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EVOLV, LLC

UNITED STATES DISTRICT COURT

CENTRAL DISTRICT OF CALIFORNIA

SOUTHERN DIVISION

EVOLV, LLC,

Plaintiff,

v.

JOYETECH USA, INC., JOYETECH (CHANGZHOU) ELECTRONICS CO., LTD., and WISMEC INDUSTRY CO. LTD.,

Defendants.

Case No. 8:16-cv-00459

COMPLAINT FOR PATENT INFRINGEMENT

DEMAND FOR JURY TRIAL

Plaintiff Evolv, LLC ("Evolv"), by and through its attorneys, hereby pleads the following claims for patent infringement of U.S. Patent No. 8,820,330 ("the '330 Patent") against Defendants Joyetech USA Inc. ("Joyetech USA"), Joyetech (Changzhou) Electronics Co., Ltd., ("Joyetech China") (collectively, Joyetech China and Joyetech USA are "Joyetech"), and Wismec Industry Co. Ltd. ("Wismec") (collectively, Joyetech and Wismec are "Defendants"), alleging as follows:

PARTIES

1. Evolv, LLC is an Ohio corporation with its principal place of business at 5171 Hudson Drive, Hudson, Ohio 44236.

2. Joyetech USA, Inc.is a California corporation that is located at 16 Technology Drive, Suite 118, Irvine, CA 92618, and that conducts business in the Central District of California.

3. On information and belief, Joyetech (Changzhou) Electronics Co., Ltd. "is a corporation organized and existing under the laws of China, having its principal address at New District, No. 7 Feng Xiang Road Changzhou, Jiangsu, China," with the "principal address" constituting its principal place of business.

4. On information and belief, Wismec Industry Co. Ltd. is a corporation organized and existing under the laws of China, having its principal place of business at New District, No. 7 Feng Xiang Road Changzhou, Jiangsu, China.

JURISDICTION AND VENUE

5. This Court has subject matter jurisdiction over patent infringement claims under 28 U.S.C. §§ 1331 and 1338(a) because these claims against Defendants arise under Acts of Congress relating to patents including, but not limited to, 35 U.S.C. §§ 271(a)-(c), 281, 283-285, and 287(a).

6. Venue is proper in this district under 28 U.S.C. §§ 1391 and 1400(b).

Joyetech USA

7. This Court has personal jurisdiction over Joyetech USA because it is

incorporated in California and conducted business within California, conducts its principal operations in Orange County, California, and commits acts of infringement in violation of 35 U.S.C. § 271, by using, importing, offering to sell, and selling electronic vaporizers to distributors and consumers, in this judicial district. Defendant Joyetech USA regularly does business, solicits business, and/or derives substantial revenue from products provided to retailers, all while Joyetech induces the infringing resale of knockoff products. Joyetech USA has purposefully established substantial, systematic, and continuous contacts in California and this judicial district, and expects, or should reasonably expect, to be haled into court here. Additionally, the economic harm from the wrongful acts described in this Complaint were directed at and suffered by Evolv within this jurisdictional district.

8. Joyetech USA has also indirectly infringed by offering to sell to third-party U.S. manufacturers, within the United States, accused infringing circuit boards constituting a material part of the invention and lacking substantial non-infringing uses.

9. Upon information and belief, Joyetech USA has also placed infringing products containing said circuit boards into the stream of commerce throughout the United States with the expectation that such products have been and will continue to be, offered for sale, sold, and used in this judicial district.

10. Upon information and belief, Joyetech USA imports infringing products into the United States from, and is the official distributor and online retailer for, Joyetech (Changzhou) Electronics Co., Ltd., which controls Joyetech USA and other subsidiaries, affiliates, and related entities affiliated under the trade name, "Joyetech Group."

11. Upon information and belief, Joyetech USA also operates as the distributor and retailer for Wismec Industry Co. Ltd. in the United States.

12. Upon information and belief, the products that Joyetech USA imports, offers to sell, sells and distributes in the United States are sold under trademarks

including JOYETECH®, WISMEC®, ELEAF®, and ISMOKA™.

Joyetech China

13. This Court also has personal jurisdiction over Joyetech China because Joyetech China has availed itself of United States District Courts in order to sue defendants in the United States, alleging infringement of Joyetech China's own alleged intellectual property. In previous third party litigation, Joyetech China has alleged that Joyetech China had "trademark applications for the marks eGo-T (U.S. Serial No. 851477422) and eGo-C (U.S. Serial No. 85451811)," and availing itself of filings with the United States Patent and Trademark Office ("PTO").

14. Additionally, personal jurisdiction is proper because, upon information and belief, Joyetech China, acting through its controlled U.S. subsidiary, Joyetech USA, indirectly infringes upon the patent-in-issue by causing importation of infringing products into Orange County, California for redistribution throughout the United States with the specific intent that such importation would directly infringe the '330 Patent.

15. Furthermore, Joyetech China has indirectly infringed upon the patent-in-suit by inducing at least Joyetech USA to import, offer to sell, sell, and use the patented invention in the United States without Evolv's permission. Joyetech China acted with prior knowledge of the '330 Patent, and with prior knowledge that its inducement of sales by Joyetech USA would infringe, both of which were provided to an officer of that company. Joyetech China acted with specific intent in China to cause others in the United States to directly infringe in California and within this judicial district, knowing and intending that the induced acts constituted infringement within the United States and this judicial district.

16. This Court also has personal jurisdiction over Joyetech China because Joyetech China advertises and provides product specifications and customer use instructions of infringing products in the United States and this district, through www.joyetech.com, in order to support direct sales by Joyetech USA, and by such

acts demonstrates Joyetech China's specific intent to indirectly infringe via inducement. Joyetech China has purposefully established substantial, systematic, and continuous contacts in California and this judicial district, and expects, or reasonably should expect, to be haled into Court here. Additionally, the economic harm from the wrongful acts described in this Complaint were directed at, and suffered by Evolv in this judicial district.

Wismec

17. This Court has personal jurisdiction over Wismec, which after being provided with a copy of the '330 Patent, and told that incorporating its planned circuit boards into electronic vaporizers would infringe upon Evolv's patent, proceeded to design a knockoff board anyway. Wismec specifically intended to infringe the '330 Patent by causing acts that Wismec knew would constitute direct infringement in the United States by others, such as inducing Joyetech USA to directly infringe via importation, offers to sell, and selling infringing circuit boards and electronic vaporizers to manufacturers and retailers, and the vaporizers' use by end users.

18. This Court also has personal jurisdiction over Wismec because Wismec advertises and provides product specifications and customer use instructions of infringing products in the United States and this judicial district, through www.wismec.com, in order to support direct sales by Joyetech USA, and by such acts demonstrates Wismec's specific intent to indirectly infringe via inducement. Wismec has purposefully established substantial, systematic, and continuous contacts in California and this judicial district, and expects, or reasonably should expect, to be haled into Court here. Additionally, the economic harm from the wrongful acts described in this Complaint were directed at, and suffered by Evolv in this judicial district.

FACTUAL BACKGROUND

19. This patent infringement action arises out of Joyetech's and Wismec's

unauthorized inclusion of Evolv's patented technology in power regulated vaporizers. Evolv seeks damages for Joyetech's and Wismec's infringement, enhancement of damages due to their willful infringement, and a preliminary and permanent injunction restraining Defendants from further infringement.

Evolv Is The Leading Innovator of Vaporizers

20. Evolv was founded in 2010 to make safe, intuitive, and high tech electronic vaporizer products.

21. Evolv has regularly pioneered significant innovations in the design of circuit boards for vaporizers, including the design and manufacture of eleven different circuit boards in the past five years.

22. For the personal health of one of the founders – as well as for millions of other smokers – Evolv's founders desired to improve vaporizers so that demand for tobacco ends.

23. Evolv has received an award from the National Institutes of Health to create an electronic cigarette that records vapor output for use in clinical research.

24. Evolv serves as the administrator for the Technical Advisory Group for the American National Standards Institute charged with setting national standards for vaporizers.

25. Upon information and belief, electronic vaporizers have assisted smokers to transition away from tobacco use, and to completely stop smoking. Vaporizers present an opportunity to save millions of lives and to significantly reduce the burden of smoking-related diseases worldwide.

26. Vaporizers emit a water-based vapor that resembles smoke, but the devices do not include tobacco or combustion, and therefore emit substantially lower levels of harmful chemicals that are typically present in the smoke of tobacco products.

27. Evolv conducts research and development in the United States to improve vaporizer technology to invent products that appeal to traditional tobacco

users.

28. Evolv, in collaboration with a non-exclusive licensee, Dimension (also owned by a co-inventor of the '330 Patent), designs, manufactures, services, and sells circuit boards that serve as the "engines" of high-end power-regulated vaporizers. Evolv and Dimension market the inventors' circuit boards throughout the United States and in dozens of countries worldwide.

29. Evolv is the leading entity based in the United States engaged in the innovation, design, manufacture, and sale of circuit boards for power regulated vaporizers. Evolv and its inventor-owned manufacturing licensee employ a staff of 19 educated and skilled workers at their design, manufacturing, and assembly facilities in Ohio.

Joyetech Copied Evolv's Early Innovations

30. Upon information and belief, Joyetech China distributes and sells products into the United States through Joyetech USA. Upon information and belief, Joyetech China operates under the trade name, "Joyetech Group," and controls a world-wide family of related companies, including Joyetech USA.

31. Joyetech USA also operates as the distributor and retailer of Wismec products in the United States.

32. In or about April 2012, Evolv introduced the first wattage-control circuit board to market – the DNA® 12. Evolv introduced DNA® 20 and DNA® 30 circuit boards to the market in or about December 2012 and December 2013, respectively. Evolv sold these boards to high-end device makers who included the boards in the vaporizers they sold to consumers.

33. In or about August 2014, Joyetech began marketing a 30-watt device that sold for less than one-third the price of devices containing Evolv's circuit boards. Because of the very low price point, Joyetech's product quickly dominated the low-quality end of the market.

34. In or about September 2014, Evolv released the DNA® 40, which not

only increased wattage, but was the first product to employ temperature control. As with Evolv's introduction each prior circuit boards, Joyetech again moved to bring out a similar, but still low-quality, product that that quickly dominated the low-quality end of the market.

Evolv Pioneers Wattage Control

35. Wattage control is a key recent innovation invented by Evolv for electronic vaporizers. Prior to Evolv's invention, existing vaporizers produced inconsistent vapor due to residue buildup. This buildup consumed the heating element, significantly altering the resistance generated when voltage was applied to the heating element. As the resistance changed, the quantity of vapor would vary from what the user intended and the quality of vapor would often deteriorate into an unpleasant burnt chemical taste.

36. Wattage control solved these problems by automatically accounting for variations in resistance. With wattage control, the circuitry automatically adjusts the current applied to the heating element to maintain a selected wattage. The power level, i.e. wattage, can be a pre-set level or a level selected by the user. By maintaining a steady level of power, wattage control provides the user with consistent control over the vapor produced.

Evolv Granted Patent

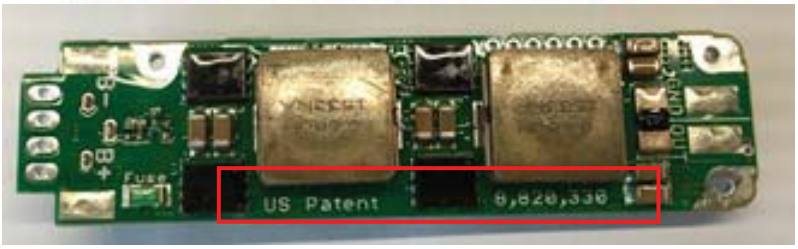
37. Evolv sought and obtained patent protection for its wattage control innovation.

38. On September 2, 2014, the U.S. Patent and Trademark Office duly and legally issued U.S. Patent No. 8,820,330 titled "Personal Vaporizer That Simulates Smoking With Power Control." A true and correct copy of the '330 Patent is attached as Exhibit 1.

39. Evolv is the owner by assignment of all rights, title, and interest in and to the '330 Patent.

40. Evolv actively practices the inventions of the '330 Patent.

41. Evolv's circuit boards that incorporate the inventions claimed in the '330 Patent are marketed under the registered trademark DNA®. The below image depicts a DNA® 200 circuit board. The 200 designation indicates the maximum wattage produced by this DNA® circuit board. Each DNA® 200 circuit board is produced with notice of Evolv's patent on the board (red box in second photo below).



42. Through its sole (US) licensee, Evolv sells DNA® 200 circuit boards to vapor device manufacturers who include the circuit boards as an integral part of the devices that the manufacturers in turn sell to distributors and end-users.

43. Wismec is one of the vaporizer manufacturers to whom Evolv has sold, and continues to sell, the DNA® 200 circuit boards. Evolv has sold DNA® 200 circuit boards to Wismec since August 2015. Wismec's products containing Evolv's DNA® 200 circuit boards are not accused of infringement by this Complaint.

44. At Wismec's instructions, Evolv ships the DNA® 200 circuit boards purchased by Wismec to facilities in China, including facilities at the same Changzhou City address that operates as the principal place of business for both Wismec and Joyetech China. Wismec's payment to Evolv for the circuit boards are sent from overseas accounts in China.

45. Wismec actively touts the Evolv DNA® 200 circuit board in its

product marketing. Wismec named its product containing Evolv's circuit board as the "Reuleaux DNA 200." On the website where Wismec offers for sale the "Reuleaux DNA 200" in the United States – www.wismec.com – the first sentence of the product description reads: "Reuleaux, powered by DNA200, becomes the new highlight of Wismec."

Mr. Qian Holds Himself Out As An Officer In Three Companies: Joyetech USA, Joyetech Group, and Wismec

46. On or around November 11, 2015, Evolv's President met with representatives of Joyetech and Wismec in Irvine, California, to discuss the design and supply of DNA® 200 circuit boards for the "Reuleaux DNA 200." One of the Joyetech representatives, Mr. Davy Qian, provided a business card listing his title as "General Manager, Joyetech USA Inc." Upon information and belief, Mr. Qian has created publicly-available accounts on LinkedIn listing his corporate titles as "Vice President of Joyetech Group" and "VP at Joyetech USA Inc." In subsequent written communications, Mr. Qian also represented that he was acting on behalf of "Wismec Shenzhen Co. Ltd.," and stated that he was "responsible for the whole [Wismec] operations in China."

Evolv Meets With Joyetech And Informs Joyetech of Patent and Infringement

47. During the November 11, 2015 meeting in Irvine, California, Joyetech's and Wismec's representative informed Evolv's President of Joyetech and Wismec's intent to market a competing "low budget" 200-wattage device based upon a new circuit board alternative to the DNA® 200.

48. During the same meeting, Evolv's President, Brandon Ward, advised Mr. Qian of the '330 Patent and instructed him that the '330 Patent claims many of the inventions found in the DNA® 200 circuit board. Mr. Ward informed Mr. Qian of the need for Joyetech to obtain a license from Evolv in order to import, make, sell, or offer for sale the "low budget" 200-wattage vaporizer containing a circuit board not purchased from Evolv. Mr. Qian did not initially respond except to

request a copy of the ’330 Patent.

49. On or about November 17, 2015, Evolv’s President e-mailed Mr. Qian, providing him with a copy of the ’330 Patent, and offering to further discuss Joyetech and Wismec’s planned “low budget” 200-wattage device. Mr. Qian replied that he had forwarded the ’330 Patent to “our IP department” for review.

50. Evolv’s President reiterated that Joyetech and Wismec must obtain a license of the ’330 Patent to avoid infringement. Evolv offered to negotiate such a license in order to mitigate the harm that would result from a flood of Joyetech and Wismec’s pirated products being imported into the United States, as at the time the license was offered, Defendants had to date only produced low quality products.

51. Joyetech and Wismec refused to negotiate any license, instead making a *pro forma* denial of infringement, but refusing to explain why when asked. Again, without providing any explanation, Mr. Qian made an oblique reference to a “2008 publication,” but did not identify it. Defendants did not back away from their intended plan to sell copied circuit boards, and to incorporate them into infringing vaporizers, for importation, sale and re-sale within the United States.

Wismec’s KnockOff “Reuleaux RX 200” Enters Market Last Thanksgiving

52. Rather than negotiate a license, Wismec promptly began selling its “low budget” 200-wattage vaporizer – the “Reuleaux RX 200.” On information and belief, Wismec began selling the “Reuleaux RX 200” in the United States on or about November 23, 2015.

53. The images below are taken from www.wismec.com, where Wismec presents a “Product Introduction” for both the “Reuleaux DNA 200” – which includes Evolv’s DNA® 200 circuit board – and the low budget “Reuleaux RX 200.”

Reuleaux DNA 200

Reuleaux RX 200

54. The circuit board included in the "Reuleaux RX 200" vaporizer is designed, manufactured, and sold by Joyetech and Wismec under the Wismec® brand. The product description provided to online retailers for the "Reuleaux RX 200" devices includes the language: "Designed in conjunction with Wismec and Joyetech, the chipset features an equally powerful 200W maximum output, with full temperature control that is compatible with Ni200 Nickel, Titanium, and Stainless Steel heating materials."

55. Upon information and belief, the circuit board included in the "Reuleaux RX 200" was jointly designed by Joyetech and Wismec by copying the design of the DNA® 200 circuit board.

Accelerated Price Erosion Begins

56. Upon information and belief, Joyetech and Wismec's "Reuleaux RX 200" is marketed at a substantially lower price compared to the "Reuleaux DNA 200." Many online retailers offer the knockoff "Reuleaux RX 200" device at prices under one-half that of the "Reuleaux DNA 200" and other legitimate devices that contain Evolv's DNA® 200 circuit board.

57. Upon information and belief, Joyetech and Wismec actively tout the

price difference between the "Reuleaux RX 200" and the "Reuleaux DNA 200" as a primary point of consumer interest. The product description provided to online retailers for the "Reuleaux RX 200" devices includes the language: "The Wismec Reuleaux RX200 Box Mod by Jay Bo Designs builds upon the Reuleaux triple 18650 (batteries sold separately) platform, utilizing the chassis and design while integrating an equally powerful 200W chipset that simultaneously brings the device to a much more affordable price point."

58. Upon information and belief, Wismec has placed on its website, www.wismec.com, a video review of the "Reuleaux RX 200" by "VapingwithTwisted420." The video review states that the "Reuleaux RX 200" is "pretty much identical" to the "Reuleaux DNA 200," that it uses a "Joyetech board," and that it is "basically a Reuleaux but cheaper."

59. Upon information and belief, Joyetech and Wismec continue to offer for sale its "Reuleaux DNA 200" vaporizer, which includes a legitimate DNA® 200 circuit board. Evolv has not instructed Joyetech and Wismec to cease sales of the "Reuleaux DNA 200," nor taken any action to limit Joyetech and Wismec's sales of vaporizers that include Evolv's DNA® 200 circuit boards.

60. The Food and Drug Administration ("FDA") has announced its intention to regulate electronic vaporizers.

61. Upon information and belief, Joyetech and Wismec's decision to market a knockoff version of the "Reuleaux" product, while having an authorized version freely available, is based on Joyetech and Wismec's intention to drive down the price of all vaporizers featuring Evolv's patented circuit boards, and thereby effectively drive Evolv and other manufacturing competitors from the United States market before the market consolidates around FDA-approved devices.

Joyetech's Latest KnockOff Device, The "Cuboid"

62. On information and belief, Joyetech began selling a second knockoff device – the Cuboid – to distributors and retailers in the United States on or about

December 28, 2015.

63. The images below are taken from www.joyetech.com, where Joyetech presents product information for the new device.

Cuboid

64. TThe Cuboid device is designed and manufactured by Joyetech China, and imported, offered for sale, and sold by Joyetech USA in this district, and throughout the United States. A news release posted on Joyetech's website states that the device has a 150 watt output, but can be upgraded to 200 watts with free downloadable firmware.

65. Upon information and belief, the circuit board included in the Cuboid was copied by Joyetech China, which reverse engineered Evolv's DNA® 200 circuit board.

66. Upon information and belief, Joyetech's Cuboid is marketed at a substantially lower price compared to the "Reuleaux DNA 200." Many online retailers offer the knockoff Cuboid device at prices under one-half to one-third that of the "Reuleaux DNA 200" and other legitimate devices that contain Evolv's DNA® 200 circuit board.

67. Upon information and belief, Joyetech's decision to market a second knockoff device, while having Evolv's boards freely available for purchase and integration into the finished product, is based on Joyetech's intention to drive down the price of all vaporizers featuring Evolv's patented circuit boards and thereby drive Evolv and other competitors from the United States market before the market consolidates around FDA-approved devices.

Joyetech and Wismec's Piracy Threatens Evolv's Survival

68. Since its founding in 2010, Evolv has consistently brought new innovations to the electronic vaporizer market to encourage traditional tobacco consumers to stop smoking.

69. Upon information and belief, if Defendants' piracy is allowed to continue unabated, Evolv will be driven from the electronic vaporizer circuit board market, and the only significant remaining market entities will be Chinese-based manufacturers, and the consumer market will be denied the benefit of future technology developments from Evolv.

70. Because of the stark price difference between the Defendants' knockoff devices and legitimate devices containing Evolv's DNA® 200 circuit boards, Evolv is under pressure by its customers – the vaporizer manufacturers – to reduce the price of its circuit boards. One high volume device manufacturer has already cancelled a purchase order for DNA® 200 circuit boards, explaining that it can no longer realistically sell vaporizers containing the DNA® 200 circuit board because of the low-priced "Reuleaux RX 200" alternative. Other manufacturers have ceased placing new orders for Evolv's circuit board.

71. Moreover, Joyetech and Wismec have recently begun selling the RX 200 circuit board as a replacement for Evolv's DNA® 200 circuit board – creating a direct competition with Evolv, and undermining Evolv's relationships with its vaporizer manufacturer customers.

72. Upon information and belief, the "Reuleaux DNA 200" has confused

and will continue to confuse end-users who mistakenly believe that the device contains an Evolv circuit board. Complaints regarding the "Reuleaux RX 200" have already been logged with Evolv's service department by consumers who mistakenly believe that Evolv is the manufacturer of the Joyetech and Wismec's low-budget devices.

Joyetech and Wismec's Cuboid And Reuleaux RX 200 Devices Infringe

73. Joyetech and Wismec have infringed and continue to infringe claims 1-23 of the '330 Patent in the United States by making, using, offering for sale, selling and importing products that are covered by the claims of '330 Patent. Specifically, the Wismec "Reuleaux RX 200" and Joyetech "Cuboid" infringe every claim of the '330 Patent.

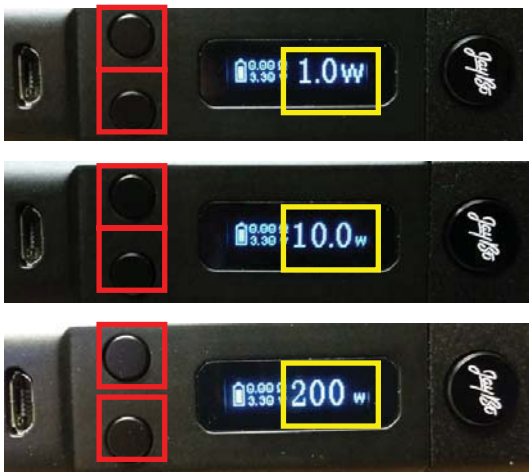
74. A claim chart showing infringement of all of the claims of '330 Patent by Wismec's "Reuleaux RX 200" vaporizer is attached as Exhibit 2.

75. A claim chart showing infringement of all of the claims of '330 Patent by Joyetech's "Cuboid" vaporizer is attached as Exhibit 3.

76. For example, a summary of the infringement of Claim 1 of the '330 Patent is provided as follows:

a. Preamble: The RX 200 and Cuboid devices are each personal vaporizers used to simulate smoking.

b. Element 1[a]: The RX 200 and Cuboid devices each contain control buttons (boxed in red) that provide a user input device that allows a user to select a wattage setting (boxed in yellow) from a plurality of wattage settings. In each device, the wattage setting corresponds to a power level in watts that is delivered to a heating element for vaporizing material during a simulated smoking session. Testing by Evolv's technical expert witness confirms correspondence of a set power level to an actual power level employing multiple resistors of known resistance.



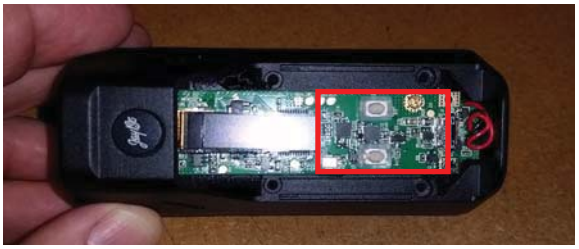
c. Reuleaux RX 200 Cuboid

Element 1[b]: The RX 200 and Cuboid devices each contain a plurality of batteries (IMR 18650 3.7V / 3000MAH / 40A) that generate a power level delivered to the heating element. The power source is the sole source of power. Testing by Evolv's technical expert witness confirms that the selected power level corresponds to the power delivered to the heating element.

d. Reuleaux RX 200 Cuboid

Element 1[c]: The RX 200 and Cuboid devices each contain control elements (generally boxed in red) that function as a power manager to perform the claimed aspects in the circuit. Testing by Evolv's technical expert witness confirms accurate control based on the user input regardless of heating element parameters (e.g.,

actual resistance) and regardless of the state of the power source. This was shown by, e.g., varying resistance in testing to simulate changes in the heating element.



e. Reuleaux RX 200 Cuboid

77. On information and belief, the following vaporizer products directly infringe at least claim 1 of the ’330 Patent: Wismec Reuleaux RX 200, Wismec Presa Standard, Wismec Presa TC75W, Wismec Presa TC40W, Wismec VaporFlask series (including at least the Classic, Lite, and Stout models), Joyetech Cuboid, Joyetech eVic Series (including at least the VT, VTC, and VTC mini models), Joyetech eGrip Series (including at least the VT and OLED models), Joyetech eCom wattage controlled, Joyetech eMode, and Eleaf iStick series (including at least the Eleaf Mini iStick 10W, Eleaf Mini iStick 20W, Eleaf iStick 20W, Eleaf iStick 30W, Eleaf iStick 50W, Eleaf iStick 100W, Eleaf iStick TC40W, Eleaf iStick TC60W, and Eleaf iStick TC100W models).

78. More specifically, Joyetech and Wismec make, use, sell, offer to sell, supply, and/or cause to be supplied to retailers and end users at least the following vaporizers that contain technology disclosed and claimed in the ’330 Patent: Wismec Reuleaux RX 200, Wismec Presa Standard, Wismec Presa TC75W, Wismec Presa TC40W, Wismec VaporFlask series (including at least the Classic, Lite, and Stout models), Joyetech Cuboid, Joyetech eVic Series (including at least the VT, VTC, and VTC mini models), Joyetech eGrip Series (including at least the VT and OLED models), Joyetech eCom wattage controlled, Joyetech eMode, and Eleaf iStick series (including at least the Eleaf Mini iStick 10W, Eleaf Mini iStick

20W, Eleaf iStick 20W, Eleaf iStick 30W, Eleaf iStick 50W, Eleaf iStick 100W, Eleaf iStick TC40W, Eleaf iStick TC60W, and Eleaf iStick TC100W models), and the circuit boards contained within each of them, (collectively, vaporizer products and circuit boards are "Accused Products").

79. Upon information and belief, all of the Accused Products specified in paragraph 78 of this Complaint infringe a least claim 1 of the '330 Patent.

80. Defendants' infringement of claims 1-23 of the '330 Patent has injured Evolv and will cause irreparable injury in the future unless Defendants are preliminarily and permanently enjoined from further infringement.

FIRST CLAIM FOR RELIEF

(Infringement of U.S. Patent No. 8,820,330)

81. Evolv re-alleges and incorporates by reference the foregoing paragraphs 1-80 as though fully set forth herein.

82. Joyetech USA has directly infringed and continues to infringe all claims of the '330 Patent in violation of 35 U.S.C. § 271(a), by importing into the United States, and by offering to sell, selling, supplying, using, and/or causing to be used within the United States, devices and/or systems that embody or practice the inventions claimed in the '330 Patent, including the Accused Products.

83. Joyetech USA has indirectly infringed, and continues to infringe, within the United States, all claims of the '330 Patent in violation of 35 U.S.C. § 271(b), with prior knowledge of the '330 Patent and with the specific intent that the acts of "selling" by other retailers, "making" by manufacturers, and "using" by consumers, which Joyetech USA induces, would infringe all claims of the '330 Patent.

84. Joyetech USA has also indirectly infringed all claims of the '330 Patent in violation of 35 U.S.C. § 271(c), within the United States, after importing, and with specific intent to cause infringement by others, by offering to sell to at least one U.S.-based third-party manufacturer of electronic vaporizers, circuit

boards that Joyetech USA knows would contributorily infringe if "offered for sale," "sold," or "used," as the circuit boards are a material part of the patented invention, especially made for an infringing use, and not a staple article or commodity of commerce without substantial non-infringing uses.

85. Joyetech China and Wismec, within China, have also indirectly infringed all claims of the '330 Patent, each of them, pursuant to 35 U.S.C. § 271(b), with prior knowledge of the '330 Patent and the specific intent to cause Joyetech USA within the United States to make infringing designs, import, offer for sale, and sell to retailers, manufacturers, and consumers the Accused Products, including the Wismec Reuleaux RX 200 and Joyetech Cuboid, with the specific intent that such induced acts would infringe. With specific intent to cause infringement, Joyetech China and Wismec provided instructions regarding how to use the Accused Products, Accused Product specifications, and advertised infringing Accused Products within the United States, at least through their respective company websites.

86. Additionally, after saturating the United States market with knock-offs for almost four months, Defendants, and each of them, finally conceded after prodding, that a license to avoid infringement was necessary. Defendants' Mr. Qian wrote in a March 7, 2016 e-mail, "[w]e have fully studied your patent with 22 [sic] claimed rights. How much do you need us pay for each licensed products…?"

87. Evolv replied as follows in relevant part, "Evolv is not willing to sell or license its patent. We are willing to continue to sell Wismec and Joyetech our boards, and to work with you to fulfill all of your needs [*i.e.*, sell Evolv's circuit boards in sufficient quantities].

88. The circuit board components included in the infringing Accused Products drive the demand for the entire product.

89. As a result of Defendants' infringement of the '330 Patent by Joyetech China and Wismec, Evolv has been damaged, and will continue to be damaged, by

Defendants' conduct. Evolv is, therefore, entitled to such damages pursuant to 35 U.S.C. § 284 in an amount that presently cannot be ascertained, but that will be determined at trial.

90. Evolv has complied with the statutory requirement pursuant to 35 U.S.C. § 287(a) of giving notice of the '330 Patent to Wismec and Joyetech by identifying the patent number in advance of this lawsuit as described above.

91. Upon information and belief, Defendants' past and continued infringement of the '330 Patent has been deliberate and willful, and this case is therefore an exceptional case, which warrants an award of treble damages and attorneys' fees to Evolv pursuant to 35 U.S.C. § 285. Each of the Defendants had advance knowledge of the '330 Patent prior to the filing of this Complaint, and prior notice that Wismec and Joyetech's proposed "low budget" 200-wattage vaporizer would infringe. Notwithstanding Defendants' prior knowledge of the patent and resulting infringement, Defendants chose to make the Accused Devices and caused within the United States importation, and the offer for sale, sale and use of the Accused Products without a license from Evolv, in order to drive demand away from 200-wattage vaporizer devices that contain Evolv's DNA® 200 circuit boards, and to thereby injure Evolv's profitability and ultimately drive Evolv from the marketplace.

92. The direct and indirect infringement by Joyetech USA, and indirect infringement by Joyetech China and Wismec, has injured and continues to injure Evolv and will cause irreparable harm unless Defendants are enjoined from infringing the claims of the '330 Patent. Accordingly, Evolv is entitled to temporary, preliminary, and/or permanent injunctive relief against each Defendant from further infringements pursuant to 35 U.S.C. § 283.

WHEREFORE, Plaintiff Evolv prays for the following judgment and relief:

a. entry of judgment that Joyetech USA, Inc. has directly and indirectly infringed the '330 Patent pursuant to 35 U.S.C. § 271(a)-(c);

b. entry of judgment that Joyetech (Changzhou) Electronics Co., Ltd., and Wismec Industry Co. Ltd., each of them, have indirectly infringed the ’330 Patent pursuant to 35 U.S.C. § 271(b);

c. entry of judgment that Joyetech USA, Inc., Joyetech (Changzhou) Electronics Co., Ltd., and Wismec Industry Co. Ltd., each of them, have willfully infringed the ’330 Patent;

d. an order that Evolv is entitled to preliminary and permanent injunctions enjoining Joyetech USA, Inc., Joyetech (Changzhou) Electronics Co., Ltd., and Wismec Industry Co. Ltd., and their respective agents, servants, officers, directors, employees, affiliated companies, successors-in-interest, and persons or entities acting in concert with each of them from infringing directly or indirectly, inducing others to directly infringe, and/or contributing to the infringement of claims of the ’330 Patent;

e. an order that Joyetech USA, Inc., Joyetech (Changzhou) Electronics Co., Ltd., and Wismec Industry Co. Ltd., each of them, provide an accounting and pay to Evolv damages in an amount adequate to compensate Evolv for Defendants’ infringement of the ’330 Patent, including damages for lost profits, but in no event less than a reasonable royalty, including up to treble damages for willful infringement pursuant to 35 U.S.C. § 284;

f. an order that Joyetech USA, Inc., Joyetech (Changzhou) Electronics Co., Ltd., and Wismec Industry Co. Ltd., each of them, be ordered to file with this Court, and to promptly serve on counsel for Evolv, within twenty (20) days after entry of any injunction issued by the Court in this action, a sworn statement setting forth in detail the manner and form in which that Joyetech USA, Inc., Joyetech (Changzhou) Electronics Co., Ltd., and Wismec Industry Co. Ltd., each of them, have complied with the injunction;

g. an order that Evolv is entitled to prejudgment and postjudgment interest and costs from each Defendant;

h. an order that this is an exceptional case under 35 U.S.C. § 285 meriting that Evolv be awarded its costs, including its reasonable attorneys' fees and other expenses incurred in connection with this action from each Defendant; and,

i. any other relief that the Court finds legal, just and equitable, as may be available under law or equity, and which the Court finds proper.

Dated: March 9, 2016

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Attorneys for Plaintiff
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DEMAND FOR JURY TRIAL

Pursuant to United States District Court, Central District of California Local Rule 38-1, Plaintiff Evolv demands trial by jury in this action of all issues so triable.

Dated: March 9, 2016

BAKER & HOSTETLER LLP

By: */s/ R. Scott Feldmann*
R. Scott Feldmann

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608313902.9

EXHIBIT 1

US008820330B2

(12) **United States Patent**
Bellinger et al.

(10) **Patent No.: US 8,820,330 B2**
(45) **Date of Patent: Sep. 2, 2014**

(54) **ELECTRONIC VAPORIZER THAT SIMULATES SMOKING WITH POWER CONTROL**

(71) Applicant: **Evolv, LLC**, Ashtabula, OH (US)

(72) Inventors: **John Bellinger**, Cuyahoga Falls, OH (US); **Brandon Ward**, Ashtabula, OH (US)

(73) Assignee: **Evolv, LLC**, Ashtabula, OH (US)

(*) 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.: **13/661,184**

(22) Filed: **Oct. 26, 2012**

(65) **Prior Publication Data**

US 2013/0104916 A1 May 2, 2013

Related U.S. Application Data

(60) Provisional application No. 61/553,129, filed on Oct. 28, 2011.

(51) **Int. Cl.**

A24F 47/00	(2006.01)
A61M 16/16	(2006.01)
A61M 11/04	(2006.01)
A61M 15/06	(2006.01)
A61M 16/00	(2006.01)

(52) **U.S. Cl.**

CPC ***A61M 15/06*** (2013.01); ***A61M 16/161*** (2014.02); *A61M 2205/332* (2013.01); *A61M 2205/3368* (2013.01); ***A61M 11/041*** (2013.01); ***A61M 11/042*** (2014.02); *A61M 2205/3375* (2013.01); *A61M 2205/8206* (2013.01); *A61M 2205/505* (2013.01); *A61M 2205/3317* (2013.01); *A61M 2016/0024* (2013.01)

USPC **131/273**; 128/202.21; 131/270

(58) **Field of Classification Search**

USPC 131/194, 270, 273, 328–330

See application file for complete search history.

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Assistant Examiner — Eric Yaary
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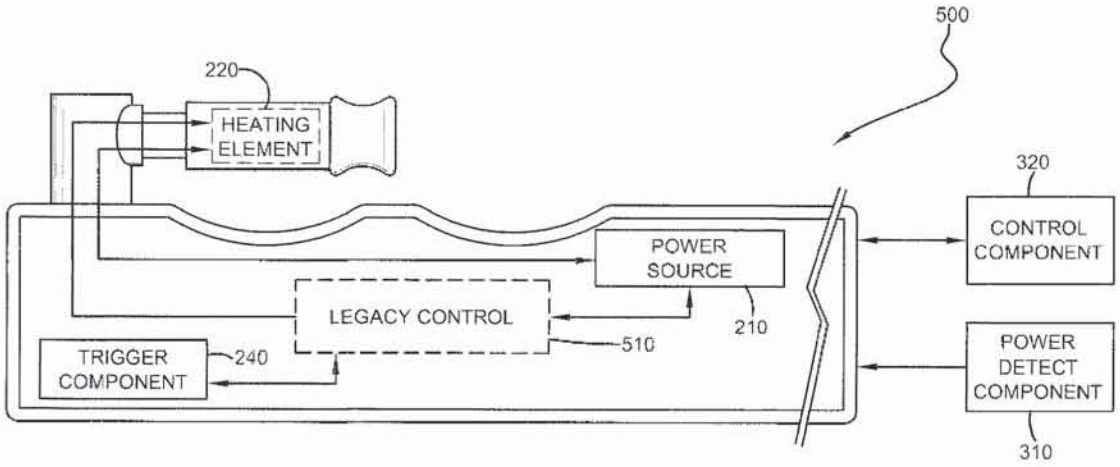
(57) **ABSTRACT**

The claimed subject matter provides a control component that regulates output of an electronic vaporizer used to simulate smoking. The control component manages power to a heating element. A power detect component collects a parameter of the heating element to determine actual power output thereof. The control component dynamically adjusts the power source based on the actual power output.

23 Claims, 8 Drawing Sheets



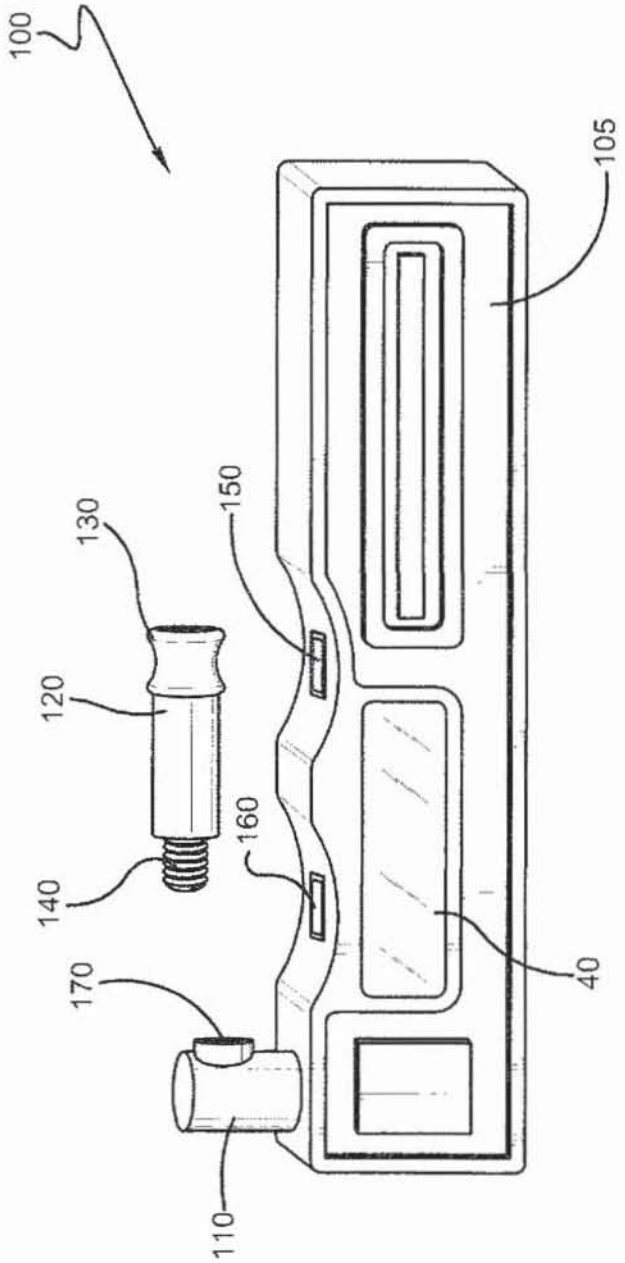


FIG. 1

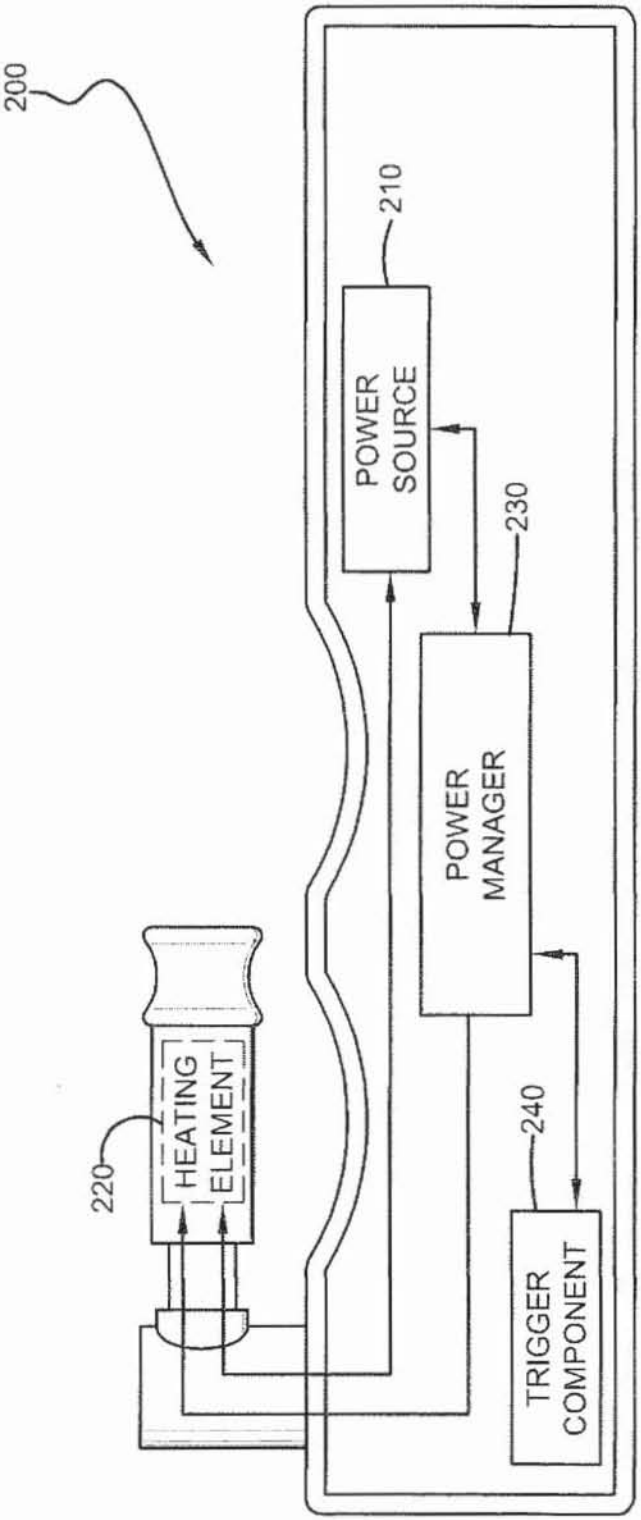

200
210
POWER SOURCE
230
POWER MANAGER
240
TRIGGER COMPONENT
220
HEATING ELEMENT

FIG. 2

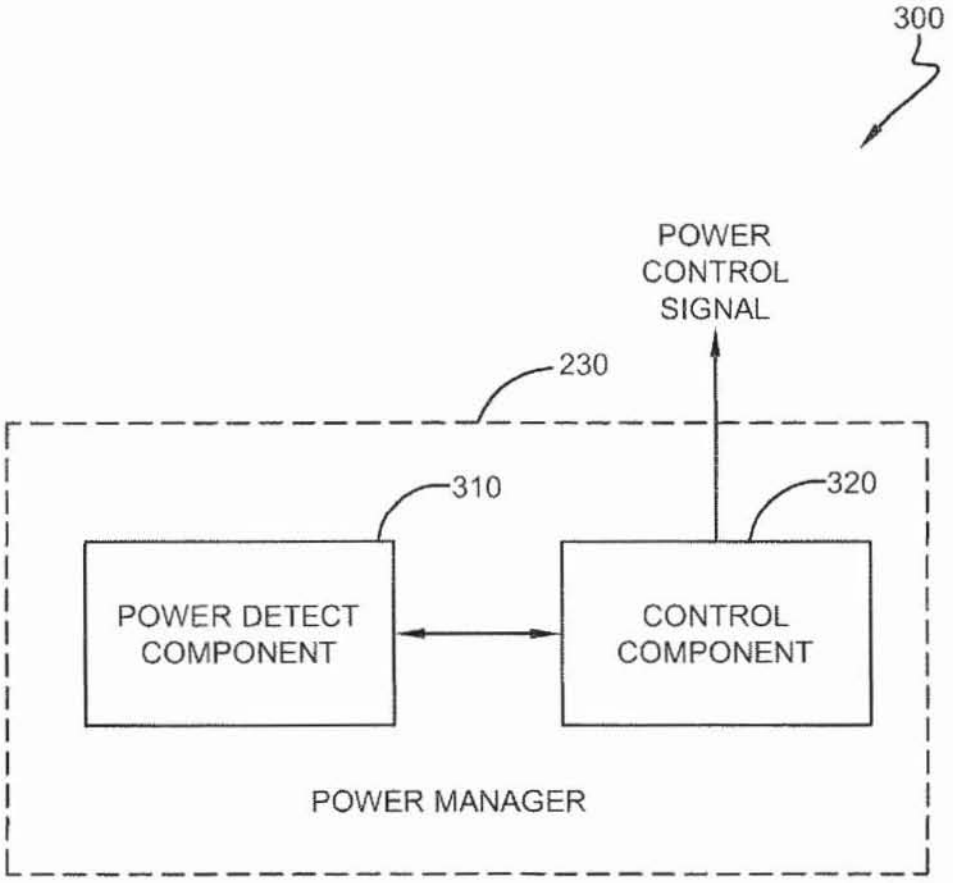

300
POWER CONTROL SIGNAL
230
310
320
POWER DETECT COMPONENT
CONTROL COMPONENT
POWER MANAGER

FIG. 3

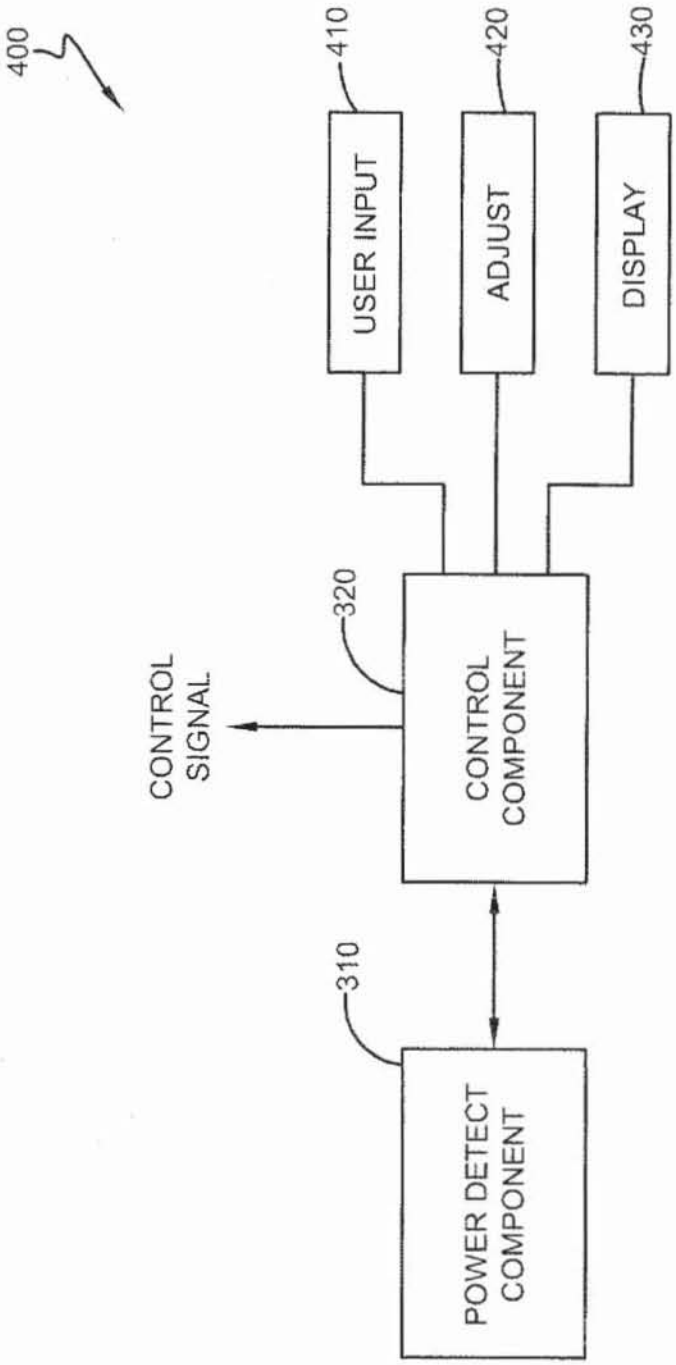

400
410
420
430
USER INPUT
ADJUST
DISPLAY
320
CONTROL SIGNAL
CONTROL COMPONENT
310
POWER DETECT COMPONENT

FIG. 4

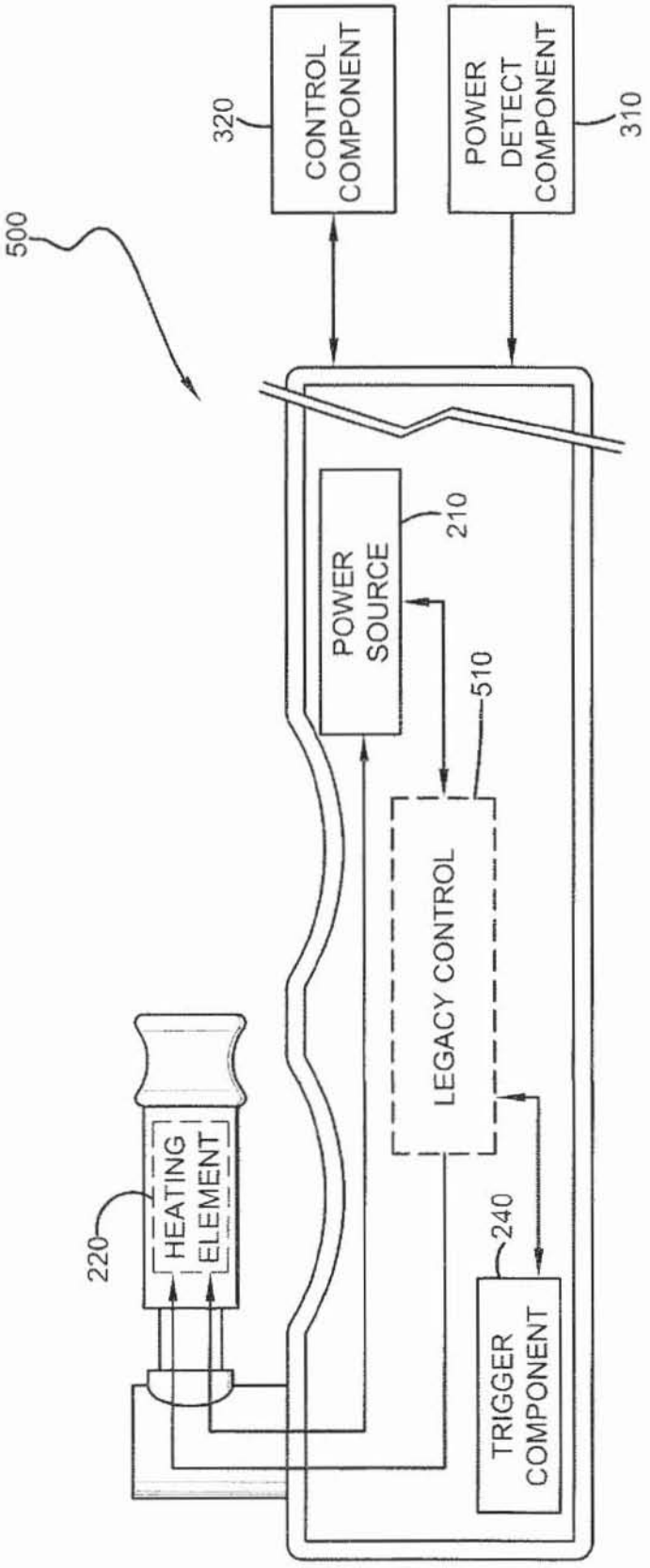

CONTROL COMPONENT
320
POWER DETECT COMPONENT
310
500
POWER SOURCE
210
510
LEGACY CONTROL
240
TRIGGER COMPONENT
220
HEATING ELEMENT

FIG. 5

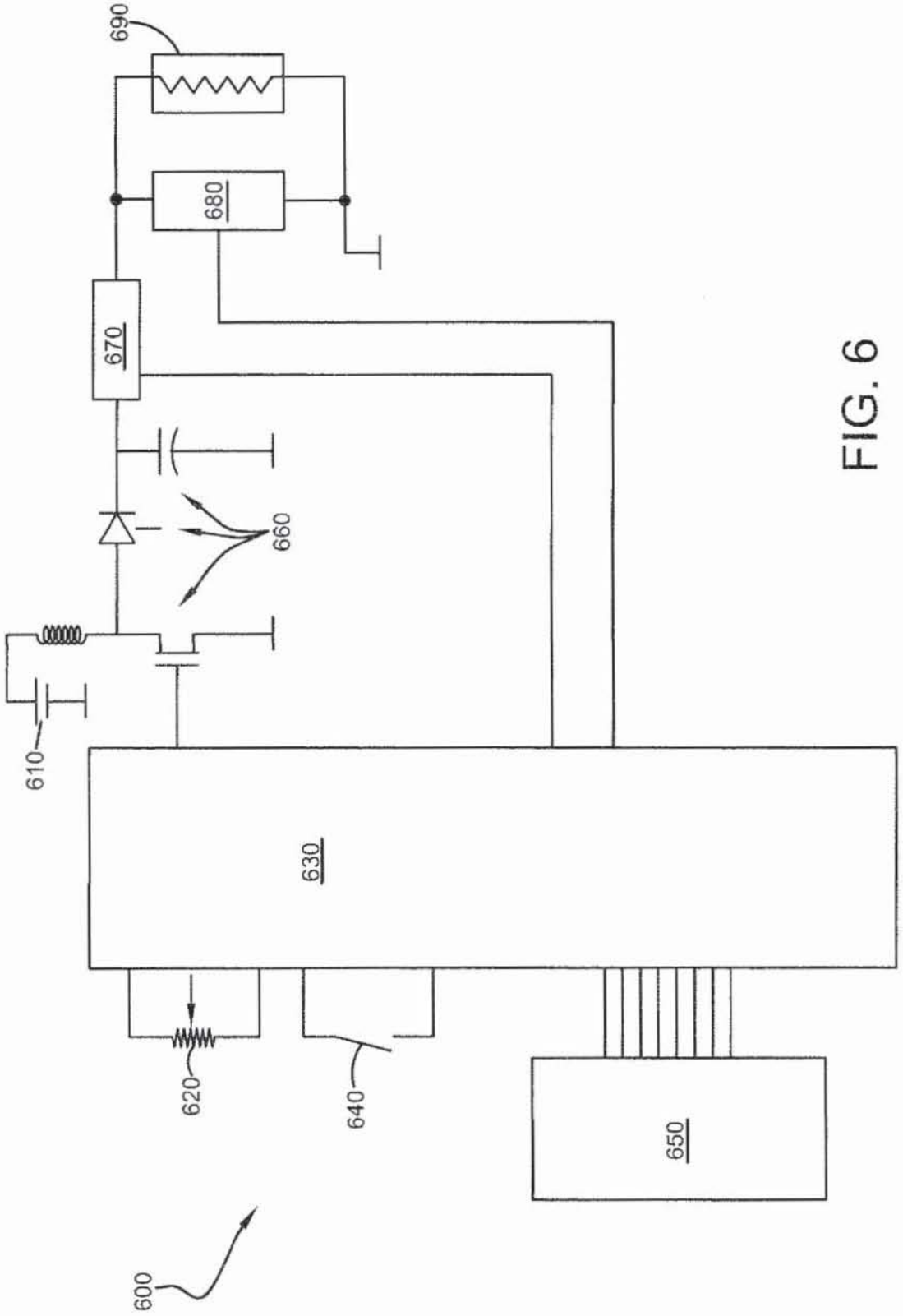


FIG. 6

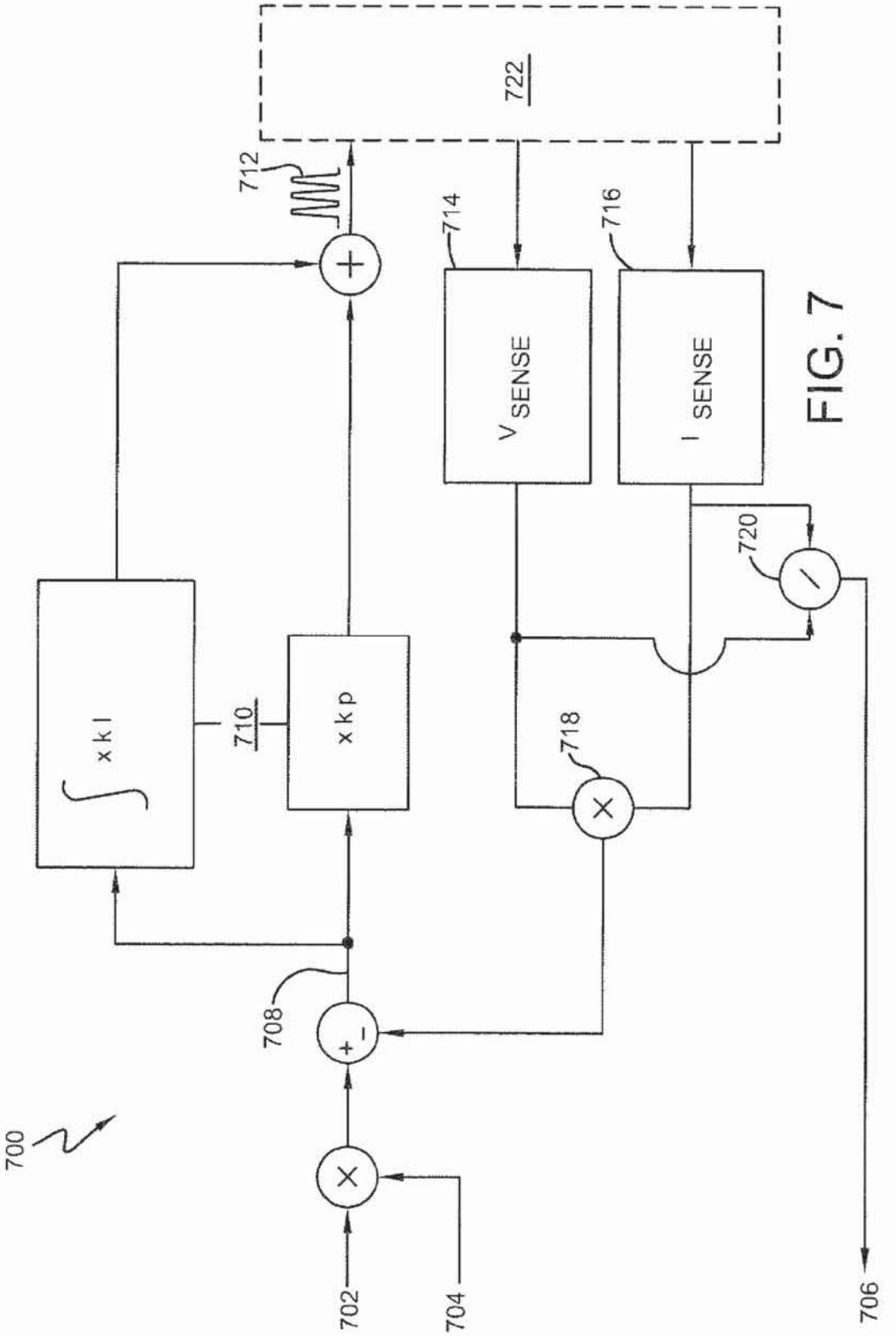

722
712
714
716
V SENSE
I SENSE
720
x k I
710
x k p
718
708
+ -
700
702
704
706

FIG. 7

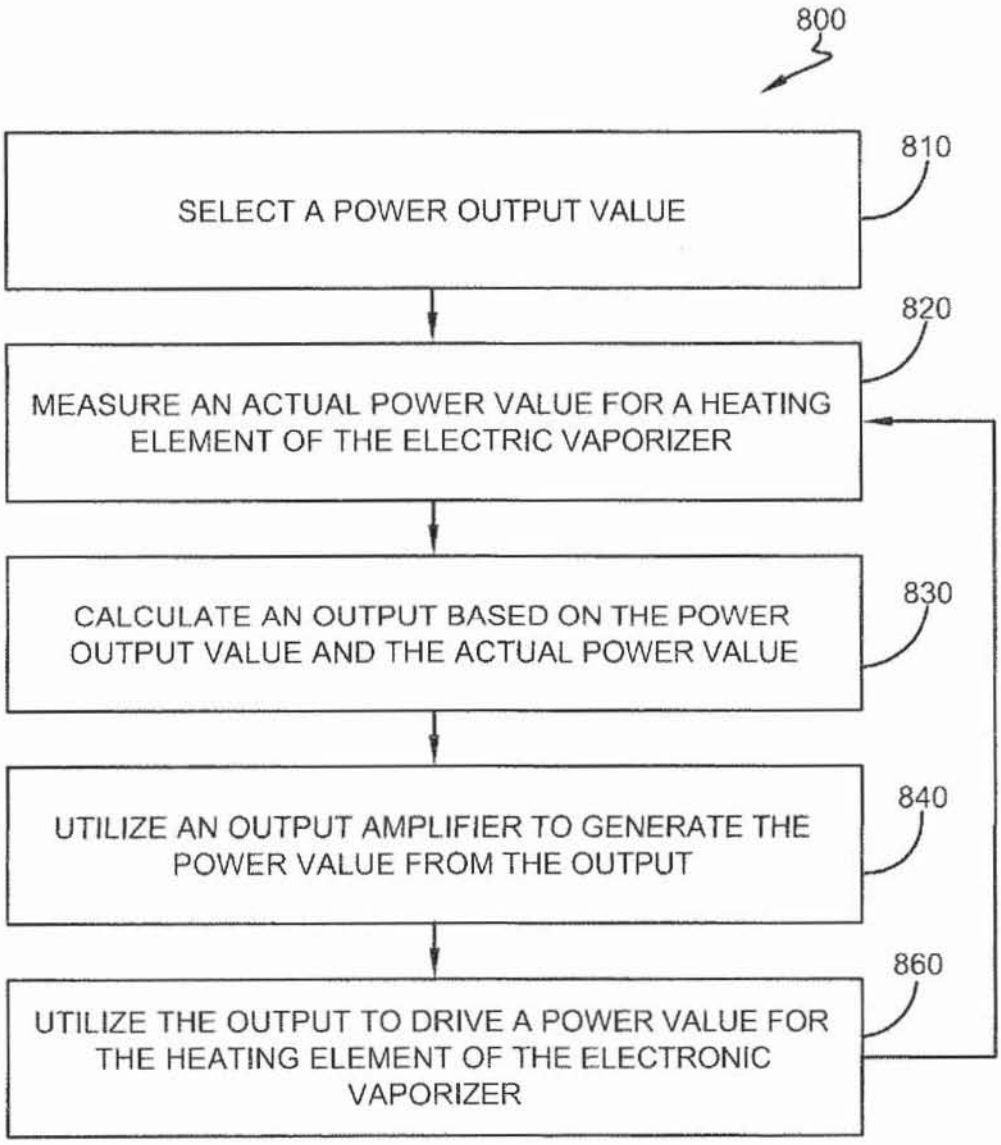

800
SELECT A POWER OUTPUT VALUE
810
MEASURE AN ACTUAL POWER VALUE FOR A HEATING ELEMENT OF THE ELECTRIC VAPORIZER
820
CALCULATE AN OUTPUT BASED ON THE POWER OUTPUT VALUE AND THE ACTUAL POWER VALUE
830
UTILIZE AN OUTPUT AMPLIFIER TO GENERATE THE POWER VALUE FROM THE OUTPUT
840
UTILIZE THE OUTPUT TO DRIVE A POWER VALUE FOR THE HEATING ELEMENT OF THE ELECTRONIC VAPORIZER
860

FIG. 8

ELECTRONIC VAPORIZER THAT SIMULATES SMOKING WITH POWER CONTROL

CROSS-REFERENCE TO RELATED APPLICATIONS

This application claims the benefit of U.S. Provisional Application Ser. No. 61/553,129, filed Oct. 28, 2011, and entitled "POWER REGULATED ELECTRONIC CIGARETTE CONTROLLER." The entirety of the aforementioned application is incorporated herein by reference.

SUMMARY

The subject innovation relates to a power regulated electronic vaporizer (or a component and/or circuitry thereof) for a smoking simulator device in which direct regulation of the input or output power provides a uniform and consistent user experience. The electronic vaporizer includes a heating element, a power source that provides power to the heating element, and a trigger component that activates the heating element to vaporize a material from a cartridge for consumption (e.g., inhale, smoke, and the like). The electronic vaporizer further includes a control component that is configured to adjust the power source to regulate a vaporization of the material from the cartridge for a uniform distribution to the user, wherein the adjustment is based upon a power output or a power input from a component to the heating element.

In an embodiment, a controller component for an electronic vaporizer is provided. The controller component for an electronic vaporizer device can be used to simulate smoking. The controller component includes a first component configured to determine an actual measured power output to a heating element. The controller component includes a second component configured to control a power source that powers the heating element based on the actual measured power output.

In an embodiment, a controller component for an electronic vaporizer is provided. The controller component for an electronic vaporizer device can be used to simulate smoking. The controller component includes a first component configured to determine an actual measured power input to a heating element. The controller component includes a second component configured to control a power source that powers the heating element based on the actual measured power input.

In an embodiment, a method is provided. The method can control an electronic vaporizer in a simulated smoking device. The method includes selecting a power output value, measuring an actual power value for a heating element of the electronic vaporizer, calculating an output based on the power output value and the actual power value, and utilizing the output to drive a power value for the heating element of the electronic vaporizer.

The following description and the annexed drawings set forth in detail certain illustrative aspects of the claimed subject matter. These aspects are indicative, however, of but a few of the various ways in which the principles of the innovation may be employed and the claimed subject matter is intended to include all such aspects and their equivalents. Other advantages and novel features of the claimed subject matter will become apparent from the following detailed description of the innovation when considered in conjunction with the drawings.

BRIEF DESCRIPTION OF THE DRAWINGS

FIG. **1** illustrates a perspective view of an electronic vaporizer that simulates smoking.

FIG. **2** illustrates a system that manages output for an electronic vaporizer.

FIG. **3** illustrates a system that regulates an output for an electronic vaporizer based on an actual power output and a selected power output.

FIG. **4** illustrates a system that provides uniform control of a heating element of an electronic vaporizer based on dynamic measurements related to power consumption of the heating element.

FIG. **5** illustrates an electronic vaporizer that simulates smoking with variable voltage control and a coupled power management system.

FIG. **6** illustrates a circuit diagram for power regulation in an electronic vaporizer.

FIG. **7** illustrates a control loop diagram **700** implementing power regulation for an electronic vaporizer.

FIG. **8** illustrates a flow chart diagram of a method for controlling an electronic vaporizer based on measured power output of a heating element.

DETAILED DESCRIPTION

The subject innovation pertains generally to a control component that regulates output of an electronic vaporizer that simulates smoking or inhaling of a material. The control component manages a power output to a heating element. In an embodiment, a power detect component collects a parameter related to the heating element to determine actual power output thereof. Based on a selected power output level and the aggregated parameter(s), the control component dynamically adjusts the a power output or a power input of the power source.

The claimed subject matter is described with reference to the drawings, wherein like reference numerals are used to refer to like elements throughout. In the following description, for purposes of explanation, numerous specific details are set forth to provide a thorough understanding of the subject innovation. It may be evident, however, that the claimed subject matter may be practiced without these specific details. In other instances, well-known structures and devices are shown in block diagram form to facilitate describing the subject innovation.

Features that are described and/or illustrated with respect to one embodiment may be used in the same way or in a similar way in one or more other embodiments and/or in combination with or instead of the features of the other embodiments. These and further aspects and features will be apparent with reference to the following description and attached drawings. In the description and drawings, particular embodiments of the subject innovation have been disclosed in detail as being indicative of some of the ways in which the principles of the subject innovation may be employed, but it is understood that the subject innovation is not limited correspondingly in scope. Rather, the subject innovation includes all changes, modifications and equivalents coming within the scope of the claims appended hereto. The accompanying illustrations are examples of the subject disclosure, but the innovation can appear in various embodiments depending on varying sleeve lengths and personal customizations that are not illustrated here.

Of course, those skilled in the art will recognize many modifications may be made to this configuration without departing from the scope or spirit of the claimed subject matter. Moreover, the word "exemplary" is used herein to mean serving as an example, instance, or illustration. Any aspect or design described herein as "exemplary" is not necessarily to be construed as preferred or advantageous over

other aspects or designs. It should be emphasized that the term "comprises/comprising" when used in this specification is taken to specify the presence of stated features, integers, steps or components but does not preclude the presence or addition of one or more other features, integers, steps, components or groups thereof.

FIG. **1** illustrates an electronic vaporizer **100** that simulates smoking or inhaling of a material that is vaporized. The electronic vaporizer **100** includes a casing **105** that houses components such as, but not limited to a power source (discussed in more detail below). The electronic vaporizer **100** further includes a connective port **110** that is operative to receive a cartridge **120** which contains a material for vaporization and inhaling, wherein the cartridge **120** can include a mouth piece **130** on one end and a connector **140** on an opposite end. A heating element (discussed in more detail below) can be included or incorporated in the cartridge **120**. It is to be appreciated and understood that the cartridge **120** includes a heating element which can be controlled by one or more components included within the electronic vaporizer **100**. Thus, although the cartridge **120** and heating element can be a separate component or element of the electronic vaporizer **100**, control of the heating element can be based on components included within the electronic vaporizer **100**. The cartridge **120** can physically connect to the electronic vaporizer **100** via the connective port **110** and the connector **140**. For instance, the connector **140** and the connective port **110** can be a male/female connection, a threaded connection, among others. It is to be appreciated that any suitable connective means can couple the cartridge **120** to the electronic vaporizer **100**. In an embodiment, the connective port **110** can be used as an on/off switch to power on or power off the electronic vaporizer **100**. By way of example and not limitation, the connective port **110** can be twisted in a first direction (e.g., clockwise) to turn on the electronic vaporizer **100** and twisted in a second direction (e.g., counter-clockwise) to turn off the electronic vaporizer **100**. In another embodiment, the electronic vaporizer **100** can include a designated on/off switch (not shown) that can power on or power off the electronic vaporizer **100**.

The electronic vaporizer **100** can further include a display **40** that displays or renders information, data, and the like. For instance, the display **40** can communicate information such as, a letter, a number, a symbol, a picture, a graphic, a reading, a measurement, a current, a voltage, a power output, a resistance, among others. The display **40** can be, for instance, an LED display, a backlit display, an LCD display, a plasma display, among others. In an embodiment, the display **40** can be a touchscreen that provides data as well as receives an input. A first input **150** can further be included with the electronic vaporizer **100** in which the first input **150** initiates an output for user consumption (e.g., inhaling, smoking, and the like). For example, the first input **150** can light up the display **40** and/or activate a vaporization of the material in the cartridge **120** for consumption. A second input **150** can be also included with the electronic vaporizer **100**, wherein the second input **150** can be for user input (e.g., dial, potentiometer, setting control, display **40** brightness, among others).

The electronic vaporizer **100** simulates the act of smoking by producing an inhaled vapor bearing the physical sensation, appearance, and often the flavor (e.g., with or without nicotine content) of inhaled smoke. For instance, the electronic vaporizer **100** can simulate the act of smoking tobacco, flavored tobacco, Mu'assel, Sheesha, medicinal marijuana, among others. It is to be appreciated that the material that is smoked is not to be limiting on the subject innovation and that the electronic vaporizer **100** can be used with a suitable material that allows the simulation of smoking or inhaling vapors from such material. The electronic vaporizer **100** simulates smoking without the ill effects such as odor, health risks, among others since vapor is inhaled or consumed rather than actual smoke from the material.

The electronic vaporizer **100** can use heat to vaporize a material into a mist for inhalation or consumption. The material can be contained within the cartridge **120**, wherein the material can be, but is not limited to being, propylene glycol, glycerin-based liquid solution, among others. The electronic vaporizer **100** can be a portable electronic hand-held device that vaporizes a material for inhaling by a user in which the inhaling and consumption simulates the act of smoking.

The electronic vaporizer **100** can be portable, self-contained device that can vary in size, shape, colors, and the like. In an embodiment, the electronic vaporizer **100** can be a cylindrical-based or rectangular-based shaped device. Yet, any shape, size, dimensions, or material may be chosen with sound engineering judgment without departing from the intended scope of coverage of the embodiments of the subject invention. In an embodiment, the electronic vaporizer **100** can be a reusable device with replaceable or refillable components. In another embodiment, the electronic vaporizer **100** can be disposable or with disposable components.

It is to be appreciated that the subject innovation is not to be limited to the material used or vaporized with the electronic vaporizer **100** for personal inhaling or consumption. For instance, the material can be a liquid with various flavors, nicotine, nicotine-free, various nicotine concentrations, among others. Moreover, the material can be a marijuana-based material that can be vaporized for inhalation in relation to medicinal purposes, for instance.

As discussed above, an electronic vaporizer (also referred to as an electronic cigarette) can be a device consisting of a battery (e.g., a power source) and a heating element which is used to vaporize a flavored, sometimes nicotine-containing fluid, plus a casing and user interface. Conventional electronic cigarettes contain charging circuitry for the power source or voltage adjustments to change the feel and quantity of vapor inhaled by the user. The following is an overview of conventional techniques utilized with electronic cigarettes.

Conventional heating elements used in electronic cigarettes do not have stable resistances. Heating elements are considered a consumable part in an electronic cigarette. The resistance changes with temperature, so as the electronic cigarette is used repeatedly in a short period of time, the resistance will not be the same between the first output from the electronic cigarette and a later output from the electronic cigarette. Further, the fluids or materials being vaporized tend to leave a residue on the heating element. This residue is conductive, so as the residue builds up, the overall resistance of the heating element changes (e.g., the resistance of the heating element varies over time). Conventional electronic cigarettes are powered by batteries, usually lithium ion type. Lithium ion batteries can have a fully charged voltage of 4.2 volts, and a fully discharged voltage of 3.0 volts.

Conventional control circuitry can include a direct battery voltage. Conventional electronic cigarettes (e.g., also referred to as e-cigarette) connect a heating element to a power source directly through a switch or a trigger component. This causes the voltage of a heating element to vary, for instance, between 4.2 volts and 3.0 volts for a typical e-cigarette with a power source (e.g., a lithium battery). For example, a resistive heater element can vary between 3 ohms resistance and 2 ohms resistance, depending on factors such as, but not limited to, age, temperature, material being vaporized, and manufacturing variation (e.g. material of construction, composition of

materials, inconsistencies in connections, among others). This can cause a power level in a heating element for a directly connected power source to vary, for instance, between 3 watts and 9 watts, without user control resulting in a highly inconsistent user experience (e.g., varying output, inconsistent vaporization, among others).

Conventional control circuitry can regulate voltage. Conventional electronic cigarettes use a controlled output voltage, generated with commodity switching or linear voltage regulators, to supply a constant voltage to a heating element. For instance, conventional voltage controlled electronic cigarettes are either adjustable between, for instance, 4 volts and 6 volts, or fixed at some output voltage such as, for instance, 5 volts. Conventional voltage controlled electronic cigarettes provide a tolerable user experience because a voltage is regulated for the output. For instance, a typical 5 volt voltage regulated electronic cigarette can have an output power somewhere between 12.5 watts if a heating element has a resistance of 2 ohms, to 8.3 watts if a heater element has a resistance of 3 ohms. This range of 12.5 watts to 8.3 watts impacts the vapor output of the device.

The subject innovation overcomes the above stated deficiencies by providing an improved electronic control method for regulating power delivered to a heating element used by the electronic vaporizer **100**, thereby controlling the quantity and quality of vapor produced by the electronic vaporizer **100**. An improved electronic vaporizer power control system can directly control the output power generated in a heating element, regardless of a resistance of a heating element or state of a power supply. This control results in a much more consistent user experience and uniform output.

FIG. **2** illustrates a system **200** that manages output for the electronic vaporizer **100**. The electronic vaporizer **100** includes components that provide vaporization of a material for consumption for a user. The electronic vaporizer **100** includes a power source **210** that provides power to a heating element **220**, wherein the heating element **220** generates heat to vaporize a material for a user to inhale or consume. As discussed, although the heating element **220** is within the cartridge (discussed in FIG. **1**), control can be included within the electronic vaporizer **100**. It is to be appreciated and understood that the power source **210** can be a battery, a Lithium Ion battery, a Universal Serial Bus (USB) power source, or a suitable power source that powers the heating element **220**. The electronic vaporizer **100** further includes a trigger component **240** that activates the heating element **220** to vaporize a material for user consumption. By way of example and not limitation, the trigger component **240** can be an input such as a button, a dial, a touch screen, a proximity sensor, a voice detection, a motion sensor, a switch, a suction sensor, a pressure sensor, a flow sensor, a pressure switch, or a combination thereof.

The electronic vaporizer **100** further includes a power manager **230** that controls a power output or power input to the heating element **220** via adjustment to the power source **210**, wherein the adjustment is based on a measured parameter associated with the heating element **220**. In an embodiment, the power manager **230** can control power to the heating element **220** based on an actual measured power output of the power source **210**. In such embodiment, the power manager **230** can adjust a current from the power source **210** to generate a selected power output. In another example, the power manager **230** can adjust a voltage from the power source **210** to generate a selected power output. In such embodiment, the power manager **230** can adjust the power source **210** directly to generate a selected power output. In such embodiment, the power manager **230** can adjust the power source **210** directly utilizing an average power calculation.

In another embodiment, the power manager **230** can control power to the heating element **220** based on an actual measured power input of the power source **210**. In such embodiment, the power manager **230** can adjust a current from the power source **210** to generate a selected power output. In such embodiment, the power manager **230** can adjust a voltage from the power source **210** to generate a selected power output. In such embodiment, the power manager **230** can adjust the power source **210** directly to generate a selected power output. In such embodiment, the power manager **230** can adjust the power source **210** directly utilizing an average power calculation

In another embodiment, the power manager **230** can adjust a duty cycle for the power source **210** to control the power output or power input to the heating element **220**. The power manager **230** can measure an actual power output for the heating element **220** based on, for instance, a current of the heating element **220**, a resistance of the heating element **220**, a voltage of the heating element **220**, average power input, average power output, power based on efficiency of a portion of circuitry or component, and/or any suitable manner in which power is calculated with one or more components. A selected power output can be identified, wherein the selected power output can be a variable value defined by the user, a predefined value, a set value, a calculation from a controller component of the electronic vaporizer, or a combination thereof. The power manager **230** can adjust power to the heating element **220** based on the actual power output (e.g., measured power output) and/or the selected power output. In other words, if the actual power output of the heating element **220** differs from the selected power output, the power output of the power source **210** can be adjusted.

Inside heating element **220**, the heat supplied performs three functions. First, the heat raises a temperature of the fluid (e.g., material to be vaporized for inhalation) to a boiling point. Second, the heat boils some of the fluid or material. Third, the heat heats a resulting vapor above the boiling point (e.g., boiling temperature). Because the heat of vaporization can be larger than the liquid specific heat of the fluid or material, additional heat transfer into the vapor is limited by a higher thermal resistance of the heater-vapor interface. Additionally, the vapor is being drawn away from the heating element **220** by suction created by the user, resulting in a majority of the heat generated in the heating element going to vaporizing the fluid or material. Therefore, by controlling the power input (e.g., in watts) to the heating element **220**, a quantity of vapor produced can be controlled. Controlling the output based on power creates a uniform, consistent user experience based on the regulated output even as the heating element **220** or the power source **210** changes, degrades, among others.

The power manager **230** can measure or collect measurements of two of the following: a heating element resistance, an output voltage to the heating element **220**, and an output current of the heating element. From these, an actual power output of the heating element **220** can be calculated or measured by use of Ohm's law (e.g., Voltage=Current*Resistance, or a variation thereof) and a definition of power output (e.g., Power=Voltage*Current, or a variation thereof). The power manager **230** can directly control power to produce a regulated and uniform output from the vaporization of the material from the heating element. In an embodiment, a control loop can be used (e.g., feedback, feedforward, among others) to dynamically control the power output to the heating element **220**.

In an embodiment, a direct power regulator can be utilized in which the direct power regulator uses a microcontroller to measure a system property or parameter, perform control in software, and then output a control signal to a standard DC-DC structure, such as a regulator (e.g., boost regulator, among others). It is to be appreciated that any suitable combination of hardware, software, or circuitry can be implemented with the subject innovation and the disclosed examples are not to be limiting. For example, FIGS. **6** and **7** illustrate circuit diagrams for implementation of the subject innovation (discussed in more detail below). In an embodiment, the power manager **230** can adjust a current from the power source **210** to generate a selected power output. In an embodiment, the power manager **230** can adjust a voltage from the power source **210** to generate a selected power output.

It is to be appreciated and understood that power manager **230** can be a single component (as depicted) or parsed into sub-components (see FIG. **3** for example). Power manager **230** is illustrated as a stand-alone component solely as an example and is not to be limiting on the subject innovation. For instance, power manager **230** can be a stand-alone component (as depicted), incorporated into the power source **210**, incorporated into the trigger component **240**, incorporated into the heating element **220**, integrated into legacy control system, coupled to a legacy control system, or a suitable combination thereof.

FIG. **3** illustrates a system **300** that regulates an output for an electronic vaporizer based on an actual power output and a selected power output. The system **300** can be a power regulator system in which the power manager **230** includes a power detect component **310** and a control component **320**. The power detect component **310** is configured to measure at least one parameter associated with the heating element (illustrated in FIG. **2**) in which the at least one parameter is used to measure actual power output of the heating element. By way of example and not limitation, the parameter can be a voltage of a heating element (e.g., received via the power source), a current of the heating element, a resistance of the heating element, a power output to the heating element, a power input to the heating element, an average power, a power efficiency of a portion of circuitry or component used by the electronic vaporizer, instantaneous output power, average input power, instantaneous input power, among others.

The system **300** can further include a safety check based upon measured parameters (e.g., voltage, power, current, a power input to the heating element, an average power, a power efficiency of a portion of circuitry or component used by the electronic vaporizer, instantaneous output power, average input power, instantaneous input power, among others) of the electronic vaporizer and/or a component thereof. For instance, based on the detected parameters of the electronic vaporizer (via the power detect component **310**, for instance), the system **300** can be managed (e.g., shut down, error message displayed, time delay for use/activation, among others) in order to ensure safety of at least one of a user, a component/element of the electronic vaporizer, the electronic vaporizer, or a combination thereof.

The control component **320** is configured to generate a control signal to the power source (shown in FIG. **2**) in order to adjust or manage the actual power output (e.g., measured power output). For instance, a power output can be adjusted, a power input can be adjusted, a voltage can be adjusted, a current can be adjusted, an average power can be adjusted, among others.

The control component **320** (e.g., also referred to as a regulator module) can output a controlled power level to the heater element, regardless of changes to the input voltage or output resistance. The control component **320** can measure output or input voltage and current, multiply these in software, hardware, or a combination thereof. The control component **320** uses the result of the multiplication as a resulting power signal and provides such signal as an input to a control loop in a converter (e.g., DC/DC converter for instance). The control loop can be implemented in software, hardware, analog hardware, or a combination thereof.

The control component **320** can use 1) a measure or calculation of an input power of the heating element or 2) a combination of an input voltage, an output voltage, a current, a resistance, and 3) a calculation or approximation of a converter efficiency to regulate output power. The control component **320** can further utilize a feedback or feedfoward that is a portion of software, a portion of hardware, a portion of analog hardware, or a combination thereof. For instance, a feedback, feedforward, or control loop could employ a sample rate between a range of 1 Hz to 2,500 Hz. In another embodiment, a sample rate of 2,000 Hz could be employed. In another embodiment, a continuous analog system can be employed. Still, a sample rate can be employed with sound engineering judgment without departing from the intended scope of coverage of the embodiments of the subject invention.

The control component **320** can dynamically update a display of the electronic vaporizer, wherein the display renders the output power provided to the heating element. The control component **320** can calculate and/or display the resistance of the output heating element (e.g., display to user). The control component **320** can include an input that allows the user to adjust the regulated output power level directly, wherein the input is at least one of a potentiometer, pushbutton, a voice command, or a user interface. The control component **320** can further be fixed to a specific output power.

FIG. **4** illustrates a system **400** that provides uniform control of a heating element of an electronic vaporizer based on dynamic measurements related to power output to the heating element. The system **400** includes the power detect component **310** that is configured to detect actual measured power input or output. The power detect component **310** is further configured to calculate an actual power output to the heating element. Furthermore, the system **400** includes the control component **310** that is configured to regulate a power output from a power source (based upon the power detect component **310**) to regulate an output from the electronic vaporizer.

The system **400** further includes a user input **410**. The user input **410** can be a selected power output in which the control component **320** adjusts the power output of the power source to target the selected power output. The user input **410** can be an input related to, but not limited to, a setting, a resistance level, a power level, an activation of the heating element, a trigger for generation of output for inhaling, a security mechanism (e.g., a password, a thumbprint, a unique indicia, a voice command, a pattern, among others), among others. The user input **410** can be a suitable input such as, but not limited to, a button (press activated), a touch activated button, a touch screen, a proximity detector, a moisture sensor, a temperature sensor, a suction sensor, a pressure switch, a pressure sensor, a flow sensor, among others.

An adjust component **420** can be utilized with the control component **320** to manually change a setting related to the electronic vaporizer. By way of example and not limitation, the setting can be a selected power output for the power source, type of material for vaporization and consumption, and the like.

The system **400** can further include a display **430**. The term display collectively refers to any component capable of pro-

viding information to a user including audio, visual or tactile methods of conveying information. In the example shown, a visual display is used. A suitable visual display is one that can render a portion of a graphic, a letter, a number, a symbol, a color, among others. The visual display can be an LED screen, a dot matrix screen, a Liquid Crystal Display (LCD) screen, a plasma screen, a touch screen, a display with a flexible property, among others. The display **430** can convey information in real time. For instance, the display **430** can provide operating condition information to the user including current (e.g., current of heating element, current of power source, and the like), voltage (e.g., voltage of the heating element, voltage of the power source, and the like), resistance (e.g., resistance of the heating element, and the like), a power output (e.g., a selected power output, a defined or fixed power output, a power output of the power source, a power output to the heating element, and the like), or a combination thereof.

FIG. **5** illustrates an electronic vaporizer **500** for simulating smoking with a control system that uniformly regulates the heating element. The electronic vaporizer **500** includes the power source **210**, the heating element **220**, the trigger component **240**. It is to be appreciated that the heating element **220** can be included within a cartridge. Yet, the control system can be included within the electronic vaporizer **500** or a component included or used therewith. For example, the control system can be included within any suitable component or part of the electronic vaporizer. The electronic vaporizer **500** may or may not include a legacy control component **510**. For instance, the electronic vaporizer **500** can include the legacy control component **510**. In another example, the electronic vaporizer **500** does not include a control system or control circuitry. The legacy control component **510** is a conventional control module for the electronic vaporizer **500**.

The control component **320** and/or the power detect component **310** can be utilized with the electronic vaporizer **500** to include power output control to the legacy control component **510**. In an embodiment, the control component **320** and/or the power detect component **310** can be retro-fitted to the legacy control component **510** to provide enhanced control of output of an electronic vaporizer. In another embodiment, the control component **320** and/or the power detect component **310** can leverage at least one of the elements or components utilized in the electronic vaporizer. For instance, the control component **320** and/or the power detect component **310** can utilize at least one of the power source **210**, the heating element **220**, or the trigger component **240**. Such retro-fitting enables the legacy control component **510** to be enhanced to manage output of the electronic vaporizer in a uniform manner based on power output to the heating element **220**. For example, the control component **320** and/or the power detect component **310** can be incorporated into the electronic vaporizer **500**, physically coupled to the electronic vaporizer **500**, physically attached to the electronic vaporizer **500**, electronically coupled to at least one of the power source **210**, the heating element **220**, the legacy control component **510**, the trigger component **640**, or a suitable combination thereof.

FIG. **6** illustrates a circuit diagram **600** for power regulation in an electronic vaporizer. The circuit diagram **600** can include a power source **610**, a potentiometer for user adjustment (e.g., adjustment of a selected power output), a microcontroller **630**, a switch **640** (e.g., switch for user activation of the electronic vaporizer), a display **650**, a converter **660** (e.g., a boost converter, and the like), an output current sensor **670**, an output voltage sensor **680**, and a heating element **690**. It is to be appreciated that the circuit diagram **600** is solely for exemplary purposes only and that any suitable variation can be implemented in hardware, software, or a combination thereof.

FIG. **7** illustrates a control loop diagram **700** implementing power regulation for an electronic vaporizer. The circuit diagram **700** can include a power control input signal **702**, an on/off control input signal **704**, a measured resistance to output to display **706**, an error term for a control loop **708**, a control loop **710** (e.g., a proportional integral type control loop, a feed forward control loop, among others), an output Pulse-Width Modulation (PWM) signal to regulator **712**, a voltage sense with scaling and conditioning **714**, a current sense with scaling and conditioning **716**, a calculated measured power signal **718**, a calculated measured resistance signal **720**, and a converter **722** (e.g., a hardware boost converter, an external to software hardware boost regulator, or the like). It is to be appreciated that the circuit diagram **700** is solely for exemplary purposes only and that any suitable variation can be implemented in hardware, software, or a combination thereof.

The aforementioned systems, components (e.g., power manager, control component, power detect component, etc.), and the like have been described with respect to interaction between several components and/or elements. It should be appreciated that such devices and elements can include those elements or sub-elements specified therein, some of the specified elements or sub-elements, and/or additional elements. Further yet, one or more elements and/or sub-elements may be combined into a single component to provide aggregate functionality. The elements may also interact with one or more other elements not specifically described herein for the sake of brevity, but known by those of skill in the art.

Furthermore, as will be appreciated, various portions of the disclosed systems above and methods below can include or consist of artificial intelligence, machine learning, or knowledge or rule-based components, sub-components, processes, means, methodologies, or mechanisms (e.g., support vector machines, neural networks, expert systems, Bayesian belief networks, fuzzy logic, data fusion engines, classifiers, among others). Such components, inter alia, can automate certain mechanisms or processes performed thereby to make portions of the systems and methods more adaptive as well as efficient and intelligent. By way of example and not limitation, the power manager **230** or one or more sub-components thereof can employ such mechanisms to efficiently determine a power output to approximate to an actual power of a heating element associated with an electronic vaporizer.

In view of the exemplary systems described supra, methodologies that may be implemented in accordance with the disclosed subject matter will be better appreciated with reference to the flow chart of FIG. **8**. While for purposes of simplicity of explanation, the methodology are shown and described as a series of blocks, it is to be understood and appreciated that the claimed subject matter is not limited by the order of the blocks, as some blocks may occur in different orders and/or concurrently with other blocks from what is depicted and described herein. Moreover, not all illustrated blocks may be required to implement the methods described hereinafter.

FIG. **8** illustrates a flow chart diagram of a method **800** for controlling an electronic vaporizer based on measured power output of a heating element. At reference numeral **810**, a power output value is selected. At reference numeral **820**, an actual power value for a heating element of the electronic vaporizer is measured. At reference numeral **830**, an output is calculated based on the power output value and the actual power value. At reference numeral **840**, an output amplifier is

utilized to generate the power value from the output. At reference numeral **850**, the output is utilized to drive a power value for the heating element of the electronic vaporizer. After reference numeral **850**, the method **800** can continue to reference numeral **820** to measure actual power for the heating element. The method can further include displaying at least one of a selected power output, a resistance of the heating element in real time, or the measured power output to the heating element in real time.

What has been described above includes examples of the subject innovation. It is, of course, not possible to describe every conceivable combination of components or methodologies for purposes of describing the claimed subject matter, but one of ordinary skill in the art may recognize that many further combinations and permutations of the subject innovation are possible. Accordingly, the claimed subject matter is intended to embrace all such alterations, modifications, and variations that fall within the spirit and scope of the appended claims.

As used herein, the terms "component" and "system," as well as forms thereof are intended to refer to a computer-related entity, either hardware, a combination of hardware and software, software, or software in execution. For example, a component may be, but is not limited to being, a process running on a processor, a processor, an object, an instance, an executable, a thread of execution, a program, and/or a computer. By way of illustration, both an application running on a computer and the computer can be a component. One or more components may reside within a process and/or thread of execution and a component may be localized on one computer and/or distributed between two or more computers.

The word "exemplary" or various forms thereof are used herein to mean serving as an example, instance, or illustration. Any aspect or design described herein as "exemplary" is not necessarily to be construed as preferred or advantageous over other aspects or designs. Furthermore, examples are provided solely for purposes of clarity and understanding and are not meant to limit or restrict the claimed subject matter or relevant portions of this disclosure in any manner. It is to be appreciated a myriad of additional or alternate examples of varying scope could have been presented, but have been omitted for purposes of brevity.

Specific embodiments of an innovation are disclosed herein. One of ordinary skill in the art will readily recognize that the innovation may have other applications in other environments. In fact, many embodiments and implementations are possible. The following claims are in no way intended to limit the scope of the subject innovation to the specific embodiments described above. In addition, any recitation of "means for" is intended to evoke a means-plus-function reading of an element and a claim, whereas, any elements that do not specifically use the recitation "means for", are not intended to be read as means-plus-function elements, even if the claim otherwise includes the word "means".

Although the subject innovation has been shown and described with respect to a certain preferred embodiment or embodiments, it is obvious that equivalent alterations and modifications will occur to others skilled in the art upon the reading and understanding of this specification and the annexed drawings. In particular regard to the various functions performed by the above described elements (e.g., components, etc.), the terms (including a reference to a "means") used to describe such elements are intended to correspond, unless otherwise indicated, to any element which performs the specified function of the described element (e.g., that is functionally equivalent), even though not structurally equivalent to the disclosed structure which performs the function in the herein illustrated exemplary embodiment or embodiments of the innovation. In addition, while a particular feature of the innovation may have been described above with respect to only one or more of several illustrated embodiments, such feature may be combined with one or more other features of the other embodiments, as may be desired and advantageous for any given or particular application. Although certain embodiments have been shown and described, it is understood that equivalents and modifications falling within the scope of the appended claims will occur to others who are skilled in the art upon the reading and understanding of this specification.

In addition, while a particular feature of the subject innovation may have been disclosed with respect to only one of several implementations, such feature may be combined with one or more other features of the other implementations as may be desired and advantageous for any given or particular application. Furthermore, to the extent that the terms "includes," "including," "has," "contains," variants thereof, and other similar words are used in either the detailed description or the claims, these terms are intended to be inclusive in a manner similar to the term "comprising" as an open transition word without precluding any additional or other elements.

What is claimed is:

1. An electronic vaporizer device used to simulate smoking, comprising:

a user input device configured to allow a user to select a wattage setting from a plurality of wattage settings, wherein the wattage setting corresponds to a power level in watts to be delivered to a heating element for vaporizing a material during a simulated smoking session;

a power source configured to generate the power level to be delivered to the heating element; and

a power manager operatively connected to the user input device and the power source and configured to regulate the power level delivered to the heating element to substantially the wattage setting during activation of the electronic vaporizer device, regardless of heating element parameters and a state of the power source, to consistently control a quantity and a quality of vapor produced by the electronic vaporizer device.

2. The electronic vaporizer device of claim **1**, further comprising a trigger component operatively connected to the power manager and configured to activate the electronic vaporizer device via the power manager.

3. The electronic vaporizer device of claim **2**, wherein the trigger component includes at least one of an input from a user, a button input, a voice command, a touch screen input, a motion detection, a pressure switch, a pressure sensor, a flow sensor, or a proximity sensor input.

4. The electronic vaporizer device of claim **1**, wherein the power manager is configured to provide an input signal to the power source to adjust at least one of a current or a voltage provided by the power source to regulate the power level delivered to the heating element to substantially the wattage setting during activation of the electronic vaporizer device.

5. The electronic vaporizer device of claim **1**, wherein the power manager is configured to adjust at least one of a current or a voltage output by the power source to regulate the power level delivered to the heating element to substantially the wattage setting during activation of the electronic vaporizer device.

6. The electronic vaporizer device of claim **1**, wherein the power manager is configured to sense at least one of a current or a voltage applied to the heating element in real time.

7. The electronic vaporizer device of claim 1, wherein the power manager is configured to determine a resistance of the heating element in real time.

8. The electronic vaporizer device of claim 1, further comprising a display component operatively connected to the power manager and configured to display at least one of the wattage setting, a real time watt output, a resistance of the heating element in real time, a voltage applied to the heating element in real time, or a current applied to the heating element in real time.

9. The electronic vaporizer device of claim 1, wherein the power manager is configured to simultaneously measure or sense at least two of a resistance of the heating element, an output voltage of the heating element, and an output current of the heating element as part of regulating the power level delivered to the heating element.

10. The electronic vaporizer device of claim 1, wherein the power manager is configured to simultaneously control one of a resistance of the heating element, an output voltage of the heating element, and an output current of the heating element while measuring another of the resistance of the heating element, the output voltage of the heating element, and the output current of the heating element as part of regulating the power level delivered to the heating element.

11. An electronic vaporizing system used to simulate smoking, comprising:

a cartridge containing a heating element for vaporizing a material for inhaling;

an electronic vaporizer device operatively connected to the cartridge, wherein the electronic vaporizer device is configured to:

allow a user to select a wattage setting from a plurality of wattage settings, wherein the wattage setting corresponds to a power level in watts to be delivered to the heating element for vaporizing the material during a simulated smoking session,

generate the power level to be delivered to the heating element, and

regulate the power level to about the wattage setting during activation of the electronic vaporizer device, even when the heating element changes, to provide a consistent vapor during the simulated smoking session.

12. The electronic vaporizing system of claim 11, wherein the electronic vaporizer device is configured to display at least one of the wattage setting, a resistance of the heating element in real time, a voltage applied to the heating element in real time, or a current applied to the heating element in real time.

13. The electronic vaporizing system of claim 11, wherein the electronic vaporizer device is configured to allow a user to activate the electronic vaporizer device to initiate delivery of the power level to the heating element.

14. The electronic vaporizing system of claim 11, wherein the cartridge is configured to allow a user to inhale a vaporized material produced inside the cartridge.

15. The electronic vaporizing system of claim 11, wherein the electronic vaporizer device is configured as a portable electronic hand-held device.

16. The electronic vaporizing system of claim 11, wherein the cartridge is configured to be connected to and disconnected from the electronic vaporizer device.

17. The electronic vaporizing system of claim 11, wherein the electronic vaporizer device is configured to connect to and operate with cartridges having heating elements of different resistances.

18. The electronic vaporizing system of claim 11, wherein the electronic vaporizer device is configured to regulate, in real time, the power level delivered to the heating element to about the wattage setting during activation of the electronic vaporizer device, even as the resistance of the heating element changes.

19. A method to simulate smoking with an electronic vaporizer device and a cartridge, comprising:

regulating a power level delivered to a heating element of a cartridge connected to an electronic vaporizer device, for vaporizing a material within the cartridge during a simulated smoking session, substantially to a user-selected wattage setting during activation of the electronic vaporizer device to provide a consistent quantity and quality of vapor during the simulated smoking session.

20. The method of claim 19, wherein the regulating of the power level, delivered to the heating element, substantially to the user-selected wattage setting is performed in real time regardless of a resistance of the heating element of the cartridge.

21. The method of claim 19, wherein the regulating of the power level, delivered to the heating element, substantially to the user-selected wattage setting is performed in real time regardless of a change in a resistance of the heating element of the cartridge during the simulated smoking session.

22. The method of claim 19, further comprising displaying at least one of the wattage setting, a resistance of the heating element, a voltage applied to the heating element, or a current applied to the heating element.

23. An electronic vaporizer device used to simulate smoking, comprising:

a power source configured to generate a power level being a pre-programmed wattage level to be delivered to a heating element for vaporizing a material during a simulated smoking session; and

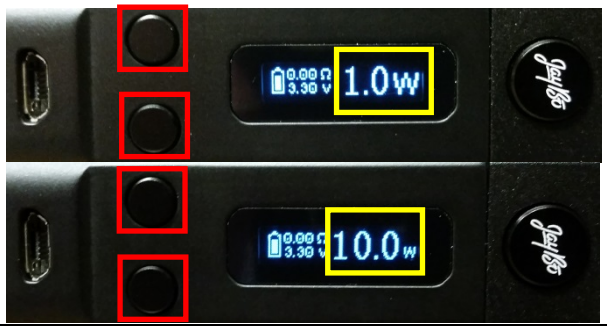
a power manager operatively connected to the power source and configured to regulate the power level delivered to the heating element to substantially the pre-programmed wattage level during activation of the electronic vaporizer device, regardless of heating element parameters and a state of the power source, to consistently control a quantity and a quality of vapor produced by the electronic vaporizer device.

* * * * *

EXHIBIT 2

Exhibit 2

'330 Patent Infringement Analysis – "Reuleaux RX200"

Claim Limitation	Joyetech's Wismec Reuleaux RX200
1. An electronic vaporizer device used to simulate smoking, comprising:	 The Reuleaux RX200 is a vaporizer device used to simulate smoking. It is shown here with a cartridge (atomizer and consumable) attached.
a user input device configured to allow a user to select a wattage setting from a plurality of wattage settings, wherein the wattage setting corresponds to a power level in watts to be delivered to a heating element for vaporizing a material during a simulated smoking session;	The control buttons (boxed in red) on the Reuleaux RX200 device provide a user input device that allows a user to select a wattage setting (boxed in yellow) from a plurality of wattage settings. The Reuleaux RX200 buttons allow the user to select settings from 1 watt up to 200 watts in one tenth of one watt increments. The pair of buttons is shown in red boxes in the picture of the board underlying the external controls. The wattage is displayed after selection. 

Claim Limitation	Joyetech's Wismec Reuleaux RX200
	  Testing confirmed that the wattage setting corresponds to the power level in watts delivered to the heating element for vaporizing a material during a simulated smoking session. Testing of the RX200 to confirm correspondence of set power level to actual power level employed multiple resistors of known resistance. The multiple resistors of known resistance model the resistance of the heating element and changes to resistance thereof. The test equipment was electrically coupled with the component for attaching cartridges to the unit to place known resistors in the operational electrical path without disruption. The tests accounted for resistance consequent to the testing setup. In an example testing iteration, with the device wattage set to 1.0 watts, the device was actuated. With 0.311 ohm resistance applied to the device, the output voltage generated by the device was .570 volts, and the

<table>
<tr><th>Claim Limitation</th><th>Joyetech's Wismec Reuleaux RX200</th></tr>
<tr><td></td><td>measured power was 1.045 watts, within engineering tolerances of the programmed value to be delivered. Repeating the test with a resistor at 0.398, 0.555 and 1.052 ohms similar results were observed.

Reuleaux RX200

<table>
<tr><th>Measured Power</th><th>Resistance</th><th>Measured Voltage</th></tr>
<tr><td>1.045</td><td>0.311</td><td>0.570</td></tr>
<tr><td>1.045</td><td>0.398</td><td>0.645</td></tr>
<tr><td>1.066</td><td>0.555</td><td>0.769</td></tr>
<tr><td>1.072</td><td>1.052</td><td>1.062</td></tr>
</table>

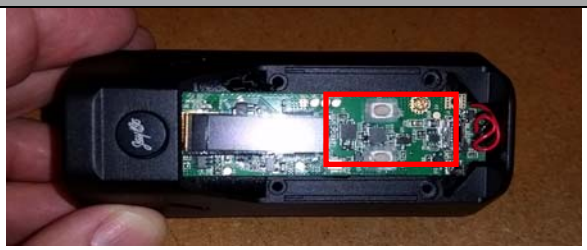
The same test was performed with a selected wattage of 10 watts. Again the measured wattage corresponded to the selected wattage within engineering tolerances.

Reuleaux RX200

<table>
<tr><th>Measured Power</th><th>Resistance</th><th>Measured Voltage</th></tr>
<tr><td>10.303</td><td>0.311</td><td>1.790</td></tr>
<tr><td>10.252</td><td>0.398</td><td>2.020</td></tr>
<tr><td>10.292</td><td>0.555</td><td>2.390</td></tr>
<tr><td>10.352</td><td>1.052</td><td>3.300</td></tr>
</table>

As the measured power is in the output path of the device, simulating the presence of a cartridge (e.g., atomizer), this is the power which would be delivered to the heating element of the cartridge.</td></tr>
</table>

Claim Limitation	Joyetech's Wismec Reuleaux RX200
a power source configured to generate the power level to be delivered to the heating element; and	The power source is provided by the battery enclosure holding the batteries (*e.g.*, three IMR 18650 3.7V / 3000MAH / 40A batteries). The power source is the sole source of power and the testing indicated the selected power level corresponds to the power delivered to the heating element.  The micro-USB (universal serial bus) port, adjacent the control buttons and boxed in red, can also be used for battery recharging. 
a power manager operatively connected to the user input device and the power source and configured to	The circuit board, which includes microcontrollers (generally boxed in red), functions as a power manager performing the claimed aspects in the circuit as demonstrated through testing.

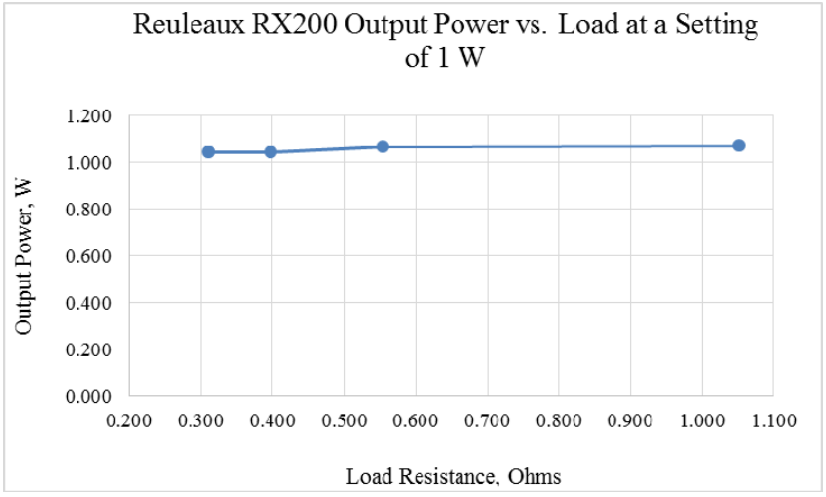
Claim Limitation	Joyetech's Wismec Reuleaux RX200
regulate the power level delivered to the heating element to substantially the wattage setting during activation of the electronic vaporizer device, regardless of heating element parameters and a state of the power source, to consistently control a quantity and a quality of vapor produced by the electronic vaporizer device.	 The testing confirmed accurate control based on the user input regardless of heating element parameters (*e.g.*, actual resistance) and regardless of the state of the power source. This was shown by, *e.g.*, varying resistance in testing to simulate changes in the heating element. In the testing, the Reuleaux RX200 wattage set point was kept constant and different known resistors attached. Values such as, *e.g.*, the output voltage were shown to change with the varying resistance to maintain constant wattage. This test was performed at user selected 1 watt and 10 watt settings. In addition to the variation of the resistance, it was observed during testing that the battery charge level decreased over time. As shown in the graphs below, for which the measurements were taken over time as battery power decreased, the device power manager regulated wattage regardless of heating element and power source changes.

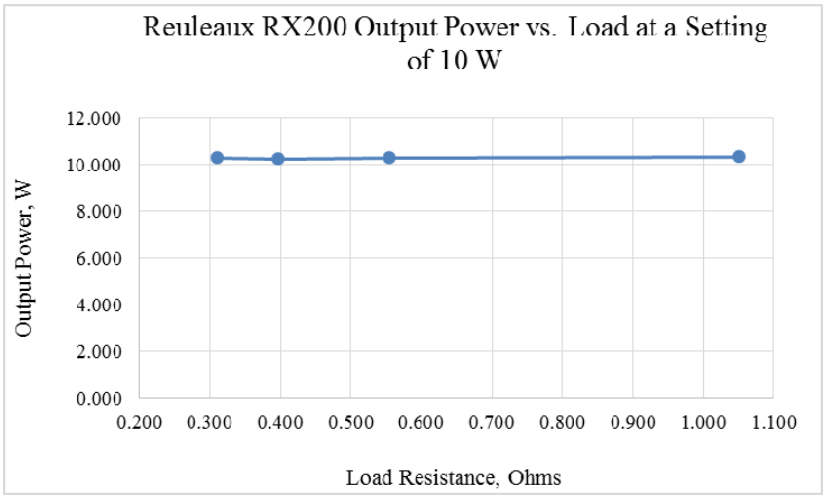
Claim Limitation	Joyetech's Wismec Reuleaux RX200

Reuleaux RX200

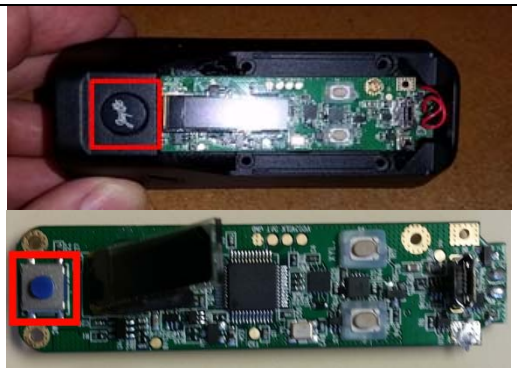
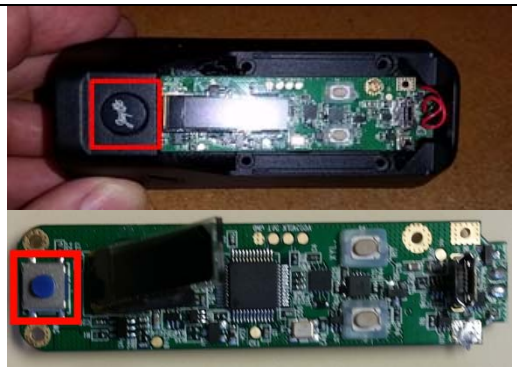
Measured Power	Resistance	Measured Voltage
	One Watt Setting	
1.045	0.311	0.570
1.045	0.398	0.645
1.066	0.555	0.769
1.072	1.052	1.062
	Ten Watt Setting	
10.303	0.311	1.790
10.252	0.398	2.020
10.292	0.555	2.390
10.352	1.052	3.300

These results are captured visually in the graphs below.





Because power output is regulated to a consistent level,

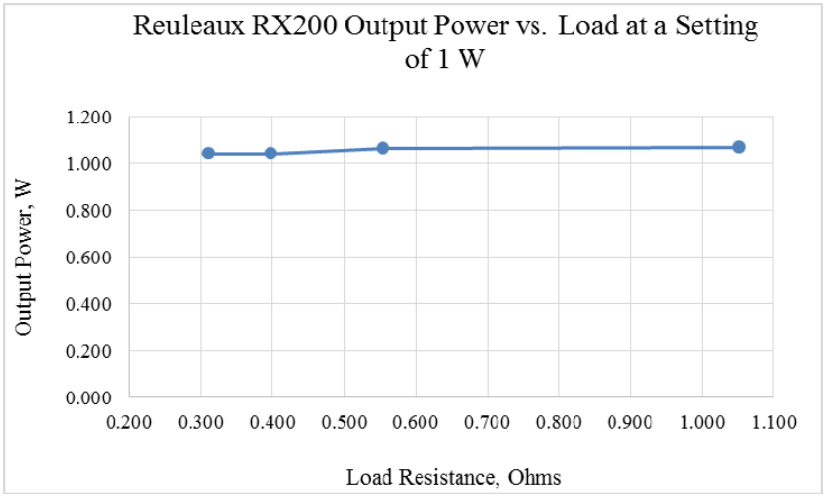
Claim Limitation	Joyetech's Wismec Reuleaux RX200
	quantity and quality of vapor would be consistent.
2. The electronic vaporizer device of claim 1, further comprising a trigger component operatively connected to the power manager and configured to activate the electronic vaporizer device via the power manager.	 The external "Fire" button links to circuit board, providing a combination button input and electronic trigger (both boxed in red) for activation.
3. The electronic vaporizer device of claim 2**,** wherein the trigger component includes at least one of an input from a user, a button input, a voice command, a touch screen input, a motion detection, a pressure switch, a pressure sensor, a flow sensor,	 The external "Fire" button links to circuit board, providing a combination button input and electronic trigger (both boxed in red) for activation.

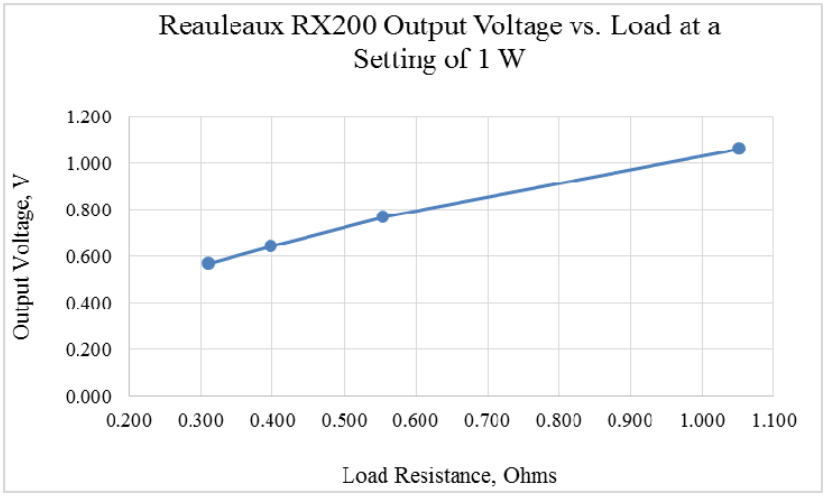
<table>
<tr><th>Claim Limitation</th><th>Joyetech's Wismec Reuleaux RX200</th></tr>
<tr><td>or a proximity sensor input.</td><td></td></tr>
<tr><td>4. The electronic vaporizer device of claim 1, wherein the power manager is configured to provide an input signal to the power source to adjust at least one of a current or a voltage provided by the power source to regulate the power level delivered to the heating element to substantially the wattage setting during activation of the electronic vaporizer device.</td><td>The device power manager is the RX200 circuit board, partially boxed in red within the device housing.
 
The device controls and testing indicate that the device power manager controls power source to change at least voltage to maintain the selected wattage level delivered to the heating element. In particular, during testing, the measured voltage varied when different resistors were attached to maintain the selected wattage setting.
<u>Reuleaux RX200</u>
<table><tr><th>Measured Power</th><th>Resistance</th><th>Measured Voltage</th></tr><tr><td></td><td>One Watt Setting</td><td></td></tr><tr><td>1.045</td><td>0.311</td><td>0.570</td></tr><tr><td>1.045</td><td>0.398</td><td>0.645</td></tr><tr><td>1.066</td><td>0.555</td><td>0.769</td></tr><tr><td>1.072</td><td>1.052</td><td>1.062</td></tr></table></td></tr>
</table>

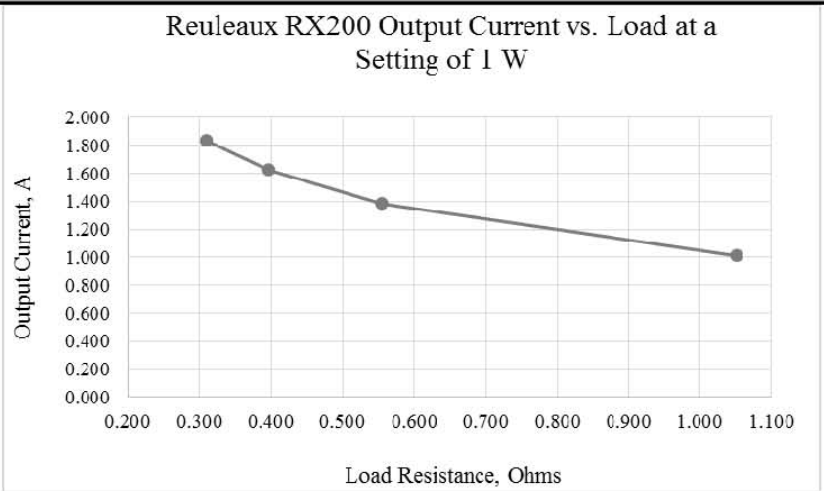
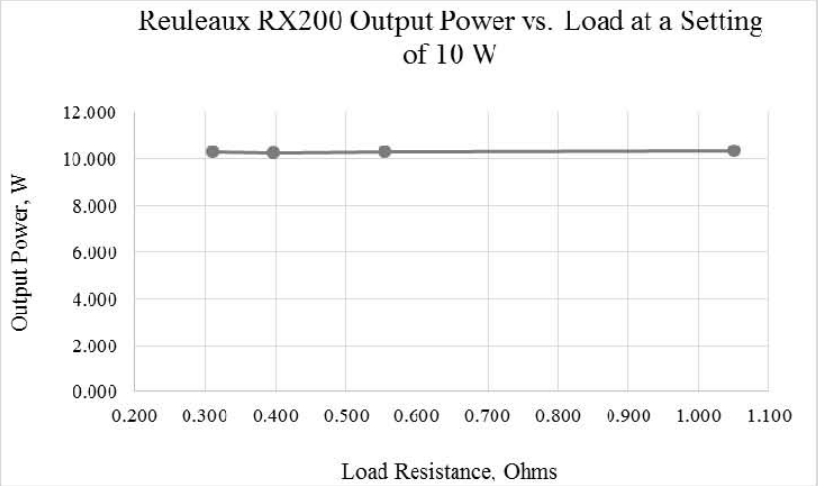
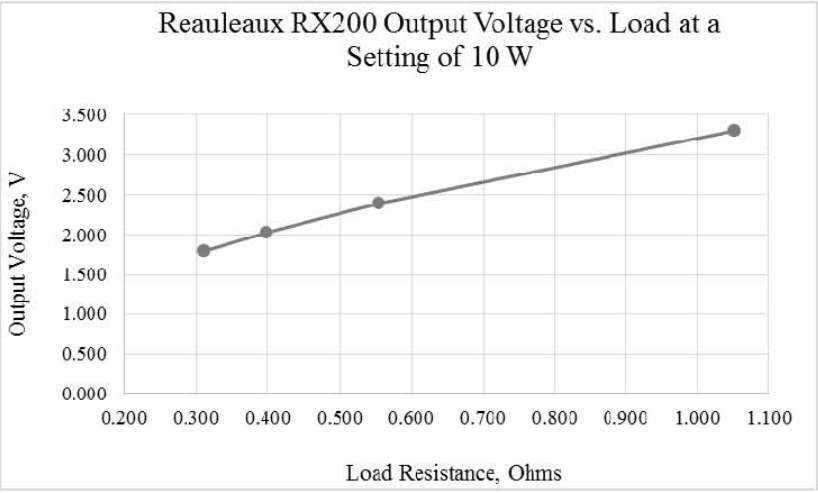
Claim Limitation	Joyetech's Wismec Reuleaux RX200

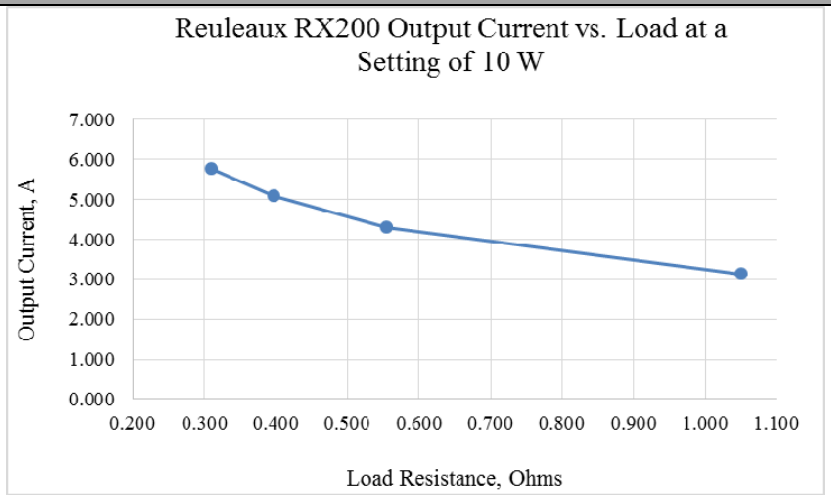
Ten Watt Setting

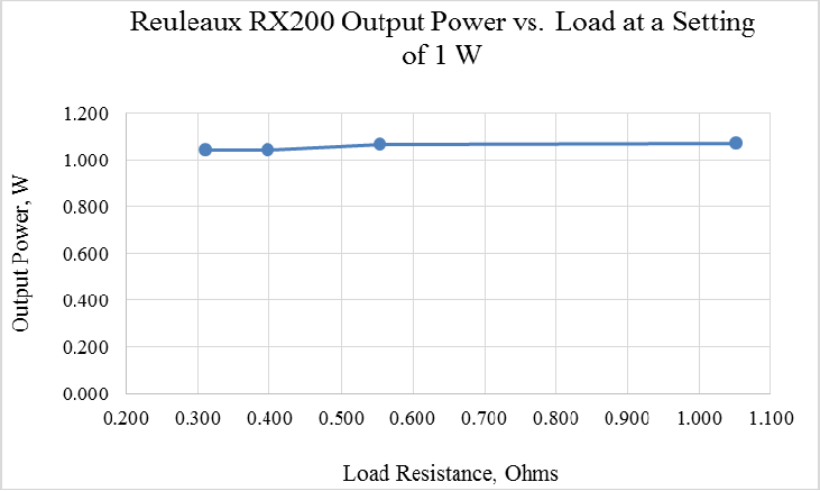
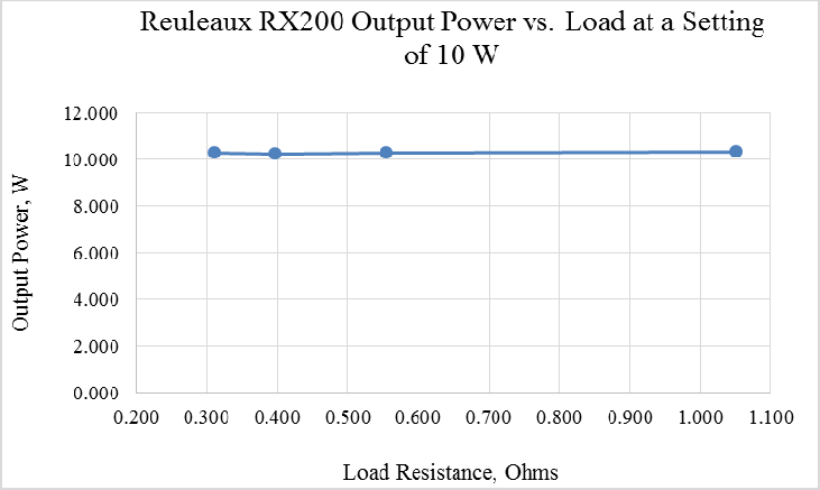
10.303	0.311	1.790
10.252	0.398	2.020
10.292	0.555	2.390
10.352	1.052	3.300

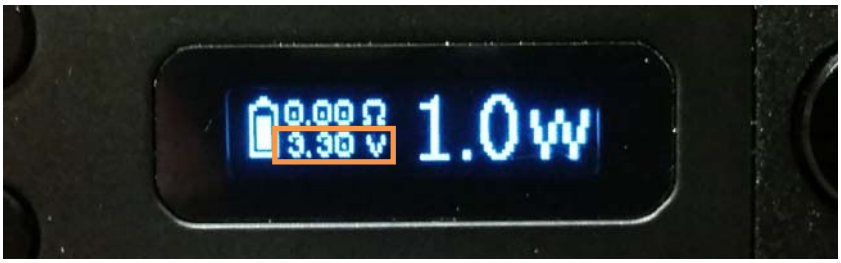
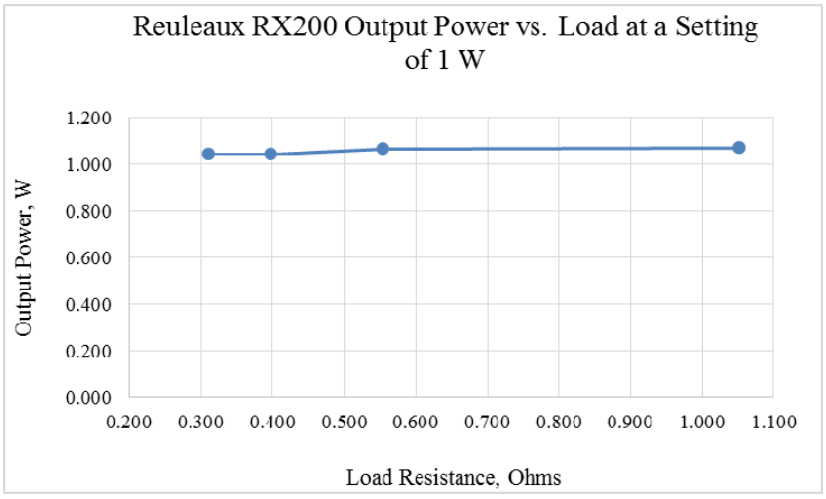


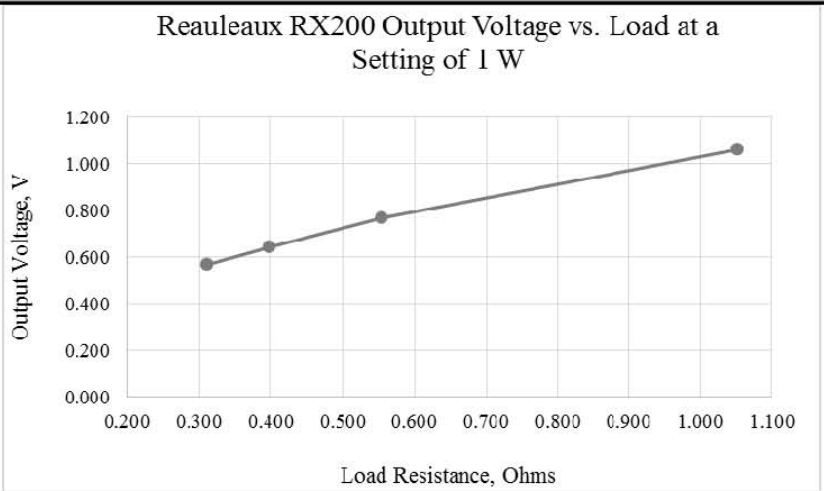
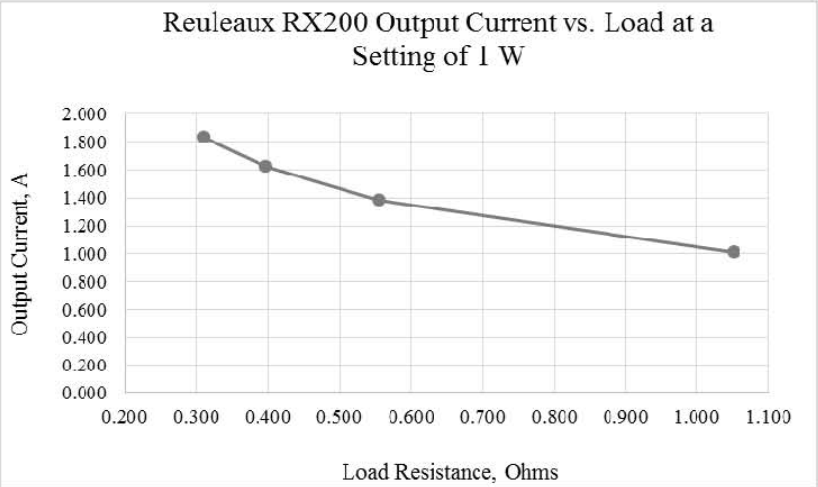
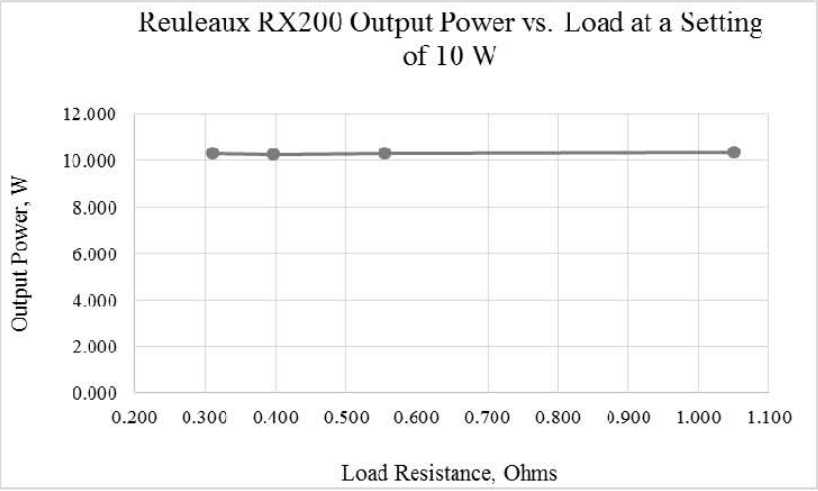


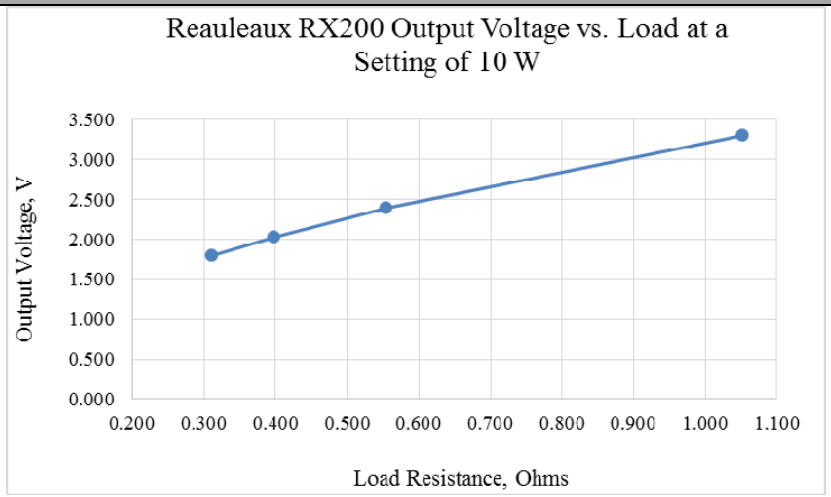
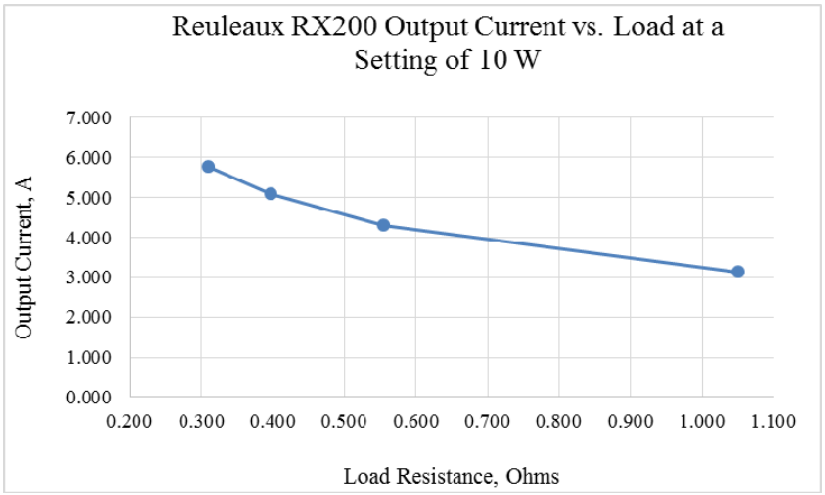
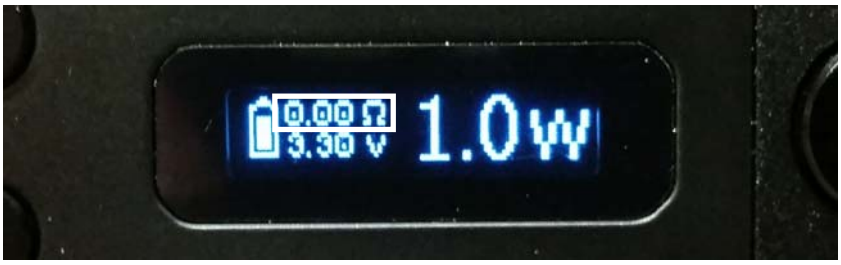
Claim Limitation	Joyetech's Wismec Reuleaux RX200
	  

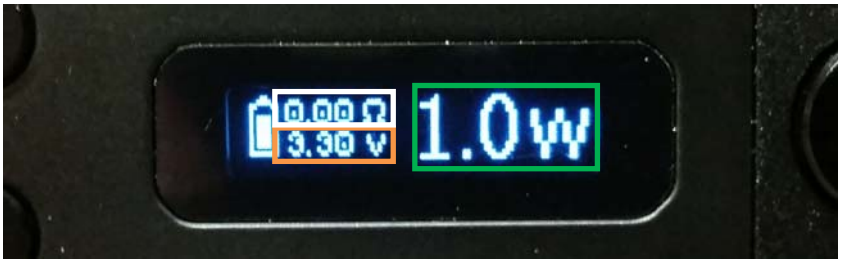
Claim Limitation	Joyetech's Wismec Reuleaux RX200
	 The tests performed and charts provided therefrom demonstrate practice of the claimed aspect, specifically providing an input signal to the power source to adjust at least one of a current or a voltage provided by the power source to regulate the power level.
5. The electronic vaporizer device of claim 1, wherein the power manager is configured to adjust at least one of a current or a voltage output by the power source to regulate the power level delivered to the heating element to substantially the wattage setting during activation of the	The device power manager is the RX200 circuit board, partially boxed in red within the device housing.  The device controls and testing indicate that the device power manager controls power source to change at least voltage to maintain the selected wattage level delivered to the heating element. In particular, during testing, the measured voltage varied when different resistors were attached to maintain the selected wattage setting.

Claim Limitation	Joyetech's Wismec Reuleaux RX200
electronic vaporizer device.	Reuleaux RX200 **Measured Power** / **Resistance** / **Measured Voltage** *One Watt Setting* 1.045 / 0.311 / 0.570 1.045 / 0.398 / 0.645 1.066 / 0.555 / 0.769 1.072 / 1.052 / 1.062 *Ten Watt Setting* 10.303 / 0.311 / 1.790 10.252 / 0.398 / 2.020 10.292 / 0.555 / 2.390 10.352 / 1.052 / 3.300   The tests performed and charts provided therefrom

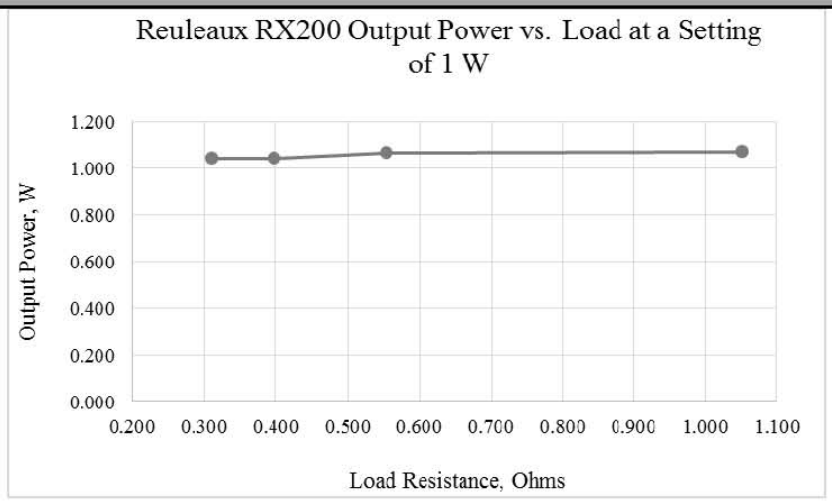
Claim Limitation	Joyetech's Wismec Reuleaux RX200
	demonstrate practice of the claimed aspect, specifically adjusting at least one of a current or a voltage output by the power source to regulate the power level to the wattage setting.
6. The electronic vaporizer device of claim 1, wherein the power manager is configured to sense at least one of a current or a voltage applied to the heating element in real time.	The voltage is sensed and shown on the display, boxed here in orange.  Further, the RX200 circuit board acts as the device power manager and, as demonstrated through testing, varies at least the voltage to maintain a wattage selected by the user. The graphs below demonstrate constant power with changing resistance and changing voltage with changing resistance. 

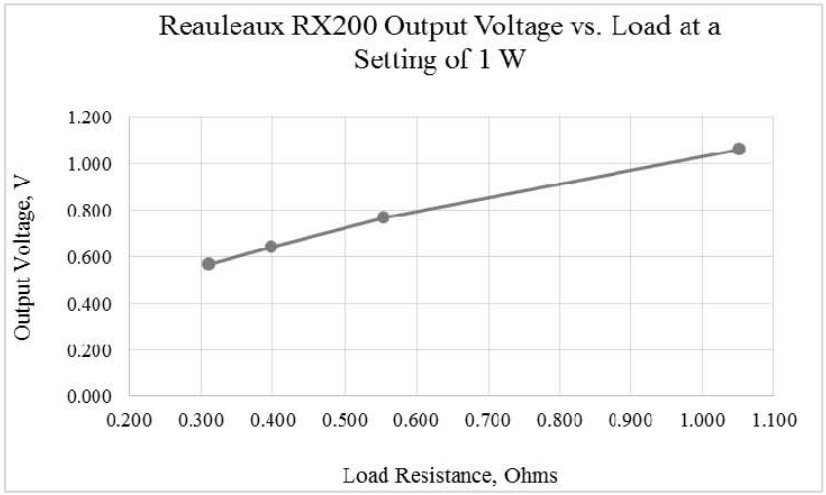
Claim Limitation	Joyetech's Wismec Reuleaux RX200
	  

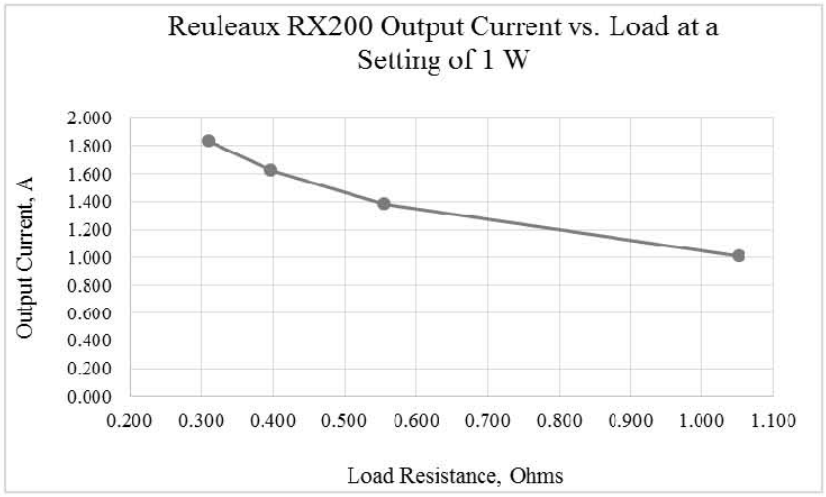
Claim Limitation	Joyetech's Wismec Reuleaux RX200
	 
7. The electronic vaporizer device of claim 1, wherein the power manager is configured to determine a resistance of the heating element in real time.	Resistance is determined in real time for power management as shown in the plots provided with claim 6. Resistance of the heating element is determined in real-time and displayed on the display, boxed in white below. 

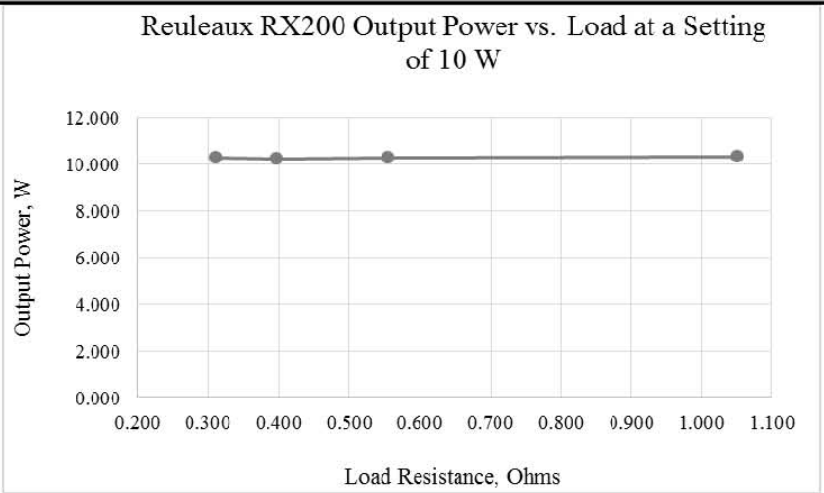
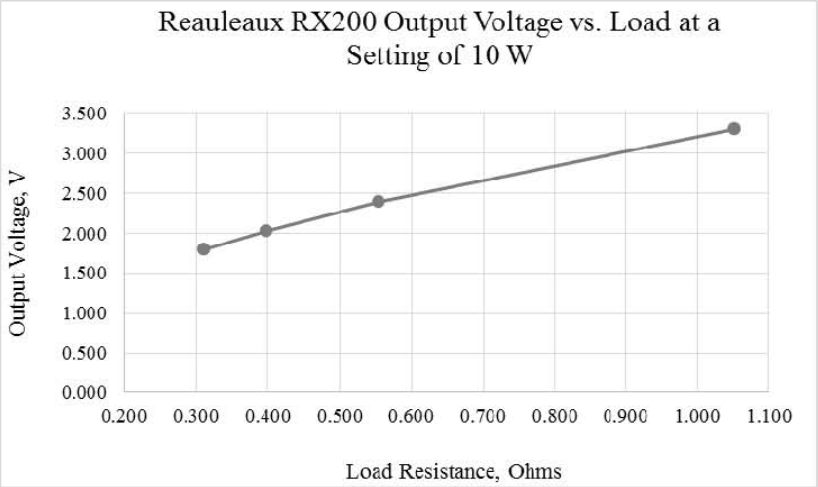
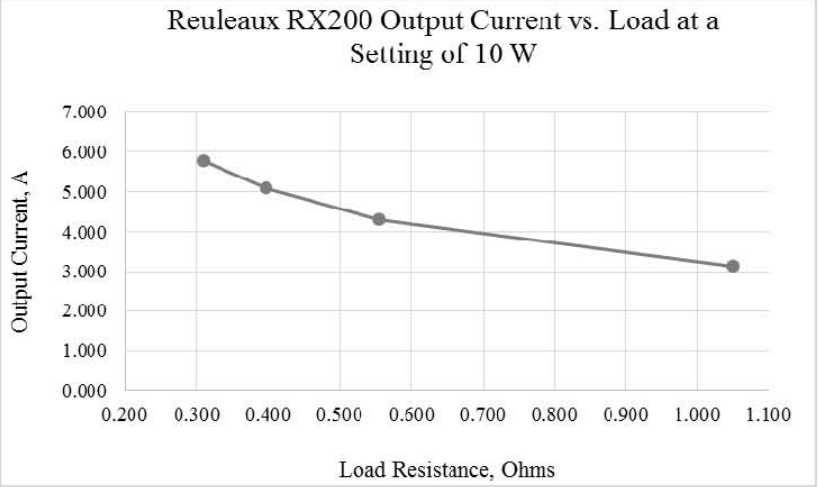
Claim Limitation	Joyetech's Wismec Reuleaux RX200
8. The electronic vaporizer device of claim 1, further comprising a display component operatively connected to the power manager and configured to display at least one of the wattage setting, a real time watt output, a resistance of the heating element in real time, a voltage applied to the heating element in real time, or a current applied to the heating element in real time.	The claimed display is present and boxed in red below on the RX200 circuit board. The display is also visible comprising a portion of the exterior of the RX200 device.   The display provides at least one of the wattage setting (boxed in green above), the real time watt output (known to correspond within engineering tolerances to the wattage setting in accordance with testing), the resistance (boxed in white above), and the voltage (boxed in orange above). The inset photo shows the display with wattage setting (1.0 W) and a real time resistance of the heating element (zero Ω with no cartridge attached), satisfying the claim elements. The graphs below showing values measured in device testing further reinforce the determination of values for display.

Claim Limitation	Joyetech's Wismec Reuleaux RX200

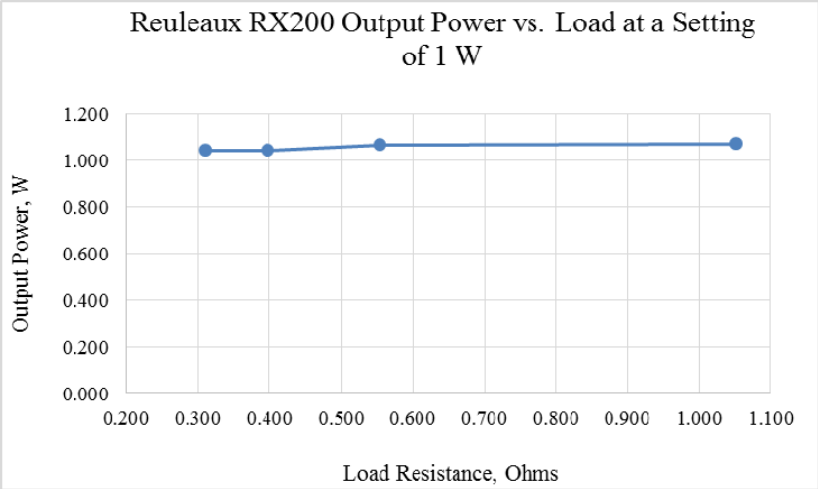
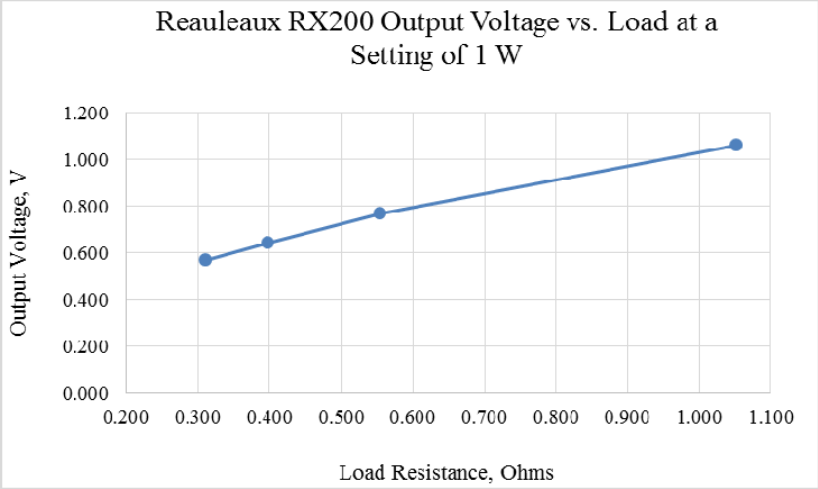
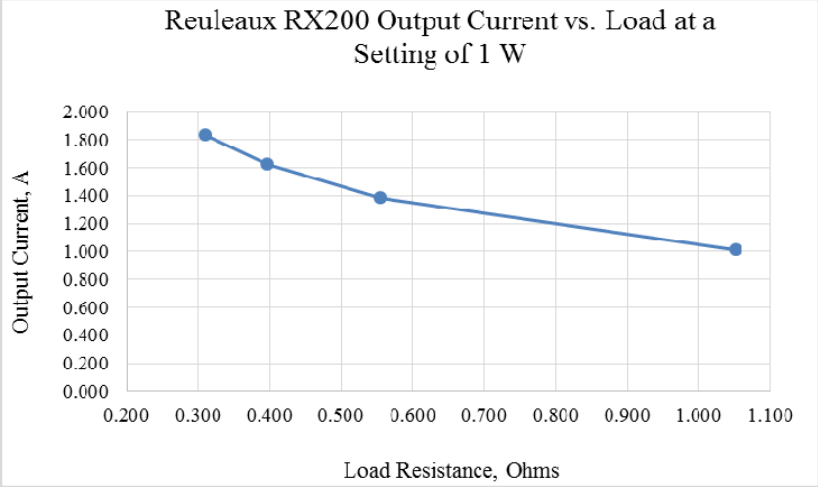


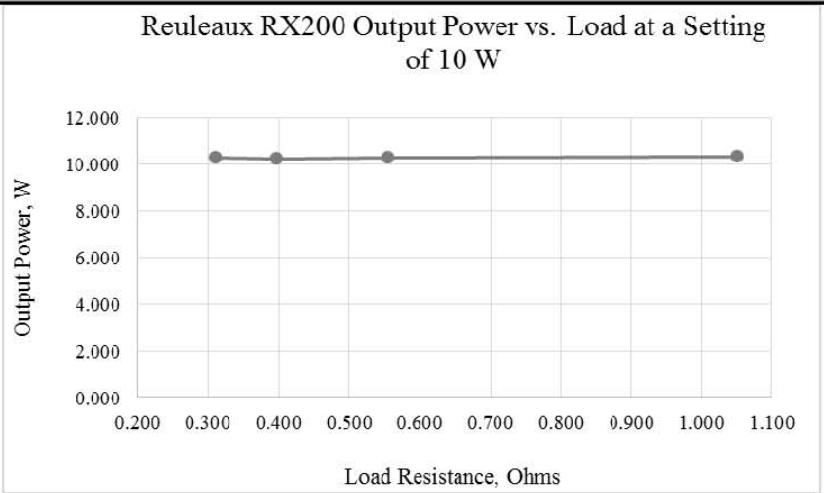
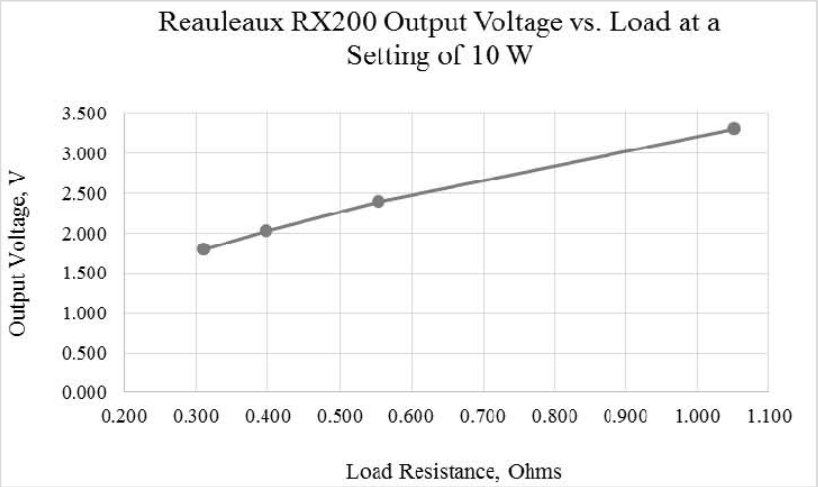
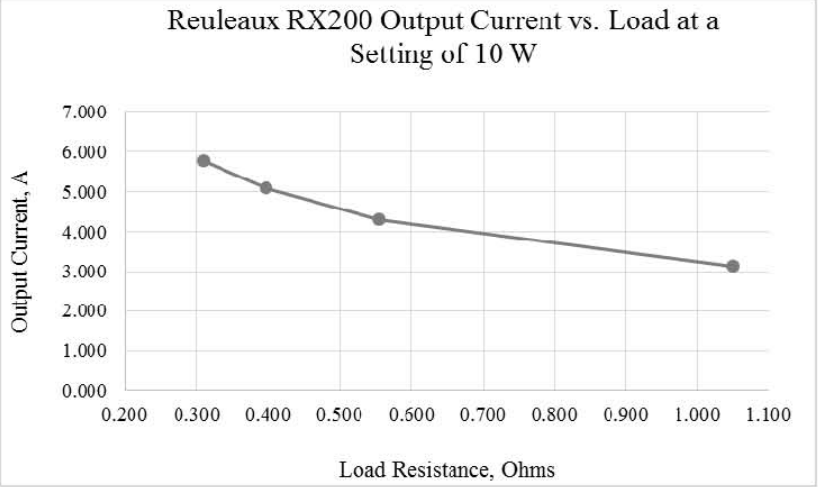


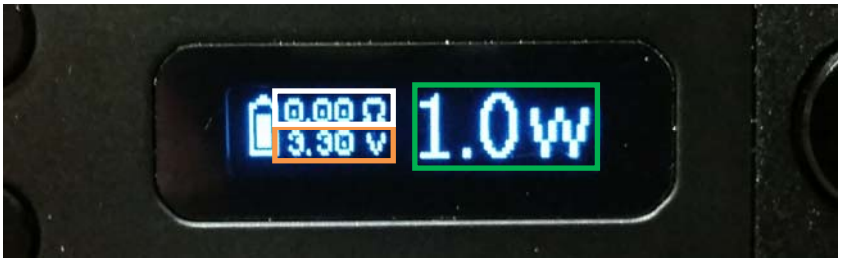


Claim Limitation	Joyetech's Wismec Reuleaux RX200
	  

Claim Limitation	Joyetech's Wismec Reuleaux RX200
9. The electronic vaporizer device of claim 1, wherein the power manager is configured to simultaneously measure or sense at least two of a resistance of the heating element, an output voltage of the heating element, and an output current of the heating element as part of regulating the power level delivered to the heating element.	The RX200 circuit board must measure at least two of the resistance of the heating element, an output voltage of the heating element and an output current of the heating element as part of regulating the power level delivered to the heating element since power is a function of current, voltage and resistance. No regulation can occur with fewer than these two variables determined by the device. As demonstrated in the testing and shown in the tables and graphs above, the RX200 circuit board varied the output voltage in response to changes in the heating element resistance to maintain the selected wattage, necessarily practicing claim 9.
10. The electronic vaporizer device of claim 1, wherein the power manager is configured to simultaneously control one of a resistance of the heating element, an output voltage of the	The device power manager (*e.g.*, circuitry) practices at least controlling one of the output voltage and/or output current (the first sub-element of the claim) as shown below in the graphs of testing demonstrating constant power in view of changing voltage and resistance.

Claim Limitation	Joyetech's Wismec Reuleaux RX200
heating element, and an output current of the heating element while measuring another of the resistance of the heating element, the output voltage of the heating element, and the output current of the heating element as part of regulating the power level delivered to the heating element.	  

Claim Limitation	Joyetech's Wismec Reuleaux RX200
	   Simultaneously measurements are taken of at least one of the resistance, output voltage, and/or output current

Claim Limitation	Joyetech's Wismec Reuleaux RX200
	(the second sub-element of the claim), as is necessary to effect regulation. These values are also displayed as shown below, with resistance boxed in white and voltage boxed in orange. 
11. An electronic vaporizing system used to simulate smoking, comprising:	 The Reuleaux RX200 (boxed in red) is a vaporizer device used to simulate smoking by providing power for vaporization. It is shown here with a cartridge (*e.g.*, atomizer and consumable, boxed in yellow) attached.

Claim Limitation	Joyetech's Wismec Reuleaux RX200
a cartridge containing a heating element for vaporizing a material for inhaling;	 The hardware port (boxed in red) accepts a cartridge. Electronic vaporizing systems and electronic cigarettes include the resistance element in the cartridge containing the material for vaporization. Such a cartridge is shown in the image relating to the preamble of claim 11, above.
an electronic vaporizer device operatively connected to the cartridge, wherein the electronic vaporizer device is configured to: allow a user to select a wattage setting from a plurality of wattage settings, wherein the wattage setting corresponds to a power level in watts to be delivered to the heating element for vaporizing	The control buttons on the Reuleaux RX200 device provide a user input device that allows a user to select a wattage setting (boxed in yellow) from a plurality of wattage settings. The Reuleaux RX200 buttons allow the user to select settings from 1 watt up to 200 watts in one tenth of one watt increments. The pair of buttons is shown in red boxes in the picture of the board underlying the external controls. The wattage is displayed after selection. 

Claim Limitation	Joyetech's Wismec Reuleaux RX200
the material during a simulated smoking session,	  Testing confirmed that the wattage setting corresponds to the power level in watts delivered to the heating element for vaporizing a material during a simulated smoking session. Testing of the accused device to confirm correspondence of set power level to actual power level employed multiple resistors of known resistance. The multiple resistors of known resistance model the resistance of the heating element and changes to resistance thereof. The test equipment was electrically coupled with the component for attaching cartridges to the unit to place known resistors in the operational electrical path without disruption. The tests accounted for resistance consequent to the testing setup. In an example testing iteration, with the device wattage set to 1.0 watts, the device was actuated. With 0.311 ohm resistance applied to the device, the output voltage generated by the device was 0.570 volts, and the

<table>
<tr><th>Claim Limitation</th><th>Joyetech's Wismec Reuleaux RX200</th></tr>
<tr><td></td><td>measured power was 1.045 watts, within engineering tolerances of the programmed value to be delivered. Repeating the test with a resistor at 0.398, 0.555 and 1.052 ohms similar results were observed.

Reuleaux RX200

<table>
<tr><th>Measured Power</th><th>Resistance</th><th>Measured Voltage</th></tr>
<tr><td>1.045</td><td>0.311</td><td>0.570</td></tr>
<tr><td>1.045</td><td>0.398</td><td>0.645</td></tr>
<tr><td>1.066</td><td>0.555</td><td>0.769</td></tr>
<tr><td>1.072</td><td>1.052</td><td>1.062</td></tr>
</table>

The same test was performed with a selected wattage of 10 watts. Again the measured wattage corresponded to the selected wattage within engineering tolerances.

Reuleaux RX200

<table>
<tr><th>Measured Power</th><th>Resistance</th><th>Measured Voltage</th></tr>
<tr><td>10.303</td><td>0.311</td><td>1.790</td></tr>
<tr><td>10.252</td><td>0.398</td><td>2.020</td></tr>
<tr><td>10.292</td><td>0.555</td><td>2.390</td></tr>
<tr><td>10.352</td><td>1.052</td><td>3.300</td></tr>
</table>

As the measured power is in the output path of the device, simulating the presence of a cartridge (e.g., atomizer), this is the power which would be delivered to the heating element of the cartridge.</td></tr>
<tr><td>generate the power level to be delivered to the heating element, and</td><td>The power source is provided by the battery enclosure holding the batteries (e.g., three IMR 18650 3.7V / 3000MAH / 40A batteries). The power source is the sole source of power and the testing indicated the</td></tr>
</table>

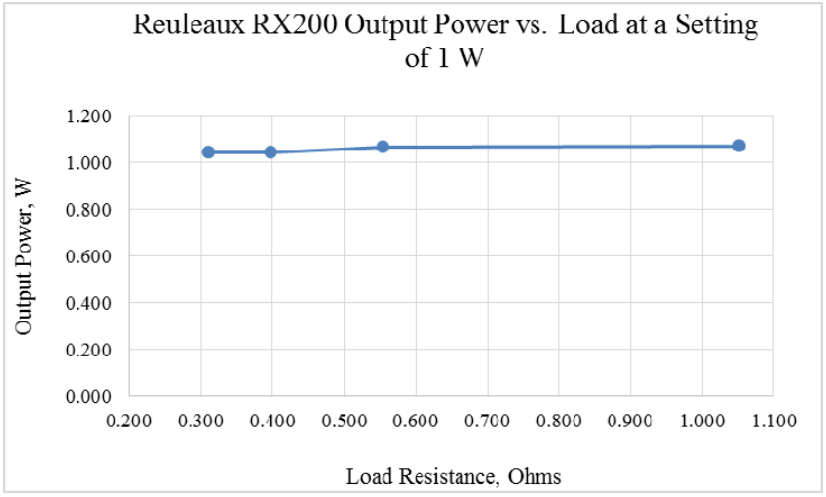
Claim Limitation	Joyetech's Wismec Reuleaux RX200
	selected power level corresponds to the power delivered to the heating element.  The micro-USB (universal serial bus) port adjacent the control buttons can also be used for battery recharging. 
regulate the power level to about the wattage setting during activation of the electronic vaporizer device, even when the heating element changes, to provide a consistent vapor during the simulated smoking session.	Testing confirmed accurate regulation based on the user input regardless of changes to the heating element (*e.g.*, actual resistance). This was shown by, *e.g.*, varying resistance in testing to simulate changes in the heating element. In the testing, the Reuleaux RX200 wattage set point was kept constant and different known resistors attached. Values such as, *e.g.*, the output voltage were shown to change with the varying resistance to maintain constant wattage. This test was performed at user selected 1 watt and 10 watt settings. As shown in the graphs below, the device power

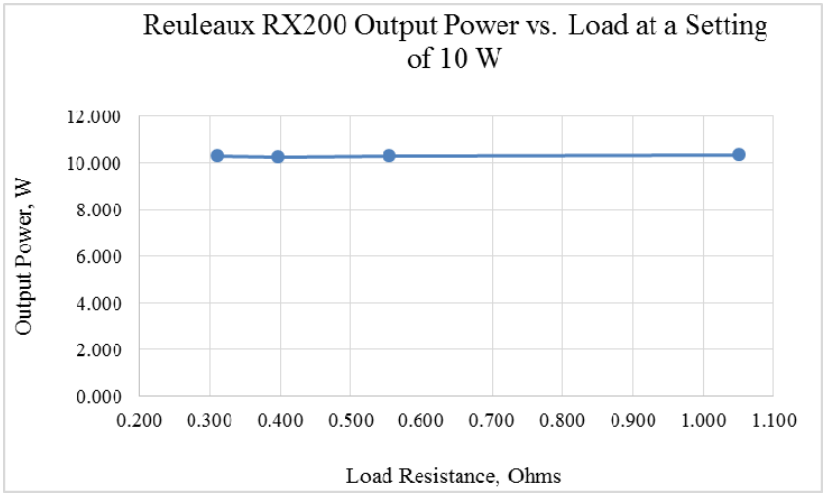
Claim Limitation	Joyetech's Wismec Reuleaux RX200

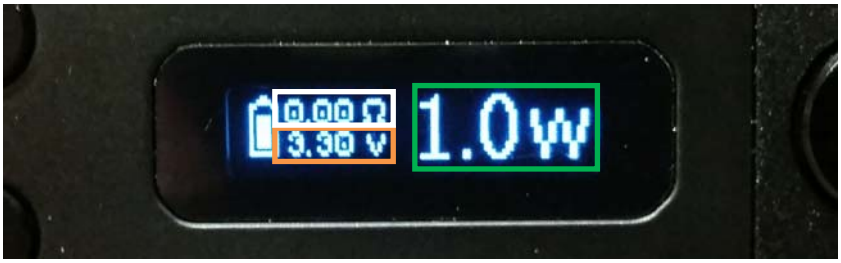
manager regulated wattage regardless of heating element changes.

Reuleaux RX200

Measured Power	Resistance	Measured Voltage
	One Watt Setting	
1.045	0.311	0.570
1.045	0.398	0.645
1.066	0.555	0.769
1.072	1.052	1.062
	Ten Watt Setting	
10.303	0.311	1.790
10.252	0.398	2.020
10.292	0.555	2.390
10.352	1.052	3.300

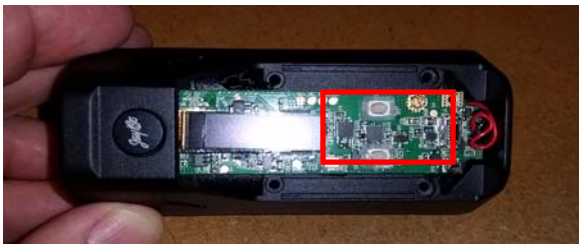




Claim Limitation	Joyetech's Wismec Reuleaux RX200
	Because power output is regulated to a consistent level, quantity and quality of vapor would be consistent.
12. The electronic vaporizing system of claim 11, wherein the electronic vaporizer device is configured to display at least one of the wattage setting, a resistance of the heating element in real time, a voltage applied to the heating element in real time, or a current applied to the heating element in real time.	The claimed display is present and boxed in red on the RX200 circuit board.   The display is also visible comprising a portion of the exterior of the RX200 device. The display provides at least one of the wattage setting (boxed in green), the real time watt output (known to correspond within engineering tolerances to the wattage setting based on testing), the resistance (boxed in white), and the voltage (boxed in orange). The inset photo shows the display with wattage setting (1.0 W) and a real time resistance of the heating element (zero Ω with no cartridge attached), satisfying the claim elements.

Claim Limitation	Joyetech's Wismec Reuleaux RX200
13. The electronic vaporizing system of claim 11, wherein the electronic vaporizer device is configured to allow a user to activate the electronic vaporizer device to initiate delivery of the power level to the heating element.	  The external "Fire" button links to circuit board, providing a combination button input and electronic trigger (both boxed in red) for activation.
14. The electronic vaporizing system of claim 11, wherein the cartridge is configured to allow a user to inhale a vaporized material produced inside the cartridge.	 The mouthpiece for inhalation, boxed in red, is shown at the end of the cartridge distal to the RX200.

Claim Limitation	Joyetech's Wismec Reuleaux RX200
15. The electronic vaporizing system of claim 11, wherein the electronic vaporizer device is configured as a portable electronic hand-held device.	  The RX200 is portable and hand-held.
16. The electronic vaporizing system of claim 11, wherein the cartridge is configured to be connected to and disconnected from the electronic vaporizer device.	 The hardware port accepts a removable and re-installable cartridge. The port is threaded to allow connection and disconnection. Electronic vaporizing systems and electronic cigarettes include the resistance element in the cartridge containing the material for vaporization. A cartridge is shown attached above (*e.g.*, claim 15).

Claim Limitation	Joyetech's Wismec Reuleaux RX200
17. The electronic vaporizing system of claim 11, wherein the electronic vaporizer device is configured to connect to and operate with cartridges having heating elements of different resistances.	 The RX200 includes a connection on its upper surface that is threaded to accept multiple cartridges having heating elements of different resistances. The threaded connection and electrical connector are common to a variety of similar products. Electronic vaporizing systems and electronic cigarettes include the resistance element in the cartridge containing the material for vaporization. Varying resistance elements and the changing resistance of a resistance element through its service life are known in the art.
18. The electronic vaporizing system of claim 11, wherein the electronic vaporizer device is configured to regulate, in real time, the power level delivered to the heating element to about the wattage setting during activation of the electronic vaporizer device, even as the	The RX200 (particularly, *e.g.*, its circuit board, which includes microcontrollers generally boxed in red), is configured to practice the claimed regulation aspects in real time and while resistance of the heating element changes as demonstrated through testing.  The testing confirmed accurate control based on the user input regardless of changes to the heating element (*e.g.*, actual resistance). This was shown by, *e.g.*,

<table>
<tr><th>Claim Limitation</th><th>Joyetech's Wismec Reuleaux RX200</th></tr>
<tr><td>resistance of the heating element changes.</td><td>varying resistance in testing to simulate changes in the heating element. In the testing, the Reuleaux RX200 wattage set point was kept constant and different known resistors attached. Values such as, e.g., the output voltage were shown to change with the varying resistance to maintain constant wattage. This test was performed at user selected 1 watt and 10 watt settings. As shown in the graphs below, for which the measurements were taken over time as battery power decreased, the device power manager regulated wattage regardless of heating element changes.

Reuleaux RX200

<table>
<tr><th>Measured Power</th><th>Resistance</th><th>Measured Voltage</th></tr>
<tr><td></td><td>One Watt Setting</td><td></td></tr>
<tr><td>1.045</td><td>0.311</td><td>0.570</td></tr>
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<tr><td>1.072</td><td>1.052</td><td>1.062</td></tr>
<tr><td></td><td>Ten Watt Setting</td><td></td></tr>
<tr><td>10.303</td><td>0.311</td><td>1.790</td></tr>
<tr><td>10.252</td><td>0.398</td><td>2.020</td></tr>
<tr><td>10.292</td><td>0.555</td><td>2.390</td></tr>
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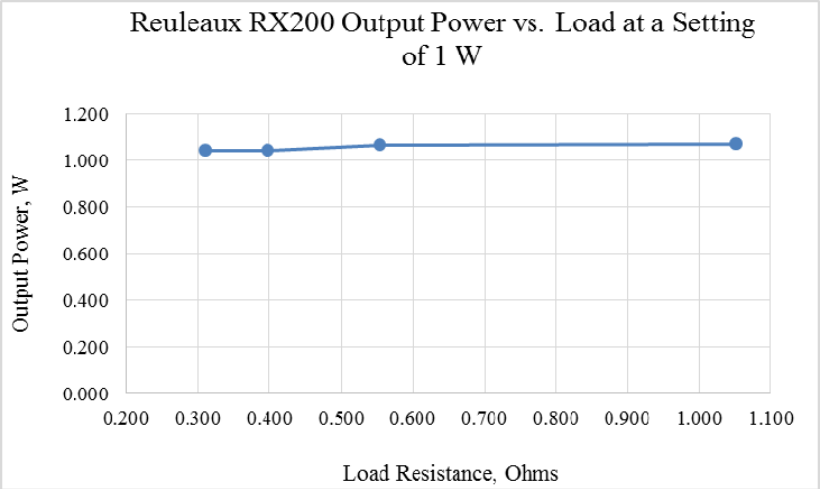
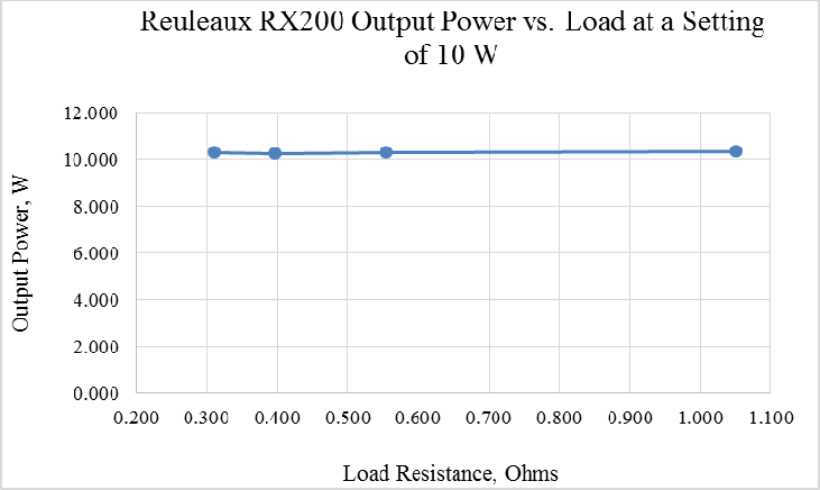
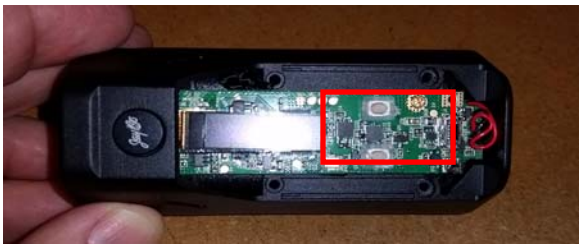
</table>
</td></tr>
</table>

Claim Limitation	Joyetech's Wismec Reuleaux RX200
	  Because power output is regulated to a consistent level, quantity and quality of vapor would be consistent.

Claim Limitation	Joyetech's Wismec Reuleaux RX200
19. A method to simulate smoking with an electronic vaporizer device and a cartridge, comprising:	 The RX200 practices the claimed method. The RX200 (boxed in red) is a device used to simulate smoking by providing power for vaporization. It is shown here with a cartridge (*e.g.*, atomizer and consumable, boxed in yellow) attached.
regulating a power level delivered to a heating element of a cartridge connected to an electronic vaporizer device, for vaporizing a material within the cartridge during a simulated smoking session, substantially to a user-selected wattage setting during activation of the electronic vaporizer device to provide a consistent quantity	Users select the wattage using the RX200 control buttons, boxed below in red.    The circuit board, which includes microcontrollers (generally boxed in red), functions as a power manager performing the claimed regulation aspects in the circuit as demonstrated through testing.

<table>
<tr><th>Claim Limitation</th><th>Joyetech's Wismec Reuleaux RX200</th></tr>
<tr><td>and quality of vapor during the simulated smoking session.</td><td>The testing described confirmed accurate regulation based on the user input. This was shown by, e.g., varying resistance in testing to simulate changes in the heating element. In the testing, the Reuleaux RX200 wattage set point was kept constant and different known resistors attached. Values such as, e.g., the output voltage were shown to change with the varying resistance to maintain constant wattage. This test was performed at user selected 1 watt and 10 watt settings using different resistors of known resistance. As shown in the graphs below, for which the measurements were taken over time as battery power decreased, the device power manager regulated wattage to the user setting.

Reuleaux RX200

<table>
<tr><th>Measured Power</th><th>Resistance</th><th>Measured Voltage</th></tr>
<tr><td>1.045</td><td>0.311</td><td>0.570</td></tr>
<tr><td>1.045</td><td>0.398</td><td>0.645</td></tr>
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The same test was performed with a selected wattage of 10 watts. Again the measured wattage corresponded to the selected wattage within engineering tolerances.</td></tr>
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Claim Limitation	Joyetech's Wismec Reuleaux RX200

Reuleaux RX200

Measured Power	Resistance	Measured Voltage
10.303	0.311	1.790
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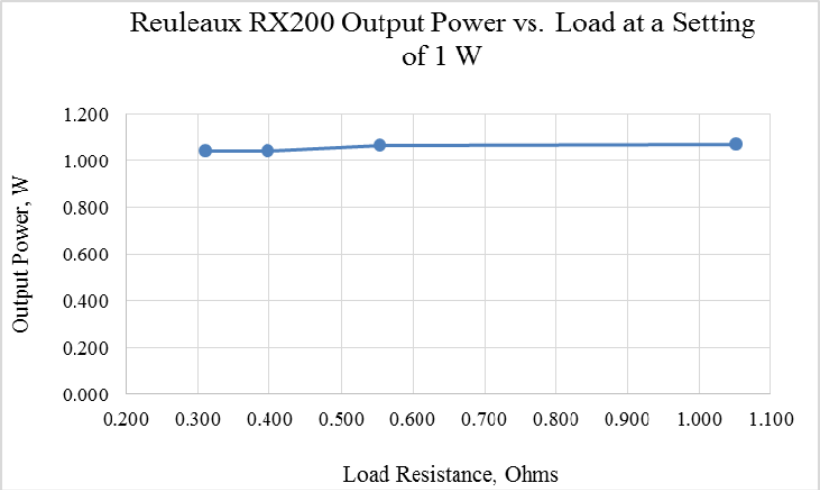
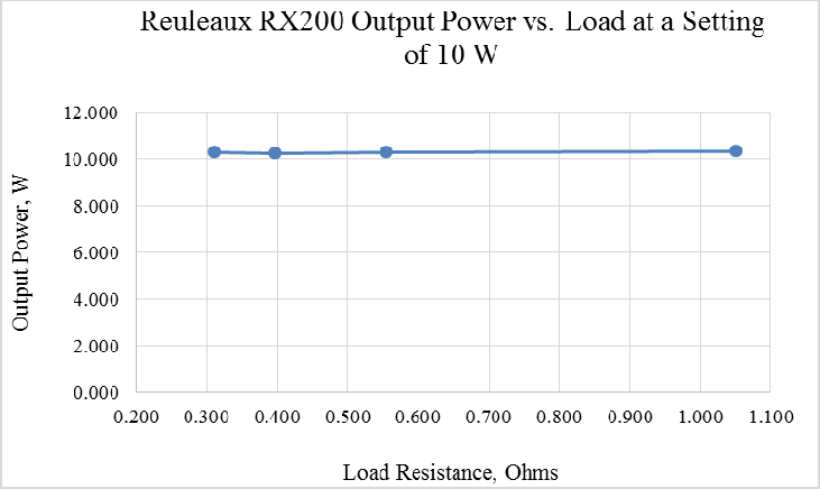
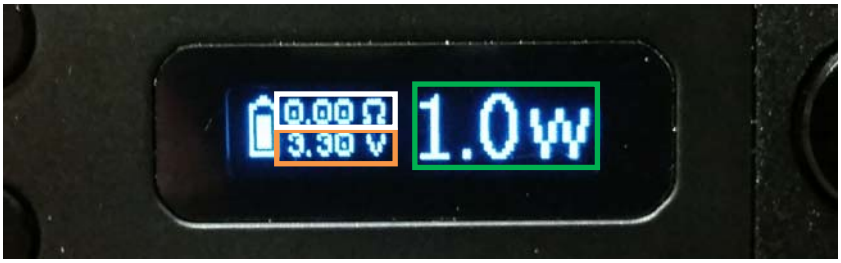




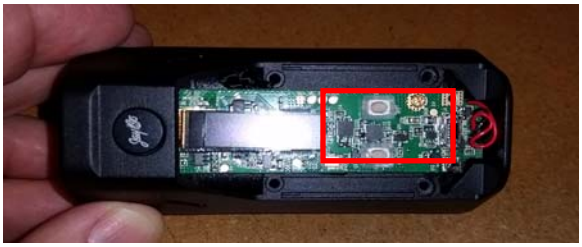
Because power output is regulated to a consistent level, quantity and quality of vapor would be consistent.

Claim Limitation	Joyetech's Wismec Reuleaux RX200
20. The method of claim 19**,** wherein the regulating of the power level, delivered to the heating element, substantially to the user-selected wattage setting is performed in real time regardless of a resistance of the heating element of the cartridge.	The RX200 circuit board (generally outlined below in red and shown in the device housing) performs this function of the claimed device based on testing and circuit design.  The testing confirmed accurate control based on the user input regardless of heating element resistance. This was shown by, *e.g.*, varying resistance in testing to simulate changes in the heating element. In the testing, the Reuleaux RX200 wattage set point was kept constant and different known resistors attached. Values such as, *e.g.*, the output voltage were shown to change with the varying resistance to maintain constant wattage. This test was performed at user selected 1 watt and 10 watt settings. As shown in the graphs above (*e.g.*, claim 19), the device power manager regulated wattage regardless of heating element changes.
21. The method of claim 19, wherein the regulating of the power level, delivered to the heating element,	The RX200 circuit board (generally outlined below in red and shown in the device housing) performs this function of the claimed device based on testing and circuit design.

Claim Limitation	Joyetech's Wismec Reuleaux RX200
substantially to the user-selected wattage setting is performed in real time regardless of a change in a resistance of the heating element of the cartridge during the simulated smoking session.	 The testing confirmed accurate control based on the user input regardless of heating element resistance. This was shown by, *e.g.*, varying resistance in testing to simulate changes in the heating element. In the testing, the Reuleaux RX200 wattage set point was kept constant and different known resistors attached. Values such as, *e.g.*, the output voltage were shown to change with the varying resistance to maintain constant wattage. This test was performed at user selected 1 watt and 10 watt settings. As shown in the graphs above (*e.g.*, claim 19), the device power manager regulated wattage regardless of heating element changes. Different wattages are set which correspond to actual power delivered to heating element in accordance with testing above. The voltage (or temperature) selected are regulated to the target value regardless of other parameters during the smoking session, which is understood to include the entire time of device use rather than only during actuation (*e.g.*, pressing the "Fire" button).

Claim Limitation	Joyetech's Wismec Reuleaux RX200
22. The method of claim 19, further comprising displaying at least one of the wattage setting, a resistance of the heating element, a voltage applied to the heating element, or a current applied to the heating element.	The claimed display of variables is practiced by the RX200. The physical component used for such displaying is present and boxed in red below on the RX200 circuit board.   The display is also visible comprising a portion of the exterior of the RX200 device. The display includes at least one of the wattage setting (boxed in green above), a resistance of the heating element in real time (boxed in white above), or a voltage applied to the heating element in real time (boxed in orange above). The inset photo shows the display with wattage setting (1.0 W) and a real time resistance of the heating element (zero Ω with no cartridge attached), satisfying the claim elements.

Claim Limitation	Joyetech's Wismec Reuleaux RX200
23. An electronic vaporizer device used to simulate smoking, comprising:	 The Reuleaux RX200 is a vaporizer device used to simulate smoking. It is shown here with a cartridge (*e.g.*, atomizer and consumable) attached.
a power source configured to generate a power level being a pre-programmed wattage level to be delivered to a heating element for vaporizing a material during a simulated smoking session; and	The power source is provided by the battery enclosure holding the batteries (*e.g.*, three IMR 18650 3.7V / 3000MAH / 40A batteries). The power source is the sole source of power and the testing indicated the selected power level corresponds to the power delivered to the heating element.  The micro-USB (universal serial bus) port, boxed in red, adjacent the control buttons can also be used for

Claim Limitation	Joyetech's Wismec Reuleaux RX200
	battery recharging. 
a power manager operatively connected to the power source and configured to regulate the power level delivered to the heating element to substantially the pre- programmed wattage level during activation of the electronic vaporizer device, regardless of heating element parameters and a state of the power source, to consistently control a quantity and a quality of vapor produced by the electronic vaporizer device.	The circuit board, which includes microcontrollers (generally boxed in red), functions as a power manager performing the claimed aspects in the circuit as demonstrated through testing.  The testing confirmed accurate control based on the user input regardless of heating element parameters (*e.g.*, actual resistance) and regardless of the state of the power source. This was shown by, *e.g.*, varying resistance in testing to simulate changes in the heating element. In the testing, the Reuleaux RX200 wattage set point was kept constant and different known resistors attached. Values such as, *e.g.*, the output voltage were shown to change with the varying resistance to maintain constant wattage. This test was performed at user selected 1 watt and 10 watt settings. In addition to the variation of the resistance, it was observed during testing that the battery charge level

<table>
<tr><th>Claim Limitation</th><th>Joyetech's Wismec Reuleaux RX200</th></tr>
<tr><td></td><td>
decreased over time. As shown in the graphs below, for which the measurements were taken over time as battery power decreased, the device power manager regulated wattage regardless of heating element and power source changes.

Reuleaux RX200
<table>
<tr><th>Measured Power</th><th>Resistance</th><th>Measured Voltage</th></tr>
<tr><td>1.045</td><td>0.311</td><td>0.570</td></tr>
<tr><td>1.045</td><td>0.398</td><td>0.645</td></tr>
<tr><td>1.066</td><td>0.555</td><td>0.769</td></tr>
<tr><td>1.072</td><td>1.052</td><td>1.062</td></tr>
</table>

The same test was performed with a selected wattage of 10 watts. Again the measured wattage corresponded to the selected wattage within engineering tolerances.

Reuleaux RX200
<table>
<tr><th>Measured Power</th><th>Resistance</th><th>Measured Voltage</th></tr>
<tr><td>10.303</td><td>0.311</td><td>1.790</td></tr>
<tr><td>10.252</td><td>0.398</td><td>2.020</td></tr>
<tr><td>10.292</td><td>0.555</td><td>2.390</td></tr>
<tr><td>10.352</td><td>1.052</td><td>3.300</td></tr>
</table>
</td></tr>
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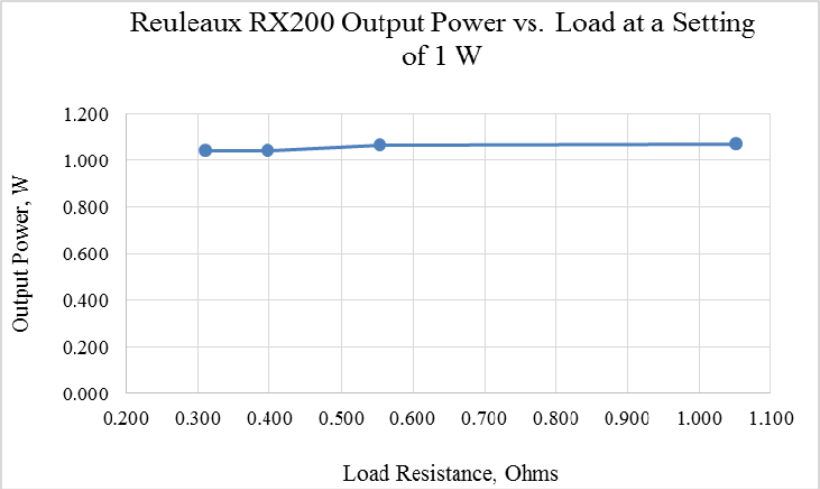
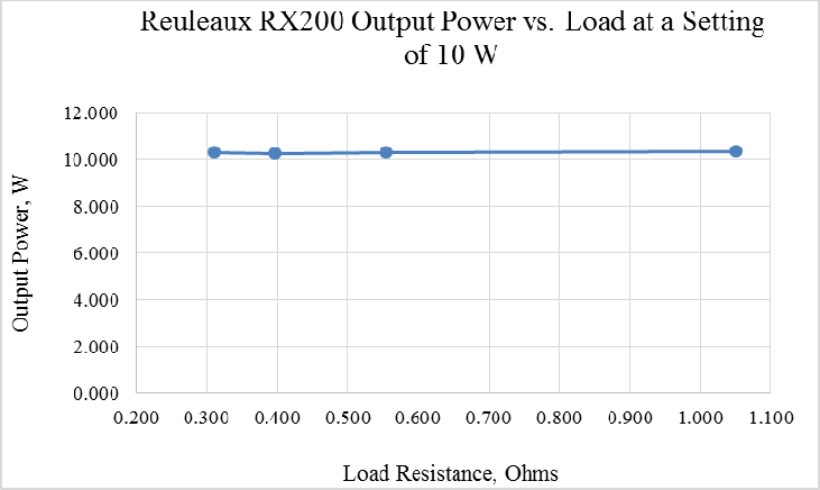
Claim Limitation	Joyetech's Wismec Reuleaux RX200
	  Because power output is regulated to a consistent level, quantity and quality of vapor would be consistent.

EXHIBIT 3

Exhibit 3

'330 Patent Infringement Analysis – Joyetech Cuboid

Claim Limitations	Joyetech Cuboid
1. An electronic vaporizer device used to simulate smoking, comprising:	 The Cuboid is a vaporizer device used to simulate smoking. It is shown here with a cartridge (*e.g.*, atomizer and consumable) attached.
a user input device configured to allow a user to select a wattage setting from a plurality of wattage settings, wherein the wattage setting corresponds to a power level in watts to be delivered to a heating element for vaporizing a material during a simulated smoking session;	The control buttons (boxed in red) on the Cuboid device provide a user input device that allows a user to select a wattage setting (boxed in yellow) from a plurality of wattage settings. 

Claim Limitations	Joyetech Cuboid
	  The Cuboid buttons allow the user to select settings from 1 watt up to 150 watts (or more depending on firmware installed to circuit board) in one tenth of one watt increments. The pair of buttons is shown in red boxes in the picture of the board underlying the external controls. The wattage is displayed after selection. Testing confirmed that the wattage setting corresponds to the power level in watts delivered to the heating element for vaporizing a material during a simulated smoking session. Testing of the Cuboid to confirm correspondence of set power level to actual power level employed multiple resistors of known resistance. The multiple resistors of

<table>
<tr><th>Claim Limitations</th><th>Joyetech Cuboid</th></tr>
<tr><td></td><td>known resistance model the resistance of the heating element and changes to resistance thereof. The test equipment was electrically coupled with the component for attaching cartridges to the unit to place known resistors in the operational electrical path without disruption. The tests accounted for resistance consequent to the testing setup.

In an example testing iteration, with the device wattage set to 1.0 watts, the device was actuated. With 0.311 ohm resistance applied to the device, the output voltage generated by the device was 0.573 volts, and the measured power was 1.056 watts, within engineering tolerances of the programmed value to be delivered. Repeating the test with a resistor at 0.398, 0.555 and 1.052 ohms similar results were observed.

<table>
<tr><th></th><th><u>Cuboid</u></th><th></th></tr>
<tr><th>Measured Power</th><th>Resistance</th><th>Measured Voltage</th></tr>
<tr><td>1.056</td><td>0.311</td><td>0.573</td></tr>
<tr><td>1.042</td><td>0.398</td><td>0.644</td></tr>
<tr><td>1.057</td><td>0.555</td><td>0.766</td></tr>
<tr><td>1.050</td><td>1.052</td><td>1.051</td></tr>
</table>

The same test was performed with a selected wattage of 10 watts. Again the measured wattage corresponded to the selected wattage within engineering tolerances.</td></tr>
</table>

Claim Limitations	Joyetech Cuboid
	Cuboid **Measured Power** / **Resistance** / **Measured Voltage** 10.280 / 0.311 / 1.788 10.202 / 0.398 / 2.015 10.292 / 0.555 / 2.390 10.415 / 1.052 / 3.310 As the measured power is in the output path of the device, simulating the presence of a cartridge (*e.g.*, atomizer), this is the power which would be delivered to the heating element of the cartridge.
a power source configured to generate the power level to be delivered to the heating element; and	The power source is provided by the battery enclosure holding the batteries (*e.g.*, two IMR 18650 3.7V / 3000MAH / 40A batteries). The power source is the sole source of power and the testing indicated the selected power level corresponds to the power delivered to the heating element.  

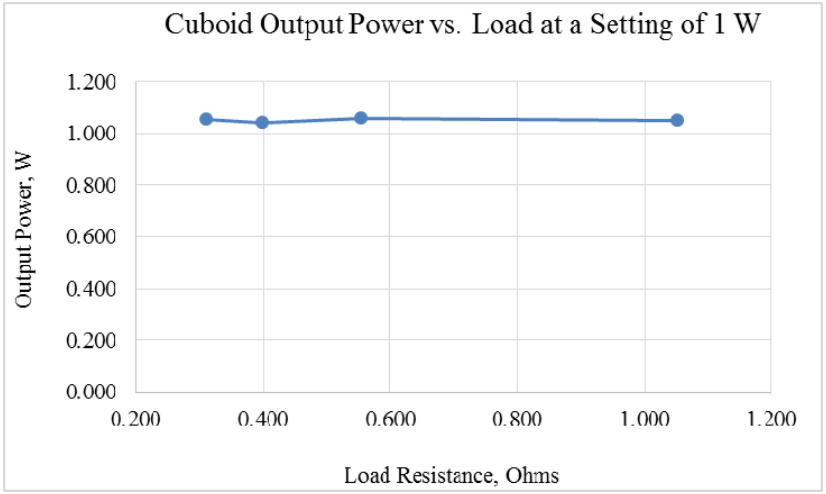
Claim Limitations	Joyetech Cuboid
a power manager operatively connected to the user input device and the power source and configured to regulate the power level delivered to the heating element to substantially the wattage setting during activation of the electronic vaporizer device, regardless of heating element parameters and a state of the power source, to consistently control a quantity and a quality of vapor produced by the electronic vaporizer device.	 The circuit board, which includes a power manager realized through control elements (generally boxed in red), performs the claimed aspects as demonstrated through testing. The testing confirmed accurate control based on the user input regardless of heating element parameters (*e.g.*, actual resistance) and regardless of the state of the power source. This was shown by, *e.g.*, varying resistance in testing to simulate changes in the heating element. In the testing, the Cuboid wattage set point was kept constant and different known resistors attached. Values such as, *e.g.*, the output voltage were shown to change with the varying resistance to maintain constant wattage. This test was performed at user selected 1 watt and 10 watt settings. In addition to the variation of the resistance, it was observed during testing that the battery charge level decreased over time. As shown in the graphs below, for which the measurements were taken over time as battery power decreased, the device power manager regulated wattage regardless of heating element and power source changes.

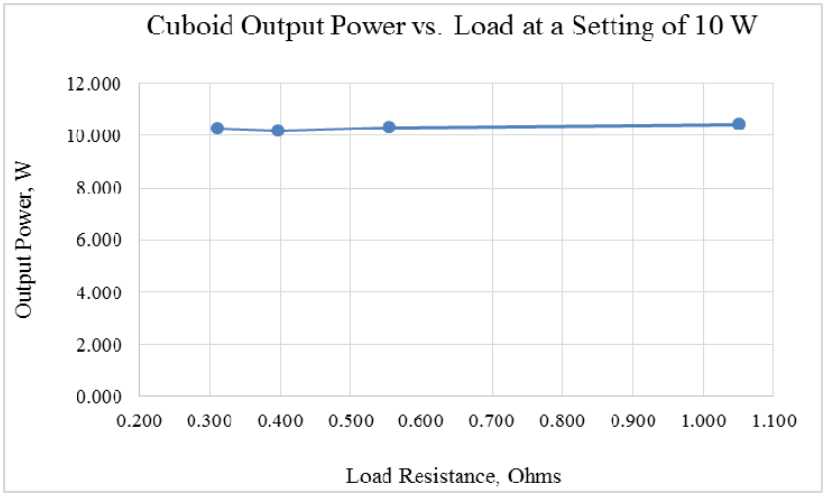
Claim Limitations	Joyetech Cuboid

Cuboid

Measured Power	Resistance	Measured Voltage
	One Watt Setting	
1.056	0.311	0.573
1.042	0.398	0.644
1.057	0.555	0.766
1.050	1.052	1.051
	Ten Watt Setting	
10.280	0.311	1.788
10.202	0.398	2.015
10.292	0.555	2.390
10.415	1.052	3.310

These results are captured visually in the graphs below.





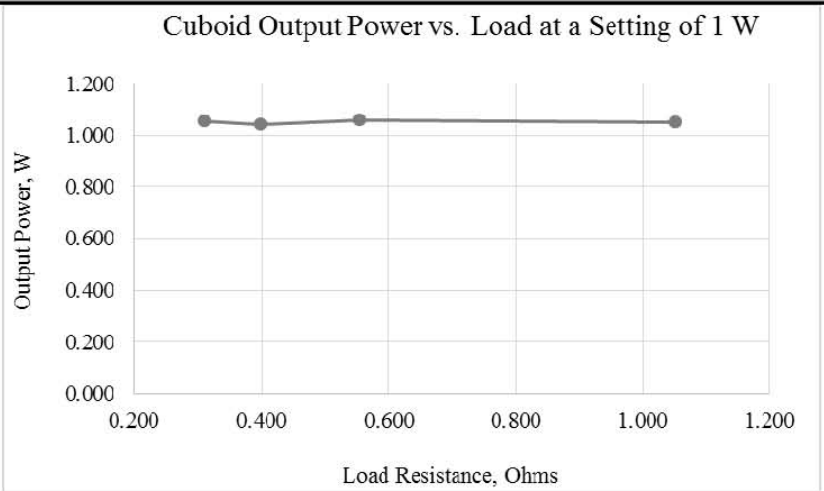
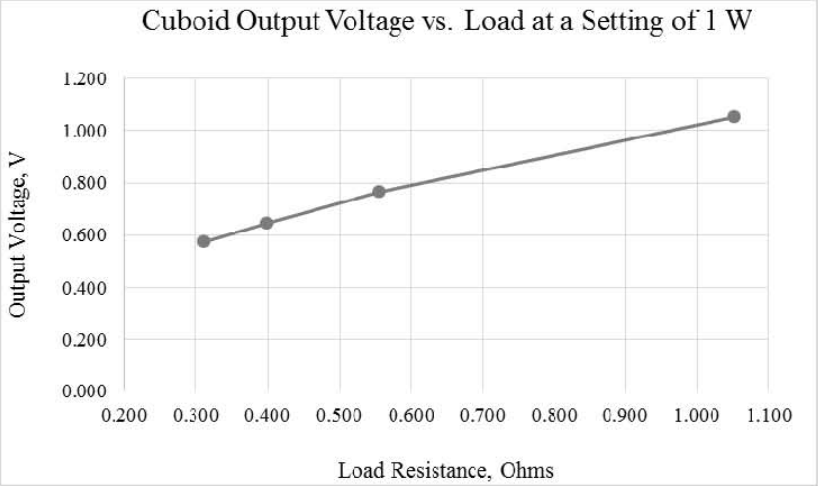
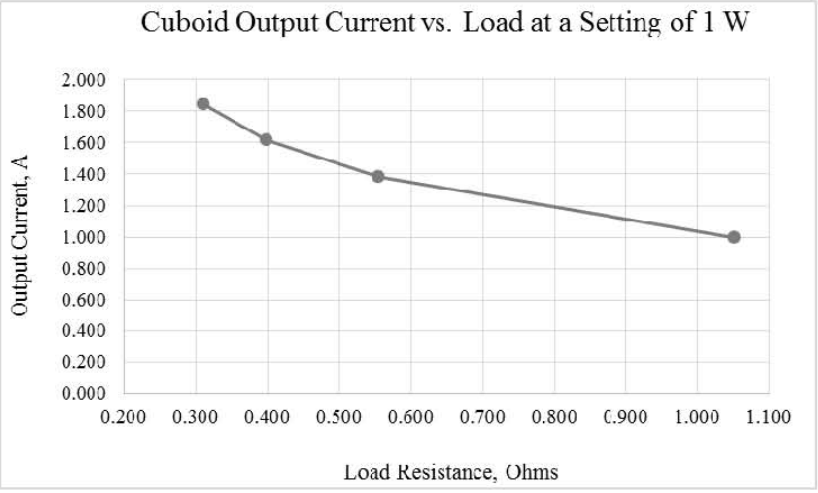
Because power output is regulated to a consistent level,

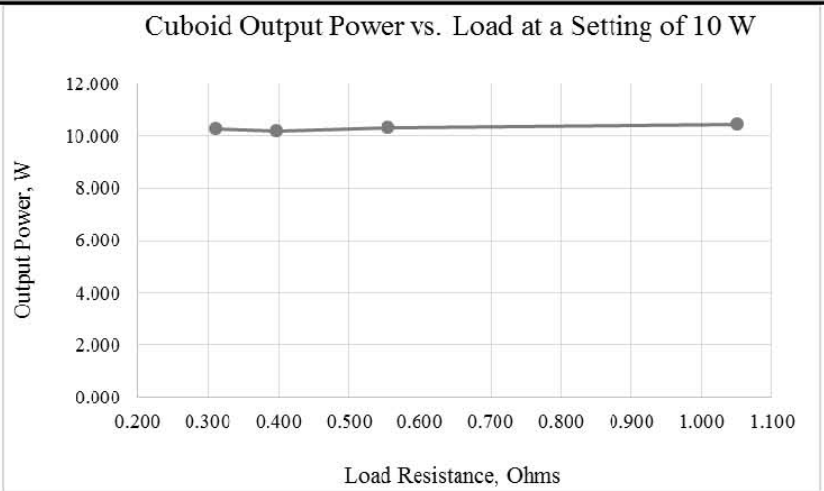
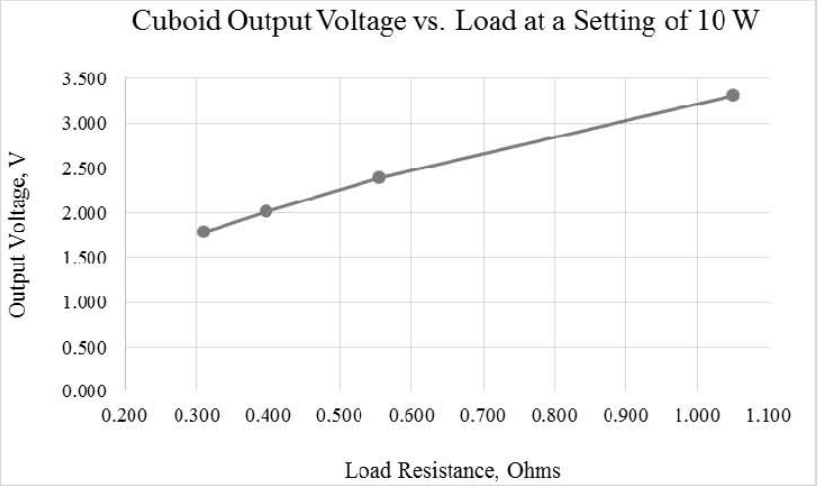
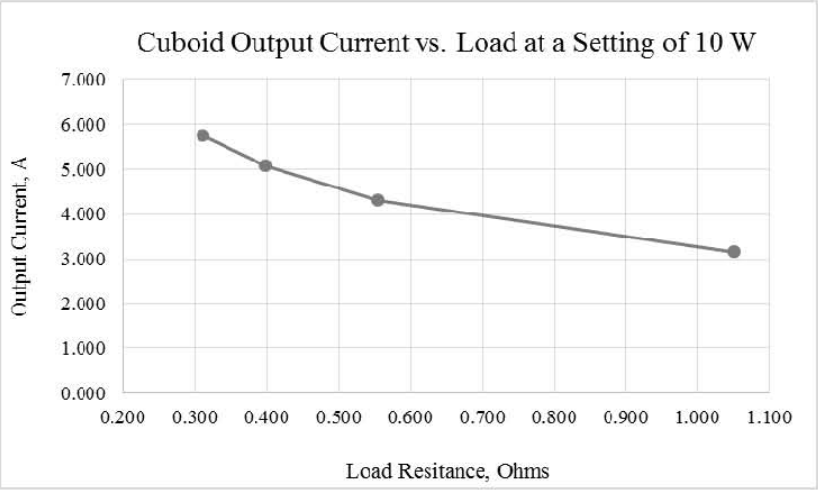
Claim Limitations	Joyetech Cuboid
	quantity and quality of vapor would be consistent.
2. The electronic vaporizer device of claim 1, further comprising a trigger component operatively connected to the power manager and configured to activate the electronic vaporizer device via the power manager.	 The external "Fire" button (boxed in red) links to circuit board, providing a combination button input and electronic trigger for activation.
3. The electronic vaporizer device of claim 2, wherein the trigger component includes at least one of an input from a user, a button input, a voice command, a touch screen input, a motion detection, a pressure switch, a pressure sensor, a flow sensor, or a proximity sensor	 The external "Fire" button (boxed in red) links to circuit board, providing a combination button input and electronic trigger for activation.

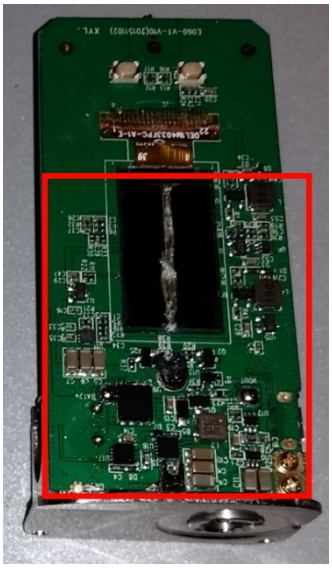
<table>
<tr><th>Claim Limitations</th><th>Joyetech Cuboid</th></tr>
<tr><td>input.</td><td></td></tr>
<tr><td>4. The electronic vaporizer device of claim 1, wherein the power manager is configured to provide an input signal to the power source to adjust at least one of a current or a voltage provided by the power source to regulate the power level delivered to the heating element to substantially the wattage setting during activation of the electronic vaporizer device.</td><td>The device power manager is the Cuboid circuit board, partially boxed in red.
 
The device controls and testing indicate that the device power manager controls power source to change at least voltage to maintain the selected wattage level delivered to the heating element. In particular, during testing, the measured voltage varied when different resistors were attached to maintain the selected wattage setting.

Cuboid

<table>
<tr><th>Measured Power</th><th>Resistance</th><th>Measured Voltage</th></tr>
<tr><td></td><td>One Watt Setting</td><td></td></tr>
<tr><td>1.056</td><td>0.311</td><td>0.573</td></tr>
<tr><td>1.042</td><td>0.398</td><td>0.644</td></tr>
<tr><td>1.057</td><td>0.555</td><td>0.766</td></tr>
<tr><td>1.050</td><td>1.052</td><td>1.051</td></tr>
<tr><td></td><td>Ten Watt Setting</td><td></td></tr>
<tr><td>10.280</td><td>0.311</td><td>1.788</td></tr>
<tr><td>10.202</td><td>0.398</td><td>2.015</td></tr>
<tr><td>10.292</td><td>0.555</td><td>2.390</td></tr>
<tr><td>10.415</td><td>1.052</td><td>3.310</td></tr>
</table>
</td></tr>
</table>

Claim Limitations	Joyetech Cuboid
	  

Claim Limitations	Joyetech Cuboid
	   The tests performed and charts provided therefrom demonstrate practice of the claimed aspect, specifically

<table>
<tr><th>Claim Limitations</th><th>Joyetech Cuboid</th></tr>
<tr><td></td><td>providing an input signal to the power source to adjust at least one of a current or a voltage provided by the power source to regulate the power level to the wattage setting.</td></tr>
<tr><td>5. The electronic vaporizer device of claim 1, wherein the power manager is configured to adjust at least one of a current or a voltage output by the power source to regulate the power level delivered to the heating element to substantially the wattage setting during activation of the electronic vaporizer device.</td><td>The device power manager is the Cuboid circuit board.
 
The device controls and testing indicate that the device power manager controls power source to change at least voltage to maintain the selected wattage level delivered to the heating element. In particular, during testing, the measured voltage varied when different resistors were attached to maintain the selected wattage setting.

<u>Cuboid</u>

Measured Power | Resistance | Measured Voltage
One Watt Setting
1.056 | 0.311 | 0.573
1.042 | 0.398 | 0.644
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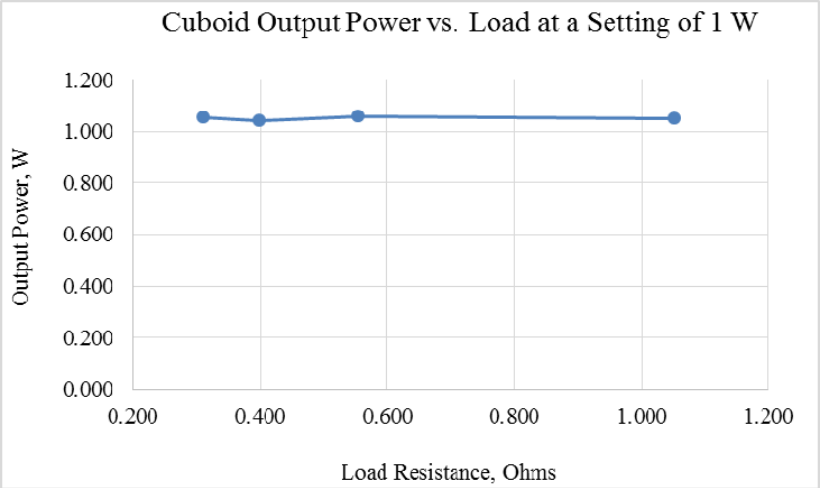
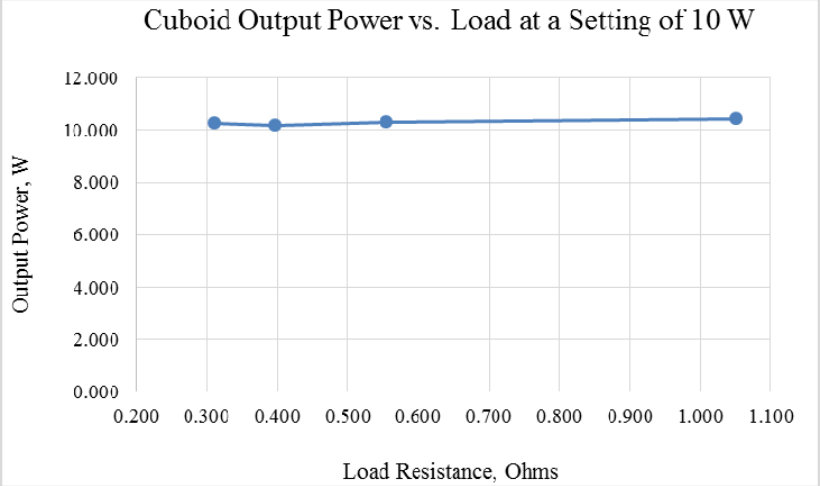
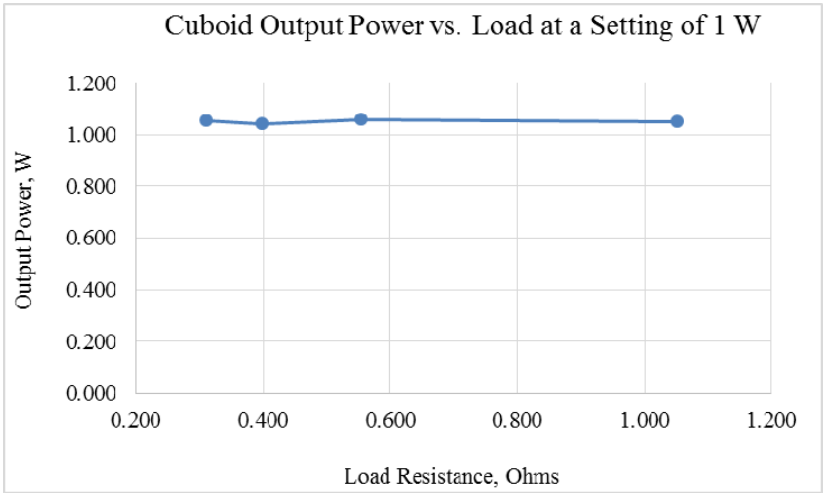
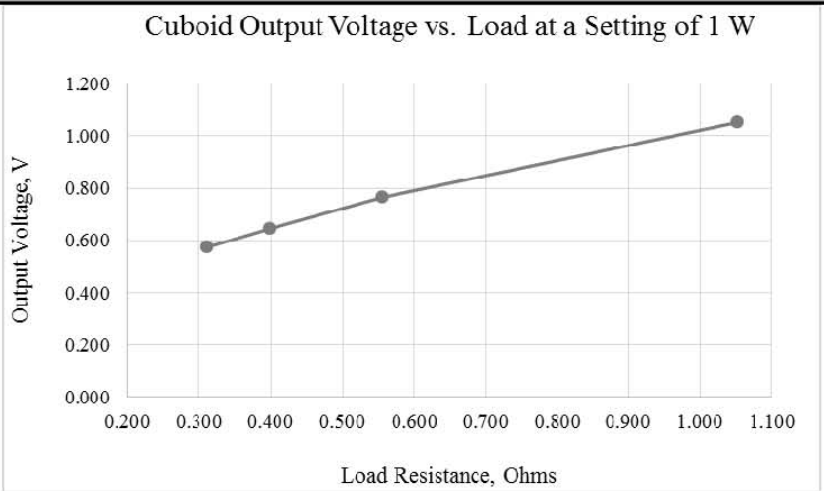
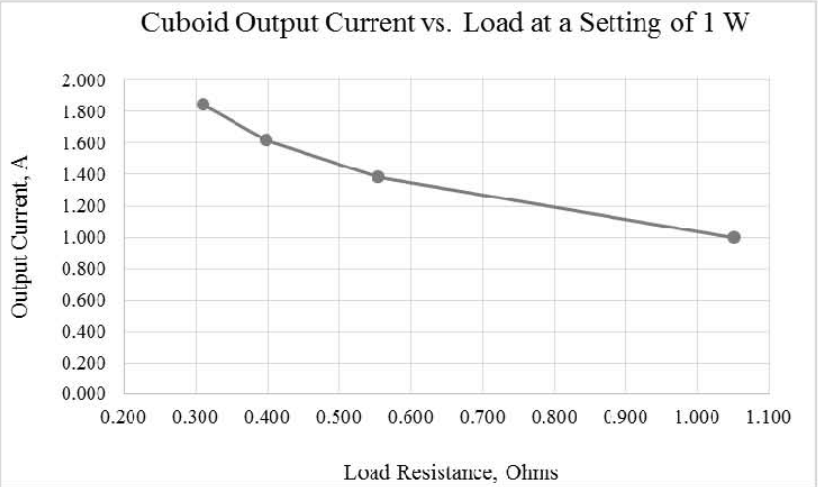
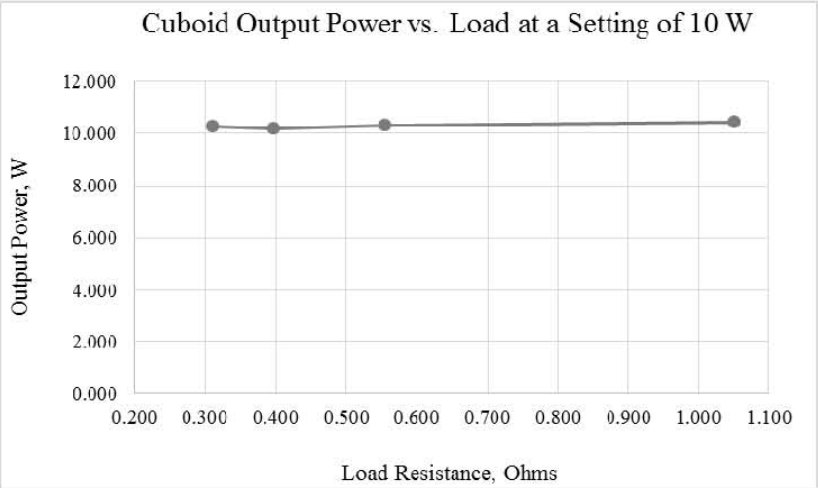
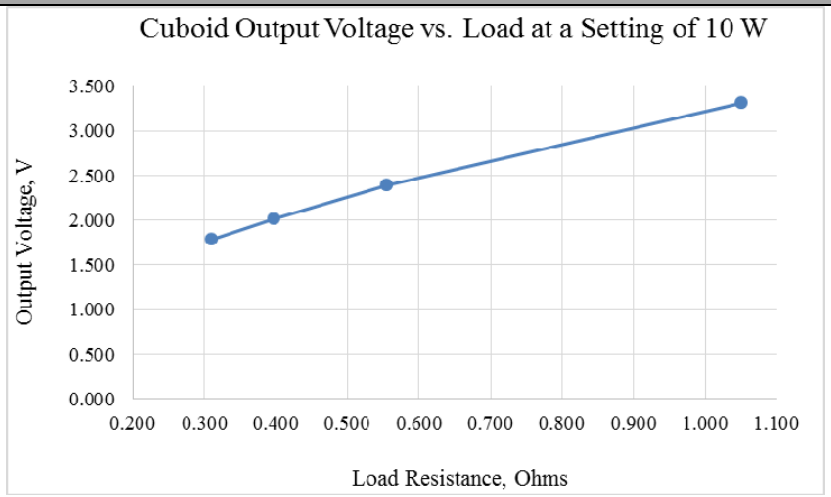
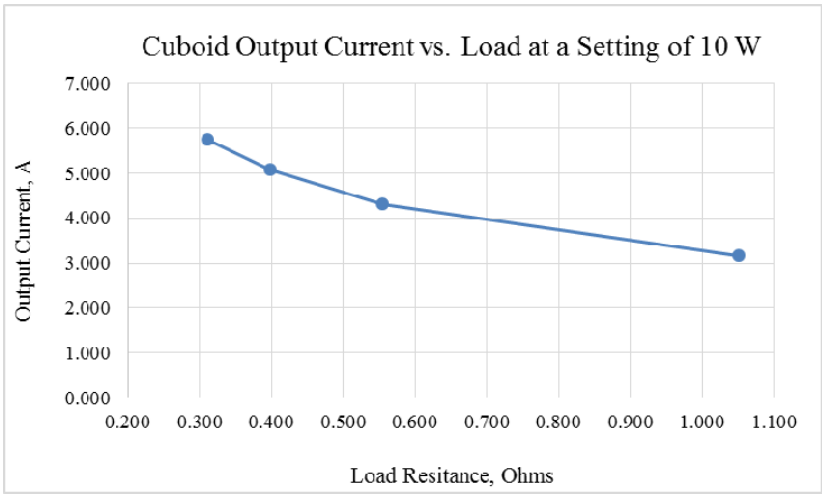
1.050 | 1.052 | 1.051
Ten Watt Setting
10.280 | 0.311 | 1.788
10.202 | 0.398 | 2.015
10.292 | 0.555 | 2.390
10.415 | 1.052 | 3.310</td></tr>
</table>

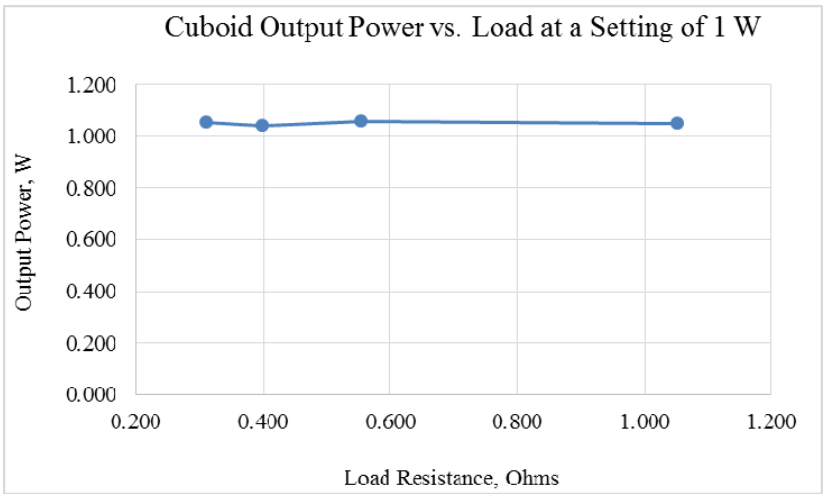
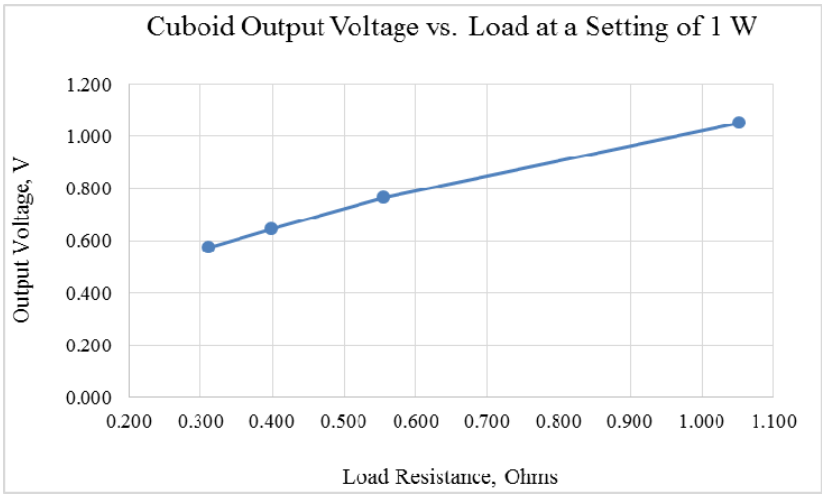
Claim Limitations	Joyetech Cuboid
	  The tests performed and charts provided therefrom demonstrate practice of the claimed aspect, specifically providing an input signal to the power source to adjust at least one of a current or a voltage provided by the power source to regulate the power level to the wattage setting.

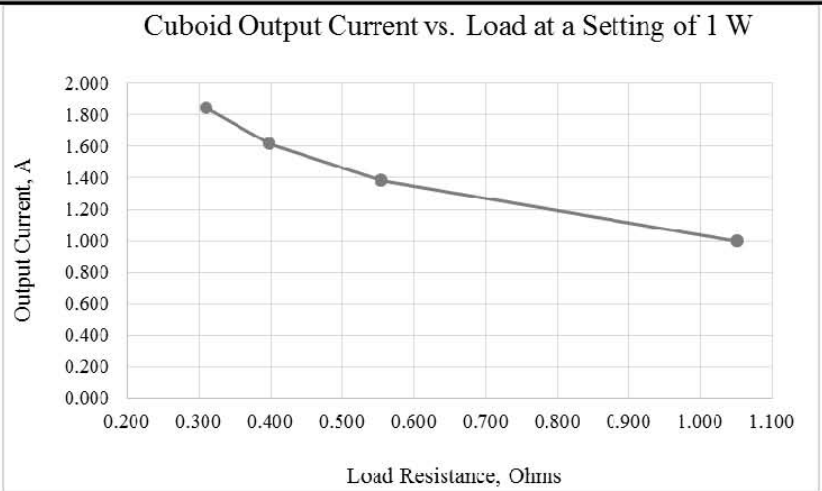
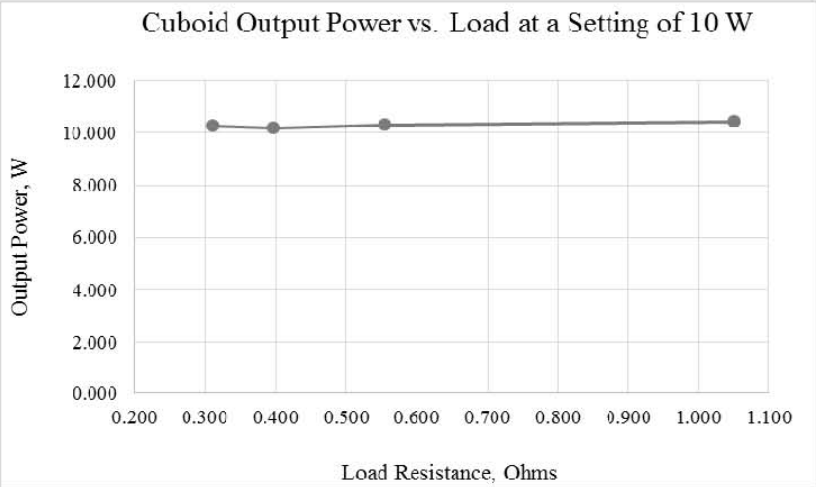
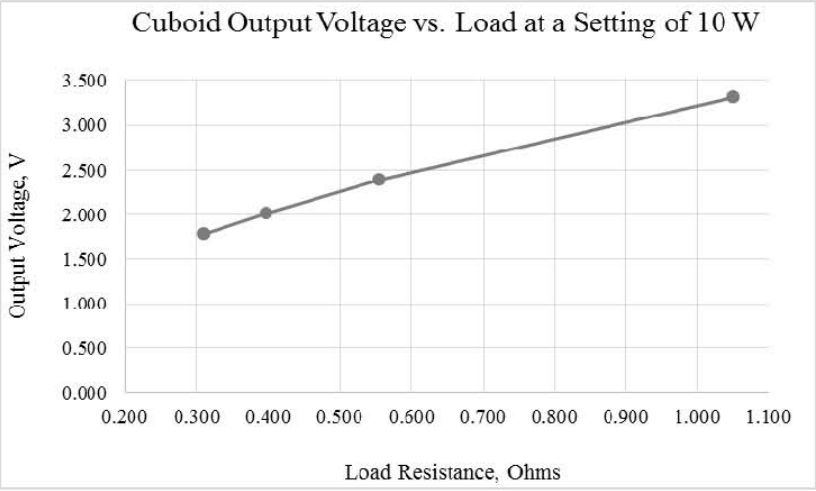
Claim Limitations	Joyetech Cuboid
6. The electronic vaporizer device of claim 1, wherein the power manager is configured to sense at least one of a current or a voltage applied to the heating element in real time.	 The voltage and current are sensed and shown on the display, with voltage boxed at left in orange and current in yellow. Further, the Cuboid circuit board acts as the device power manager and, as demonstrated through testing, varies at least the voltage to maintain a wattage selected by the user. The graphs below demonstrate constant power with changing resistance and changing voltage with changing resistance. 

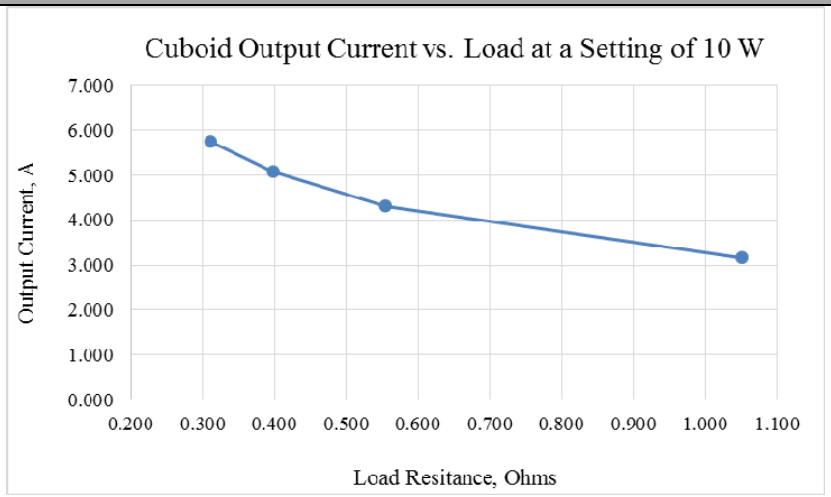
Claim Limitations	Joyetech Cuboid
	  

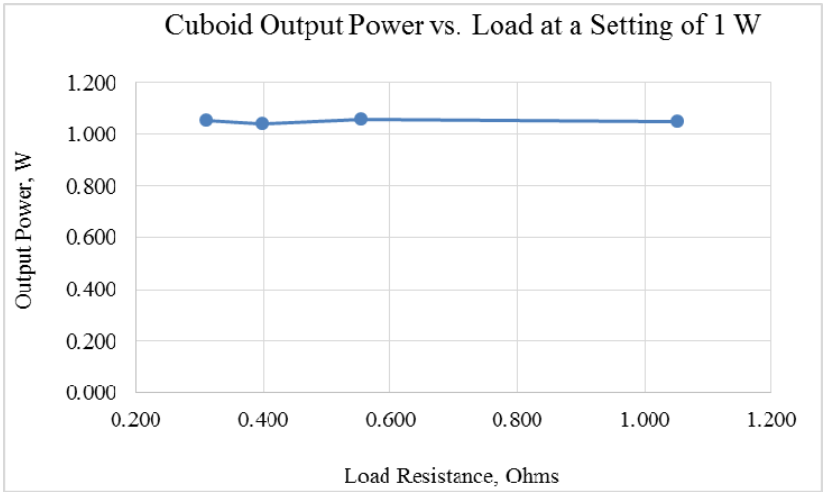
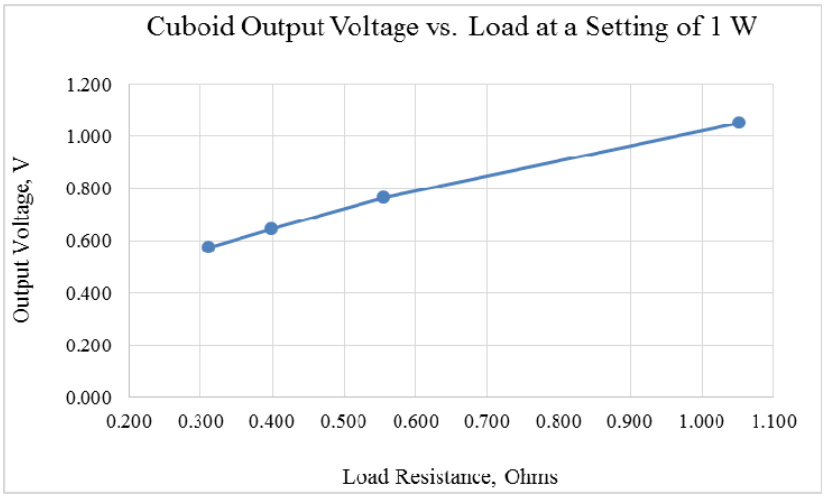
Claim Limitations	Joyetech Cuboid
	 
7. The electronic vaporizer device of claim 1, wherein the power manager is configured to determine a resistance of the heating element in real time.	 Resistance is determined in real time for power management as shown in the plots provided with claim 6. The resistance determined is also visible on the screen of the device (*e.g.*, zero ohms with no cartridge, boxed in red at left).

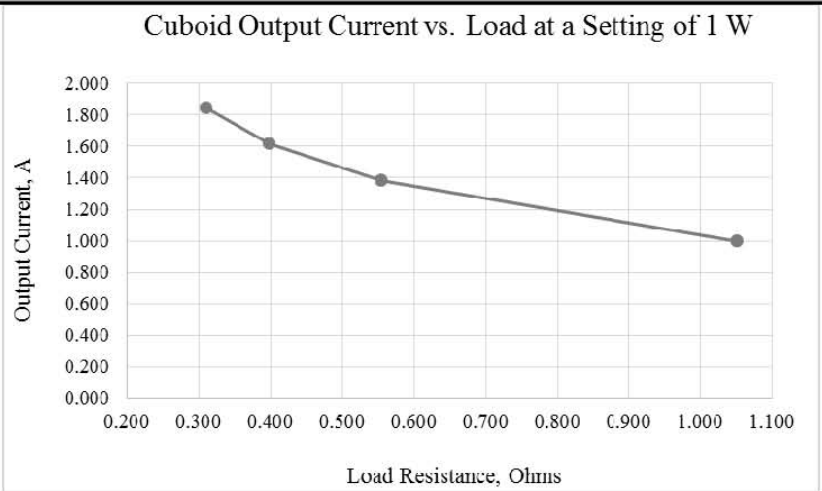
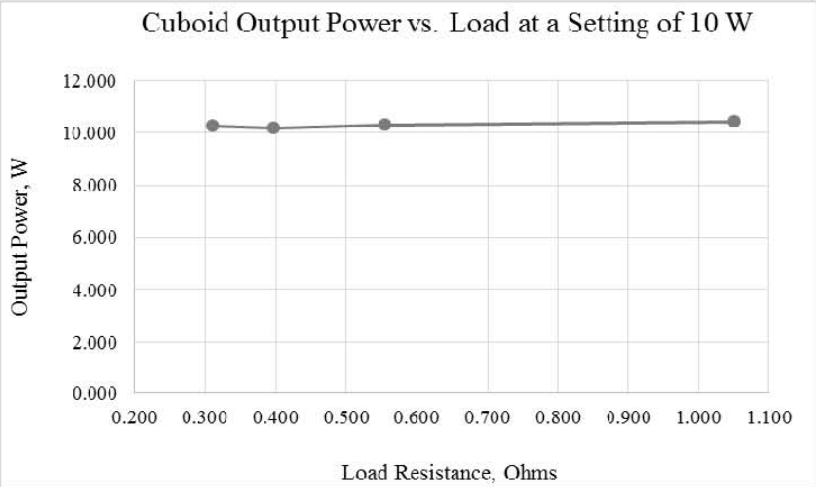
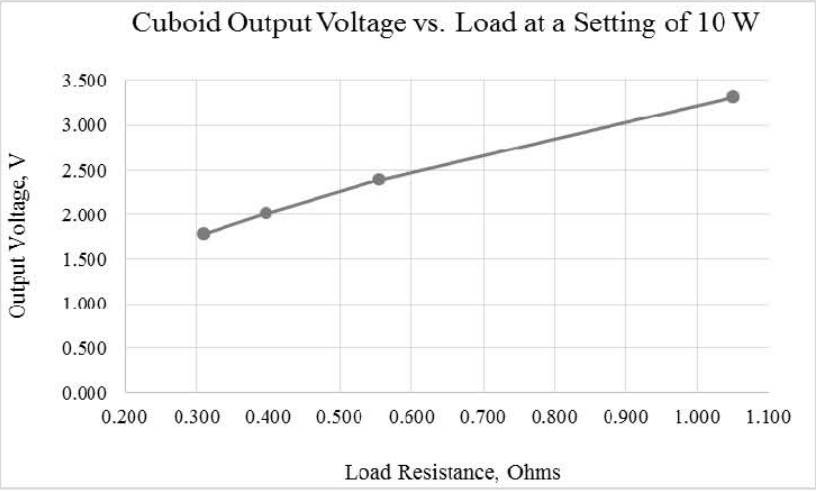
Claim Limitations	Joyetech Cuboid
8. The electronic vaporizer device of claim 1, further comprising a display component operatively connected to the power manager and configured to display at least one of the wattage setting, a real time watt output, a resistance of the heating element in real time, a voltage applied to the heating element in real time, or a current applied to the heating element in real time.	The claimed display is present and boxed in red below on the Cuboid circuit board.  The display is also visible comprising a portion of the exterior of the Cuboid device. The display provides at least one of the wattage setting (boxed in green above), a real time watt output (which corresponds within engineering tolerances to the wattage setting in accordance with the testing), a resistance of the heating element in real time (boxed in white above), a voltage applied to the heating element in real time (boxed in orange above), or a current applied to the heating element in real time (boxed in yellow above). The inset photo shows the display with wattage setting (1.0 W), a real time resistance of the heating element (zero Ω with no cartridge attached), and a current applied to the heating element in real time (zero A with no

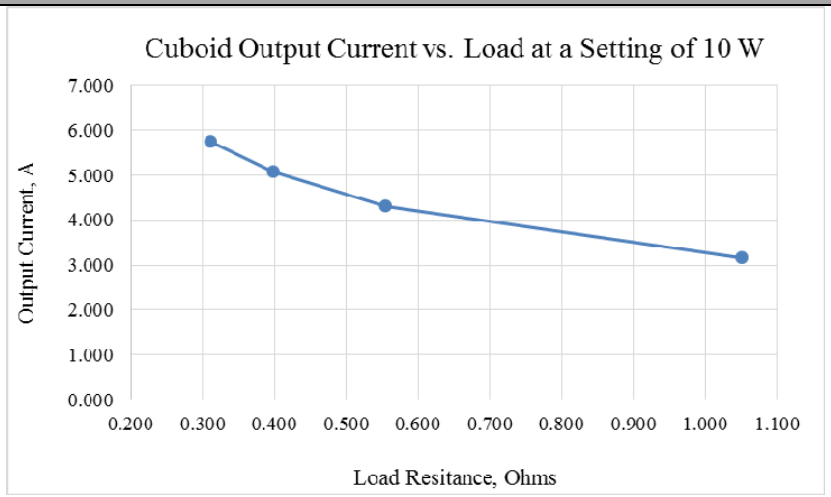
Claim Limitations	Joyetech Cuboid
	cartridge attached), satisfying the claim elements. The graphs below showing values measured in device testing further reinforce the determination of values for display.  

Claim Limitations	Joyetech Cuboid
	  

Claim Limitations	Joyetech Cuboid
	
9. The electronic vaporizer device of claim 1, wherein the power manager is configured to simultaneously measure or sense at least two of a resistance of the heating element, an output voltage of the heating element, and an output current of the heating element as part of regulating the power level delivered to the heating element.	The Cuboid circuit board must measure at least two of the resistance of the heating element, an output voltage of the heating element and an output current of the heating element as part of regulating the power level delivered to the heating element since power is a function of current, voltage and resistance. No regulation can occur with fewer than these two variables determined by the device. As demonstrated in the testing and shown in the tables and graphs above, the Cuboid circuit board varied the output voltage in response to changes in the heating element resistance to maintain the selected wattage, necessarily practicing claim 9.

Claim Limitations	Joyetech Cuboid
10. The electronic vaporizer device of claim 1, wherein the power manager is configured to simultaneously control one of a resistance of the heating element, an output voltage of the heating element, and an output current of the heating element while measuring another of the resistance of the heating element, the output voltage of the heating element, and the output current of the heating element as part of regulating the power level delivered to the heating element.	The Cuboid power manager (*e.g.*, circuitry) practices at least controlling one of the output voltage and/or output current (the first sub-element of the claim) as shown below in the graphs of testing demonstrating constant power in view of changing voltage and resistance.  

Claim Limitations	Joyetech Cuboid
	  

Claim Limitations	Joyetech Cuboid
	  Simultaneously measurements are taken of at least one of the resistance, output voltage, and/or output current (the second sub-element of the claim), as is necessary to effect regulation. These values are also displayed as shown at left, with resistance boxed in white, voltage boxed in orange, and current boxed in yellow.

Claim Limitations	Joyetech Cuboid
11. An electronic vaporizing system used to simulate smoking, comprising:	 The Cuboid (boxed in red) is a device used to simulate smoking by providing power for vaporization. It is shown here with a cartridge (*e.g.*, atomizer and consumable, boxed in yellow) attached.
a cartridge containing a heating element for vaporizing a material for inhaling;	 The hardware port (boxed in red) accepts a cartridge. Electronic vaporizing systems and electronic cigarettes include the resistance element in the cartridge containing the material for vaporization. Such a cartridge is shown in the image relating to the preamble of claim 11, above.

Claim Limitations	Joyetech Cuboid
an electronic vaporizer device operatively connected to the cartridge, wherein the electronic vaporizer device is configured to: allow a user to select a wattage setting from a plurality of wattage settings, wherein the wattage setting corresponds to a power level in watts to be delivered to the heating element for vaporizing the material during a simulated smoking session,	The control buttons (boxed in red) on the Cuboid device provide a user input device that allows a user to select a wattage setting (boxed in yellow) from a plurality of wattage settings.   The Cuboid buttons allow the user to select settings from 1 watt up to 150 watts (or more depending on firmware installed to circuit board) in one tenth of one

Claim Limitations	Joyetech Cuboid
	watt increments. The pair of buttons is shown in red boxes in the picture of the board underlying the external controls. The wattage is displayed after selection. Testing confirmed that the wattage setting corresponds to the power level in watts delivered to the heating element for vaporizing a material during a simulated smoking session. Testing of the Cuboid to confirm correspondence of set power level to actual power level employed multiple resistors of known resistance. The multiple resistors of known resistance model the resistance of the heating element and changes to resistance thereof. The test equipment was electrically coupled with the component for attaching cartridges to the unit to place known resistors in the operational electrical path without disruption. The tests accounted for resistance consequent to the testing setup. In an example testing iteration, with the device wattage set to 1.0 watts, the device was actuated. With 0.311 ohm resistance applied to the device, the output voltage generated by the device was 0.573 volts, and the measured power was 1.056 watts, within engineering

Claim Limitations	Joyetech Cuboid
	tolerances of the programmed value to be delivered. Repeating the test with a resistor at 0.398, 0.555 and 1.052 ohms similar results were observed. Cuboid **Measured Power** / **Resistance** / **Measured Voltage** 1.056 / 0.311 / 0.573 1.042 / 0.398 / 0.644 1.057 / 0.555 / 0.766 1.050 / 1.052 / 1.051 The same test was performed with a selected wattage of 10 watts. Again the measured wattage corresponded to the selected wattage within engineering tolerances. Cuboid **Measured Power** / **Resistance** / **Measured Voltage** 10.280 / 0.311 / 1.788 10.202 / 0.398 / 2.015 10.292 / 0.555 / 2.390 10.415 / 1.052 / 3.310 As the measured power is in the output path of the device, simulating the presence of a cartridge (*e.g.*, atomizer), this is the power which would be delivered to the heating element of the cartridge.

Claim Limitations	Joyetech Cuboid
generate the power level to be delivered to the heating element, and	The power source is provided by the battery enclosure holding the batteries (*e.g.*, two IMR 18650 3.7V / 3000MAH / 40A batteries). The power source is the sole source of power and the testing indicated the selected power level corresponds to the power delivered to the heating element. 
regulate the power level to about the wattage setting during activation of the electronic vaporizer device, even when the heating element changes, to provide a consistent vapor during the simulated smoking session.	Testing confirmed accurate regulation based on the user input regardless of changes to the heating element (*e.g.*, actual resistance). This was shown by, *e.g.*, varying resistance in testing to simulate changes in the heating element. In the testing, the Cuboid wattage set point was kept constant and different known resistors attached. Values such as, *e.g.*, the output voltage were shown to change with the varying resistance to maintain constant wattage. This test was performed at user selected 1 watt and 10 watt settings. As shown in the graphs below, the Cuboid power manager regulated wattage regardless of heating element changes.

Claim Limitations	Joyetech Cuboid

Cuboid

Measured Power	Resistance	Measured Voltage
	One Watt Setting	
1.056	0.311	0.573
1.042	0.398	0.644
1.057	0.555	0.766
1.050	1.052	1.051
	Ten Watt Setting	
10.280	0.311	1.788
10.202	0.398	2.015
10.292	0.555	2.390
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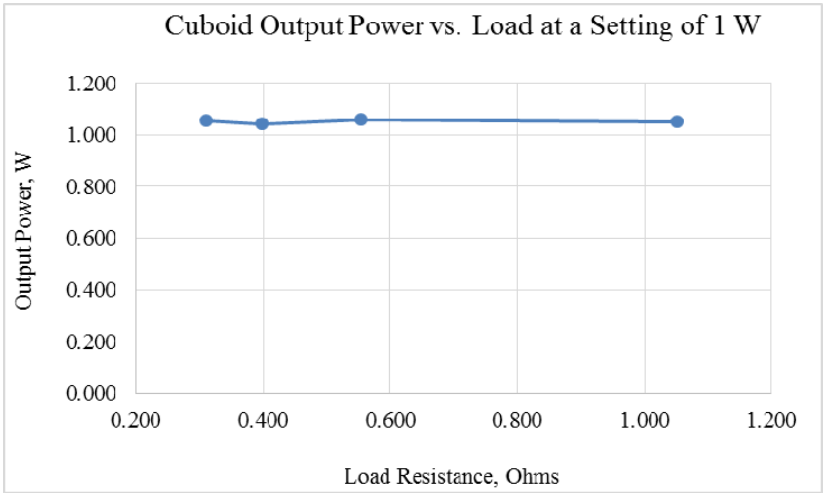
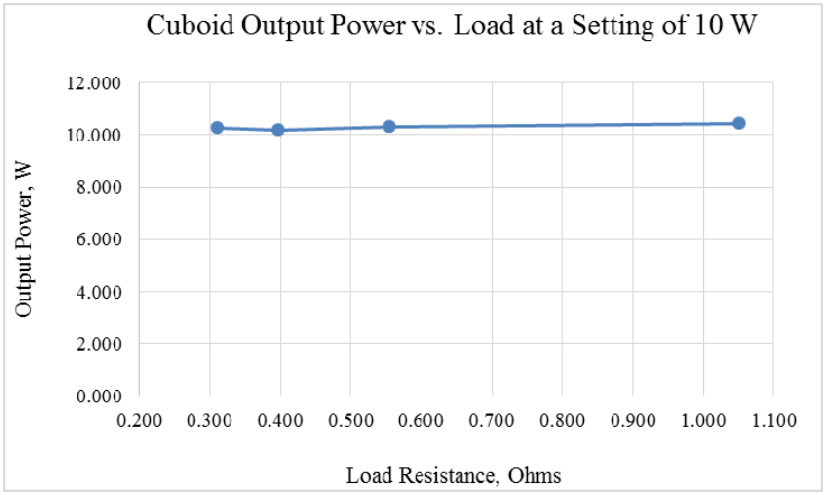




Because power output is regulated to a consistent level, quantity and quality of vapor would be consistent.

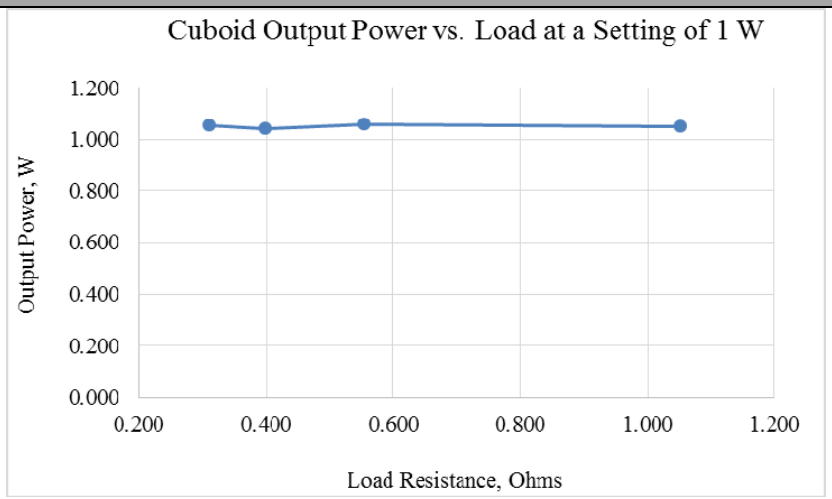
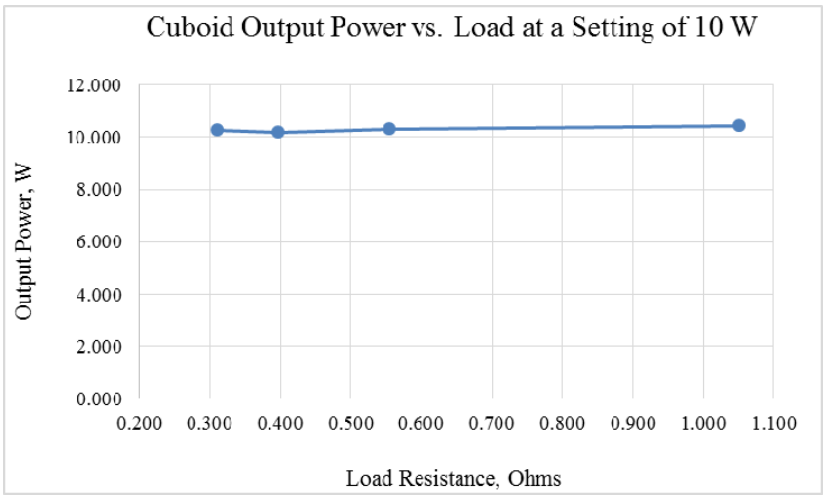
Claim Limitations	Joyetech Cuboid
12. The electronic vaporizing system of claim 11, wherein the electronic vaporizer device is configured to display at least one of the wattage setting, a resistance of the heating element in real time, a voltage applied to the heating element in real time, or a current applied to the heating element in real time.	The claimed display is present and boxed in red below on the Cuboid circuit board.  The display is also visible comprising a portion of the exterior of the Cuboid device. The display provides at least one of the wattage setting (boxed in green), a real time watt output (shown in testing to correspond to the wattage setting within engineering tolerances), a resistance of the heating element in real time (boxed in white), a voltage applied to the heating element in real time (boxed in orange), or a current applied to the heating element in real time (boxed in yellow). The inset photo shows the display with wattage setting (1.0 W), a real time resistance of the heating element (zero Ω with no cartridge attached), and a current applied to the heating element in real time (zero A with no cartridge attached), satisfying the claim elements.

Claim Limitations	Joyetech Cuboid
13. The electronic vaporizing system of claim 11, wherein the electronic vaporizer device is configured to allow a user to activate the electronic vaporizer device to initiate delivery of the power level to the heating element.	 The external "Fire" button (boxed in red) links to circuit board, providing a combination button input and electronic trigger for activation.
14. The electronic vaporizing system of claim 11, wherein the cartridge is configured to allow a user to inhale a vaporized material produced inside the cartridge.	 The mouthpiece for inhalation, boxed in red, is shown at the end of the cartridge distal to the Cuboid.

Claim Limitations	Joyetech Cuboid
15. The electronic vaporizing system of claim 11, wherein the electronic vaporizer device is configured as a portable electronic hand-held device.	 The Cuboid is portable and hand-held.
16. The electronic vaporizing system of claim 11, wherein the cartridge is configured to be connected to and disconnected from the electronic vaporizer device.	 The hardware port accepts a removable and re-installable cartridge. The port is threaded to allow connection and disconnection. Electronic vaporizing systems and electronic cigarettes include the resistance element in the cartridge containing the material for vaporization. A cartridge is shown attached above (*e.g.*, claim 15).

Claim Limitations	Joyetech Cuboid
17. The electronic vaporizing system of claim 11, wherein the electronic vaporizer device is configured to connect to and operate with cartridges having heating elements of different resistances.	 The Cuboid includes a connection on its upper surface that is threaded to accept multiple cartridges having heating elements of different resistances. The threaded connection and electrical connector are common to a variety of similar products. A cartridge is shown attached above (*e.g.*, claim 15). Electronic vaporizing systems and electronic cigarettes include the resistance element in the cartridge containing the material for vaporization. Varying resistance elements and the changing resistance of a resistance element through its service life are known in the art.
18. The electronic vaporizing system of claim 11, wherein the electronic vaporizer device is configured to regulate, in real time, the power level delivered to the heating element to about the wattage setting during activation of the electronic vaporizer device, even as the	The Cuboid (particularly, *e.g.*, its circuit board, which includes a power manager comprised of control elements generally boxed in red), is configured to  practice the claimed regulation aspects in real time and while resistance of the heating element changes as demonstrated through testing. The testing confirmed accurate control based on the user input regardless of changes to the

<table>
<tr><th>Claim Limitations</th><th>Joyetech Cuboid</th></tr>
<tr><td>resistance of the heating element changes.</td><td>heating element (e.g., actual resistance). This was shown by, e.g., varying resistance in testing to simulate changes in the heating element. In the testing, the Cuboid wattage set point was kept constant and different known resistors attached. Values such as, e.g., the output voltage were shown to change with the varying resistance to maintain constant wattage. This test was performed at user selected 1 watt and 10 watt settings. As shown in the graphs below, for which the measurements were taken over time as battery power decreased, the Cuboid power manager regulated wattage regardless of heating element changes.
<table>
<tr><th></th><th>Cuboid</th><th></th></tr>
<tr><th>Measured Power</th><th>Resistance</th><th>Measured Voltage</th></tr>
<tr><td></td><td>One Watt Setting</td><td></td></tr>
<tr><td>1.056</td><td>0.311</td><td>0.573</td></tr>
<tr><td>1.042</td><td>0.398</td><td>0.644</td></tr>
<tr><td>1.057</td><td>0.555</td><td>0.766</td></tr>
<tr><td>1.050</td><td>1.052</td><td>1.051</td></tr>
<tr><td></td><td>Ten Watt Setting</td><td></td></tr>
<tr><td>10.280</td><td>0.311</td><td>1.788</td></tr>
<tr><td>10.202</td><td>0.398</td><td>2.015</td></tr>
<tr><td>10.292</td><td>0.555</td><td>2.390</td></tr>
<tr><td>10.415</td><td>1.052</td><td>3.310</td></tr>
</table>
</td></tr>
</table>

Claim Limitations	Joyetech Cuboid
	  Because power output is regulated to a consistent level, quantity and quality of vapor would be consistent.

Claim Limitations	Joyetech Cuboid
19. A method to simulate smoking with an electronic vaporizer device and a cartridge, comprising:	 The Cuboid practices the claimed method. The Cuboid (boxed in red) is a device used to simulate smoking by providing power for vaporization. It is shown here with a cartridge (*e.g.*, atomizer and consumable, boxed in yellow) attached.
regulating a power level delivered to a heating element of a cartridge connected to an electronic vaporizer device, for vaporizing a material within the cartridge during a simulated smoking session, substantially to a user-selected wattage setting during activation of the electronic vaporizer device to provide a consistent quantity and quality of vapor	Users select the wattage using the Cuboid control buttons, boxed below in red.  

<table>
<tr><th>Claim Limitations</th><th>Joyetech Cuboid</th></tr>
<tr><td>during the simulated smoking session.</td><td>

The circuit board, which includes a power manager realized through control elements (generally boxed in red), performs the claimed aspects as demonstrated through testing.

The testing described confirmed accurate regulation based on the user input. This was shown by, e.g., varying resistance in testing to simulate changes in the heating element. In the testing, the Cuboid wattage set point was kept constant and different known resistors attached. Values such as, e.g., the output voltage were shown to change with the varying resistance to maintain constant wattage. This test was performed at user selected 1 watt and 10 watt settings using different resistors of known resistance. As shown in the graphs below, the Cuboid power manager regulated wattage to the user setting.

<u>Cuboid</u>
<table>
<tr><th>Measured Power</th><th>Resistance
One Watt Setting</th><th>Measured Voltage</th></tr>
<tr><td>1.056</td><td>0.311</td><td>0.573</td></tr>
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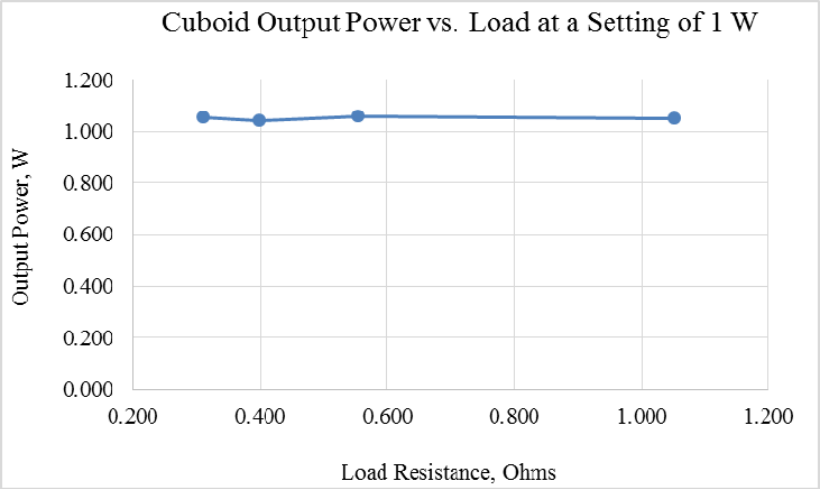
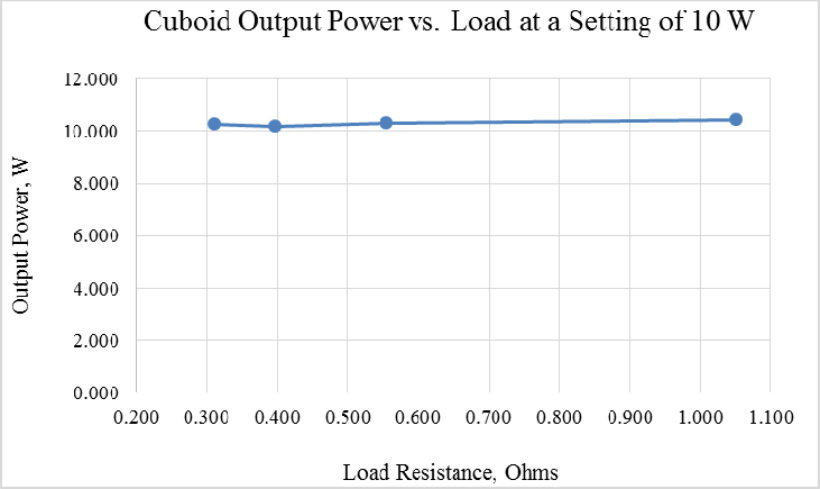
</table>
</td></tr>
</table>

Claim Limitations	Joyetech Cuboid

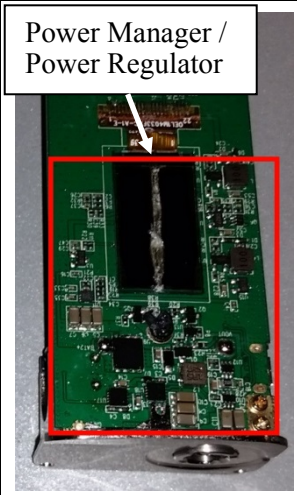
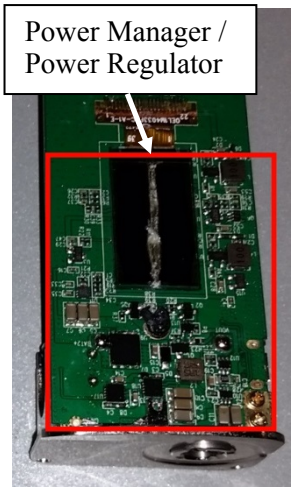
Ten Watt Setting

10.280	0.311	1.788
10.202	0.398	2.015
10.292	0.555	2.390
10.415	1.052	3.310





Because power output is regulated to a consistent level, quantity and quality of vapor would be consistent.

Claim Limitations	Joyetech Cuboid
20. The method of claim 19, wherein the regulating of the power level, delivered to the heating element, substantially to the user-selected wattage setting is performed in real time regardless of a resistance of the heating element of the cartridge.	 The Cuboid circuit board performs this function of the claimed device based on testing and circuit design. The testing confirmed accurate control based on the user input regardless of heating element resistance. This was shown by, *e.g.*, varying resistance in testing to simulate changes in the heating element. In the testing, the Cuboid wattage set point was kept constant and different known resistors attached. Values such as, *e.g.*, the output voltage were shown to change with the varying resistance to maintain constant wattage. This test was performed at user selected 1 watt and 10 watt settings. As shown in the graphs above (*e.g.*, claim 19), the Cuboid power manager regulated wattage regardless of heating element changes.
21. The method of claim 19, wherein the regulating of the power level, delivered to the heating element, substantially to the user-selected wattage setting is performed in	 The Cuboid circuit board performs this function of the claimed device based on testing and circuit design. The testing confirmed accurate control based on the user input regardless of heating element resistance. This was shown by,

Claim Limitations	Joyetech Cuboid
real time regardless of a change in a resistance of the heating element of the cartridge during the simulated smoking session.	*e.g.*, varying resistance in testing to simulate changes in the heating element. In the testing, the Cuboid wattage set point was kept constant and different known resistors attached. Values such as, *e.g.*, the output voltage were shown to change with the varying resistance to maintain constant wattage. This test was performed at user selected 1 watt and 10 watt settings. As shown in the graphs above (*e.g.*, claim 19), the Cuboid power manager regulated wattage regardless of heating element changes. Different wattages are set which correspond to actual power delivered to heating element in accordance with testing above. The voltage (or temperature) selected are regulated to the target value regardless of other parameters during the smoking session, which is understood to include the entire time of device use rather than only during actuation (*e.g.*, pressing the "Fire" button).

Claim Limitations	Joyetech Cuboid
22. The method of claim 19, further comprising displaying at least one of the wattage setting, a resistance of the heating element, a voltage applied to the heating element, or a current applied to the heating element.	 The claimed display of variables is practiced by the Cuboid. The physical component used for such displaying is present on the Cuboid circuit board. The display is also visible comprising a portion of the exterior of the Cuboid device. The display includes at least one of the wattage setting (boxed in green), a resistance of the heating element in real time (boxed in white), a voltage applied to the heating element in real time (boxed in orange), or a current applied to the heating element in real time (boxed in yellow). The inset photo shows the display with wattage setting (1.0 W), a real time resistance of the heating element (zero Ω with no cartridge attached), and a current applied to the heating element in real time (zero A with no cartridge attached), satisfying the claim elements.

Claim Limitations	Joyetech Cuboid
23. An electronic vaporizer device used to simulate smoking, comprising:	 The Cuboid is a vaporizer device used to simulate smoking. It is shown here with a cartridge (atomizer and consumable) attached.
a power source configured to generate a power level being a pre-programmed wattage level to be delivered to a heating element for vaporizing a material during a simulated smoking session; and	The power source is provided by the battery enclosure holding the batteries (*e.g.*, two IMR 18650 3.7V / 3000MAH / 40A batteries). The power source is the sole source of power and the testing indicated the selected power level corresponds to the power delivered to the heating element.  

Claim Limitations	Joyetech Cuboid
a power manager operatively connected to the power source and configured to regulate the power level delivered to the heating element to substantially the pre- programmed wattage level during activation of the electronic vaporizer device, regardless of heating element parameters and a state of the power source, to consistently control a quantity and a quality of vapor produced by the electronic vaporizer device.	 The circuit board, which includes a power manager realized through control elements (generally boxed in red), performs the claimed aspects as demonstrated through testing. The testing confirmed accurate control based on the user input regardless of heating element parameters (*e.g.*, actual resistance) and regardless of the state of the power source. This was shown by, *e.g.*, varying resistance in testing to simulate changes in the heating element. In the testing, the Cuboid wattage set point was kept constant and different known resistors attached. Values such as, *e.g.*, the output voltage were shown to change with the varying resistance to maintain constant wattage. This test was performed at user selected 1 watt and 10 watt settings. In addition to the variation of the resistance, it was observed during testing that the battery charge level decreased over time. As shown in the graphs below, for which the measurements were taken over time as battery power decreased, the Cuboid power manager regulated wattage regardless of heating element and power source changes.

Claim Limitations	Joyetech Cuboid

Cuboid

Measured Power	Resistance	Measured Voltage
	One Watt Setting	
1.056	0.311	0.573
1.042	0.398	0.644
1.057	0.555	0.766
1.050	1.052	1.051
	Ten Watt Setting	
10.280	0.311	1.788
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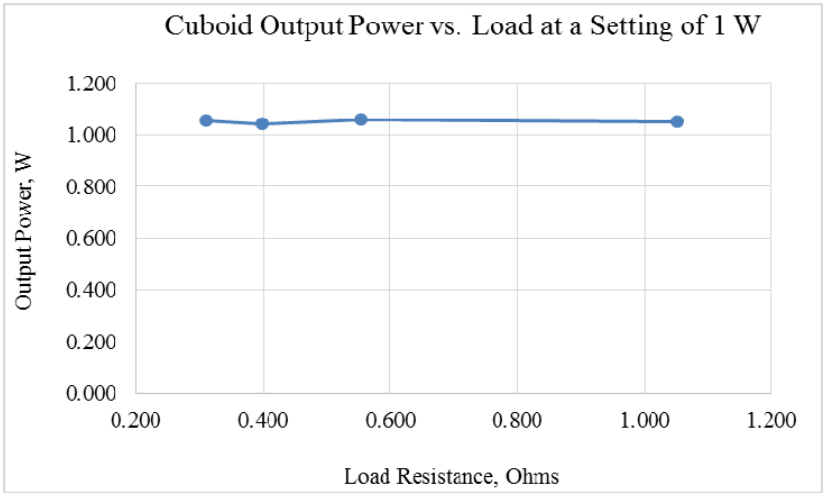

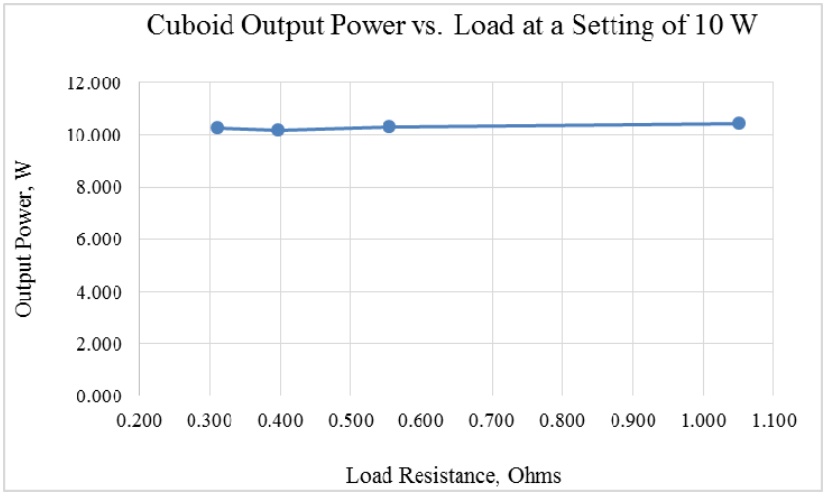

Because power output is regulated to a consistent level, quantity and quality of vapor would be consistent.