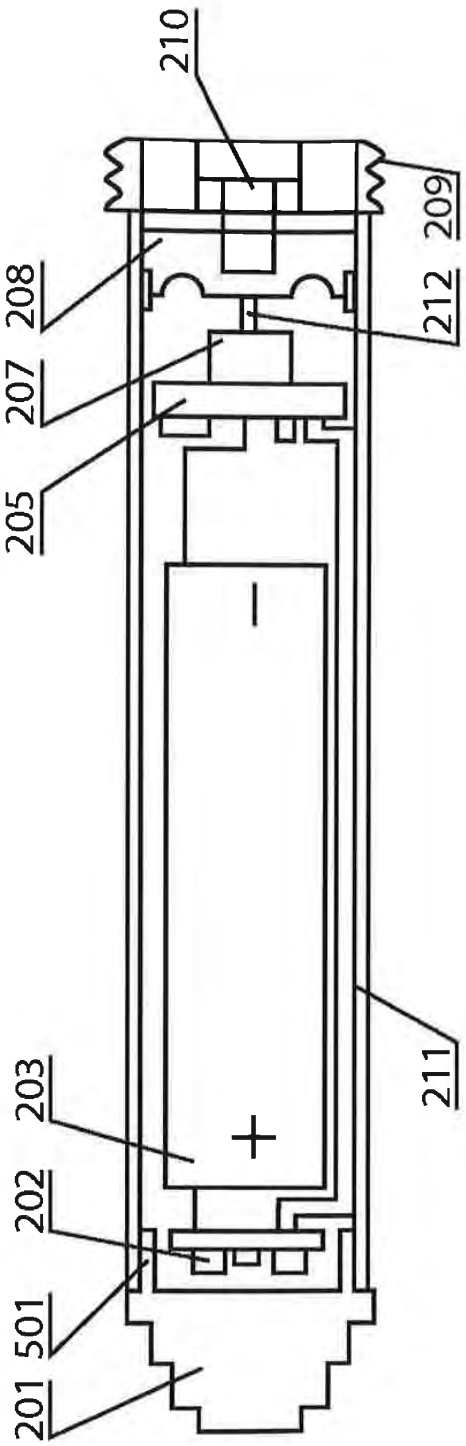

Figure 2A

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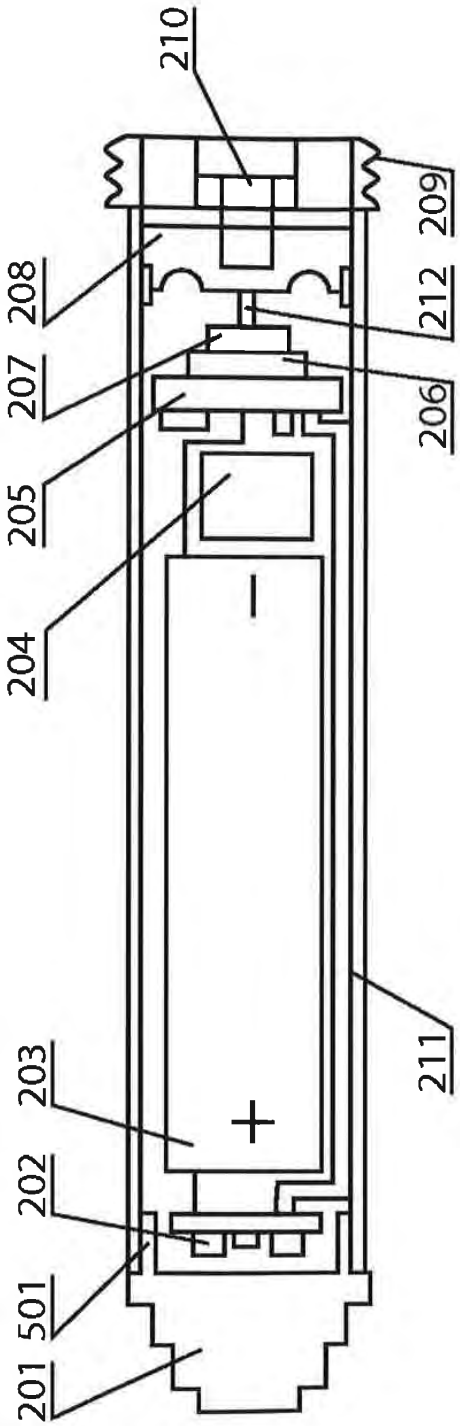

Figure 2B

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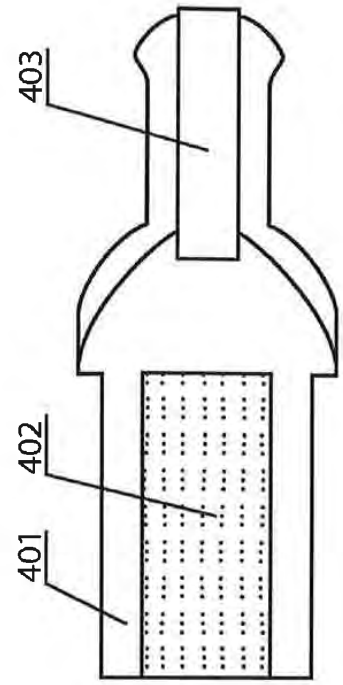

Figure 4

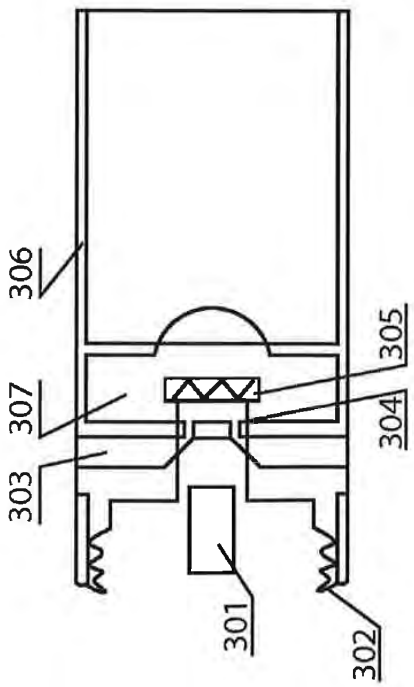

Figure 3

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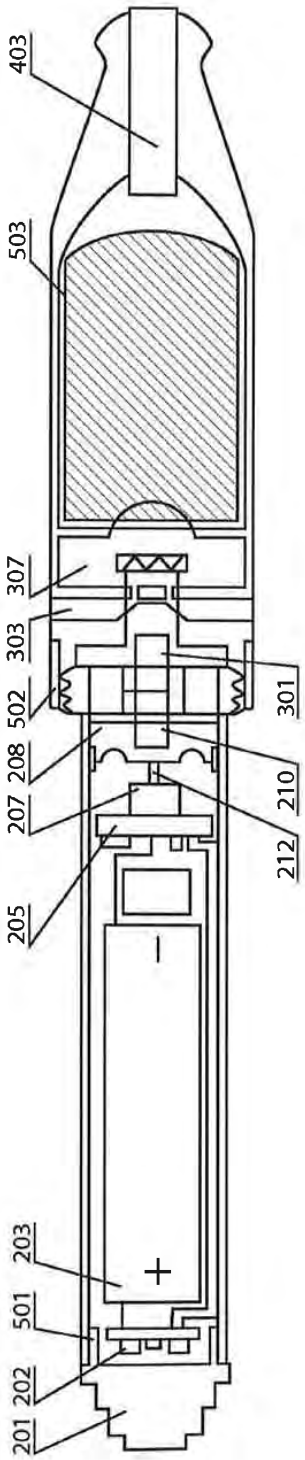

Figure 5A

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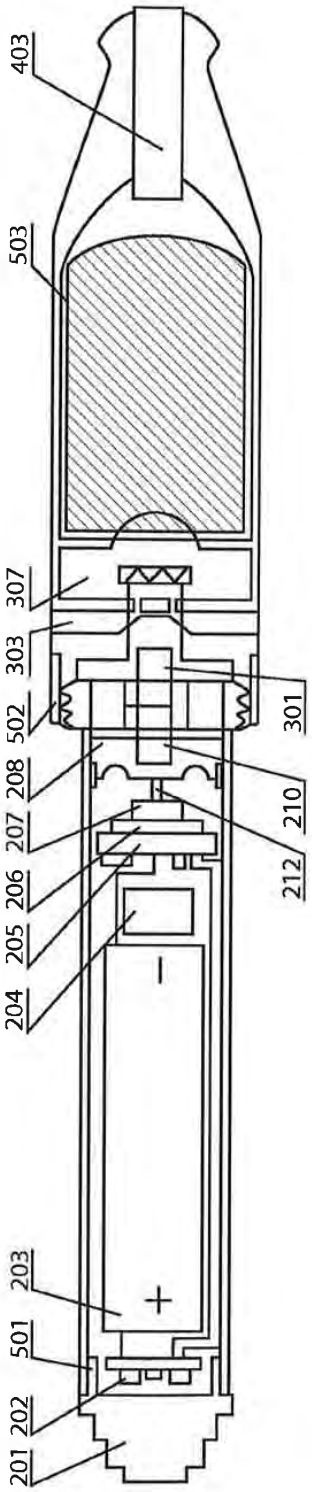

Figure 5B

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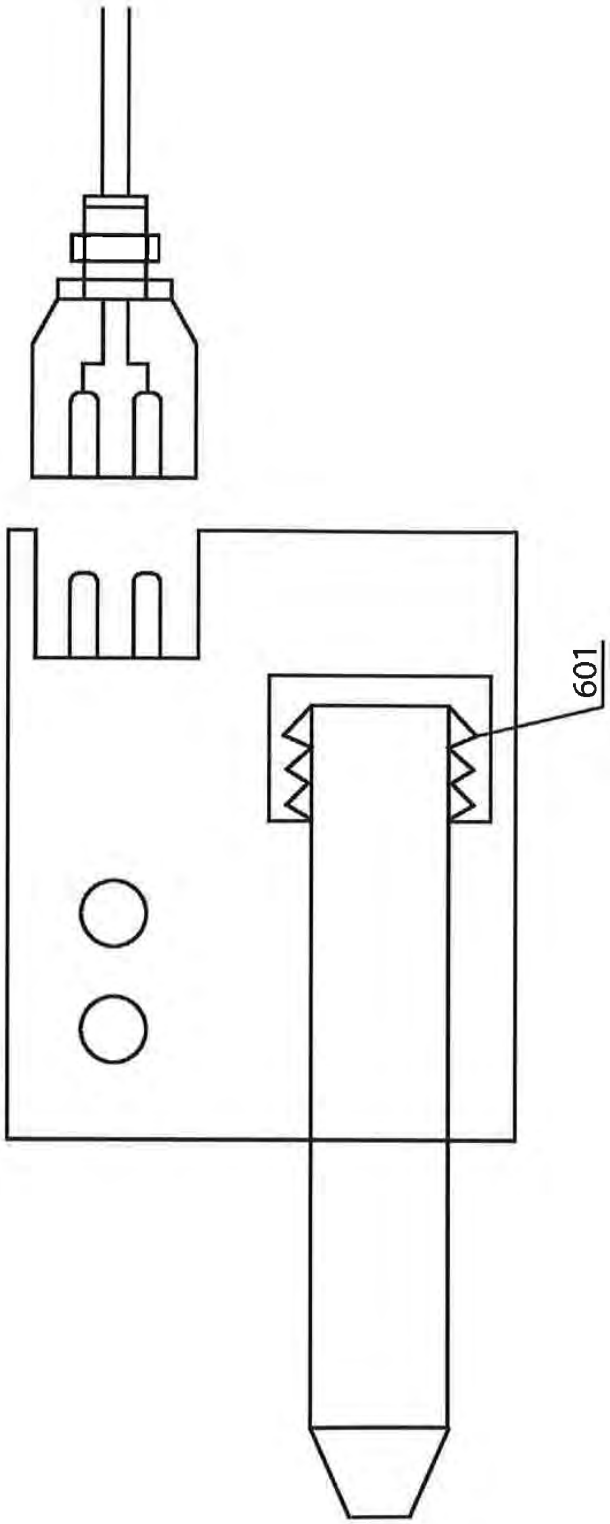

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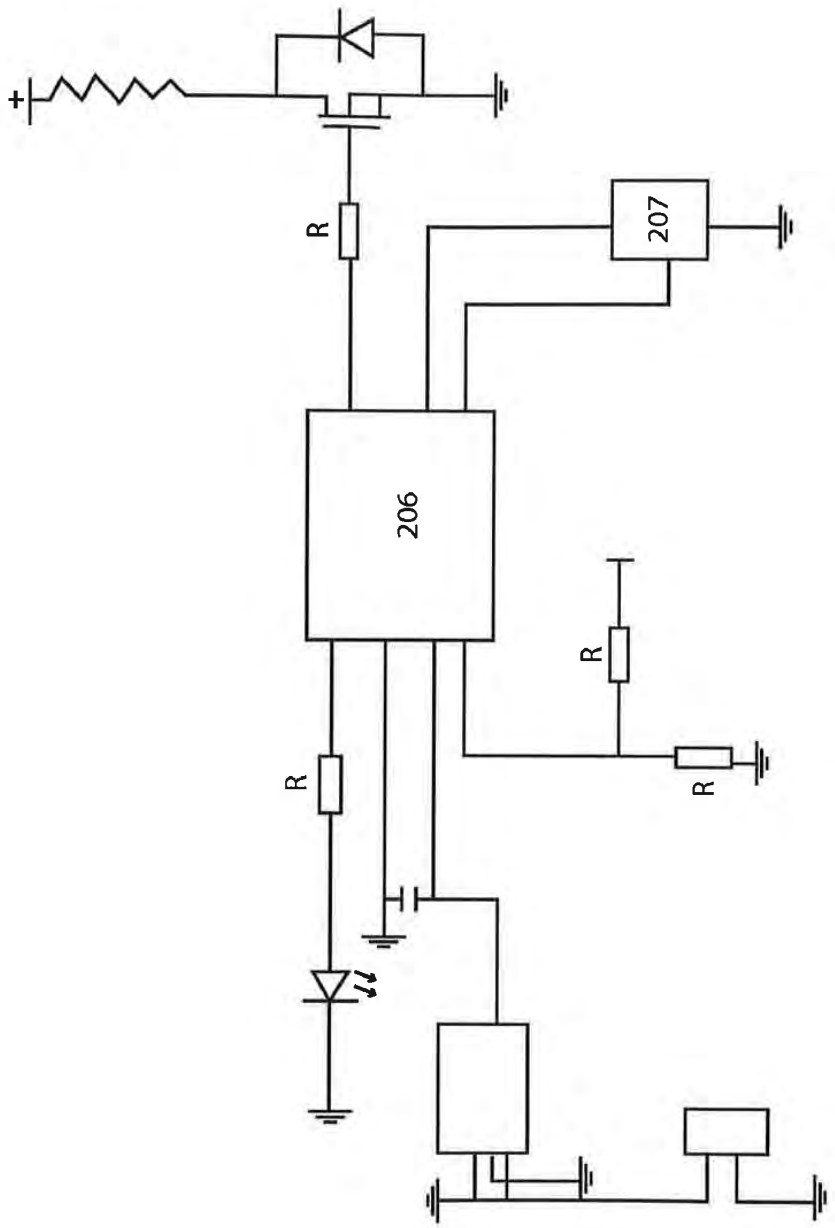

Figure 7

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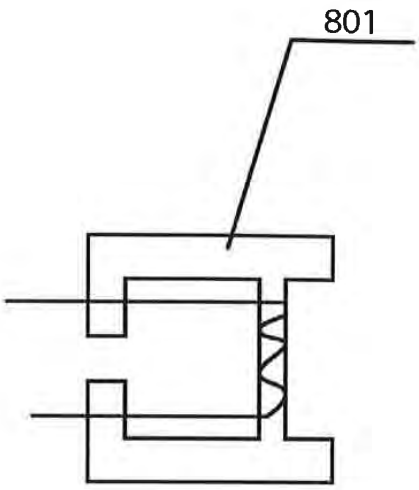

Figure 8

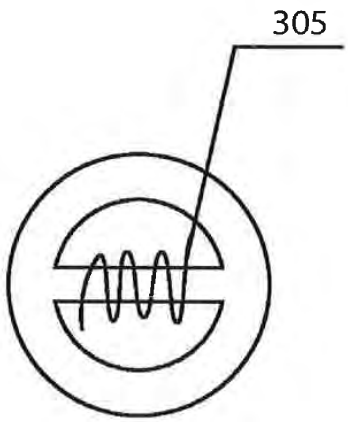

Figure 9

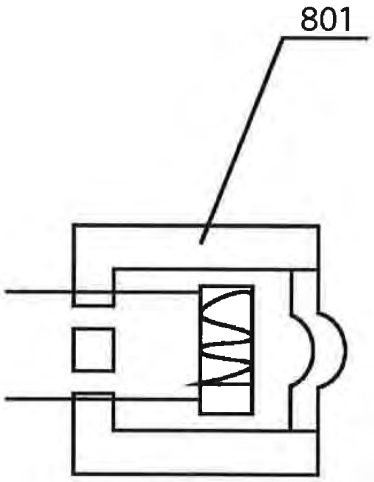

Figure 10

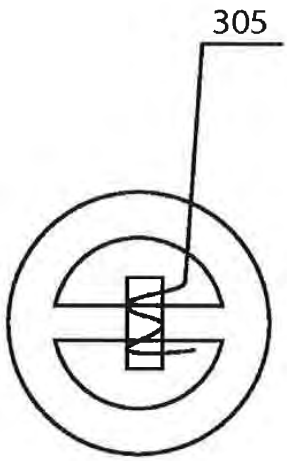

Figure 11

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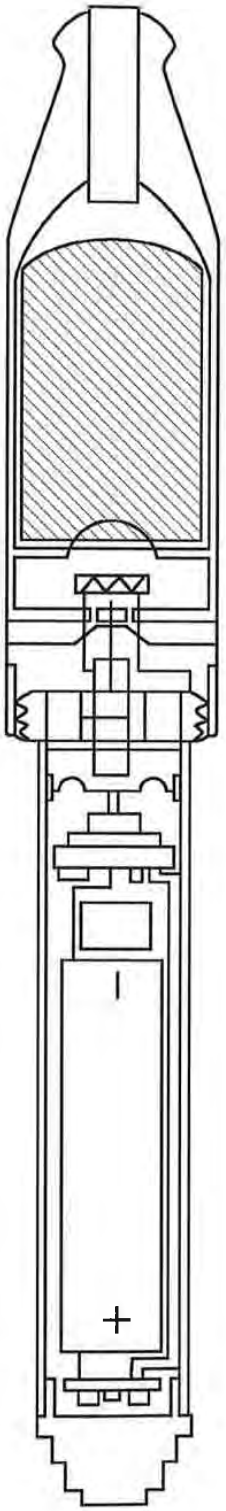

Figure 12

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ELECTRONIC CIGARETTE

TECHNICAL FIELD

The invention relates to an electronic cigarette containing nicotine but not tar.

BACKGROUND ART

Today when it is known that "smoking is harmful to your health", there are still one billion people smoking cigarettes, and this figure is increasing every year. Although smoking causes serious respiratory system diseases and cancers, it is still difficult for smokers to completely quit smoking.

Nicotine is the active ingredient of a cigarette. During smoking, nicotine produces a lot of tar mist as the cigarette burns. The tar mist accesses the smoker's pulmonary alveolus and is quickly absorbed into the blood. Nicotine thus acts on the receptors of the smoker's central nervous system.

Nicotine is a micromolecular alkaloid, which is basically harmless to human bodies within a small dosage. Plus, the half life period of nicotine is extremely short in blood. Tar, on the other hand, is the major harmful substance in tobacco. Tobacco tar may include several thousands of ingredients, dozens of which are carcinogenic substances. Furthermore, it has been shown that second hand smoking is even more harmful to non-smokers.

Some cigarette substitutes do not contain harmful tar but do contain relatively pure nicotine. Such products include the "Cigarette Patch", "Nicotine Gargle", "Aerosol Packed in the High Pressure Tank with Propellant", "Nicotine Chewing Gum". These products are not as harmful as tar, but they are absorbed very slowly. As a result, the peak concentration of nicotine cannot be effectively established in blood, and the smokers are not satisfied in full. In addition, the substitutes do not satisfy the smokers "smoking" habit of repetitively inhaling and exhaling. Therefore, the substitute products are not effective as cigarette substitutes to quit smoking.

THE SUMMARY OF THE INVENTION

The purpose of this invention is to provide an electronic cigarette that substitutes for real cigarettes and helps smokers to quit smoking. For this invention, the aerosol may be regarded as liquid drops suspended in the air.

The present invention includes a battery assembly, an atomizer assembly and a cigarette bottle assembly. The battery assembly connects with one end of the atomizer assembly, and the cigarette bottle assembly is inserted into the other end of the atomizer assembly, thus forming one cigarette type or cigar type body.

The atomizer may be a capillary impregnation atomizer or spray atomizer, inside which there is a heating body. The said spray atomizer has a spray hole on it. The said spray hole is made of foamed ceramics, micro-porous ceramics, foamed metal, stainless steel fiber felt, or chemical fiber molding, which are drilled for holes. The said heating body is made of the micro-porous ceramics on which nickel-chromium alloy wire, iron-chromium alloy wire, platinum wire, or other electrothermal materials are wound. Alternatively, it may be a porous component made of electrically conductive ceramics or PTC ceramics and associated with a sintered electrode. The surface of the heating body is sintered into high-temperature glaze to fix the zeolite grains, which are made of natural zeolite, artificial non-organic micro-porous ceramics or aluminum oxide grains. The said cigarette bottle assembly includes the cigarette liquid bottle, fiber and suction nozzle.

The fiber containing cigarette liquid is located on one end of the cigarette liquid bottle, and this end is inserted into the secondary shell and lies against the atomizer. The suction nozzle is located on the other end of the cigarette liquid bottle. Between the fiber and interior wall of the cigarette liquid bottle is an air intake hole. The said cigarette liquid bottle and suction nozzle are made of non-toxic plastic. The said fiber is made of polypropylene or nylon. The cigarette liquid in the said fiber for atomization contains 0.1-3.5% nicotine, 0.05-5% tobacco flavor, 0.1-3% organic acid, 0.1-0.5% stabilizer, and propanediol for the remaining. The said sucker and its connecting structure may be loaded with conventional drugs for delivery to the lung.

This invention will bring the following benefits and active effects: For this invention, smoking doesn't bring any cigarette tar, considerably reducing the carcinogenic risks. At the same time, the smokers can still enjoy the feel and excitement of smoking, and there is no fire hazard since there is no need for igniting. In addition, the unit and its connecting structure of this invention may also be loaded with conventional drugs for delivery to the lung.

DESCRIPTION OF DRAWINGS

FIG. **1** is the visual appearance of the cigarette type of this invention.

FIG. **2**A is the diagram of one structure of the battery assembly of this invention.

FIG. **2**B is the diagram of another structure of the battery assembly of this invention.

FIG. **3** is the diagram of the diagram of the atomizer assembly of this invention.

FIG. **4** is the diagram of the cigarette bottle assembly of this invention.

FIG. **5**A is the diagram of one internal structure of this invention.

FIG. **5**B is the diagram of another internal structure of this invention.

FIG. **6** is the diagram of the structure of the charger of this invention.

FIG. **7** is the electric circuit diagram of MCU and MOSFET of this invention.

FIG. **8** is the diagram of the structure of the capillary impregnation atomizer of this invention.

FIG. **9** is the left view of FIG. **8**.

FIG. **10** is the diagram of the structure of the spray atomizer of this invention.

FIG. **11** is the left view of FIG. **10**.

FIG. **12** is the diagram of the structure of the cigar type of this invention.

SPECIFIC MODE FOR CARRYING OUT THE INVENTION

This invention is further described as follows on the basis of the drawings.

Example 1

As shown in FIG. **1**, the visual appearance of this invention is similar to a cigarette inserted into the cigarette holder, and includes a battery assembly, an atomizer assembly and a cigarette bottle assembly. An external thread electrode (**209**) is located in one end of the battery assembly, and an internal thread electrode (**302**) is located in one end of the atomizer assembly. The battery assembly and atomizer assembly are connected through the screwthread electrode into an emula-

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tion cigarette. The cigarette bottle assembly is inserted into the other end of atomizer assembly, to form one cigarette type emulation aerosol sucker.

As shown in FIG. **2A**, the battery assembly includes the indicator (**202**), lithium ion battery (**203**), MOSFET electric circuit board (**205**), sensor (**207**), silica gel corrugated membrane (**208**), primary screwthread electrode (**209**), primary negative pressure cavity (**210**), and primary shell (**211**). On one end of the primary shell (**211**) is an external thread electrode (**209**), while on the other end is an indicator (**202**), where there is an indicator cap (**201**) on one side, in which there is a fine hole (**501**). On the other side, the lithium ion battery (**203**) and MOSFET electric circuit board (**205**) are connected successively. The sensor (**207**) is located on MOSFET electric circuit board (**205**). Between the primary screwthread electrode (**209**) and sensor (**207**) is a silica gel corrugated membrane (**208**), on which there is the primary negative pressure cavity (**210**). The sensor (**207**) is connected with the silica gel corrugated membrane (**208**) through the switch spring (**212**).

Therein, the sensor (**207**) 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. The indicators (**202**) include two red LEDs. The lithium ion battery (**203**) may be either a rechargeable polymer lithium ion battery or a rechargeable lithium ion battery. The external thread electrode (**209**) is a gold-coated stainless steel or brass part with a hole drilled in the center. The silica gel corrugated membrane (**208**) may alternatively be made of fluorinated rubber, butyronitrile rubber, or elastic alloy film.

As shown in FIG. **3**, the atomizer assembly includes the internal thread electrode (**302**), air-liquid separator (**303**), atomizer (**307**) and the secondary shell (**306**). One end of the secondary shell (**306**) is inserted into the cigarette bottle assembly for connection, while the other end has an internal thread electrode (**302**), in which there is the secondary negative pressure cavity (**301**). The air-liquid separator (**303**) and the atomizer (**307**) are connected with the internal thread electrode (**302**) successively. On the secondary shell (**306**), there is an air intake hole (**502**). The air-liquid separator (**303**) is made of stainless steel or plastic with a hole drilled. The internal thread electrode (**302**) is a gold-coated stainless steel or brass part with a hole drilled in the center.

The atomizer (**307**) may be a capillary impregnation atomizer as FIGS. **8** and **9** show, or a spray atomizer as FIGS. **10** and **11** show. For this embodiment, it is a spray atomizer.

As shown in FIG. **4**, the cigarette bottle assembly includes the cigarette liquid bottle (**401**), fiber (**402**) and suction nozzle (**403**). The fiber (**402**) containing cigarette liquid is located on one end of the cigarette liquid bottle (**401**), and this end is inserted into the secondary shell (**306**) and lies against the atomizer (**307**). The suction nozzle (**403**) is located on the other end of the cigarette liquid bottle (**401**). Between the fiber (**402**) and interior wall of the cigarette liquid bottle (**401**) is an air intake hole (**503**).

As shown in FIG. **5A**, the standby state of this invention has the fully charged battery assembly shown on FIG. **2A** fastened onto the atomizer assembly shown on FIG. **3**, which is then inserted into the cigarette bottle assembly shown on FIG. **4**. When the user slightly sucks the suction nozzle (**403**), the negative pressure forms on the silica gel corrugated membrane (**208**) through the air intake hole (**503**) and the primary and secondary negative pressure cavities (**210**, **301**), and the silica gel corrugated membrane (**208**), under the action of suction pressure difference, distorts to drive the switch spring (**212**) and sensor (**207**), thus invoking MOSFET electric circuit board (**205**). At this moment, the indicators (**202**) are lit gradually; the lithium ion battery (**203**) electrifies the heating body (**305**) inside the atomizer (**307**) through MOSFET electric circuit board (**205**) as well as the internal and external thread electrodes (**302**, **209**), so that the heating body (**305**) inside the atomizer (**307**) produces heat. The fiber (**402**) inside the cigarette liquid bottle (**401**) contains cigarette liquid, which soaks the micro-porous ceramics (**801**) inside the atomizer through the fiber (**402**). The air enters through the air intake hole (**502**), passes through the run-through hole on the air-liquid separator (**303**), and helps to form air-liquid mixture in the spray nozzle (**304**) of the atomizer (**307**). The air-liquid mixture sprays onto the heating body (**305**), gets vaporized, and is quickly absorbed into the airflow and condensed into aerosol, which passes through the air intake hole (**503**) and suction nozzle (**403**) to form white mist type aerosol.

When suction stops, the switch spring (**212**) and sensor (**207**) are reset; the atomizer (**307**) stops working; the indicators (**202**) gradually die down. When the operation times reaches the pre-set value, the atomizer (**307**) provides a work delay of 5-20 seconds per time, so as to remove the micro-dirt accumulated on the heating body (**305**).

Besides the micro-porous ceramics, the liquid supply material of the atomizer (**307**) may also be foamed ceramics, micro-porous glass, foamed metal, stainless steel fiber felt, terylene fiber, nylon fiber, nitrile fiber, aramid fiber or hard porous plastics. The heating body (**305**) is made of the micro-porous ceramics on which nickel-chromium alloy wire, iron-chromium alloy wire, platinum wire, or other electrothermal materials are wound. Alternatively, it may be a porous component directly made of electrically conductive ceramics or PTC (Positive Temperature Coefficient) ceramics and associated with a sintered electrode. The surface of the heating body (**305**) is sintered into high-temperature glaze to fix the zeolite grains, which are made of natural zeolite, artificial non-organic micro-porous ceramics or aluminum oxide grains. The cigarette liquid bottle (**401**) and suction nozzle (**403**) in the cigarette bottle assembly are made of non-toxic plastic, and inside them is the fiber (**402**) made of polypropylene fiber or nylon fiber to absorb cigarette liquid. In the battery assembly, there is a fine hole (**501**) on the indicator cap (**201**) for balancing the pressure difference on both sides of the silica gel corrugated membrane (**208**).

The cigarette liquid contains 0.1-3.5% nicotine, 0.05-5% tobacco flavor, 0.1-3% organic acid, 0.1-0.5% stabilizer, and propanediol for the remaining.

The primary and secondary shell (**211**, **306**) of this invention are made of stainless steel tube or copper alloy tube with baked-enamel coating of real cigarette color.

As shown in FIG. **12**, this invention may have the diameter of the battery assembly increased in proportion, so that it is consistent with the diameter of the atomizer assembly. Its shell may be decorated with the leaf veins and sub-gloss brown-yellow baked-enamel coating, to create a cigar type emulation aerosol sucker.

For charging of the lithium ion battery (**203**) of this invention, the screwthread electrode (**601**) that matches the external thread electrode (**209**) on the battery assembly may be used as the charging interface.

Example 2

As shown in FIG. **2B**, the differences of this example from example 1 are as follows: MCU (**206**) is added between MOSFET electric circuit board (**205**) and sensor (**207**). On

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the surface of the primary shell (**211**), there is a screen (**204**) for display of the power of the lithium ion battery (**203**) and the sucking times.

As shown in FIG. **5**B, the standby state of this invention has the fully charged battery assembly shown on FIG. **2**B fastened onto the atomizer assembly, which is then inserted into the cigarette bottle assembly shown on FIG. **4**. When the user slightly sucks the suction nozzle (**403**), the negative pressure forms on the silica gel corrugated membrane (**208**) through the air intake hole (**503**) and the primary and secondary negative pressure cavities (**210**, **301**), and the silica gel corrugated membrane (**208**), under the action of suction pressure difference, distorts to drive the switch spring (**212**) and sensor (**207**), thus invoking MCU (**206**) and MOSFET electric circuit board (**205**). At this moment, the indicators (**202**) are lit gradually; the lithium ion battery (**203**) electrifies the heating body (**305**) inside the atomizer (**307**) through MOSFET electric circuit board (**205**) as well as the internal and external thread electrodes (**302**, **209**), so that the heating body (**305**) inside the atomizer (**307**) produces heat. The fiber (**402**) inside the cigarette liquid bottle (**401**) contains cigarette liquid, which soaks the micro-porous ceramics (**801**) inside the atomizer through the fiber (**402**). The air enters through the air intake hole (**502**), passes through the run-through hole on the air-liquid separator (**303**), and helps to form air-liquid mixture in the spray nozzle (**304**) of the atomizer (**307**). The air-liquid mixture sprays onto the heating body (**305**), gets vaporized, and is quickly absorbed into the airflow and condensed into aerosol, which passes through the air intake hole (**503**) and suction nozzle (**403**) to form white mist type aerosol.

As shown in FIG. **7**, when the action of suction evokes the sensor, MCU (**206**) scans the sensor (**207**) in the power-saving mode of pulse, and according to the signal parameters of the sensor (**207**), restricts the atomizing capacity with the integral function of frequency to single operation time. Also, the MCU (**206**) accomplishes the pulse width modulation and over discharging protection for the constant power output, automatic cleansing for thousands of times per operation, step lighting/dying down control of the indicator, display of the operation times and battery capacity, automatic recovery after sensor malfunction shutdown, etc.

The unit and its connecting structure of this invention may also be loaded with drugs for delivery to the lung.

Above are just specifications of a concrete example and applied example of this invention. This doesn't necessarily restrict the scope of protection of this invention. Any equivalent modification or decoration made on the basis of the design spirit of this invention shall fall into the scope of protection of this invention.

The invention claimed is:

1. An electronic cigarette or cigar comprising:

a battery assembly comprising a battery assembly housing having a first end and a second end, with a battery, a micro-controller unit (MCU) and a sensor electrically connected to a circuit board within the battery assembly housing;

a primary screwthread electrode located on the first end of the battery assembly housing and having a hole through its center;

an atomizer assembly comprising:

an atomizer assembly housing having a first end and a second end;

an atomizer, and a solution storage area in the atomizer assembly housing;

a secondary screwthread electrode located on the second end of the atomizer assembly housing and having a hole through its center, the battery assembly and the atomizer assembly connected through the primary and secondary screwthread electrodes; and

with the atomizer including a heater coil wound around a porous component.

2. The electronic cigarette or cigar of claim **1**, with the solution storage area in the solution assembly having a first end and a second end, and the second end of the solution assembly is inserted into the first end of the atomizer assembly housing.

3. The electronic cigarette or cigar of claim **1**, wherein the primary screwthread electrode is an external screwthread electrode and the secondary screwthread electrode is an internal screwthread electrode.

4. The electronic cigarette or cigar of claim **1**, wherein the battery assembly further comprises a membrane located between the primary screwthread electrode and the sensor.

5. The electronic cigarette or cigar of claim **1**, further comprising a screen located on a surface of the battery assembly housing.

6. The electronic cigarette or cigar of claim **1**, wherein the sensor comprises a switch sensor, a Hall element, a semiconductor force-sensitive chip, a semiconductor matrix thermoelectric bridge chip, a capacitance sensor or an inductance sensor.

7. The electronic cigarette or cigar of claim **1**, wherein the atomizer assembly has an air intake hole at the secondary screwthread electrode.

8. The electronic cigarette or cigar of claim **1** further comprising a fiber material within the solution storage area.

9. The electronic cigarette or cigar of claim **1** with the porous component that the heater coil is wound around comprising a fiber material.

10. An electronic cigarette or cigar comprising:

a battery assembly housing having a first end and second end;

a battery connected to a circuit board within the battery assembly housing;

a primary screwthread electrode located on the first end of the battery assembly housing;

an atomizer assembly comprising:

an atomizer assembly housing having a first end and a second end;

a secondary screwthread electrode located on the second end of the atomizer assembly housing with the battery assembly and the atomizer assembly connected through the primary and secondary screwthread electrodes;

an atomizer in the atomizer assembly housing, with atomizer including a heater coil wound around a porous component; and

a solution assembly, which comprises, a suction nozzle at a first end of the solution assembly, and a solution storage area with a liquid containing fiber material in the solution storage area.

11. The electronic cigarette or cigar of claim **10** with the porous component that the heater coil is wound around comprising a fiber material.

12. The electronic cigarette or cigar of claim **10**, wherein the second end of the solution assembly is inserted into the first end of the atomizer assembly, thus forming a cigarette or cigar body.

13. The electronic cigarette or cigar of claim **10**, wherein the circuit board is a Metallic Oxide Semiconductor Field Effect Transistor (MOSFET) circuit board.

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14. The electronic cigarette or cigar of claim 10, wherein the primary screwthread electrode is an external screwthread electrode and the secondary screwthread electrode is an internal screwthread electrode.

15. The electronic cigarette or cigar of claim 10, wherein the battery assembly further comprises a membrane located between the primary screwthread electrode and the sensor.

16. The electronic cigarette or cigar of claim 10, wherein the battery assembly further comprises a micro controller unit (MCU) electrically connected to the circuit board.

17. The electronic cigarette or cigar of claim 10, wherein the atomizer assembly has an air intake hole.

18. The electronic cigarette or cigar of claim 17, wherein the air intake hole is at the secondary screwthread.

19. The electronic cigarette or cigar of claim 10 wherein the coil comprises nickel-chromium alloy wire, iron-chromium alloy wire, platinum wire or another electrothermal material.

20. The electronic cigarette or cigar of claim 10 wherein the heating element comprises a plurality of zeolite grains.

21. The electronic cigarette or cigar of claim 10, wherein the primary screwthread electrode connects to a charger.

22. The electronic cigarette or cigar of claim 10 with at least one of the primary and the secondary screwthread electrodes having a hole through its center.

23. An electronic cigarette comprising:

battery assembly including a battery assembly housing having a front end and a back end, with a battery, a micro-controller unit (MCU) and a sensor electrically connected to a circuit board within the battery assembly housing;

a first screwthread electrode located on the back end of the battery assembly housing;

an atomizer assembly comprising:

an atomizer assembly housing having a front end and a back end;

an atomizer, and a solution storage area in the atomizer assembly housing;

a second screwthread electrode located on the front end of the atomizer assembly housing, the battery assembly and the atomizer assembly connected through the first and second screwthread electrodes; and

with the atomizer including a heater coil wound around a porous component.

24. The electronic cigarette of claim 23 with the solution storage area within a solution assembly, and with a front end of the solution assembly inserted into the back end of the atomizer assembly.

* * * * *

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UNITED STATES PATENT AND TRADEMARK OFFICE

CERTIFICATE OF CORRECTION

PATENT NO.	: 8,375,957 B2
APPLICATION NO.	: 12/226819
DATED	: February 19, 2013
INVENTOR(S)	: Lik Hon

It is certified that error appears in the above-identified patent and that said Letters Patent is hereby corrected as shown below:

On the Title page of the patent, between (65) and (51), insert

-- (30) Foreign Application Priority Data

May 16, 2006 (CN) ..... 200620090805 U --.

In the Claims:

In column 6, line 37, in claim 10, before "second" insert -- a --.

In column 8, line 2, in claim 23, before "battery assembly including" insert -- a --.

Signed and Sealed this
Second Day of July, 2013

Teresa Stanek Rea

Teresa Stanek Rea
Acting Director of the United States Patent and Trademark Office

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December 21, 2016

THIS IS TO CERTIFY THAT ANNEXED HERETO IS A TRUE COPY FROM THE RECORDS OF THIS OFFICE OF:

U.S. PATENT: ***8,393,331***
ISSUE DATE: ***March 12, 2013***

By Authority of the
Under Secretary of Commerce for Intellectual Property
and Director of the United States Patent and Trademark Office

R. BLAKENEY
Certifying Officer

US008393331B2

(12) **United States Patent**
Hon

(10) **Patent No.: US 8,393,331 B2**
(45) **Date of Patent: *Mar. 12, 2013**

(54) **ELECTRONIC ATOMIZATION CIGARETTE**

(75) Inventor: **Lik Hon**, Hong Kong (CN)

(73) Assignee: **Ruyan Investment (Holdings) Limited**, Tortola (VG)

(*) Notice: Subject to any disclaimer, the term of this patent is extended or adjusted under 35 U.S.C. 154(b) by 0 days.

This patent is subject to a terminal disclaimer.

(21) Appl. No.: **12/944,123**

(22) Filed: **Nov. 11, 2010**

(65) **Prior Publication Data**

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Related U.S. Application Data

(63) Continuation of application No. 10/587,707, filed as application No. PCT/CN2005/000337 on Mar. 18, 2005, now Pat. No. 7,832,410.

(51) **Int. Cl.**
A24F 1/22 (2006.01)

(52) **U.S. Cl.** **131/194**; 131/270; 131/273; 128/202.21

(58) **Field of Classification Search** 131/270–273, 131/194; 128/200.14, 202.21
See application file for complete search history.

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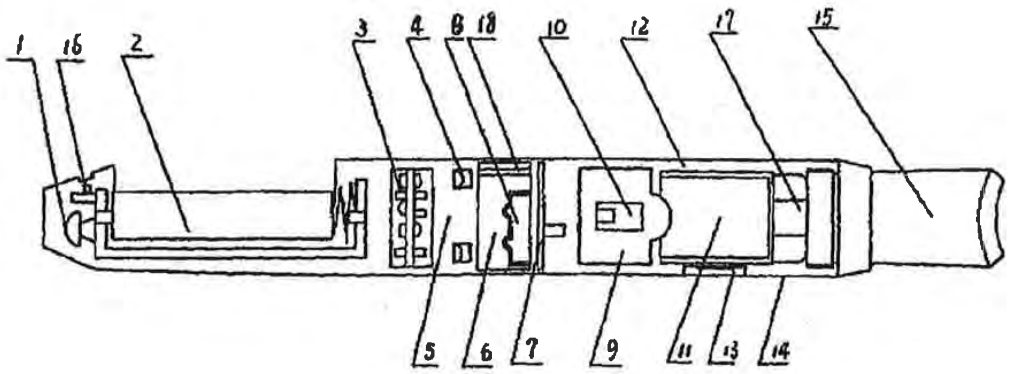
(74) *Attorney, Agent, or Firm* — Perkins Coie LLP

(57) **ABSTRACT**

An electronic cigarette includes a shell and a mouthpiece. The external wall of the shell has an air inlet. An atomizer and a liquid-supply are in contact with each other. The air inlet, atomizer, an aerosol passage, and a mouthpiece are sequentially interconnected.

5 Claims, 5 Drawing Sheets



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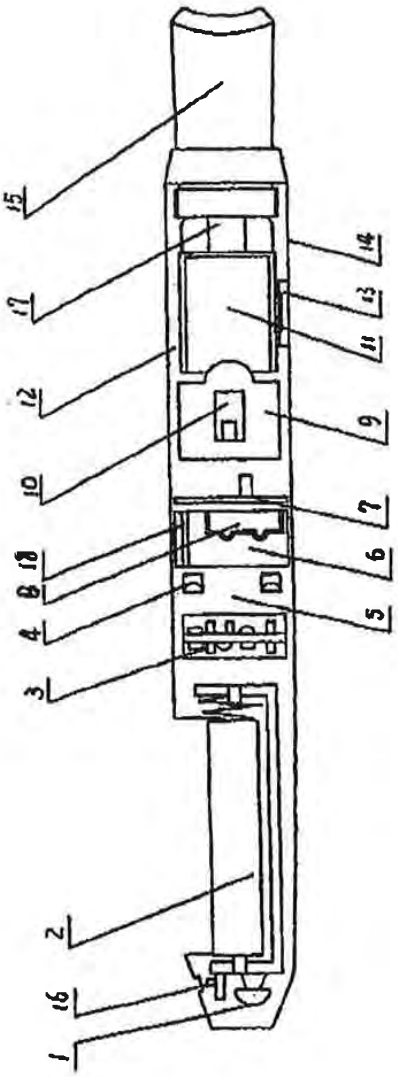

Fig. 1

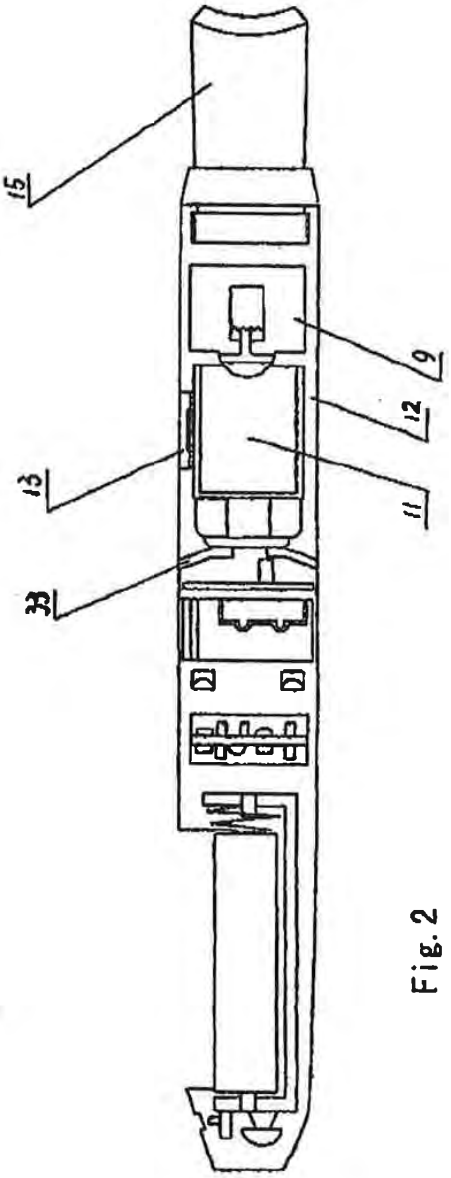

Fig. 2

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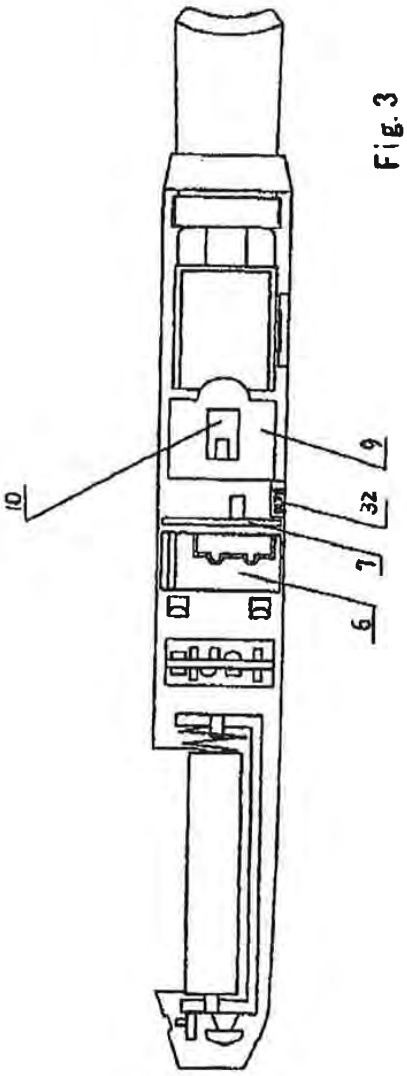

Fig. 3

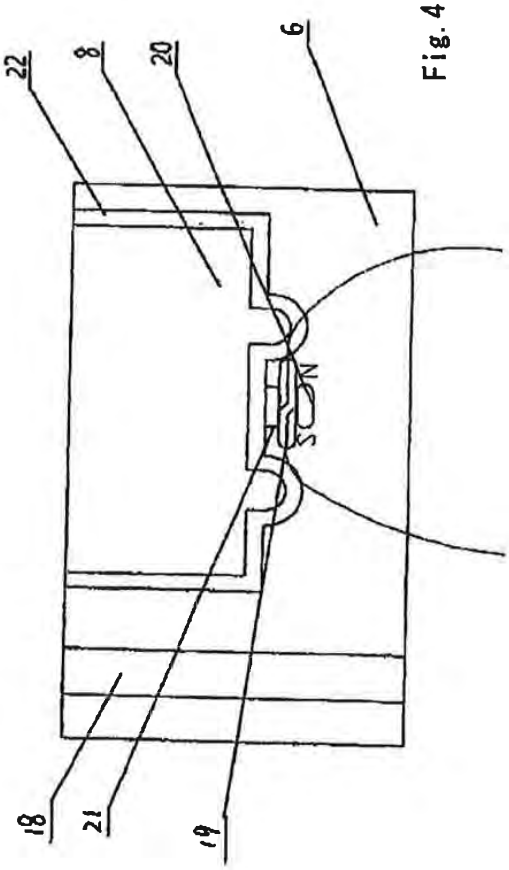

Fig. 4

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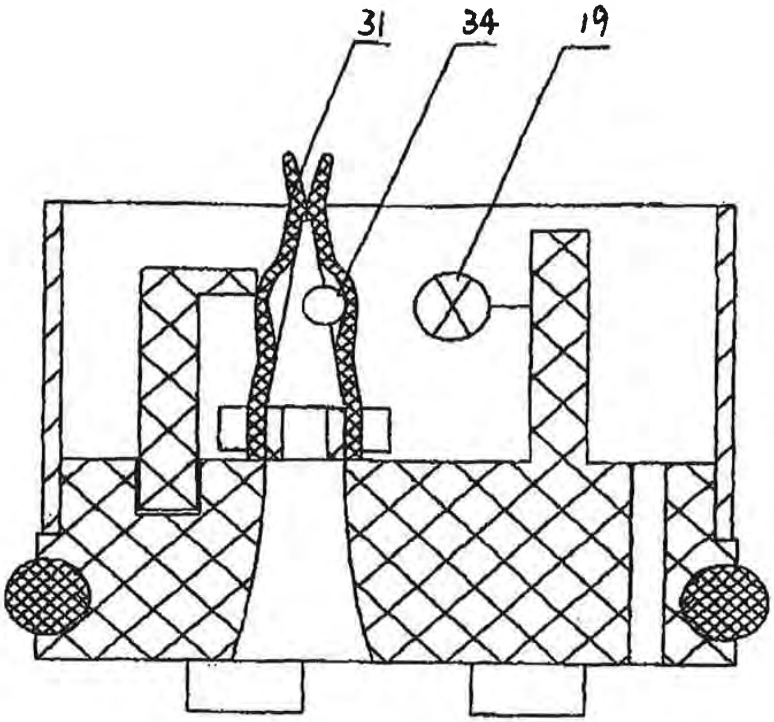

Fig. 5

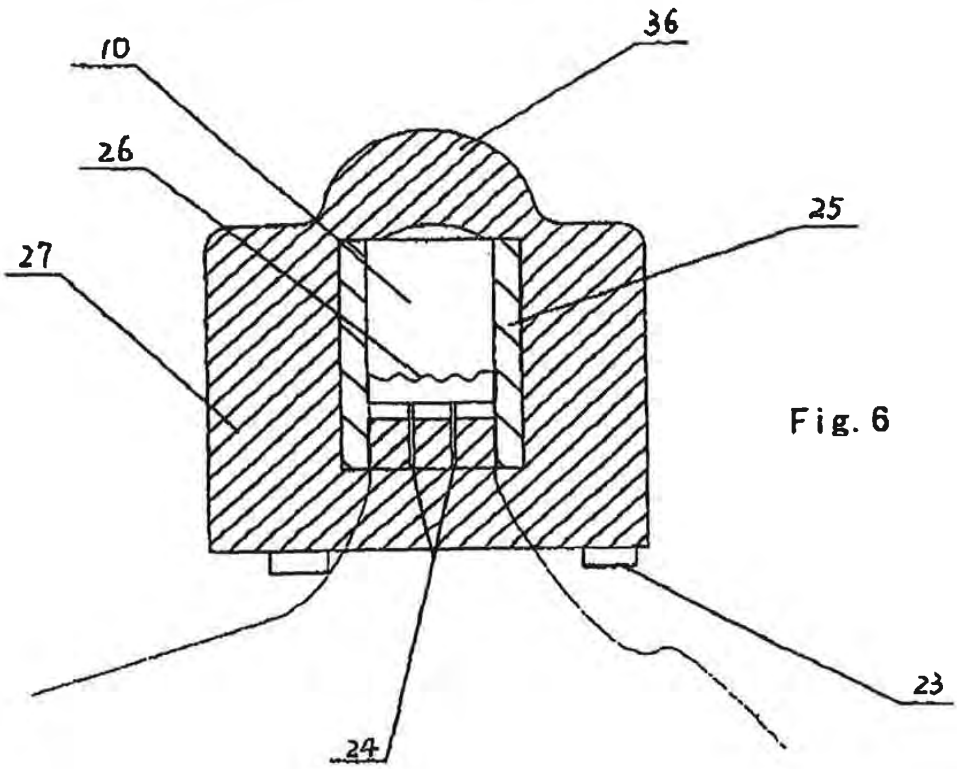

Fig. 6

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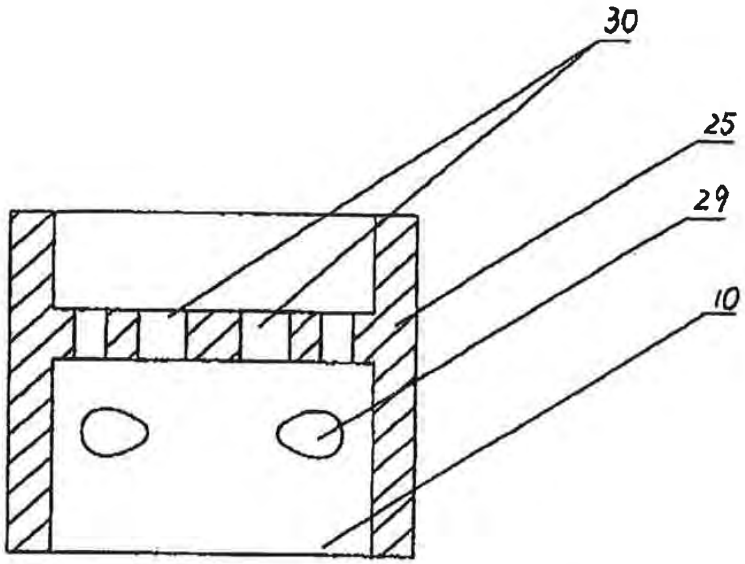

Fig. 7

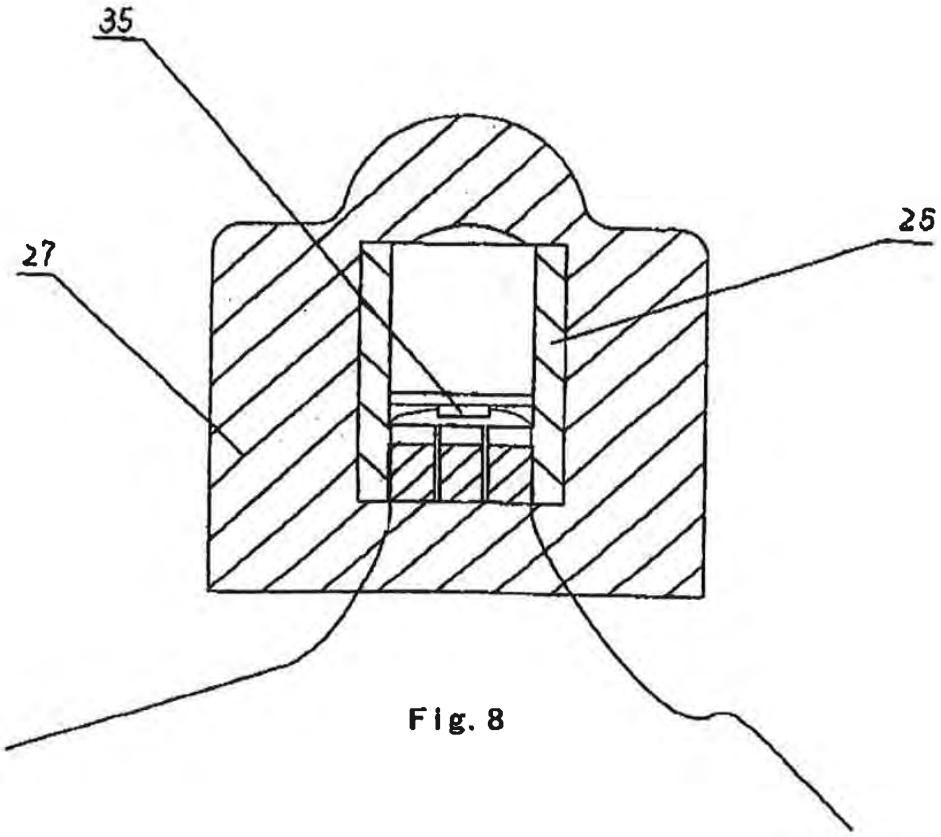

Fig. 8

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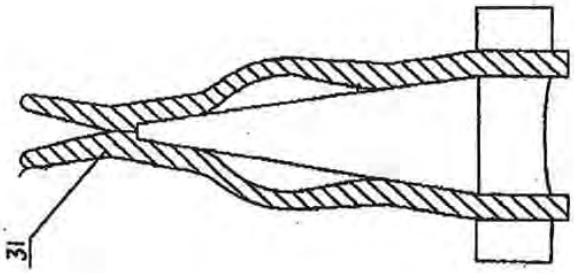

Fig. 10

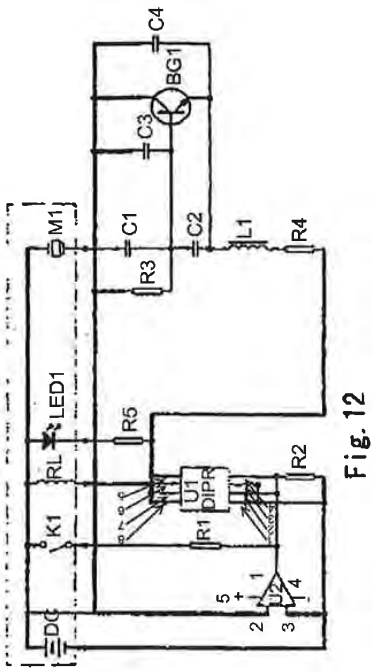

Fig. 12

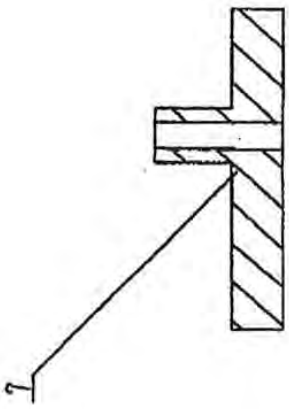

Fig. 9

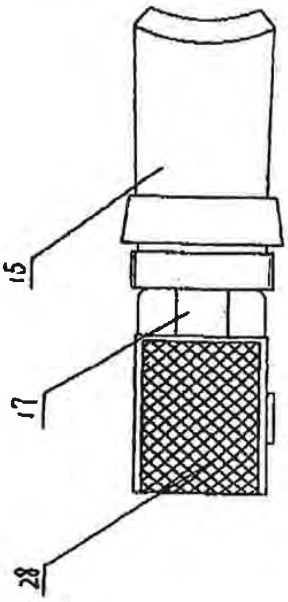

Fig. 11

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ELECTRONIC ATOMIZATION CIGARETTE

CROSS REFERENCE TO RELATED APPLICATIONS

This application is a continuation of U.S. patent application Ser. No. 10/587,707, filed Mar. 9, 2007, now U.S. Pat. No. 7,832,410B2 which claims the benefit of International PCT Application No. PCT/CN05/00337, filed Mar. 18, 2005, which claims the benefit of Chinese Patent Application No. 20040031182.0, filed Apr. 14, 2004, all of which are incorporated herein by reference in their entirety.

TECHNICAL FIELD

The present invention relates to an electronic cigarette, in particular to an electronic atomization cigarette that contains only nicotine without tar.

BACKGROUND ART

Although it is commonly known that "smoking is harmful to your health", the number of smokers worldwide is up to 1 billion, and the number is increasing every year. According to the statistical data from the World Health Organization, about 4.9 million people die of smoking diseases each year. Although smoking may cause serious respiratory diseases and cancer, it remains extremely difficult for smokers to quit smoking completely.

The active ingredient in a cigarette is nicotine. During smoking, nicotine, along with tar aerosol droplets, enter the smoker's alveolus and are rapidly absorbed. The nicotine then affects the receptors of the smoker's central nervous system.

Nicotine is a kind of alkaloid with low molecular weight. A small dose of nicotine is essentially harmless to human body and its half-life in blood is quite short. The major harmful substance in tobacco is tar. Tar in tobacco is composed of thousands of ingredients. Several of these are cancerogenic.

Some cigarette substitutes that contain only nicotine without tar have been proposed. Many of them, such as "nicotine patch", "nicotine mouthwash", "nicotine chewing gum", "nicotine drink" etc., are made of pure nicotine. Although these cigarette substitutes are free from tar, their major disadvantage is that an effective peak concentration can not be reached in the blood of a smoker due to slow absorption of nicotine In addition, these cigarette substitutes can not satisfy habitual smoking actions of a smoker, for example, inhaling action, and thus are not likely to be widely accepted as effective substitutes for smoking.

THE SUMMARY OF THE INVENTION

An electronic atomization cigarette that functions as substitutes for quitting smoking and cigarette substitutes includes a shell; a mouthpiece; an air inlet provided in the external wall of the shell; an electronic circuit board, a normal pressure cavity, a sensor, a vapor-liquid separator, an atomizer, and a liquid-supply arranged sequentially within the shell. A stream passage is provided on one side of the sensor. A negative pressure cavity provided in the sensor. An atomization cavity is arranged in the atomizer. The electronic circuit board comprises an electronic switching circuit and a high frequency generator. The liquid-supply is in contact with the atomizer.

With slight modification of the solution storage container, the device and connecting structures of the present invention can be filled with conventional drug for pulmonary administration apparatus.

DESCRIPTION OF THE DRAWINGS

FIG. **1** is a schematic diagram of an overall structure;

FIG. **2** is a schematic diagram of another overall structure;

FIG. **3** is a schematic diagram of a overall structure with a display screen;

FIG. **4** is a structural diagram of a sensor;

FIG. **5** is a structural diagram of a sensor with a silicon gel check valve;

FIG. **6** is a structural diagram of an atomizer;

FIG. **7** is a structural diagram of the ceramic member in an atomizer;

FIG. **8** is a structural diagram of another atomizer;

FIG. **9** is a structural diagram of a vapor-liquid separator;

FIG. **10** is a structural diagram of another vapor-liquid separator;

FIG. **11** is a structural diagram of the connection of a liquid-supplying bottle and a mouthpiece;

FIG. **12** is a functional diagram of a circuit.

DETAILED DESCRIPTION OF THE INVENTION

The present invention is further described below with reference to the accompanying drawings.

Embodiment 1

As shown in FIG. **1**, an air inlet **4** is provided on the external wall of the shell **14**. A LED **1**, a cell **2**, an electronic circuit board **3**, a normal pressure cavity **5**, a sensor **6**, a vapor-liquid separator **7**, an atomizer **9**, a liquid-supplying bottle **11** and a mouthpiece **15** are sequentially provided within the shell **14**. The electronic circuit board **3** comprises an electronic switching circuit and a high frequency generator.

As shown in FIG. **4**, a negative pressure cavity **8** is provided in the sensor **6** and is separated from the sensor **6** by a film **22** A first magnetic steel **20**, a second magnetic steel **21** and a Reed switch **19** arranged between them is also provided within the sensor **6**. The second magnetic steel **21** is attached to the film **22**. The atomizer **9** is in contact with the liquid-supplying bottle **11** via the bulge **36**, and the atomization cavity **10** is provided in the atomizer **9**.

As shown in FIGS. **6** and **7**, the overflow hole **29** is provided on the wall **25** of the atomization cavity **10**. A heating element **26**, which can be made of platinum wire, nickel chromium alloy or iron chromium aluminum alloy wire with rare earth element, is provided within the cavity, and can also be made into a sheet form with conductive ceramics or PTC ceramics. An ejection hole is provided on the side opposite to the heating element **26**. The ejection hole can be determined to select either the long stream ejection hole **24** or the short stream ejection hole **30**, depending on the material used for the atomization cavity wall **25**. The long stream ejection hole **24** can employ slot structure of 0.1 mm-1.3 mm or circular hole structure with a single and multiple holes. The short stream ejection hole **30** has the diameter of about 0.3 mm-1.3 mm.

The 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. A first piezoelectric element **23** is also provided on the atomizer **9**. The atomization cavity wall **25** can be made of

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aluminum oxide or ceramic. As shown in FIG. **9**, a through hole is provided on the vapor-liquid separator **7**, and can be made of plastic or silicon rubber. As shown in FIG. **2**, a retaining ring **13** for locking the liquid-supplying bottle **11** is provided between one side of the liquid-supplying bottle **11** and the shell **14**. An aerosol passage **12** is provided on the other side of the liquid-supplying bottle.

As shown in FIG. **11**, the solution storage porous body **28** is provided in the liquid-supplying bottle, and can be filled with polypropylene fiber, terylene fiber or nylon fiber, or be filled with plastic 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 air inlet **4**, normal pressure cavity **5**, vapor-liquid separator **7**, atomizer **9**, aerosol passage **12**, gas vent **17**, mouthpiece **15** are sequentially interconnected.

As shown in the functional diagram of the circuit in FIG. **12**, K1 refers to the Reed switch **19**, RL refers to the heating element **26**, LED1 refers to the Light Emitting Diode **1**, U2 refers to the low voltage detecting element used for the over-discharging protection of the lithium cell, M1 refers to the first piezoelectric element **23**, and C1, C2, R3, L1, C3, BG, M1 collectively constitute a Colpitts oscillator. The operating principle of the circuit is as follows: when K1 is closed, U1, i.e., the field effect power transistor, is turned on, RL starts, and the Colpitts oscillator starts oscillating, M1 will provide the high frequency mechanical oscillatory wave to the atomizer **9**.

When 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** causes the sensor **6** to output an actuating signal, the electronic circuit board **3** connected therewith goes into operation. Now the ripple film **22** in the sensor **6** is deformed to take the second magnetic steel **21** away from the Reed switch **19**. The Reed switch **19** is then closed (i.e., K1 is closed) under the effect of the excessive magnetic line of force from the first magnetic steel **20**, starting the field effect power transistor electronic switch (i.e., U1 is opened). The high frequency oscillator may uses the Colpitts oscillator with the frequency of 550 KHz-8 MHz. The automatic fine-adjusting element in the circuit resonates with the first piezoelectric element **23**. The LED **1** can be lit under the supply of the rechargeable battery **2**.

Air enters the normal pressure cavity **5** through the air inlet **4**, passes through the air passage **18** of the sensor and then the through hole in the vapor-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 droplets, 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 droplets with large diameters stick to the wall under the action of eddy flow and are reabsorbed by the porous body **27** via the overflow hole **29**. Droplets with small diameters float in stream and form 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** is 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 sensor ripple film.

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 connection of the whole electronic atomization cigarette is the same as the embodiment 1. In addition, as shown FIG. **8**, the first piezoelectric element **23** and the heating element **26** in the atomizer **9** can be omitted, an additional second piezoelectric element **35** in the form of platen with a single layer or multiple laminated layers can be arranged in the atomization cavity, and the stream passing through the ejection hole vibrates the focus at 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 silicon gel check valve **31**. During smoking, the stream comes into the silicon gel check valve **31**, the air pressure increases and the air expands, the third magnetic steel **34** in the valve approaches the Reed switch **19** gradually until the Reed switch is closed and the circuit is turned on, and the air outlet of the silicon gel check valve **31** is opened with the increment of the air pressure difference. The Reed switch **19** can also be made of Hall device or magneto diode or magneto triode instead.

Embodiment 2

As shown in FIG. **2**, to improve the liquid-supplying state, the liquid-supplying bottle **11** is arranged between the vapor-liquid separator **7** and the atomizer **9**. A spring piece **33** for pressing the liquid-supplying bottle **11** on the atomizer **9** is provided on one end of the liquid-supplying bottle **11**. Other components and their functions are the same as those in the embodiment 1.

On the inner wall of the shell **14** of the electronic atomization cigarette described in the embodiment 1 and 2, a digital display screen **32** for showing the smoking times per day and the cell capacity can be also provided. The sensor **6** uses a linear signal output, which is proportional to the suction force (i.e., the stronger one sucks, the longer the time of operation is), the atomizer **9** operates in the linear mode, thereby simulating a cigarette that looks like a normal cigarette.

Within the shell **14**, the microswitch **16** is connected to the sensor **6** in parallel and used for manually cleaning. When users do not smoke, they press the microswitch **16** to start the sensor **6** connected therewith in parallel, or clean the residue or other impurity substance within the shell **14**.

The nicotine solution for atomization contains 0.4-3.5% nicotine, 0.05-2% cigarette essence, 0.1-3.1% organic acid, 0.1-0.5% anti-oxidation agent, and the rest is 1,2-propylene glycol.

The invention claimed is:

1. An electronic cigarette comprising;

a housing;

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a mouth piece on the housing;
an LED at a first end of the housing;
an air inlet leading into the housing;
a battery within the housing;
an electronic circuit board within the housing;
a sensor within the housing;
an atomizer within the housing;
a stream passage within the housing leading from the inlet to the atomizer;
a cavity arranged in the atomizer;
a liquid-supply within the housing; and
an aerosol passage leading from the atomizer to the mouthpiece; and
with the liquid-supply in physical contact with the atomizer; and
a heating element within the cavity.

2. An electronic cigarette, comprising:
a housing;
a mouthpiece on the housing;
an LED at a first end of the housing;
an air inlet for providing air into the housing;
a battery and a sensor electrically connected to an electronic circuit board within the housing, with the sensor in a stream passage in the housing;
an atomizer within the housing, with the atomizer having a heating element within a cavity, and with the atomizer making contact with a liquid-supply, to provide for movement of liquid to the atomizer via capillary action; and
an aerosol passage extending from the atomizer to the mouthpiece.

3. The electronic cigarette of claim **2** with the heating element comprising platinum wire, nickel chromium alloy or iron chromium aluminum wire with a rare earth element.

4. The electronic cigarette of claim **2** wherein the heating element comprises a wire coil.

5. The electronic cigarette of claim **2** with the liquid-supply comprising a porous body.

* * * * *

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EXHIBIT C

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December 21, 2016

THIS IS TO CERTIFY THAT ANNEXED HERETO IS A TRUE COPY FROM THE RECORDS OF THIS OFFICE OF:

U.S. PATENT: ***8,863,752***
ISSUE DATE: ***October 21, 2014***

By Authority of the
Under Secretary of Commerce for Intellectual Property
and Director of the United States Patent and Trademark Office

R. BLAKENEY
Certifying Officer

US008863752B2

(12) **United States Patent**
Hon

(10) **Patent No.: US 8,863,752 B2**
(45) **Date of Patent: *Oct. 21, 2014**

(54) **ELECTRONIC CIGARETTE**

(71) Applicant: **Fontem Holdings 1 B.V.**, Amsterdam (NL)

(72) Inventor: **Lik Hon**, North Point (HK)

(73) Assignee: **Fontem Holdings 1 B.V.**, Amsterdam (NL)

(*) Notice: Subject to any disclaimer, the term of this patent is extended or adjusted under 35 U.S.C. 154(b) by 0 days.

This patent is subject to a terminal disclaimer.

(21) Appl. No.: **13/915,427**

(22) Filed: **Jun. 11, 2013**

(65) **Prior Publication Data**

US 2013/0276798 A1 Oct. 24, 2013

Related U.S. Application Data

(63) Continuation of application No. 13/754,521, filed on Jan. 30, 2013, which is a continuation of application No. 12/226,819, filed as application No. PCT/CN2007/001576 on May 15, 2007, now Pat. No. 8,375,957.

(51) **Int. Cl.**
A24F 1/32 (2006.01)
A24F 47/00 (2006.01)

(52) **U.S. Cl.**
CPC ***A24F 47/002*** (2013.01); ***A24F 47/004*** (2013.01); ***A24F 47/008*** (2013.01)
USPC **131/194**; 131/270; 128/202.21

(58) **Field of Classification Search**
USPC 131/194, 270
See application file for complete search history.

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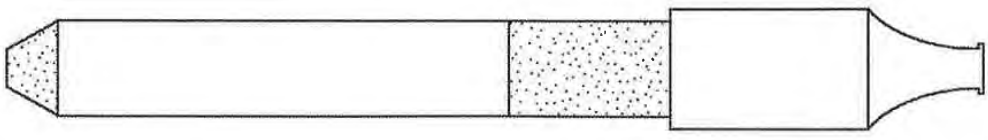
(74) *Attorney, Agent, or Firm* — Kenneth H. Ohriner; Perkins Coie LLP

(57) **ABSTRACT**

An electronic cigarette includes a battery assembly, an atomizer assembly and a cigarette bottle assembly. An external thread electrode is located in one end of battery assembly. An internal thread electrode is located in one end of atomizer assembly. The battery assembly and the atomizer assembly are connected by the screwthread electrode. The cigarette bottle assembly is inserted into the other end of the atomizer assembly and both form a cigarette type or cigar type body.

20 Claims, 10 Drawing Sheets



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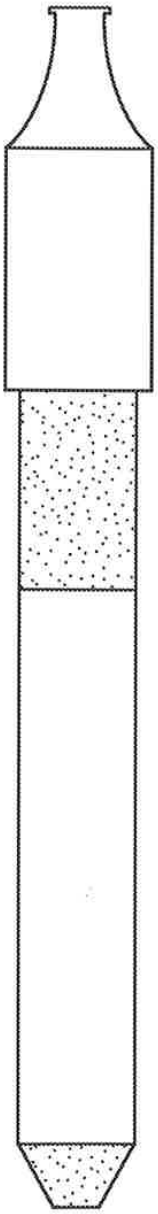

Figure 1

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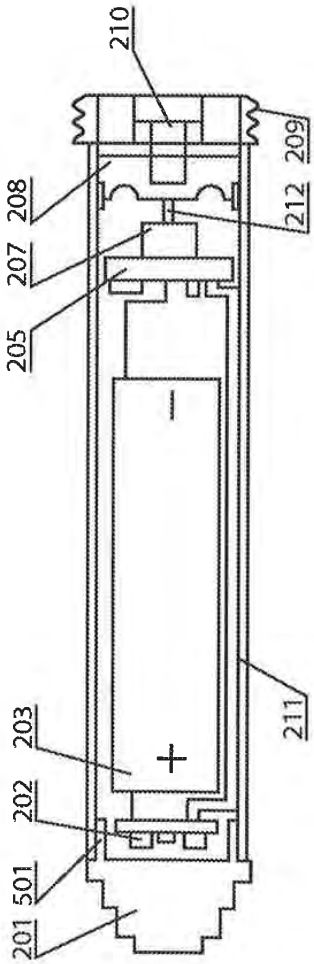

Figure 2A

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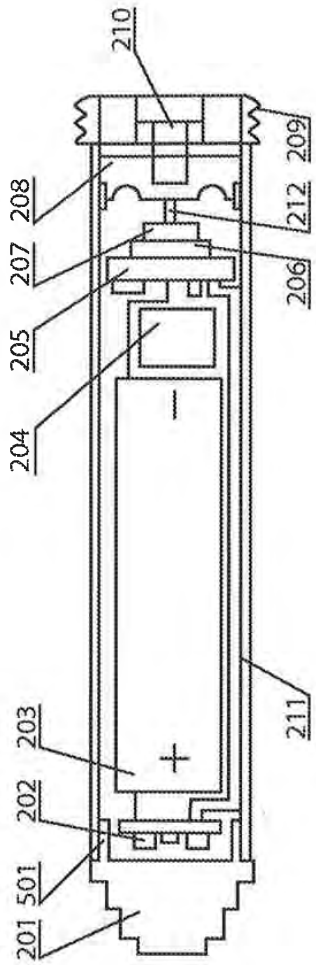

Figure 2B

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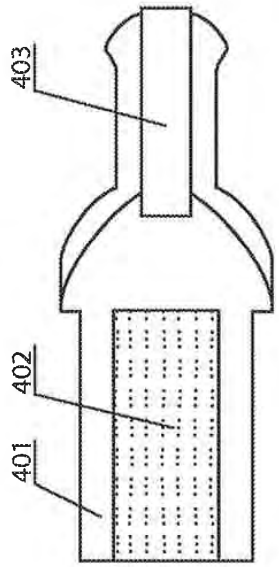

Figure 4

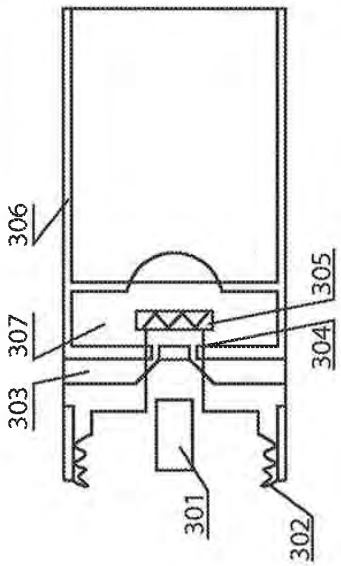

Figure 3

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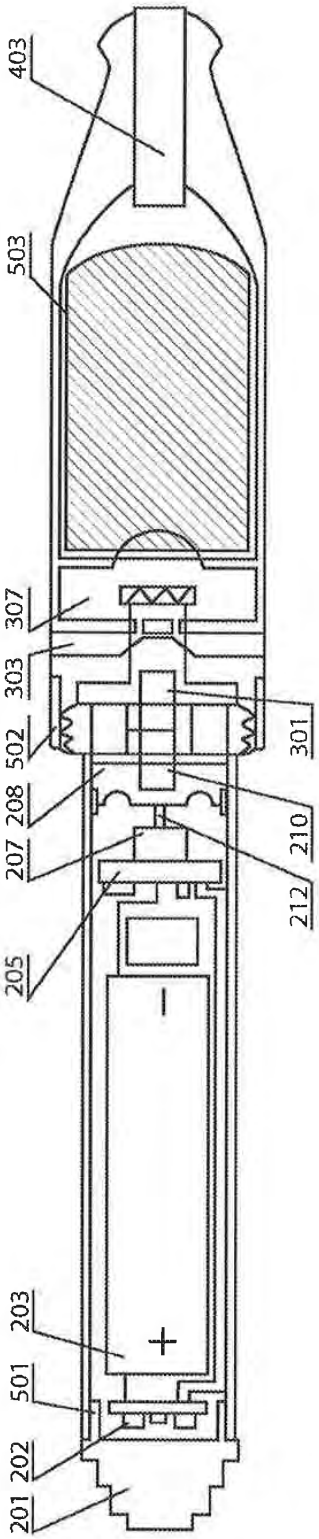

Figure 5A

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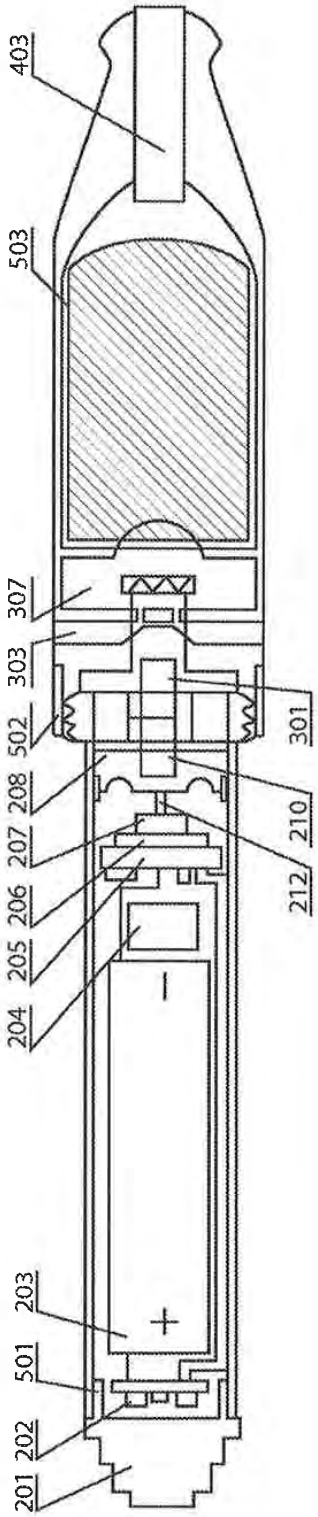

Figure 5B

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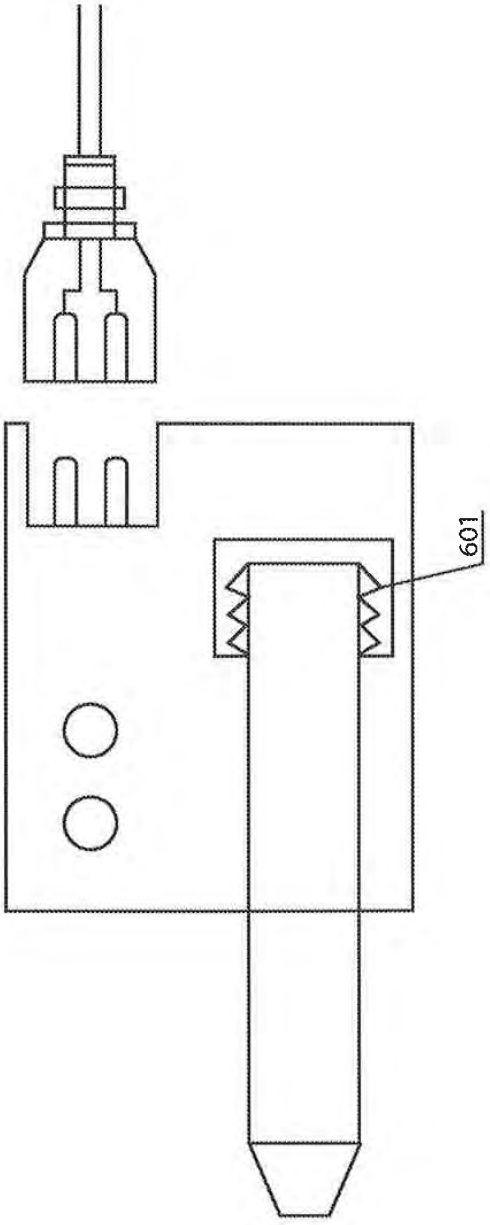

Figure 6

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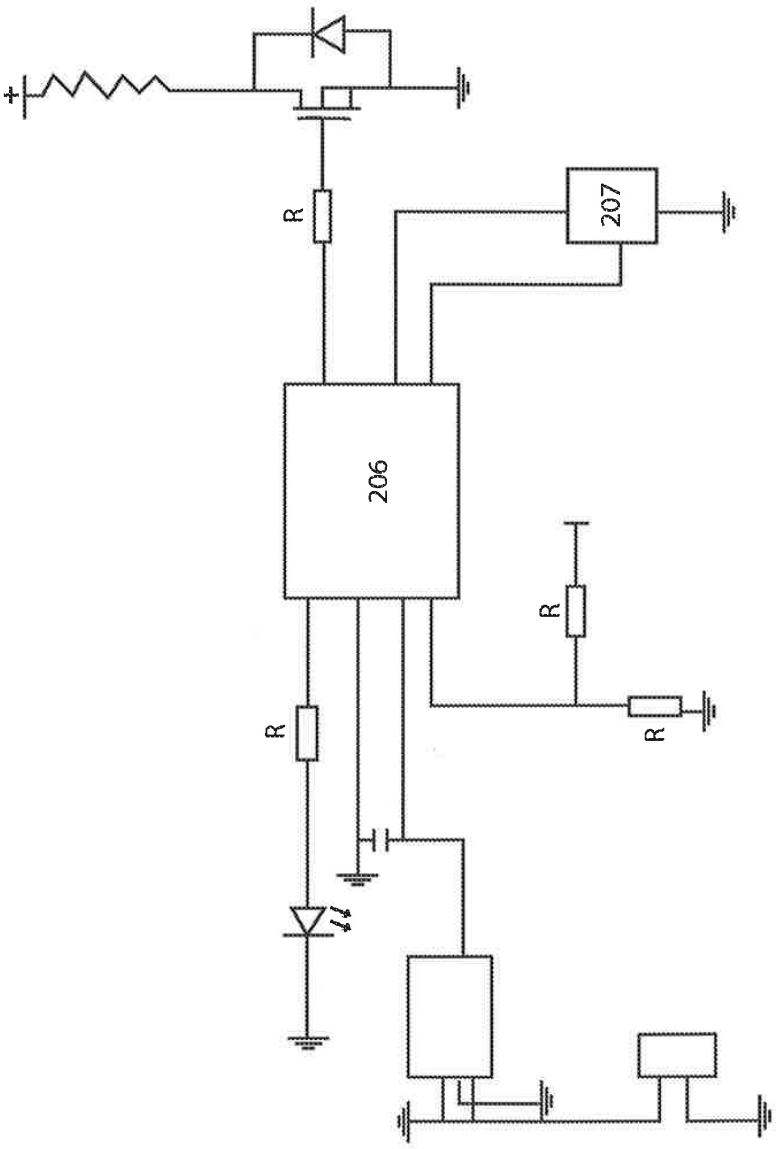

Figure 7

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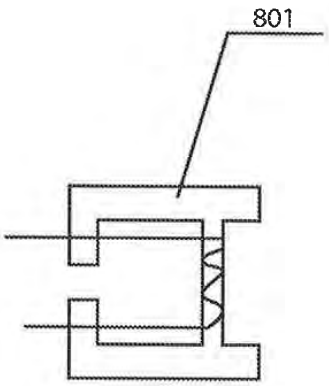

Figure 8

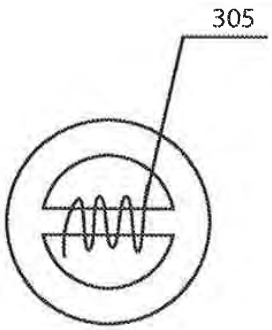

Figure 9

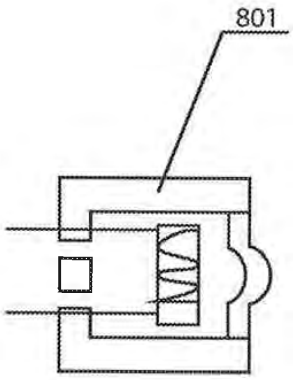

Figure 10

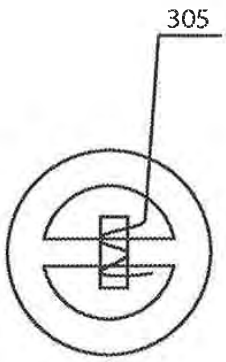

Figure 11

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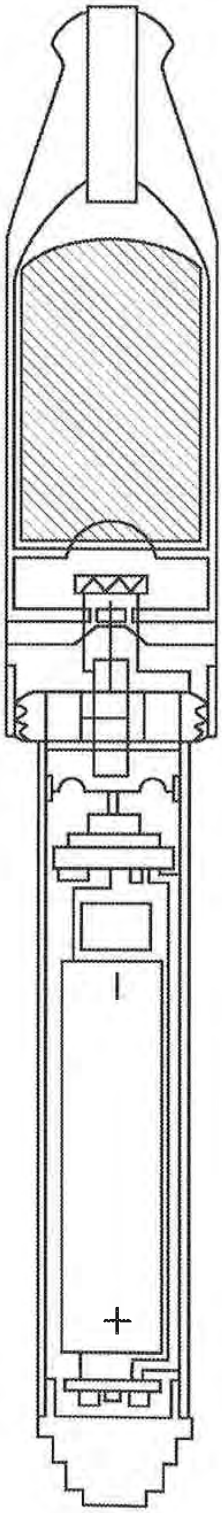

Figure 12

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ELECTRONIC CIGARETTE

CROSS-REFERENCE TO RELATED APPLICATIONS

This application is a continuation of U.S. patent application Ser. No. 13/754,521, filed Jan. 30, 2013 and now pending, which is a continuation of U.S. patent application Ser. No. 12/226,819, filed Jan. 15, 2009, now U.S. Pat. No. 8,375,957, which is a 371 national phase application of International Patent Application No. PCT/CN2007/001576, filed May 15, 2007 and now converted, which claims the benefit of Chinese Patent Application No. 200620090805.0, filed May 16, 2006. All of these applications are incorporated herein by reference in their entirety.

BACKGROUND

Although smoking causes serious respiratory diseases and cancers, it is difficult to get smokers to quit smoking. Nicotine is the effective ingredient in cigarettes. Nicotine is a micromolecular alkaloid which is basically harmless to humans at low dosages. Tar is the major harmful substance in tobacco. Tobacco tar contains thousands of ingredients, dozens of which are carcinogenic.

Cigarette substitutes have used relatively pure nicotine in patches, chewing gum and aerosols. Still disadvantages remain with cigarette substitutes or products for helping smokers to quit smoking.

SUMMARY OF THE INVENTION

An improved electronic cigarette has a battery assembly, an atomizer assembly and a cigarette bottle assembly. The battery assembly connects with one end of the atomizer assembly, and the cigarette bottle assembly is inserted into the other end of the atomizer assembly, thus forming one cigarette type or cigar type body. Use of the electronic cigarette reduces cancer risks and fire hazards while providing a simulated smoking experience.

BRIEF DESCRIPTION OF DRAWINGS

FIG. **1** is a side view of an electronic cigarette.
FIG. **2**A is a view of the battery assembly.
FIG. **2**B is a view of another battery assembly.
FIG. **3** is the diagram of the atomizer assembly.
FIG. **4** is the diagram of the cigarette bottle assembly.
FIG. **5**A is a section view of an electronic cigarette.
FIG. **5**B is a section view of another embodiment.
FIG. **6** is a diagram of a charger.
FIG. **7** is the electric circuit diagram.
FIG. **8** is a side view of an atomizer.
FIG. **9** is an end view of the atomizer shown in FIG. **8**.
FIG. **10** is a diagram of a spray atomizer.
FIG. **11** is an end view of the atomizer shown in FIG. **10**.
FIG. **12** is a section view of another embodiment.

DETAILED DESCRIPTION OF THE DRAWINGS

As shown in FIG. **1**, an electronic cigarette has an appearance similar to a cigarette inserted into the cigarette holder. As shown in FIG. **2**A, the electronic cigarette includes a battery assembly, an atomizer assembly and a cigarette bottle assembly. An external thread electrode (**209**) is located in one end of the battery assembly, and an internal thread electrode (**302**) is located in one end of the atomizer assembly. The battery assembly and atomizer assembly are connected through the screw thread electrode into an electronic cigarette. The cigarette bottle assembly is inserted into the other end of atomizer assembly.

As shown in FIG. **2**A, the battery assembly includes an indicator (**202**), lithium ion battery (**203**), MOSFET electric circuit board (**205**), sensor (**207**), silica gel corrugated membrane (**208**), primary screw thread electrode (**209**), primary negative pressure cavity (**210**), and primary shell (**211**). On one end of the primary shell (**211**) is an external thread electrode (**209**). On the other end is an indicator (**202**), where there is an indicator cap (**201**) on one side having a small hole (**501**). On the other side, the lithium ion battery (**203**) and MOSFET (Metallic Oxide Semiconductor Field Effect Tube) electric circuit board (**205**) are connected successively. The sensor (**207**) is located on MOSFET electric circuit board (**205**). Between the primary screw thread electrode (**209**) and sensor (**207**) is a silica gel corrugated membrane (**208**), on which there is the primary negative pressure cavity (**210**). The sensor (**207**) is connected with the silica gel corrugated membrane (**208**) through the switch spring (**212**).

The sensor (**207**) may be switch sensor made of elastic alloy slice, a linear output Hall sensor, a semiconductor force-sensitive chip, a semiconductor matrix thermoelectric bridge chip, capacitance or inductance sensor. The indicators (**202**) include two red LEDs. The lithium ion battery (**203**) may be either a rechargeable polymer lithium ion battery or a rechargeable lithium ion battery. The external thread electrode (**209**) is a gold-coated stainless steel or brass part with a hole drilled in the center. The silica gel corrugated membrane (**208**) may alternatively be made of fluorinated rubber, butyronitrile rubber, or elastic alloy film.

As shown in FIG. **3**, the atomizer assembly includes the internal thread electrode (**302**), air-liquid separator (**303**), atomizer (**307**) and the secondary shell (**306**). One end of the secondary shell (**306**) is inserted into the cigarette bottle assembly for connection, while the other end has an internal thread electrode (**302**), in which there is the secondary negative pressure cavity (**301**). The air-liquid separator (**303**) and the atomizer (**307**) are connected with the internal thread electrode (**302**) successively. On the secondary shell (**306**), there is an air intake hole (**502**). The air-liquid separator (**303**) is made of stainless steel or plastic with a hole. The internal thread electrode (**302**) is a gold-coated stainless steel or brass part with a hole in the center.

The atomizer (**307**) may be a capillary impregnation atomizer as in FIGS. **8** and **9**, or a spray atomizer as in FIGS. **10** and **11**. As shown in FIG. **4**, the cigarette bottle assembly includes the cigarette liquid bottle (**401**), fiber (**402**) and suction nozzle (**403**). The fiber (**402**) containing cigarette liquid is located on one end of the cigarette liquid bottle (**401**). This end is inserted into the secondary shell (**306**) and lies against the atomizer (**307**). The suction nozzle (**403**) is located on the other end of the cigarette liquid bottle (**401**). Between the fiber (**402**) and interior wall of the cigarette liquid bottle (**40** I) is an air intake hole (**503**).

As shown in FIG. **5**A, the standby state has the fully charged battery assembly shown on FIG. **2**A fastened onto the atomizer assembly shown on FIG. **3**, which is then inserted into the cigarette bottle assembly shown in FIG. **4**. When the user slightly sucks the suction nozzle

(**403**), negative pressure forms on the silica gel corrugated membrane (**208**) through the air intake hole (**503**) and the primary and secondary negative pressure cavities (**210**, **301**). The silica gel corrugated membrane (**208**), under the action of suction pressure difference, distorts to drive the switch spring (**212**) and sensor (**207**), thus switching MOSFET electric

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circuit board (205). At this moment, the indicators (202) are lit gradually; the lithium ion battery (203) electrifies the heating body (305) inside the atomizer (307) through MOSFET electric circuit board (205) as well as the internal and external thread electrodes (302, 209).

The heating body (305) inside the atomizer (307) produces heat. The fiber (402) inside the cigarette liquid bottle (401) contains cigarette liquid, which soaks the micro-porous ceramics (801) inside the atomizer through the fiber (402). The air enters through the air intake hole (502), passes through the run-through hole on the air-liquid separator (303), and helps to form air-liquid mixture in the spray nozzle (304) of the atomizer (307). The air-liquid mixture sprays onto the heating body (305), gets vaporized, and is quickly absorbed into the airflow and condensed into aerosol, which passes through the air intake hole (503) and suction nozzle (403) to form white mist type aerosol.

When suction stops, the switch spring (212) and sensor (207) are reset; the atomizer (307) stops working; the indicators (202) gradually die down. When the operation times reaches the pre-set value, the atomizer (307) provides a work delay of 5-20 seconds per time, so as to remove the micro-dirt accumulated on the heating body (305).

Besides the micro-porous ceramics, the liquid supply material of the atomizer (307) may also be foamed ceramics, micro-porous glass, foamed metal, stainless steel fiber felt, terylene fiber, nylon fiber, nitrile fiber, aramid fiber or hard porous plastics. The heating body (305) is made of the micro-porous ceramics on which nickel-chromium alloy wire, iron-chromium alloy wire, platinum wire, or other electro thermal materials are wound. Alternatively, it may be a porous component directly made of electrically conductive ceramics or PTC (Positive Temperature Coefficient) ceramics and associated with a sintered electrode. The surface of the heating body (305) is sintered into high-temperature glaze to fix the zeolite grains, which are made of natural zeolite, artificial non-organic micro-porous ceramics or aluminum oxide grains. The cigarette liquid bottle (401) and suction nozzle (403) in the cigarette bottle assembly are made of non-toxic plastic. The fiber (402) inside of them is made of polypropylene fiber or nylon fiber to absorb cigarette liquid. In the battery assembly, there is a fine hole (501) on the indicator cap (201) for balancing the pressure difference on both sides of the silica gel corrugated membrane (208).

The cigarette liquid contains 0.1-3.5% nicotine, 0.05-5% tobacco flavor, 0.1-3% organic acid, 0.1-0.5% stabilizer, and propanediol for the remaining.

The primary and secondary shells (211, 306) are made of stainless steel tube or copper alloy tube with baked-enamel coating of real cigarette color.

As shown in FIG. 12, the diameter of the battery assembly may be increased in proportion, so that it is consistent with the diameter of the atomizer assembly. Its shell may be decorated with the leaf veins and sub-gloss brown-yellow baked-enamel coating, to create a cigar type device.

For charging the lithium ion battery (203), the screw thread electrode (601) matches the external thread electrode (209) on the battery assembly, so that it may be used as the charging interface.

The design in FIG. 2B is difference from the design in FIG. 1A as follows: Microcircuit (206) is added between MOSFET electric circuit board (205) and sensor (207). On the surface of the primary shell (211), there is a screen (204) for display of the power of the lithium ion battery (203) and the sucking times.

As shown in FIG. 5B, a fully charged battery assembly is attached onto the atomizer assembly, which is then inserted into the cigarette bottle assembly shown on FIG. 4. When the user slightly sucks the suction nozzle (403), negative pressure forms on the silica gel corrugated membrane (208) through the air intake hole (503) and the primary and secondary negative pressure cavities (210, 301). The silica gel corrugated membrane (208), under the action of suction pressure difference, distorts to drive the switch spring (212) and sensor (207), thus activating the Microcircuit (206) and MOSFET electric circuit board (205). At this moment, the indicators (202) are lit gradually; the lithium ion battery (203) electrifies the heating body (305) inside the atomizer (307) through MOSFET electric circuit board (205) as well as the internal and external thread electrodes (302, 209), so that the heating body (305) inside the atomizer (307) produces heat.

The fiber (402) inside the cigarette liquid bottle (401) contains cigarette liquid, which soaks the micro-porous ceramics (801) inside the atomizer through the fiber (402). The air enters through the air intake hole (502), passes through the run-through hole on the air-liquid separator (303), and helps to form air-liquid mixture in the spray nozzle (304) of the atomizer (307). The air-liquid mixture sprays onto the heating body (305), gets vaporized, and is quickly absorbed into the airflow and condensed into aerosol, which passes through the air intake hole (503) and suction nozzle (403) to form white mist type aerosol.

As shown in FIG. 7, when the action of suction activates the sensor, Microcircuit (206) scans the sensor (207) in the power-saving mode of pulse, and according to the signal parameters of the sensor (207), restricts the atomizing capacity with the integral function of frequency to single operation time. Also, the microcircuit (206) accomplishes the pulse width modulation and over discharging protection for the constant power output, automatic cleansing for thousands of times per operation, step lighting/dying down control of the indicator, display of the operation times and battery capacity, automatic recovery after sensor malfunction shutdown, etc.

The unit and its connecting structure may also be loaded with drugs for delivery to the lung.

Above are just specifications of an example and do not necessarily restrict the scope of protection. Any equivalent modification made on the basis of the design spirit shall fall into the scope of protection.

The invention claimed is:

1. An atomizer assembly for an electronic cigarette, comprising:

an atomizer assembly housing containing an atomizer, liquid storage, and a screw thread electrode on one end of the atomizer assembly housing, with the screw thread electrode having a through hole centered on the screw thread electrode, and

with the atomizer in physical contact with the liquid storage; and

a flow passageway leading from the atomizer to an outlet of the atomizer assembly housing.

2. The atomizer assembly for an electronic cigarette of claim 1 with the atomizer electrically connected to the screw thread electrode.

3. The atomizer assembly of claim 2 with the atomizer comprising a heater coil.

4. The atomizer assembly for an electronic cigarette of claim 1 with the atomizer including a heater coil wound around a porous component.

5. The atomizer assembly for an electronic cigarette of claim 4 where the porous component includes a fiber material.

6. The atomizer assembly for an electronic cigarette claim 1 with the screw thread electrode on a first end of the atomizer

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assembly housing and the liquid storage inserted into a second end of the atomizer assembly opposite from the first end.

7. The atomizer assembly for an electronic cigarette of claim **1** with the through hole substantially aligned with the atomizer.

8. The atomizer assembly for an electronic cigarette of claim **7** with the through hole in the screw thread electrode, the passageway and the outlet comprising a flow path through the atomizer assembly housing passing through the atomizer.

9. The atomizer assembly of claim **1** with part of the flow passageway between the liquid storage and an inside wall of the housing.

10. The atomizer assembly of claim **1** with the through-hole aligned with the atomizer.

11. An atomizer assembly for an electronic cigarette, comprising:

an atomizer assembly housing containing an atomizer and liquid storage;

a screw thread electrode on one end of the atomizer assembly housing;

a through-hole in the screw thread electrode substantially aligned with the atomizer;

the atomizer electrically connected to the screw thread electrode and with the atomizer in physical contact with the liquid storage; and

a flow passageway leading from the atomizer to an outlet of the atomizer assembly housing.

12. The atomizer assembly for an electronic cigarette of claim **11** with the atomizer including a heater coil wound around a porous component.

13. The atomizer assembly of claim **11** with the through-hole centered in the screw thread electrode.

14. An atomizer assembly for an electronic cigarette, comprising:

an atomizer assembly housing containing an atomizer and liquid storage;

a screw thread electrode on one end of the atomizer assembly housing, with the atomizer electrically connected to the screw thread electrode;

a through-hole in the screw thread electrode substantially aligned with the atomizer; and

a flow passageway from the atomizer to an outlet of the atomizer assembly housing.

15. The atomizer assembly of claim **14** with the through-hole centered in the screw thread electrode

16. An atomizer assembly for an electronic cigarette, comprising:

an atomizer assembly housing containing an atomizer, liquid storage, and a screw thread electrode on a first end of the atomizer assembly housing, the atomizer in physical contact with the liquid storage, and the liquid storage inserted into a second end of the atomizer assembly opposite from the first end; and

a flow passageway leading from the atomizer to an outlet of the atomizer assembly housing.

17. The atomizer assembly of claim **16** further including a through-hole centered in the screw thread electrode.

18. The atomizer assembly of claim **16** with the through-hole aligned with the atomizer.

19. An atomizer assembly for an electronic cigarette, comprising:

an atomizer assembly housing containing an atomizer, liquid storage, and a screw thread electrode on one end of the atomizer assembly housing, with the screw thread electrode having a through hole substantially aligned with the atomizer, and, with the atomizer in physical contact with the liquid storage; and

a flow passageway leading from the atomizer to an outlet of the atomizer assembly housing.

20. The atomizer assembly of claim **19** with the through-hole centered in the screw thread electrode.

* * * * *

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EXHIBIT D

U 7616329

THE UNITED STATES OF AMERICA

TO ALL TO WHOM THESE PRESENTS SHALL COME:

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office

December 21, 2016

THIS IS TO CERTIFY THAT ANNEXED HERETO IS A TRUE COPY FROM THE RECORDS OF THIS OFFICE OF:

U.S. PATENT: ***9,364,027***
ISSUE DATE: ***June 14, 2016***

By Authority of the
Under Secretary of Commerce for Intellectual Property
and Director of the United States Patent and Trademark Office

R. BLAKENEY
Certifying Officer

US009364027B2

(12) **United States Patent**
Hon

(10) **Patent No.: US 9,364,027 B2**
(45) **Date of Patent: Jun. 14, 2016**

(54) **ELECTRONIC CIGARETTE**

(71) Applicant: **FONTEM HOLDINGS 1 B.V.**, Amsterdam (NL)

(72) Inventor: **Lik Hon**, North Point (HK)

(73) Assignee: **Fontem Holdings 1 B.V.**, Amsterdam (NL)

(*) Notice: Subject to any disclaimer, the term of this patent is extended or adjusted under 35 U.S.C. 154(b) by 0 days.

(21) Appl. No.: **14/328,561**

(22) Filed: **Jul. 10, 2014**

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Related U.S. Application Data

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(30) **Foreign Application Priority Data**

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(52) **U.S. Cl.**
CPC ***A24F 47/008*** (2013.01); ***A24F 47/002*** (2013.01); ***A61K 9/007*** (2013.01)

(58) **Field of Classification Search**
CPC A24F 47/008
USPC 131/270; 128/202.21
See application file for complete search history.

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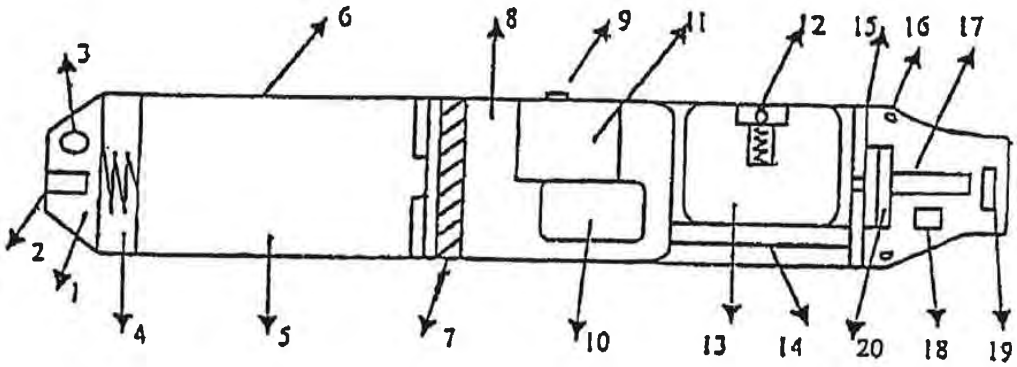
(57) **ABSTRACT**

An electronic cigarette comprises nicotine without harmful tar. The cigarette includes a shell, a cell, nicotine solution, control circuit, and an electro-thermal vaporization nozzle installed in the air suction end of the shell. The advantages of the present invention are smoking without tar, reducing the risk of cancer, the user still gets a smoking experience, the cigarette is not lit, and there is no fire danger.

17 Claims, 6 Drawing Sheets



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U.S. District Court, Central District of California, Western Division, Defendant NJOY, Inc.'s Exhibit 1 to Defendants' Motion for Leave to Amend Invalidity Contentions dated Jun. 29, 2015 and filed in Consolidated Case No. CV 14-01645 GW (MRW) and related consolidated cases.
U.S. District Court, Central District of California, Western Division, Defendant NJOY, Inc.'s Exhibit 2 to Defendants' Motion for Leave to Amend Invalidity Contentions dated Jun. 29, 2015 and filed in Consolidated Case No. CV 14-01645 GW (MRW) and related consolidated cases.
U.S. District Court, Central District of California, Western Division, Defendant NJOY, Inc.'s Exhibit 3 to Defendants' Motion for Leave to Amend Invalidity Contentions dated Jun. 29, 2015 and filed in Consolidated Case No. CV 14-01645 GW (MRW) and related consolidated cases.
U.S. District Court, Central District of California, Western Division, Defendant NJOY, Inc.'s Exhibit 4 to Defendants' Motion for Leave to Amend Invalidity Contentions dated Jun. 29, 2015 and filed in Consolidated Case No. CV 14-01645 GW (MRW) and related consolidated cases.
U.S. District Court, Central District of California, Western Division, Defendant NJOY, Inc.'s Exhibit 5 to Defendants' Motion for Leave to Amend Invalidity Contentions dated Jun. 29, 2015 and filed in Consolidated Case No. CV 14-01645 GW (MRW) and related consolidated cases.
U.S. District Court, Central District of California, Western Division, Defendant NJOY, Inc.'s Reply Brief in Support of Defendants' Motion for Leave to Amend Invalidity Contentions dated Jul. 13, 2015 and filed in Consolidated Case No. CV 14-01645 GW (MRW) and related consolidated cases.
U.S. District Court, Central District of California, Western Division, Defendant NJOY, Inc.'s production documents VLACHOS 0000061-72; Consolidated Case No. CV 14-01645 GW (MRW) and related consolidated cases.

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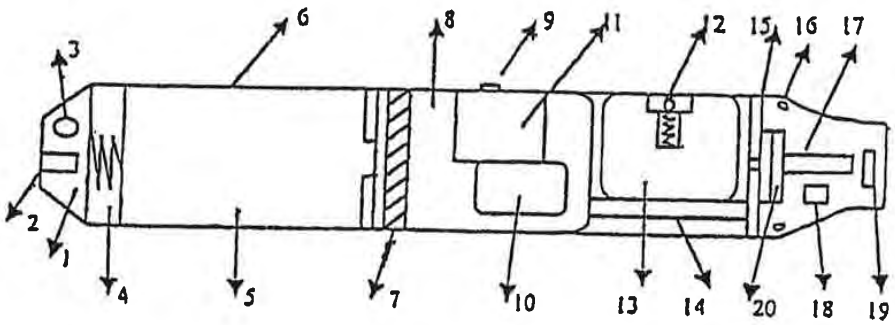

FIG. 1

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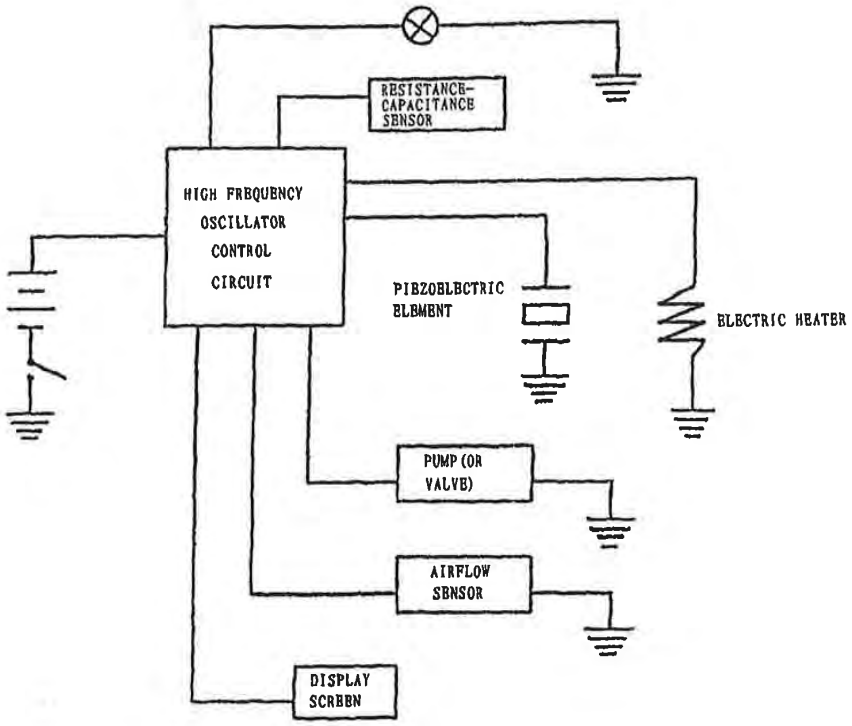

FIG. 2

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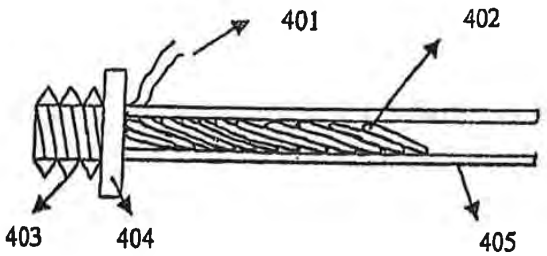

FIG. 3

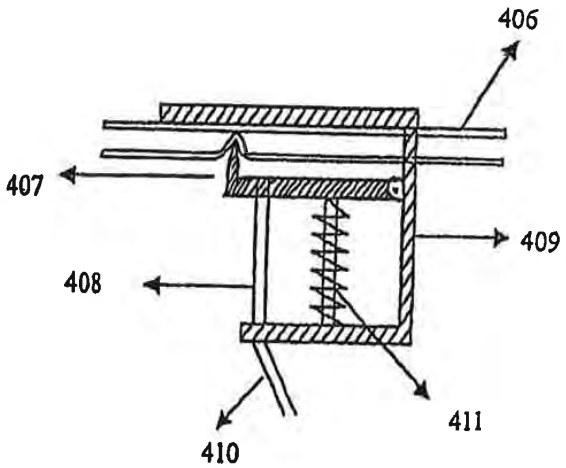

FIG. 4

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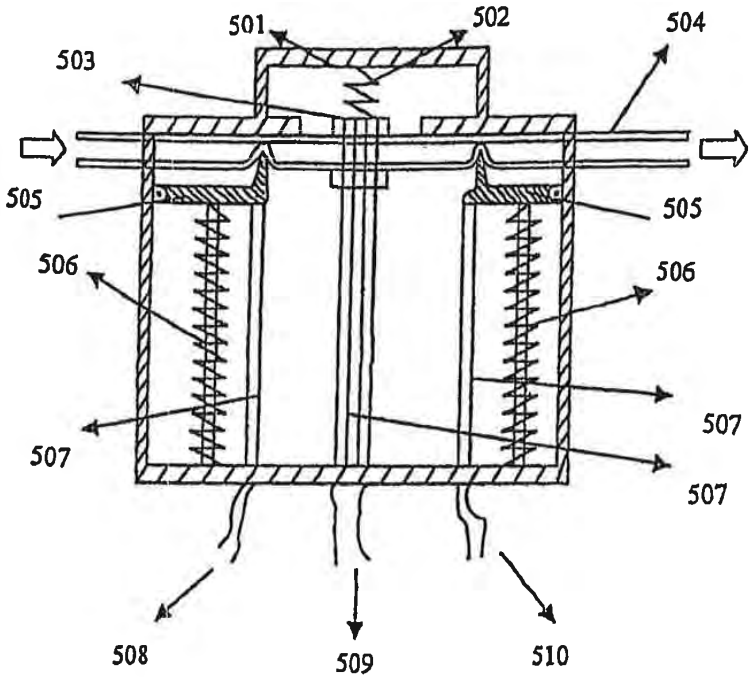

FIG. 5

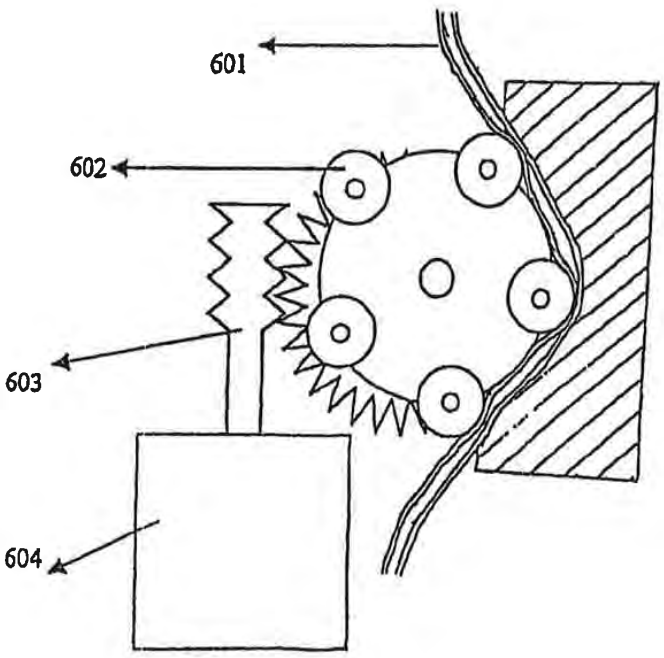

FIG. 6

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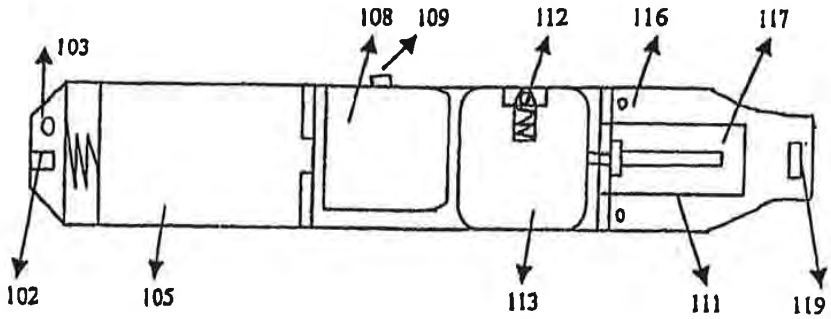

FIG. 7

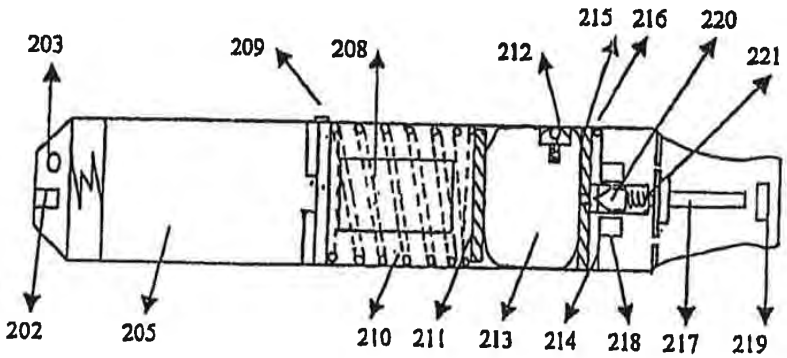

FIG. 8

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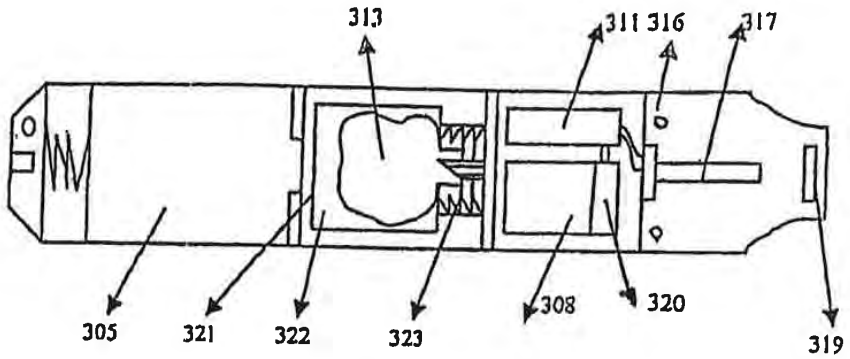

FIG. 9

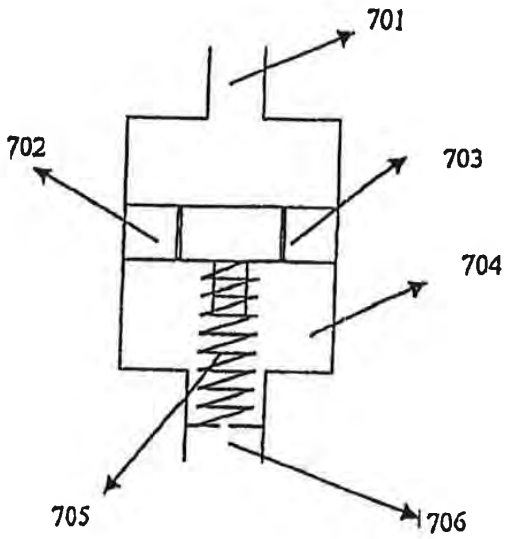

FIG. 10

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ELECTRONIC CIGARETTE

This Application is a Continuation of U.S. patent application Ser. No. 13/921,582 filed Jun. 19, 2013 and now U.S. Pat. No. 8,910,641, which is a Continuation of U.S. patent application Ser. No. 13/088,276 filed Apr. 15, 2011 and now U.S. Pat. No. 8,511,318, which is a Division of U.S. patent application Ser. No. 10/547,244 filed Feb. 27, 2006 and now abandoned, which is the U.S. National Phase Application of International Patent Application No. PCT/CN2004/000182 filed Mar. 8, 2004, which claims priority to Chinese Patent Application No. 03111582.9 filed Apr. 29, 2003. These applications are incorporated herein by reference.

TECHNICAL FIELD

The invention relates to an electronic cigarette which contains only nicotine without tar.

BACKGROUND ART

Despite it is commonly known that "smoking is harmful to your health", the number of smokers worldwide is up to 1 billion, and the number is increasing every year. According to the statistical data from the World Health Organization, about 4.9 million people die of diseases caused by smoking each year. Although smoking may cause serious respiratory diseases and cancer, it remains extremely difficult for smokers to quit smoking completely.

The active ingredient in a cigarette is nicotine. During smoking, nicotine, along with a tar aerosol droplets produced in the burning cigarette, enters smoker's alveolus and is rapidly absorbed. After being absorbed into the blood of a smoker, nicotine then produces an effect on the receptors of the smoker's central nervous system.

Nicotine is a kind of alkaloid with low molecular weight. A small dose of nicotine is essentially harmless to human body and its half-life in blood is quite short. The major harmful substance in tobacco is tar, and the tar in tobacco is composed of thousands of ingredients, tens of which are cancerogenic substances. At present, it has been proven that passive smoking can be harmful to non-smokers.

Some cigarette substitutes that contain only nicotine without tar have been proposed, and many of them, such as "nicotine patch", "nicotine mouthwash", "nicotine chewing gum", "nicotine drink" etc., are made of pure nicotine. Although these cigarette substitutes are free from tar, their major disadvantage is that an effective peak concentration cannot be reached in the blood of a smoker due to slow absorption of nicotine. In addition, these cigarette substitutes cannot satisfy habitual smoking actions of a smoker, for example, inhaling action or sucking action, and thus are not likely to be widely accepted as effective substitutes for quitting smoking.

SUMMARY OF THE INVENTION

An objective of the present invention is to provide an electronic cigarette that overcomes the above-mentioned disadvantages and provides a cigarette that looks like a normal cigarette. The electronic cigarette, which is an integrated assembly resembling a cigarette holder, includes a shell, a cell, nicotine solution, a control circuit, a high temperature vaporization nozzle and accessories. An electro-thermal vaporization nozzle is arranged within an air suction end of the shell. The control circuit provides starting current to the electric heater within the vaporization nozzle. Under the high temperature in the vaporization nozzle, the liquid is rapidly vaporized to form a puff of smoke. The cell which provides power to the electric heater via the control circuit can be a disposable battery or a rechargeable battery.

The advantages of the present invention include smoking without tar, significantly reducing the cancerogenic risk. Furthermore, users still feel as if they are smoking, and the cigarette has no need to be lit and has no fire risk.

DESCRIPTION OF THE DRAWINGS

FIG. **1** is a structural diagram of the device in the first example in accordance with the present invention.

FIG. **2** is a block diagram of the circuit structure.

FIG. **3** is a schematic diagram of the structure of the high temperature vaporization nozzle and the electric-thermal element.

FIG. **4** is a schematic diagram of the valve made of memory alloy.

FIG. **5** is a schematic diagram of the peristaltic pump made of memory alloy.

FIG. **6** is a schematic diagram of the peristaltic pump.

FIG. **7** is a structural diagram of the electronic cigarette in a second example.

FIG. **8** is a structural diagram of the electronic cigarette in a third example.

FIG. **9** is a structural diagram of the electronic cigarette in a fourth example.

FIG. **10** is a structural diagram of the metering cavity in the fourth example.

DETAILED DESCRIPTION OF THE INVENTION

The high frequency generator of a control circuit board **8** is composed of a capacitance connecting three point type oscillator, an inductance connecting three point type oscillator, or a transformer-type oscillating circuit, which has the frequency of 35 KHz to 3.3 MHz. The circuit includes a automatic frequency fine-adjusting circuit resonating with a piezoelectric element **20**. A nicotine solution storage container **13** is made of silicon rubber, alternatively, other polymers that can be protected against the penetration of nicotine can be used. A one-way valve for liquid injection **12** is sealed by a ball or cone member under the pressure of a spring. An airflow sensor **18** can be comprised of an array of integrated thermal sensitive resistors in the shape of film. The electrode of a resistance or capacitance sensor **19**, which is sensitive to touches of human body, is composed of an upper metal film and a lower metal film and located at the end of the cigarette holder. The changes of the resistance or capacitance parameters due to human touch are inputted into the control circuit to perform the operation of a body sensitive switch.

The electric controlled pump **11**, driven by a motor or a linear motor, drives a retarder that has a large speed ratio, via a shaft coupling, to revolve at a low speed but with large torque. The pump can be a peristaltic pump, a plunger pump, an eccentric pump or a screw pump. Alternatively, the liquid pump can use piezoelectric pump, a super magnetostrictive pump, a thermal expansion drive pump, a thermal contraction drive pump, a thermal bubble pump. The electric control pump or valve may be thermal contractible.

The valve is formed on a silicon rubber tube by nickel-titanium memory alloy or copper-based memory alloy under the force of electro-thermal contractions.

The electro-thermal vaporization nozzle **17** is made of high-temperature resistant materials with low thermal conductivity. The nozzle **17** is a tubule, with the internal diameter of 0.05-2 mm and the effective working length of 3-20 mm.

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An electric heating element is provided within the nozzle, and the shapes of the electric heating element and the cavity of the nozzle are designed to facilitate vaporization and ejection of liquid. The vaporization nozzle **17** may be made of conventional ceramics, or be made of aluminum silicate ceramics, titanium oxide, zirconium dioxide, yttrium oxide ceramics, molten silicon, silicon dioxide, molten aluminum oxide. The vaporization nozzle **17** may be in the shape of straight tube or spiral, and may also be made from polytetrafluoethylene, carbon fiber, glass fiber or other materials with similar properties.

The electric heating element arranged within the vaporization nozzle **17** may be made of wires of nickel chromium alloy, iron chromium aluminum alloy, stainless steel, gold, platinum, tungsten molybdenum alloy, etc., and may be in the shape of straight line, single spiral, double spiral, cluster or spiral cluster, wherein the straight line and cluster are preferred. The heating function of the electric heating element may be achieved by applying a heating coating on the inner wall of the tube, and the coating may be made from electro-thermal ceramic materials, semiconductor materials, corrosion-resistant metal films, such as gold, nickel, chromium, platinum and molybdenum. The method for coating can include a coat sintering process, a chemical deposition sintering process and an ion spraying process. The materials mentioned above can be provided within the inner wall of vaporization nozzle in any of the processes mentioned above.

The nozzle with high resistance, made of metal, can have no electric heating element being attached, and can be directly applied with heating current. Alternatively, the materials mentioned above can be arranged outside of the nozzle in any of the ways mentioned above, and an appropriate response time can also be achieved in the power supply mode of short-term preheating. Nicotine solution used in the atomization process comprises nicotine, propylene glycol, glycerol, organic acids, anti-oxidation agents, essence, water and alcohol, in which the nicotine content is 0.1%-6%, propylene glycol content 80%-90%, organic acids 0.2%-20%, the rest is glycerol, essence, anti-oxidation agents, water and alcohol.

Example 1

The Structural Diagram of the Device Shown in FIG. 1

When a smoker puts the cigarette holder on his/her mouth, the resistance sensor **19** activates the control circuit board **8**. The control circuit board **8** then outputs two driving voltages respectively, one used to supply power to the electric heating element of the vaporization nozzle **17** and the other used to activate the micro pump **11** (shown in FIG. **6**). The stored solution is then pumped to the nozzle **17** by the solution storage container **13**. On the electric heating element of the nozzle **17**, the nicotine solution is then vaporized into high temperature vapor which is subsequently ejected from the opening end. In the air, the vapor ejected out is then expanded and condensed into micro aerosol droplets.

The effect of the ultrasonic piezoelectric element **20** mounting on the nozzle is that, firstly, the large liquid droplets in the unstable thermal airflow under high pressure will be in sufficient contact with the electric heating element, and thereby be vaporized. Secondly, the liquid droplets in the nozzle **17** are directly fragmented and atomized. Thirdly, possible bumping when the liquid is above a boiling point will be avoided. The effect of integrated atomization will allow aerosol droplets with diameters of 0.2-3 um to enter into the alveolus easily and be absorbed. The airflow sensor **18** is sensitive to the diluted air which enters through air inlet **16** when a "suction" action take places. The sensed signals are transmitted to the control circuit, and the control circuit then stops supplying power to the micro pump and the electric heater after a certain time delay.

The relay relationship between the time delays of the micro pump and electric heater is as follows: after the electric heater is activated, the micro pump is activated after a time delay of 0.1-0.5 seconds; the electric heater is then turned off after a time delay of 0.2-0.5 seconds when the control circuit of the micro pump is turned off, so as to guarantee a complete vaporization of the liquid after quantitative liquid injection without any leftovers.

The nicotine solution container may be designed to be different sizes as required. The nicotine solution may be refilled once a day, or once a couple of days. The liquid crystal display screen **10** can show operating state parameters, such as cell capacity, smoking times per day, average using cycle and warnings for over smoking. A red LED **3** blinks for each smoking action, and a sawtooth wave signal that lasts for 1.2 seconds is given by the control circuit for blinking signals, which provides a gradual change of luminance to imitate the ignition and combustion process of a conventional cigarette. The charger **1**, charging jack **2**, spring **4**, shell **6**, threads **7**, switch **9**, passage tube **14** and baffle plate **15** are shown in FIG. **1**. The silicon gel tube **601**, pinch roller **602**, worm **603** and motor **604** are shown in FIG. **6**.

The control circuit and the ultrasonic micro pump may be integrated on one single chip by using a Micro Electronic Mechanical System (MEMS).

Example 2

The Simplified Electronic Cigarette

FIG. **7** is a structural diagram of the simplified device in which the ultrasonic atomization high frequency generator and the piezoelectric ceramic element **20** are omitted. To achieve a desirable atomization effect, tiny heating wires are used in combination with the nozzle (see FIG. **3**), so that the maximum diameters of one or more vaporization cavities formed between the heating wire and the inner wall of the nozzle range from 0.02 mm to 0.6 mm. The function of the airflow sensor **18** omitted is replaced by the manner that the initial signal of the resistance or capacitance sensor **119** is delayed a certain time via the control circuit and acts as the ending signal. The electronic cigarette is configured as follows: the vaporization nozzle **117**, the thermal drive pump **111** (see FIG. **5**) made of nickel titanium memory alloy wire, and the liquid storage container **113** connected to the thermal drive pump constitute a liquid transmission system. Two outputs of the control circuit board **108** are respectively connected to the electric heater and the pump or valve. A body sensitive resistance sensor **119** is connected to the input of the control circuit. The cell **105** and red LED **103** are provided in the front end within the shell, and resemble a cigarette holder, a pipe or a pen.

The thermal drive pump is an electro-thermal shrinkable peristaltic pump, made of wires of nickel titanium memory alloy or copper based alloy, with gel tube which is pressed at three points respectively during the process of electro-thermal contraction to form a pressure cavity for pumping out liquid. The change of volume of the cavity within the thermal drive pump determines the quantity of the solution to be atomized each time. Upon contacting with user's mouth, the resistance sensor **119** activates the control circuit **108**, the control circuit **108** then provides operating current to the

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thermal drive pump and the electric heater, and the output of the control circuit is turned off after the delay of 2 seconds for reactivation at the next smoking action. Alternatively, a thermal expansion drive pump or a thermal bubble pump is also applicable. The thermal expansion drive pump forms a pressure cavity for pumping out liquid by allowing a micro hydrogen container with an embedded electric heating element to block the liquid inlet and open the liquid outlet at the time of thermal expansion. The charging jack **102**, LED **103**, cell **105**, switch **109**, liquid-refilling valve **112** and air hole **116** are shown in FIG. **7**.

The electrode lead wire **401**, heating wire **402**, thread **403**, base **404** and nozzle **405** are shown in FIG. **3**. The support **501**, extension spring **502**, pumping-out pressure plate **503**, silicon gel tube **504**, stop pressure plate **505**, supporting spring **506**, memory alloy wire **507**, electrode A **508**, electrode B **509** and electrode **510** are shown in FIG. **5**.

Example 3

The Electronic Cigarette Made of a Ni—Ti Memory Alloy

FIG. **8** is a structural diagram of the electronic cigarette. The electro-thermal vaporization nozzle **217** of the device is connected to the liquid storage container **213** via a pneumatic valve **220**. The super elastic member **210** is connected to the pressure plate **211** which is connected to the liquid storage container **213**. The pneumatic valve is composed of a pneumatic film **214**, a magnetic steel ring **218**, a steel valve needle **220** and a reset spring **221**. The super elastic member **210**, which is made of Ni—Ti memory alloy, is used to apply a constant pressure on the liquid storage container via the pressure plate **211**. When the pneumatic valve opens, the liquid with nicotine enters the vaporization nozzle from the liquid storage container via the pneumatic valve and is vaporized and condensed subsequently to form a puff of smoke at high temperature. Upon contacting with user's mouth, the resistance sensor activates the control circuit to supply power to the electric heater. When the user performs suction action, the Nd—Fe—B permanent magnetic alloy ring attracts the valve needle to move in response to the pneumatic film being subjected to negative pressure. Liquid is supplied when the valve needle opens, and after the pneumatic valve is reset, power supply to the electric heater is turned off after the delay of 0.5 seconds by the control circuit. The LED **203**, charging jack **202**, cell **205**, control circuit **208**, switch **209**, refilling valve **212**, baffle plate **215**, air hole **216** and resistance sensor **219** are shown in FIG. **8**.

Example 4

The Electronic Spray Cigarette Utilizing the Pressure of a Container

In the device (see FIG. **9**), the electro-thermal vaporization nozzle **317**, the electronic valve **311** connected with the metering cavity **320**, and the liquid storage container **313** form a liquid transmission passage. A gas vessel filled with high-pressure nitrogen is arranged around the periphery of the liquid storage container to exert pressure thereon to facilitate the transmission of the liquid. When a control signal is applied to the electronic valve, the electronic valve is activated, and the solution with nicotine enters the metering cavity from the liquid storage container under pressure. The solution pushes a piston so as to allow a constant volume of liquid at the other side of the piston to enter the vaporization nozzle via the electronic valve. The metering cavity provided at the valve is a cylinder having a liquid inlet and a liquid outlet. Located within the cylinder are the piston micro holes and the reset spring connected onto the piston. The control circuit which is activated by the resistance sensor **319** controls the states of the electronic valve and the electric heater respectively. Due to slow infiltration of the micro hole of the piston in the metering cavity and the force of the reset spring, the piston returns to its original position within 5-8 seconds after each atomization process. The cell **305**, pressure vessel **321**, pressure chamber **322**, seal threaded-opening **323**, control circuit board **308** and air hole **316** are showed in FIG. **9**.

The silicon gel tube **406**, pressure-stopping plate **407**, memory alloy wires **408**, support **409**, electrode lead wire **410** and pressure spring **411** are shown in FIG. **4**. The inlet **701**, piston **702**, micro hole of the piston **703**, metering cavity **704**, reset spring **705** and outlet **706** are shown in FIG. **10**.

The recipes of nicotine solution used are:

1. 6% nicotine, 85% propylene glycol, 2% glycerol, 2% essence, 1% organic acid and 1% anti-oxidation agent;

2. 4% nicotine, 80% propylene glycol, 5% glycerol, 1% butyl valerate, 1% isopentyl hexonate, 0.6% lauryl laurate, 0.4% benzyl benzoate, 0.5% methyl octynicate, 0.2% ethyl heptylate, 0.3% hexyl hexanoate, 2% geranyl butyrate, 0.5% menthol, 0.5% citric acid and 4% tobacco essence;

3. 2% nicotine, 90% propylene glycol, 2.5% citric acid, 1% essence and 4.5% tobacco essence;

4. 0.1% nicotine, 80% propylene glycol, 5% glycerol, 8% alcohol, 2.9% water, 1% essence, 1% tobacco essence and 2% organic acid.

The invention claimed is:

1. An electronic smoking device, comprising:

a tubular housing having a first end and a second end;

an outlet on the second end of the tubular housing;

a wire coil in a tube, with the tube within the housing, and the wire coil configured to vaporize liquid moving from outside of the tube into the tube and contacting the wire coil;

a control circuit in the tubular housing electrically connected to the wire coil and to a sensor;

at least one air opening leading into the tubular housing, with the wire coil in between the at least one air opening and the second end of the tubular housing; and

an LED at the first end of the tubular housing, with the LED electrically connected to the control circuit, and the LED configured to provide a gradual change in luminance to imitate a conventional cigarette.

2. The electronic smoking device of claim **1** with further comprising screw threads at the first end of the tubular housing.

3. The electronic smoking device of claim **1** with the tube comprising a fiber material.

4. The electronic smoking device of claim **1** wherein the housing resembles a cigarette.

5. The electronic smoking device of claim **1** with the wire coil parallel to the tubular housing.

6. The electronic cigarette of claim **1** with the LED configured to provide luminance that changes based on an output of the sensor.

7. The electronic smoking device of claim **1** with the tube attached to a first side of a base in the housing and further including screw threads on a second side of the base, opposite from the first side of the base.

8. An electronic smoking device, comprising:

an electronic cigarette having a housing having a first end and a second end;

an outlet on a second end of the housing;

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a wire coil in a tube comprising a fiber material, with the tube in the housing and attached to a base in the housing, and with liquid in the housing moving from a location outside of the tube into contact with the wire coil in the tube to create vapor in the tube;

a control circuit in the housing electrically connected to the wire coil and to a sensor and a battery;

at least one air opening leading into the housing, with the wire coil in between the at least one air opening and the second end of the housing; and

an LED at the first end of the housing, with the LED electrically connected to the control circuit, and the LED configured to provide a gradual change in luminance to imitate a conventional cigarette.

9. The electronic smoking device of claim **8** with the tube attached to a first side of the base and further including screw threads on a second side of the base, opposite from the first side of the base.

10. The electronic smoking device of claim **8** with the LED configured to provide a gradual change in luminance based on an output of the sensor.

11. The electronic smoking device of claim **8** wherein the housing resembles a cigarette.

12. An electronic smoking device, comprising:

an electronic cigarette having a housing having a first end and a second end;

an outlet on a second end of the housing;

a wire coil in a tube, with the tube in the housing and attached to a base in the housing;

a control circuit in the housing electrically connected to the wire coil and to a sensor and a battery in the housing;

an LED at the first end of the housing, with the LED electrically connected to the control circuit, and the LED configured to provide a gradual change in luminance via the control circuit;

at least one air opening leading into the housing, with the wire coil in between the at least one air opening and the second end of the housing.

13. The electronic smoking device of claim **12** with tube comprising a fiber material.

14. The electronic smoking device of claim **12** with the LED configured to provide a gradual change in luminance via the control unit that changes based on an output of the sensor.

15. The electronic smoking device of claim **12** wherein the housing resembles a cigarette.

16. An electronic cigarette, comprising:

a housing having a first section having a first end and a second section having a second end, with the first section attached to the second section;

an outlet at the second end of the second section of the housing;

a wire heating coil in a tube in the second section of the housing;

a control circuit electrically connected to the wire heating coil and to a sensor, and to a battery in the first section of the housing;

an LED at the first end of the first section of the housing, with the LED electrically connected to the control circuit, and the LED configured to provide luminance that changes based on an output of the sensor, to imitate a conventional cigarette; and

at least one air opening leading into at least one of the first and second sections of the housing, with the wire heating coil in between the at least one air opening and the second end of the second section of the housing.

17. The electronic cigarette of claim **16** wherein the housing has a tubular first section attached to a tubular second section, and with the battery in the first section.

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EXHIBIT E

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December 21, 2016

THIS IS TO CERTIFY THAT ANNEXED HERETO IS A TRUE COPY FROM THE RECORDS OF THIS OFFICE OF:

U.S. PATENT: ***9,339,062***
ISSUE DATE: ***May 17, 2016***

By Authority of the
Under Secretary of Commerce for Intellectual Property
and Director of the United States Patent and Trademark Office

R. BLAKENEY
Certifying Officer

US009339062B2

(12) **United States Patent**
Hon

(10) **Patent No.: US 9,339,062 B2**
(45) **Date of Patent: *May 17, 2016**

(54) **ELECTRONIC CIGARETTE**

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(72) Inventor: **Lik Hon**, North Point (HK)

(73) Assignee: **Fontem Holdings 1 B.V.**, Amsterdam (NL)

(*) Notice: Subject to any disclaimer, the term of this patent is extended or adjusted under 35 U.S.C. 154(b) by 0 days.

This patent is subject to a terminal disclaimer.

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(58) **Field of Classification Search**
None
See application file for complete search history.

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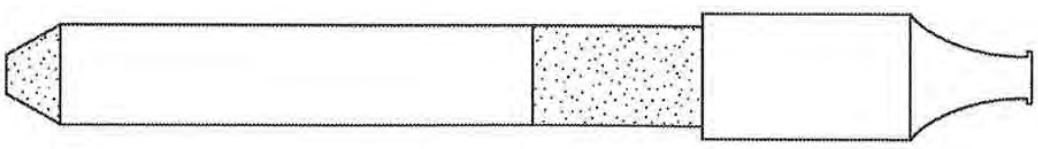
(57) **ABSTRACT**

An electronic cigarette includes a battery assembly, an atomizer assembly and a cigarette bottle assembly. An external thread electrode is located in one end of battery assembly. An internal thread electrode is located in one end of atomizer assembly. The battery assembly and the atomizer assembly are connected by the screwthread electrode. The cigarette bottle assembly is inserted into the other end of the atomizer assembly and both form a cigarette type or cigar type body.

19 Claims, 10 Drawing Sheets



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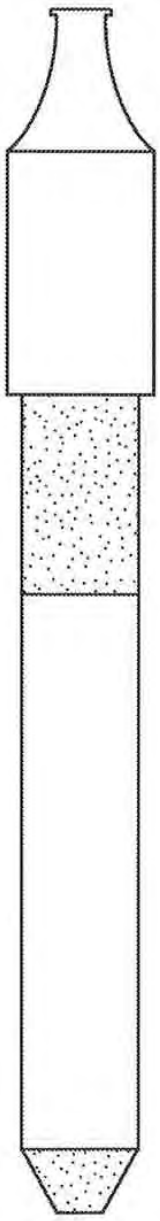

Figure 1

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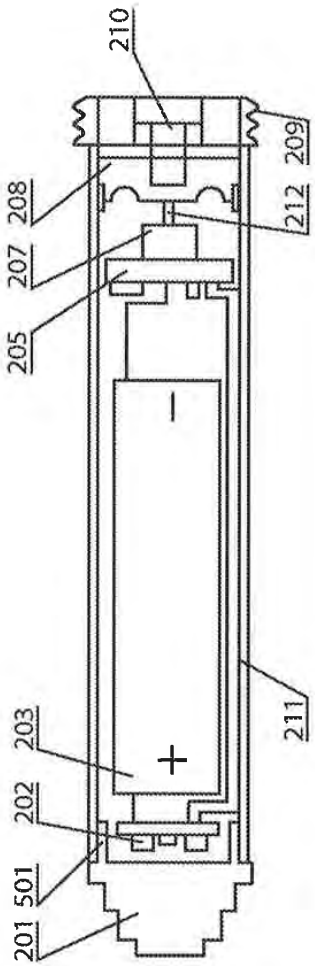

Figure 2A

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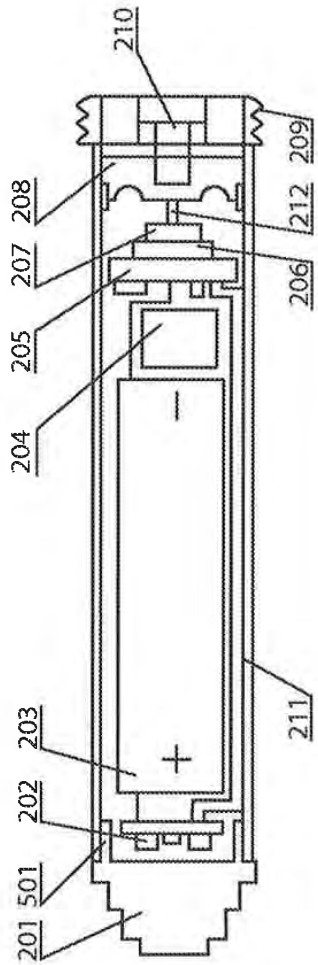

Figure 2B

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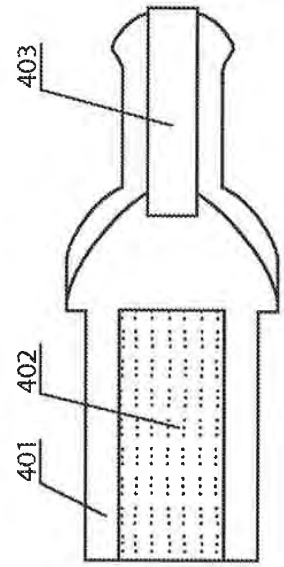

Figure 4

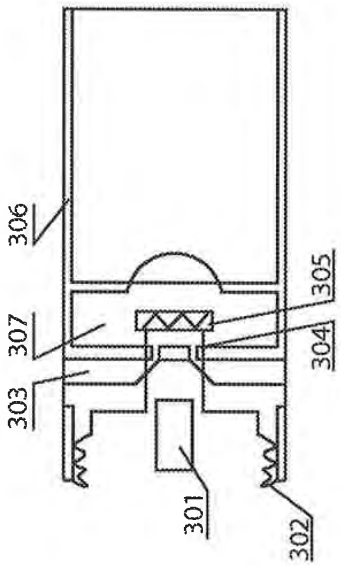

Figure 3

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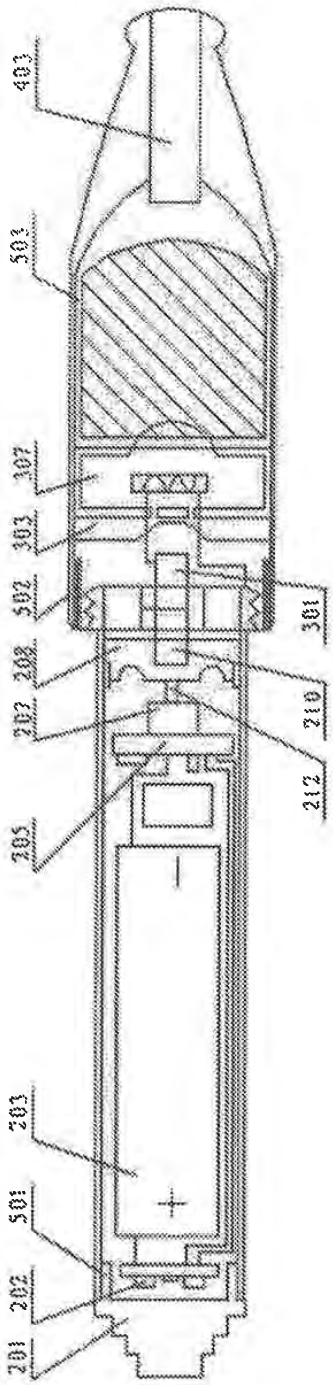

Figure 5A

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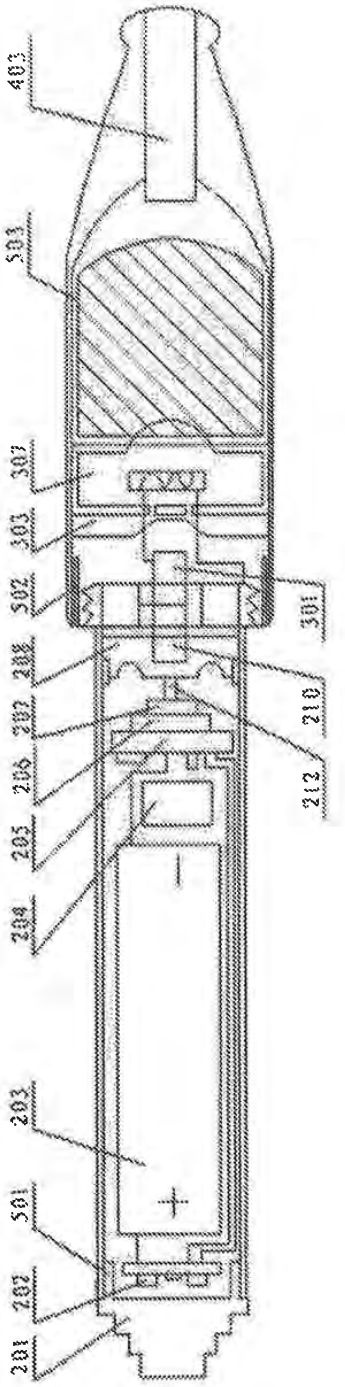

Figure 5B

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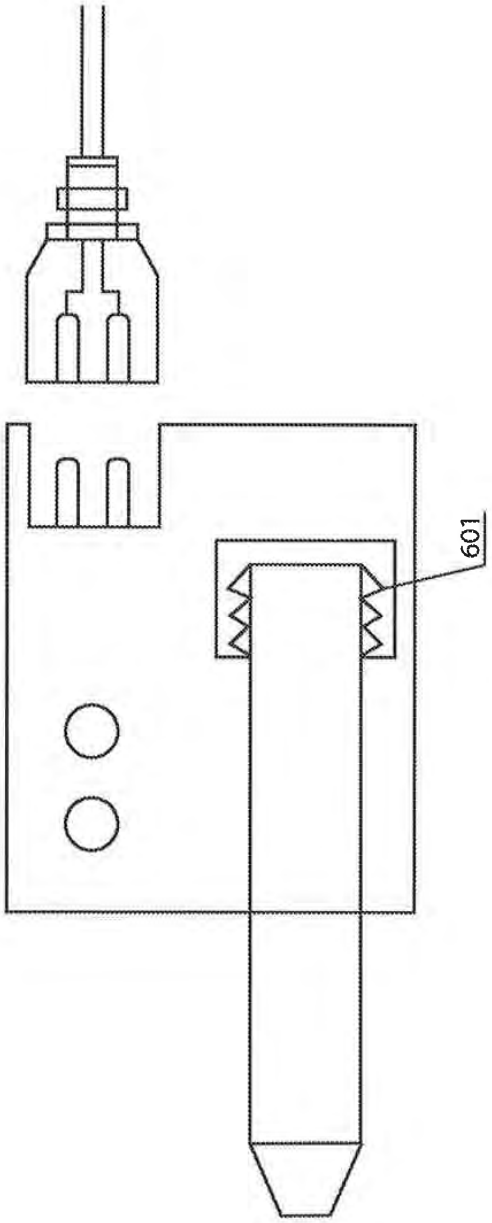

Figure 6

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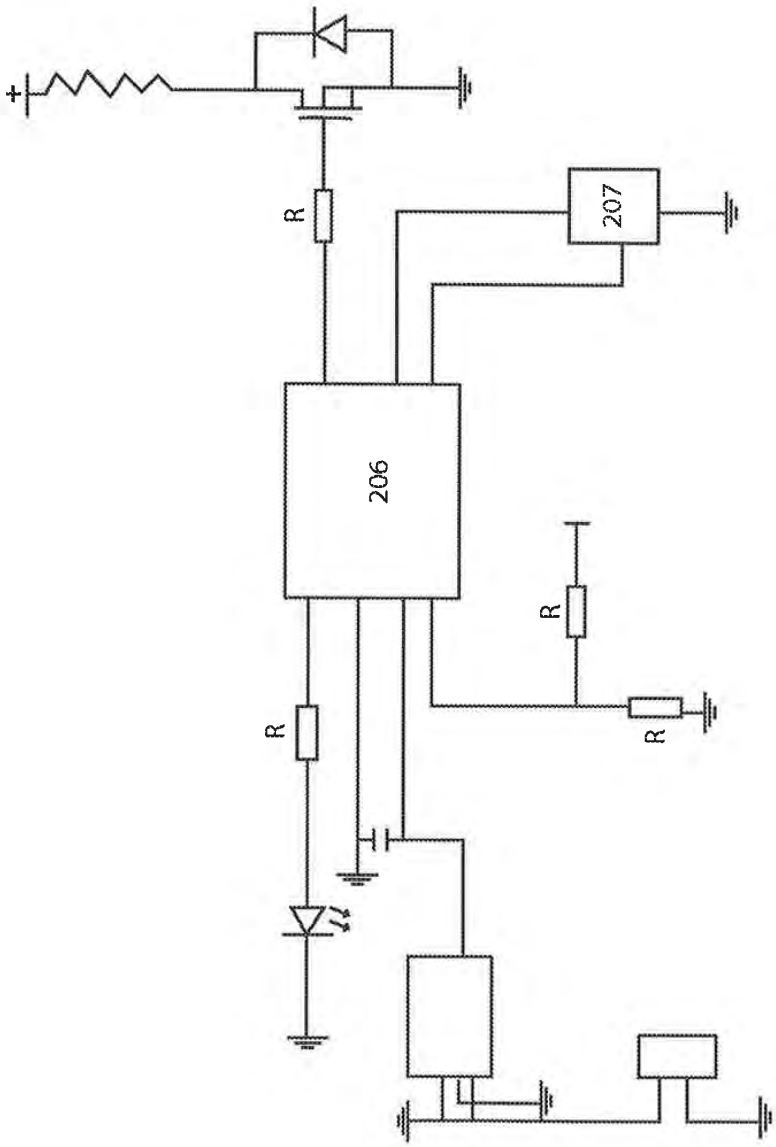

Figure 7

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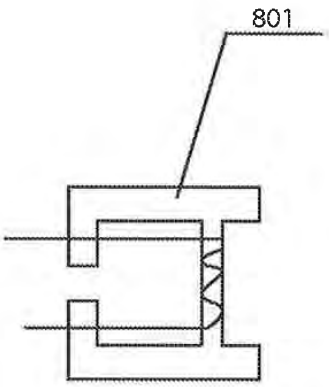

Figure 8

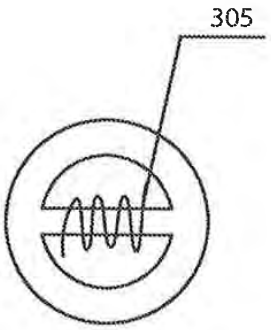

Figure 9

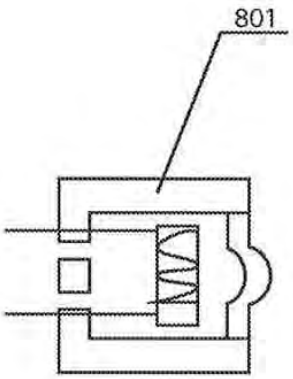

Figure 10

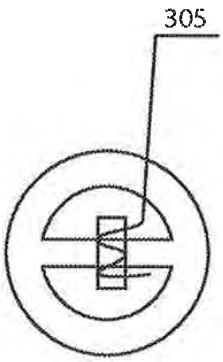

Figure 11

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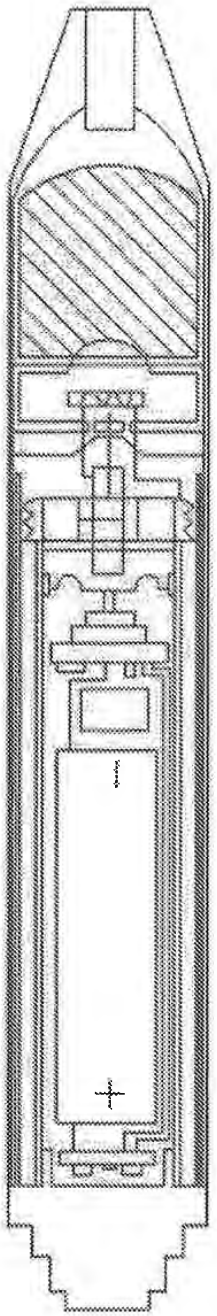

Figure 12

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ELECTRONIC CIGARETTE

CROSS-REFERENCE TO RELATED APPLICATIONS

This application is a continuation of U.S. patent application Ser. No. 13/754,521, filed Jan. 30, 2013, which is a continuation of U.S. patent application Ser. No. 12/226,819, filed Jan. 15, 2009, and now U.S. Pat. No. 8,375,957, which is a 371 national phase application of International Patent Application No. PCT/CN2007/001576, filed May 15, 2007 and now converted, which claims the benefit of Chinese Patent Application No. 200620090805.0, filed May 16, 2006. All of these applications are incorporated herein by reference in their entirety.

BACKGROUND

Although smoking causes serious respiratory diseases and cancers, it is difficult to get smokers to quit smoking. Nicotine is the effective ingredient in cigarettes. Nicotine is a micromolecular alkaloid which is basically harmless to humans at low dosages. Tar is the major harmful substance in tobacco. Tobacco tar contains thousands of ingredients, dozens of which are carcinogenic.

Cigarette substitutes have used relatively pure nicotine in patches, chewing gum and aerosols. Still disadvantages remain with cigarette substitutes or products for helping smokers to quit smoking.

SUMMARY OF THE INVENTION

An improved electronic cigarette has a battery assembly, an atomizer assembly and a cigarette bottle assembly. The battery assembly connects with one end of the atomizer assembly, and the cigarette bottle assembly is inserted into the other end of the atomizer assembly, thus forming one cigarette type or cigar type body. Use of the electronic cigarette reduces cancer risks and fire hazards while providing a simulated smoking experience.

BRIEF DESCRIPTION OF THE DRAWINGS

FIG. **1** is a side view of an electronic cigarette.
FIG. **2**A is a view of the battery assembly.
FIG. **2**B is a view of another battery assembly.
FIG. **3** is the diagram of the atomizer assembly.
FIG. **4** is the diagram of the cigarette bottle assembly.
FIG. **5**A is a section view of an electronic cigarette.
FIG. **5**B is a section view of another embodiment.
FIG. **6** is a diagram of a charger.
FIG. **7** is the electric circuit diagram.
FIG. **8** is a side view of an atomizer.
FIG. **9** is an end view of the atomizer shown in FIG. **8**.
FIG. **10** is a diagram of a spray atomizer.
FIG. **11** is an end view of the atomizer shown in FIG. **10**.
FIG. **12** is a section view of another embodiment.

DETAILED DESCRIPTION OF THE DRAWINGS

As shown in FIG. **1**, an electronic cigarette has an appearance similar to a cigarette inserted into the cigarette holder. As shown in FIG. **2**A, the electronic cigarette includes a battery assembly, an atomizer assembly and a cigarette bottle assembly. An external thread electrode (**209**) is located in one end of the battery assembly, and an internal thread electrode (**302**) is located in one end of the atomizer assembly. The battery assembly and atomizer assembly are connected through the screw thread electrode into an electronic cigarette. The cigarette bottle assembly is inserted into the other end of atomizer assembly.

As shown in FIG. **2**A, the battery assembly includes an indicator (**202**), lithium ion battery (**203**), MOSFET electric circuit board (**205**), sensor (**207**), silica gel corrugated membrane (**208**), primary screw thread electrode (**209**), primary negative pressure cavity (**210**), and primary shell (**211**). On one end of the primary shell (**211**) is an external thread electrode (**209**). On the other end is an indicator (**202**), where there is an indicator cap (**201**) on one side having a small hole (**501**). On the other side, the lithium ion battery (**203**) and MOSFET (Metallic Oxide Semiconductor Field Effect Tube) electric circuit board (**205**) are connected successively. The sensor (**207**) is located on MOSFET electric circuit board (**205**). Between the primary screw thread electrode (**209**) and sensor (**207**) is a silica gel corrugated membrane (**208**), on which there is the primary negative pressure cavity (**210**). The sensor (**207**) is connected with the silica gel corrugated membrane (**208**) through the switch spring (**212**).

The sensor (**207**) may be switch sensor made of elastic alloy slice, a linear output Hall sensor, a semiconductor force-sensitive chip, a semiconductor matrix thermoelectric bridge chip, capacitance or inductance sensor. The indicators (**202**) include two red LEDs. The lithium ion battery (**203**) may be either a rechargeable polymer lithium ion battery or a rechargeable lithium ion battery. The external thread electrode (**209**) is a gold-coated stainless steel or brass part with a hole drilled in the center. The silica gel corrugated membrane (**208**) may alternatively be made of fluorinated rubber, butyronitrile rubber, or elastic alloy film.

As shown in FIG. **3**, the atomizer assembly includes the internal thread electrode (**302**), air-liquid separator (**303**), atomizer (**307**) and the secondary shell (**306**). One end of the secondary shell (**306**) is inserted into the cigarette bottle assembly for connection, while the other end has an internal thread electrode (**302**), in which there is the secondary negative pressure cavity (**301**). The air-liquid separator (**303**) and the atomizer (**307**) are connected with the internal thread electrode (**302**) successively. On the secondary shell (**306**), there is an air intake hole (**502**). The air-liquid separator (**303**) is made of stainless steel or plastic with a hole. The internal thread electrode (**302**) is a gold-coated stainless steel or brass part with a hole in the center.

The atomizer (**307**) may be a capillary impregnation atomizer as in FIGS. **8** and **9**, or a spray atomizer as in FIGS. **10** and **11**. As shown in FIG. **4**, the cigarette bottle assembly includes the cigarette liquid bottle (**401**), fiber (**402**) and suction nozzle (**403**). The fiber (**402**) containing cigarette liquid is located on one end of the cigarette liquid bottle (**401**). This end is inserted into the secondary shell (**306**) and lies against the atomizer (**307**). The suction nozzle (**403**) is located on the other end of the cigarette liquid bottle (**401**). Between the fiber (**402**) and interior wall of the cigarette liquid bottle (**40** I) is an air intake hole (**503**).

As shown in FIG. **5**A, the standby state has the fully charged battery assembly shown on FIG. **2**A fastened onto the atomizer assembly shown on FIG. **3**, which is then inserted into the cigarette bottle assembly shown in FIG. **4**. When the user slightly sucks the suction nozzle (**403**), negative pressure forms on the silica gel corrugated membrane (**208**) through the air intake hole (**503**) and the primary and secondary negative pressure cavities (**210**, **301**). The silica gel corrugated membrane (**208**), under the action of suction pressure difference, distorts to drive the switch spring (**212**) and sensor (**207**), thus switching MOSFET electric circuit board (**205**).

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At this moment, the indicators (**202**) are lit gradually; the lithium ion battery (**203**) electrifies the heating body (**305**) inside the atomizer (**307**) through MOSFET electric circuit board (**205**) as well as the internal and external thread electrodes (**302**, **209**).

The heating body (**305**) inside the atomizer (**307**) produces heat. The fiber (**402**) inside the cigarette liquid bottle (**401**) contains cigarette liquid, which soaks the micro-porous ceramics (**801**) inside the atomizer through the fiber (**402**). The air enters through the air intake hole (**502**), passes through the run-through hole on the air-liquid separator (**303**), and helps to form air-liquid mixture in the spray nozzle (**304**) of the atomizer (**307**). The air-liquid mixture sprays onto the heating body (**305**), gets vaporized, and is quickly absorbed into the airflow and condensed into aerosol, which passes through the air intake hole (**503**) and suction nozzle (**403**) to form white mist type aerosol.

When suction stops, the switch spring (**212**) and sensor (**207**) are reset; the atomizer (**307**) stops working; the indicators (**202**) gradually die down. When the operation times reaches the pre-set value, the atomizer (**307**) provides a work delay of 5-20 seconds per time, so as to remove the micro-dirt accumulated on the heating body (**305**).

Besides the micro-porous ceramics, the liquid supply material of the atomizer (**307**) may also be foamed ceramics, micro-porous glass, foamed metal, stainless steel fiber felt, terylene fiber, nylon fiber, nitrile fiber, aramid fiber or hard porous plastics. The heating body (**305**) is made of the micro-porous ceramics on which nickel-chromium alloy wire, iron-chromium alloy wire, platinum wire, or other electro thermal materials are wound. Alternatively, it may be a porous component directly made of electrically conductive ceramics or PTC (Positive Temperature Coefficient) ceramics and associated with a sintered electrode. The surface of the heating body(**305**) is sintered into high-temperature glaze to fix the zeolite grains, which are made of natural zeolite, artificial non-organic micro-porous ceramics or aluminum oxide grains. The cigarette liquid bottle (**401**) and suction nozzle (**403**) in the cigarette bottle assembly are made of non-toxic plastic. The fiber (**402**) inside of them is made of polypropylene fiber or nylon fiber to absorb cigarette liquid. In the battery assembly, there is a fine hole (**501**) on the indicator cap (**201**) for balancing the pressure difference on both sides of the silica gel corrugated membrane (**208**).

The cigarette liquid contains 0.1-3.5% nicotine, 0.05-5% tobacco flavor, 0.1-3% organic acid, 0.1-0.5% stabilizer, and propanediol for the remaining.

The primary and secondary shells (**211**, **306**) are made of stainless steel tube or copper alloy tube with baked-enamel coating of real cigarette color.

As shown in FIG. **12**, the diameter of the battery assembly may be increased in proportion, so that it is consistent with the diameter of the atomizer assembly. Its shell may be decorated with the leaf veins and sub-gloss brown-yellow baked-enamel coating, to create a cigar type device.

For charging the lithium ion battery (**203**), the screw thread electrode (**601**) matches the external thread electrode (**209**) on the battery assembly, so that it may be used as the charging interface.

The design in FIG. **2**B is difference from the design in FIG. **1**A as follows: Microcircuit (**206**) is added between MOSFET electric circuit board (**205**) and sensor (**207**). On the surface of the primary shell (**211**), there is a screen (**204**) for display of the power of the lithium ion battery (**203**) and the sucking times.

As shown in FIG. **5**B, a fully charged battery assembly is attached onto the atomizer assembly, which is then inserted into the cigarette bottle assembly shown on FIG. **4**. When the user slightly sucks the suction nozzle (**403**), negative pressure forms on the silica gel corrugated membrane (**208**) through the air intake hole (**503**) and the primary and secondary negative pressure cavities (**210**, **301**). The silica gel corrugated membrane (**208**), under the action of suction pressure difference, distorts to drive the switch spring (**212**) and sensor (**207**), thus activating the Microcircuit (**206**) and MOSFET electric circuit board (**205**). At this moment, the indicators (**202**) are lit gradually; the lithium ion battery (**203**) electrifies the heating body (**305**) inside the atomizer (**307**) through MOSFET electric circuit board (**205**) as well as the internal and external thread electrodes (**302**, **209**), so that the heating body (**305**) inside the atomizer (**307**) produces heat.

The fiber (**402**) inside the cigarette liquid bottle (**401**) contains cigarette liquid, which soaks the micro-porous ceramics (**801**) inside the atomizer through the fiber (**402**). The air enters through the air intake hole (**502**), passes through the run-through hole on the air-liquid separator (**303**), and helps to form air-liquid mixture in the spray nozzle (**304**) of the atomizer (**307**). The air-liquid mixture sprays onto the heating body (**305**), gets vaporized, and is quickly absorbed into the airflow and condensed into aerosol, which passes through the air intake hole (**503**) and suction nozzle (**403**) to form white mist type aerosol.

As shown in FIG. **7**, when the action of suction activates the sensor, Microcircuit (**206**) scans the sensor (**207**) in the power-saving mode of pulse, and according to the signal parameters of the sensor (**207**), restricts the atomizing capacity with the integral function of frequency to single operation time. Also, the microcircuit (**206**) accomplishes the pulse width modulation and over discharging protection for the constant power output, automatic cleansing for thousands of times per operation, step lighting/dying down control of the indicator, display of the operation times and battery capacity, automatic recovery after sensor malfunction shutdown, etc.

The unit and its connecting structure may also be loaded with drugs for delivery to the lung.

Above are just specifications of an example and do not necessarily restrict the scope of protection. Any equivalent modification made on the basis of the design spirit shall fall into the scope of protection.

The invention claimed is:

1. A combination of an electronic cigarette, and a battery charger, comprising:

a battery assembly comprising a tubular battery assembly housing having a first end and a second end, with a battery and a micro-controller unit electrically connected to a circuit board within the battery assembly housing;

a first screw thread electrode on the first end of the battery assembly housing, with a first through hole at a center of the first screw thread electrode;

an atomizer assembly comprising:

a tubular atomizer assembly housing having a first end and a second end;

an atomizer and a liquid supply in the tubular atomizer assembly housing;

a second screw thread electrode on the second end of the atomizer assembly housing, with a second through hole at a center of the second screw thread electrode;

with the atomizer including a heater wire and a porous body, with the heater wire wound on a part of the porous body which is perpendicular to a longitudinal axis of the tubular atomizer assembly housing;

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an airflow path from an air inlet through an opening in the atomizer, to an outlet at the second end of the tubular atomizer assembly housing;

with the battery assembly mechanically and electrically connectable to the atomizer assembly to form the electronic cigarette by engagement of the first screw thread electrode with the second screw thread electrode, and with electricity conducted from the battery to the heater wire through the first and second screw thread electrodes for heating the heater wire; and

a battery charger having a third screw thread electrode mechanically and electrically engageable with the first screw thread electrode, for charging the battery by conducting electricity from the battery charger through the third and first screw thread electrodes to the battery.

2. The combination of claim **1** further including a sensor in the battery assembly housing, with the sensor electrically connected to the micro-controller unit.

3. The combination of claim **2** further including a pressure balancing hole in the battery assembly housing.

4. The combination of claim **3** with the pressure balancing hole at the second end of the battery assembly housing.

5. The combination of claim **4** with the pressure balancing hole on a first side of the sensor and the air inlet on a second side of the sensor, opposite from the first side of the sensor.

6. The combination of claim **5** with the first screw thread electrode having external screw threads on an outside surface of the tubular battery assembly housing.

7. The combination of claim **5** further including a separator between the air inlet and the atomizer, with the separator having a run-through hole, and with the air flow path passing through the run-through hole.

8. The combination of claim **5** with the porous body comprising a fiber material.

9. The combination of claim **5** with the air inlet at the second screw thread electrode.

10. The combination of claim **5** further including a liquid supply in the tubular atomizer assembly housing, with the liquid supply containing a liquid, and the liquid in contact with the porous body.

11. The combination of claim **10** with the liquid including 0.1-3.5% nicotine.

12. A combination of an electronic cigarette, and a battery charger, comprising:

a battery assembly comprising a tubular battery assembly housing having a first end and a second end, and a pressure balancing hole;

a battery, a sensor and a micro-controller unit electrically connected to a circuit board within the battery assembly housing, with the pressure balancing hole on a first side of the sensor and an air inlet on a second side of the sensor, opposite from the first side of the sensor;

a first screw thread electrode on the first end of the battery assembly housing, with a first through hole at a center of the first screw thread electrode;

an atomizer assembly comprising:

a tubular atomizer assembly housing having a first end and a second end;

an atomizer and a liquid supply in the tubular atomizer assembly housing;

a second screw thread electrode on the second end of the atomizer assembly housing, with a second through hole at a center of the second screw thread electrode;

the atomizer including a heater wire and a porous body comprising a fiber material, with the heater wire wound on a part of the porous body which is perpendicular to a longitudinal axis of the tubular atomizer assembly housing;

a liquid supply in the tubular atomizer assembly housing, with the liquid supply holding a liquid, and the liquid in contact with the porous body;

an airflow path from an air inlet through an opening in the atomizer, to an outlet at the second end of the tubular atomizer assembly housing;

with the battery assembly mechanically and electrically connectable to the atomizer assembly to form the electronic cigarette by engagement of the first screw thread electrode with the second screw thread electrode, and with electricity conducted from the battery to the heater wire through the first and second screw thread electrodes for heating the heater wire; and

a battery charger having a third screw thread electrode mechanically and electrically engageable with the first screw thread electrode, for charging the battery by conducting electricity from the battery charger through the third and first screw thread electrodes to the battery.

13. The combination of claim **12** with the pressure balancing hole at the second end of the battery assembly housing.

14. The combination of claim **12** with the first screw thread electrode having external screw threads on an outside surface of the tubular battery assembly housing.

15. The combination of claim **12** further including a separator between the air intake and the atomizer, with the separator having a run-through hole, and with the air flow path passing through the run-through hole.

16. The combination of claim **12** with the air inlet at the second screw thread electrode.

17. The combination of claim **12** with the liquid supply containing a liquid including 0.1-3.5% nicotine.

18. A combination of an electronic cigarette, and a battery charger, comprising:

a battery assembly comprising a tubular battery assembly housing having a first end and a second end, and a pressure balancing hole;

a battery, a sensor and a micro-controller unit electrically connected to a circuit board within the battery assembly housing, with the pressure balancing hole on a first side of the sensor and an air inlet on a second side of the sensor, opposite from the first side of the sensor;

a first screw thread electrode on the first end of the battery assembly housing, with a first through hole at a center of the first screw thread electrode;

an atomizer assembly comprising:

a tubular atomizer assembly housing having a first end and a second end;

an atomizer and a liquid supply in the tubular atomizer assembly housing;

a second screw thread electrode on the second end of the atomizer assembly housing, with a second through hole at a center of the second screw thread electrode, and with the air inlet at the second screw thread electrode;

with the atomizer including a heater wire and a porous body comprising a fiber material, with the heater wire wound on a part of the porous body which is perpendicular to a longitudinal axis of the tubular atomizer assembly housing;

a liquid supply in the tubular atomizer assembly housing, and the liquid supply having a liquid in contact with the porous body;

an airflow path from an air inlet through an opening in the atomizer, to an outlet at the second end of the tubular atomizer assembly housing;

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a separator between the air inlet and the atomizer, with the separator having a run-through hole, and with the air flow path passing through the run-through hole.

with the battery assembly mechanically and electrically connectable to the atomizer assembly to form the electronic cigarette by engagement of the first screw thread electrode with the second screw thread electrode, and with electricity conducted from the battery to the heater wire through the first and second screw thread electrodes for heating the heater wire; and

a battery charger having a third screw thread electrode mechanically and electrically engageable with the first screw thread electrode, for charging the battery by conducting electricity from the battery charger through the third and first screw thread electrodes to the battery.

19. The combination of claim **18** with the air inlet at the second screw thread electrode.

* * * * *

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EXHIBIT F

U 7616329

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December 21, 2016

THIS IS TO CERTIFY THAT ANNEXED HERETO IS A TRUE COPY FROM THE RECORDS OF THIS OFFICE OF:

U.S. PATENT: ***9,326,550***
ISSUE DATE: ***May 03, 2016***

By Authority of the
Under Secretary of Commerce for Intellectual Property
and Director of the United States Patent and Trademark Office

R. BLAKENEY
Certifying Officer

US009326550B2

(12) **United States Patent**
Hon

(10) **Patent No.: US 9,326,550 B2**
(45) **Date of Patent: *May 3, 2016**

(54) **ELECTRONIC CIGARETTE**

(71) Applicant: **FONTEM HOLDINGS 1 B.V.**, Amsterdam (NL)

(72) Inventor: **Lik Hon**, North Point (HK)

(73) Assignee: **Fontem Holdings 1 B.V.**, Amsterdam (NL)

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This patent is subject to a terminal disclaimer.

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(58) **Field of Classification Search**
None
See application file for complete search history.

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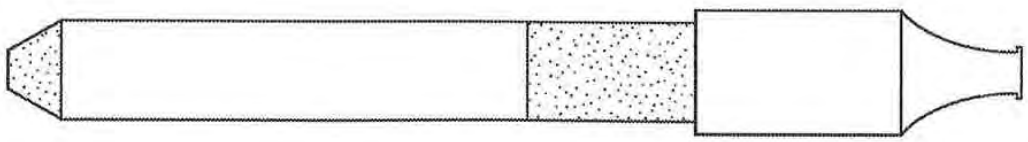
(57) **ABSTRACT**

An electronic cigarette includes a battery assembly, an atomizer assembly and a cigarette bottle assembly. An external thread electrode is located in one end of battery assembly. An internal thread electrode is located in one end of atomizer assembly. The battery assembly and the atomizer assembly are connected by the screwthread electrode. The cigarette bottle assembly is inserted into the other end of the atomizer assembly and both form a cigarette type or cigar type body.

24 Claims, 10 Drawing Sheets



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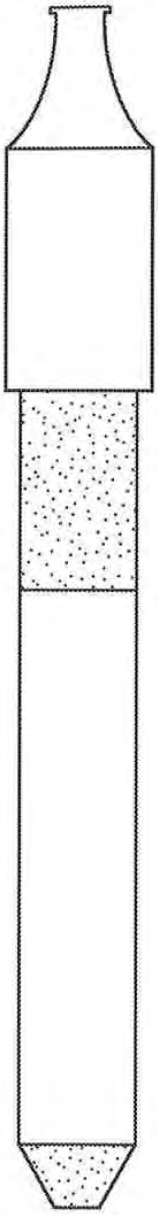

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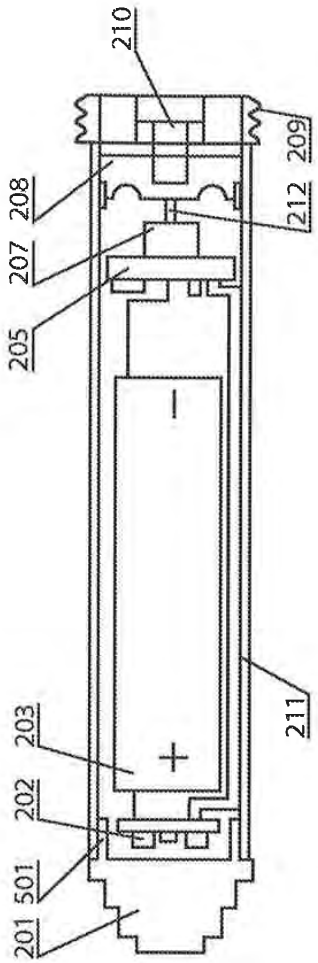

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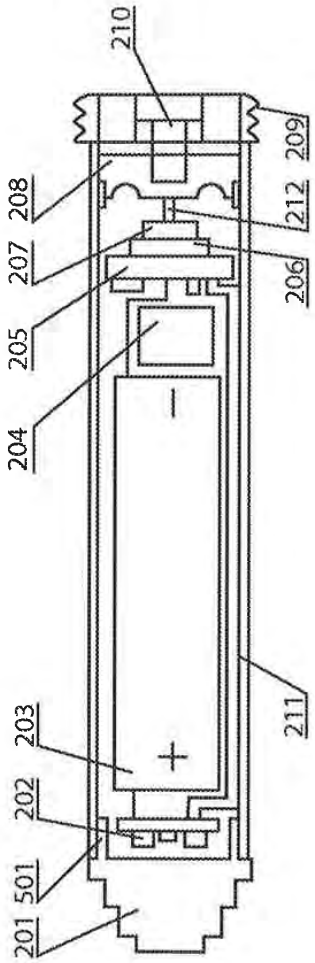

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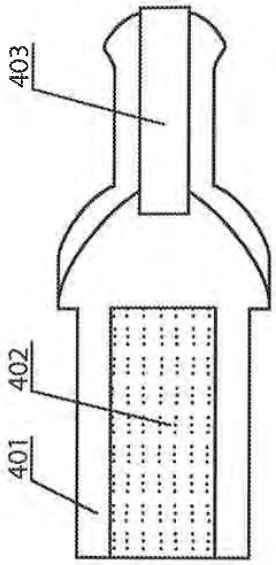

Figure 4

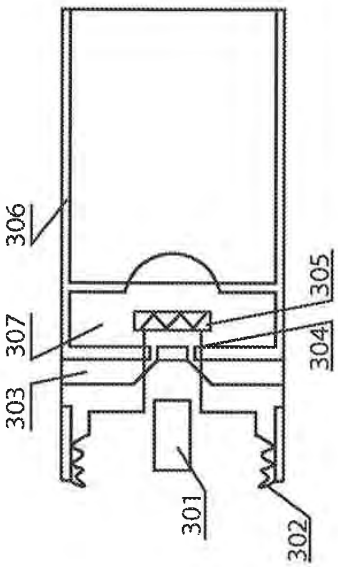

Figure 3

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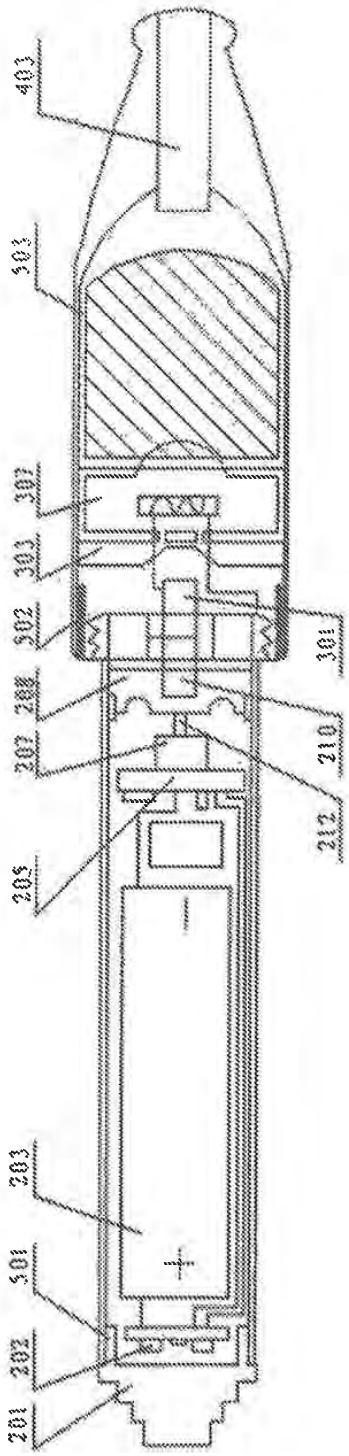

Figure 5A

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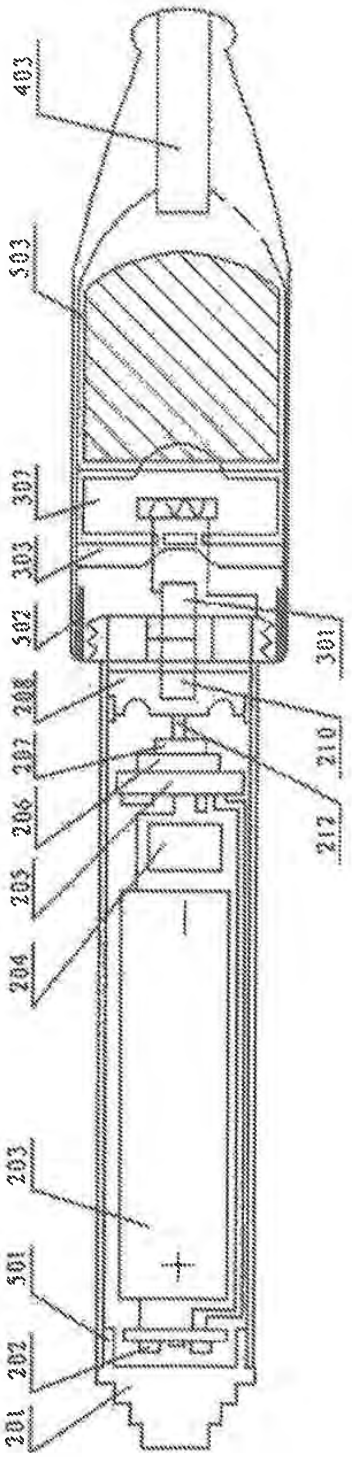

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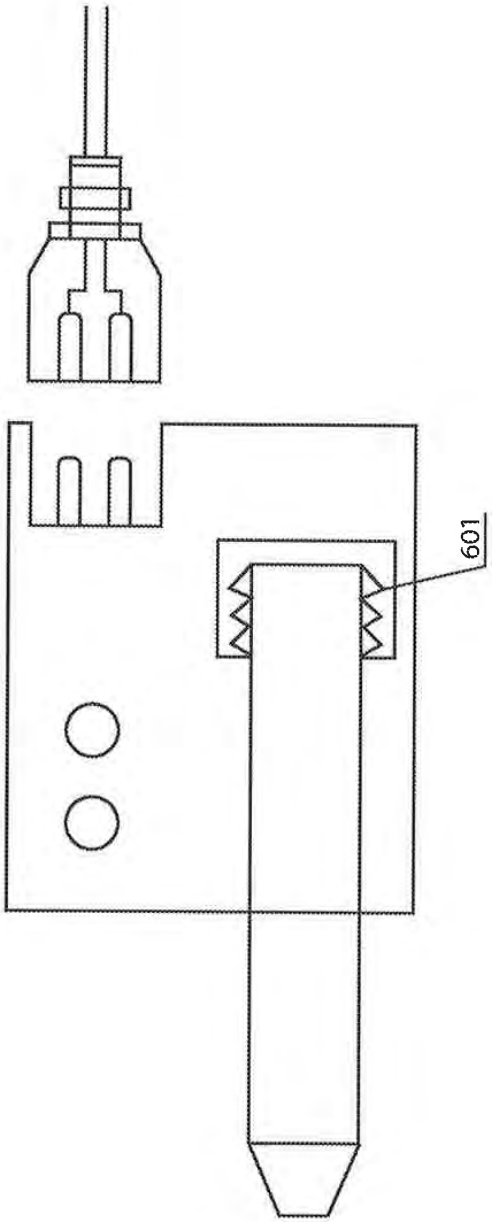

Figure 6

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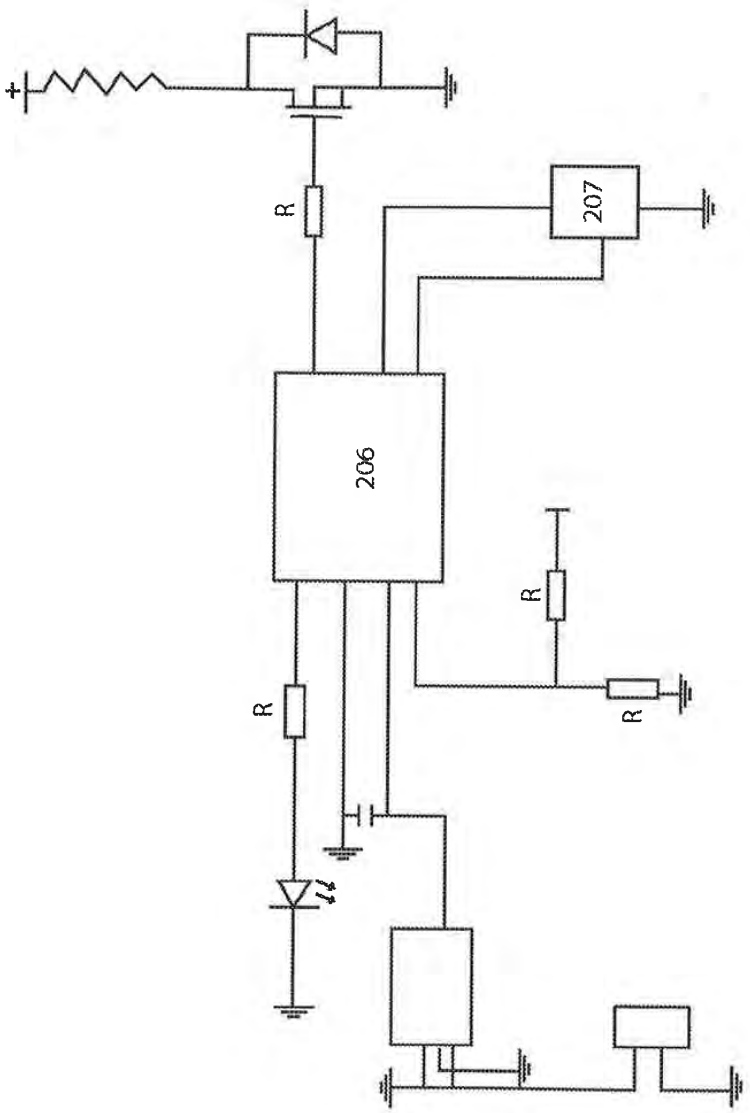

Figure 7

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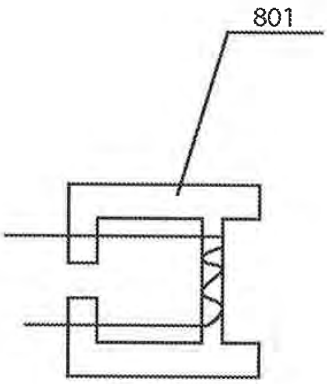

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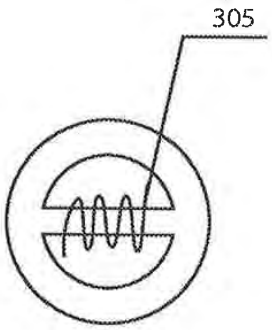

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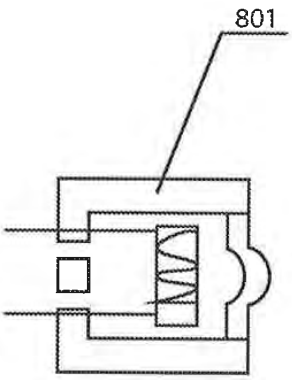

Figure 10

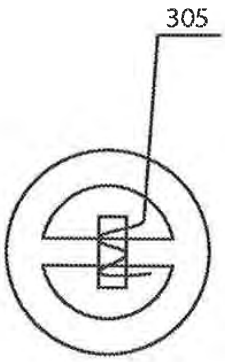

Figure 11

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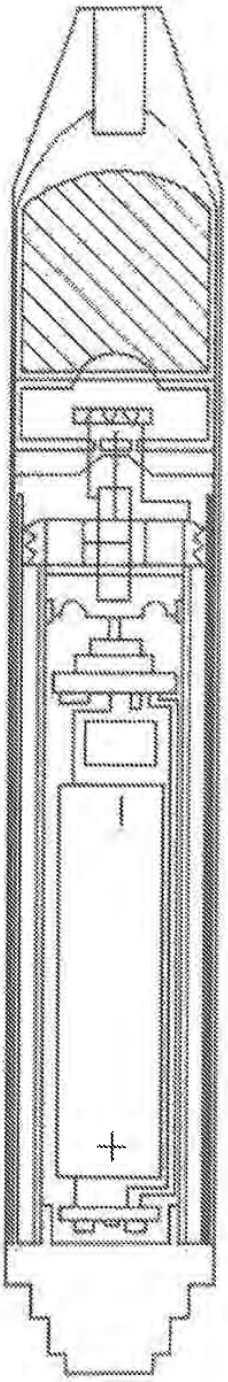

Figure 12

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ELECTRONIC CIGARETTE

CROSS-REFERENCE TO RELATED APPLICATIONS

This application is a continuation of U.S. patent application Ser. No. 13/754,521, filed Jan. 30, 2013, and now pending, which is a continuation of U.S. patent application Ser. No. 12/226,819, filed Jan. 15, 2009, and now U.S. Pat. No. 8,375,957, which is a 371 national phase application of International Patent Application No. PCT/CN2007/001576, filed May 15, 2007 and now converted, which claims the benefit of Chinese Patent Application No. 200620090805.0, filed May 16, 2006. All of these applications are incorporated herein by reference in their entirety.

BACKGROUND

Although smoking causes serious respiratory diseases and cancers, it is difficult to get smokers to quit smoking. Nicotine is the effective ingredient in cigarettes. Nicotine is a micromolecular alkaloid which is basically harmless to humans at low dosages. Tar is the major harmful substance in tobacco. Tobacco tar contains thousands of ingredients, dozens of which are carcinogenic.

Cigarette substitutes have used relatively pure nicotine in patches, chewing gum and aerosols. Still disadvantages remain with cigarette substitutes or products for helping smokers to quit smoking.

SUMMARY OF THE INVENTION

An improved electronic cigarette has a battery assembly, an atomizer assembly and a cigarette bottle assembly. The battery assembly connects with one end of the atomizer assembly, and the cigarette bottle assembly is inserted into the other end of the atomizer assembly, thus forming one cigarette type or cigar type body. Use of the electronic cigarette reduces cancer risks and fire hazards while providing a simulated smoking experience.

BRIEF DESCRIPTION OF THE DRAWINGS

FIG. **1** is a side view of an electronic cigarette.
FIG. **2**A is a view of the battery assembly.
FIG. **2**B is a view of another battery assembly.
FIG. **3** is the diagram of the atomizer assembly.
FIG. **4** is the diagram of the cigarette bottle assembly.
FIG. **5**A is a section view of an electronic cigarette.
FIG. **5**B is a section view of another embodiment.
FIG. **6** is a diagram of a charger.
FIG. **7** is the electric circuit diagram.
FIG. **8** is a side view of an atomizer.
FIG. **9** is an end view of the atomizer shown in FIG. **8**.
FIG. **10** is a diagram of a spray atomizer.
FIG. **11** is an end view of the atomizer shown in FIG. **10**.
FIG. **12** is a section view of another embodiment.

DETAILED DESCRIPTION OF THE DRAWINGS

As shown in FIG. **1**, an electronic cigarette has an appearance similar to a cigarette inserted into the cigarette holder. As shown in FIG. **2**A, the electronic cigarette includes a battery assembly, an atomizer assembly and a cigarette bottle assembly. An external thread electrode (**209**) is located in one end of the battery assembly, and an internal thread electrode (**302**) is located in one end of the atomizer assembly. The battery assembly and atomizer assembly are connected through the screw thread electrode into an electronic cigarette. The cigarette bottle assembly is inserted into the other end of atomizer assembly.

As shown in FIG. **2**A, the battery assembly includes an indicator (**202**), lithium ion battery (**203**), MOSFET electric circuit board (**205**), sensor (**207**), silica gel corrugated membrane (**208**), primary screw thread electrode (**209**), primary negative pressure cavity (**210**), and primary shell (**211**). On one end of the primary shell (**211**) is an external thread electrode (**209**). On the other end is an indicator (**202**), where there is an indicator cap (**201**) on one side having a small hole (**501**). On the other side, the lithium ion battery (**203**) and MOSFET (Metallic Oxide Semiconductor Field Effect Tube) electric circuit board (**205**) are connected successively. The sensor (**207**) is located on MOSFET electric circuit board (**205**). Between the primary screw thread electrode (**209**) and sensor (**207**) is a silica gel corrugated membrane (**208**), on which there is the primary negative pressure cavity (**210**). The sensor (**207**) is connected with the silica gel corrugated membrane (**208**) through the switch spring (**212**).

The sensor (**207**) may be switch sensor made of elastic alloy slice, a linear output Hall sensor, a semiconductor force-sensitive chip, a semiconductor matrix thermoelectric bridge chip, capacitance or inductance sensor. The indicators (**202**) include two red LEDs. The lithium ion battery (**203**) may be either a rechargeable polymer lithium ion battery or a rechargeable lithium ion battery. The external thread electrode (**209**) is a gold-coated stainless steel or brass part with a hole drilled in the center. The silica gel corrugated membrane (**208**) may alternatively be made of fluorinated rubber, butyronitrile rubber, or elastic alloy film.

As shown in FIG. **3**, the atomizer assembly includes the internal thread electrode (**302**), air-liquid separator (**303**), atomizer (**307**) and the secondary shell (**306**). One end of the secondary shell (**306**) is inserted into the cigarette bottle assembly for connection, while the other end has an internal thread electrode (**302**), in which there is the secondary negative pressure cavity (**301**). The air-liquid separator (**303**) and the atomizer (**307**) are connected with the internal thread electrode (**302**) successively. On the secondary shell (**306**), there is an air intake hole (**502**). The air-liquid separator (**303**) is made of stainless steel or plastic with a hole. The internal thread electrode (**302**) is a gold-coated stainless steel or brass part with a hole in the center.

The atomizer (**307**) may be a capillary impregnation atomizer as in FIGS. **8** and **9**, or a spray atomizer as in FIGS. **10** and **11**. As shown in FIG. **4**, the cigarette bottle assembly includes the cigarette liquid bottle (**401**), fiber (**402**) and suction nozzle (**403**). The fiber (**402**) containing cigarette liquid is located on one end of the cigarette liquid bottle (**401**). This end is inserted into the secondary shell (**306**) and lies against the atomizer (**307**). The suction nozzle (**403**) is located on the other end of the cigarette liquid bottle (**401**). Between the fiber (**402**) and interior wall of the cigarette liquid bottle (**40** I) is an air intake hole (**503**).

As shown in FIG. **5**A, the standby state has the fully charged battery assembly shown on FIG. **2**A fastened onto the atomizer assembly shown on FIG. **3**, which is then inserted into the cigarette bottle assembly shown in FIG. **4**. When the user slightly sucks the suction nozzle (**403**), negative pressure forms on the silica gel corrugated membrane (**208**) through the air intake hole (**503**) and the primary and secondary negative pressure cavities (**210**, **301**). The silica gel corrugated membrane (**208**), under the action of suction pressure difference, distorts to drive the switch spring (**212**) and sensor (**207**), thus switching MOSFET electric circuit board (**205**).

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At this moment, the indicators (202) are lit gradually; the lithium ion battery (203) electrifies the heating body (305) inside the atomizer (307) through MOSFET electric circuit board (205) as well as the internal and external thread electrodes (302, 209).

The heating body (305) inside the atomizer (307) produces heat. The fiber (402) inside the cigarette liquid bottle (401) contains cigarette liquid, which soaks the micro-porous ceramics (801) inside the atomizer through the fiber (402). The air enters through the air intake hole (502), passes through the run-through hole on the air-liquid separator (303), and helps to form air-liquid mixture in the spray nozzle (304) of the atomizer (307). The air-liquid mixture sprays onto the heating body (305), gets vaporized, and is quickly absorbed into the airflow and condensed into aerosol, which passes through the air intake hole (503) and suction nozzle (403) to form white mist type aerosol.

When suction stops, the switch spring (212) and sensor (207) are reset; the atomizer (307) stops working; the indicators (202) gradually die down. When the operation times reaches the pre-set value, the atomizer (307) provides a work delay of 5-20 seconds per time, so as to remove the micro-dirt accumulated on the heating body (305).

Besides the micro-porous ceramics, the liquid supply material of the atomizer (307) may also be foamed ceramics, micro-porous glass, foamed metal, stainless steel fiber felt, terylene fiber, nylon fiber, nitrile fiber, aramid fiber or hard porous plastics. The heating body (305) is made of the micro-porous ceramics on which nickel-chromium alloy wire, iron-chromium alloy wire, platinum wire, or other electro thermal materials are wound. Alternatively, it may be a porous component directly made of electrically conductive ceramics or PTC (Positive Temperature Coefficient) ceramics and associated with a sintered electrode. The surface of the heating body (305) is sintered into high-temperature glaze to fix the zeolite grains, which are made of natural zeolite, artificial non-organic micro-porous ceramics or aluminum oxide grains. The cigarette liquid bottle (401) and suction nozzle (403) in the cigarette bottle assembly are made of non-toxic plastic. The fiber (402) inside of them is made of polypropylene fiber or nylon fiber to absorb cigarette liquid. In the battery assembly, there is a fine hole (501) on the indicator cap (201) for balancing the pressure difference on both sides of the silica gel corrugated membrane (208).

The cigarette liquid contains 0.1-3.5% nicotine, 0.05-5% tobacco flavor, 0.1-3% organic acid, 0.1-0.5% stabilizer, and propanediol for the remaining.

The primary and secondary shells (211, 306) are made of stainless steel tube or copper alloy tube with baked-enamel coating of real cigarette color.

As shown in FIG. 12, the diameter of the battery assembly may be increased in proportion, so that it is consistent with the diameter of the atomizer assembly. Its shell may be decorated with the leaf veins and sub-gloss brown-yellow baked-enamel coating, to create a cigar type device.

For charging the lithium ion battery (203), the screw thread electrode (601) matches the external thread electrode (209) on the battery assembly, so that it may be used as the charging interface.

The design in FIG. 2B is difference from the design in FIG. 1A as follows: Microcircuit (206) is added between MOSFET electric circuit board (205) and sensor (207). On the surface of the primary shell (211), there is a screen (204) for display of the power of the lithium ion battery (203) and the sucking times.

As shown in FIG. 5B, a fully charged battery assembly is attached onto the atomizer assembly, which is then inserted into the cigarette bottle assembly shown on FIG. 4. When the user slightly sucks the suction nozzle (403), negative pressure forms on the silica gel corrugated membrane (208) through the air intake hole (503) and the primary and secondary negative pressure cavities (210, 301). The silica gel corrugated membrane (208), under the action of suction pressure difference, distorts to drive the switch spring (212) and sensor (207), thus activating the Microcircuit (206) and MOSFET electric circuit board (205). At this moment, the indicators (202) are lit gradually; the lithium ion battery (203) electrifies the heating body (305) inside the atomizer (307) through MOSFET electric circuit board (205) as well as the internal and external thread electrodes (302, 209), so that the heating body (305) inside the atomizer (307) produces heat.

The fiber (402) inside the cigarette liquid bottle (401) contains cigarette liquid, which soaks the micro-porous ceramics (801) inside the atomizer through the fiber (402). The air enters through the air intake hole (502), passes through the run-through hole on the air-liquid separator (303), and helps to form air-liquid mixture in the spray nozzle (304) of the atomizer (307). The air-liquid mixture sprays onto the heating body (305), gets vaporized, and is quickly absorbed into the airflow and condensed into aerosol, which passes through the air intake hole (503) and suction nozzle (403) to form white mist type aerosol.

As shown in FIG. 7, when the action of suction activates the sensor, Microcircuit (206) scans the sensor (207) in the power-saving mode of pulse, and according to the signal parameters of the sensor (207), restricts the atomizing capacity with the integral function of frequency to single operation time. Also, the microcircuit (206) accomplishes the pulse width modulation and over discharging protection for the constant power output, automatic cleansing for thousands of times per operation, step lighting/dying down control of the indicator, display of the operation times and battery capacity, automatic recovery after sensor malfunction shutdown, etc.

The unit and its connecting structure may also be loaded with drugs for delivery to the lung.

Above are just specifications of an example and do not necessarily restrict the scope of protection. Any equivalent modification made on the basis of the design spirit shall fall into the scope of protection.

The invention claimed is:

1. A vaporizing device comprising:

an electronic cigarette including:

a battery assembly comprising a tubular battery assembly housing having a first end and a second end, with a battery and a micro-controller unit electrically connected to a circuit board within the battery assembly housing;

a first screw thread electrode on the first end of the battery assembly housing, with a first through hole at a center of the first screw thread electrode;

an atomizer assembly comprising:

a tubular atomizer assembly housing having a first end and a second end;

an atomizer having a porous body, and a liquid supply in the tubular atomizer assembly housing;

with the atomizer including a heater wire wound on a part of the porous body which is perpendicular to a longitudinal axis of the tubular atomizer assembly housing;

an airflow path through an opening in the atomizer to a suction nozzle at the second end of the tubular atomizer assembly housing;

a second screw thread electrode on the second end of the atomizer assembly housing, with a second through hole at a center of the second screw thread electrode; and

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the battery assembly and the atomizer assembly mechanically connected to form the electronic cigarette by engagement of the first screw thread electrode with the second screw thread electrode, and with electricity conducted from the battery to the heater wire through the first and second screw thread electrodes for heating the heater wire.

2. The device of claim **1** further including a sensor in the battery assembly housing, with the sensor electrically connected to the micro-controller unit.

3. The device of claim **2** further including a pressure balancing hole in the battery assembly housing.

4. The device of claim **3** with the pressure balancing hole at the second end of the battery assembly housing.

5. The device of claim **3** further including an air inlet at the second screw thread electrode.

6. The device of claim **5** with the pressure balancing hole on a first side of the sensor and the air inlet on a second side of the sensor, opposite from the first side of the sensor.

7. The device of claim **1** with the porous body comprising a fiber material.

8. The device of claim **1** with the first screw thread electrode having external screw threads on an outside surface of the tubular battery assembly housing.

9. The device of claim **5** further including a separator between the air inlet and the atomizer, with the separator having a run-through hole, and with the air flow path passing through the run-through hole.

10. The device of claim **1** wherein the first screw thread electrode surrounds and is concentric with the second screw thread electrode.

11. The device of claim **10** with the heater wire having a first lead connected to the inner electrode and a second lead connected to the outer electrode.

12. The device of claim **11** with the first and second through holes leading into the airflow path.

13. A vaporizing device comprising:

an electronic cigarette including:

a battery assembly comprising a tubular battery assembly housing having a first end and a second end, with a battery, a sensor, and a micro-controller unit electrically connected to a circuit board within the battery assembly housing;

a pressure balancing hole in the tubular battery assembly housing on a first side of the sensor and an air inlet in the tubular battery assembly housing on a second side of the sensor, opposite from the first side of the sensor;

a first screw thread electrode on the first end of the battery assembly housing, with a first through hole at a center of the first screw thread electrode;

an atomizer assembly comprising:

a tubular atomizer assembly housing having a first end and a second end;

an atomizer having a porous body, and a liquid supply in the tubular atomizer assembly housing;

with the atomizer including a heater wire wound on a part of the porous body which is perpendicular to a longitudinal axis of the tubular atomizer assembly housing;

an airflow path through an opening in the atomizer to a suction nozzle at the second end of the tubular atomizer assembly housing;

a second screw thread electrode on the second end of the atomizer assembly housing, with a second through hole at a center of the second screw thread electrode; and

the battery assembly and the atomizer assembly mechanically connected to form the electronic cigarette by engagement of the first screw thread electrode with the second screw thread electrode, and with electricity conducted from the battery to the heater wire through the first and second screw thread electrodes for heating the heater wire.

14. The device of claim **13** with the pressure balancing hole at the second end of the battery assembly housing.

15. The device of claim **13** with the porous body comprising a fiber material.

16. The device of claim **15** with the first screw thread electrode having external screw threads on an outside surface of the tubular battery assembly housing.

17. The device of claim **15** further including a rubber or plastic separator between the air inlet and the atomizer, with the separator having a run-through hole, and with the air flow path passing through the run-through hole.

18. The device of claim **15** wherein the first screw thread electrode surrounds and is concentric with the second screw thread electrode.

19. The device of claim **15** with the heater wire having a first lead connected to the inner electrode and a second lead connected to the outer electrode.

20. The device of claim **15** with the first and second through holes leading into the airflow path.

21. A vaporizing device comprising:

an electronic cigarette including:

a battery assembly comprising a tubular battery assembly housing having a first end and a second end, with a battery, a sensor, and a micro-controller unit electrically connected to a circuit board within the battery assembly housing;

a pressure balancing hole in the tubular battery assembly housing on a first side of the sensor and an air inlet in the tubular battery assembly housing on a second side of the sensor, opposite from the first side of the sensor;

a first screw thread electrode on the first end of the battery assembly housing, with a first through hole at a center of the first screw thread electrode;

an atomizer assembly comprising:

a tubular atomizer assembly housing having a first end and a second end;

an atomizer having a porous body comprising a fiber material, and a liquid supply in the tubular atomizer assembly housing;

with the atomizer including a heater wire wound on a part of the porous body which is perpendicular to a longitudinal axis of the tubular atomizer assembly housing;

an airflow path through an opening in the atomizer to a suction nozzle at the second end of the tubular atomizer assembly housing;

a rubber or plastic separator between the air intake hole and the atomizer, with the separator having a run-through hole, and with the air flow path passing through the run-through hole;

a second screw thread electrode on the second end of the atomizer assembly housing, with a second through hole at a center of the second screw thread electrode, with the first and second through holes leading into the airflow path; and

the battery assembly and the atomizer assembly mechanically connected to form the electronic cigarette by engagement of the first screw thread electrode with the second screw thread electrode, and with electricity conducted from the battery to the heater wire through the first and second screw thread electrodes for heating the heater wire.

22. The device of claim **21** with the pressure balancing hole at the second end of the battery assembly housing.

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23. The device of claim 21 further including an air inlet at the second screw thread electrode.

24. The device of claim 21 wherein the first screw thread electrode surrounds and is concentric with the second screw thread electrode.

* * * * *

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EXHIBIT G

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U.S. PATENT: *9,326,551*
ISSUE DATE: *May 03, 2016*

By Authority of the
Under Secretary of Commerce for Intellectual Property
and Director of the United States Patent and Trademark Office

R. BLAKENEY
Certifying Officer

US009326551B2

(12) **United States Patent**
Hon

(10) **Patent No.: US 9,326,551 B2**
(45) **Date of Patent: *May 3, 2016**

(54) **ELECTRONIC CIGARETTE**

(71) Applicant: **FONTEM HOLDINGS 1 B.V.**, Amsterdam (NL)

(72) Inventor: **Lik Hon**, North Point (HK)

(73) Assignee: **Fontem Holdings 1 B.V.**, Amsterdam (NL)

(*) Notice: Subject to any disclaimer, the term of this patent is extended or adjusted under 35 U.S.C. 154(b) by 0 days.

This patent is subject to a terminal disclaimer.

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(22) Filed: **May 27, 2015**

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(63) Continuation of application No. 13/754,521, filed on Jan. 30, 2013, which is a continuation of application No. 12/226,819, filed as application No. PCT/CN2007/001576 on May 15, 2007, now Pat. No. 8,375,957.

(30) **Foreign Application Priority Data**

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A24F 13/00 (2006.01)
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CPC ***A24F 47/008*** (2013.01); ***A24F 47/002*** (2013.01); ***A24F 47/004*** (2013.01); ***F22B 1/284*** (2013.01); ***H01M 2/1055*** (2013.01);
(Continued)

(58) **Field of Classification Search**
None
See application file for complete search history.

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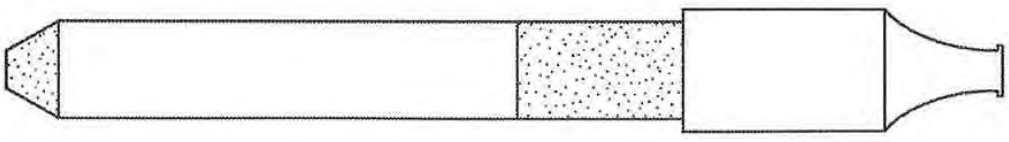
Primary Examiner — Michael H Wilson
Assistant Examiner — Phu Nguyen
(74) *Attorney, Agent, or Firm* — Perkins Coie LLP

(57) **ABSTRACT**

An electronic cigarette includes a battery assembly, an atomizer assembly and a cigarette bottle assembly. An external thread electrode is located in one end of battery assembly. An internal thread electrode is located in one end of atomizer assembly. The battery assembly and the atomizer assembly are connected by the screwthread electrode. The cigarette bottle assembly is inserted into the other end of the atomizer assembly and both form a cigarette type or cigar type body.

15 Claims, 10 Drawing Sheets



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A24F 25/00	(2006.01)
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H05B 3/42	(2006.01)
F22B 1/28	(2006.01)
H01M 2/10	(2006.01)
H01M 10/42	(2006.01)
H01M 10/46	(2006.01)
H02J 7/00	(2006.01)

(52) **U.S. Cl.**

CPC ***H01M10/425*** (2013.01); ***H01M 10/46*** (2013.01); ***H02J 7/0042*** (2013.01); ***H02J 7/0052*** (2013.01); ***H05B 1/0244*** (2013.01); ***H05B 1/0297*** (2013.01); ***H05B 3/06*** (2013.01); ***H05B 3/42*** (2013.01)

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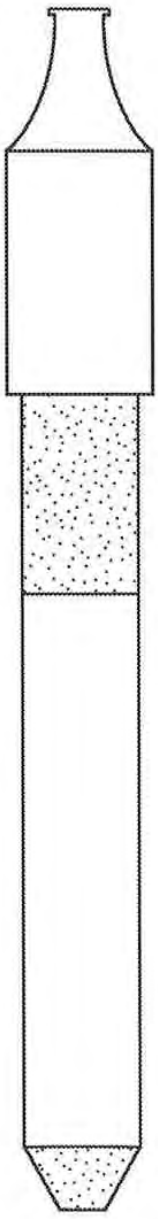

Figure 1

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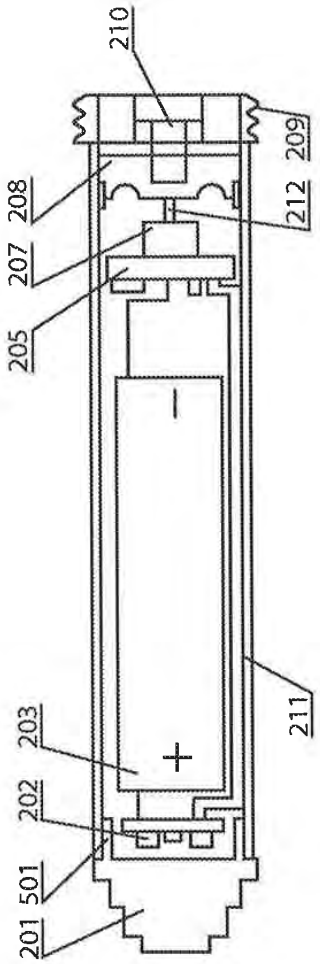

Figure 2A

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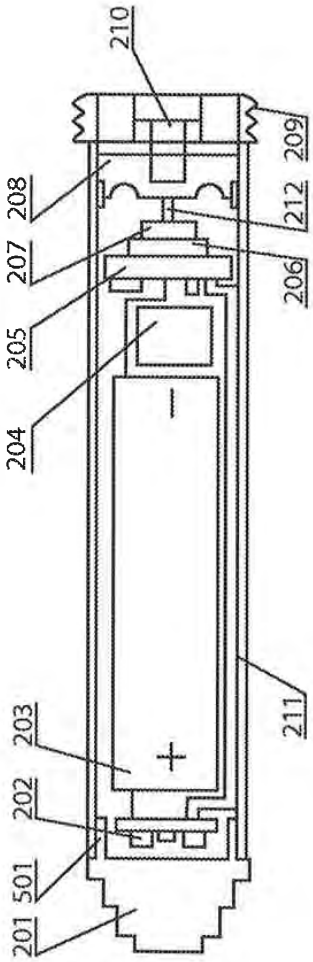

Figure 2B

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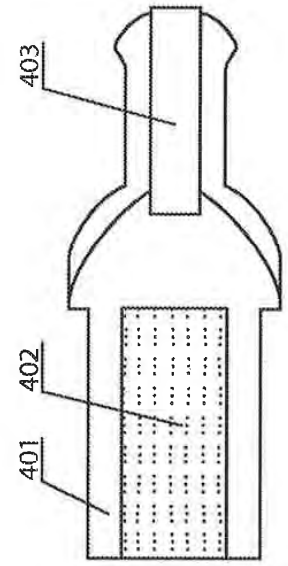

Figure 4

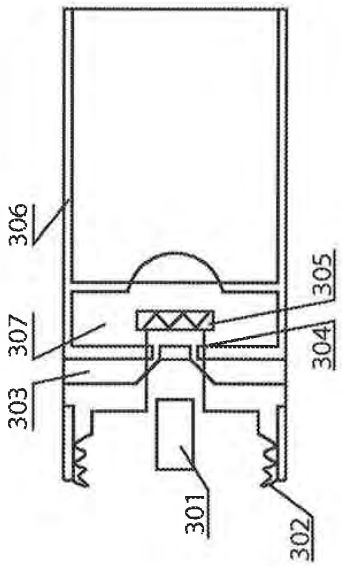

Figure 3

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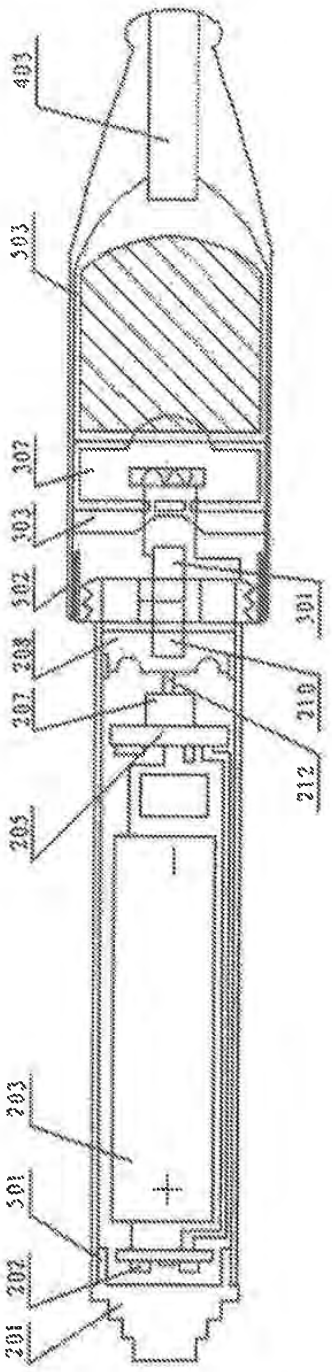

Figure 5A

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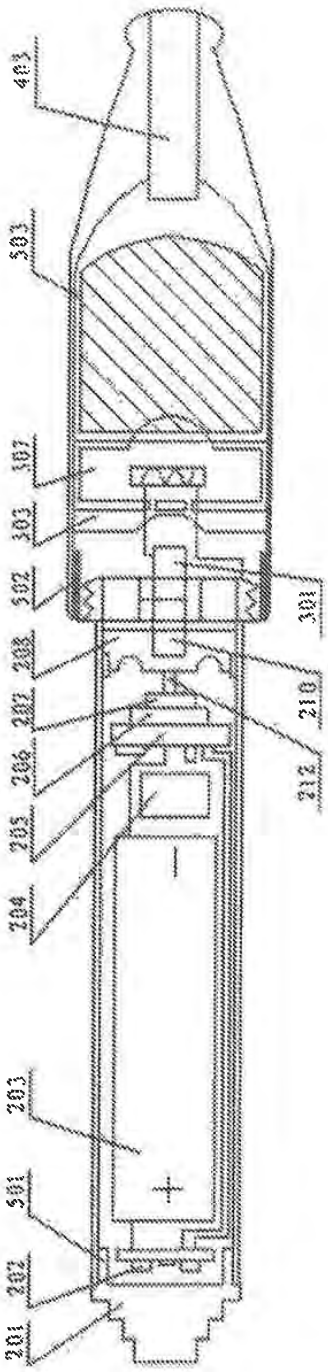

Figure 5B

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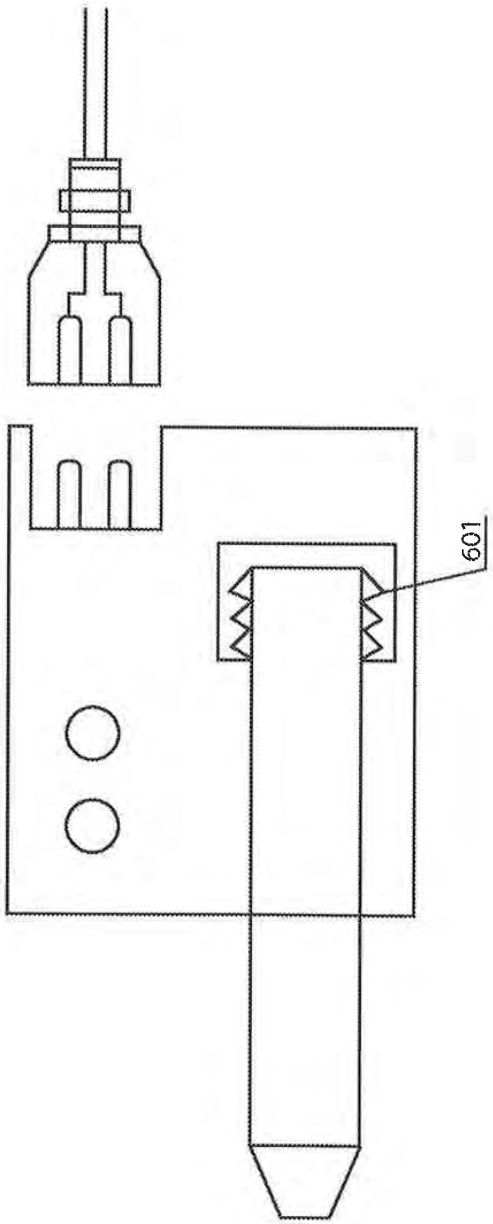

Figure 6

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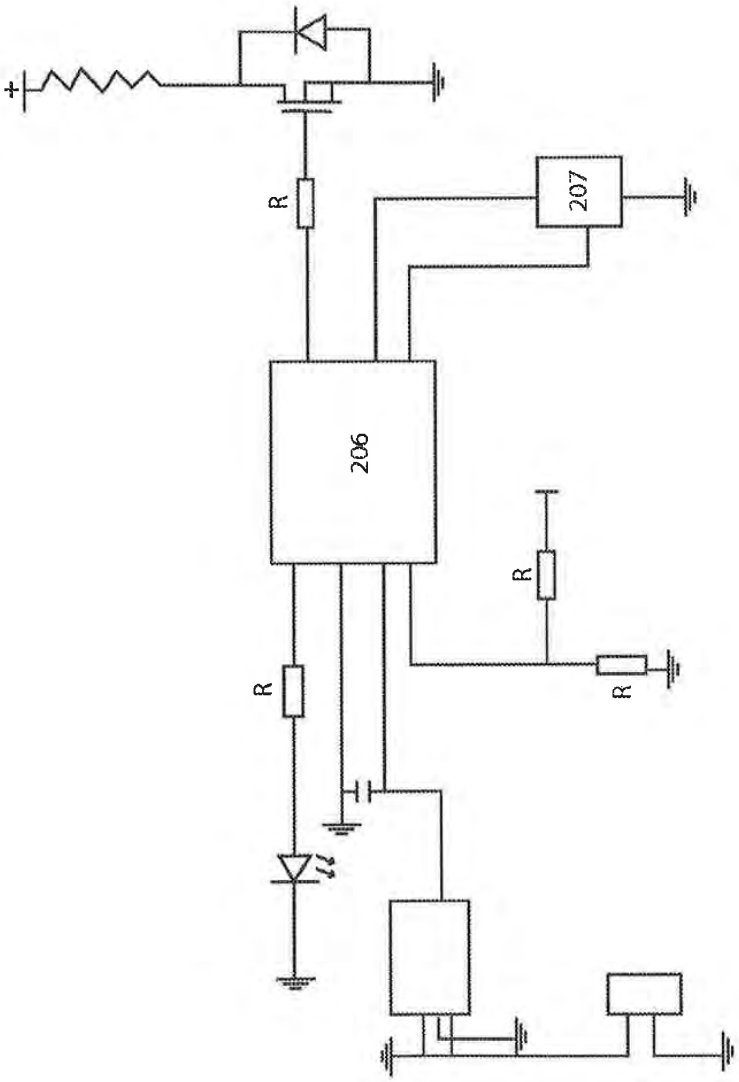

Figure 7

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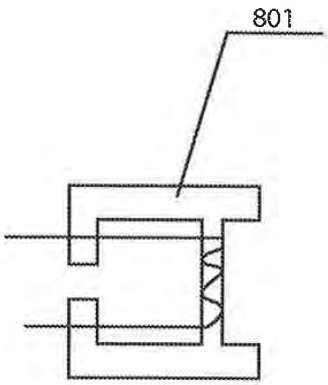

Figure 8

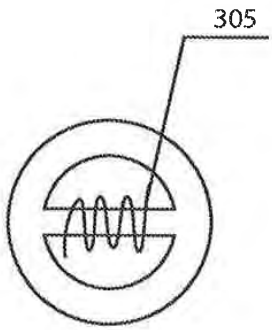

Figure 9

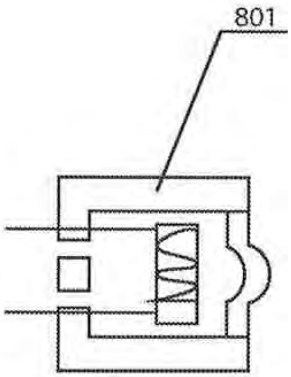

Figure 10

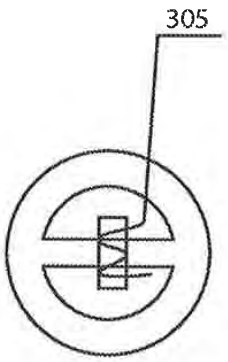

Figure 11

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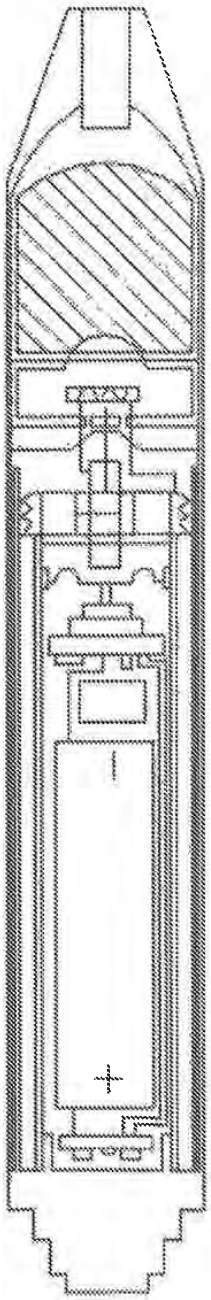

Figure 12

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ELECTRONIC CIGARETTE

CROSS-REFERENCE TO RELATED APPLICATIONS

This application is a continuation of U.S. patent application Ser. No. 13/754,521, filed Jan. 30, 2013, and now pending, which is a continuation of U.S. patent application Ser. No. 12/226,819, filed Jan. 15, 2009, and now U.S. Pat. No. 8,375,957, which is a 371 national phase application of International Patent Application No. PCT/CN2007/001576, filed May 15, 2007 and now converted, which claims the benefit of Chinese Patent Application No. 200620090805.0, filed May 16, 2006. All of these applications are incorporated herein by reference in their entirety.

BACKGROUND

Although smoking causes serious respiratory diseases and cancers, it is difficult to get smokers to quit smoking. Nicotine is the effective ingredient in cigarettes. Nicotine is a micromolecular alkaloid which is basically harmless to humans at low dosages. Tar is the major harmful substance in tobacco. Tobacco tar contains thousands of ingredients, dozens of which are carcinogenic.

Cigarette substitutes have used relatively pure nicotine in patches, chewing gum and aerosols. Still disadvantages remain with cigarette substitutes or products for helping smokers to quit smoking.

SUMMARY OF THE INVENTION

An improved electronic cigarette has a battery assembly, an atomizer assembly and a cigarette bottle assembly. The battery assembly connects with one end of the atomizer assembly, and the cigarette bottle assembly is inserted into the other end of the atomizer assembly, thus forming one cigarette type or cigar type body. Use of the electronic cigarette reduces cancer risks and fire hazards while providing a simulated smoking experience.

BRIEF DESCRIPTION OF THE DRAWINGS

FIG. **1** is a side view of an electronic cigarette.
FIG. **2**A is a view of the battery assembly.
FIG. **2**B is a view of another battery assembly.
FIG. **3** is the diagram of the atomizer assembly.
FIG. **4** is the diagram of the cigarette bottle assembly.
FIG. **5**A is a section view of an electronic cigarette.
FIG. **5**B is a section view of another embodiment.
FIG. **6** is a diagram of a charger.
FIG. **7** is the electric circuit diagram.
FIG. **8** is a side view of an atomizer.
FIG. **9** is an end view of the atomizer shown in FIG. **8**.
FIG. **10** is a diagram of a spray atomizer.
FIG. **11** is an end view of the atomizer shown in FIG. **10**.
FIG. **12** is a section view of another embodiment.

DETAILED DESCRIPTION OF THE DRAWINGS

As shown in FIG. **1**, an electronic cigarette has an appearance similar to a cigarette inserted into the cigarette holder. As shown in FIG. **2**A, the electronic cigarette includes a battery assembly, an atomizer assembly and a cigarette bottle assembly. An external thread electrode (**209**) is located in one end of the battery assembly, and an internal thread electrode (**302**) is located in one end of the atomizer assembly. The battery assembly and atomizer assembly are connected through the screw thread electrode into an electronic cigarette. The cigarette bottle assembly is inserted into the other end of atomizer assembly.

As shown in FIG. **2**A, the battery assembly includes an indicator (**202**), lithium ion battery (**203**), MOSFET electric circuit board (**205**), sensor (**207**), silica gel corrugated membrane (**208**), primary screw thread electrode (**209**), primary negative pressure cavity (**210**), and primary shell (**211**). On one end of the primary shell (**211**) is an external thread electrode (**209**). On the other end is an indicator (**202**), where there is an indicator cap (**201**) on one side having a small hole (**501**). On the other side, the lithium ion battery (**203**) and MOSFET (Metallic Oxide Semiconductor Field Effect Tube) electric circuit board (**205**) are connected successively. The sensor (**207**) is located on MOSFET electric circuit board (**205**). Between the primary screw thread electrode (**209**) and sensor (**207**) is a silica gel corrugated membrane (**208**), on which there is the primary negative pressure cavity (**210**). The sensor (**207**) is connected with the silica gel corrugated membrane (**208**) through the switch spring (**212**).

The sensor (**207**) may be switch sensor made of elastic alloy slice, a linear output Hall sensor, a semiconductor force-sensitive chip, a semiconductor matrix thermoelectric bridge chip, capacitance or inductance sensor. The indicators (**202**) include two red LEDs. The lithium ion battery (**203**) may be either a rechargeable polymer lithium ion battery or a rechargeable lithium ion battery. The external thread electrode (**209**) is a gold-coated stainless steel or brass part with a hole drilled in the center. The silica gel corrugated membrane (**208**) may alternatively be made of fluorinated rubber, butyronitrile rubber, or elastic alloy film.

As shown in FIG. **3**, the atomizer assembly includes the internal thread electrode (**302**), air-liquid separator (**303**), atomizer (**307**) and the secondary shell (**306**). One end of the secondary shell (**306**) is inserted into the cigarette bottle assembly for connection, while the other end has an internal thread electrode (**302**), in which there is the secondary negative pressure cavity (**301**). The air-liquid separator (**303**) and the atomizer (**307**) are connected with the internal thread electrode (**302**) successively. On the secondary shell (**306**), there is an air intake hole (**502**). The air-liquid separator (**303**) is made of stainless steel or plastic with a hole. The internal thread electrode (**302**) is a gold-coated stainless steel or brass part with a hole in the center.

The atomizer (**307**) may be a capillary impregnation atomizer as in FIGS. **8** and **9**, or a spray atomizer as in FIGS. **10** and **11**. As shown in FIG. **4**, the cigarette bottle assembly includes the cigarette liquid bottle (**401**), fiber (**402**) and suction nozzle (**403**). The fiber (**402**) containing cigarette liquid is located on one end of the cigarette liquid bottle (**401**). This end is inserted into the secondary shell (**306**) and lies against the atomizer (**307**). The suction nozzle (**403**) is located on the other end of the cigarette liquid bottle (**401**). Between the fiber (**402**) and interior wall of the cigarette liquid bottle (**401**) is an air intake hole (**503**).

As shown in FIG. **5**A, the standby state has the fully charged battery assembly shown on FIG. **2**A fastened onto the atomizer assembly shown on FIG. **3**, which is then inserted into the cigarette bottle assembly shown in FIG. **4**. When the user slightly sucks the suction nozzle (**403**), negative pressure forms on the silica gel corrugated membrane (**208**) through the air intake hole (**503**) and the primary and secondary negative pressure cavities (**210**, **301**). The silica gel corrugated membrane (**208**), under the action of suction pressure difference, distorts to drive the switch spring (**212**) and sensor (**207**), thus switching MOSFET electric circuit board (**205**).

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At this moment, the indicators (**202**) are lit gradually; the lithium ion battery (**203**) electrifies the heating body (**305**) inside the atomizer (**307**) through MOSFET electric circuit board (**205**) as well as the internal and external thread electrodes (**302**, **209**).

The heating body (**305**) inside the atomizer (**307**) produces heat. The fiber (**402**) inside the cigarette liquid bottle (**401**) contains cigarette liquid, which soaks the micro-porous ceramics (**801**) inside the atomizer through the fiber (**402**). The air enters through the air intake hole (**502**), passes through the run-through hole on the air-liquid separator (**303**), and helps to form air-liquid mixture in the spray nozzle (**304**) of the atomizer (**307**). The air-liquid mixture sprays onto the heating body (**305**), gets vaporized, and is quickly absorbed into the airflow and condensed into aerosol, which passes through the air intake hole (**503**) and suction nozzle (**403**) to form white mist type aerosol.

When suction stops, the switch spring (**212**) and sensor (**207**) are reset; the atomizer (**307**) stops working; the indicators (**202**) gradually die down. When the operation times reaches the pre-set value, the atomizer (**307**) provides a work delay of 5-20 seconds per time, so as to remove the micro-dirt accumulated on the heating body (**305**).

Besides the micro-porous ceramics, the liquid supply material of the atomizer (**307**) may also be foamed ceramics, micro-porous glass, foamed metal, stainless steel fiber felt, terylene fiber, nylon fiber, nitrile fiber, aramid fiber or hard porous plastics. The heating body (**305**) is made of the micro-porous ceramics on which nickel-chromium alloy wire, iron-chromium alloy wire, platinum wire, or other electro thermal materials are wound. Alternatively, it may be a porous component directly made of electrically conductive ceramics or PTC (Positive Temperature Coefficient) ceramics and associated with a sintered electrode. The surface of the heating body (**305**) is sintered into high-temperature glaze to fix the zeolite grains, which are made of natural zeolite, artificial non-organic micro-porous ceramics or aluminum oxide grains. The cigarette liquid bottle (**401**) and suction nozzle (**403**) in the cigarette bottle assembly are made of non-toxic plastic. The fiber (**402**) inside of them is made of polypropylene fiber or nylon fiber to absorb cigarette liquid. In the battery assembly, there is a fine hole (**501**) on the indicator cap (**201**) for balancing the pressure difference on both sides of the silica gel corrugated membrane (**208**).

The cigarette liquid contains 0.1-3.5% nicotine, 0.05-5% tobacco flavor, 0.1-3% organic acid, 0.1-0.5% stabilizer, and propanediol for the remaining.

The primary and secondary shells (**211**, **306**) are made of stainless steel tube or copper alloy tube with baked-enamel coating of real cigarette color.

As shown in FIG. **12**, the diameter of the battery assembly may be increased in proportion, so that it is consistent with the diameter of the atomizer assembly. Its shell may be decorated with the leaf veins and sub-gloss brown-yellow baked-enamel coating, to create a cigar type device.

For charging the lithium ion battery (**203**), the screw thread electrode (**601**) matches the external thread electrode (**209**) on the battery assembly, so that it may be used as the charging interface.

The design in FIG. **2**B is difference from the design in FIG. **1**A as follows: Microcircuit (**206**) is added between MOSFET electric circuit board (**205**) and sensor (**207**). On the surface of the primary shell (**211**), there is a screen (**204**) for display of the power of the lithium ion battery (**203**) and the sucking times.

As shown in FIG. **5**B, a fully charged battery assembly is attached onto the atomizer assembly, which is then inserted into the cigarette bottle assembly shown on FIG. **4**. When the user slightly sucks the suction nozzle (**403**), negative pressure forms on the silica gel corrugated membrane (**208**) through the air intake hole (**503**) and the primary and secondary negative pressure cavities (**210**, **301**). The silica gel corrugated membrane (**208**), under the action of suction pressure difference, distorts to drive the switch spring (**212**) and sensor (**207**), thus activating the Microcircuit (**206**) and MOSFET electric circuit board (**205**). At this moment, the indicators (**202**) are lit gradually; the lithium ion battery (**203**) electrifies the heating body (**305**) inside the atomizer (**307**) through MOSFET electric circuit board (**205**) as well as the internal and external thread electrodes (**302**, **209**), so that the heating body (**305**) inside the atomizer (**307**) produces heat.

The fiber (**402**) inside the cigarette liquid bottle (**401**) contains cigarette liquid, which soaks the micro-porous ceramics (**801**) inside the atomizer through the fiber (**402**). The air enters through the air intake hole (**502**), passes through the run-through hole on the air-liquid separator (**303**), and helps to form air-liquid mixture in the spray nozzle (**304**) of the atomizer (**307**). The air-liquid mixture sprays onto the heating body (**305**), gets vaporized, and is quickly absorbed into the airflow and condensed into aerosol, which passes through the air intake hole (**503**) and suction nozzle (**403**) to form white mist type aerosol.

As shown in FIG. **7**, when the action of suction activates the sensor, Microcircuit (**206**) scans the sensor (**207**) in the power-saving mode of pulse, and according to the signal parameters of the sensor (**207**), restricts the atomizing capacity with the integral function of frequency to single operation time. Also, the microcircuit (**206**) accomplishes the pulse width modulation and over discharging protection for the constant power output, automatic cleansing for thousands of times per operation, step lighting/dying down control of the indicator, display of the operation times and battery capacity, automatic recovery after sensor malfunction shutdown, etc.

The unit and its connecting structure may also be loaded with drugs for delivery to the lung.

Above are just specifications of an example and do not necessarily restrict the scope of protection. Any equivalent modification made on the basis of the design spirit shall fall into the scope of protection.

The invention claimed is:

1. An atomizer assembly used with a battery assembly to provide an electronic cigarette comprising:

a tubular atomizer assembly housing having a first end and a second end;

an atomizer and a liquid supply in the tubular atomizer assembly housing;

an inner electrode and an outer electrode at the first end of the tubular atomizer assembly housing, with the inner electrode concentric with the outer electrode;

with the atomizer including a heater wire wound on a porous body and the porous body perpendicular to a central longitudinal axis of the tubular atomizer assembly housing, with the heater wire having a first lead connected to the inner electrode and a second lead connected to the outer electrode; and

an airflow path through the tubular atomizer assembly housing from the atomizer to an outlet at the second end of the tubular atomizer assembly housing.

2. The atomizer assembly of claim **1** further including a through hole centered on the central longitudinal axis of the tubular atomizer assembly housing, and with the through hole leading to the airflow path.

3. The atomizer assembly of claim **2** with the through hole at a center of the inner electrode.

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4. The atomizer assembly of claim 3 with the porous body comprising a fiber material.

5. The atomizer assembly of claim 4 further including a liquid supply in the tubular atomizer assembly housing in contact with the porous body.

6. The atomizer assembly of claim 5 with the liquid supply containing a liquid including 0.1-3.5% nicotine.

7. The atomizer assembly of claim 5 with the fiber material confined within inner cylindrical walls of the tubular atomizer assembly housing.

8. The atomizer assembly of claim 7 further including an air passageway within the tubular atomizer assembly housing around the liquid supply.

9. The atomizer assembly of claim 4 further including a mouthpiece at the second end of the tubular atomizer assembly housing, and with the outlet in the mouthpiece.

10. The atomizer assembly of claim 9 wherein the mouthpiece is removable from the second end of the tubular atomizer assembly housing.

11. An atomizer assembly component of an electronic cigarette comprising:

a tubular atomizer assembly housing having a first end and a second end;

an atomizer and a liquid supply in the tubular atomizer assembly housing;

an inner electrode and an outer electrode at the first end of the tubular atomizer assembly housing, with the inner electrode concentric with the outer electrode;

with the atomizer including a heater wire wound on a porous body comprising a fiber material, and the porous body perpendicular to a central longitudinal axis of the tubular atomizer assembly housing, with the heater wire having a first lead connected to the inner electrode and a second lead connected to the outer electrode;

an airflow path through the tubular atomizer assembly housing from the atomizer to an outlet at the second end of the tubular atomizer assembly housing;

a through hole at a center of the inner electrode leading into the airflow path;

a liquid supply in the tubular atomizer assembly housing in contact with the porous body, with the liquid supply containing a liquid including nicotine.

12. The atomizer assembly of claim 11 further including an air passageway within the tubular atomizer assembly housing around the liquid supply.

13. The atomizer assembly of claim 12 further including a mouthpiece at the second end of the tubular atomizer assembly housing, and with the outlet in the mouthpiece.

14. The atomizer assembly of claim 13 wherein the mouthpiece is removable from the second end of the tubular atomizer assembly housing.

15. An atomizer assembly component of an electronic cigarette comprising:

a tubular atomizer assembly housing having a first end and a second end;

a mouthpiece having an outlet at the second end of the tubular atomizer assembly housing;

an atomizer and a liquid supply in the tubular atomizer assembly housing;

an inner electrode and an outer electrode at the first end of the tubular atomizer assembly housing, with the inner electrode concentric with the outer electrode;

with the atomizer including a heater wire wound on a porous body comprising a fiber material, and the porous body perpendicular to a central longitudinal axis of the tubular atomizer assembly housing, with the heater wire having a first lead connected to the inner electrode and a second lead connected to the outer electrode;

an airflow path through the tubular atomizer assembly housing from the atomizer to an outlet at the second end of the tubular atomizer assembly housing;

a through hole at a center of the inner electrode leading into the airflow path;

a liquid supply in the tubular atomizer assembly housing in contact with the porous body, with the liquid supply containing a liquid including nicotine.

* * * * *

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EXHIBIT H

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U.S. PATENT: ***9,456,632***
ISSUE DATE: ***October 04, 2016***

By Authority of the
Under Secretary of Commerce for Intellectual Property
and Director of the United States Patent and Trademark Office

R. BLAKENEY
Certifying Officer

US009456632B2

(12) **United States Patent**
Hon

(10) **Patent No.: US 9,456,632 B2**
(45) **Date of Patent: *Oct. 4, 2016**

(54) **ELECTRONIC CIGARETTE**

(71) Applicant: **Lik Hon**, North Point (HK)

(72) Inventor: **Lik Hon**, North Point (HK)

(73) Assignee: **FONTEM HOLDINGS 1 B.V.**, Amsterdam (NL)

(*) Notice: Subject to any disclaimer, the term of this patent is extended or adjusted under 35 U.S.C. 154(b) by 254 days.

This patent is subject to a terminal disclaimer.

(21) Appl. No.: **13/740,011**

(22) Filed: **Jan. 11, 2013**

(65) **Prior Publication Data**

US 2013/0125906 A1 May 23, 2013

Related U.S. Application Data

(60) Continuation of application No. 13/079,937, filed on Apr. 5, 2011, now Pat. No. 8,365,742, which is a division of application No. 12/226,818, filed as application No. PCT/CN2007/001575 on May 15, 2007, now Pat. No. 8,156,944.

(30) **Foreign Application Priority Data**

May 16, 2006 (CN) 2006 2 0090805

(51) **Int. Cl.**
A24F 47/00 (2006.01)
H05B 1/02 (2006.01)
(Continued)

(52) **U.S. Cl.**
CPC ***A24F 47/008*** (2013.01); ***A24F 47/002*** (2013.01); ***A24F 47/004*** (2013.01); ***F22B 1/284*** (2013.01); ***H01M 2/1055*** (2013.01); ***H01M 10/425*** (2013.01); ***H01M 10/46*** (2013.01); ***H02J 7/0042*** (2013.01); ***H02J 7/0052*** (2013.01); ***H05B 1/0244*** (2013.01);
(Continued)

(58) **Field of Classification Search**
CPC A24F 47/008; A24F 47/002
USPC 131/270, 273; 128/202.21
See application file for complete search history.

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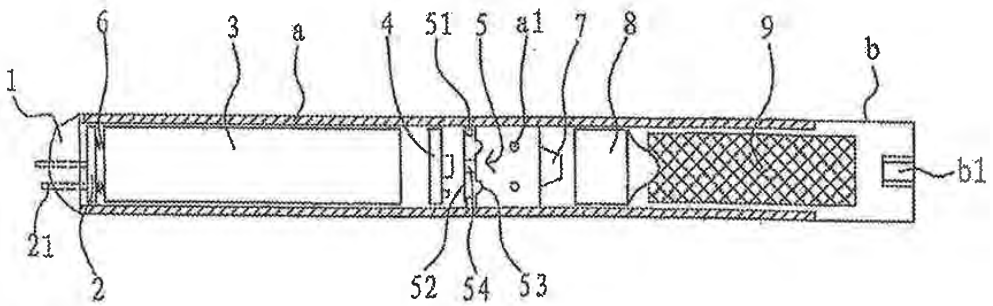
Primary Examiner — Michael H Wilson
Assistant Examiner — Dionne Walls Mayes
(74) *Attorney, Agent, or Firm* — Perkins Coie LLP

(57) **ABSTRACT**

An electronic cigarette includes a battery assembly and an atomizer assembly within a housing with the battery assembly electrically connected to the atomizer assembly. The housing has one or more air inlets. A liquid storage component is in contact with a porous component of the atomizer assembly, with the porous component having a run-through hole. A heating wire is in an air flow path through the run-through hole.

19 Claims, 8 Drawing Sheets



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(51) **Int. Cl.**

H05B 3/06	(2006.01)
H05B 3/42	(2006.01)
F22B 1/28	(2006.01)
H01M 2/10	(2006.01)
H01M 10/42	(2006.01)
H01M 10/46	(2006.01)
H02J 7/00	(2006.01)

(52) **U.S. Cl.**
CPC ***H05B 1/0297*** (2013.01); ***H05B 3/06*** (2013.01); ***H05B 3/42*** (2013.01)

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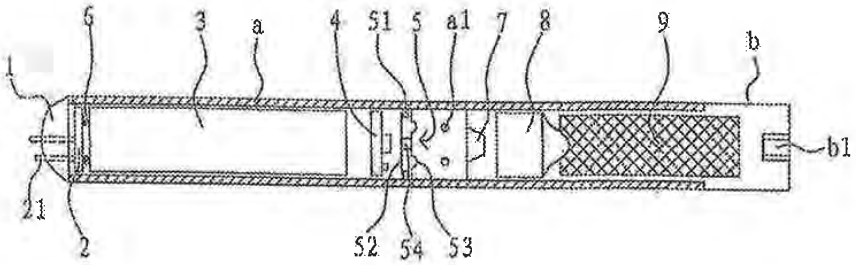

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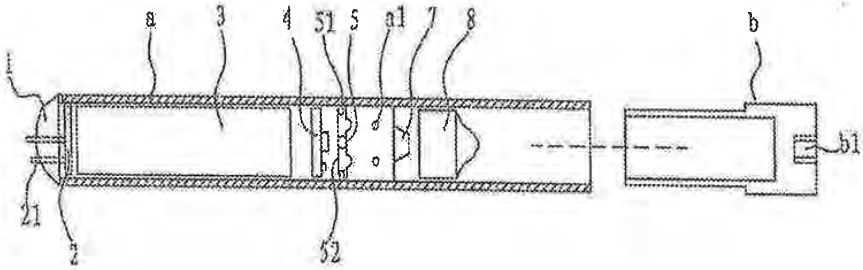

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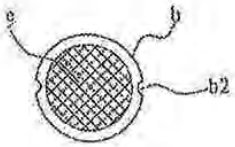

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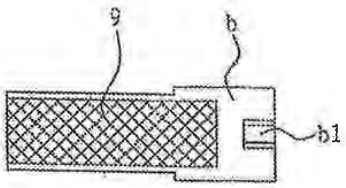

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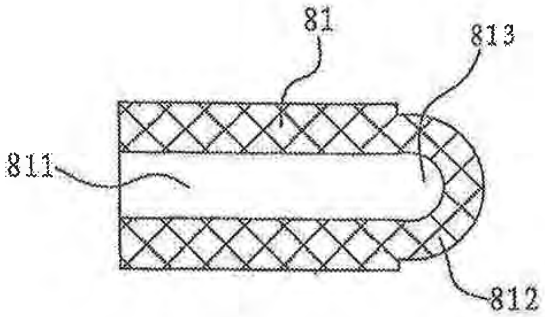

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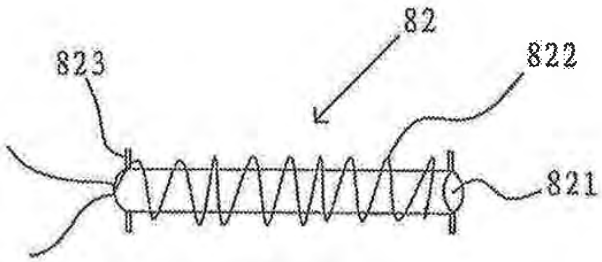

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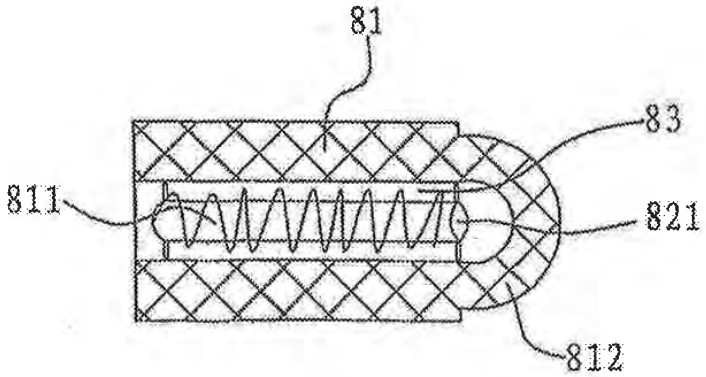

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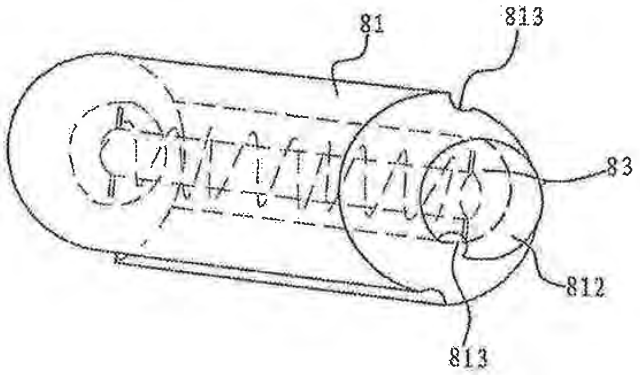

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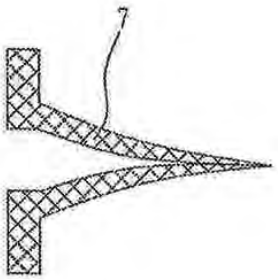

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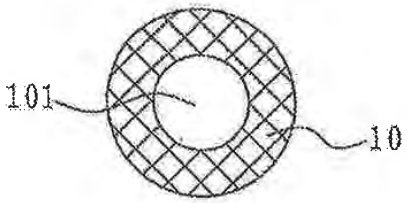

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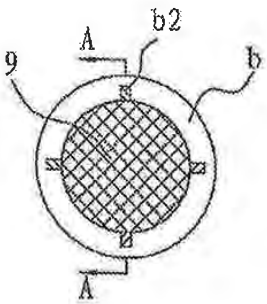

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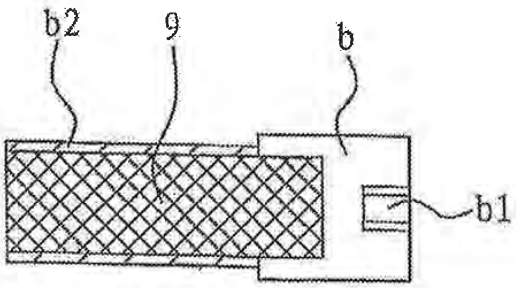

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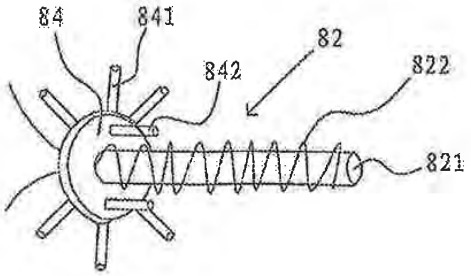

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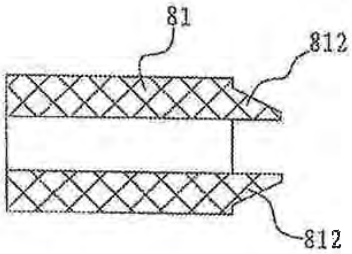

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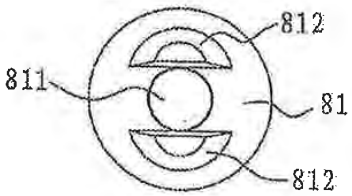

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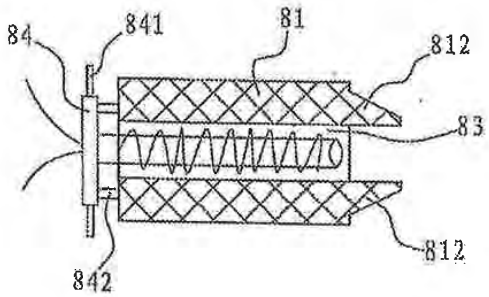

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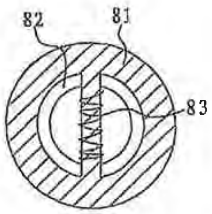

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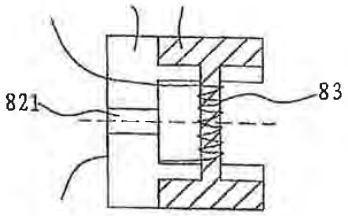

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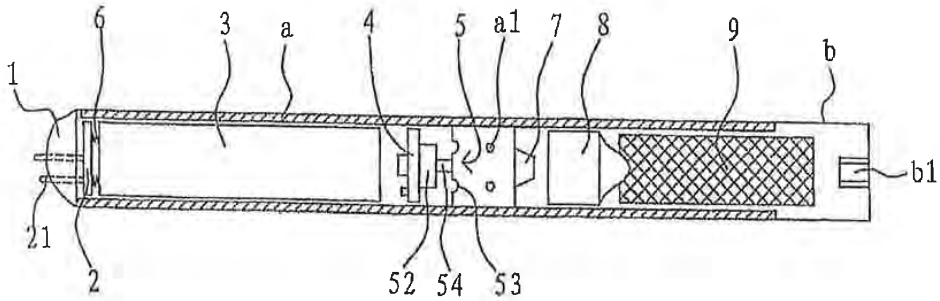

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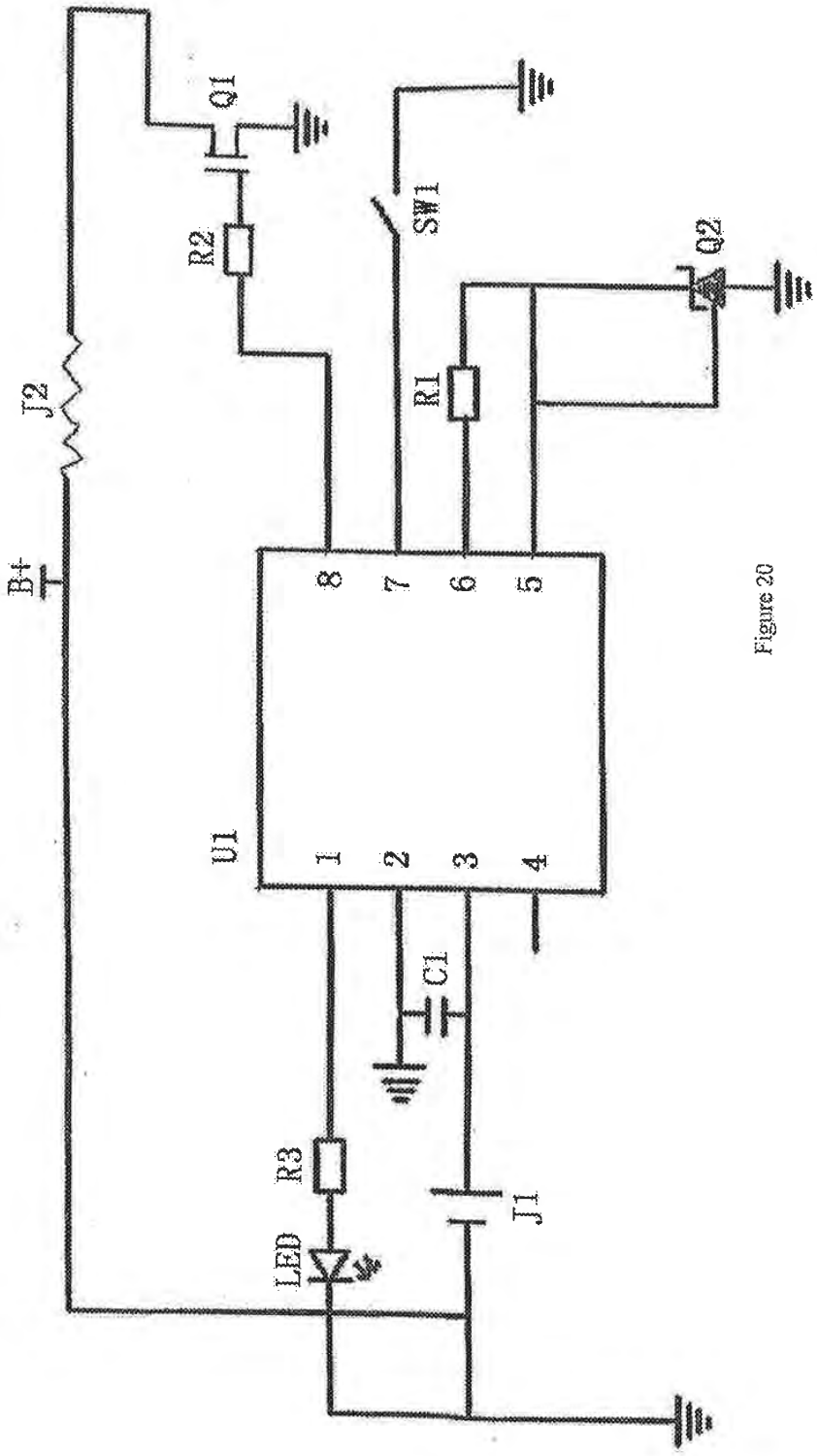

Figure 20

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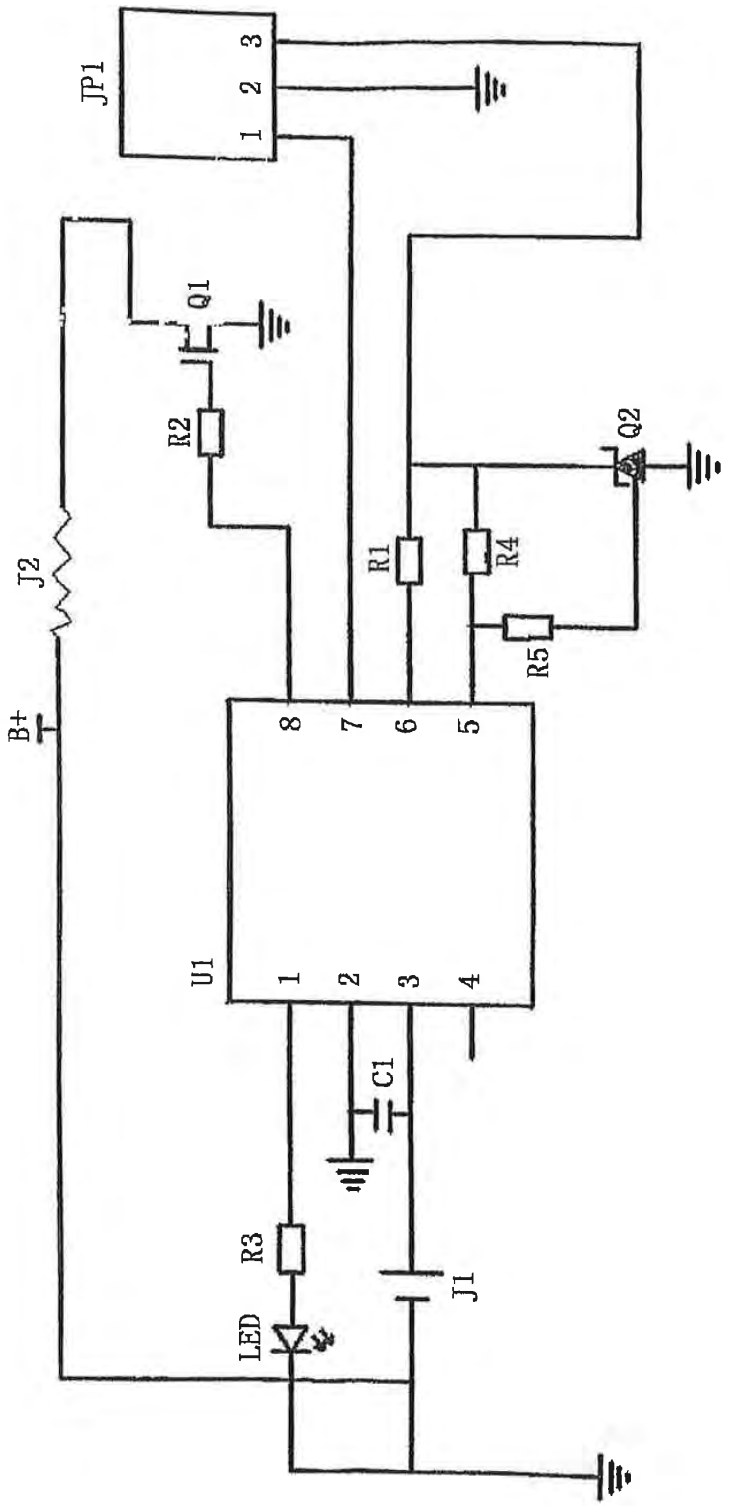

Figure 21

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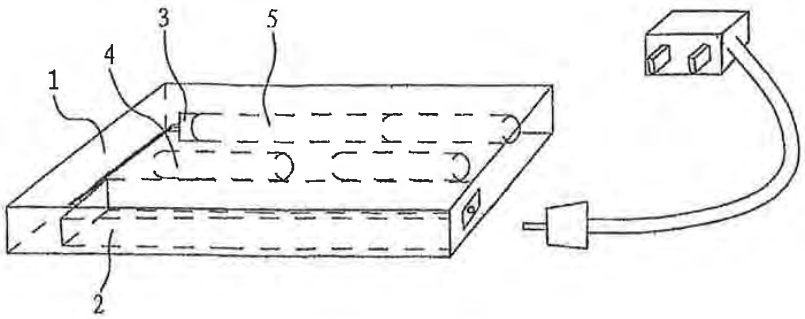

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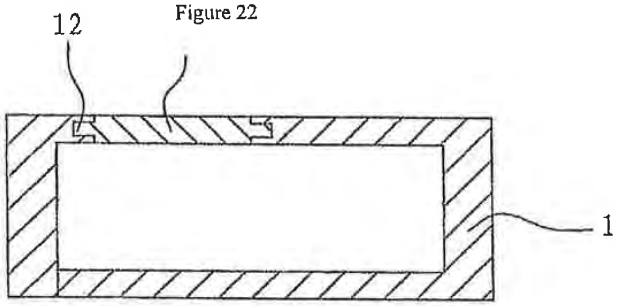

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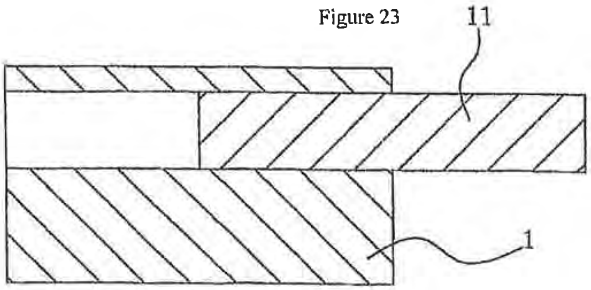

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ELECTRONIC CIGARETTE

CROSS-REFERENCE TO RELATED APPLICATIONS

This application is a continuation of U.S. patent application Ser. No. 13/079,937, filed Apr. 5, 2011 and now pending, which is a divisional of U.S. patent application Ser. No. 12/226,818, filed Oct. 29, 2008 and now issued as U.S. Pat. No. 8,156,944, which is a 371 national filing of International Application No. PCTCN2007/001575, filed May 15, 2007, which claims priority to Chinese Patent Application No. 200620090805.0, filed May 16, 2006. All these applications are incorporated herein by reference in their entirety.

BACKGROUND ART

Smoking causes serious respiratory system diseases and cancer, though it is hard to persuade the smokers to completely quit smoking.

Nicotine is the effective ingredient in cigarettes. Nicotine acts on the receptor of the central nervous system.

Nicotine is a micromolecular alkaloid, which is basically harmless to human bodies at a small dosage. Plus, its half life period is extremely short in blood. Tar is the major harmful substance in tobacco. Tobacco tar comprises several thousands of ingredients, dozens of which are carcinogenic substances.

To provide cigarette substitutes that contain nicotine but not harmful tar, many products have been used. These products are not as harmful as tar, but are absorbed very slowly. As a result, smokers can't be satisfied in full. In addition, the smokers are deprived of the "smoking" habit.

The electronic cigarettes currently available on the market may resolve the above-mentioned issue, though they are complicated in structure, they don't provide the ideal aerosol effects, and their atomizing efficiency is not high. Their cigarette bodies can be roughly divided into three sections, which have to be connected via plugging or thread coupling before use.

SUMMARY OF INVENTION

To overcome the above-mentioned disadvantages, an aerosol electronic cigarette includes a battery assembly, an atomizer assembly and a bottle assembly. The battery assembly connects with the atomizer assembly and both are located in a housing. The bottle assembly is located in one end of the housing and fits with the atomizer assembly.

The battery assembly may include the battery, an operating indicator, electronic circuit board, and airflow sensor, which are connected with the battery, and with the signal output of the airflow sensor connected to the electronic circuit board.

A component for liquid storage of the cigarette bottle assembly stores the nicotine liquid. Smokers can enjoy the feel of smoking, with no fire hazard since there is no need for igniting.

DESCRIPTION OF DRAWINGS

FIG. **1** is the side section view of an electronic cigarette.

FIG. **2** is the section view of the housing (a) separated from the cigarette bottle assembly.

FIG. **3** is the diagram of the axial structure of the cigarette bottle assembly, illustrating the ventilating groove on the peripheral surface of the cigarette holder housing.

FIG. **4** is the side section view of the cigarette bottle assembly, illustrating the structure of the air channel.

FIG. **5** is the side section view of a porous component of the atomizer.

FIG. **6** is the diagram of the structure of an electric heating rod of the atomizer.

FIG. **7** is the side section of the atomizer, illustrating the locations of and connection relation between the electric heating rod and porous component.

FIG. **8** is the diagram of the atomizer, illustrating the locations of and connection relation between the electric heating rod and porous component.

FIG. **9** is the section view of a check valve.

FIG. **10** is the front section view of a restriction component in a second embodiment.

FIG. **11** is a diagram of the axial structure of the cigarette bottle assembly in another embodiment.

FIG. **12** is a sectional view taken along line A-A of FIG. **11**.

FIG. **13** is a diagram of the structure of the electric heating rod of the atomizer in another embodiment.

FIG. **14** is a section view of the porous component of the atomizer in the embodiment shown in FIG. **13**.

FIG. **15** is a diagram of the axial structure of FIG. **14**.

FIG. **16** is a side section view of the atomizer in the embodiment of FIG. **13**, illustrating the locations of and connection relation between the electric heating rod and porous component.

FIG. **17** is a diagram of the axial structure of the atomizer in another embodiment.

FIG. **18** is the side section view of the atomizer shown in FIG. **17**.

FIG. **19** is the side section view of another electronic cigarette embodiment.

FIG. **20** is the electric circuit diagram of an electronic cigarette.

FIG. **21** is another electric circuit diagram of an electronic cigarette.

FIG. **22** is a diagram of a charging device, illustrating the locations of and connection relation of various internal parts.

FIG. **23** is the side section view of the charging device.

FIG. **24** is the diagram of the front structure of the charging device.

SPECIFIC MODE FOR CARRYING OUT THE INVENTION

As shown in FIGS. **1-10**, an aerosol electronic cigarette includes a battery assembly, an atomizer assembly and a cigarette bottle assembly, and also includes a shell or housing (a), which is hollow and integrally formed. The battery assembly connects with the atomizer assembly and both are located in the shell. The cigarette bottle assembly is located in one end of the shell, which is detachable. The cigarette bottle assembly fits with the atomizer assembly. The shell has through-air-inlets (a**1**).

In this specific embodiment, the battery assembly includes the battery, and the operating indicator (**1**), electronic circuit board (**4**), and airflow sensor (**5**), which are connected with the battery. It also includes a check valve (**7**). The signal output of the airflow sensor (**5**) is connected with the said electronic circuit board (**4**). The battery is a rechargeable battery (**3**), which may be either a rechargeable polymer lithium ion battery or a rechargeable lithium ion

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battery. The airflow sensor (5) may be alternatively a semiconductor force-sensitive chip capacitance sensor or an inductance sensor.

The rechargeable battery (3) has a flexibly connected charging plug (2). The blades (21) of the charging plug (2) come out of the other end of the shell (a). Between the charging plug (2) and rechargeable battery (3) is a spring (6), which lies against the body of the rechargeable battery (3) on one end, while its free end lies against the charging plug (2), forming a flexible structure, which buffers the charging plug (2) when plugged for charging, thus protecting the rechargeable battery against any damage. Of course, the rechargeable battery (3) in this embodiment has a charging slot on it, which replaces the structure of charging plug (2) to perform the charging function and protect the rechargeable battery (3) against any damage. The operating indicator (1) is a LED. In this embodiment, there are two LEDs. The electronic circuit board (4) includes an electronic switch circuit, which controls the electric circuit according to the input signals, so that the rechargeable battery (3) electrifies the electric heating rod (82) inside the atomizer (8) and the LEDs as well.

As shown in FIGS. 1 and 2, the airflow sensor (5) has a silica gel corrugated membrane (53), which connects with magnetic steel (54) with a reed relay (52) on one of its ends. Both ends of the said reed relay (52) correspond to the relay electrodes (51) respectively.

As shown in FIGS. 5-8, the atomizer assembly is an atomizer (8), which includes a porous component (81) and a heating rod (82). The body of the porous component (82) has a run-through atomizing chamber (811). The diameter of the electric heating rod (82) is less than the diameter of the atomizing chamber (811). The electric heating rod (82) enters into the atomizing chamber (811), and there is a clearance between the electric heating rod (82) and interior wall of the atomizing chamber (811), which forms a negative pressure cavity (83). One end of the porous component (81) fits with the cigarette bottle assembly. As FIGS. 5, 7 and 8 show, the porous component (81) has a protuberance (812) on the other end, and the protuberance (812) fits with the cigarette bottle assembly. The protuberance (812) is a protruding half sphere, on the side of which there is a run-through hole (813) connecting to the atomizing chamber (811). Of course, the protuberance (812) may also be a taper, rectangle or any other shape. The porous component (81) is 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.

As shown in FIG. 6, the electric heating rod (82) includes a cylinder (821). The heating wire (822) is wound on the wall of the cylinder (821). On the wall of both ends of the cylinder (821), there are mandrils (823) respectively, which lie against the interior wall of the atomizing chamber (811) of the porous component (81). There is a negative pressure cavity (83) between the electric heating rod and interior wall of the atomizing chamber.

The heating wire is made of platinum wire, nickel-chromium alloy wire or iron-chromium alloy wire containing rare earth, or is flaked. The electric heating rod (82) may alternatively have on its peripheral wall the heating layer made of electrically conductive ceramic PTC material, to replace the heating wire.

In this embodiment, the battery assembly and atomizer assembly are mutually connected and then installed inside the integrally formed shell (a) to form a one-piece part. The rechargeable battery (3) may be charged without frequent change of battery. The user just needs to plug the cigarette bottle assembly into the open end of the shell (a), for easy use and very easy change.

As shown in FIGS. 3 and 4, the cigarette bottle assembly includes a hollow cigarette holder shell (b), and a perforated component for liquid storage (9) inside the shell (b). The perforated component for liquid storage (9) is made of such materials as PLA fiber, terylene fiber or nylon fiber, which are suitable for liquid storage. Alternatively, it may be plastic foam molding or column of multi-layer plates made through plastic injection with polyvinyl chloride, polypropylene and polycarbonate. One end of the cigarette holder shell (b) plugs into the shell (a), and the outer peripheral surface of the cigarette holder shell (b) has an inward ventilating groove (b2). On one end surface of the cigarette holder shell (b), there is an air channel (b1) extending inward. The air channel (b1) is located in the center on the surface of one end of shell (b).

As shown in FIGS. 1-9, one end of the porous component (81) lies against one end surface of the perforated component for liquid storage (9), and contacts the perforated component for liquid storage (9). It absorbs the cigarette liquid from the perforated component for liquid storage (9). When the smoker smokes, the cavity of the cigarette holder shell (b) is in the negative pressure state. In the shell (b), one end of the airflow sensor (5) forms a normal pressure cavity, while the other end forms a negative pressure cavity. The air pressure difference between the normal pressure cavity and negative pressure cavity or the high-speed airflow enables the magnetic steel (54) of the airflow sensor (5) to drive the reed relay (52) to contact the relay electrode (51).

As shown in FIG. 20, the electric circuit is electrified, and the electronic switch circuit on the electronic circuit board (4) is electrified. Thus, the rechargeable battery (3) starts to electrify the electric heating rod (82) inside the atomizer (8), and at the same time, the LEDs, which are electrified by the rechargeable battery (3), emit light. The air enters the normal pressure cavity through the air inlet (a1), passes the check valve (7) via the airflow passage in the airflow sensor (5), and flows to the negative pressure cavity (83) in the atomizer (8). Since the negative pressure cavity (83) provides the negative pressure compared with the outside, the air flow sprays into it, bringing the cigarette liquid from the porous component (81) to spray into the negative pressure cavity (83) in the form of fine drops.

In the meantime, the electric heating rod (82) is electrified by the rechargeable battery (3) under the control of electronic circuit board (4), to heat the fine drops for atomization. After atomization, the big-diameter fine drops are re-absorbed by the porous component (81) under the action of vortex, while the small-diameter fine drips are suspended in the airflow to form aerosol, which is discharged through the negative pressure cavity (83) and run-through hole (813), flows into the cigarette holder shell (b) of the cigarette bottle assembly, and is absorbed by the air channel (b1). When the aerosol enters the cigarette holder shell (b), multiple small liquid drops are condensed into bigger ones, which fall into the clearance between the cigarette holder shell (b) and air channel (b1) without being absorbed by the air channel (b1). The perforated component for liquid storage (9) of the cigarette bottle assembly and the porous component (81) of the atomizer (8) contact each other to achieve the capillary impregnation for liquid supply.

The unit and its connecting structure of this invention may also be loaded with drugs for delivery to the lung.

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As shown in FIGS. **22**, **23** and **24**, the electronic cigarette (**5**) is held in a charging device. The charging device includes a case (**1**), which contains an auxiliary charging storage battery (**2**) inside it, and holds the electronic cigarette (**5**) and the charger (**3**) for the rechargeable battery embedded in the electronic cigarette (**5**), as well as the power supply circuit. The power inputs of the auxiliary charging storage battery (**2**) and charger (**3**) are connected with the power supply respectively. The charger (**3**) in this embodiment is a constant voltage & current charger. It may be a GY5210 charger, or any other constant voltage & current charger. The case (**1**) has a spare liquid supply bottle (**4**) in it. The power output of the auxiliary charging storage battery (**2**) is connected with the power input of the charger (**3**). The power output of the charger (**3**) is a charging slot (**31**), which fits with the charging plug of the rechargeable battery inside the electronic cigarette, or a charging plug, which fits with the charging slot of the rechargeable battery.

As shown in FIGS. **23** and **24**, on the body of the shell (**1**), there is a pair of slide ways (**12**) corresponding to the position of the electronic cigarette, and on the slide ways, there is a slide cover (**11**).

In the second preferred embodiment, a restriction component (**10**), which is detachable, is set on one end of the porous component (**81**). There is a restriction hole (**101**) on the body of the restriction component (**10**). The restriction hole (**101**) corresponds to the atomizing chamber (**811**). The pore diameter of the restriction hole is less than the inner diameter of the atomizing chamber (**811**) to the extent that the size of the restriction component (**10**) installed on the porous component (**81**) varies, for the purpose of airflow capacity control. On the basis of different applications, the restriction component of different sizes and pore diameters may be used.

In the third preferred embodiment of this utility model, as shown in **11** and **12**, on the outer peripheral wall of the cigarette shell (b), there is a protruding rib (b2) that is evenly partitioned. The perforated component for liquid storage (**9**) enters the cigarette holder shell (b) and lies against the protruding rib (b2). Thus, there appears a clearance between the outer peripheral surface of the perforated component for liquid storage (**9**) and the interior wall of the shell (b). The clearance is for connection the shell (a) and cigarette holder shell (b). When the user smokes, the air channel (b1) absorbs the air to cause airflow inside the shell (a), thus triggering the airflow sensor (**5**) and eventually starting the electronic cigarette. Also, the atomizer (**8**) works to atomize the cigarette liquid and produce gas flow, which enters the cigarette holder shell (b).

In the fourth preferred embodiment, as shown in FIGS. **13**, **14**, **15** and **16**, on one end of the cylinder (**821**), there is a fixed plate (**84**), whose outer peripheral wall has partitioned supports (**841**). The outer ends of the supports (**841**) lie against the interior wall of the shell (a), thus suspending the cylinder (**821**), which is connected with the fixed plate (**84**), in the cavity of the shell (a). On the surface of the fixed plate (**84**), there is a mandril (**842**), whose front end lies against one end of the porous component (**81**), so that the fixed plate (**84**) is separated from the atomizing chamber (**811**) of the porous component (**81**). As a result, the run-through hole on one end of the atomizing chamber (**811**) won't be blocked, and the mist generated in the atomizing chamber (**811**) can be dispersed. One end of the porous component (**81**) has two protuberances (**812**) at the outlet of the atomizing chamber (**811**). Between the two protuberances (**812**) is a clearance. The two protuberances (**812**) lie against the perforated component for liquid storage (**9**).

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 component (**81**) is made of foamed nickel, stainless steel fiber felt, macromolecular polymer foam or foamed ceramics.

In the sixth preferred embodiment, as shown in FIG. **19**, the airflow sensor (**5**) has a silica gel corrugated membrane (**53**), which connects with magnetic steel (**54**) with a Hall element (**52**), or a magneto-diode or a magneto-triode on one of its ends. FIG. **21** shows the electric circuit of the electronic cigarette of this solution.

The invention claimed is:

1. A electronic vaporizing device, comprising:

a battery and a liquid storage component in an elongated cylindrical housing having at least one air inlet and an outlet;

a hollow cylindrical component comprising a fiber material, with the hollow cylindrical component in the elongated cylindrical housing and having a central axis parallel to a longitudinal axis of the elongated cylindrical housing, with the hollow cylindrical component in contact with the liquid storage component, and an atomizing chamber formed within inner cylindrical walls of the hollow cylindrical component between a front end opening and a back end opening of the hollow cylindrical component, to allow air to flow into the atomizing chamber from the front end opening and out from the back end opening of the hollow cylindrical component;

an air flow path from the one or more air inlets through the atomizing chamber in the hollow cylindrical component, to the outlet; and

a wire coil in the atomizing chamber wound on a porous component and electrically connected to the battery.

2. The device of claim **1** further including a restriction component in the air flow path having a restriction hole concentric with the front end opening of the hollow cylindrical component.

3. The device of claim **1** further including a plate fixed in place in the elongated cylindrical housing at the front end opening of the hollow cylindrical component, with the plate in contact with the hollow cylindrical component.

4. The device of claim **3** with the wire coil having first and second wire leads passing out of the front end opening of the hollow cylindrical component, and with the first and second wire leads extending through the plate, for connecting the wire coil to the battery.

5. The device of claim **3** with the atomizing chamber having a uniform diameter along the length of the atomizing chamber, and the plate having a diameter larger than the diameter of the atomizing chamber.

6. The device of claim **1** with the front end opening and the back end opening of the hollow cylindrical component having equal diameters.

7. The device of claim **1** with the hollow cylindrical component having a single front end opening.

8. The device of claim **1** with the liquid storage component at a position in the elongated cylindrical housing between the outlet and the hollow cylindrical component.

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9. The device of claim 1 further including a restriction component between the hollow cylindrical component and the at least one inlet, with the restriction component having a restriction hole smaller than the front end opening of the hollow cylindrical component.

10. The device of claim 1 with the hollow cylindrical component having an outer cylindrical sidewall having a first diameter, and with the wire coil having an outer diameter less than the first diameter.

11. The device of claim 10 with the atomizing chamber parallel to the longitudinal axis.

12. The device of claim 11 with the wire coil including first and second wire leads passing out of the front end opening of the porous component.

13. The device of claim 12 further comprising a frame including a first section having a first diameter and a second section having a second diameter less than the first diameter, and with second section inserted into the front end opening of the hollow cylindrical component.

14. A vaporizing device, comprising:

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

a liquid storage component in the elongated cylindrical housing;

with the elongated cylindrical housing having one or more air inlets;

the atomizer assembly including an atomization chamber having a front end opening and a back end opening to allow air to flow into the atomization chamber from the front end opening and out from the back end opening; and

a heating wire coil wound on a porous component that is perpendicular to a longitudinal axis of the elongated cylindrical housing, with the heating wire coil in an air flow path between the front end opening and the back end opening of the atomization chamber.

15. The device of claim 14 with the atomization chamber having a uniform diameter along the length of the atomization chamber.

16. The device of claim 14 with the heating wire coil having an outer diameter less than an inner diameter of the atomizing chamber.

17. The device of claim 14 further comprising a check valve between the inlet and the porous component.

18. The device of claim 14 further including a restriction component between the hollow cylindrical component and the at least one air inlet, with the restriction component having a restriction hole smaller than the open front end of the hollow cylindrical component.

19. The device of claim 14 further including a plate fixed in place in the tubular housing, with the plate in contact with the front end of the hollow cylindrical component, and the atomization chamber having a uniform diameter along the length of the atomization chamber, and the plate having a diameter larger than the uniform diameter of the atomization chamber.

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EXHIBIT I

UNITED STATES DISTRICT COURT
MIDDLE DISTRICT OF NORTH CAROLINA

FONTEM VENTURES B.V., a Netherlands company; and FONTEM HOLDINGS 1 B.V., a Netherlands company, *Plaintiffs* v. R.J. REYNOLDS VAPOR COMPANY, a North Carolina company, *Defendant*	**1:16-cv-01255** **[LEAD CASE]**
FONTEM VENTURES B.V., a Netherlands company; and FONTEM HOLDINGS 1 B.V., a Netherlands company, *Plaintiffs* v. R.J. REYNOLDS VAPOR COMPANY, a North Carolina company, *Defendant*	**1:16-cv-01257**
FONTEM VENTURES B.V., a Netherlands company; and FONTEM HOLDINGS 1 B.V., a Netherlands company, *Plaintiffs* v. R.J. REYNOLDS VAPOR COMPANY, a North Carolina company, *Defendant*	**1:16-cv-01258**

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DEFENDANT R.J. REYNOLDS VAPOR COMPANY'S
RESPONSES TO FONTEM'S FIRST SET OF INTERROGATORIES

Pursuant to Rules 26 and 33 of the Federal Rules of Civil Procedure, R.J. Reynolds Vapor Company ("Reynolds") hereby responds and objects to Fontem Ventures B.V. and Fontem Holdings 1 B.V.'s (collectively "Fontem") First Set of Interrogatories (Nos. 1-12). In providing information in response to these interrogatories, Reynolds does not concede the relevancy, materiality, or admissibility of any such information and hereby reserves all objections.

These responses are made solely for purposes of this action, and are made without waiving, or intending to waive, the right at any time to revise, correct, modify, supplement, or clarify any response provided herein or the right to object on any proper grounds to the use of these responses, for any purposes in whole or in part, in any proceeding, in this action, or any other action. On the contrary, the right to raise any applicable objection at any time is expressly reserved.

The fact that any interrogatory herein has been answered should not be takes as an admission or acceptance of the existence of any facts set forth or assumed by such interrogatory, or that such answer constitutes admissible evidence. The responses herein reflect only the present state of Reynolds' investigation and the present state of discovery. Except as otherwise indicated, an objection or response to a specific interrogatory does not imply that facts or documents responsive to the interrogatory exist.

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GENERAL OBJECTIONS

The specific responses to the Interrogatories below are made subject to and in reliance on the general objection set forth herein. The recitation of one or more specific objections in any particular response is not to be construed as a waiver of any applicable general objection.

Each of the following general objections is incorporated into each specific response below. The recitation of one or more specific objection in any particular response is not to be construed as a waiver of any applicable general objection. The responses are made subject to and in reliance on the general objections set forth below.

1. Reynolds objects to Fontem's definition of the term "RJRV" as overly broad to the extent it includes any of Reynolds' parents, subsidiaries, assigns or other affiliated or related businesses that are not involved in the development, manufacture, marketing or sale of the Accused Products. Reynolds also objects to the definition to the extent it includes officers, directors or employees of Reynolds acting in a non-corporate or non-employee capacity. Reynolds also objects to the definition to the extent it includes principals, agents, attorneys, contractors, salespersons, investors, shareholders, members, sales representatives, and representatives, or any other persons acting or purporting to act on behalf of Reynolds. Reynolds responds to these requests on its own behalf and not on behalf of any individual or other entity.

2. Reynolds objects to Fontem's definition of the term "Accused Products." In responding to these requests, Reynolds shall construe Accused Products to refer to the

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VUSE Solo Rechargeable Digital Vapor Cigarettes, the VUSE Connect Power Units when used with the VUSE Cartridges, and the VUSE Fob Power Units when used with the VUSE Cartridges. In addition, the VUSE Vibe Pre-Filled Vapor Tank System recently was identified and accused of infringement in Fontem's Infringement Contentions. As such, Reynolds also will construe Accused Products to include the VUSE Vibe product. Reynolds does not construe Accused Products to include any other products.

3. Reynolds objects to Fontem's definition of the term "Vaping Device" as overbroad, unduly burdensome and not proportional to the needs of the case. Reynolds will consider a more narrowly tailored definition.

4. Reynolds objects to Fontem's definition of the term "Alternative Smoking Device" as overbroad, unduly burdensome and not proportional to the needs of the case. Reynolds will consider a more narrowly tailored definition.

5. Reynolds objects to Fontem's definition of the term "Convoyed Products" as overbroad, unduly burdensome and not proportional to the needs of the case. Reynolds will consider a more narrowly tailored definition.

6. Reynolds will apply the usual and ordinary meaning to English terms and objects to Fontem's attempt to redefine such words.

7. Reynolds objects to Fontem's interrogatories, definitions, and instructions to the extent they call for a narrative or "all" facts or information concerning the subject matter of the interrogatory.

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8. Reynolds objects to Fontem's interrogatories to the extent they require Reynolds to breach any obligation of confidentiality to a third party.

9. Reynolds objects to Fontem's interrogatories to the extent that they are inconsistent with the Federal Rules of Civil Procedure and the Local Rules of the United States District Court for the Middle District of North Carolina, including the Local Civil Rules and Local Patent Rules, or any Order of the Court.

10. Reynolds objects to Fontem's interrogatories, definitions and instructions to the extent they seek production of information, facts, documents and/or things that are protected by the attorney-client privilege, work product doctrine, or any other applicable privilege or immunity. In the event that any privileged information is inadvertently produced by Reynolds, such production shall not constitute waiver of any applicable privilege. Reynolds shall not be precluded from challenging the use of any inadvertently produced documents or information at any time during these or later proceedings.

11. To the extent the interrogatories seek confidential information, such information will be supplied after the parties enter into a confidentiality agreement.

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INTERROGATORIES

INTERROGATORY NO. 1

Identify separately for each asserted claim of the Asserted Patents in this Litigation, all factual and legal bases that support any contention that You do not infringe each claim literally or by equivalents, either directly or indirectly.

ANSWER:

Reynolds objects to this interrogatory as premature based on the Court's scheduling order. Reynolds objects to this contention interrogatory as premature given the stage of discovery. Reynolds also objects to this interrogatory to the extent it calls for expert discovery. Reynolds will provide its non-infringement contentions in accordance with the Court's scheduling order.

INTERROGATORY NO. 2

Identify separately for each asserted claim of the Asserted Patents in this Litigation, all factual and legal bases for Your contention that the claim is invalid, including an identification of any Prior Art that supports Your contention, a comparison of that Prior Art to each claim, and an identification of all persons known to You who are most knowledgeable about that Prior Art.

ANSWER:

Reynolds objects to this interrogatory as premature based on the Court's scheduling order. Reynolds objects to this contention interrogatory as premature given the stage of discovery. Reynolds also objects to this interrogatory to the extent it calls for expert discovery. Subject to the foregoing objections, the asserted claims are invalid based on at least the facts and bases set forth in Reynolds' Answers and Affirmative Defenses. Individuals with knowledge of these facts and bases include the individuals

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identified in Reynolds' Initial Disclosures. Reynolds will provide its invalidity contentions in accordance with the Court's scheduling order.

INTERROGATORY NO. 3

Identify each person You intend to call as a fact witness at trial and provide a detailed description of the subject matter on which each witness is expected to testify.

ANSWER:

Reynolds objects to this interrogatory as premature based on the Court's scheduling order. Reynolds also objects to the interrogatory to the extent it seeks impose disclosure requirements beyond those required under FRCP 26 for witnesses with knowledge about the facts of the case. In addition, an interrogatory that seeks a detailed description of the subject matter on which each fact witness is expected to testify is unduly burdensome. Subject to the foregoing objections, Reynolds states that it may call at trial as fact witnesses one or more of the individuals identified in its Initial Disclosures to testify on the subject matter identified in the Initial Disclosures.

INTERROGATORY NO. 4

Identify all factual and legal bases that support any contention that Plaintiffs' claim for damages against RJR Vapor is limited by 35 U.S.C. § 287.

ANSWER:

Reynolds objects to this contention interrogatory as premature given the stage of discovery. Reynolds also objects to this interrogatory to the extent it calls for expert discovery. Reynolds will respond to this interrogatory further after receiving in discovery, evidence of at least (i) product marking by Fontem and its licensees, (ii)

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practicing of the one or more of the claims of each of the asserted patents by the marked products, and (iii) distribution of the marked products.

INTERROGATORY NO. 5

Identify separately for each claim of the Asserted Patents all factual and legal bases that support any contention that there are non-infringing alternatives to the inventions recited in each claim.

ANSWER:

Reynolds objects to this contention interrogatory as premature given the stage of discovery. Reynolds also objects to this interrogatory to the extent it calls for expert discovery. Subject to the foregoing objections, Reynolds states that its products are non-infringing alternatives to the claimed inventions. Additional non-infringing alternatives will be identified as discovery proceeds.

INTERROGATORY NO. 6

Identify each and every Vaping Device You have manufactured, used, sold, or offered for sale in the United States, or imported into the United States from February 5, 2013 to present, and all products sold together with, or for use with, any Vaping Device identified in this interrogatory (*e.g.*, liquids, cartridges, tanks, car chargers, wall chargers, USB chargers, cases, atomizers, heating coils, filters, mouthpieces, and batteries).

ANSWER:

Reynolds objects to this interrogatory to the extent it seeks information about Vaping Devices that are not the Accused Products. In lieu of a further written response, Reynolds will produce documents, pursuant to FRCP 33(d) sufficient to identify the Accused Products and the products sold together with or for use with the Accused Products.

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INTERROGATORY NO. 7

Describe in detail all design modifications to each Vaping Device identified in response to Interrogatory No. 6 from February 5, 2013 to present. Your description should include, without limitation, a description of the modification, the date the modification was implemented, and the reasons for the modification.

ANSWER:

Reynolds objects to this interrogatory to the extent it seeks information about Vaping Devices that are not the Accused Products. Reynolds also objects to this interrogatory to the extent it seeks information about design modifications to the Accused Products where the design modifications do not relate to any accused feature in the Accused Product. In lieu of a further written response, Reynolds will produce documents, pursuant to FRCP 33(d), sufficient to describe the design modifications related to the accused features in the Accused Products and the reasons for those design modifications.

INTERROGATORY NO. 8

Describe in detail the supply chain for each product identified in response to Interrogatory No. 6. Your description should include, without limitation, identification of all suppliers, manufacturers, vendors, distributors, and resellers for each product or components thereof.

ANSWER:

Reynolds objects to this interrogatory to the extent it seeks information about Vaping Devices that are not the Accused Products. Reynolds also objects to this interrogatory as overly broad, unduly burdensome, not likely to lead to the discovery of admissible evidence and not proportional to the needs of the case to the extent it seeks the

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identification of all suppliers, manufacturers, vendors, distributors and resellers. In lieu of a further written response, Reynolds will produce documents, pursuant to FRCP 33(d), sufficient to provide a general description of the acquisition process of the Accused Products and the distribution channel(s) for the Accused Products.

INTERROGATORY NO. 9

For all products identified in Your response to Interrogatory No. 6, identify sales, revenue, and profit information. Your description should include, without limitation: (a) the number of units made, sold, or offered for sale within the United States, or imported into the United States (by month); (b) the unit sales and gross revenues for each product (by month); (c) the unit cost for each product; (d) the unit price for each product; (e) the forecasted sales for each product; (f) any other direct or indirect cost for each product; and (g) the total profit for each product (by month).

ANSWER:

Reynolds objects to this interrogatory to the extent it seeks information about Vaping Devices that are not the Accused Products. Reynolds also objects to this interrogatory as overly broad, unduly burdensome, not likely to lead to the discovery of admissible evidence and not proportional to the needs of the case Reynolds also objects to this interrogatory to the extent it seeks information not maintained in the ordinary course. In lieu of a further written response, Reynolds will produce non-privileged regularly generated documents, pursuant to FRCP 33(d), sufficient to reflect the income and expenses associated with the Accused Products.

INTERROGATORY NO. 10

Explain when and how You first (a) became aware of each of the Asserted Patents or any U.S. or foreign patent or patent application related thereto; and (b) received notice of infringement of each of the Asserted Patents.

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ANSWER:

Reynolds objects to this interrogatory to the extent it seeks privileged information. Without waiving and subject to all claims of privilege concerning its knowledge of the Asserted Patents and notice of the alleged infringement, Reynolds states that it first became aware of the existence of the Asserted Patents at or shortly after their respective issue dates. Reynolds first received notice of the alleged infringement of certain claims of certain Asserted Patents with respect to the VUSE Solo and VUSE Connect and VUSE Fob at or shortly after commencement of the consolidated actions. Reynolds first received notice of alleged infringement of certain claims of certain Asserted Patents with respect to the VUSE Vibe and the VUSE Fob at or shortly after Fontem served its infringement contentions.

INTERROGATORY NO. 11

Identify the person or persons most knowledgeable about: (i) the design and development of the products identified in Interrogatory No. 6; (ii) how the products identified in Interrogatory No. 6 are marketed; (iii) actual and forecasted sales of the products identified in Interrogatory No. 6; and (iv) Your policies and procedures relating to patent licensing, patent procurement, and patent defense.

ANSWER:

Reynolds objects to this interrogatory to the extent it seeks information about Vaping Devices that are not the Accused Products. The persons most knowledge about the design, development and marketing of the Accused Products are identified in Reynolds' Initial Disclosures. The persons most knowledge about the actual and forecasted sales of the Accused products are Brian Stebbins. The persons most

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knowledge about Reynolds' policies and procedures relating to patent licensing, patent procurement and patent defense are individuals within the legal department.

INTERROGATORY NO. 12

Identify and describe each written or oral opinion or conclusion of which You are aware that relates to the invalidity, enforceability, infringement or non-infringement, or scope of the Asserted Patents.

ANSWER:

Reynolds objects to this request on the ground that it seeks privileged information. Reynolds also objects on the ground that it is premature and inconsistent with the Court's scheduling order.

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DATED: January 18, 2017

/s/ *David R. Boaz*

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R.J. REYNOLDS VAPOR COMPANY

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CERTIFICATE OF SERVICE

The undersigned hereby certifies that all counsel of record who are deemed to have consented to electronic service are being served with a copy of **R.J. REYNOLDS VAPOR COMPANY'S RESPONSES TO FONTEM'S FIRST SET OF INTERROGATORIES (NOS. 1-12)** via E-mail on January 18, 2017. Any other counsel of record will be served by First Class U.S. mail on this same date.

DATED: January 18, 2017

/s/ Oluwafemi L. Masha
Oluwafemi L. Masha

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EXHIBIT J

From:	Dueppen, Lara (Perkins Coie)
To:	mafinkelstein@jonesday.com; omasha@brinksgilson.com; rgabric@brinksgilson.com; rmallin@brinksgilson.com; Gregory.stone@mto.com; Peter.detre@mto.com; Peter.gratzinger@mto.com; Zachary.briers@mto.com; stephen.bosco@weil.com; anish.desai@weil.com; "elizabeth.weiswasser@weil.com"
Cc:	Hamilton, Joseph (Perkins Coie); Michael Wise (MWise@perkinscoie.com)
Subject:	Joint Meet & Confer re Fontem v. Nu Mark/R.J. Reynolds Vapor, Case Nos. CV16-2291 & CV16-2286
Date:	Tuesday, July 12, 2016 10:33:00 AM
Attachments:	DRAFT Joint Rule 26(f) Report - Nu Mark (16-2291) (7).docx DRAFT Joint Rule 26(f) Report - RJR (16-2286) (6).docx DRAFT PROPOSED E-Discovery Order - Nu Mark 16-2291 (2).docx DRAFT PROPOSED Protective Order - Nu Mark16-2291 (2).docx

Counsel:

In view of the Scheduling Conference for August 8, 2016, we would like to conduct a joint meet and confer pursuant to Rule 26(f) with counsel for both Nu Mark and R.J. Reynolds Vapor to coordinate the cases (note that counsel for both parties are copied on this email). To facilitate the call, please find attached:

1) A draft Rule 26(f) Joint Report for each party (for purposes of common agreements and disputes, we propose that we all edit the Nu Mark Document);
2) A single draft Protective Order (the draft is for the Nu Mark case, and mirrors the order entered by Judge Wilner in Fontem's previous cases before the court); and
3) A single draft E-Discovery Order (the draft is for the Nu Mark case, and mirrors the order entered by Judge Wilner in Fontem's previous cases before the court).

As the meet and confer must be completed by July 18, 2016, we suggest a teleconference on Thursday (7/14) or Friday (7/15) anytime between 9am to 12pm (PDT). Please let us know whether you are available during those times or propose a different time.

Regards,
Lara

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EXHIBIT K

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Attorneys for Defendant and Counter-plaintiff *NU MARK LLC*

UNITED STATES DISTRICT COURT

CENTRAL DISTRICT OF CALIFORNIA

FONTEM VENTURES B.V., *et al.*, Plaintiffs, v. NU MARK LLC, Defendant.	Case No. CV16-2291 GW (MRWx) **JOINT SCHEDULING CONFERENCE REPORT PURSUANT TO RULE 26(f)** STATUS CONFERENCE Date: August 8, 2016 Time: 8:30 a.m. Courtroom: 10 (Spring Street)
AND RELATED COUNTERCLAIMS	

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Pursuant to Federal Rule of Civil Procedure 26(f), Local Rule 26-1, and the Court Order on July 6, 2016 (Dkt. # 34), Plaintiffs and Counter-defendants Fontem Ventures B.V. ("Fontem Ventures") and Fontem Holdings 1 B.V. ("Fontem Holdings") (collectively, "Fontem") and Defendant and Counter-plaintiff Nu Mark LLC ("Nu Mark") submit this joint report.

I. CASE SYNOPSIS AND CONFERENCE OF PARTIES UNDER RULE 26(f)(1)

A. Current Case (Case No. CV16-2291)

On April 4, 2016, Fontem filed a complaint alleging infringement of United States Patent Nos. 8,365,742 ("the '742 Patent"), 8,375,957 ("the '957 Patent"), 8,393,331 ("the '331 Patent"), 8,689,805 ("the '805 Patent"), 8,490,628 ("the '628 Patent"), 8,863,752 ("the '752 Patent"), 8,893,726 ("the '726 Patent"), and 8,899,239 ("the '239 Patent"), against Nu Mark in this action (Dkt # 1).

Nu Mark answered the complaint and filed counterclaims on June 27, 2016 (Dkt. # 25). At Fontem's request, Nu Mark has agreed to amend its answer and counterclaims by July 28, 2016. (Dkt. # 35).

On June 29, 2016, Nu Mark filed a Motion to Transfer this case to the Middle District of North Carolina. (Dkt. # 28.) The hearing for the motion to Transfer is scheduled for August 8, 2016, the same day as this Scheduling Conference.

B. Related Case (Case No. CV16-4537)

Since filing its complaint in the instant action, Fontem filed a second complaint on June 22, 2016 alleging infringement of United States Patent Nos. 9,320,300 ("the '300 Patent"), 9,326,548 ("the '548 Patent"), 9,326,549 ("the '549 Patent"), 9,326,550 ("the '550 Patent"), 9,326,551 ("the '551 Patent"), 9,339,062 ("the '062 Patent"), 9,364,027 ("the '027 Patent"), and 9,370,205 ("the '205 Patent") (Case No. CV16-4537, Dkt. #1) ("the related case"). This related case

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involves allegations of infringement related to the same or similar accused products and the asserted patents involve the same or similar technology.

The parties jointly propose to consolidate the instant case with the Related Case for all purposes. The parties agree that this joint report—including the Schedule of Trial and Pretrial Dates ("the Proposed Schedule") attached herein as Exhibit A—applies to both cases.

C. Co-Pending Cases

Fontem has also filed three cases against R.J. Reynolds Vapor Company alleging infringement of the '742 Patent, the '628 Patent, the '726 Patent, the '239 Patent, the '548 Patent, the '549 Patent, and the '205 Patent.[1]

The parties jointly propose to consolidate current and related Case Nos. CV16-2291 and CV16-4537 with these co-pending cases—Case Nos. CV16-2286, CV16-3049, and CV16-4534—for all purposes except trial. The Proposed Schedule attached herein as Exhibit A coincides with the Proposed Schedule attached to the Joint Status Report filed for the co-pending cases.[2]

II. CONTENT OF CONFERENCE UNDER RULE 26(f)(2)

During the Rule 26(f) Conference, the parties considered the nature and basis of their claims, counterclaims and defenses and the possibilities for promptly settling or resolving the case; made or arranged for the disclosures required by Rule 26(a)(1); discussed any issues about preserving discoverable information; and developed a proposed discovery plan.

A. Possibilities for Settlement or Resolution

The parties have held substantive settlement discussions that are ongoing.

[1] *See* Case Nos. CV16-2286 (Dkt. #1), CV16-3049 (Dkt. #1), and CV16-4534 (Dkt. #1).

[2] *See* Joint Scheduling Conference Report Pursuant to Rule 26(f), filed on July 25, 2016 in *Fontem Ventures B.V. et al. v. R.J. Reynolds Vapor Company*, Case No. CV16-2286.

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B. Rule 26(a)(1) Disclosures

The parties have agreed to serve initial disclosures by August 22, 2016.

C. Preservation of Discoverable Information

The parties have taken reasonable measures to ensure that discoverable information has not been destroyed or altered.

D. Proposed Discovery Plan

The parties have outlined their views and proposals related to the requirements set forth in Fed. R. Civ. P. 26(f)(3) below.

III. PROPOSED DISCOVERY PLAN UNDER RULE 26(f)(3)

As contemplated by Rule 26(f), the parties hereby set forth the following written discovery plan that will govern this case and any case that is consolidated with this case.

A. Rule 26(f)(3)(A): Rule 26(a)(1) Disclosures

The parties have agreed to serve initial disclosures by August 22, 2016.

B. Rule 26(f)(3)(B): Fact Discovery

1. Discovery Subjects

Fontem's Statement: Although the full scope of discovery required will not be known until Defendant provides further details with respect to the devices accused of infringement in the complaint, at this time, Fontem will be seeking discovery of at least the following: (a) the design and technical aspects of the accused devices as set forth in the complaint; (b) manufacturing, sales and profit information relating to the accused devices as set forth in the complaint; and (c) the bases for Defendants' Affirmative Defenses and counterclaims.

Nu Mark's Statement:

2. Timing and Conduct of Discovery

As set forth in the completed Proposed Schedule attached herein as Exhibit A, the parties propose competing schedules which reflect timing of discovery under

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Rule 26. Additionally, as discussed above in Sections I(A)-(B), the parties jointly propose to consolidate:

- current Case No. CV16-2291 with related Case No. CV16-4537 for all purposes; and
- current and related Case Nos. CV16-2291 and CV16-4537 with co-pending Case Nos. CV16-2286, CV16-3049, and CV16-4534 for all purposes except trial.

The parties propose that the Proposed Schedule apply to all cases discussed above. The parties do not believe that discovery should be conducted in phases, except with respect to timing of discovery, wherein expert discovery is to be completed after fact discovery as described above.

Otherwise, the parties do not believe that discovery should be limited or focused on particular issues at this time, but reserve the right to supplement this section as their investigation of the matter continues.

C. Rule 26(f)(3)(C): Electronically Stored Information

The parties anticipate that this case will involve production of electronically stored information ("ESI"). The parties include a proposed stipulated E-Discovery Order attached hereto.

D. Rule 26(f)(3)(D): Privilege and Protection

The parties identify the following issues regarding claims of privilege or of protection.

1. Privilege Log

The parties shall exchange privilege logs identifying the documents or information and the basis for any disputed claim of privilege in a manner that, without revealing information itself privileged or protected, will enable the other parties to assess the applicability of the privilege or protection. The parties will meet and confer regarding the creation and submission of a privilege log, including the types of documents that will be logged and the information to be provided on

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the log (e.g., how email threads need to be logged, how attachments will be handled and the like), and when privilege logs will be exchanged.

A party may move the Court for an order compelling the production of any privileged documents or information identified on any other party's privilege log. No party is obligated to identify on its privilege log any privileged or work product documents that were generated on or after the filing of the complaint in this action, except to the extent that that party intends to rely on that document for any purpose in this case.

2. Protective Order

The parties believe that a protective order is required in this case due to the anticipated production or disclosure of confidential and sensitive information. A proposed stipulated Protective Order is attached hereto.

In addition:

- To facilitate discovery and avoid delay, the parties agree that until a protective order is entered, all discovery responses, documents filed under seal, and documents produced in this case will be treated as outside counsel only and will not be disclosed to any party other than the party providing the discovery.

The parties agree that Federal Rule of Evidence 502, including Rule 502(e), shall govern any inadvertent waiver of attorney-client privilege or attorney work-product and that Rule 502 will be incorporated into a court order.

E. Rule 26(f)(3)(E): Limitations on Discovery

The parties believe that no changes are needed in the limitations imposed by the Federal Rules of Civil Procedure other than as set forth below. The parties agree to meet and confer in good faith about reasonable adjustments to these limitations as discovery progresses. Any party may move to modify these limitations for good cause.

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For the purposes of this section:

(i) The parties' agreements assume that current and related Case Nos. CV16-2291 and CV16-4537 will be consolidated for all purposes.

(ii) The parties' agreements assume that current and related Case Nos. CV16-2291 and CV16-4537 will be consolidated with co-pending Case Nos. CV16-2286, CV16-3049, and CV16-4534 for all purposes except trial.

(ii) Fontem comprises one side and Nu Mark and R.J. Reynolds Vapor Company ("RJRV") comprise the other side. But, should the Court decide not to consolidate the cases under Section III(E)(ii), Fontem comprises one side and Nu Mark comprises the other side.

1. Email Service

The parties agree that all documents that are not served through the Case Management/Electronic Case Filing (CM/ECF) system may be served via email, in lieu of mail service, on all counsel of record, including to the following designated email addresses, pursuant to Rule 5(b)(2)(E):

- For Fontem – MWise@perkinscoie.com; JHamilton@perkinscoie.com; LDueppen@perkinscoie.com; CProchnow@perkinscoie.com; and FontemTeam@perkinscoie.com.
- For Nu Mark – __

2. Interrogatories

The parties agree that each side may serve up to ten (10) common interrogatories on the other side. Additionally, each Defendant may serve up to fifteen (15) individual interrogatories on Fontem and Fontem may serve up to fifteen (15) individual interrogatories on each Defendant.

The parties agree that an interrogatory that requires an answer addressing the asserted claims of each of the Patents-in-Suit counts as a single interrogatory without discrete subparts, and to fully answer such an interrogatory, the responding party must answer fully as to each asserted claim of each Patent-in-Suit.

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The parties also agree that an interrogatory that requires an answer addressing a group of products or devices counts as a single interrogatory without discrete subparts, and to fully answer such an interrogatory, the responding party must answer fully as to each product or device.

The parties further agree that an interrogatory that requires addressing each affirmative defense or counterclaim counts as a single interrogatory without discrete subparts, and to fully answer such an interrogatory, the responding party must answer fully as to each affirmative defense or counterclaim.

3. Requests for Admission

Each side may serve up to 35 common requests for admission on the other side. Additionally, each Defendant may serve up to 35 individual requests for admission on Fontem and Fontem may serve up to 35 individual requests for admission on each Defendant. Notwithstanding the foregoing, there shall be no limitations on the number of requests for admission any party may use solely for the purpose of authentication of evidence. Requests for admission directed to document authentication shall be clearly denoted as such, and shall be served separately from any requests for admission subject to the numerical limitations stated above.

4. Depositions of Parties and Third-Parties

(a) The parties agree that each side is collectively limited to seventy (70) deposition hours of third parties in this action.

(b) The parties agree that Defendants are collectively entitled to take up to eighty (80) hours of deposition testimony of Plaintiff, including current officers, directors and employees and of the named inventor of the patents-in-suit.

(c) The parties agree that Fontem is entitled to take up to one hundred-twenty (120) hours of deposition testimony from the Defendants collectively; provided however that Plaintiff may not take more than sixty (60) hours of

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deposition testimony of each Defendant in this action, including current officers, directors, and employees of that Defendant.

(d) The parties agree that 30(b)(6) depositions are included within the sixty (60) hour limit per defendant and the one hundred-twenty (120) hour limit of Plaintiffs set for the in III(E)(4)(b) and (c) above.

(e) The parties agree that all individual depositions, other than that of the named inventor of the patents-in-suit, shall be limited to seven hours in accordance with the Federal Rules of Civil Procedure except:

(i) any deposition other than that of the named inventor of the patents-in-suit, requiring the use of an interpreter shall be limited to fourteen (14) hours. For any deposition that requires use of an interpreter, only half of the actual deposition time will count against the party's total deposition time in this action;

(ii.) The deposition of the named inventor is limited to twenty-one (21) hours. Any additional time for the use of an interpreter is included in the 21 hour limit. Questions by Plaintiff's counsel and objections are not included in the 21 hour limit. The inventor shall be made available in Los Angeles for deposition.

(iii.) No deposition shall exceed 7 hours in a single day unless the parties agree otherwise.

(f) Depositions on written questions of custodians of business records for third parties are also permitted but are not included in the limit on deposition hours per side set forth in III(E)(4)(a) above.

The parties agree to meet and confer in good faith about reasonable adjustments to any of the preceding limits as discovery progresses. Any party may move to modify these limitations for good cause.

5. Expert Discovery

The parties agree to the following with respect to Expert Discovery in addition to the protection explicitly provided under Federal Rule of Civil Procedure 26(b)(4):

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(a) Oral and written communication between an expert witness for any party or parties, and the party or parties, or their attorneys or representatives employing such expert, which are made in connection with the expert witness' engagement for this case, are not discoverable, except to the extent that the expert relies upon them for his / her opinions.

(b) Drafts of a report of an expert witness for any party or parties that are prepared in connection with the expert witness' engagement for this action are not discoverable.

(c) All notes, memoranda and other writings of an expert witness that are prepared in connection with the expert witness' engagement for this case are not discoverable, except to the extent that the expert consults them while testifying at a deposition or at trial.

(d) Any deposition of an expert witness in this action will be limited to 7 hours per witness per report in this action (such that, for example, if a Defendant's expert issues a report on claim construction, a report on invalidity, and a report on noninfringement, that witness would be subject to one 7-hour day of deposition for each of his three reports). In addition to the 7 hour per report deposition, if the expert witness issues a report addressing infringement or damages issues for multiple Defendants in this action (whether or behalf of plaintiffs or defendants), for that report, he/she may be deposed for an additional two hours (such that, for example, if an expert issues a report addressing the alleged infringement of a first Defendant and a second Defendant, that witness would be subject to a maximum of 9 hours of deposition [7+2]). Depositions of experts are not included in the limits on depositions per side set forth in III(E)(4)(a)-(c) above.

F. Rule 26(f)(3)(F): Other Orders

1. Order Regarding Consolidation of Case

As set forth in Sections I(B)-(C) and III(B)(2) above, the parties request an order consolidating:

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- current Case No. CV16-2291 with related Case No. CV16-4537 for all purposes; and
- current and related Case Nos. CV16-2291 and CV16-4537 with co-pending Case Nos. CV16-2286, CV16-3049, and CV16-4534 for all purposes except trial.

2. Other Orders

The parties do not believe that any additional orders will be needed at this time, but reserve the right to supplement this section as their investigation of the matter continues.

IV. REQUIREMENTS UNDER LOCAL RULE 26-1

In addition to the issues discussed above in relation to Fed. R. Civ. P. 26(f), the parties also discussed the following matters pursuant to L.R. 26-1.

A. Complex Cases

The parties agree that this case is not a complex case warranting the use of the Manual For Complex Litigation procedures.

B. Motion Schedule

Currently, the parties do not have any plans to file any early dispositive or partially dispositive motions, but reserve the right to supplement this list as their investigation of the matter continues. The parties expect they may file dispositive or partially dispositive motions later in the case.

C. ADR

Of the three ADR Procedures specified in L.R. 16-15.4, the parties agree that ADR Procedure No. 3, a private dispute resolution proceeding, is best suited to the circumstances of the case.

D. Trial Estimate

The parties have requested a trial by jury. The parties expect that the trial will take 14 days, but reserve the right to amend this number as their investigation of the matter continues.

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E. Additional parties

The parties reserve the right to supplement these statements as their investigation of the matter continues, but have agreed that it is unlikely that the appearance of any additional parties will be requested.

F. Expert Witnesses

The parties propose schedules for disclosures under Fed. R. Civ. P. 26(a)(2) as set forth in the Schedule attached herein as Exhibit A.

DATED: _____, 2016

PERKINS COIE LLP

By:_____
Michael J. Wise

Attorneys for Plaintiffs and
Counter-defendants
FONTEM VENTURES B.V. and
FONTEM HOLDINGS 1 B.V.

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DATED: _____, 2016

MUNGER, TOLLES & OLSON LLP
WEIL, GOTSHAL & MANGES LLP

By:_____
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NU MARK LLC

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EXHIBIT A. PROPOSED SCHEDULE

	Fontem's Request	Defendants' Request	Court Order
Infringement Contentions Due	27-Sep-2016		
Invalidity Contentions Due	25-Oct-2016		
Exchange Claim Terms to be Construed (limited to ten terms)	01-Nov-2016		
Exchange Preliminary Constructions and Supporting Extrinsic and Intrinsic Evidence	15-Nov-2016		
Joint Claim Construction and Prehearing Statement is Due	29-Nov-2016		
Completion of Claim Construction Discovery	29-Dec-2016		
Simultaneous Opening Claim Construction Briefs	26-Jan-2017		
Simultaneous Responsive Claim Construction Briefs	16-Feb-2017		
Tutorial Hearing (if needed)	23-Feb-2017		
Approximate Date for Claim Construction Hearing	5-Mar-2017		

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	Fontem's Request	Defendants' Request	Court Order
Mediation Cutoff	11-May-2017		
Post-Mediation Status Conference	12-May-2017		
Fact Discovery Cutoff	12-Jun-2017		
Due date for Opening Expert Reports	3-Jul-2017		
Due date for Rebuttal Expert Reports	31-Jul-2017		
Expert Discovery Cutoff	21-Aug-2017		
Motion hearing cut-off	2-Oct-2017		
Pretrial Conference	13-Nov-2017		
Trial	27-Nov-2017		

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EXHIBIT L

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Attorneys for Defendant and
Counterclaim Plaintiff VAPOR CORP.

UNITED STATES DISTRICT COURT

CENTRAL DISTRICT OF CALIFORNIA

FONTEM VENTURES B.V., *et al.*, Plaintiffs, v. NJOY, INC., *et al.*, Defendants. AND RELATED COUNTERCLAIMS	Case No. CV14-1645 GW (MRWx) and Related Consolidated Cases: Case Nos. CV14-1648; CV14-1649; CV14-1650; CV14-1651; CV14-1652; CV14-1653; CV14-1654; CV14-1655; CV14-8144; CV14-8149; CV14-8154; CV14-8155; CV14-8156; CV14-8157; CV14-8158; CV14-8160; CV14-8161; CV14-9263; CV14-9265; CV14-9266; CV14-9267; CV14-9268; CV14-9269; CV14-9270; CV14-9271; CV14-9273 **VAPOR'S NOTICE OF RULE 30(b)(6) DEPOSITION OF REYNOLDS AMERICAN INC**

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PLEASE TAKE NOTICE THAT, pursuant to Fed. R. Civ. P. 45 and 30(b)(6), Defendant VAPOR CORP. ("DEFENDANT" OR "VAPOR") will take the deposition of third-party Reynolds American, Inc. ("RAI") upon the matters for examination identified below. This deposition will take place at 9:30 am on June 2, 2015 or such other time as counsel for DEFENDANT agrees, at the offices of Nexsen Pruet, 701 Green Valley Road, Suite 100, Greensboro, North Carolina, 27408, or such other location as agreed to by counsel for DEFENDANT, before a Notary Public or other officer duly authorized to administer oaths. The deposition will continue from day to day until completed, excluding weekends and holidays. Notice is further given that the deposition testimony will be recorded by stenographic means and/or by videotape, and real time transcription services may be utilized.

PLEASE TAKE FURTHER NOTICE that pursuant to Fed. R. Civ. P. 30(b)(6), RAI is required to designate one or more appropriate person(s) to testify fully on their behalf with respect to each of the matters for examination set forth below, and the person(s) so designated shall be required to testify as to each of those matters known or reasonably available to RAI. Please provide notice of the identity of the witness(es) you designate to DEFENDANT's counsel no later than five days prior to the date of the deposition.

DEFINITIONS

1. The term "ITG" shall refer to ITG Brands, LLC, formerly known as Lignum-2, LLC, any and all of its predecessors in interest and/or successors in interest, and any of its present or former officers, directors, employees, partners, investors, corporate parents, subsidiaries, affiliates, joint ventures, corporate partners, acquired entities, divisions, departments and any other associated entities or persons working

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with it or on its behalf, including but not limited to Imperial Tobacco Group PLC, Fontem Ventures B. V. and Fontem Holdings 1 B.V.

2. The term "Lorillard" shall refer to Lorillard, Inc., any and all of its predecessors in interest and/or successors in interest, and any of its present or former officers, directors, employees, partners, investors, corporate parents, subsidiaries, affiliates, joint ventures, corporate partners, acquired entities, divisions, departments and any other associated entities or persons working with it or on its behalf, including but not limited to LOEC, Inc. dba blu eCigs.

3. The term "RAI" shall refer to Reynolds American, Inc., any and all of its predecessors in interest and/or successors in interest, and any of its present or former officers, directors, employees, partners, investors, corporate parents, subsidiaries, affiliates, joint ventures, corporate partners, acquired entities, divisions, departments and any other associated entities or persons working with it or on its behalf, including but not limited to Lantern Acquisition Co.

4. The term "Defendants" shall refer to Vapor Corp., NJOY, Inc., FIN Branding Group, LLC, Electronic Cigarettes International Group, Ltd. f/k/a Victory Electronic Cigarettes Corporation, Ballantyne Brands, LLC, CB Distributors, Inc., Logic Technology Development LLC, VMR Products, LLC dba V2CIGS, Spark Industries, LLC and LOEC, Inc. dba blu eCigs.

5. The term "Consolidated Litigations" shall refer to consolidated case *Fontem Ventures B.V. et al. v. NJOY Civil Action No. 2:14-cv-01645 GW (MRW)* and related

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consolidated cases *Fontem Ventures B.V. et al. v. LOEC, Inc. et al. Civil Action No. 2:14-cv-01648 GW (MRW), Fontem Ventures B.V. et al. v. CB Distributors, Inc. et al. Civil Action No. 2:14-cv-01649 GW (MRW), Fontem Ventures B.V. et al. v. Vapor Corp. Civil Action No. 2:14-cv-01650 GW (MRW), Fontem Ventures B.V. et al. v. FIN Branding Group, LLC, Electronic Cigarettes International Group, Ltd. f/k/a Victory Electronic Cigarettes Corporation et al. Civil Action No. 2:14-cv-01651 GW (MRW), Fontem Ventures B.V. et al. v. Ballantyne Brands, LLC Civil Action No. 2:14-cv-01652 GW (MRW), Fontem Ventures B.V. et al. v. Spark Industries, LLC Civil Action No. 2:14-cv-01653 GW (MRW), Fontem Ventures B.V. et al. v. Logic Technology Development LLC Civil Action No. 2:14-cv-01654 GW (MRW), Fontem Ventures B.V. et al. v. VMR Products, LLC et al. Civil Action No. 2:14-cv-01655 GW (MRW), Fontem Ventures B.V. et al. v. NJOY Civil Action No. 2:14-cv-08144 GW (MRW), Fontem Ventures B.V. et al. v. LOEC, Inc. et al. Civil Action No. 2:14-cv-08149 GW (MRW), Fontem Ventures B.V. et al. v. CB Distributors, Inc. et al. Civil Action No. 2:14-cv-08154 GW (MRW), Fontem Ventures B.V. et al. v. Vapor Corp. Civil Action No. 2:14-cv-08155 GW (MRW), Fontem Ventures B.V. et al. v. FIN Branding Group, LLC, Electronic Cigarettes International Group, Ltd. f/k/a Victory Electronic Cigarettes Corporation et al. Civil Action No. 2:14-cv-08156 GW (MRW), Fontem Ventures B.V. et al. v. Ballantyne Brands, LLC Civil Action No. 2:14-cv-08157 GW (MRW), Fontem Ventures B.V. et al. v. Spark Industries, LLC Civil Action No. 2:14-cv-08158 GW*

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(MRW), Fontem Ventures B.V. et al. v. Logic Technology Development LLC Civil Action No. 2:14-cv-08160 GW (MRW), Fontem Ventures B.V. et al. v. VMR Products, LLC et al. Civil Action No. 2:14-cv-08161 GW (MRW), Fontem Ventures B.V. et al. v. NJOY Civil Action No. 2:14-cv-09263 GW (MRW), Fontem Ventures B.V. et al. v. LOEC, Inc. et al. Civil Action No. 2:14-cv-09265 GW (MRW), Fontem Ventures B.V. et al. v. CB Distributors, Inc. et al. Civil Action No. 2:14-cv-09266 GW (MRW), Fontem Ventures B.V. et al. v. Vapor Corp. Civil Action No. 2:14-cv-09267 GW (MRW), Fontem Ventures B.V. et al. v. FIN Branding Group, LLC, Electronic Cigarettes International Group, Ltd. f/k/a Victory Electronic Cigarettes Corporation et al. Civil Action No. 2:14-cv-09268 GW (MRW), Fontem Ventures B.V. et al. v. Ballantyne Brands, LLC Civil Action No. 2:14-cv-09269 GW (MRW), Fontem Ventures B.V. et al. v. Spark Industries, LLC Civil Action No. 2:14-cv-09270 GW (MRW), Fontem Ventures B.V. et al. v. Logic Technology Development LLC Civil Action No. 2:14-cv-09271 GW (MRW), Fontem Ventures B.V. et al. v. VMR Products, LLC et al. Civil Action No. 2:14-cv-09273 GW (MRW).

6. The term "Electronic Cigarette" shall mean and refer to a device that simulates the feel and experience of a cigarette without burning.

7. The term "all Electronic Cigarettes" or "each Electronic Cigarette" shall mean all current and discontinued Electronic Cigarettes.

8. The term "Patents-in-suit" shall mean and refer to U.S. Patent NO. 8,365,742 issued on February 5, 2013 and titled "Aerosol Electronic Cigarette", U.S. Patent

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NO. 8,375,957 issued on February 19, 2013 and titled "Electronic Cigarette", U.S. Patent NO. 8,393,331 issued on March 12, 2013 and titled "Electronic Atomization Cigarette", U.S. Patent NO. 8,490,628 issued on July 23, 2013 and titled "Electronic Atomization Cigarette", U.S. Patent NO. 8,689,805 issued on April 8, 2014 and titled "Electronic Cigarette", U.S. Patent No. 8,893,726 issued November 25, 2014 and titled "Electronic Cigarette", U.S. Pat. No. 8,910,641 issued December 16, 2014 and titled "Electronic Cigarette", U.S. Patent No. 8,899,239 issued December 2, 2014 and titled "Electronic Cigarette", U.S. Patent No. 8,863,752 issued October 21, 2014 and titled "Electronic Cigarette" and all patent applications, continuations, continuations-in-part, divisionals, reissues, reexaminations of any of the foregoing and/or any foreign counterpart patents or foreign counterpart patent applications that disclose or claim all or part of the subject matter disclosed or claimed in the Patents-in-suit.

9. The term "Vaporizer" shall mean and refer to a device that is used to vaporize nicotine for inhalation by a user.

10. Wherever used herein, the singular shall be deemed to include the plural, and the plural shall be deemed to include the singular; the masculine shall be deemed to include the feminine, and the feminine shall be deemed to include the masculine; the disjunctive ("or") shall be deemed to include the conjunctive ("and"), and the conjunctive ("and") shall be deemed to include the disjunctive ("or"); the present tense shall be deemed to include the past tense, and the past tense shall be deemed to

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include the present tense; and each of the functional words "each," "every," "any," and "all" shall be deemed to include each of the other functional words, so as to be inclusive of any documents which otherwise may be excluded from production.

11. The term "documents" shall be construed in its broadest possible sense and encompasses the entire scope of discovery contemplated by Rule 34 of the Federal Rules of Civil Procedure including records produced in any and all media whatsoever, including, but not limited to: any writing and each original, or a copy in the absence of the original, and every copy bearing notes or markings not present on the original or copy, of the following items, however produced or reproduced, namely: books, accounting records of any nature whatsoever, agreements, communications, correspondence, telegrams, cables, telexes, electronic mail, voice mail, memoranda, recordings, podcasts, studies, summaries or records of telephone conversations, summaries or records of personal conversations or interviews, diaries, letters, forecasts, statistical statements, graphs, laboratory or engineering reports and records, notebooks, charts, plans, sketches, drawings, video tapes, films, slides, information bearing photographic products of any nature whatsoever, photo-records, microfilms, tape recordings, minutes or records of meetings or conferences, expressions or statements of policy, lists of persons attending meetings or conferences, reports or summaries of interviews, reports or summaries of investigations, opinions or reports of consultants, patent appraisals, opinions of counsel, records, reports or summaries of negotiations, sales literature of any nature

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whatsoever, brochures, catalogues, catalogue sheets, pamphlets, periodicals, advertisements, circulars or trade letters, press releases, trade releases, publicity releases, new product releases, reprints, drafts of any documents, working papers, indices, original or preliminary notes, computer source code, software and hardware applications and tools, system, method and computer printouts, printed or recorded copies of computer-based electronic screen displays, and/or computer-based electronic screen shots, and other data compilations from which information can be obtained or translated, if necessary, by you through detection devices into reasonably usable form. The term "document" also refers to any tangible object or "thing" other than a document as described above, and includes objects of every kind and nature such as, but not limited to, prototypes, models, and specimens.

12. The term "communication" shall mean any transmission, exchange, or making known information or thoughts by oral, written, pictorial or other means, including, but not limited to, personal conversations, conferences, telephone conversations, memoranda, letters, correspondence, reports and publications, and shall include any means of conveying a message from one or more persons to one or more persons, including electronic mail and shall be given the broadest possible interpretation.

13. The term "concerning" shall mean and include: with respect to, reflecting, referring to, relating to, regarding, substantiating, purporting, embodying, establishing, identifying, listing, evidencing, comprising, connected with,

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memorializing, recording, commenting upon, responding to, showing, describing, analyzing, representing or constituting, whether in whole or part.

14. The term "date" means the exact month, date and year, to the extent known, or if not known, your best approximation thereof.

15. The terms "person" or "persons" shall mean any natural person, individual groups of natural persons, corporation, partnerships, joint ventures, firms, associations, proprietorships, and organizations and any other incorporated or unincorporated entity or association, including government entities, agencies, officers and departments.

16. The term "Altria" shall refer to Altria Group, Inc., any and all of its predecessors in interest and/or successors in interest, and any of its present or former officers, directors, employees, partners, investors, corporate parents, subsidiaries, affiliates, joint ventures, corporate partners, acquired entities, divisions, departments and any other associated entities or persons working with it or on its behalf, including but not limited to Phillip Morris USA, U.S. Smokeless Tobacco and Nu Mark LLC.

TOPICS FOR EXAMINATION

Pursuant to Rules 45 and 30(b)(6) of the Federal Rules of Civil Procedure, Defendants, by and through its counsel, seek examination of RAI on the following topics.

TOPIC NO. 1:

The proposed merger between Lorillard and RAI announced on July 15, 2014.

TOPIC NO. 2:

Communication and/or correspondence between Lorillard and RAI concerning, referring to and/or relating to Electronic Cigarettes or Vaporizers.

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TOPIC NO. 3:

Communication and/or correspondence between ITG and RAI concerning, referring to and/or relating to Electronic Cigarettes or Vaporizers.

TOPIC NO. 4:

Any studies conducted by RAI or any third party relating to the acceptance of Electronic Cigarettes or Vaporizers by tobacco smokers.

TOPIC NO. 5:

Communication by, between or among RAI and any third party concerning Defendants.

TOPIC NO. 6:

Communication by, between or among RAI and any third party concerning this Consolidated Litigation.

TOPIC NO. 7:

The asset purchase agreement between RAI and ITG entered into on July 15, 2014.

TOPIC NO. 8:

Information related to all Electronic Cigarettes or Vaporizers sold by RAI under the VUSE brand name including marketing, development, sales, public disclosure and allegations of patent infringement.

TOPIC NO. 9:

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Any analysis of the market for Electronic Cigarettes or Vaporizers including without limitation, studies or reports relating to marketing, competitors, market share, product acceptance, demand analyses, customer surveys and sales forecasts.

TOPIC NO. 10:

Any agreements, license agreements, settlements or covenants that involve Electronic Cigarette or Vapprizers including without limitation any patent license agreements, agreements, settlements or covenants between ITG, RAI, Lorillard and/or Altria.

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EXHIBIT M

SCHEDULE A

Instructions

1. You are requested to respond to these requests for production of documents within 14 days of the date of the service in accordance with Rules 34 and 45 of the Federal Rules of Civil Procedure. Your responses should be sent to the office of Vapor Corp.'s counsel, addressed as follows:

(If Hand Delivered)

Torri's Legal Services
C/O Kimberly Hamilton
1619 Broadway Drive
Graham, NC 27253

(If Sent by First Class Mail or Overnight Delivery)

W. John McKeague
Porzio, Bromberg & Newman P.C.
1200 New Hampshire Avenue, NW
Suite 710
Washington, DC 20036
(202) 517-1888

2. You are required to respond to these requests for production of documents in writing after making relevant inquiries of all persons who may have the knowledge required to respond fully to each request for production of documents. You must divulge or produce all information that is in your possession, custody or control or that is in the possession, custody, or control of your attorneys, investigators, officers, directors, agents, employees, boards, supervisors, overseers, consultants, contractors, or other representatives of yourself or your attorneys.

3. If you are unable to respond to any part of the following requests for production in full, please respond to the extent possible and specify your reason for not responding completely. If you lack information necessary to respond fully to any request for production, please describe

the specific efforts made by you or by anyone on your behalf to ascertain the information and state as definitively as possible when you anticipate obtaining the information sought and supplementing your response. If any requested document cannot be produced in full, produce it to the extent possible, specifying your reasons for your inability to produce the remainder and stating whatever information, knowledge or belief you have concerning the portion not produced.

4. All documents produced in response to an individual Request shall be physically separated from documents produced in response to any other Requests, and the Request to which they are responsive shall be specifically identified. If a document is responsive to more than one Request, each of the Requests to which the document is responsive shall be specified.

5. In producing the documents, all documents that are physically attached to each other shall be left so attached. Documents that are separated from other documents, whether by inclusion in binders, files, subfiles, or by use of dividers, tabs, or other methods, shall be left so separated. Documents shall be retained in the order in which they were maintained in the location where found.

6. Identify all responsive documents that have been lost, discarded, or destroyed. In so doing, state the type of document, its date, the approximate date it was lost, discarded, or destroyed, and the identity of each person having knowledge of the contents thereof.

7. In the event that any document called for by these requests for production is withheld on the basis of any claim of privilege or any objection, please identify the document by providing the following information:

A. the title, date and the subject matter of the document;

B. the title and the position of the sender of the document;

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C. the identity and position of each person who participated in the preparation of the document or on whose behalf the document was prepared;

D. the identity and position of all persons (1) to whom the document was addressed, (2) to whom the document was sent, (3) who has seen the document, (4) who has possession or custody of the document, and (5) who is aware of the contents of the documents; and

E. a detailed statement of the basis for withholding the document in sufficient detail to permit the Court to adjudicate the validity of the refusal, including facts establishing any claim of privilege, facts showing that the privilege has not been waived, and the status of the person claiming the privilege.

F. Identify and produce all separate portions of any responsive document to which a claim of privilege, attorney work product, or other basis for withholding the document does not apply.

8. In the event that any document called for by these requests for production is withheld on the basis of disclosure of any trade secret or other confidential research, development, or commercial information, please identify the document by providing the following information:

A. the title, date and the subject matter of the document;

B. the title and the position of the sender of the document;

C. the identity and position of each person who participated in the preparation of the document or on whose behalf the document was prepared;

D. the identity and position of all persons (1) to whom the document was addressed, (2) to whom the document was sent, (3) who has seen the document, (4) who has

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possession or custody of the document, and (5) who is aware of the contents of the documents; and

E. a detailed statement of the basis for withholding the document in sufficient detail to permit the Court to adjudicate the validity of the refusal, including facts establishing the confidentiality of the information, facts showing that confidentiality has not been waived, and facts showing the steps taken to preserve the confidentiality of such information.

F. Identify and produce all separate portions of any responsive document to which a claim of confidentiality does not apply.

9. These document Requests are intended as continuing Requests, requiring you to respond by supplemental response setting forth any document within the scope of the document Request created or located following your original response.

DEFINITIONS

10. The term "RAI" shall refer to Reynolds American, Inc., any and all of its predecessors in interest and/or successors in interest, and any of its present or former officers, directors, employees, partners, investors, corporate parents, subsidiaries, affiliates, joint ventures, corporate partners, acquired entities, divisions, departments and any other associated entities or persons working with it or on its behalf, including but not limited to Lantern Acquisition Co.

11. The term "Lorillard" shall refer to Lorillard, Inc., any and all of its predecessors in interest and/or successors in interest, and any of its present or former officers, directors, employees, partners, investors, corporate parents, subsidiaries, affiliates, joint ventures, corporate partners, acquired entities, divisions, departments and any other associated entities or persons working with it or on its behalf, including but not limited to LOEC, Inc. dba blu eCigs.

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12. The term "ITG" shall refer to ITG Brands, LLC, formerly known as Lignum-2, LLC, any and all of its predecessors in interest and/or successors in interest, and any of its present or former officers, directors, employees, partners, investors, corporate parents, subsidiaries, affiliates, joint ventures, corporate partners, acquired entities, divisions, departments and any other associated entities or persons working with it or on its behalf, including but not limited to Imperial Tobacco Group PLC, Fontem Ventures B. V. and Fontem Holdings 1 B.V.

13. The term "Defendants" shall refer to Vapor Corp., NJOY, Inc., FIN Branding Group, LLC, Electronic Cigarettes International Group, Ltd. f/k/a Victory Electronic Cigarettes Corporation, Ballantyne Brands, LLC, CB Distributors, Inc., Logic Technology Development LLC, VMR Products, LLC dba V2CIGS, Spark Industries, LLC and LOEC, Inc. dba blu eCigs.

14. The term "Consolidated Litigations" shall refer to consolidated case *Fontem Ventures B.V. et al. v. NJOY Civil Action No. 2:14-cv-01645 GW (MRW)* and related consolidated cases *Fontem Ventures B.V. et al. v. LOEC, Inc. et al. Civil Action No. 2:14-cv-01648 GW (MRW), Fontem Ventures B.V. et al. v. CB Distributors, Inc. et al. Civil Action No. 2:14-cv-01649 GW (MRW), Fontem Ventures B.V. et al. v. Vapor Corp. Civil Action No. 2:14-cv-01650 GW (MRW), Fontem Ventures B.V. et al. v. FIN Branding Group, LLC, Electronic Cigarettes International Group, Ltd. f/k/a Victory Electronic Cigarettes Corporation et al. Civil Action No. 2:14-cv-01651 GW (MRW), Fontem Ventures B.V. et al. v. Ballantyne Brands, LLC Civil Action No. 2:14-cv-01652 GW (MRW), Fontem Ventures B.V. et al. v. Spark Industries, LLC Civil Action No. 2:14-cv-01653 GW (MRW), Fontem Ventures B.V. et al. v. Logic Technology Development LLC Civil Action No. 2:14-cv-01654 GW (MRW), Fontem Ventures B.V. et al. v. VMR Products, LLC et al. Civil Action No. 2:14-cv-01655 GW (MRW), Fontem Ventures B.V. et al. v. NJOY Civil Action No. 2:14-cv-08144 GW (MRW), Fontem Ventures B.V. et al. v. LOEC, Inc. et al.*

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Civil Action No. 2:14-cv-08149 GW (MRW), Fontem Ventures B.V. et al. v. CB Distributors, Inc. et al. Civil Action No. 2:14-cv-08154 GW (MRW), Fontem Ventures B.V. et al. v. Vapor Corp. Civil Action No. 2:14-cv-08155 GW (MRW), Fontem Ventures B.V. et al. v. FIN Branding Group, LLC, Electronic Cigarettes International Group, Ltd. f/k/a Victory Electronic Cigarettes Corporation et al. Civil Action No. 2:14-cv-08156 GW (MRW), Fontem Ventures B.V. et al. v. Ballantyne Brands, LLC Civil Action No. 2:14-cv-08157 GW (MRW), Fontem Ventures B.V. et al. v. Spark Industries, LLC Civil Action No. 2:14-cv-08158 GW (MRW), Fontem Ventures B.V. et al. v. Logic Technology Development LLC Civil Action No. 2:14-cv-08160 GW (MRW), Fontem Ventures B.V. et al. v. VMR Products, LLC et al. Civil Action No. 2:14-cv-08161 GW (MRW), Fontem Ventures B.V. et al. v. NJOY Civil Action No. 2:14-cv-09263 GW (MRW), Fontem Ventures B.V. et al. v. LOEC, Inc. et al. Civil Action No. 2:14-cv-09265 GW (MRW), Fontem Ventures B.V. et al. v. CB Distributors, Inc. et al. Civil Action No. 2:14-cv-09266 GW (MRW), Fontem Ventures B.V. et al. v. Vapor Corp. Civil Action No. 2:14-cv-09267 GW (MRW), Fontem Ventures B.V. et al. v. FIN Branding Group, LLC, Electronic Cigarettes International Group, Ltd. f/k/a Victory Electronic Cigarettes Corporation et al. Civil Action No. 2:14-cv-09268 GW (MRW), Fontem Ventures B.V. et al. v. Ballantyne Brands, LLC Civil Action No. 2:14-cv-09269 GW (MRW), Fontem Ventures B.V. et al. v. Spark Industries, LLC Civil Action No. 2:14-cv-09270 GW (MRW), Fontem Ventures B.V. et al. v. Logic Technology Development LLC Civil Action No. 2:14-cv-09271 GW (MRW), Fontem Ventures B.V. et al. v. VMR Products, LLC et al. Civil Action No. 2:14-cv-09273 GW (MRW).

15. The term "Electronic Cigarette" shall mean and refer to a device that simulates the feel and experience of a cigarette without burning.

16. The term "all Electronic Cigarettes" or "each Electronic Cigarette" shall mean all current and discontinued Electronic Cigarettes.

17. The term "Patents-in-suit" shall mean and refer to U.S. Patent NO. 8,365,742 issued on February 5, 2013 and titled "Aerosol Electronic Cigarette", U.S. Patent NO. 8,375,957 issued on February 19, 2013 and titled "Electronic Cigarette", U.S. Patent NO. 8,393,331 issued on March 12, 2013 and titled "Electronic Atomization Cigarette", U.S. Patent NO. 8,490,628 issued on July 23, 2013 and titled "Electronic Atomization Cigarette", U.S. Patent NO. 8,689,805 issued on April 8, 2014 and titled "Electronic Cigarette", U.S. Patent No. 8,893,726 issued November 25, 2014 and titled "Electronic Cigarette", U.S. Pat. No. 8,910,641 issued December 16, 2014 and titled "Electronic Cigarette", U.S. Patent No. 8,899,239 issued December 2, 2014 and titled "Electronic Cigarette", U.S. Patent No. 8,863,752 issued October 21, 2014 and titled "Electronic Cigarette" and all patent applications, continuations, continuations-in-part, divisionals, reissues, reexaminations of any of the foregoing and/or any foreign counterpart patents or foreign counterpart patent applications that disclose or claim all or part of the subject matter disclosed or claimed in the Patents-in-suit.

18. The term "Vaporizer" shall mean and refer to a device that is used to vaporize nicotine for inhalation by a user.

19. Wherever used herein, the singular shall be deemed to include the plural, and the plural shall be deemed to include the singular; the masculine shall be deemed to include the feminine, and the feminine shall be deemed to include the masculine; the disjunctive ("or") shall be deemed to include the conjunctive ("and"), and the conjunctive ("and") shall be deemed to include the disjunctive ("or"); the present tense shall be deemed to include the past tense, and the past tense shall be deemed to include the present tense; and each of the functional words "each,"

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"every," "any," and "all" shall be deemed to include each of the other functional words, so as to be inclusive of any documents which otherwise may be excluded from production.

20. The term "documents" shall be construed in its broadest possible sense and encompasses the entire scope of discovery contemplated by Rule 34 of the Federal Rules of Civil Procedure including records produced in any and all media whatsoever, including, but not limited to: any writing and each original, or a copy in the absence of the original, and every copy bearing notes or markings not present on the original or copy, of the following items, however produced or reproduced, namely: books, accounting records of any nature whatsoever, agreements, communications, correspondence, telegrams, cables, telexes, electronic mail, voice mail, memoranda, recordings, podcasts, studies, summaries or records of telephone conversations, summaries or records of personal conversations or interviews, diaries, letters, forecasts, statistical statements, graphs, laboratory or engineering reports and records, notebooks, charts, plans, sketches, drawings, video tapes, films, slides, information bearing photographic products of any nature whatsoever, photo-records, microfilms, tape recordings, minutes or records of meetings or conferences, expressions or statements of policy, lists of persons attending meetings or conferences, reports or summaries of interviews, reports or summaries of investigations, opinions or reports of consultants, patent appraisals, opinions of counsel, records, reports or summaries of negotiations, sales literature of any nature whatsoever, brochures, catalogues, catalogue sheets, pamphlets, periodicals, advertisements, circulars or trade letters, press releases, trade releases, publicity releases, new product releases, reprints, drafts of any documents, working papers, indices, original or preliminary notes, computer source code, software and hardware applications and tools, system, method and computer printouts, printed or recorded copies of computer-based electronic screen displays, and/or computer-based electronic screen

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shots, and other data compilations from which information can be obtained or translated, if necessary, by you through detection devices into reasonably usable form. The term "document" also refers to any tangible object or "thing" other than a document as described above, and includes objects of every kind and nature such as, but not limited to, prototypes, models, and specimens.

21. The term "communication" shall mean any transmission, exchange, or making known information or thoughts by oral, written, pictorial or other means, including, but not limited to, personal conversations, conferences, telephone conversations, memoranda, letters, correspondence, reports and publications, and shall include any means of conveying a message from one or more persons to one or more persons, including electronic mail and shall be given the broadest possible interpretation.

22. The term "concerning" shall mean and include: with respect to, reflecting, referring to, relating to, regarding, substantiating, purporting, embodying, establishing, identifying, listing, evidencing, comprising, connected with, memorializing, recording, commenting upon, responding to, showing, describing, analyzing, representing or constituting, whether in whole or part.

23. The term "date" means the exact month, date and year, to the extent known, or if not known, your best approximation thereof.

24. The terms "person" or "persons" shall mean any natural person, individual groups of natural persons, corporation, partnerships, joint ventures, firms, associations, proprietorships, and organizations and any other incorporated or unincorporated entity or association, including government entities, agencies, officers and departments.

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REQUESTS FOR PRODUCTION OF DOCUMENTS

Pursuant to Rule 45 of the Federal Rules of Civil Procedure, Defendants, by and through its undersigned counsel, propound the following requests for production of documents upon RAI.

REQUEST FOR PRODUCTION NO. 1:

All documents concerning, referring to and/or relating to the proposed merger between RAI and Lorillard announced on July 15, 2014, including documents concerning due diligence.

REQUEST FOR PRODUCTION NO. 2:

All documents concerning, referring to and/or relating to the asset purchase agreement between RAI and ITG entered into on July 15, 2014, including documents concerning due diligence.

REQUEST FOR PRODUCTION NO. 3:

All documents exchanged between RAI and ITG concerning, referring to and/or relating to Electronic Cigarettes or Vaporizers.

REQUEST FOR PRODUCTION NO. 4:

All documents exchanged between RAI and Lorillard concerning, referring to and/or relating to Electronic Cigarettes or Vaporizers.

REQUEST FOR PRODUCTION NO. 5:

All documents concerning, referring and/or relating to any studies conducted by RAI or any third party relating to the acceptance of Electronic Cigarettes or Vaporizers by tobacco smokers.

REQUEST FOR PRODUCTION NO. 6:

All documents concerning, referring or relating to communication by, between or among RAI and any third party concerning Defendants.

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REQUEST FOR PRODUCTION NO. 7:

All documents concerning, referring or relating to communication by, between or among RAI and any third party concerning this Consolidated Litigation.

REQUEST FOR PRODUCTION NO. 8:

All documents concerning, referring or relating to any analysis of the market for Electronic Cigarettes or Vaporizers including without limitation, studies or reports relating to marketing, competitors, market share, product acceptance, demand analyses, customer surveys and sales forecasts.

REQUEST FOR PRODUCTION NO. 9:

All documents concerning, referring or relating to any license agreements, settlements or covenants that involve Electronic Cigarette or Vaporizers including without limitation any patent license agreements.

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EXHIBIT N

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

IN RE: SUBPOENA ISSUED TO REYNOLDS AMERICAN INC.

No. 15 MC 22

--in--

FONTEM VENTURES B.V., et al.

Plaintiffs,

vs.

NJOY, INC., et al.

Defendants,

Underlying Action Pending in the United States District Court for the Central District of California Civil Action No. CV 2:14-01645 GW (MRW), Related Consolidated Cases, and Misc. Case No. 3:15 MC004, a related motion pending in the United States District Court for the Eastern District of Virginia

NON-PARTY REYNOLDS AMERICAN INC.'S MOTION TO QUASH VAPOR CORP.'S SUBPOENA SEEKING DEPOSITION TESTIMONY

Non-party Reynolds American Inc. ("RAI"), by and through counsel and pursuant to Rule 45(d) of the Federal Rules of Civil Procedure and Local Rule 7.3, hereby moves this Court for an order quashing a subpoena issued by Vapor Corp. ("Defendant and Counterclaimant"). The Subpoena commands RAI to designate a corporate representative and to appear on June 2, 2015, for a deposition at Nexsen Pruet, 701 Green Valley Road, Suite 100, Greensboro, North Carolina 27408. A true and correct copy of the subpoena is attached as Exhibit 2 to the memorandum in support of this motion.

In support of this Motion, RAI submits the accompanying Memorandum of Law. Pursuant to Rule 45(d) of the Federal Rules of Civil Procedure, the Subpoena should be

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quashed for two important and independent reasons. First, the subpoena must be quashed because it imposes an undue burden on RAI. Second, the subpoena should be quashed because it seeks the disclosure of confidential information.

Local Rule 37.1 Certification

Pursuant to Middle District of North Carolina Local Rule 37.1(a), Robert S. Pierce, RAI's undersigned counsel certifies that he conferred on May 27 and 28, 2015 with Richard Oparil of Porzio, Bromberg & Newman, PC via telephone in an effort to resolve or dispose of this matter, but the parties were unsuccessful in reaching any resolution.

WHEREFORE, RAI respectfully requests that this Court quash the Subpoena issued by Defendant and Counterclaimant and grant such other relieve as the court may deem appropriate.

This the 1st day of June, 2015.

OF COUNSEL:

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Attorneys for Reynolds American Inc.

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CERTIFICATE OF SERVICE

It is hereby certified that the foregoing *Motion to Quash* has been emailed to and served on counsel for the parties via first class U.S. Mail, addressed as follows:

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PORZIO, BROMBERG & NEWMAN P.C.
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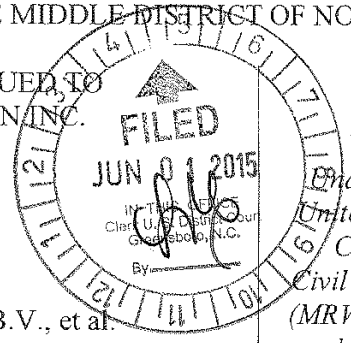
EXHIBIT O

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



IN RE: SUBPOENA ISSUED TO REYNOLDS AMERICAN INC.

--in--

FONTEM VENTURES B.V., et al.

Plaintiffs,

vs.

NJOY, INC., et al.

Defendants,

No. 15MC22

Underlying Action Pending in the United States District Court for the Central District of California Civil Action No. CV 2:14-01645 GW (MRW), Related Consolidated Cases, and Misc. Case No. 3:15 MC004, a related motion pending in the United States District Court for the Eastern District of Virginia

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MEMORANDUM OF LAW IN SUPPORT OF MOTION TO QUASH SUBPOENA TO TESTIFY AT A DEPOSITION IN A CIVIL ACTION SERVED ON REYNOLDS AMERICAN INC.

Pursuant to Rule 45 of the Federal Rules of Civil Procedure, non-party Reynolds American, Inc. ("RAI"), through undersigned counsel, respectfully submits this Memorandum of Law in support of RAI's Motion to Quash the Subpoena to Testify at a Deposition in a Civil Action (the "Subpoena"), issued by Vapor Corp.

I. PRELIMINARY STATEMENT

On May 12, 2015 Defendant and counterclaimant Vapor Corp. served RAI with a Subpoena and Notice. The Subpoena and Notice seek a RAI representative to testify, on approximately three weeks' notice, regarding an expansive list of topics, with no temporal limitations. Moreover, while separate corporations that RAI indirectly owns are in the e-vapor business, RAI is not. RAI is a holding company that does not itself directly engage in the e-vapor business and, as such, should not be called upon to provide a Rule 30(b)(6) witness to testify regarding the proposed topics.

The Subpoena issued from the underlying action before United States District Judge George H. Wu pending in the United States District Court for the Central District of California. The action is for alleged patent infringement (the "Patent action"); plaintiffs Fontem Ventures and Fontem Holdings (Fontem)[1] seek damages from Vapor Corp. and eight other defendants. In pertinent part, Fontem alleges infringement of nine different patents relating to electronic cigarettes and nicotine vaporizer products ("e-

[1] Fontem Ventures and Fontem Holdings are each wholly-owned subsidiaries of Imperial Tobacco Group ("ITG").

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vapor products"). The Patent action ultimately involves two questions: (1) whether or not the patents that form the basis for the action are valid and (2) if so, whether or not they have been breached.

RAI is not a party to the Patent action and has no connection to the litigation. Notwithstanding these facts, Vapor Corp. served RAI with two overly broad and oppressive subpoenas[2] –first, a subpoena *duces tecum* seeking a vast array of documents and second, a subpoena requiring the attendance of a 30(b)(6) deponent on the following ten "Topics" of inquiry:

> **TOPIC NO. 1:**
>
> The proposed merger between Lorillard and RAI announced on July 15, 2014.
>
> **TOPIC NO. 2:**
>
> Communication and/or correspondence between Lorillard and RAI concerning, referring to and/or relating to Electronic Cigarettes or Vaporizers.
>
> **TOPIC NO. 3:**
>
> Communication and/or correspondence between ITG and RAI concerning, referring to and/or relating to Electronic Cigarettes or Vaporizers.
>
> **TOPIC NO. 4:**
>
> Any studies conducted by RAI or any third party relating to the acceptance of Electronic Cigarettes or Vaporizers by tobacco smokers.

[2] The subpoena *duces tecum* and the subpoena *ad testificandum* are attached as Exhibits 1 and 2, respectively.

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EXHIBIT P

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Attorneys for Plaintiffs
FONTEM VENTURES B.V. and
FONTEM HOLDINGS 1 B.V.

UNITED STATES DISTRICT COURT

CENTRAL DISTRICT OF CALIFORNIA

FONTEM VENTURES B.V., a Netherlands company; and FONTEM HOLDINGS 1 B.V., a Netherlands company,

Plaintiffs,

v.

NJOY, INC., a Delaware corporation, and DOES 1-5, Inclusive,

Defendant.

Case No. CV14-1645

COMPLAINT FOR PATENT INFRINGEMENT

DEMAND FOR JURY TRIAL

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For its Complaint against Defendant NJOY, INC. ("Defendant"), Plaintiff Fontem Ventures B.V. ("Fontem Ventures") and Plaintiff Fontem Holdings 1 B.V. ("Fontem Holdings") allege as follows:

JURISDICTION AND VENUE

1. This is a civil action for patent infringement arising under the patent laws of the United States, 35 U.S.C. §§ 101, et seq., and in particular § 271.

2. This Court has subject matter jurisdiction over this patent infringement action under 28 U.S.C. §§ 1331 and 1338(a).

3. This Court has personal jurisdiction over Defendant because it solicits and conducts business in California, including the provision of goods over the Internet, derives revenue from goods sold in California and within this judicial district, and has committed acts of infringement in this judicial district.

4. Venue lies in this judicial district pursuant to 28 U.S.C. §§ 1391(b) and (c), and 1400(b).

PARTIES

5. Plaintiff Fontem Ventures is a company organized and existing under the laws of the Netherlands, with its principal place of business at 12th Floor, 101 Barbara Strozzilaan, 1083 HN Amsterdam, The Netherlands. Fontem Ventures is in the business of developing innovative non-tobacco products, including electronic cigarettes.

6. Plaintiff Fontem Holdings is a company organized and existing under the laws of the Netherlands, with its principal place of business at 12th Floor, 101 Barbara Strozzilaan, 1083 HN Amsterdam, The Netherlands.

7. Plaintiffs Fontem Ventures and Fontem Holdings (together, "the Plaintiffs") are informed and believe that: Defendant NJOY, INC. ("NJOY") is a corporation organized and existing under the laws of the State of Delaware, having its principal place of business at 15211 N. Kierland Blvd., Scottsdale, AZ, 85254,

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USA. NJOY is doing business in this judicial district related to the claims asserted in this Complaint.

8. The true names and capacities, whether individual, corporate, associate, or otherwise of defendants sued herein as DOES 1 through 5, inclusive, are unknown to the Plaintiffs at the present time, and the Plaintiffs therefore sue said Defendants by such fictitious names. The Plaintiffs, after obtaining leave of court, if necessary, will amend this Complaint to show such true names and capacities when the same have been ascertained.

FIRST CAUSE OF ACTION

(Infringement of U.S. Patent No. 8,365,742)

9. The Plaintiffs incorporate by reference the allegations contained in paragraphs 1-8 above.

10. Plaintiff Fontem Holdings is the owner of the entire right, title, and interest in and to United States Patent No. 8,365,742 ("the '742 Patent") and Plaintiff Fontem Ventures is the exclusive licensee of the '742 Patent. The '742 Patent was duly and legally issued by the United States Patent Office on February 5, 2013 and is valid, subsisting, and in full force and effect. A copy of the '742 Patent is attached to the Complaint as Exhibit A.

11. The Plaintiffs are informed and believe that: Defendant has had knowledge of the '742 Patent, and of the Plaintiffs' rights therein, at least as of February 13, 2014. On that date, a Joint Status Report containing an assignment document identifying Plaintiff Fontem Holdings as the owner of the '742 Patent was filed in a related case.[1] The Joint Status Report was reviewed and signed by

[1] *See* Joint Status Report filed February 13, 2014 (Dkt. No. 63, Exh. A) in *Ruyan Investment Holdings Limited v. Sottera, Inc.*, Case No. CV 12-05454 GAF (FFMx) (C.D. Cal.), which is consolidated for purposes of discovery with Case Nos. CV 12-05455 GAF (FFMx), CV 12-05456 GAF (FFMx), CV 12-05462 GAF (FFMx), CV 12-05466 GAF (FFMx), CV 12-05468 GAF (FFMx), CV 12-05472 GAF (FFMx), CV 12-05477 GAF (FFMx), CV 12-05482 GAF (FFMx), and CV 12-06268 GAF (FFMx).

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Defendant's counsel. Defendant shall have additional knowledge of the '742 Patent as of the date of service for the present Complaint.

12. The Plaintiffs are informed and believe that: Defendant has directly infringed the '742 Patent in violation of at least 35 U.S.C. § 271(a) by, itself and/or through its agents, unlawfully and wrongfully making, using, importing, offering to sell, and/or selling electronic cigarette products embodying one or more of the inventions claimed in the '742 Patent, within and/or from the United States without permission or license from the Plaintiffs, and will continue to do so unless enjoined by this Court. Examples of electronic cigarette products that directly infringe the '742 Patent include, but are not limited to, (1) NJOY Rechargeable Express Kits; (2) NJOY Cartridge Refills for use with NJOY Rechargeable Electronic Cigarette Batteries purchased separately or as part of an NJOY Rechargeable Express Kit; (3) NJOY Rechargeable Electronic Cigarette Batteries; (4) NJOY OneJoy Non Rechargeable Electronic Cigarettes; and (5) NJOY King Disposable Electronic Cigarettes. Such products infringe at least claims 2 and 3 of the '742 Patent.

13. The Plaintiffs are informed and believe that: Defendant has contributed to the infringement of the '742 Patent in violation of at least 35 U.S.C. § 271(c) by, itself and/or through its agents, contributing to the direct infringement of the '742 Patent by its customers by unlawfully and wrongfully making, using, importing, offering to sell, and/or selling electronic cigarette components having no substantially non-infringing use, which, when purchased and/or used by its customers, result in direct infringement of one or more embodiments of the inventions claimed in the '742 Patent, within and/or from the United States without permission or license from the Plaintiffs, and will continue to do so unless enjoined by this Court. Examples of electronic cigarette components that have no substantial noninfringing uses and that contribute to the direct infringement of the '742 Patent include, but are not limited to, (1) NJOY Cartridge Refills ("NJOY E-Cig Cartridges") for use with NJOY Rechargeable Electronic Cigarette Batteries

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purchased separately or as part of an NJOY Rechargeable Express Kit; and (2) NJOY Rechargeable Electronic Cigarette Batteries ("NJOY E-Cig Batteries").

14. The Plaintiffs are informed and believe that: Having knowledge of the '742 Patent, Defendant has been aware that its NJOY E-Cig Cartridges and NJOY E-Cig Batteries, when purchased and/or used by its customers, result in direct infringement of one or more embodiments of the inventions claimed in the '742 Patent. Defendant states on its website that when a rechargeable NJOY product is being used "and the vapor volume is reduced below a satisfactory level or is no longer visible, immediately discontinue use of that cartridge and replace it with a new NJOY cartridge."[2] It also instructs users that an NJOY battery "will last 1-3 days before needing re-charging, depending on the intensity and quantity of puffs;" and encourages users to carry "an extra, charged battery."[3] Moreover, according to NJOY, "the only maintenance required [for its rechargeable product] is charging and replacing batteries as well as attaching fresh cartridges."[4] As such, Defendant knows that its NJOY E-Cig Cartridges and NJOY E-Cig Batteries that are sold separately from its Starter Kits have no substantial non-infringing uses other than to provide users with the ability to assemble and use an electronic cigarette that infringes at least claims 2 and 3 of the '742 Patent, and therefore that they are especially made or adapted for use in infringement of the '742 Patent.

15. As a direct and proximate result of the foregoing acts of Defendant, the Plaintiffs have suffered, and are entitled to, monetary damages in an amount not yet determined. The Plaintiffs are also entitled to their costs of suit and interest.

16. Defendant's continuing infringement has inflicted and, unless restrained by this court, will continue to inflict great and irreparable harm upon the

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[2] *See*, e.g., Frequently Asked Question (FAQ) No. 7, found at http://www.njoy.com/faqs (last visited March 5, 2014).

[3] *See*, e.g., Frequently Asked Question (FAQ) No. 8, found at http://www.njoy.com/faqs (last visited March 5, 2014).

[4] *See*, e.g., Frequently Asked Question (FAQ) No. 13, found at http://www.njoy.com/faqs (last visited March 5, 2014).

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Plaintiffs. The Plaintiffs have no adequate remedy at law. The Plaintiffs are entitled to preliminary and permanent injunctions enjoining Defendant from engaging in further acts of infringement.

SECOND CAUSE OF ACTION

(Infringement of U.S. Patent No. 8,375,957)

17. The Plaintiffs incorporate by reference the allegations contained in paragraphs 1-8 above.

18. Fontem Holdings is the owner of the entire right, title, and interest in and to United States Patent No. 8,375,957 ("the '957 Patent") and Fontem Ventures is the exclusive licensee of the '957 Patent. The '957 Patent was duly and legally issued by the United States Patent Office on February 19, 2013 and is valid, subsisting, and in full force and effect. A copy of the '957 Patent is attached to the Complaint as Exhibit B.

19. The Plaintiffs are informed and believe that: Defendant has had knowledge of the '957 Patent, and of the Plaintiffs' rights therein, at least as of February 13, 2014. On that date, a Joint Status Report containing an assignment document identifying Plaintiff Fontem Holdings as the owner of the '957 Patent was filed in a related case.[5] The Joint Status Report was reviewed and signed by Defendant's counsel. Defendant shall have additional knowledge of the '957 Patent as of the date of service for the present Complaint.

20. The Plaintiffs are informed and believe that: Defendant has directly infringed the '957 Patent in violation of at least 35 U.S.C. § 271(a) by, itself and/or through its agents, unlawfully and wrongfully making, using, importing, offering to

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[5] *See* Joint Status Report filed February 13, 2014 (Dkt. No. 63, Exh. A) in *Ruyan Investment Holdings Limited v. Sottera, Inc.*, Case No. CV 12-05454 GAF (FFMx) (C.D. Cal.), which is consolidated for purposes of discovery with Case Nos. CV 12-05455 GAF (FFMx), CV 12-05456 GAF (FFMx), CV 12-05462 GAF (FFMx), CV 12-05466 GAF (FFMx), CV 12-05468 GAF (FFMx), CV 12-05472 GAF (FFMx), CV 12-05477 GAF (FFMx), CV 12-05482 GAF (FFMx), and CV 12-06268 GAF (FFMx).

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sell, and/or selling electronic cigarette products embodying one or more of the inventions claimed in the '957 Patent, within and/or from the United States without permission or license from the Plaintiffs, and will continue to do so unless enjoined by this Court. Examples of electronic cigarette products that directly infringe the '957 Patent include, but are not limited to, (1) NJOY Rechargeable Express Kits; (2) NJOY Cartridge Refills for use with NJOY Rechargeable Electronic Cigarette Batteries purchased separately or as part of an NJOY Rechargeable Express Kit; and (3) NJOY Rechargeable Electronic Cigarette Batteries. Such products infringe at least claims 1, 10, and 23 of the '957 Patent.

21. The Plaintiffs are informed and believe that: Defendant has contributed to the infringement of the '957 Patent in violation of at least 35 U.S.C. § 271(c) by, itself and/or through its agents, contributing to the direct infringement of the '957 Patent by its customers by unlawfully and wrongfully making, using, importing, offering to sell, and/or selling electronic cigarette components having no substantially non-infringing use, which, when purchased and/or used by its customers, result in direct infringement of one or more embodiments of the inventions claimed in the '957 Patent, within and/or from the United States without permission or license from the Plaintiffs, and will continue to do so unless enjoined by this Court. Examples of electronic cigarette components that have no substantial noninfringing uses and that contribute to the direct infringement of the '957 Patent include, but are not limited to, (1) NJOY Cartridge Refills ("NJOY E-Cig Cartridges") for use with NJOY Rechargeable Electronic Cigarette Batteries purchased separately or as part of an NJOY Rechargeable Express Kit; and (2) NJOY Rechargeable Electronic Cigarette Batteries ("NJOY E-Cig Batteries").

22. The Plaintiffs are informed and believe that: Having knowledge of the '957 Patent, Defendant has been aware that its NJOY E-Cig Cartridges and NJOY E-Cig Batteries, when purchased and/or used by its customers, result in direct infringement of one or more embodiments of the inventions claimed in the '957

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Patent. Defendant states on its website that when a rechargeable NJOY product is being used "and the vapor volume is reduced below a satisfactory level or is no longer visible, immediately discontinue use of that cartridge and replace it with a new NJOY cartridge."[6] It also instructs users that an NJOY battery "will last 1-3 days before needing re-charging, depending on the intensity and quantity of puffs;" and encourages users to carry "an extra, charged battery."[7] Moreover, according to NJOY, "the only maintenance required [for its rechargeable product] is charging and replacing batteries as well as attaching fresh cartridges."[8] As such, Defendant knows that its NJOY E-Cig Cartridges and NJOY E-Cig Batteries that are sold separately from its Starter Kits have no substantial non-infringing uses other than to provide users with the ability to assemble and use an electronic cigarette that infringes at least claims 1, 10, and 23 of the '957 Patent, and therefore that they are especially made or adapted for use in infringement of the '957 Patent.

23. As a direct and proximate result of the foregoing acts of Defendant, the Plaintiffs have suffered, and are entitled to, monetary damages in an amount not yet determined. The Plaintiffs are also entitled to their costs of suit and interest.

24. Defendant's continuing infringement has inflicted and, unless restrained by this court, will continue to inflict great and irreparable harm upon the Plaintiffs. The Plaintiffs have no adequate remedy at law. The Plaintiffs are entitled to preliminary and permanent injunctions enjoining Defendant from engaging in further acts of infringement.

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[6] *See*, e.g., Frequently Asked Question (FAQ) No. 7, found at http://www.njoy.com/faqs (last visited March 5, 2014).

[7] *See*, e.g., Frequently Asked Question (FAQ) No. 8, found at http://www.njoy.com/faqs (last visited March 5, 2014).

[8] *See*, e.g., Frequently Asked Question (FAQ) No. 13, found at http://www.njoy.com/faqs (last visited March 5, 2014).

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THIRD CAUSE OF ACTION

(Infringement of U.S. Patent No. 8,393,331)

25. The Plaintiffs incorporate by reference the allegations contained in paragraphs 1-8 above.

26. Fontem Holdings is the owner of the entire right, title, and interest in and to United States Patent No. 8,393,331 ("the '331 Patent") and Fontem Ventures is the exclusive licensee of the '331 Patent. The '331 Patent was duly and legally issued by the United States Patent Office on March 12, 2013 and is valid, subsisting, and in full force and effect. A copy of the '331 Patent is attached to the Complaint as Exhibit C.

27. The Plaintiffs are informed and believe that: Defendant has had knowledge of the '331 Patent, and of the Plaintiffs' rights therein, at least as of February 13, 2014. On that date, a Joint Status Report containing an assignment document identifying Plaintiff Fontem Holdings as the owner of the '331 Patent was filed in a related case.[9] The Joint Status Report was reviewed and signed by Defendant's counsel. Defendant shall have additional knowledge of the '331 Patent as of the date of service for the present Complaint.

28. The Plaintiffs are informed and believe that: Defendant has directly infringed the '331 Patent in violation of at least 35 U.S.C. § 271(a) by, itself and/or through its agents, unlawfully and wrongfully making, using, importing, offering to sell, and/or selling electronic cigarette products embodying one or more of the inventions claimed in the '331 Patent, within and/or from the United States without permission or license from the Plaintiffs, and will continue to do so unless enjoined

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[9] *See* Joint Status Report filed February 13, 2014 (Dkt. No. 63, Exh. A) in *Ruyan Investment Holdings Limited v. Sottera, Inc.*, Case No. CV 12-05454 GAF (FFMx) (C.D. Cal.), which is consolidated for purposes of discovery with Case Nos. CV 12-05455 GAF (FFMx), CV 12-05456 GAF (FFMx), CV 12-05462 GAF (FFMx), CV 12-05466 GAF (FFMx), CV 12-05468 GAF (FFMx), CV 12-05472 GAF (FFMx), CV 12-05477 GAF (FFMx), CV 12-05482 GAF (FFMx), and CV 12-06268 GAF (FFMx).

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by this Court. Examples of electronic cigarette products that directly infringe the '331 Patent include, but are not limited to, (1) NJOY Rechargeable Express Kits; (2) NJOY Cartridge Refills for use with NJOY Rechargeable Electronic Cigarette Batteries purchased separately or as part of an NJOY Rechargeable Express Kit; (3) NJOY Rechargeable Electronic Cigarette Batteries; (4) NJOY OneJoy Non Rechargeable Electronic Cigarettes; and (5) NJOY King Disposable Electronic Cigarettes. Such products infringe at least claims 1 and 2 of the '331 Patent.

29. The Plaintiffs are informed and believe that: Defendant has contributed to the infringement of the '331 Patent in violation of at least 35 U.S.C. § 271(c) by, itself and/or through its agents, contributing to the direct infringement of the '331 Patent by its customers by unlawfully and wrongfully making, using, importing, offering to sell, and/or selling electronic cigarette components having no substantially non-infringing use, which, when purchased and/or used by its customers, result in direct infringement of one or more embodiments of the inventions claimed in the '331 Patent, within and/or from the United States without permission or license from the Plaintiffs, and will continue to do so unless enjoined by this Court. Examples of electronic cigarette components that have no substantial noninfringing uses and that contribute to the direct infringement of the '331 Patent include, but are not limited to, (1) NJOY Cartridge Refills ("NJOY E-Cig Cartridges") for use with NJOY Rechargeable Electronic Cigarette Batteries purchased separately or as part of an NJOY Rechargeable Express Kit; and (2) NJOY Rechargeable Electronic Cigarette Batteries ("NJOY E-Cig Batteries").

30. The Plaintiffs are informed and believe that: Having knowledge of the '331 Patent, Defendant has been aware that its NJOY E-Cig Cartridges and NJOY E-Cig Batteries, when purchased and/or used by its customers, result in direct infringement of one or more embodiments of the inventions claimed in the '331 Patent. Defendant states on its website that when a rechargeable NJOY product is being used "and the vapor volume is reduced below a satisfactory level or is no

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longer visible, immediately discontinue use of that cartridge and replace it with a new NJOY cartridge."[10] It also instructs users that an NJOY battery "will last 1-3 days before needing re-charging, depending on the intensity and quantity of puffs;" and encourages users to carry "an extra, charged battery."[11] Moreover, according to NJOY, "the only maintenance required [for its rechargeable product] is charging and replacing batteries as well as attaching fresh cartridges."[12] As such, Defendant knows that its NJOY E-Cig Cartridges and NJOY E-Cig Batteries that are sold separately from its Starter Kits have no substantial non-infringing uses other than to provide users with the ability to assemble and use an electronic cigarette that infringes at least at least claims 1 and 2 of the '331 Patent, and therefore that they are especially made or adapted for use in infringement of the '331 Patent.

31. As a direct and proximate result of the foregoing acts of Defendant, the Plaintiffs have suffered, and are entitled to, monetary damages in an amount not yet determined. The Plaintiffs are also entitled to their costs of suit and interest.

32. Defendant's continuing infringement has inflicted and, unless restrained by this court, will continue to inflict great and irreparable harm upon the Plaintiffs. The Plaintiffs have no adequate remedy at law. The Plaintiffs are entitled to preliminary and permanent injunctions enjoining Defendant from engaging in further acts of infringement.

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[10] *See*, e.g., Frequently Asked Question (FAQ) No. 7, found at http://www.njoy.com/faqs (last visited March 5, 2014).

[11] *See*, e.g., Frequently Asked Question (FAQ) No. 8, found at http://www.njoy.com/faqs (last visited March 5, 2014).

[12] *See*, e.g., Frequently Asked Question (FAQ) No. 13, found at http://www.njoy.com/faqs (last visited March 5, 2014).

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FOURTH CAUSE OF ACTION

(Infringement of U.S. Patent No. 8,490,628)

33. The Plaintiffs incorporate by reference the allegations contained in paragraphs 1-8 above.

34. Fontem Holdings is the owner of the entire right, title, and interest in and to United States Patent No. 8,490,628 ("the '628 Patent") and Fontem Ventures is the exclusive licensee of the '628 Patent. The '628 Patent was duly and legally issued by the United States Patent Office on July 23, 2013 and is valid, subsisting, and in full force and effect. A copy of the '628 Patent is attached to the Complaint as Exhibit D.

35. The Plaintiffs are informed and believe that: Defendant has had knowledge of the '628 Patent, and of the Plaintiffs' rights therein, at least as of February 13, 2014. On that date, a Joint Status Report containing an assignment document identifying Plaintiff Fontem Holdings as the owner of the '628 Patent was filed in a related case.[13] The Joint Status Report was reviewed and signed by Defendant's counsel. Defendant shall have additional knowledge of the '628 Patent as of the date of service for the present Complaint.

36. The Plaintiffs are informed and believe that: Defendant has directly infringed the '628 Patent in violation of at least 35 U.S.C. § 271(a) by, itself and/or through its agents, unlawfully and wrongfully making, using, importing, offering to sell, and/or selling electronic cigarette products embodying one or more of the inventions claimed in the '628 Patent, within and/or from the United States without permission or license from the Plaintiffs, and will continue to do so unless enjoined

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[13] *See* Joint Status Report filed February 13, 2014 (Dkt. No. 63, Exh. A) in *Ruyan Investment Holdings Limited v. Sottera, Inc.*, Case No. CV 12-05454 GAF (FFMx) (C.D. Cal.), which is consolidated for purposes of discovery with Case Nos. CV 12-05455 GAF (FFMx), CV 12-05456 GAF (FFMx), CV 12-05462 GAF (FFMx), CV 12-05466 GAF (FFMx), CV 12-05468 GAF (FFMx), CV 12-05472 GAF (FFMx), CV 12-05477 GAF (FFMx), CV 12-05482 GAF (FFMx), and CV 12-06268 GAF (FFMx).

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by this Court. Examples of electronic cigarette products that directly infringe the '628 Patent include, but are not limited to, (1) NJOY OneJoy Non Rechargeable Electronic Cigarettes; and (2) NJOY King Disposable Electronic Cigarettes. Such products infringe at least claims 1, 7, and 8 of the '628 Patent.

37. As a direct and proximate result of the foregoing acts of Defendant, the Plaintiffs have suffered, and are entitled to, monetary damages in an amount not yet determined. The Plaintiffs are also entitled to their costs of suit and interest.

38. Defendant's continuing infringement has inflicted and, unless restrained by this court, will continue to inflict great and irreparable harm upon the Plaintiffs. The Plaintiffs have no adequate remedy at law. The Plaintiffs are entitled to preliminary and permanent injunctions enjoining Defendant from engaging in further acts of infringement.

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PRAYER FOR RELIEF

The Plaintiffs request entry of judgment that:

A. The '742 Patent, the '957 Patent, the '331 Patent, and the '628 Patent are valid and enforceable;

B. Defendant is liable for infringement of the '742 Patent, the '957 Patent, the '331 Patent, and the '628 Patent under at least the provisions of 35 U.S.C. § 271(a) and/or (c);

C. Defendant and all affiliates, subsidiaries, officers, employees, agents, representatives, licensees, successors, assigns, and all those acting in concert with, or for or on behalf of Defendant, shall be enjoined from infringing the '742 Patent, the '957 Patent, the '331 Patent, and the '628 Patent;

D. Defendant shall pay damages to the Plaintiffs resulting from Defendant's patent infringement pursuant to 35 U.S.C. § 284;

E. The Plaintiffs be entitled to prejudgment interest and post-judgment interest on the damages; and

F. The Plaintiffs be awarded such other and further relief, in law or in equity, as the Court deems just, equitable or appropriate.

DATED: March 5, 2014

Respectfully submitted,

PERKINS COIE LLP

By: */s/Michael J. Wise*
Michael J. Wise

Attorneys for Plaintiff
FONTEM VENTURES B.V. and
FONTEM HOLDINGS 1 B.V.

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DEMAND FOR JURY TRIAL

Plaintiffs Fontem Ventures and Fontem Holdings hereby demand a trial by jury of all issues triable by a jury.

DATED: March 5, 2014

PERKINS COIE LLP

By: */s/Michael J. Wise*
Michael J. Wise

Attorneys for Plaintiff
FONTEM VENTURES B.V. and
FONTEM HOLDINGS 1 B.V.

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EXHIBIT Q

Get started
1. Charge battery
2. Attach tank
3. Vape
4. Enjoy!
Tips
• Don't vape an empty tank
• Only use VUSE VIBE™ pre-filled tanks with a VUSE VIBE™ battery
• Only use the VUSE VIBE™ battery with the VUSE VIBE™ charger
This product is not a smoking cessation product and has not been tested as such. The U.S. Food and Drug Administration has not evaluated the safety of this product or any of the statements made by the manufacturer on behalf of this product. This product is not intended to diagnose, treat, cure, or prevent any condition, disorder, disease or physical or mental condition.
For more information, go to www.vusevapor.com*
*WEBSITE AND OFFERS RESTRICTED TO AGE 21+ TOBACCO CONSUMERS
1-877-614-VUSE
Not For Sale To Minors
© RJRVC
20012451

EXHIBIT R

1-10 of 191 reviews

Available Now

Visit our Store Locator to find VIBE near you.

STORE LOCATOR

VUSE VIBE™

Pre-charged and comes with a USB Charger

$20*

VIBE TANKS

$10*

*Estimated retail price. State and local taxes may vary

Not for sale to minors. VUSE contains nicotine extracted from the tobacco plant. Nicotine is addictive and no tobacco product has been shown to be safe.

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EXHIBIT S

FREQUENTLY ASKED PRODUCT RELATED QUESTIONS

What is VUSE?

VUSE is the only Electronic Cigarette (or, "e-cigarette") that finally delivers a satisfying and great tasting vapor experience combined with consistent and reliable performance.

Why is it called a Digital Vapor Cigarette?

VUSE is the most advanced e-cigarette and the first e-cigarette designed with Smart Technology. The **VUSE** Digital **Vapor** Cigarette contains a VaporDelivery Processor that uses algorithms in the same way a computer does, therefore it is "digital." The VaporDelivery Processor in the **Power**Unit, working with the **Smart**Memory™ microchip in the Cartridge, monitors and adjusts the power and heat delivered to the Cartridge up to 2,000 times a second, ensuring consistently satisfying puffs.

What does the "vapor" in "Digital Vapor Cigarettes" reference?

VUSE products produce vapor, not smoke. They do not burn tobacco, but rather, heat liquid containing nicotine derived from tobacco.

Do VUSE Digital Vapor Cigarettes produce tobacco smoke?

No, **VUSE** products do not produce tobacco smoke. "Smoking" or "smoke" specifically means the burning of a lighted cigarette, cigar, pipe, or any other matter or substance that contains a tobacco product.

Do VUSE Digital Vapor Cigarettes produce "secondhand" smoke?

VUSE products produce vapor, not smoke. They do not burn tobacco, but rather, heat liquid containing nicotine derived from tobacco.

How do VUSE Digital Vapor Cigarettes work?

An adult tobacco consumer connects a **VUSE** Cartridge to the **Power**Unit, then inhales to activate a battery that heats the V-**Liquid**™, producing vapor.

Is there a VUSE Disposable e-cigarette?

No, **VUSE** Digital **Vapor** Cigarettes are only offered in rechargeable formats.

Why doesn't VUSE offer disposable styles?

VUSE Digital **Vapor** Cigarettes use rechargeable technology to minimize waste for adult tobacco consumers and to help minimize its environmental impact. The **VUSE** Solo provides the same convenience and affordability as disposable e-cigarettes in the market, but with cost savings and opportunity for future use. Every **VUSE** Digital **Vapor** Cigarette comes pre-charged and ready to go right out of the pack. The USB charger included with all **VUSE** Digital **Vapor** Cigarettes lets adult tobacco consumers who enjoy **VUSE** continue doing so by simply purchasing replacement Cartridges. This affords cost savings for adult tobacco consumers and helps reduce the environmental impact from the disposal of additional Lithium Polymer batteries. As of mid-2013, the electronic cigarette market is about 72% disposable.

Does VUSE offer a recycling program?

Yes. **VUSE** offers an entirely cost-free and environmentally friendly way to dispose of your depleted **VUSE Power**Unit and Cartridges. To participate in the **VUSE** Recycling Program, consumers need only to visit vusevapor.com/recycling or call a toll free number to register. We will send a pre-paid mailer so that, when ready, adult tobacco consumers can return **VUSE Power**Units and Cartridges to the company for recycling. Go to www.vusevapor.com/recycling to join the Recycling Program and find out more.

What is the VUSE Digital Vapor Cigarette made of?

A **VUSE** Digital **Vapor** Cigarette consists of a **VUSE Power**Unit connected to a **VUSE** Cartridge.

Do VUSE Digital Vapor Cigarettes contain nicotine?

Yes. **VUSE** Cartridges include the highest quality nicotine extracted from the tobacco plant.

What is the level of nicotine in the VUSE Digital Vapor Cigarette?

The **VUSE** Digital **Vapor** Cigarette liquid contains 4.8% nicotine by weight.

Do VUSE products contain tobacco?

No. **VUSE** products do not contain actual tobacco. However, the nicotine in **VUSE** is derived from tobacco.

Are VUSE Digital Vapor Cigarettes considered tobacco products?

Yes. Because **VUSE** products contain tobacco-derived nicotine, they meet the definition of tobacco products under the Family Smoking Prevention and Tobacco Control Act. The Food and Drug Administration has stated its intent to regulate these types of products as tobacco products.

Why is there a different warning on VUSE packaging than on combustible cigarettes?

While **VUSE** products are considered to be tobacco products, they are not combustible cigarettes. **VUSE** products are Digital **Vapor** Cigarettes. Therefore, they carry warnings appropriate for the product category.

Do I smoke a VUSE the same way I smoke a traditional cigarette?

No. According to our conversations with adult vapers, the best way to ensure a smooth and enjoyable vaping experience is to take longer and slower puffs.

What are the ingredients of VUSE V-Liquid™?

VUSE V-**Liquid** is made of high quality ingredients consisting of tobacco-derived nicotine, vegetable glycerin, propylene glycol, reverse-osmosis water and natural and artificial flavorings.

Are VUSE products for quitting smoking?

No. The **VUSE** Digital **Vapor** Cigarette is not a smoking cessation product. It is a tobacco product, and no tobacco product is safe or without risk. The best course of action for tobacco consumers concerned about their health is to quit. **VUSE** presents an alternative for adult smokers who may be interested in switching to a smoke-free tobacco product. The **VUSE** Digital **Vapor** Cigarette offers many advantages over a traditional cigarette that adult tobacco consumers may find attractive–there's no ash and no burning odor. For adult tobacco consumers who have made the informed decision to continue using tobacco products and are looking for an alternative to traditional cigarettes, **VUSE** is another option to consider.

How long does the VUSE Digital Vapor Cigarette cartridge last compared to combustible cigarettes?

It is important to note that all adult tobacco consumers use tobacco products differently, so comparing the **VUSE** Digital **Vapor** Cigarette with a combustible cigarette is not necessarily an accurate comparison. In terms of length of use, generally speaking, one **VUSE** Cartridge lasts about as long as a pack of combustible cigarettes.

What type of battery do VUSE Digital Vapor Cigarettes use?

A **VUSE Power**Unit uses one Lithium Polymer battery. Similar batteries are found in cellular phones and other consumer electronic goods.

How many puffs come from one Cartridge?

One Cartridge lasts about the same as one pack of cigarettes.

What if there is a problem with my VUSE product?

VUSE stands behind the quality and superiority of its products. If there is a product issue with a purchased **VUSE** product, consumers are encouraged to call Customer Service at 1-877-614-VUSE (8873). A representative will assist and provide options at that time.

Can I use non-VUSE Cartridges with the VUSE PowerUnit?

No. **VUSE** Digital **Vapor** Cigarettes include proprietary encryption technology that does not permit any non-**VUSE** cartridges to be used with **VUSE Power**Units. This ensures our adult tobacco consumers enjoy high quality and superior vapor experience - without risk of counterfeit or substandard cartridges. **VUSE** Cartridges are only compatible with **VUSE** products.

Can I use VUSE Cartridges with non-VUSE power units?

No. **VUSE** Digital **Vapor** Cigarettes include proprietary encryption technology that does not permit any other e-cigarette to be used with **VUSE** Cartridges.

Why does VUSE not look more like a traditional cigarette?

VUSE was designed to look different, because it - is - different. Some e-cigarettes are made to closely resemble combustible cigarettes. **VUSE** Digital **Vapor** Cigarettes were not designed this way. **VUSE**'s design reflects the unique componentry found inside every **VUSE** Digital **Vapor** Cigarette.

How long will the battery stay charged?

The **VUSE** rechargeable Lithium Polymer battery should last, on average, one day before requiring charging. The battery has limited recharge cycles and may eventually require replacement with the purchase of another **VUSE** Solo. Battery life and charge cycles vary by use, however, and a **VUSE** Solo on average should last roughly four to six months.

How many charges does a PowerUnit last for before it needs replacing?

Battery life and charge cycles vary by use, however, the **VUSE** rechargeable Lithium Polymer battery has limited recharge cycles and will eventually require replacement through purchase of a new **VUSE** Solo. On average the battery should last from four to six months. The number of charges can vary over the lifetime of the battery, depending on length and frequency of charges, but on average, if using one cartridge per day, a **VUSE Power**Unit battery can be expected to last from four to six months. After fully charging the battery, on average the **VUSE** battery should hold a charge for about a whole day, depending on how it is used. If battery life is shorter, it may need charging more frequently.

How will I know when it is time to change the Cartridge or recharge the PowerUnit?

VUSE is the only Digital **Vapor** Cigarette designed with a **Smart**Light™ Indicator to always keep consumers informed. The **Smart**Light Indicator informs on both the battery and Cartridge life. The **Smart**Light flashes white for two seconds when the Cartridge is getting low. The light flashes red for two seconds when the battery is getting low. When the **Smart**Light flashes white continuously, it is time to change the Cartridge. When the light flashes red continuously, it is time to recharge the battery.

How do I know the VUSE PowerUnit is charging?

When you insert the **VUSE Power**Unit into the **VUSE** USB charger, the **Smart**Light indicator will blink red as the **Power**Unit is charging. When the **Power**Unit has reached full charge, the **Smart**Light indicator will glow white, indicating the **Power**Unit is fully charged.

Is the battery used in VUSE UL certified?

Yes. The **VUSE** battery cell is UL (Underwriters Laboratories) and IEC Certified (International Electrotechnical Commission). The **VUSE Power**Unit is FCC (Federal Communications Commission) Certified.

Is there a way to remove the battery from the PowerUnit?

No. The Lithium Polymer battery is housed inside the **VUSE Power**Unit and is not accessible.

Are VUSE Cartridges tamper-resistant?

Yes. **VUSE** Cartridges are designed to prevent modification by consumers.

Why are VUSE Cartridges foil sealed?

VUSE Cartridges are foil sealed to lock in freshness and flavor.

What is the VUSE PowerUnit?

The **VUSE Power**Unit is a stainless steel rod that houses the electronics. The electronics consist of a Lithium Polymer battery, a **VUSE** Vapor**Delivery** microprocessor, the **VUSE** LED **Smart**Light indicator and power management software. The **Power**Unit was designed for efficiency and ensures the longest usage time between charging, contributing to longer battery life. The **Power**Unit connects to a **VUSE** Cartridge.

What is VUSE V-Liquid™?

VUSE Cartridges contain V-**Liquid**, a proprietary blend unique to **VUSE**. V-**Liquid** was developed and blended by tobacco experts with over 100 years of experience making great tasting tobacco products. The V-**Liquid** contained in all **VUSE** Cartridges is made with the highest quality ingredients under strict manufacturing standards.

What is the VUSE SmartLight™?

The **VUSE Smart**Light is an LED at the tip of the **Power**Unit informing consumers when both the battery and/or Cartridge are running low, and when it is time to replace the Cartridge or recharge the battery. The LED indicates with a white light when the Cartridge is nearing expiration; and with a red light when the battery is getting low. The **VUSE Smart**Light puts consumers in full control of the experience.

What is the VUSE SmartMemory™?

VUSE Smart Memory is designed to take the guesswork out of how many puffs have been taken from the Cartridge. While other e-cigarettes cannot inform consumers when cartridges are empty or how much liquid remains, **VUSE Smart**Memory knows precisely when the cartridge is finished. The **Smart**Light indicator flashes white, letting the consumer know it's time to change the Cartridge. If a consumer wishes to swap cartridges or replace a battery mid-use, **Smart**Memory remembers how many puffs have been taken, and how many puffs remain in each cartridge.

What is the VUSE VaporDelivery Processor?

The **VUSE** Vapor**Delivery** Processor in the **Power**Unit, working with the **Smart**Memory microchip in the Cartridge, continuously monitors and adjusts the power and heat delivered to the Cartridge up to 2,000 times a second, throughout the puff duration, ensuring consistently satisfying puffs.

What is the VUSE QuickConnect?

VUSE Quick**Connect** Cartridges feature a unique interface designed for ease of use. A consumer connects the Cartridge to the **Power**Unit, producing a "click." The proprietary interface means only **VUSE** Cartridges can connect to **VUSE Power**Units, ensuring **VUSE** standards of quality.

What happens if my battery won't charge?

After fully charging, the **VUSE** battery on average should provide enough energy for more than a cartridge. If your battery life is shorter, it may need more frequent charging.

Will the VUSE wall adapter and car adapter charge the product by themselves?

No. The wall adapter and car adapter need to be used in conjunction with the **VUSE** USB Charger. The USB charger is the only component that actually charges the **VUSE** Digital **Vapor** Cigarette. A USB Charger can be connected to either the wall adapter, the car adapter or the USB port of a computer.

Where can I purchase VUSE accessories?

VUSE accessories are available for purchase online at www.vusevapor.com, which is restricted to verified adult tobacco consumers 21 years of age or older.

What types of VUSE accessories are available?

VUSE accessories include an assortment of carrying cases, car charger, wall charger, and a USB charger.

Why can't I purchase VUSE Digital Vapor Cigarettes or Cartridges online like other e-cigarette manufacturers?

R.J. Reynolds Vapor Company does not offer **VUSE** Digital **Vapor** Cigarettes for sale online. Reynolds American and its operating companies are committed to youth tobacco prevention, and we believe face-to-face sales allow greater security against youth access to tobacco products, as clerks can check IDs. Furthermore, adult tobacco consumers are accustomed to purchasing tobacco products at traditional retail stores. Therefore, we are focusing distribution of our products through traditional retail outlets to minimize potential out-of-stock situations.

What does the name "VUSE" mean?

"**VUSE**" (rhymes with "news") is a unique term combining "V" of "vapor" and "use"–referring to the product's use.

Can the VUSE battery or product overheat?

The heater has an auto shutoff mechanism that ensures the maximum heating activation cannot exceed four seconds per puff. The battery is protected via electronics to prevent a range of unsafe conditions that could lead to overheating. This is just one of the benefits of having microprocessors and intelligence built into **VUSE Power**Units and Cartridges.

Why doesn't VUSE provide refillable Cartridges?

VUSE pioneered digital vapor cigarette technology to ensure consumers get a perfect puff - each time, every time. **VUSE** Cartridges were designed with a closed Cartridge system that prevents the consumer from using the cartridges with third party electronic cigarette devices. **VUSE** intentionally does not offer refillable replacement Cartridges to help ensure that our products cannot be modified and in turn, offer only a superior vaping experience.