FUMA-1001 CIP2C

Title: ELECTRONIC VAPORIZER

## CONTINUATION DATA

This Application is a continuation of U.S. Application No. 14/510,955 filed October 9, 2014, which is a continuation of U.S. Application No. 13/594,813 filed August 25, 2012, which is a non-provisional of U.S. Provisional Application No. 61/527,434 filed August 25, 2011 and which is a continuation-in-part of U.S. Application No. 12/843,917 filed July 27, 2010, which is a non-provisional of U.S. Provisional Application Nos. 61/273,097filed July 31, 2009 and 61/271,819 filed July 27, 2009. All these Applications are hereby incorporated herein by reference in their entirety.

## BACKGROUND

[0001] Electronic cigarettes (also referred to as e-cigarettes or personal vaporizers) are generally battery-powered devices that are configured to deliver a vapour that comprises nicotine to an individual. Conventional electronic cigarette designs generally include a battery, a heating element, and a mouthpiece. The mouthpiece includes a liquid solution that comprises nicotine, and the battery provides power to the heating element, which in turn operates to vaporize the solution. Accordingly, when the user places the mouthpiece in her mouth and draws from the mouthpiece, the user receives vaporized nicotine. Due to the ever-increasing taxes on tobacco products, popularity of electronic cigarettes is expected to continue to correspondingly increase.

## SUMMARY

[0002] The following is a brief summary of subject matter that is described in greater detail herein. This summary is not intended to be limiting as to the scope of the claims.



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[0003] Described herein are various aspects generally pertaining to electronic vaporizers, and more particularly pertaining to cartridges that comprise heating elements configured to vaporize a solution. In an exemplary embodiment, a cartridge configured for utilization in connection with an electronic vaporizer comprises a housing that has an interior, a first end, and a second end. The housing is constructed of one of a polymer, wood, ceramic or any combination thereof. The cartridge can also include a heating element that resides in the interior of the housing. The cartridge can be manufactured as a single assembly or can be designed so that the cartridge can be manufactured as a multi-piece assembly. The cartridge also comprises a solution that is positioned proximate to the heating element. The heating element is configured to vaporize the solution responsive to receiving power from a power source (e.g., a battery). Pursuant to an example, the cartridge can be designed for utilization as a portion of an electronic cigarette. Accordingly, the solution may comprise nicotine or other components. Furthermore, the solution can be configured such that the vapor has a flavor when received by a user as well as other ingredients.

[0004] Additionally, an adapter is described herein, wherein the adapter is configured to electrically or electronically couple a power source (such as a battery) having a first configuration with a heating element having a second configuration. Specifically, manufacturers of vaporizers generally manufacture a power source and a heating element in a proprietary manner, such that only a heating element provided by the manufacturer can be electrically or electronically coupled to a power source provided by the manufacturer. Typically, the power source (battery) is significantly more expensive than associated cartridges, and once a user purchases a power source they may not wish to purchase a different power source from a different manufacturer even if the tastes of the user change over time. The adapters described

herein are configured to electrically or electronically couple power sources from a first manufacturer with a heating element from a second manufacturer.

[0005] The aforementioned adapter can provide for air flow (both direct and indirect), electrical and or electronic connection, data connections as well as power or an external heating source. The adapter may also incorporate onboard circuitry and/or sensors for collecting data from the adapter.

[0006] Other aspects will be appreciated upon reading and understanding the attached figures and description.

## BRIEF DESCRIPTION OF THE DRAWINGS

[0007] Fig. 1 is a functional block diagram of an exemplary electronic vaporizer.

[0008] Fig. 2 is an exemplary configuration of a cartridge for utilization in an electronic vaporizer.

[0009] Fig. 3 is an exemplary configuration of a cartridge for utilization in an electronic vaporizer.

[0010] Fig. 4 is a functional block diagram of an exemplary electronic vaporizer.

[0011] Fig. 5 is a functional block diagram of an exemplary package of cartridges.

[0012] Fig. 6 is a flow diagram illustrating an exemplary methodology for manufacturing a cartridge for employment in an electronic vaporizer.

[0013] Fig. 7 is a functional block diagram of an exemplary adaptor.

[0014] Fig. 8 is a functional block diagram of an exemplary adaptor.

[0015] Fig. 9 is a functional block diagram of an exemplary electronic vaporizer that includes a power harvesting device.

## DETAILED DESCRIPTION

[0016] Various technologies pertaining to electronic vaporizers will now be described with reference to the drawings, where like reference numerals represent like elements throughout. In addition, several functional block diagrams of exemplary electronic vaporizers, cartridges, and/or adapters are illustrated and described herein for purposes of explanation; however, it is to be understood that functionality that is described as being carried out by certain components of the electronic vaporizers may be performed by multiple separate components. Similarly, for instance, a component may be configured to perform functionality that is described as being carried out by multiple components.

[0017] With reference to Fig. 1, an exemplary electronic vaporizer 100 is illustrated. Pursuant to an example, the electronic vaporizer 100 may be an electronic cigarette that is configured to deliver a vaporized nicotine solution to a user thereof. It is to be understood, however, that the electronic vaporizer 100 may be utilized for other purposes, including deliverance of various vaporized solutions to the user for recreational or medicinal purposes.

[0018] The electronic vaporizer 100 comprises a power source 102 and a cartridge 104. The power source 102 and the cartridge 104 are configured to be mechanically and electrically coupled to one another. For example, the cartridge 104 may comprise an electrically conductive threaded fastener, and the power source 102 may comprise an electrically conductive threaded receiver. The threaded fastener and the threaded receiver can be coupled to one another, thereby mechanically and electrically coupling the power source 102 with the cartridge 104. Of course, other types of connection mechanisms that can mechanically and electrically couple the power source 102 with the cartridge 104 are contemplated and are intended to fall under the scope of the hereto-appended claims. These include magnetic connection mechanisms, snaps, twist caps,

push on connections, gasketed connections, quick connection mechanisms, turn lock mechanisms, t-bar connections, etc.

[0019] The power source 102 comprises a housing 106, which may be manufactured from a metal, a polymer, a ceramic, or some other suitable material. As used herein, a "polymer" can refer to a formulation of manufactured materials comprising plastics, PVC, and/or some other compound that derives from the classification of a polymer or polymer derivative. A "ceramic" refers to a compound that is classified or derivative of such compound that are derived from clay or man-made materials that are listed in a suitable classification scheme as being a ceramic, which may include compounds that are derived with some portion of the compound being ceramic in nature that is a blended or compounded material.

[0020] In the example shown and described with respect to Fig. 1, the housing 106 is cylindrical in nature. It is to be understood, however, that the housing 106 may be any suitable shape. As shown, the housing 106 comprises a first end 108 and a second end 110 that is opposite the first end 108, and also includes an interior. While not shown, the second end 110 can comprise an aperture, wherein the aperture is configured to receiver airflow from a user. A switch/sensor 112 resides on the interior of the housing 106. The power source 102 also includes a process controller 114 that is in electrical communication with the switch/sensor 112. The process controller 114, for example, can be a microchip that is configured to cause the power source 102 to operate as desired when the electronic vaporizer 100 is utilized by a user. A light emitting diode (LED) 116 is positioned proximate to the first end 108 of the housing 106. A battery 118 resides in the interior of the housing 106, and is electrically coupled to the LED 116, the process controller 114, and the switch/sensor 112. The process controller 114 controls operation of the LED 116 based at least in part upon output of the switch/sensor 112.

[0021] The cartridge 104 comprises a housing 120 that has an interior. The cartridge 104 also comprises a first end 122 and a second end 124, which may be considered as a portion of the housing 120 or apart from the housing 120. The housing 120 of the cartridge is manufactured from a non-metallic material, such as a polymer material or a ceramic material. In an example, the polymer may be a conductive polymer. As shown, the housing 120 is cylindrical in shape. It is to be understood, however, that the housing 120 may be of some other suitable shape. Moreover, the housing 120 may comprise only a cartridge wall (that can be cylindrical as well as other shapes). In another example, the housing 120 may comprise the cylindrical wall and two end-caps, all constructed of the polymer material or the ceramic material. In still yet another embodiment, the housing 120 may comprise the cartridge wall and a single end-cap. One or more end-caps described herein may be constructed from conductive material, such as metal, a conductive polymer, or the like.

[0022] A heating element 126 resides in the interior of the housing 120. The heating element 126 may be or include any suitable technology for outputting heat, including resistive heating, laser-based heating, flame, etc. It is to be understood that other technologies can be utilized other than heat to vaporize a liquid solution, including but not limited to ultrasonic technologies, ultraviolet technologies, chemical technologies, etc. Therefore, another state-changing apparatus may be substituted for the heating element 126.

[0023] A liquid, gelatin, frozen or solid solution (solution) 128 also resides in the interior of the housing 120, wherein the solution can be suspended in an absorbent material, capsule, or reservoir, wherein such devices may act as the holding medium for the solution 128. The solution 128 may be a mixture that is configured to deliver a particular substance in vaporized form to the user when the solution 128 changes state to a gaseous solution (e.g., subsequent to a

sufficient amount of heat being provided to the solution 128). In an example, such substance can be nicotine. In another example, the substance may be tobacco, THC, and/or any derivative thereof. Other substances are also contemplated, such as but not limited to caffeine, vitamins, herbal substances, and any other substance deemed necessary to achieve intended goals, including those that may be desirably delivered to a user for medicinal purposes. In other examples, the substances may include various pharmaceuticals or medications. Thus, as used herein a solution can refer to an element, compound, or substance that is blended, formulated or compounded to be used in the vaporizer 100 in order to deliver the user desired effects and or taste. The solution 128 may be in liquid state, gaseous state, gelatin state, frozen state or solid state.

[0024] The first end 122 of the cartridge 104 comprises a first aperture 130 that is located at approximately the center of the first end 122 of the cartridge 104. The second end 124 comprises a second aperture 132 that is located at approximately the center of the second end 124 of the cartridge 104. An airflow passageway 134 extends between the first aperture 130 and the second aperture 132 axially proximate to the center of the housing 120.

[0025] In operation, the user mechanically and electrically couples the power source 102 with the cartridge 104. Specifically, the battery 118 is electrically coupled to the heating element 126 when the power source 102 is mechanically coupled to the cartridge 104. The user places the second end 124 of the cartridge 104 in her mouth, and draws air through the airflow passageway 134. The switch/sensor 112 in the power source 106 is configured to detect the drawing of air through the airflow passageway 134, and an electric circuit is closed between the battery 118 and the heating element 126. The process controller 114 controls an amount of voltage/current to be received by the heating element 126 from the battery 118, such that the

heating element 126 receives an appropriate amount of electrical current/voltage. The heating element 126 outputs a sufficient amount of heat to vaporize at least a portion of the solution 128, and the user receives the vaporized solution orally. When the user ceases to draw air by way of the air passageway 134, the sensor/switch 112 detects the lack of airflow in the air passageway 134, and the electric circuit between the battery 118 and the heating element 126 is opened (e.g., directly by the sensor/switch 112 or responsive to receipt of instructions from the process controller 114) with or without delay circuitry built into the control. Manual switching or activation of the power source is also an option.

[0026] With respect to the power source 102, the battery 118 may be any suitable disposable, replaceable and/or rechargeable battery, including but not limited to a alkaline, lead acid battery, gel, a nickel cadmium battery, a nickel metal hydride battery, a lithium ion battery, a lithium ion polymer battery, amongst others. Other power sources may also be used in place of a battery such as direct power from any DC, AC or alternative energy source including inductive, solar, chemical, perpetual motion, etc. that can be used to power a heating source. Indirect or direct flame may also be used as a power source as appropriate to trigger the state change of the solution 128 from an initial state to a gaseous aerosol state. As mentioned previously, the process controller 114 can be a microchip or microcontroller that operates as desired when used (or not used) by an individual in regards to the electronic vaporizer 100. Thus, the process controller 114 can receive readings from the switch/sensor 112, and can cause the voltage/current to be supplied to the heating element 126 in the cartridge 104 as a function of such readings. The switch/sensor 112 can be a switch, a sensor, or a combination of a switch and sensor. For instance, the switch/sensor 112 may comprise an electronic airflow sensor, wherein the electronic airflow sensor senses when the user is drawing on the electronic cigarette 100.

Additionally or alternatively, the switch/sensor 112 may comprise a tactile sensor that is configured to sense that the user has depressed a tactile button on the cartridge 104 and/or the power source 102. That is, the user depresses a button to activate the heating element and draw the vaporized solution from the electronic vaporizer 100. Still further, the switch/sensor 112 may comprise a timed switch that opens the circuit between the battery 118 and the heating element 126 after the circuit has been closed for a threshold amount of time. There are a variety of switches and sensor that can be used to detect air flow and/or pressure that can be utilized to activate the heating element.

[0027] With respect to the cartridge 104, as mentioned previously, the main body of the housing 120 is constructed of a polymer. The first end 122 and the second end 124 may be or include end caps, wherein such end caps may be constructed of the polymer. In an exemplary embodiment, an end cap coupled to the first end 122 may at least be partially constructed of a conductive material, such as a conductive metal or a conductive polymer. Furthermore, a wood tip may be positioned upon the second end 124, wherein the wood tip is configured to be received orally by the user. In alternative embodiments, the second end 124 may include a tip comprised of a soft, malleable and/or a flexible polymer. Also in alternative embodiments, the second end 124 may include a paper wrapping around the tip of the second end in order to more closely simulate the tip of a conventional cigarette. Such a paper wrapping may further include flavorings capable of being tasted by a user (e.g., mint, tobacco, candy, fruit, or any other types of flavorings and/or aromas).

[0028] Additionally, as described above, the solution 128 may be placed in an absorbent material, such as cotton, wool, polyester, a batting material, or some other suitable absorbent material. A wicking material may be used in order to channel the liquid or gel to the heating

element. Pursuant to an example, the solution 128 may include a primary substance, such as propylene glycol, glycerin (both vegetable and manmade), glycerol and/or any combination thereof. Additionally, the solution 128 may comprise a portion of amount of a particular drug, such as nicotine, caffeine, THC, other stimulants or medicinal substance. Further, the solution 128 may comprise some amount of flavoring, such as tobacco flavoring, menthol flavoring, other suitable flavoring or any combination thereof.

[0029] Now turning to Fig. 2, a cutaway diagram of an exemplary cartridge 200 for utilization in an electronic personal vaporizer is illustrated. The cartridge 200 comprises a housing 202, which is constructed of a non-metallic material, such as a polymer, wood, ceramic, and/or any combination thereof. The housing 202 comprises an absorbent material 204 that has a liquid solution absorbed therein in a measured dose. The cartridge 200 includes a first end 206 and a second end 208 that is opposite the first end 206, wherein the first and second ends 206 and 208 can be removable caps, respectively. In an example, the first end 206 is formed of a polymer, and the second end 208 is formed of a conductive material, such as a conductive polymer or a conductive metal.

[0030] The first end 206 comprises a first aperture 210, and the second end 208 comprises a second aperture 212. As shown, the first aperture 210 and the second aperture 212 are positioned at approximately the centers of the first and second ends 206 and 208, respectively, such that a central axis of the cartridge 200 passes through both apertures 210 and 212. Both or either the first end 206 or second end 208 can be integrated into a single assembly as part of the housing 202. Additionally, the resulting assembly may or may not be able to be unassembled by the end user. An air passageway 214 begins at the first aperture 210 and extends to the second aperture 212 approximately along the central axis of the cartridge 200. For

example, the wall of the air passageway 214 may be constructed from a polymer or other suitable material.

[0031] The cartridge 200 further comprises a conductive element 216, at least a portion of which resides in the interior of the housing 202. For instance, the conductive element may be metallic threads that facilitate mechanically and electrically coupling the cartridge 200 with a power source (battery). The cartridge further comprises a center post 218 that extends from the second end 208 of the cartridge 202 to the airflow passageway 214, wherein the center post 218 is hollow to allow the airflow passageway 214 to extend through the center post 218 to the second aperture 212. In an example, the center post 218 can be formed of a conductive material, and may be constructed as being a portion of an end cap. An electrical isolator 220 is coupled to the center post 218 and extends outward from the center post 218. For instance, the electrical isolator 220 may be an O-ring or other suitable isolator.

[0032] The cartridge 200 further comprises a heating element 222 that is coupled to the electrical isolator 220 and the conductive element 216 in the interior of the housing 202 by way of conductive lines 224 and 226. The heating element 222 can comprise wicking material that draws the liquid solution from the absorbent material 204 towards the heating element 222. When the cartridge 200 is coupled to a power source, the conductive element 216 is electrically coupled to a negative terminal of the power source and the center post 218 (and thus the electrical isolator 220) is electrically coupled to a positive terminal of the power source. When a user draws a breath by way of the airflow passageway 214, a circuit is closed, thereby providing current to the heating element 222. The heating element 222 acts to vaporize the liquid solution in the absorbent material 204, and the resulting vapor is received by the user. Additionally, as shown, a gap 228 may exist between the first end 206 of the cartridge 200 and the absorbent

material 204. This gap 228 can be utilized to mix air and the vaporized liquid solution to provide the user with an appropriate amount of vaporized solution.

[0033] While the heating element 222 is shown as residing solely in the airflow passageway 214, it is to be understood that various other configurations of the heating element 222 with respect to the airflow passageway are contemplated and are intended to fall under the scope of the hereto-appended claims. In a first example, the heating element 222 may reside on the exterior of the airflow passageway 214, such that the heating element 222 heats the airflow passageway 214 by heating the wall of the airflow passageway 214. In a second example, the heating element 222 may reside on the interior and the exterior of the airflow passageway 214. In yet another example, as will be shown in greater detail below, the heating element 222 can be helical in nature and may wrap around the airflow passageway 214, which may be constructed of a ceramic. In such a design, the wall of the airflow passageway 214 may have apertures, be permeable, or be conductive to heat such that the vaporized liquid solution may be provided to the user. Furthermore, the airflow passageway 214 itself may act as a heating element, wherein the airflow passageway 214 is constructed from an electrically conductive and a thermally conductive material, such as a conductive ceramic. Accordingly, it is readily recognized that airflow may pass directly over the heating element, through a chamber that is proximate to the heating element, or other suitable configuration.

[0034] It is to be understood that the cartridge design shown in Fig. 2 is merely but one example of a cartridge design, and numerous other designs that cause a heating element to reside in a non-metallic housing together with a liquid solution that is desirably vaporized are contemplated.

[0035] Also, an alternative embodiment of a cartridge (adapted to mount to the described power source) may be configured to receive one or more capsules or pellets. Such capsules or pellets may be comprised of one or more medicines, vitamins, a tobacco, and/or other chemical(s) that the end user may desire to taste/consume. In such an embodiment, when the cartridge with a capsules is mounted to a power source (e.g. such as the power source 104 discussed above), the mechanical connection of the cartridge and power source may cause the capsule to open and release the contents therein. The end user may then provide a suction on the tip of the cartridge with his/her mouth in order to draw the released contents of the capsule into his/her mouth. In examples of this described embodiment, the capsule may be included in the cartridge during the manufacturing of the cartridge. However, it should be appreciated that in other embodiments, the cartridge may be designed to accept one or more capsules therein via a pharmacist and/or an end user prior to mounting the cartridge to a power source. Also it should be appreciated that this described example of the cartridge may also include a heating element therein that is configured to heat a capsule (or a pellet) to cause release of the contents of the capsule/pellet when the cartridge is mounted to the power source or when other actions are detected (e.g. a button press, suction through the cartridge).

[0036] Referring now to Fig. 3, another cutaway diagram of an exemplary cartridge 300 for utilization in an electronic personal vaporizer is illustrated. In this exemplary cartridge 300, the center post 218 may be of a conductive material, such as a conductive ceramic or a metallic material, and may act as a heating element. Thus, walls of the airflow passageway 214 may become heated when a user draws on the cartridge, thereby altering the state of the liquid solution in the absorbent material 204 to a vapor for provision to the user. Similar to the previously described exemplary cartridge 200 (Fig. 2), the gap 228 may exist to facilitate mixing

of vaporized solution with air. This gap is optional, as other designs may call for the walls of the airflow passageway 214 to be permeable or have apertures therein, to allow for vaporized solution to mix with air in the airflow passageway 214.

[0037] In another exemplary embodiment, a heating element 302 may be helical in nature and may wrap around the exterior of the airflow chamber 214. The heating element in this case may also be an integrated material as part of the airflow chamber. The air flow chamber in all cases may be solid or porous in nature or have ventilation to allow for aerosol and air stream blending. The walls of the airflow chamber may be constructed of a thermally conductive material, such as a ceramic, which causes the walls of the heating element to generate a sufficient amount of heat to vaporize the liquid solution in the absorbent material 204. In such a design, the conductive lines 224 and 226 may be coupled to the center post 218 and the conductive element 216, respectively, thereby electrically coupling the heating element 302 to negative and positive terminals of a power source. When the user draws on the cartridge, current is provided to the heating element 302 by way of the conductive lines 224 and 226 from the power source. The heating element 302 then heats the walls of the airflow passageway 214 to a temperature that is sufficient to alter the state of the liquid solution in the absorbent material 204 when the user draws on the cartridge 300. Again, these designs are merely exemplary in nature, and various other designs are contemplated by the inventors and are intended to fall under the scope of the hereto-appended claims.

[0038] With reference now to Fig. 4, another exemplary electronic vaporizer 400 is illustrated. The exemplary electronic vaporizer 400 comprises three separate portions: 1) the power source 102; 2) a first cartridge 402 that comprises the heating element 126; and 3) a

second cartridge 404 (a mouthpiece cartridge) that comprises the solution 128. Operation of the power source 102 has been described above, and is not repeated here for sake of brevity.

[0039] The first cartridge 402 can comprise a housing 406 that is cylindrical in nature, wherein the housing 406 can be constructed from a non-metallic material such as a polymer or ceramic. The housing 406, of course, may be manufactured to be in a shape other than a cylinder. The first cartridge 402 includes a first end 408 and a second end 410 that is opposite the first end 408. The first end 408 of the first cartridge 402 is configured to be mechanically coupled to the second end 110 of the first cartridge 402. Mechanical coupling of the power source 102 and the first cartridge 402 causes the battery 118 to be electrically coupled to the heating element 126 as described above. The heating element 126 can be positioned proximate to the second end 310 of the first cartridge 402, and thus proximate to the solution 128 in the second cartridge 404.

[0040] The second cartridge 404 comprises a housing 412, wherein the housing 412 can be constructed of a pliable plastic material. The second cartridge 404 can comprise a first end 414 and a second end 416 that is opposite the first end 414, wherein the first end 414 is configured to be mated with the second end 410 of the first cartridge 402, and the second end 414 is configured to be received orally by a user. The first cartridge 402 and the second cartridge 404 may have airflow passageways (not shown) extending axially there through, such that the switch/sensor 112 can determine when the user is drawing air through the airflow passageways. The process controller 114 can cause an appropriate current/voltage to be provided to the heating element 126 by way of the battery 118, and the heating element 126 can vaporize the solution 128 in the third cartridge 404, thus providing the user with a vaporized substance.

[0041] While the designs of the electronic vaporizer described above include an internal direct heating element, it is to be understood that alternative designs are contemplated, wherein the heating element is reusable or disposable and is located exterior to the housing. In such a design, the heating element transfers heat to the solution in order to vaporize the solution for oral provision to a user.

[0042] Referring now to Fig. 5, an exemplary package 500 is illustrated, wherein the package 500 is configured for sale to consumers. The package 500 comprises a plurality of first cartridges 402 and a corresponding plurality of second cartridges 404, which have been described in detail above with respect to Fig. 4. The package 500 may be a tamper-proof package, with each combination of first and second cartridges sharing a compartment in the package 500.

[0043] With reference now to Fig. 6, an exemplary methodology is illustrated and described. While the methodology is described as being a series of acts that are performed in a sequence, it is to be understood that the methodology is not limited by the order of the sequence. For instance, some acts may occur in a different order than what is described herein. In addition, an act may occur concurrently with another act. Furthermore, in some instances, not all acts may be required to implement a methodology described herein.

[0044] With more specificity pertaining to Fig. 6, a methodology 600 that facilitates constructing a cartridge for utilization in connection with an electronic vaporizer is illustrated. The methodology 600 begins at 602, and at 604 a polymer-injection manufacturing technique is utilized to generate a housing for the cartridge. The polymer-injection manufacturing technique may be a multi-step polymer injection. Other manufacturing techniques are also contemplated

(but not limited to), including chemical bonding, thermal molding, thermal bonding, molding through utilization of metal molds, form casting, roll forming, machining, amongst others.

[0045] At 606, a heating element and liquid solution (e.g., placed in an absorbent material) are caused to be included in the housing. For instance, the housing can be cylindrical in nature with a size approximately the size of a filter on a cigarette. The heating element and the liquid solution reside in the interior of the housing. The methodology 600 completes at 608.

[0046] Turning now to Fig. 7, an exemplary personal electronic vaporizer 700 is illustrated. In a first embodiment, the electronic vaporizer 700 may be an electronic cigarette. In another embodiment, the electronic vaporizer 700 may be a drug delivery device for utilization in a medical field. The electronic vaporizer 700 comprises a power source 702 that is of a particular type. For example, the power source 702 may be manufactured by a particular manufacturer. In another example, the power source 702 may be a particular model of power source. Accordingly, the power source 702 has a connector 704 corresponding thereto that is of a first type that is associated with the particular type of the power source 702. Pursuant to an example, the power source 702 may be a battery that is commonly utilized in electronic cigarettes. In another example, the power source 702 may be an automobile battery, a AA battery, a portable telephone, a 9 volt battery, a personal computer, an AC outlet, a generator, or some other suitable power source.

[0047] The electronic vaporizer 700 also comprises a heating element 706 that is of a type that is different than the type associated with the power source 702. For example, the heating element 706 may be manufactured by a manufacturer that is different from the manufacturer of the power source 702. Thus, the heating element 706 can have a connector 708 that is of a second type that is different than the type of the connector 704 on the power source

702. Pursuant to an example, the first connector type may be a threaded connector, a magnetic connector, a push-on connector, a snap-on connector, a turn-lock connector, or other suitable connector type. The second connector type may be some connector type that is different from the first connector type.

[0048] The electronic vaporizer 700 also comprises an adapter 710 that is configured to mechanically mate the power source 702 with the heating element 706 by way of the adapter 710. Additionally, the adapter 710 is configured to electrically couple the power source 702 with the heating element 706. Thus, the adapter 710 comprises a first connector 712 that is of the first type (the same type as the connector 704 of the power source 702) and a second connector 714 that is of the second type (the same type as the connector 708 of the heating element 706). In an example, if the connector 704 is a threaded connector, the first connector 712 on the adapter 710 may be a threaded connector that is configured to receive or screw into the connector 704 of the power source 702. Additionally, while not shown, the adapter 710 may comprise an airflow passageway that allows airflow to reach the power source 702 when a user draws on the electronic vaporizer 700. Accordingly, the adapter 700 may be at least partially constructed of a conductive material, such as a conductive metal or a conductive polymer.

[0049] With reference now to Fig. 8, an exemplary adapter 800 that facilitates mechanically mating and electronically coupling a power source and a heating element in an electronic vaporizer having dissimilar connection mechanisms is illustrated. The adapter 800 comprises a first connector 802 of a first type and a second connector 804 of a second type. The first connector 802 is configured to mechanically and electrically mate with a power source and the second connector 804 is configured to mechanically and electrically mate with a heating

element. Accordingly, the power source is electrically and mechanically coupled to the heating element by way of the adapter 800.

[0050] The adapter 800 also comprises circuitry 806, which can be or include microchip, a voltage regulator, an AC/DC converter, an amplifier, circuitry that is configured to step up or step down voltage received from the power source, or some other suitable circuitry that can allow for power delivered from the power source to properly operate the heating element to cause vapor to be provided to a user as desired. Accordingly, while not shown, the adapter 800 can comprise an airflow passageway that allows air to flow between the heating element and the power source by way of the adapter.

[0051] As mentioned previously, the connectors 804 and 806 may be of dissimilar type. Therefore, for instance, the first connector 804 may be one of a threaded fastener, a magnetic connector, a twist cap connector, a push-on connector, a quick-lock connector, a t-bar connector, a half-turn lock, amongst other type of connectors, and the second connector 806 may be of a type that is dissimilar from the type of the first connector 804.

[0052] As discussed previously with respect to Figure 7, an example embodiment of a personal electronic vaporizer may include a power source 702 that corresponds to a generator. Such a generator may correspond to a power harvesting device operative to generate electricity from energy in the environment associated with the personal electronic vaporizer. Fig. 9 shows an example 900 of a personal electronic vaporizer that includes a power harvesting device such as a generator 902 as the power source. In this example, the generator 902 is mounted in a housing 904 of the electronic vaporizer. The housing 904 also includes an airflow passageway 906 that extends adjacent at least portions of the generator.

[0053] The generator may include at least one actuator device 908 such as an blade, impeller, fan, turbine, propeller, airfoil, squirrel-cage impeller, electron mass inductor, plasma accelerator and/or other type of device that is responsive to airflow through the airflow passageway 906 to urge a shaft 910 of the generator to rotate and generate an electrical current. There may also be a venturi, air duct, air ram or other channelling and/or funnelling technologies used in order to increase or decrease the speed and/or volume of the airflow. The generated electrical current may be directed via a controller 912 (e.g., a microprocessor and/or analog circuitry) included in the electronic vaporizer to power a heating element 914 sufficiently to vaporize a portion of a liquid solution 916. As described in previous embodiments, the heating element 914 and the liquid solution 916 may be integrated into a second housing 918 that is adapted to removably connect to the first housing 904.

[0054] As can be appreciated, the amount of electrical energy generated by the generator 902 will vary depending on the amount of air drawn through the airflow passageway 906 by a user inhaling and/or exhaling through the electronic vaporizer. In an example embodiment, the controller may be capable of regulating electricity generated from one or more inhales/exhales through the airflow passageway in order to provide the heating element with sufficient power to vaporize a portion of the liquid solution 916. For example, the controller 912 may be in operative connection with a storage device 920 such as one or more capacitors and/or a battery. Electrical energy generated by the generator from several inhales/exhales through the airflow passageways may be stored in the storage device 920. When a sufficient amount of energy is accumulated, the controller 912 may be operative to direct power to the heating element from the storage device in order to vaporize the liquid solution.

[0055] In order to ensure that the heating element is activated at a time desirable by a user, power to the heating element may be triggered by the controller responsive to information available to the controller (such as an air flow indication provided by a dedicated airflow sensor). However, rather than using a dedicated air flow sensor, in some embodiments, electricity generated from the generator itself may instead serve as a sensor indicating when a user is actively inhaling through the electronic vaporizer. The detection of inhaling coupled with a detection of a sufficient amount of energy in the storage device may cause the controller to power the heating element.

[0056] However, it should be appreciated that in other embodiments, additional or other information may be used to trigger the power of the heating element. For example, wind or other external air source may also be operative to urge the actuator device to turn the shaft of the generator. In order to prevent wind from activating the heating element at undesirable times, the electronic vaporizer may include at least one further sensor 922 adapted to sense that a user is holding and/or is ready for the electronic vaporizer to operate. Such a further sensor may correspond to a button or a switch, which is activated in order for the heating element to be powered.

[0057] In this described embodiment, the generator corresponds to a power harvesting device operative to acquire energy from airflows. However, it should be appreciated that in alternative embodiments of the electronic vaporizer, other types of power harvesting devices may be used. For example, an embodiment may include an induction device operative to acquire electrical power for charging a battery wirelessly via induction from an induction source near the electronic vaporizer. In another example, the power harvesting device may correspond to an inductive jet that is operative to generate electricity responsive to airflow through the inductive

jet, venturi or any other mechanism that directs a air or gas flow (including air) that could or may increase or decrease the gas speed and/or volume. Furthermore this may be used as an induction system pulling gases or vapors from a secondary stream for more flow mass/speed or to use as a mixing and/or blending mechanism.

[0058] In further embodiments, the electronic vaporize may include a power harvesting device in the form of a radio frequency (RF) power receiver device that is operative to acquire electrical power from RF signals transmitted by an RF power transmitter device. In further embodiments, the power receiver may be operative to harvest power from other RF sources in the environment such as wireless network signals and/or mobile phone communication signals. Examples of RF power harvesting devices include the power harvester modules sold by Powercast Corporation in Pittsburgh, PA.

[0059] Also, in further example embodiments, the electronic vaporizer may include a power harvesting device in the form of a vibration power receiver which is operative to convert mechanical vibrations (e.g., accelerations caused by movement of the electronic vaporizer) to electrical energy. Power harvesting devices may also include solar cells, static electricity harvesters, or any other type of device capable of harvesting power from energy sources in the vicinity of the detection device.

[0060] In these described embodiments, the power harvesting device may be operative to charge a rechargeable battery with the acquired electrical energy. The other components of the electronic vaporizer (e.g., the controller and heating element) may be powered via the battery. However, it is to be understood that example embodiments of some of the described harvesting devices may directly provide power to the controller and heating element without using a battery.

[0061] In example embodiments that include a generator, the controller may be operative to estimate an amount of airflow being drawn through the airflow passageway responsive to the electrical output from the generator. The controller may also be operative to determine when such an air flow includes a vaporized solution caused by the powering of the heating element by the controller. With such information, an example embodiment of the controller may be operative to estimate an amount of the vaporized solution that is likely being inhaled by the user. The controller may be operative to use this information to regulate and control the dosage of the vaporized solution received by the user. In this embodiment, the electronic vaporizer may correspond to a metered dosage inhaler (MDI) for nicotine, medications (e.g., for treatment of an asthma attack or other condition), and/or other chemicals.

[0062] For example, as illustrated in Figure 9, the controller may include a data store 924 such as a flash memory device or other non-volatile memory in which the controller is operative to store information regarding the amounts of vaporized solution that a user may have inhaled. The controller may also be operative to store time and/or date information in association with the measured amounts of inhaled vaporized solution. An example embodiment of the controller may be operative to operate the heating element responsive to the information stored in the data store. The controller may be operative to limit the amount of the vaporized solution that a user is able to inhale over a given predetermined (and/or configurable) period of time. This may be accomplished by the controller monitoring the amount of vaporized solution that is likely inhaled via the device for a predetermined period of time. When the monitored amount reaches a predetermined threshold, the controller may be operative to prevent the heater element from vaporizing additional solution, until after a predetermined amount of time, and/or until after the controller receives a manual reset signal (via a button, or other sensor device) included in the

electronic vaporizer. These described predetermined periods of time and predetermined thresholds may be stored in the data 924.

[0063] In one or more of the previously described embodiments (e.g., embodiments with either a battery or a power harvesting device), the described controller 912 (and/or a controller 928 in the housing 918 with the solution 916) may be operative to prevent the heater element from operating to vaporize a solution unless a specific user is detected by the electronic vaporizer. For example, in cases where the solution includes a prescription medication, a pain killer, a pharmaceutical, a narcotic, a controlled substance and/or other chemical, which is intended to be used by a specific person, the electronic vaporizer may include a sensor (e.g., such as sensor 922 in Figure 9) that corresponds to a fingerprint reader or other type of biometric device. Such a biometric device may acquire data from a user which is used by the controller 912 and/or 926 to verify that a predetermined user is currently holding the electronic vaporizer prior to vaporizing the solution.

[0064] In this described embodiment (with reference to Figure 9), a further data store 926 (e.g., a non volatile memory) may be included in the particular housing 918 that holds the solution (e.g., a prescription medication). This further data store 926 and/or data store 924 may be programmed (e.g., via a pharmacist) to include the biometric data associated with the user being treated with the prescription medication). The biometric data couples one or both of the housings 904, 918 to a particular user. Prior to causing the heater element to vaporize the solution with the prescription medication, the controller 912 and/or 928 may require the coupled user to provide (through a sensor 922) a biometric input that corresponds to the biometric data programmed into the data store 924 and/or 926.

[0065] In another example, the electronic vaporizer may be capable of having a data store be programmed (with the biometric data) by the owner of the device. In this embodiment, the electronic vaporizer may include one or more input devices through which the data store 924 or 926 can be updated with biometric data usable to couple the vaporizer to a specific user. Also, in an embodiment, the electronic vaporizer may include a communication device (e.g. a USB port, Bluetooth, Wireless Ethernet) capable of connecting to an external computing device (PC, mobile phone, or other computing device) through a wired or wireless connection. The external computing device may be operative to execute software capable of updating the data store 924 or 926 in the electronic vaporizer to included biometric data that couples the device to a specific user. Coupling an electronic vaporizer to a particular user may minimize the opportunity for children or other people from using the electronic vaporizer without permission.

[0066] It should also be appreciated that further embodiments may include other features for coupling an electronic vaporizer to a particular user. For example, the sensor 922 may correspond to an RFID, Bluetooth, and/or NFC reader that is operative to wirelessly read an RFID chip or other circuit (Bluetooth, NFC) integrated into an article associated with the user. Such an RFID chip or other circuit may be integrated into an article such as a ring, bracelet, necklace, card, mobile phone, clothing, or other article worn and/or carried by the user. The RFID chip or other circuit may include a unique code that corresponds to data stored in the data store 924 and/or 926. The controller 912 and/or, 928 may be operative to verify that the data stored in the data store 924 and/or 926 corresponds to code recently or currently being read by the RFID reader or other reader from the RFID chip or other circuit of the user's article, before causing the heater element to vaporize the solution. As described previously with respect to the embodiment with biometric data, a pharmacist and/or an end user may include computing

devices capable of interfacing with one or both controllers 912, 928 and storing data associated with the user's article in the data store 926 and/or 924.

[0067] To enhance security and to minimize unauthorized access to the electronic vaporizer or housings included therein, read only memory may be used as a data store for storing serial numbers, public keys, or other data that is intended to remain constant. Furthermore, updateable data (e.g. biometric data, RFID/Bluetooth/NFC data) which are programmed into a data store 924 and/or 926 by a pharmacist or other authorized person (to carry out the previously described data couplings), may be digitally signed in a manner that can be authenticated by one or more of the controllers 912, 928 in the electronic vaporizer prior to allowing the heater element to vaporize the solution.

[0068] For example, data stored in a data store 924 and/or 926 that couples the electronic vaporizer to a particular RFID chip or other circuit enabled article (e.g. a ring) may correspond to a digitally signed certificate that specifies the code that is transmitted by the article. Prior to enabling the heater element to vaporize the liquid solution, at least one of the controllers 912, 928 may require the detection of a code from an article which matches the code stored in the certificate, as well as requiring that the signature of the certificate be cryptographically authenticated. Further, the controller 912 and/or 928 may verify that the certificate includes serial number(s) associated with one or more of the housings 904, 918.

[0069] Such validly signed certificates may only be generated and stored on the electronic vaporizer by a pharmacists or other person that has access to a server with the particular private key that can sign the certificate in a manner that can be authenticated using the public key securely stored in the electronic vaporizer. Thus, an unauthorized user would not be

able to reprogram the electronic vaporizer (or the housing 918 that contains the solution 916) to work with other RFID articles by installing a fake certificate in the data store 924 and/or 926.

[0070] In addition, it should also be understood that in some embodiments a handshaking protocol may take place between controllers in different housings of the electronic vaporizer to establish encrypted communications. Such encrypted communications may minimize a man-in-the-middle attack or other hacks which may be attempted to gain unauthorized usage of the electronic vaporizer and/or associated housings/cartridges. For example, the controllers in different housings maybe able to carry out an SSL protocol to form an encrypted communication channel between the controllers through which certificates, RFID readings, biometric inputs, housing serial numbers, and/or other data may be passed therebetween. Also, it should be understood that embodiments that include an RFID/Bluetooth/NFC reader may be operative to carry out a handshaking protocol with an article. Such a handshaking protocol may establish encrypted communications with the article. The handshaking protocol may also include authentication of the article using digital certificates or other cryptographic processes.

[0071] In addition, in the previously described embodiments, the data store 924 and/or 926 may be programmed when manufactured, by a pharmacist, and/or by another authorized user to include usage and dosage information that correspond to the previously described predetermined periods of time and predetermined thresholds used to limit the amount of vaporized solution inhaled by a user. For such embodiments, the controller 912 and/or 928 may include or be in operative connection with a clock that can provide time information usable to control when to enable and/or prevent usage of the electronic vaporizer between the time intervals specified by the dosage information stored in the data store 924 and/or 926.

[0072] It should also be appreciated that one or more of the previously described embodiments of the electronic vaporizer may include a communication device for additional or other purposes besides programming the data store 926. For example, an embodiment of the electronic vaporizer may use a communication device to communicate data stored in the data store 924 associated with monitored usage of the device to an external computing device such as a remote server. The computing device may also communicate a unique identifier (e.g., a serial number, user account number, userID) to the remote server. The remote server may compile statistics regarding use of the electronic vaporizer (associated with the unique identifier) for use by a doctor or other person to evaluate and/or monitor its use. Also, the remote server may provide usage and/or dosage data to the electronic vaporizer to activate and/or modify future limits on the operation of the electronic vaporizer. In order to connect to the remote server, the communication device (e.g. a USB port, Bluetooth, NFC, Wireless Ethernet) of the electronic vaporizer may be connected to a corresponding communication device of a mobile phone, PC, or other computing device which has access to the Internet.

[0073] In addition, it should be understood that in some embodiments, in which a generator serves as a sensor (to monitor the intake of vaporized solution), the generator may not be used to provide electrical energy to power the heater element. Rather the generator may only correspond to an air flow meter. For example, the generator may be of a size that is adapted for monitoring airflow and may not be capable of timely generating a sufficient amount of energy to power the heater element. In such cases, the electronic vaporizer may include a battery as described in previous embodiments and/or some other type of power source or power harvesting device.

[0074] Also, it should be appreciated that one or more of the embodiments described herein may be operative to carry out and/or facilitate analyzing and/or capturing information about the user of the electronic vaporizer. For example in a further embodiment, the electronic vaporizer may include one or more sensors that are operative to analyze breath, saliva, skin, sweat, tissue, and/or cells of the user using the electronic vaporizer. Such sensors may be operative to acquire data from such substances, which data is stored in one or more data stores in the electronic vaporizer. Such data may be downloadable to a remote system (via a wired or wireless connection with the electronic vaporizer) in order for medical conditions and/or other characteristics of the user to be determined and evaluated by the user themselves, caregivers, and/or medical professionals.

[0075] Also in a further embodiment, the electronic vaporizer may be operative to acquire and store substances from a user (e.g., breath, saliva, skin, sweat, tissue, and/or cells) in a storage chamber within the electronic vaporizer during use of the electronic vaporize. The electronic vaporizer and/or the storage chamber may then be connected to one or more instruments capable of extracting and analyzing the contents of the storage chamber for medical conditions or other characteristics (e.g., cancer, vitamin deficiencies, drug use).

[0076] As discussed previously the power source used in one or more embodiments described herein may correspond to a rechargeable battery. Such a rechargeable battery may be capable of being rapidly charged in a relatively fast time period (e.g., < 1 hour, < 30 minutes, or other time period that is less than 2 hours to charge a battery from <10% of a full charge to >90% of a full charge). In the embodiment, a rapid charger that is used to rapidly charge a battery in an electronic vaporizer in this described manner, may be capable of being plugged into any other power sources such as an AC outlet, a USB port or a DC power source.

[0077] In addition, it should be appreciated that one or more embodiments described herein may include an epinephrine auto injector or other type of auto injector that is capable of being used by a user to inject a medication capable of treating an allergic reaction, anaphylactic shock or other condition that requires an injection of a medication into the bloodstream of a user. Such an auto injector may be included in an additional housing/cartridge removably mountable to one of the other housings/cartridges described herein and/or may be integrated into one of the housings/cartridges described herein. Such an auto injector may be capable of being activated by placing an end of the housing/cartridge with the auto injector adjacent a user's body (e.g. a muscle) and pressing a button which causes a spring loaded needle in the auto injector to enter tissue of the user and inject a medication stored in the housing into the body of the person.

[0078] Further, it should be noted that any of the chemical delivery examples described herein (vaporizer, capsule, pellet, auto injector) may be operative to deliver any type of desirable substance to a user, including but not limited to: medications, antibiotics, pain killers, pharmaceuticals, narcotics, nicotine, tobacco, THC, marijuana, caffeine, vitamins, herbal substances, food, steroids, epinephrine, insulin, and/or any other substances that may be desirable by an end user of the described embodiments. Also, it should be appreciated that that one or more example embodiments may correspond to a cartridge that comprises of a housing, heating element located in the center airflow and a storage mechanism for holding the active and inert ingredients. In addition one or more embodiments may correspond to a cartridge that comprises of a housing, heating element surrounding the center of the airflow for the purpose of vaporization of ingredient or ingredients. Further one or more embodiments may correspond to a heating element that directly or indirectly contacts a solution, solid or powder to be transferred in a gaseous, liquid, powder or solid state either directly or indirectly through a carrier medium of

any kind in order to be inhaled through breath or artificial breathing mechanism to be delivered either directly or indirectly to the user or subject. Also, one or more embodiments may correspond to a heating element made from metallic substance such as nichrome, nickel chromium, gaseous heating element, ceramic, ceramic composite, carbon, carbon hybrid, carbon fiber, polymer, hybrid polymer or any other material that are capable of heating a solution, solid or powder to a gaseous state for the purpose of delivering a desired substance or combination of substances in order to deliver flavors, nicotine, medicines, recreational consumables, tobacco, marijuana, vitamins or any other substance or combination of substances for consumption by humans or animals of any kind. In addition one or more embodiments may correspond to a device or group of devices that use software and/or hardware that can also use artificial intelligence to singularly or collectively and can be linked either wirelessly or through other hard connection mechanisms to allow for the devices and user to collaborate or share collective data either knowingly or unknowingly directly or through a medium such as a server, internet or data bank locally or remotely for data collection as well as collaboration.

[0079] It is noted that several examples have been provided for purposes of explanation. These examples are not to be construed as limiting the hereto-appended claims. Additionally, it may be recognized that the examples provided herein may be permutated while still falling under the scope of the claims.

CLAIMS

We claim:

1. An apparatus comprising:

a power source,

wherein the power source includes a battery,

wherein the power source includes an electrically conductive threaded portion; and

a cartridge having a housing that comprises an interior,

wherein the housing includes a first end and a second end that is opposite the first end, wherein the housing includes a first aperture on the first end and a second aperture on the second end,

wherein the housing includes an airflow passageway that extends with respect to the housing intermediate of the first aperture on the first end of the housing and the second aperture on the second end of the housing,



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wherein the airflow passageway is configured to allow airflow through the cartridge from the first aperture to the second aperture of the housing,

wherein the first end of the housing includes an electrically conductive threaded portion that is adapted to mechanically and electrically couple to the electrically conductive threaded portion of the power source,

wherein the housing includes a solution holding medium comprising a solution located in the interior of the housing,

wherein the solution holding medium surrounds the airflow passageway in the interior of the housing and intermediate of the first end and the second end,

wherein the housing includes a heating element located in the interior of the housing,

wherein the heating element is electrically configured to vaporize at least a portion of the solution for oral provision to an individual in the airflow from the second aperture responsive to electrical power received from the battery through the electrically conductive threaded portions of the cartridge and power source.

2. The apparatus according to claim 1, wherein the solution holding medium includes at least one of an absorbent material, a chamber, a reservoir, a capsule, or any combination thereof.

3. The apparatus according to claim 2, wherein the housing has a cylindrically shaped outer wall, wherein the housing has a central longitudinal axis that extends between the first and second apertures, wherein the airflow passageway extends coaxially with central longitudinal axis, wherein the solution holding medium surrounds the airflow passageway and the central longitudinal axis and no portion of the solution holding medium intersects the central longitudinal axis.

4. The apparatus according to claim 1, wherein the heating element extends transversely across the airflow passageway, whereby airflow through the passageway passes on both transverse sides of the element.

5. The apparatus according to claim 1, wherein the heating element extends in surrounding relation of the airflow passageway.

6. The apparatus according to claim 1, wherein the heating element is in operative connection with a wicking material, wherein the wicking material is operative to attract the solution from the solution holding medium toward the heating element.

7. The apparatus according to claim 1, wherein the solution comprises propylene glycol, nicotine, caffeine, THC, antibiotics, pain killers, vitamins, insulin, epinephrine, or any combination thereof.

8. The apparatus according to claim 1, wherein the heating element includes electrically conductive and ceramic material positioned in surrounding relation of the airflow passageway.

9. The apparatus according to claim 1, wherein the second end is at least partially covered by a wood tip.

10. The apparatus according to claim 1, wherein the housing is comprised of wood, a ceramic, or a combination thereof.

11. The apparatus according to claim 1, wherein the housing includes an outer cylindrical wall comprised at least in part of a polymer.

12. An apparatus comprising:

electronic cigarette cartridge, wherein the electronic cigarette cartridge includes a housing,

wherein the housing includes:

an interior;

a first end;

a second end that is opposite the first end;

a heating element located in the interior of the housing;

an airflow passageway that extends intermediate of the first end and the second end through the interior of the housing along an axial direction, wherein the airflow passageway enables airflow from the first end to the second end;

a solution holding medium located in the interior of the housing, wherein the medium extends in surrounding relation of the heating element and the airflow passageway, wherein the medium includes a liquid solution, wherein the medium includes at least one of an absorbent material, a chamber, a reservoir, a capsule, or any combination thereof,

wherein the first end of the housing includes an electrically conductive engageable portion that is configured to mechanically and electrically couple to a further electrically conductive engageable portion in operative connection with a power source, wherein the heating element is

configured to vaporize at least a portion of the solution for oral delivery from the second end of the housing upon receiving current from the power source through the electrically conductive engageable portion of the cartridge.

13. The apparatus according to claim 12, wherein the solution comprises propylene glycol, nicotine, caffeine, THC, antibiotics, pain killers, vitamins, insulin, epinephrine, or any combination thereof.

14. The apparatus according to claim 12, wherein the heating element is in operative connection with a wicking material that is configured to attract the solution from the solution holding medium toward the heating element.

15. The apparatus according to claim 12, wherein the housing is comprised of at least one of a polymer or a ceramic.

16. The apparatus according to claim 12, wherein the first end comprises a first aperture and the second end comprises a second aperture, wherein the airflow passageway extends along an axial direction between the first aperture and the second aperture through the interior of the housing, and wherein at least a portion of the heating element extends in the airflow passageway, and wherein no portion of the solution holding medium intersects the central longitudinal axis.

17. The apparatus according to claim 12, wherein the first end comprises a first aperture and the second end comprises a second aperture, wherein the airflow passageway extends along an axial direction between the first aperture and the second aperture, and wherein the heating element is helical and extends in surrounding relation of the airflow passageway.

18. The apparatus according to claim 12, and further comprising the power source.

19. The apparatus according to claim 12 and further comprising:

at least one sensor operative to sense at least one property corresponding to an amount of air flow through the airflow passageway,

a controller in operative connection with the at least one sensor, wherein the controller is operative to cause a change in current delivered to the heating element responsive to the at least one sensed property.

20. An apparatus comprising:

an electrical power source including a positive terminal and a negative terminal;

a housing, wherein the housing is configured to releasibly electrically and physically couple to the power source, wherein the housing comprises:

an interior area, wherein the interior area extends along a central longitudinal axis of the housing;

a first end, wherein the first end comprises a first aperture;

a second end that is opposite the first end, wherein the second end comprises a second aperture;

an airflow passageway that extends along an axial direction intermediate of the first aperture and the second aperture,

a first conductive element extending in the interior area of the housing adjacent the first end, the first conductive element configured to be electrically in operative connection with the negative terminal of the power source;

a second conductive element extending in the interior area of the housing adjacent the first end, the second conductive element configured to be electrically in operative connection with the positive terminal of the power source;

a heating element within the interior area of the housing, the heating element configured to be electrically coupled to the power source by way of the first conductive element and the second conductive element; and

a solution holding element located in the interior area of the housing, wherein the solution holding element includes at least one of an absorbent material, a chamber, a reservoir, capsule, or any combination thereof, wherein the solution holding element holds a liquid solution, wherein the solution includes at least one of nicotine, caffeine, or THC, antibiotics, pain killers, vitamins, insulin, epinephrine or combinations thereof,

wherein the heating element and airflow passageway extend within the solution holding element, and wherein the heating element is configured to vaporize at least a portion of the solution responsive to receiving power from the power source such that the vaporized solution passes into the airflow passageway.

ABSTRACT

An electronic vaporizer is provided. The electronic vaporizer includes a cartridge that facilitates provision of a vaporized solution to an individual. The cartridge includes a housing that includes an interior, wherein the housing is one of a polymer housing or a ceramic housing. The cartridge also includes a heating element located in the interior of the housing, wherein the heating element is configured to vaporize a solution for oral provision to the individual. The vaporizer may also include a power harvesting device operative to acquire energy from the environment for use with powering the heating element.



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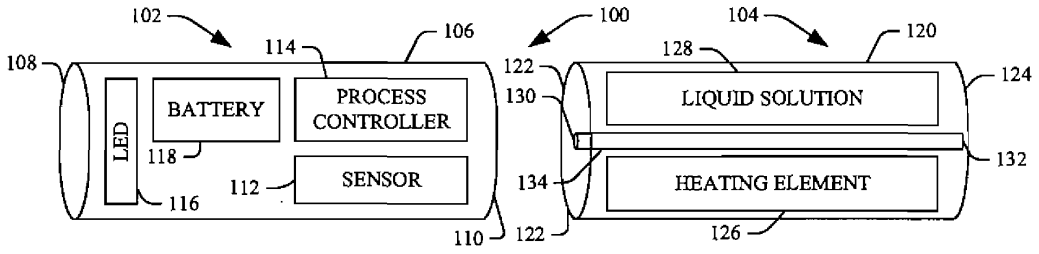

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LED
BATTERY
PROCESS CONTROLLER
LIQUID SOLUTION
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SENSOR
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HEATING ELEMENT
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122
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**FIG. 1**

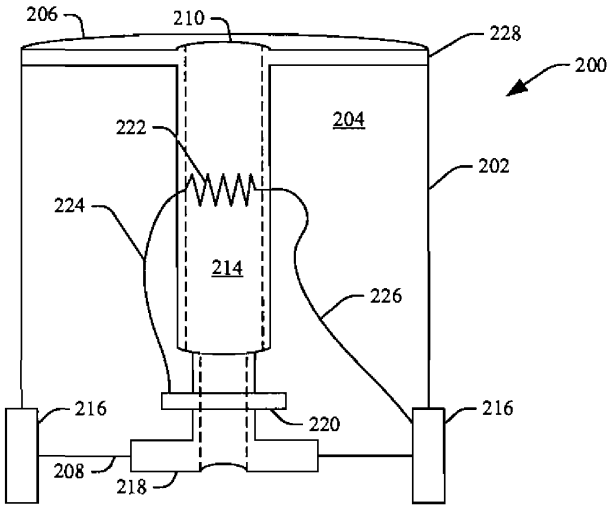

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**FIG. 2**

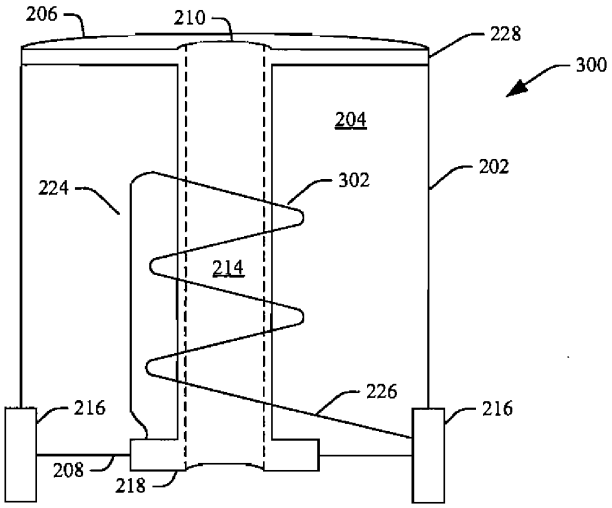



**FIG. 3**

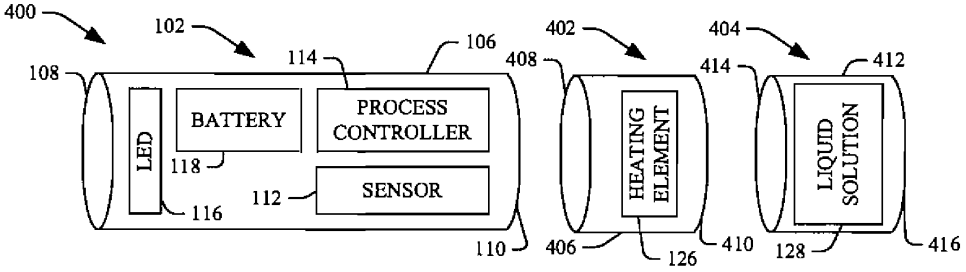

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BATTERY
PROCESS CONTROLLER
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HEATING ELEMENT
LIQUID SOLUTION
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SENSOR
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FIG. 4

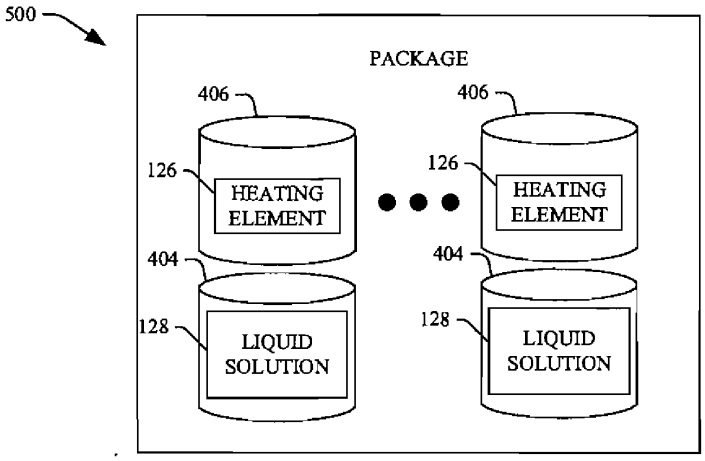

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PACKAGE
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HEATING ELEMENT
HEATING ELEMENT
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404
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LIQUID SOLUTION
LIQUID SOLUTION

FIG. 5

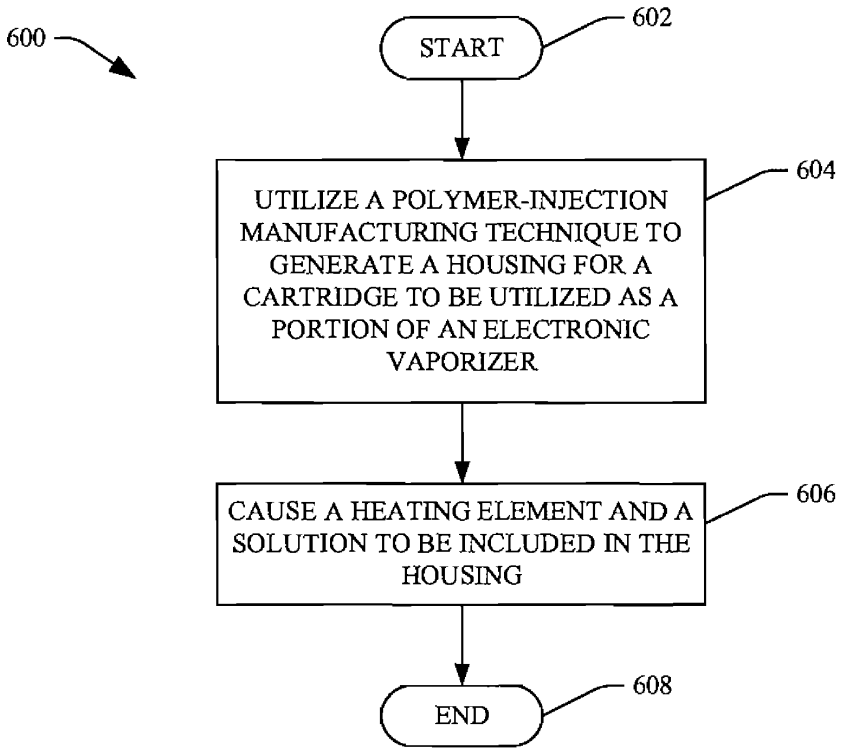

600
START
602
UTILIZE A POLYMER-INJECTION MANUFACTURING TECHNIQUE TO GENERATE A HOUSING FOR A CARTRIDGE TO BE UTILIZED AS A PORTION OF AN ELECTRONIC VAPORIZER
604
CAUSE A HEATING ELEMENT AND A SOLUTION TO BE INCLUDED IN THE HOUSING
606
END
608

**FIG. 6**

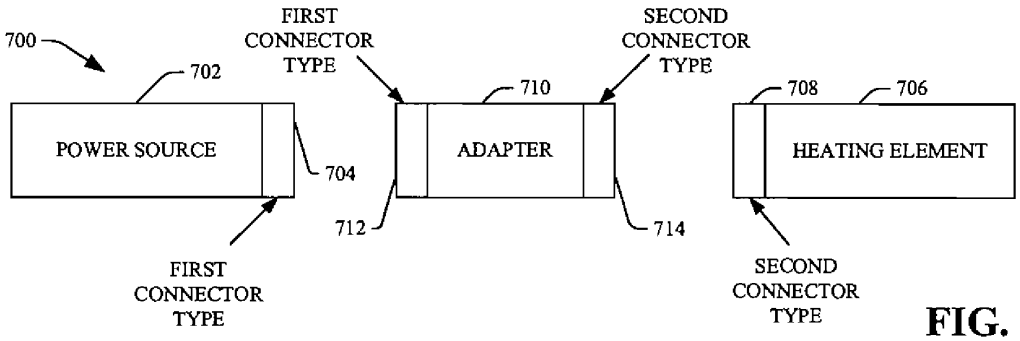

700
FIRST CONNECTOR TYPE
SECOND CONNECTOR TYPE
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710
708
706
POWER SOURCE
704
ADAPTER
HEATING ELEMENT
712
714
FIRST CONNECTOR TYPE
SECOND CONNECTOR TYPE

FIG. 7

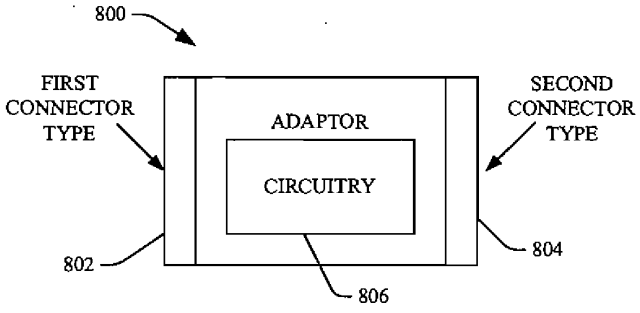

800
FIRST CONNECTOR TYPE
SECOND CONNECTOR TYPE
ADAPTOR
CIRCUITRY
802
804
806

FIG. 8

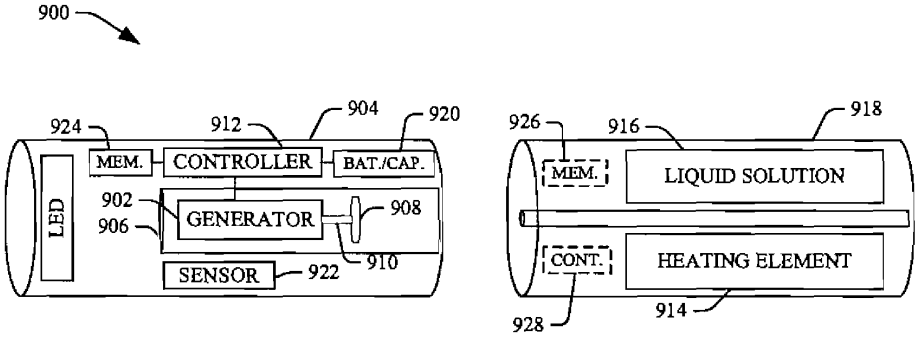

900
924
912
904
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MEM.
CONTROLLER
BAT./CAP.
LED
902
906
GENERATOR
908
910
SENSOR
922
926
916
918
MEM.
LIQUID SOLUTION
CONT.
HEATING ELEMENT
914
928

**FIG. 9**

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| Application Data Sheet 37 CFR 1.76 | Attorney Docket Number | FUMA-1001 CIP2C |
|---|---|---|
| | Application Number | |
| Title of Invention | ELECTRONIC VAPORIZER | |

The application data sheet is part of the provisional or nonprovisional application for which it is being submitted. The following form contains the bibliographic data arranged in a format specified by the United States Patent and Trademark Office as outlined in 37 CFR 1.76.
This document may be completed electronically and submitted to the Office in electronic format using the Electronic Filing System (EFS) or the document may be printed and included in a paper filed application.

## Secrecy Order 37 CFR 5.2:

☐ Portions or all of the application associated with this Application Data Sheet may fall under a Secrecy Order pursuant to 37 CFR 5.2 (Paper filers only. Applications that fall under Secrecy Order may not be filed electronically.)

## Inventor Information:

**Inventor 1** Remove

**Legal Name**

| Prefix | Given Name | Middle Name | Family Name | Suffix |
|---|---|---|---|---|
| | Gregory | D. | Conley | |

**Residence Information (Select One)** ● US Residency Non US Residency Active US Military Service

| City | Medina | State/Province | OH | Country of Residence | US |
|---|---|---|---|---|---|

**Mailing Address of Inventor:**

| Address 1 | 644 Tremain Place | | |
|---|---|---|---|
| Address 2 | | | |
| City | Medina | State/Province | OH |
| Postal Code | 44256 | Country | US |

**Inventor 2** Remove

**Legal Name**

| Prefix | Given Name | Middle Name | Family Name | Suffix |
|---|---|---|---|---|
| | Daniel | C. | Hillenbrandt | Jr. |

**Residence Information (Select One)** ◉ US Residency Non US Residency Active US Military Service

| City | Brunswick | State/Province | OH | Country of Residence | US |
|---|---|---|---|---|---|

**Mailing Address of Inventor:**

| Address 1 | 1920 George Drive | | |
|---|---|---|---|
| Address 2 | | | |
| City | Brunswick | State/Province | OH |
| Postal Code | 44212 | Country | US |

**Inventor 3** Remove

**Legal Name**

| Prefix | Given Name | Middle Name | Family Name | Suffix |
|---|---|---|---|---|
| | Rebecca | L. | Conley | |

**Residence Information (Select One)** ◉ US Residency Non US Residency Active US Military Service

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| Application Data Sheet 37 CFR 1.76 | Attorney Docket Number | FUMA-1001 CIP2C |
|---|---|---|
| | Application Number | |
| Title of Invention | ELECTRONIC VAPORIZER | |

| City | Medina | State/Province | OH | Country of Residence | US |
|---|---|---|---|---|---|

**Mailing Address of Inventor:**

| | | | |
|---|---|---|---|
| **Address 1** | 644 Tremain Place | | |
| **Address 2** | | | |
| **City** | Medina | **State/Province** | OH |
| **Postal Code** | 44256 | **Country** | US |

All Inventors Must Be Listed - Additional Inventor Information blocks may be generated within this form by selecting the **Add** button. Add

## Correspondence Information:

**Enter either Customer Number or complete the Correspondence Information section below.**
**For further information see 37 CFR 1.33(a).**

☐ **An Address is being provided for the correspondence Information of this application.**

| | | | |
|---|---|---|---|
| **Customer Number** | 07733 | | |
| **Email Address** | iplaw@walkerandjocke.com | Add Email | Remove Email |

## Application Information:

| | | | |
|---|---|---|---|
| **Title of the Invention** | ELECTRONIC VAPORIZER | | |
| **Attorney Docket Number** | FUMA-1001 CIP2C | **Small Entity Status Claimed** | ☒ |
| **Application Type** | Nonprovisional | | |
| **Subject Matter** | Utility | | |
| **Total Number of Drawing Sheets (if any)** | 6 | **Suggested Figure for Publication (if any)** | 1 |

## Filing By Reference:

Only complete this section when filing an application by reference under 35 U.S.C. 111(c) and 37 CFR 1.57(a). Do not complete this section if application papers including a specification and any drawings are being filed. Any domestic benefit or foreign priority information must be provided in the appropriate section(s) below (i.e., "Domestic Benefit/National Stage Information" and "Foreign Priority Information").

For the purposes of a filing date under 37 CFR 1.53(b), the description and any drawings of the present application are replaced by this reference to the previously filed application, subject to conditions and requirements of 37 CFR 1.57(a).

| Application number of the previously filed application | Filing date (YYYY-MM-DD) | Intellectual Property Authority or Country |
|---|---|---|
| | | |

## Publication Information:

☐ Request Early Publication (Fee required at time of Request 37 CFR 1.219)

☒ **Request Not to Publish.** I hereby request that the attached application not be published under 35 U.S.C. 122(b) and certify that the invention disclosed in the attached application **has not and will not** be the subject of an application filed in another country, or under a multilateral international agreement, that requires publication at eighteen months after filing.

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| Application Data Sheet 37 CFR 1.76 | Attorney Docket Number | FUMA-1001 CIP2C |
|---|---|---|
| | Application Number | |
| Title of Invention | ELECTRONIC VAPORIZER | |

## Representative Information:

Representative information should be provided for all practitioners having a power of attorney in the application. Providing this information in the Application Data Sheet does not constitute a power of attorney in the application (see 37 CFR 1.32).
Either enter Customer Number or complete the Representative Name section below. If both sections are completed the customer Number will be used for the Representative Information during processing.

| Please Select One: | ● Customer Number | US Patent Practitioner | ◯ Limited Recognition (37 CFR 11.9) |
|---|---|---|---|
| Customer Number | 07733 | | |

## Domestic Benefit/National Stage Information:

This section allows for the applicant to either claim benefit under 35 U.S.C. 119(e), 120, 121, 365(c), or 386(c) or indicate National Stage entry from a PCT application. Providing benefit claim information in the Application Data Sheet constitutes the specific reference required by 35 U.S.C. 119(e) or 120, and 37 CFR 1.78.
When referring to the current application, please leave the "Application Number" field blank.

| Prior Application Status | Pending | | Remove |
|---|---|---|---|
| Application Number | Continuity Type | Prior Application Number | Filing or 371(c) Date (YYYY-MM-DD) |
| | Continuation of | 14510955 | 2014-10-09 |
| Prior Application Status | Pending | | Remove |
| Application Number | Continuity Type | Prior Application Number | Filing or 371(c) Date (YYYY-MM-DD) |
| 14510955 | Continuation of | 13594813 | 2012-08-25 |
| Prior Application Status | Pending | | Remove |
| Application Number | Continuity Type | Prior Application Number | Filing or 371(c) Date (YYYY-MM-DD) |
| 13594813 | Continuation in part of | 12843917 | 2010-07-27 |
| Prior Application Status | Expired | | Remove |
| Application Number | Continuity Type | Prior Application Number | Filing or 371(c) Date (YYYY-MM-DD) |
| 12843917 | Claims benefit of provisional | 61273097 | 2009-07-31 |
| Prior Application Status | Expired | | Remove |
| Application Number | Continuity Type | Prior Application Number | Filing or 371(c) Date (YYYY-MM-DD) |
| 12843917 | Claims benefit of provisional | 61271819 | 2009-07-27 |

| Application Data Sheet 37 CFR 1.76 | Attorney Docket Number | FUMA-1001 CIP2C |
|---|---|---|
| | Application Number | |
| Title of Invention | ELECTRONIC VAPORIZER | |

| Prior Application Status | Expired | | Remove |
|---|---|---|---|
| Application Number | Continuity Type | Prior Application Number | Filing or 371(c) Date (YYYY-MM-DD) |
| 13594813 | Claims benefit of provisional | 61527434 | 2011-08-25 |
| Additional Domestic Benefit/National Stage Data may be generated within this form by selecting the **Add** button. | | | Add |

## Foreign Priority Information:

This section allows for the applicant to claim priority to a foreign application. Providing this information in the application data sheet constitutes the claim for priority as required by 35 U.S.C. 119(b) and 37 CFR 1.55. When priority is claimed to a foreign application that is eligible for retrieval under the priority document exchange program (PDX)[i] the information will be used by the Office to automatically attempt retrieval pursuant to 37 CFR 1.55(i)(1) and (2). Under the PDX program, applicant bears the ultimate responsibility for ensuring that a copy of the foreign application is received by the Office from the participating foreign intellectual property office, or a certified copy of the foreign priority application is filed, within the time period specified in 37 CFR 1.55(g)(1).

| | | | Remove |
|---|---|---|---|
| Application Number | Country[i] | Filing Date (YYYY-MM-DD) | Access Code[i] (if applicable) |
| | | | |
| Additional Foreign Priority Data may be generated within this form by selecting the **Add** button. | | | Add |

## Statement under 37 CFR 1.55 or 1.78 for AIA (First Inventor to File) Transition Applications

☐ This application (1) claims priority to or the benefit of an application filed before March 16, 2013 and (2) also contains, or contained at any time, a claim to a claimed invention that has an effective filing date on or after March 16, 2013.
NOTE: By providing this statement under 37 CFR 1.55 or 1.78, this application, with a filing date on or after March 16, 2013, will be examined under the first inventor to file provisions of the AIA.

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| Application Data Sheet 37 CFR 1.76 | Attorney Docket Number | FUMA-1001 CIP2C |
|---|---|---|
| | Application Number | |
| Title of Invention | ELECTRONIC VAPORIZER | |

## Authorization or Opt-Out of Authorization to Permit Access:

When this Application Data Sheet is properly signed and filed with the application, applicant has provided written authority to permit a participating foreign intellectual property (IP) office access to the instant application-as-filed (see paragraph A in subsection 1 below) and the European Patent Office (EPO) access to any search results from the instant application (see paragraph B in subsection 1 below).

Should applicant choose not to provide an authorization identified in subsection 1 below, applicant **must opt-out** of the authorization by checking the corresponding box A or B or both in subsection 2 below.

**NOTE**: This section of the Application Data Sheet is **ONLY** reviewed and processed with the **INITIAL** filing of an application. After the initial filing of an application, an Application Data Sheet cannot be used to provide or rescind authorization for access by a foreign IP office(s). Instead, Form PTO/SB/39 or PTO/SB/69 must be used as appropriate.

**1. Authorization to Permit Access by a Foreign Intellectual Property Office(s)**

**A. Priority Document Exchange (PDX)** - Unless box A in subsection 2 (opt-out of authorization) is checked, the undersigned hereby **grants the USPTO authority** to provide the European Patent Office (EPO), the Japan Patent Office (JPO), the Korean Intellectual Property Office (KIPO), the State Intellectual Property Office of the People's Republic of China (SIPO), the World Intellectual Property Organization (WIPO), and any other foreign intellectual property office participating with the USPTO in a bilateral or multilateral priority document exchange agreement in which a foreign application claiming priority to the instant patent application is filed, access to: (1) the instant patent application-as-filed and its related bibliographic data, (2) any foreign or domestic application to which priority or benefit is claimed by the instant application and its related bibliographic data, and (3) the date of filing of this Authorization. See 37 CFR 1.14(h)(1).

**B. Search Results from U.S. Application to EPO** - Unless box B in subsection 2 (opt-out of authorization) is checked, the undersigned hereby **grants the USPTO authority** to provide the EPO access to the bibliographic data and search results from the instant patent application when a European patent application claiming priority to the instant patent application is filed. See 37 CFR 1.14(h)(2).

The applicant is reminded that the EPO's Rule 141(1) EPC (European Patent Convention) requires applicants to submit a copy of search results from the instant application without delay in a European patent application that claims priority to the instant application.

**2. Opt-Out of Authorizations to Permit Access by a Foreign Intellectual Property Office(s)**

☒ A. Applicant **DOES NOT** authorize the USPTO to permit a participating foreign IP office access to the instant application-as-filed. If this box is checked, the USPTO will not be providing a participating foreign IP office with any documents and information identified in subsection 1A above.

☒ B. Applicant **DOES NOT** authorize the USPTO to transmit to the EPO any search results from the instant patent application. If this box is checked, the USPTO will not be providing the EPO with search results from the instant application.

**NOTE:** Once the application has published or is otherwise publicly available, the USPTO may provide access to the application in accordance with 37 CFR 1.14.

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| Application Data Sheet 37 CFR 1.76 | Attorney Docket Number | FUMA-1001 CIP2C |
|---|---|---|
| | Application Number | |
| Title of Invention | ELECTRONIC VAPORIZER | |

## Applicant Information:

Providing assignment information in this section does not substitute for compliance with any requirement of part 3 of Title 37 of CFR to have an assignment recorded by the Office.

**Applicant** 1 — Remove

If the applicant is the inventor (or the remaining joint inventor or inventors under 37 CFR 1.45), this section should not be completed. The information to be provided in this section is the name and address of the legal representative who is the applicant under 37 CFR 1.43; or the name and address of the assignee, person to whom the inventor is under an obligation to assign the invention, or person who otherwise shows sufficient proprietary interest in the matter who is the applicant under 37 CFR 1.46. If the applicant is an applicant under 37 CFR 1.46 (assignee, person to whom the inventor is obligated to assign, or person who otherwise shows sufficient proprietary interest) together with one or more joint inventors, then the joint inventor or inventors who are also the applicant should be identified in this section.

Clear

| ● Assignee | Legal Representative under 35 U.S.C. 117 | Joint Inventor |
|---|---|---|
| Person to whom the inventor is obligated to assign. | Person who shows sufficient proprietary interest | |

If applicant is the legal representative, indicate the authority to file the patent application, the inventor is:

Name of the Deceased or Legally Incapacitated Inventor:

If the Applicant is an Organization check here. ☒

| Organization Name | FUMA International, LLC | | |
|---|---|---|---|
| **Mailing Address Information For Applicant:** | | | |
| **Address 1** | 879 Progress Drive, Suite C | | |
| Address 2 | | | |
| **City** | Medina | **State/Province** | OH |
| **Country** | US | Postal Code | 44256 |
| Phone Number | | Fax Number | |
| Email Address | | | |

Additional Applicant Data may be generated within this form by selecting the Add button. — Add

## Assignee Information including Non-Applicant Assignee Information:

Providing assignment information in this section does not substitute for compliance with any requirement of part 3 of Title 37 of CFR to have an assignment recorded by the Office.

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| **Application Data Sheet 37 CFR 1.76** | Attorney Docket Number | FUMA-1001 CIP2C |
|---|---|---|
| | Application Number | |
| Title of Invention | ELECTRONIC VAPORIZER | |

**Assignee 1**

Complete this section if assignee information, including non-applicant assignee information, is desired to be included on the patent application publication. An assignee-applicant identified in the "Applicant Information" section will appear on the patent application publication as an applicant. For an assignee-applicant, complete this section only if identification as an assignee is also desired on the patent application publication.

Remove

If the Assignee or Non-Applicant Assignee is an Organization check here. ☐

| Prefix | **Given Name** | Middle Name | **Family Name** | Suffix |
|---|---|---|---|---|
| | | | | |

**Mailing Address Information For Assignee including Non-Applicant Assignee:**

| | | | |
|---|---|---|---|
| **Address 1** | | | |
| Address 2 | | | |
| **City** | | **State/Province** | |
| **Country** i | | Postal Code | |
| Phone Number | | Fax Number | |
| Email Address | | | |

Additional Assignee or Non-Applicant Assignee Data may be generated within this form by selecting the Add button. Add

## Signature:

Remove

**NOTE:** This Application Data Sheet must be signed in accordance with 37 CFR 1.33(b). **However, if this Application Data Sheet is submitted with the INITIAL filing of the application and either box A or B is not checked in subsection 2 of the "Authorization or Opt-Out of Authorization to Permit Access" section, then this form must also be signed in accordance with 37 CFR 1.14(c).**

This Application Data Sheet **must** be signed by a patent practitioner if one or more of the applicants is a **juristic entity** (e.g., corporation or association). If the applicant is two or more joint inventors, this form must be signed by a patent practitioner, **all** joint inventors who are the applicant, or one or more joint inventor-applicants who have been given power of attorney (e.g., see USPTO Form PTO/AIA/81) on behalf of **all** joint inventor-applicants.

See 37 CFR 1.4(d) for the manner of making signatures and certifications.

| **Signature** | /Ralph E. Jocke/ | | | Date (YYYY-MM-DD) | 2016-12-13 |
|---|---|---|---|---|---|
| First Name | Ralph | Last Name | Jocke | Registration Number | 31029 |

Additional Signature may be generated within this form by selecting the Add button. Add

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| **Application Data Sheet 37 CFR 1.76** | Attorney Docket Number | FUMA-1001 CIP2C |
|---|---|---|
| | Application Number | |
| Title of Invention | ELECTRONIC VAPORIZER | |

This collection of information is required by 37 CFR 1.76. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 23 minutes to complete, including gathering, preparing, and submitting the completed application data sheet form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. **SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.**

# Privacy Act Statement

The Privacy Act of 1974 (P.L. 93-579) requires that you be given certain information in connection with your submission of the attached form related to a patent application or patent. Accordingly, pursuant to the requirements of the Act, please be advised that: (1) the general authority for the collection of this information is 35 U.S.C. 2(b)(2); (2) furnishing of the information solicited is voluntary; and (3) the principal purpose for which the information is used by the U.S. Patent and Trademark Office is to process and/or examine your submission related to a patent application or patent. If you do not furnish the requested information, the U.S. Patent and Trademark Office may not be able to process and/or examine your submission, which may result in termination of proceedings or abandonment of the application or expiration of the patent.

The information provided by you in this form will be subject to the following routine uses:

1 The information on this form will be treated confidentially to the extent allowed under the Freedom of Information Act (5 U.S.C. 552) and the Privacy Act (5 U.S.C. 552a). Records from this system of records may be disclosed to the Department of Justice to determine whether the Freedom of Information Act requires disclosure of these records.

2. A record from this system of records may be disclosed, as a routine use, in the course of presenting evidence to a court, magistrate, or administrative tribunal, including disclosures to opposing counsel in the course of settlement negotiations.

3 A record in this system of records may be disclosed, as a routine use, to a Member of Congress submitting a request involving an individual, to whom the record pertains, when the individual has requested assistance from the Member with respect to the subject matter of the record.

4. A record in this system of records may be disclosed, as a routine use, to a contractor of the Agency having need for the information in order to perform a contract. Recipients of information shall be required to comply with the requirements of the Privacy Act of 1974, as amended, pursuant to 5 U.S.C. 552a(m).

5. A record related to an International Application filed under the Patent Cooperation Treaty in this system of records may be disclosed, as a routine use, to the International Bureau of the World Intellectual Property Organization, pursuant to the Patent CooperationTreaty.

6. A record in this system of records may be disclosed, as a routine use, to another federal agency for purposes of National Security review (35 U.S.C. 181) and for review pursuant to the Atomic Energy Act (42 U.S.C. 218(c)).

7. A record from this system of records may be disclosed, as a routine use, to the Administrator, General Services, or his/her designee, during an inspection of records conducted by GSA as part of that agency's responsibility to recommend improvements in records management practices and programs, under authority of 44 U.S.C. 2904 and 2906. Such disclosure shall be made in accordance with the GSA regulations governing inspection of records for this purpose, and any other relevant (i.e., GSA or Commerce) directive. Such disclosure shall not be used to make determinations about individuals.

8. A record from this system of records may be disclosed, as a routine use, to the public after either publication of the application pursuant to 35 U.S.C. 122(b) or issuance of a patent pursuant to 35 U.S.C. 151. Further, a record may be disclosed, subject to the limitations of 37 CFR 1.14, as a routine use, to the public if the record was filed in an application which became abandoned or in which the proceedings were terminated and which application is referenced by either a published application, an application open to public inspections or an issued patent.

9. A record from this system of records may be disclosed, as a routine use, to a Federal, State, or local law enforcement agency, if the USPTO becomes aware of a violation or potential violation of law or regulation.

# Electronic Patent Application Fee Transmittal

| | |
|---|---|
| **Application Number:** | |
| **Filing Date:** | |
| **Title of Invention:** | ELECTRONIC VAPORIZER |
| **First Named Inventor/Applicant Name:** | Gregory D. Conley |
| **Filer:** | Ralph E. Jocke/Delores Kugler |
| **Attorney Docket Number:** | FUMA-1001 CIP2C |

Filed as Small Entity

**Filing Fees for Utility under 35 USC 111(a)**

| Description | Fee Code | Quantity | Amount | Sub-Total in USD($) |
|---|---|---|---|---|
| **Basic Filing:** | | | | |
| UTILITY FILING FEE (ELECTRONIC FILING) | 4011 | 1 | 70 | 70 |
| UTILITY SEARCH FEE | 2111 | 1 | 300 | 300 |
| UTILITY EXAMINATION FEE | 2311 | 1 | 360 | 360 |
| **Pages:** | | | | |
| **Claims:** | | | | |
| **Miscellaneous-Filing:** | | | | |
| LATE FILING FEE FOR OATH OR DECLARATION | 2051 | 1 | 70 | 70 |
| **Petition:** | | | | |

| Description | Fee Code | Quantity | Amount | Sub-Total in USD($) |
|---|---|---|---|---|
| **Patent-Appeals-and-Interference:** | | | | |
| **Post-Allowance-and-Post-Issuance:** | | | | |
| **Extension-of-Time:** | | | | |
| **Miscellaneous:** | | | | |
| | | **Total in USD ($)** | | **800** |

| Electronic Acknowledgement Receipt | |
|---|---|
| **EFS ID:** | 27779290 |
| **Application Number:** | 15377522 |
| **International Application Number:** | |
| **Confirmation Number:** | 1065 |
| **Title of Invention:** | ELECTRONIC VAPORIZER |
| **First Named Inventor/Applicant Name:** | Gregory D. Conley |
| **Customer Number:** | 7733 |
| **Filer:** | Ralph E. Jocke/Delores Kugler |
| **Filer Authorized By:** | Ralph E. Jocke |
| **Attorney Docket Number:** | FUMA-1001 CIP2C |
| **Receipt Date:** | 13-DEC-2016 |
| **Filing Date:** | |
| **Time Stamp:** | 16:31:56 |
| **Application Type:** | Utility under 35 USC 111(a) |

## Payment information:

| | |
|---|---|
| Submitted with Payment | yes |
| Payment Type | DA |
| Payment was successfully received in RAM | $800 |
| RAM confirmation Number | 121416INTEFSW00003719100637 |
| Deposit Account | 100637 |
| Authorized User | Delores Kugler |
| The Director of the USPTO is hereby authorized to charge indicated fees and credit any overpayment as follows:<br>37 CFR 1.16 (National application filing, search, and examination fees)<br>37 CFR 1.17 (Patent application and reexamination processing fees) | |

37 CFR 1.19 (Document supply fees)

37 CFR 1.21 (Miscellaneous fees and charges)

## File Listing:

| Document Number | Document Description | File Name | File Size(Bytes)/ Message Digest | Multi Part /.zip | Pages (if appl.) |
|---|---|---|---|---|---|
| 1 | | Specification.pdf | 158576<br>037414a701660cebaff02cb84d22d15e36006a79 | yes | 41 |

| | Multipart Description/PDF files in .zip description | | |
|---|---|---|---|
| | **Document Description** | **Start** | **End** |
| | Specification | 1 | 31 |
| | Claims | 32 | 40 |
| | Abstract | 41 | 41 |

| | | | | | |
|---|---|---|---|---|---|
| **Warnings:** | | | | | |
| **Information:** | | | | | |
| 2 | Drawings-only black and white line drawings | Drawings.pdf | 27738<br>c134eef8b46363b13dc249a68f9c190822af570b | no | 6 |
| **Warnings:** | | | | | |
| **Information:** | | | | | |
| 3 | Application Data Sheet | ADS.pdf | 1823658<br>56bbde20c4337a61ec005031eb4ebff5ffee1ee1 | no | 9 |
| **Warnings:** | | | | | |
| **Information:** | | | | | |
| 4 | Fee Worksheet (SB06) | fee-info.pdf | 36892<br>b2bce29ce049b9fdba9499e556e8ef7d45d1b59b | no | 2 |
| **Warnings:** | | | | | |
| **Information:** | | | | | |
| | | **Total Files Size (in bytes):** | 2046864 | | |

**This Acknowledgement Receipt evidences receipt on the noted date by the USPTO of the indicated documents, characterized by the applicant, and including page counts, where applicable. It serves as evidence of receipt similar to a Post Card, as described in MPEP 503.**

**New Applications Under 35 U.S.C. 111**
**If a new application is being filed and the application includes the necessary components for a filing date (see 37 CFR 1.53(b)-(d) and MPEP 506), a Filing Receipt (37 CFR 1.54) will be issued in due course and the date shown on this Acknowledgement Receipt will establish the filing date of the application.**

**National Stage of an International Application under 35 U.S.C. 371**
**If a timely submission to enter the national stage of an international application is compliant with the conditions of 35 U.S.C. 371 and other applicable requirements a Form PCT/DO/EO/903 indicating acceptance of the application as a national stage submission under 35 U.S.C. 371 will be issued in addition to the Filing Receipt, in due course.**

**New International Application Filed with the USPTO as a Receiving Office**
**If a new international application is being filed and the international application includes the necessary components for an international filing date (see PCT Article 11 and MPEP 1810), a Notification of the International Application Number and of the International Filing Date (Form PCT/RO/105) will be issued in due course, subject to prescriptions concerning national security, and the date shown on this Acknowledgement Receipt will establish the international filing date of the application.**

UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

| APPLICATION NUMBER | FILING or 371(c) DATE | GRP ART UNIT | FIL FEE REC'D | ATTY.DOCKET.NO | TOT CLAIMS | IND CLAIMS |
|---|---|---|---|---|---|---|
| 15/377,522 | 12/13/2016 | 2833 | 800 | FUMA-1001 CIP2C | 20 | 3 |

**CONFIRMATION NO. 1065**

**FILING RECEIPT**

7733
WALKER & JOCKE
231 SOUTH BROADWAY STREET
MEDINA, OH 44256



Date Mailed: 12/21/2016

Receipt is acknowledged of this non-provisional patent application. The application will be taken up for examination in due course. Applicant will be notified as to the results of the examination. Any correspondence concerning the application must include the following identification information: the U.S. APPLICATION NUMBER, FILING DATE, NAME OF APPLICANT, and TITLE OF INVENTION. Fees transmitted by check or draft are subject to collection. Please verify the accuracy of the data presented on this receipt. **If an error is noted on this Filing Receipt, please submit a written request for a Filing Receipt Correction. Please provide a copy of this Filing Receipt with the changes noted thereon. If you received a "Notice to File Missing Parts" for this application, please submit any corrections to this Filing Receipt with your reply to the Notice. When the USPTO processes the reply to the Notice, the USPTO will generate another Filing Receipt incorporating the requested corrections**

**Inventor(s)**

Gregory D. Conley, Medina, OH;
Daniel C. Hillenbrandt JR., Brunswick, OH;
Rebecca L. Conley, Medina, OH;

**Applicant(s)**

FUMA International, LLC, Medina, OH;

**Power of Attorney:** None

**Domestic Priority data as claimed by applicant**

This application is a CON of 14/510,955 10/09/2014 PAT 9532604
which is a CON of 13/594,813 08/25/2012 PAT 8897628
which is a CIP of 12/843,917 07/27/2010 ABN
which claims benefit of 61/273,097 07/31/2009
and claims benefit of 61/271,819 07/27/2009
and said 13/594,813 08/25/2012
claims benefit of 61/527,434 08/25/2011

**Foreign Applications** for which priority is claimed (You may be eligible to benefit from the **Patent Prosecution Highway** program at the USPTO. Please see http://www.uspto.gov for more information.) - None.
*Foreign application information must be provided in an Application Data Sheet in order to constitute a claim to foreign priority. See 37 CFR 1.55 and 1.76.*

**Permission to Access Application via Priority Document Exchange:** No

**Permission to Access Search Results:** No

Applicant may provide or rescind an authorization for access using Form PTO/SB/39 or Form PTO/SB/69 as appropriate.

**If Required, Foreign Filing License Granted:** 12/20/2016

The country code and number of your priority application, to be used for filing abroad under the Paris Convention, is **US 15/377,522**

**Projected Publication Date:** Request for Non-Publication Acknowledged

**Non-Publication Request:** Yes

**Early Publication Request:** No
**** SMALL ENTITY ****
**Title**

ELECTRONIC VAPORIZER

**Preliminary Class**

439

**Statement under 37 CFR 1.55 or 1.78 for AIA (First Inventor to File) Transition Applications:** No

## PROTECTING YOUR INVENTION OUTSIDE THE UNITED STATES

Since the rights granted by a U.S. patent extend only throughout the territory of the United States and have no effect in a foreign country, an inventor who wishes patent protection in another country must apply for a patent in a specific country or in regional patent offices. Applicants may wish to consider the filing of an international application under the Patent Cooperation Treaty (PCT). An international (PCT) application generally has the same effect as a regular national patent application in each PCT-member country. The PCT process **simplifies** the filing of patent applications on the same invention in member countries, but **does not result** in a grant of "an international patent" and does not eliminate the need of applicants to file additional documents and fees in countries where patent protection is desired.

Almost every country has its own patent law, and a person desiring a patent in a particular country must make an application for patent in that country in accordance with its particular laws. Since the laws of many countries differ in various respects from the patent law of the United States, applicants are advised to seek guidance from specific foreign countries to ensure that patent rights are not lost prematurely.

Applicants also are advised that in the case of inventions made in the United States, the Director of the USPTO must issue a license before applicants can apply for a patent in a foreign country. The filing of a U.S. patent application serves as a request for a foreign filing license. The application's filing receipt contains further information and guidance as to the status of applicant's license for foreign filing.

Applicants may wish to consult the USPTO booklet, "General Information Concerning Patents" (specifically, the section entitled "Treaties and Foreign Patents") for more information on timeframes and deadlines for filing foreign patent applications. The guide is available either by contacting the USPTO Contact Center at 800-786-9199, or it can be viewed on the USPTO website at http://www.uspto.gov/web/offices/pac/doc/general/index.html.

For information on preventing theft of your intellectual property (patents, trademarks and copyrights), you may wish to consult the U.S. Government website, http://www.stopfakes.gov. Part of a Department of Commerce initiative, this website includes self-help "toolkits" giving innovators guidance on how to protect intellectual property in specific

countries such as China, Korea and Mexico. For questions regarding patent enforcement issues, applicants may call the U.S. Government hotline at 1-866-999-HALT (1-866-999-4258).

## LICENSE FOR FOREIGN FILING UNDER

## Title 35, United States Code, Section 184

## Title 37, Code of Federal Regulations, 5.11 & 5.15

**GRANTED**

The applicant has been granted a license under 35 U.S.C. 184, if the phrase "IF REQUIRED, FOREIGN FILING LICENSE GRANTED" followed by a date appears on this form. Such licenses are issued in all applications where the conditions for issuance of a license have been met, regardless of whether or not a license may be required as set forth in 37 CFR 5.15. The scope and limitations of this license are set forth in 37 CFR 5.15(a) unless an earlier license has been issued under 37 CFR 5.15(b). The license is subject to revocation upon written notification. The date indicated is the effective date of the license, unless an earlier license of similar scope has been granted under 37 CFR 5.13 or 5.14.

This license is to be retained by the licensee and may be used at any time on or after the effective date thereof unless it is revoked. This license is automatically transferred to any related applications(s) filed under 37 CFR 1.53(d). This license is not retroactive.

The grant of a license does not in any way lessen the responsibility of a licensee for the security of the subject matter as imposed by any Government contract or the provisions of existing laws relating to espionage and the national security or the export of technical data. Licensees should apprise themselves of current regulations especially with respect to certain countries, of other agencies, particularly the Office of Defense Trade Controls, Department of State (with respect to Arms, Munitions and Implements of War (22 CFR 121-128)); the Bureau of Industry and Security, Department of Commerce (15 CFR parts 730-774); the Office of Foreign AssetsControl, Department of Treasury (31 CFR Parts 500+) and the Department of Energy.

**NOT GRANTED**

No license under 35 U.S.C. 184 has been granted at this time, if the phrase "IF REQUIRED, FOREIGN FILING LICENSE GRANTED" DOES NOT appear on this form. Applicant may still petition for a license under 37 CFR 5.12, if a license is desired before the expiration of 6 months from the filing date of the application. If 6 months has lapsed from the filing date of this application and the licensee has not received any indication of a secrecy order under 35 U.S.C. 181, the licensee may foreign file the application pursuant to 37 CFR 5.15(b).

---

## *SelectUSA*

The United States represents the largest, most dynamic marketplace in the world and is an unparalleled location for business investment, innovation, and commercialization of new technologies. The U.S. offers tremendous resources and advantages for those who invest and manufacture goods here. Through SelectUSA, our nation works to promote and facilitate business investment. SelectUSA provides information assistance to the international investor community; serves as an ombudsman for existing and potential investors; advocates on behalf of U.S. cities, states, and regions competing for global investment; and counsels U.S. economic development organizations on investment attraction best practices. To learn more about why the United States is the best country in the world to develop

technology, manufacture products, deliver services, and grow your business, visit http://www.SelectUSA.gov or call +1-202-482-6800.

## PATENT APPLICATION FEE DETERMINATION RECORD

Substitute for Form PTO-875

Application or Docket Number: 15/377,522

### APPLICATION AS FILED - PART I

| FOR | (Column 1) NUMBER FILED | (Column 2) NUMBER EXTRA | SMALL ENTITY RATE($) | SMALL ENTITY FEE($) | OR | OTHER THAN SMALL ENTITY RATE($) | OTHER THAN SMALL ENTITY FEE($) |
|---|---|---|---|---|---|---|---|
| BASIC FEE (37 CFR 1.16(a), (b), or (c)) | N/A | N/A | N/A | 70 | | N/A | |
| SEARCH FEE (37 CFR 1.16(k), (i), or (m)) | N/A | N/A | N/A | 300 | | N/A | |
| EXAMINATION FEE (37 CFR 1.16(o), (p), or (q)) | N/A | N/A | N/A | 360 | | N/A | |
| TOTAL CLAIMS (37 CFR 1.16(i)) | 20 minus 20 = | * | x 40 = | 0.00 | OR | | |
| INDEPENDENT CLAIMS (37 CFR 1.16(h)) | 3 minus 3 = | * | x 210 = | 0.00 | | | |
| APPLICATION SIZE FEE (37 CFR 1.16(s)) | If the specification and drawings exceed 100 sheets of paper, the application size fee due is $310 ($155 for small entity) for each additional 50 sheets or fraction thereof. See 35 U.S.C. 41(a)(1)(G) and 37 CFR 1.16(s). | | | 0.00 | | | |
| MULTIPLE DEPENDENT CLAIM PRESENT (37 CFR 1.16(j)) | | | | 0.00 | | | |
| * If the difference in column 1 is less than zero, enter "0" in column 2. | | | TOTAL | 730 | | TOTAL | |

### APPLICATION AS AMENDED - PART II

| | | (Column 1) CLAIMS REMAINING AFTER AMENDMENT | | (Column 2) HIGHEST NUMBER PREVIOUSLY PAID FOR | (Column 3) PRESENT EXTRA | SMALL ENTITY RATE($) | SMALL ENTITY ADDITIONAL FEE($) | OR | OTHER THAN SMALL ENTITY RATE($) | OTHER THAN SMALL ENTITY ADDITIONAL FEE($) |
|---|---|---|---|---|---|---|---|---|---|---|
| AMENDMENT A | Total (37 CFR 1.16(i)) | * | Minus | ** | = | x = | | OR | x = | |
| | Independent (37 CFR 1.16(h)) | * | Minus | *** | = | x = | | OR | x = | |
| | Application Size Fee (37 CFR 1.16(s)) | | | | | | | | | |
| | FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM (37 CFR 1.16(j)) | | | | | | | OR | | |
| | | | | | | TOTAL ADD'L FEE | | OR | TOTAL ADD'L FEE | |

| | | (Column 1) CLAIMS REMAINING AFTER AMENDMENT | | (Column 2) HIGHEST NUMBER PREVIOUSLY PAID FOR | (Column 3) PRESENT EXTRA | RATE($) | ADDITIONAL FEE($) | OR | RATE($) | ADDITIONAL FEE($) |
|---|---|---|---|---|---|---|---|---|---|---|
| AMENDMENT B | Total (37 CFR 1.16(i)) | * | Minus | ** | = | x = | | OR | x = | |
| | Independent (37 CFR 1.16(h)) | * | Minus | *** | = | x = | | OR | x = | |
| | Application Size Fee (37 CFR 1.16(s)) | | | | | | | | | |
| | FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM (37 CFR 1.16(j)) | | | | | | | OR | | |
| | | | | | | TOTAL ADD'L FEE | | OR | TOTAL ADD'L FEE | |

* If the entry in column 1 is less than the entry in column 2, write "0" in column 3.

** If the "Highest Number Previously Paid For" IN THIS SPACE is less than 20, enter "20".

*** If the "Highest Number Previously Paid For" IN THIS SPACE is less than 3, enter "3".

The "Highest Number Previously Paid For" (Total or Independent) is the highest found in the appropriate box in column 1.

UNITED STATES PATENT AND TRADEMARK OFFICE

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United States Patent and Trademark Office
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| APPLICATION NUMBER | FILING OR 371(C) DATE | FIRST NAMED APPLICANT | ATTY. DOCKET NO./TITLE |
|---|---|---|---|
| 15/377,522 | 12/13/2016 | Gregory D. Conley | FUMA-1001 CIP2C |

**CONFIRMATION NO. 1065**

7733
WALKER & JOCKE
231 SOUTH BROADWAY STREET
MEDINA, OH 44256

**INFORMAL NOTICE**

*OC000000088018084*

Date Mailed: 12/21/2016

## INFORMATIONAL NOTICE TO APPLICANT

Applicant is notified that the above-identified application contains the deficiencies noted below. No period for reply is set forth in this notice for correction of these deficiencies. However, if a deficiency relates to the inventor's oath or declaration, the applicant must file an oath or declaration in compliance with 37 CFR 1.63, or a substitute statement in compliance with 37 CFR 1.64, executed by or with respect to each actual inventor no later than the expiration of the time period set in the "Notice of Allowability" to avoid abandonment. See 37 CFR 1.53(f).

The item(s) indicated below are also required and should be submitted with any reply to this notice to avoid further processing delays.

- A properly executed inventor's oath or declaration has not been received for the following inventor(s):
  Gregory D. Conley
  Daniel C. Hillenbrandt JR.
  Rebecca L. Conley

Questions about the contents of this notice and the requirements it sets forth should be directed to the Office of Data Management, Application Assistance Unit, at **(571) 272-4000** or **(571) 272-4200** or **1-888-786-0101**.

/tlo/

Doc Code: PA..
Document Description: Power of Attorney

PTO/AIA/82A (07-13)
Approved for use through 11/30/2014. OMB 0651-0051
U.S. Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE
Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it displays a valid OMB control number.

# TRANSMITTAL FOR POWER OF ATTORNEY TO ONE OR MORE REGISTERED PRACTITIONERS

NOTE: This form is to be submitted with the Power of Attorney by Applicant form (PTO/AIA/82B) to identify the application to which the Power of Attorney is directed, in accordance with 37 CFR 1.5, unless the application number and filing date are identified in the Power of Attorney by Applicant form. If neither form PTO/AIA/82A nor form PTO/AIA82B identifies the application to which the Power of Attorney is directed, the Power of Attorney will not be recognized in the application.

| | |
|---|---|
| Application Number | 15/377522 |
| Filing Date | 2016-12-13 |
| First Named Inventor | Gregory D. Conley |
| Title | ELECTRONIC VAPORIZER |
| Art Unit | 2833 |
| Examiner Name | N/A |
| Attorney Docket Number | 269.0003-02000 |

**SIGNATURE of Applicant or Patent Practitioner**

| | | | |
|---|---|---|---|
| Signature | /Thomas H. Martin/ | Date (Optional) | 2018-08-09 |
| Name | Thomas H. Martin | Registration Number | 34383 |
| Title (if Applicant is a juristic entity) | | | |
| Applicant Name (if Applicant is a juristic entity) | | | |

**NOTE:** This form must be signed in accordance with 37 CFR 1.33. See 37 CFR 1.4(d) for signature requirements and certifications. If more than one applicant, use multiple forms.

☑ *Total of 1 forms are submitted.

This collection of information is required by 37 CFR 1.131, 1.32, and 1.33. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.11 and 1.14. This collection is estimated to take 3 minutes to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. **SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.**

*If you need assistance in completing the form, call 1-800-PTO-9199 and select option 2.*

PTO/AIA/80 (07-17)
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# POWER OF ATTORNEY TO PROSECUTE APPLICATIONS BEFORE THE USPTO

I hereby revoke all previous powers of attorney given in the application identified in the attached statement under 37 CFR 3.73(c).

I hereby appoint:

[X] Practitioners associated with Customer Number: 22882

OR

[ ] Practitioner(s) named below (if more than ten patent practitioners are to be named, then a customer number must be used):

| Name | Registration Number | Name | Registration Number |
|---|---|---|---|
| | | | |
| | | | |
| | | | |
| | | | |
| | | | |

As attorney(s) or agent(s) to represent the undersigned before the United States Patent and Trademark Office (USPTO) in connection with any and all patent applications assigned only to the undersigned according to the USPTO assignment records or assignment documents attached to this form in accordance with 37 CFR 3.73(c).

Please change the correspondence address for the application identified in the attached statement under 37 CFR 3.73(c) to:

[X] The address associated with Customer Number: 22882

OR

[ ]

| | | |
|---|---|---|
| Firm or individual name | | |
| Address | | |
| City | State | Zip |
| Country | | |
| Telephone | Email | |

Assignee name and address: FUMA INTERNATIONAL, LLC
879 South Progress Drive, Suite C
Medina, Ohio 44256

**A copy of this form, together with a statement under 37 CFR 3.73(c) (Form PTO/AIA/96 or equivalent) is required to be filed in each application in which this form is used. The statement under 37 CFR 3.73(c) may be completed by one of the practitioners appointed in this form, and must identify the application in which this Power of Attorney is to be filed.**

**SIGNATURE of Assignee of Record**

The individual whose signature and title is supplied below is authorized to act on behalf of the assignee.

| | |
|---|---|
| Signature Gregory D. Conley | Date May 31st, 2018 |
| Name Gregory D. Conley | Telephone 330-321-1711 |
| Title President | |

This collection of information is required by 37 CFR 1.31, 1.32, and 1.33. The information is required to obtain or retain a benefit by the public, which is to update (and by the USPTO to process) the file of a patent or reexamination proceeding. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.11 and 1.14. This collection is estimated to take 18 minutes to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. **SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.**

*If you need assistance in completing the form, call 1-800-PTO-9199 and select option 2.*

PTO/AIA/96 (08-12)
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Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it displays a valid OMB control number.

# STATEMENT UNDER 37 CFR 3.73(c)

Applicant/Patent Owner: Gregory D. Conley et al.

Application No./Patent No.: 15/377522 Filed/Issue Date: 2016-12-13

Titled: ELECTRONIC VAPORIZER

FUMA INTERNATIONAL, LLC, a limited liability company

(Name of Assignee) (Type of Assignee, e.g., corporation, partnership, university, government agency, etc.)

states that, for the patent application/patent identified above, it is (choose **one** of options 1, 2, 3 or 4 below):

1. ☑ The assignee of the entire right, title, and interest.

2. ☐ An assignee of less than the entire right, title, and interest (check applicable box):

   ☐ The extent (by percentage) of its ownership interest is _____%. Additional Statement(s) by the owners holding the balance of the interest must be submitted to account for 100% of the ownership interest.

   ☐ There are unspecified percentages of ownership. The other parties, including inventors, who together own the entire right, title and interest are:

   Additional Statement(s) by the owner(s) holding the balance of the interest must be submitted to account for the entire right, title, and interest.

3. ☐ The assignee of an undivided interest in the entirety (a complete assignment from one of the joint inventors was made). The other parties, including inventors, who together own the entire right, title, and interest are:

   Additional Statement(s) by the owner(s) holding the balance of the interest must be submitted to account for the entire right, title, and interest.

4. ☐ The recipient, via a court proceeding or the like (*e.g.*, bankruptcy, probate), of an undivided interest in the entirety (a complete transfer of ownership interest was made). The certified document(s) showing the transfer is attached.

The interest identified in option 1, 2 or 3 above (not option 4) is evidenced by either (choose **one** of options A or B below):

A. ☑ An assignment from the inventor(s) of the patent application/patent identified above. The assignment was recorded in the United States Patent and Trademark Office at Reel 040369, Frame 0921, or for which a copy thereof is attached.

B. ☐ A chain of title from the inventor(s), of the patent application/patent identified above, to the current assignee as follows:

   1. From: _____ To: _____

      The document was recorded in the United States Patent and Trademark Office at

      Reel _____, Frame _____, or for which a copy thereof is attached.

   2. From: _____ To: _____

      The document was recorded in the United States Patent and Trademark Office at

      Reel _____, Frame _____, or for which a copy thereof is attached.



This collection of information is required by 37 CFR 3.73(b). The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.11 and 1.14. This collection is estimated to take 12 minutes to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. **SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.**

*If you need assistance in completing the form, call 1-800-PTO-9199 and select option 2.*

PTO/AIA/96 (08-12)
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## STATEMENT UNDER 37 CFR 3.73(c)

3. From: _____ To: _____

The document was recorded in the United States Patent and Trademark Office at

Reel _____, Frame _____, or for which a copy thereof is attached.

4. From: _____ To: _____

The document was recorded in the United States Patent and Trademark Office at

Reel _____, Frame _____, or for which a copy thereof is attached.

5. From: _____ To: _____

The document was recorded in the United States Patent and Trademark Office at

Reel _____, Frame _____, or for which a copy thereof is attached.

6. From: _____ To: _____

The document was recorded in the United States Patent and Trademark Office at

Reel _____, Frame _____, or for which a copy thereof is attached.

☐ Additional documents in the chain of title are listed on a supplemental sheet(s).

☑ As required by 37 CFR 3.73(c)(1)(i), the documentary evidence of the chain of title from the original owner to the assignee was, or concurrently is being, submitted for recordation pursuant to 37 CFR 3.11.

[NOTE: A separate copy (i.e., a true copy of the original assignment document(s)) must be submitted to Assignment Division in accordance with 37 CFR Part 3, to record the assignment in the records of the USPTO. See MPEP 302.08]

The undersigned (whose title is supplied below) is authorized to act on behalf of the assignee.

| | |
|---|---|
| /Thomas H. Martin/ | 09AUG2018 |
| Signature | Date |
| Thomas H. Martin | 34383 |
| Printed or Typed Name | Title or Registration Number |

# Privacy Act Statement

The **Privacy Act of 1974 (P.L. 93-579)** requires that you be given certain information in connection with your submission of the attached form related to a patent application or patent. Accordingly, pursuant to the requirements of the Act, please be advised that: (1) the general authority for the collection of this information is 35 U.S.C. 2(b)(2); (2) furnishing of the information solicited is voluntary; and (3) the principal purpose for which the information is used by the U.S. Patent and Trademark Office is to process and/or examine your submission related to a patent application or patent. If you do not furnish the requested information, the U.S. Patent and Trademark Office may not be able to process and/or examine your submission, which may result in termination of proceedings or abandonment of the application or expiration of the patent.

The information provided by you in this form will be subject to the following routine uses:

1. The information on this form will be treated confidentially to the extent allowed under the Freedom of Information Act (5 U.S.C. 552) and the Privacy Act (5 U.S.C 552a). Records from this system of records may be disclosed to the Department of Justice to determine whether disclosure of these records is required by the Freedom of Information Act.
2. A record from this system of records may be disclosed, as a routine use, in the course of presenting evidence to a court, magistrate, or administrative tribunal, including disclosures to opposing counsel in the course of settlement negotiations.
3. A record in this system of records may be disclosed, as a routine use, to a Member of Congress submitting a request involving an individual, to whom the record pertains, when the individual has requested assistance from the Member with respect to the subject matter of the record.
4. A record in this system of records may be disclosed, as a routine use, to a contractor of the Agency having need for the information in order to perform a contract. Recipients of information shall be required to comply with the requirements of the Privacy Act of 1974, as amended, pursuant to 5 U.S.C. 552a(m).
5. A record related to an International Application filed under the Patent Cooperation Treaty in this system of records may be disclosed, as a routine use, to the International Bureau of the World Intellectual Property Organization, pursuant to the Patent Cooperation Treaty.
6. A record in this system of records may be disclosed, as a routine use, to another federal agency for purposes of National Security review (35 U.S.C. 181) and for review pursuant to the Atomic Energy Act (42 U.S.C. 218(c)).
7. A record from this system of records may be disclosed, as a routine use, to the Administrator, General Services, or his/her designee, during an inspection of records conducted by GSA as part of that agency's responsibility to recommend improvements in records management practices and programs, under authority of 44 U.S.C. 2904 and 2906. Such disclosure shall be made in accordance with the GSA regulations governing inspection of records for this purpose, and any other relevant (*i.e.*, GSA or Commerce) directive. Such disclosure shall not be used to make determinations about individuals.
8. A record from this system of records may be disclosed, as a routine use, to the public after either publication of the application pursuant to 35 U.S.C. 122(b) or issuance of a patent pursuant to 35 U.S.C. 151. Further, a record may be disclosed, subject to the limitations of 37 CFR 1.14, as a routine use, to the public if the record was filed in an application which became abandoned or in which the proceedings were terminated and which application is referenced by either a published application, an application open to public inspection or an issued patent.
9. A record from this system of records may be disclosed, as a routine use, to a Federal, State, or local law enforcement agency, if the USPTO becomes aware of a violation or potential violation of law or regulation.

# Electronic Acknowledgement Receipt

| | |
|---|---|
| **EFS ID:** | 33425330 |
| **Application Number:** | 15377522 |
| **International Application Number:** | |
| **Confirmation Number:** | 1065 |
| **Title of Invention:** | ELECTRONIC VAPORIZER |
| **First Named Inventor/Applicant Name:** | Gregory D. Conley |
| **Customer Number:** | 7733 |
| **Filer:** | Thomas H. Martin/Sandra Blackmon |
| **Filer Authorized By:** | Thomas H. Martin |
| **Attorney Docket Number:** | FUMA-1001 CIP2C |
| **Receipt Date:** | 09-AUG-2018 |
| **Filing Date:** | 13-DEC-2016 |
| **Time Stamp:** | 15:50:12 |
| **Application Type:** | Utility under 35 USC 111(a) |

## Payment information:

| | |
|---|---|
| Submitted with Payment | no |

## File Listing:

| Document Number | Document Description | File Name | File Size(Bytes)/ Message Digest | Multi Part /.zip | Pages (if appl.) |
|---|---|---|---|---|---|
| 1 | Power of Attorney | POAdocs.pdf | 819640<br>c4da915846db14ff23df150a2067f58d16dac036 | no | 2 |

**Warnings:**

| Information: | | | | | |
|---|---|---|---|---|---|
| 2 | Assignee showing of ownership per 37 CFR 3.73 | 373cStatement.pdf | 117851<br>48413d8303307139d72a5b717c6edb75c22cf6d0 | no | 3 |
| Warnings: | | | | | |
| Information: | | | | | |
| | | Total Files Size (in bytes): | 937491 | | |

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**New Applications Under 35 U.S.C. 111**

**If a new application is being filed and the application includes the necessary components for a filing date (see 37 CFR 1.53(b)-(d) and MPEP 506), a Filing Receipt (37 CFR 1.54) will be issued in due course and the date shown on this Acknowledgement Receipt will establish the filing date of the application.**

**National Stage of an International Application under 35 U.S.C. 371**

**If a timely submission to enter the national stage of an international application is compliant with the conditions of 35 U.S.C. 371 and other applicable requirements a Form PCT/DO/EO/903 indicating acceptance of the application as a national stage submission under 35 U.S.C. 371 will be issued in addition to the Filing Receipt, in due course.**

**New International Application Filed with the USPTO as a Receiving Office**

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UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
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| APPLICATION NUMBER | FILING OR 371(C) DATE | FIRST NAMED APPLICANT | ATTY. DOCKET NO./TITLE |
|---|---|---|---|
| 15/377,522 | 12/13/2016 | Gregory D. Conley | 269.0003-02000 |

**CONFIRMATION NO. 1065**

22882
MARTIN & FERRARO, LLP
1557 LAKE O'PINES STREET, NE
HARTVILLE, OH 44632

**POA ACCEPTANCE LETTER**

*OC000000101661466*

Date Mailed: 08/14/2018

## NOTICE OF ACCEPTANCE OF POWER OF ATTORNEY

This is in response to the Power of Attorney filed 08/09/2018.

The Power of Attorney in this application is accepted. Correspondence in this application will be mailed to the above address as provided by 37 CFR 1.33.

Questions about the contents of this notice and the requirements it sets forth should be directed to the Office of Data Management, Application Assistance Unit, at **(571) 272-4000** or **(571) 272-4200** or **1-888-786-0101**.

/ytdemisse/

FORM PTO-1083

Attorney Docket No.: 269.0003-02000
Customer No. 22882

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

| | |
|---|---|
| In re application of:<br>Gregory D. Conley et al.<br>Serial No: 15/377,522<br>Filed: December 13, 2016<br>For: ELECTRONIC VAPORIZER | Confirmation No.: 1065<br><br>Art Unit: 3742<br>Examiner: Thor S. Campbell |

Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Dear Sir:

Transmitted herewith is an Amendment in the above-identified application.

☐ No additional fee is required.
☐ Applicant hereby requests a _-month extension of time to respond to the above office action.
☒ A Rule 1.131 Declaration is enclosed.
☒ A Request for Correction of Inventorship with Corrected Application Data Sheet is enclosed
☒ An Information Disclosure Statement Under 37 C.F.R. § 1.97(b) and Form PTO/SB/08 with references are enclosed.

The fee has been calculated as shown below:

| | (Col. 1) CLAIMS REMAINING AFTER AMENDMENT | | (Col. 2) HIGHEST NUMBER PREVIOUSLY PAID FOR | | (Col. 3) PRESENT EXTRA* | LG/SM $ ENTITY FEE | | ADD'L FEE DUE |
|---|---|---|---|---|---|---|---|---|
| TOTAL CLAIMS FEE | 31 | - | 20 | ** | 11 | LG=$100 SM=$50 | $50 | $ 550 |
| INDEPENDENT CLAIMS FEE | 4 | - | 3 | *** | 1 | LG=$460 SM=$230 | $230 | $ 230 |
| FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIMS | | | | | | LARGE ENTITY FEE = $820 SMALL ENTITY FEE = $410 | | $ 0 |
| | | | | | | | TOTAL | $ 780 |

* If the entry in Col. 1 is less than the entry in Col. 2, write "0" in Col. 3.
** If the "Highest Number Previously Paid For" IN THIS SPACE is less than 20, write "20" in this space.
*** If the "Highest Number Previously Paid For" IN THIS SPACE is less than 3, write "3" in this space. The "Highest Number Previously Paid For" (Total or Independent) is the highest number found from the equivalent box on Col. 1 of a prior amendment or the number of claims originally filed.

☒ The total amount of $850 to cover the $780 additional claims fee and $70 Inventorship Correction processing fee is being paid via EFS.

☒ The Commissioner is hereby authorized to charge any deficiencies of fees associated with this communication or credit any overpayment to Deposit Account No. 50-1068.
  ☒ Any filing fees under 37 C.F.R. § 1.16 for the presentation of extra claims
  ☒ Any patent application processing fees under 37 C.F.R. § 1.17

Respectfully submitted,

MARTIN & FERRARO, LLP

Date: November 2, 2018

By: _____
Thomas H. Martin
Registration No. 34,383

1557 Lake O'Pines Street, NE
Hartville, Ohio 44632
Telephone: (330) 877-0700

# Electronic Patent Application Fee Transmittal

| | |
|---|---|
| **Application Number:** | 15377522 |
| **Filing Date:** | 13-Dec-2016 |
| **Title of Invention:** | ELECTRONIC VAPORIZER |
| **First Named Inventor/Applicant Name:** | Gregory D. Conley |
| **Filer:** | Thomas H. Martin/Sandra Blackmon |
| **Attorney Docket Number:** | 269.0003-02000 |

Filed as Small Entity

**Filing Fees for Utility under 35 USC 111(a)**

| Description | Fee Code | Quantity | Amount | Sub-Total in USD($) |
|---|---|---|---|---|
| **Basic Filing:** | | | | |
| **Pages:** | | | | |
| **Claims:** | | | | |
| CLAIMS IN EXCESS OF 20 | 2202 | 11 | 50 | 550 |
| INDEPENDENT CLAIMS IN EXCESS OF 3 | 2201 | 1 | 230 | 230 |
| **Miscellaneous-Filing:** | | | | |
| PROCESSING FEE, EXCEPT PROV. APPLS. | 2830 | 1 | 70 | 70 |
| **Petition:** | | | | |
| **Patent-Appeals-and-Interference:** | | | | |

| Description | Fee Code | Quantity | Amount | Sub-Total in USD($) |
|---|---|---|---|---|
| **Post-Allowance-and-Post-Issuance:** | | | | |
| **Extension-of-Time:** | | | | |
| **Miscellaneous:** | | | | |
| | | **Total in USD ($)** | | **850** |

| Electronic Acknowledgement Receipt | |
|---|---|
| **EFS ID:** | 34183820 |
| **Application Number:** | 15377522 |
| **International Application Number:** | |
| **Confirmation Number:** | 1065 |
| **Title of Invention:** | ELECTRONIC VAPORIZER |
| **First Named Inventor/Applicant Name:** | Gregory D. Conley |
| **Customer Number:** | 22882 |
| **Filer:** | Thomas H. Martin/Sandra Blackmon |
| **Filer Authorized By:** | Thomas H. Martin |
| **Attorney Docket Number:** | 269.0003-02000 |
| **Receipt Date:** | 02-NOV-2018 |
| **Filing Date:** | 13-DEC-2016 |
| **Time Stamp:** | 15:45:07 |
| **Application Type:** | Utility under 35 USC 111(a) |

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| | |
|---|---|
| Submitted with Payment | yes |
| Payment Type | CARD |
| Payment was successfully received in RAM | $850 |
| RAM confirmation Number | 110518INTEFSW15465900 |
| Deposit Account | 501068 |
| Authorized User | Sandra Blackmon |
| The Director of the USPTO is hereby authorized to charge indicated fees and credit any overpayment as follows:<br>37 CFR 1.16 (National application filing, search, and examination fees)<br>37 CFR 1.17 (Patent application and reexamination processing fees) | |

37 CFR 1.21 (Miscellaneous fees and charges)

## File Listing:

| Document Number | Document Description | File Name | File Size(Bytes)/ Message Digest | Multi Part /.zip | Pages (if appl.) |
|---|---|---|---|---|---|
| 1 | Foreign Reference | CN201379072Y.pdf | 960697<br>5e16472c94b358c1f8e82f6839f2a4de8206783e | no | 13 |
| **Warnings:** | | | | | |
| **Information:** | | | | | |
| 2 | Foreign Reference | WO2007078273A1.pdf | 398386<br>75b1e4385fa96e689c2e6647b736d428b07bd9c3 | no | 13 |
| **Warnings:** | | | | | |
| **Information:** | | | | | |
| 3 | Foreign Reference | WO2010091593A1.pdf | 1297746<br>ed3911a935645a895e3c102b5f5d98e7c07bb04b | no | 23 |
| **Warnings:** | | | | | |
| **Information:** | | | | | |
| 4 | Non Patent Literature | Wikipedia-Electronic_Cigarette-09Feb2010.pdf | 2372616<br>72d21a6d40bf62ee76dedc30d609caedd07009f0 | no | 4 |
| **Warnings:** | | | | | |
| **Information:** | | | | | |
| 5 | Foreign Reference | CN200966824.pdf | 6659163<br>62503a950cfd7528a459124f3f752cdfa5dd9eae | no | 15 |
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| **Information:** | | | | | |
| 6 | Foreign Reference | CN201018927.pdf | 4302671<br>c9c854717447417b8154432ddf98f2ffcfbc28f | no | 13 |
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| **Information:** | | | | | |

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| 7 | Foreign Reference | CN201085044.pdf | 7868988<br>1e615a037c1e089454f704b32c15edfab108c3ee | no | 19 |
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| 8 | Foreign Reference | WO0028843_Pienemann.pdf | 1728797<br>fe94fc43aec4729172aee366417d4f307cc25952 | no | 52 |
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| 9 | Foreign Reference | WO2007131449A1.pdf | 1758283<br>b16a5efdc2fc1a0d5d70e1c7a82c15d9289a6ea5 | no | 58 |
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| 10 | Information Disclosure Statement (IDS) Form (SB08) | SB08.pdf | 654477<br>ac11bdd773706889216d29b6a0f5de63078a5ad4 | no | 4 |
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| **Information:** | | | | | |
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| 11 | Transmittal Letter | IDS.pdf | 198941<br>0650498c4ea05498f563e4a66ad0330233ceecd5 | no | 2 |
| **Warnings:** | | | | | |
| **Information:** | | | | | |
| 12 | Application Data Sheet | CorrectedADS.pdf | 119932<br>ef3e5432be053140e656f4ef7921200a01c66974 | no | 1 |
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| **Information:** | | | | | |
| This is not an USPTO supplied ADS fillable form | | | | | |
| 13 | Miscellaneous Incoming Letter | Req_Corr_of_Inventors.pdf | 119932<br>b6ce53058e235f42d8adb3a8afb83fa2bb7d3710 | no | 1 |
| **Warnings:** | | | | | |
| **Information:** | | | | | |

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| 14 | Affidavit-Rule 131-pre-AIA (FTI) ONLY | 131_Declaration_with_Exhibits.pdf | 9471658<br>1f6744cd74776e2b5ad3eb221b6228b907f4d995 | no | 31 |
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| 15 | Amendment/Req. Reconsideration-After Non-Final Reject | Amendment.pdf | 999860<br>6877aa7774a09e3c72d8532b97749697a230e54f | no | 10 |
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| 16 | Transmittal Letter | Transmittal.pdf | 136675<br>49b6c5933c34face200fd803e752d83464d2e4d4 | no | 1 |
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| **Information:** | | | | | |
| 17 | Fee Worksheet (SB06) | fee-info.pdf | 35509<br>d75ab26039e5707baee801fd2912ef951c8eea39 | no | 2 |
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| **Information:** | | | | | |
| | | | **Total Files Size (in bytes):** | 39084331 | |

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**New Applications Under 35 U.S.C. 111**

**If a new application is being filed and the application includes the necessary components for a filing date (see 37 CFR 1.53(b)-(d) and MPEP 506), a Filing Receipt (37 CFR 1.54) will be issued in due course and the date shown on this Acknowledgement Receipt will establish the filing date of the application.**

**National Stage of an International Application under 35 U.S.C. 371**

**If a timely submission to enter the national stage of an international application is compliant with the conditions of 35 U.S.C. 371 and other applicable requirements a Form PCT/DO/EO/903 indicating acceptance of the application as a national stage submission under 35 U.S.C. 371 will be issued in addition to the Filing Receipt, in due course.**

**New International Application Filed with the USPTO as a Receiving Office**

**If a new international application is being filed and the international application includes the necessary components for an international filing date (see PCT Article 11 and MPEP 1810), a Notification of the International Application Number and of the International Filing Date (Form PCT/RO/105) will be issued in due course, subject to prescriptions concerning national security, and the date shown on this Acknowledgement Receipt will establish the international filing date of the application.**

Espacenet

# Bibliographic data: CN201379072 (Y) — 2010-01-13

Improved atomizing electronic cigarette

| | |
|---|---|
| **Inventor(s):** | LI HAN ± (HAN LI) |
| **Applicant(s):** | LI HAN ± (HAN LI) |
| **Classification:** | **- international:** *A24F47/00*<br>**- cooperative:** **A24F47/008**; **A61M11/041**; **A61M11/042**; **A61M15/06**; **H05B3/0014**; **H05B3/06**; A61M2016/0024; A61M2205/8206 |
| **Application number:** | CN2009201296U 20090211 |
| **Priority number (s):** | CN2009201296U 20090211 |
| **Also published as:** | AU2010213270 (A1) AU2010213270 (B2) BRPI1008569 (A2) CA2752255 (A1) CA2752255 (C) more |

Abstract of CN201379072 (Y)

The utility model relates to an improved atomizing electronic cigarette, which comprises a power supply device, a sensor, an atomizing core assembly and a liquid storage component, and also comprises an accommodating shell, wherein an assisted air inlet is arranged on the shell, and the atomizing core assembly comprises an electric heating body and a liquid penetrating piece; the electric heating body is provided with a through hole, and the liquid storage part is provided with a channel; and the sensor is communicated with the through hole and the channel and forms an air flow loop with the assisted air inlet. The liquid penetrating piece in the atomizing core assembly is directly sleeved on the electric heating body, so that smoke fog is more fully gasified when heating, liquid droplets are smaller and more uniform, the taste is more easily accepted by users, and the gasified smoke fog is easy to reach the alveoli to be assimilated; and simultaneously, the electric heating body and the liquid storage part have the communicated through hole and channel, so that the smoke fog produced by atomization is further cooled by the impelling of air flow, and the inhaled smoke fog meets the taste of users. The detachable and replaceable split-type structure can realize the replacement of parts and is also convenient to carry.

[19] 中华人民共和国国家知识产权局

[51] Int. Cl.
*A24F 47/00 (2006.01)*

[12] 实用新型专利说明书

专利号 ZL 200920001296.3

[45] 授权公告日 2010 年 1 月 13 日

[11] 授权公告号 CN 201379072Y

[22] 申请日 2009.2.11
[21] 申请号 200920001296.3
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[72] 发明人 韩 力

[74] 专利代理机构 北京金之桥知识产权代理有限公司
代理人 朱黎光

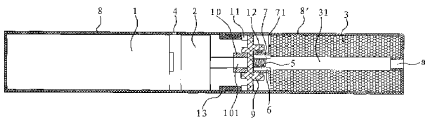
权利要求书 2 页 说明书 7 页 附图 2 页

[54] 实用新型名称

一种改进的雾化电子烟

[57] 摘要

本实用新型涉及一种改进的雾化电子烟，包括电源装置、传感器、雾化芯组件和储液部件，还包括容置壳体，壳体上开有辅助进气孔，雾化芯组件包括电加热体和液体渗透件，电加热体具有通孔，储液部件具有通道，传感器与通孔、通道相连通并与辅助进气孔形成气流回路。 本实用新型将雾化芯组件中的液体渗透件直接套于电加热体上，加热时气化的烟雾更加充分，液滴更小更均匀，使用者在口感上更易接受，而且更容易到达肺泡而便于吸收。 同时，由于电加热体及储液部件有相连通的通孔和通道，使雾化产生的烟雾在气流的推动下进一步冷却，使吸入的烟雾更复合吸烟者的口感。 可拆卸更换的分体式结构，可实现部件的更换、也便于携带。



1、一种改进的雾化电子烟，包括依次配合连接的电源装置（1）、传感器（2）、雾化芯组件和储液部件（3），还包括容置上述各部件的壳体，所述壳体上靠近传感器（2）的区域开有辅助进气孔（4），其特征在于：所述雾化芯组件包括电加热体（5）和套于所述电加热体（5）上的液体渗透件（6），所述电加热体（5）为中空结构，具有可使气体流通的通孔（51），所述储液部件（3）也为中空结构，具有可使气体流通的通道（31），所述储液部件（3）与所述液体渗透件（6）相配合将所述烟液渗透至所述液体渗透件（6），且所述传感器（2）与通孔（51）、通道（31）相连通并与辅助进气孔（4）形成气流回路。

2、根据权利要求1所述的雾化电子烟，其特征在于：所述雾化芯组件还包括与所述液体渗透件（6）相接触的液体传导件（7），所述液体传导件（7）还与所述储液部件（3）相接触。

3、根据权利要求2所述的雾化电子烟，其特征在于：所述液体传导件（7）套于所述液体渗透件（6）上，其一端沿径向方向延伸出一传导部（71），所述传导部（71）与所述储液部件（3）相接触。

4、根据权利要求2所述的雾化电子烟，其特征在于：所述传感器（2）为气压传感器或气流传感器，所述壳体包括第一壳体（8）、第二壳体（8’），所述电源装置（1）和传感器（2）位于第一壳体（8）内，所述雾化芯组件和储液部件（3）位于第二壳体（8’）内，所述第一壳体（8）和/或第二壳体（8’）上靠近传感器的区域开有所述辅助进气孔（4）。

5、根据权利要求4所述的雾化电子烟，其特征在于：所述第二壳体（8’）内设有一支架（9），所述雾化芯组件固定于所述支架（9）上，所述电加热体（5）与所述电源装置（1）、传感器（2）相连接并由传感器（2）根据气体的流动情况启动或停止加热。

6、根据权利要求5所述的雾化电子烟，其特征在于：所述支架（9）上设有一进气连接件（10）和电极环（11），所述进气连接件（10）和电极环（11）分别与电加热体（5）的两个引线电连接，所述进气连接件（10）通过与所述传感器（2）的连接实现电连接，所述电极环（11）通



JUUL Ex. 1002
Case No. IPR2024-161
Page 85 of 552

过进气连接件（10）与传感器（2）的连接与电源装置（1）电连接，所述进气连接件（10）也具有一通气孔（101），所述传感器（2）与通气孔（101）、通孔（51）、通道（31）相连通并与辅助进气孔（4）形成气流回路。

7、根据权利要求6所述的雾化电子烟，其特征在于：所述第一壳体（8）和第二壳体（8’）之间通过所述进气连接件（10）与传感器（2）的连接相拼接，所述进气连接件（10）与传感器（2）之间插接、螺纹连接或卡接。

8、根据权利要求6所述的雾化电子烟，其特征在于：所述第二壳体（8’）上开有吸气口（a），所述传感器（2）与通气孔（101）、通孔（51）、通道（31）及吸气口（a）相连通并与辅助进气孔（4）形成气流回路。

9、根据权利要求1所述的雾化电子烟，其特征在于：所述液体渗透件（6）与所述储液部件（3）相接触，所述雾化芯组件套于所述储液部件（3）的通道（31）内，所述液体渗透件（6）的外周面与所述通道（31）的内壁相贴合。

10、根据权利要求1或2或9所述的雾化电子烟，其特征在于：所述储液部件（3）采用微孔陶瓷、泡沫陶瓷、天然纤维、人造纤维、或泡沫金属材料制成，所述液体渗透件（6）采用陶瓷纤维、石英纤维、玻璃纤维、芳纶纤维、普通纤维、纸、布、或无纺布材料制成，所述液体渗透件（6）的厚度在0.5至5mm之间，所述电加热体（5）为电热丝螺旋缠绕形成，所述螺旋缠绕而成的电加热体形成所述通孔（51），所述通孔（51）的直径在0.5至4mm之间。

11、根据权利要求10所述的雾化电子烟，其特征在于：所述液体渗透件（6）的厚度为1mm，所述通孔（51）的直径为1mm。

12、根据权利要求1或2或9所述的雾化电子烟，其特征在于：所述液体渗透件（6）中添加有沸石颗粒。



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# 一种改进的雾化电子烟

## 技术领域

本实用新型涉及一种雾化电子烟，特别涉及一种改进的雾化电子烟。

## 背景技术

为开发香烟代用品，雾化电子香烟已经在控烟产品市场上占有很高的比重，同时雾化电子烟技术的改进和完善将是普遍使用无害的电子香烟的一个必要前提。

目前，现有的雾化电子烟，还存在诸多问题和不足。如雾化效果不好，最终雾化的烟气中液滴较大、液滴大小不一造成烟雾不均匀、烟雾较湿，吸入口感差。或是烟雾没有被充分足够的冷却使吸入的烟雾温度较高，给吸烟者造成不适。

上述种种问题使吸烟者在吸电子烟时产生与真烟口感上的巨大差异，不利于吸烟者选取电子烟取代真烟。

## 实用新型内容

为了克服上述现有技术中的不足，本实用新型提供一种改进的雾化电子烟。将雾化芯组件中的液体渗透件直接套于电加热体上，并通过把储液部件中的烟液渗透至液体渗透件中，当电加热体加热时直接与液体渗透件作用，更加充分的将烟液雾化，使雾化的液滴更小更均匀。同时，由于电加热体及储液部件有相连通的通孔和通道，使雾化大液滴在气流的推动吸附于储液部件，从而使吸入的烟雾更符合吸烟者的口感。

本实用新型采用的主要技术方案为：一种改进的雾化电子烟，包括依次配合连接的电源装置、传感器、雾化芯组件和储液部件，还包括容置上述各部件的壳体，所述壳体上靠近传感器的区域开有辅助进气孔，



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所述雾化芯组件包括电加热体和套于所述电加热体上的液体渗透件，所述电加热体为中空结构，具有可使气体流通的通孔，所述储液部件也为中空结构，具有可使气体流通的通道，所述储液部件与所述液体渗透件相配合将所述烟液渗透至所述液体渗透件，且所述传感器与通孔、通道相连通并与辅助进气孔形成气流回路。

本实用新型还采用如下附属技术方案：所述雾化芯组件还包括与所述液体渗透件相接触的液体传导件，所述液体传导件还与所述储液部件相接触；

所述液体传导件套于所述液体渗透件上，其一端沿径向方向延伸出一传导部，所述传导部与所述储液部件相接触；

所述传感器为气压传感器或气流传感器，所述壳体包括第一壳体、第二壳体，所述电源装置和传感器位于第一壳体内，所述雾化芯组件和储液部件位于第二壳体内，所述第一壳体或第二壳体上靠近传感器的区域开有辅助进气孔；

所述第二壳体内设有一支架，所述雾化芯组件固定于所述支架上，所述电加热体与所述电源装置、传感器相连接并由传感器根据气体的流动情况启动或停止加热；

所述支架上设有一进气连接件和电极环，所述进气连接件和电极环分别与电加热体的两个引线电连接，所述进气连接件通过与所述传感器的连接实现电连接，所述电极环通过进气连接件与传感器的连接与电源电连接，所述进气连接件也具有一通气孔，所述传感器与通气孔、通孔、通道相连通并与辅助进气孔形成气流回路；



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所述第一壳体和第二壳体之间通过所述进气连接件与传感器的连接相拼接，所述进气连接件与传感器之间插接、螺纹连接或卡接；

所述第二壳体上开有吸气口，所述传感器与通气孔、通孔、通道及吸气口相连通并与辅助进气孔形成气流回路；

所述液体渗透件与所述储液部件相接触，所述雾化芯组件套于所述储液部件的通道内，所述液体渗透件的外周面与所述通道的内壁相贴合；

所述储液部件采用微孔陶瓷、泡沫陶瓷、天然纤维、人造纤维、或泡沫金属材料制成，所述液体渗透件采用陶瓷纤维、石英纤维、玻璃纤维、芳纶纤维、普通纤维、纸、布、或无纺布材料制成，所述液体渗透件的厚度在0.5至5mm之间，所述电加热体为电热丝螺旋缠绕形成，所述螺旋缠绕而成的电加热体形成所述通孔，所述通孔的直径在0.5至4mm之间；

所述液体渗透件的厚度为1mm，所述通孔的直径为1mm。

采用本实用新型带来的有益效果：（1）本实用新型将雾化芯组件中的液体渗透件直接套于电加热体上，并把储液部件中的烟液渗透至液体渗透件中，而且本实用新型将液体渗透件设计为厚度仅为1mm，其中所渗透的烟液更加容易被电加热体气化透彻，当电加热体加热时使液体渗透件中的烟液达到沸点而汽化，使气化的烟雾更加充分，液滴更小更均匀，直径可达0.04μm~0.8μm，这种汽雾在分散度和外观上更接近真实的香烟烟雾，使用者在口感上更易接受，而且更容易到达肺泡而便于吸收。同时，由于电加热体及储液部件有相连通的通孔和通道，使雾化大液滴在气流的推动吸附于储液部件，使吸入的烟雾更符合吸烟者的口感。（2）在本实用新型提供的另一方案中，将雾化芯组件套于储液部件的通道内，使液体渗透件直接与储液部件相接触，烟液的渗透传导更加充分快速，



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使雾化的烟雾更充足，而且该结构简单、节省空间使整个雾化电子烟的体积更小。（3）本实用新型将电子烟设计为可拆卸更换的分体式结构，通过拆卸、安装第一壳体与第二壳体即可实现部件的更换、也便于携带。

附图说明

图1为本实用新型电子烟的侧面剖视图；示出第一壳体与第二壳体分离时的状态结构；

图2为本实用新型电子烟的侧面剖视图；示出第一壳体与第二壳体连接后的状态结构；

图3为本实用新型电子烟中雾化芯的侧面剖视图；

图4为本实用新型电子烟雾化芯的俯视结构图；

图5为本实用新型电子烟的各电器部件之间形成闭合回路的电气连接框图；

图6为本实用新型另一实施例的电子烟的侧面剖视图。

具体实施方式

下面结合附图对本实用新型做进一步的详述：

如图1至图5所示，为本实用新型提供的一种改进的雾化电子烟，包括依次配合连接的电源装置1、传感器2、雾化芯组件和储液部件3，还包括容置上述各部件的壳体，壳体上靠近传感器2的区域开有辅助进气孔4，雾化芯组件包括电加热体5和套于电加热体5上的液体渗透件6，电加热体5为中空结构，具有可使气体流通的通孔51，储液部件3也为中空结构，具有可使气体流通的通道31，储液部件3与液体渗透件6相配合将烟液渗透至液体渗透件6，且传感器2与通孔51、通道31相连通并与辅助进气孔4形成气流回路。

在本实施例中，如图1至图3所示，雾化芯组件还包括与液体渗透件6相接触的液体传导件7，液体传导件7还与储液部件3相接触。液体传导件



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7套于液体渗透件6上，其一端沿径向方向延伸出一传导部71，传导部71与储液部件3相接触。起到的作用就是将储液部件3上的烟液吸附过来并渗透至液体渗透件上。为了使液体传导件7与液体渗透件6贴合的更紧密而提高液体传导性，可在液体传导件7上套一紧固套12。

如图1所示，传感器2为气压传感器或气流传感器，在本实施例中，采用气流传感器。壳体包括第一壳体8、第二壳体8'，电源装置1和传感器2位于第一壳体8内，雾化芯组件和储液部件3位于第二壳体8'内，第一壳体8和/或第二壳体8'上靠近传感器2的区域开有辅助进气孔4。在本实施例中，辅助进气孔4开于第一壳体8上，并位于靠近传感器2的区域内。电源装置1为电池。电池可为充电电池或一次性电池。

在第二壳体8'内设有一支架9，雾化芯组件固定于支架9上，电加热体5与电源装置1、传感器2相连接并由传感器2根据气体的流动情况启动或停止加热。支架9上设有一进气连接件10和电极环11，进气连接件10和电极环11分别与电加热体5的两个引线电连接，进气连接件10通过与传感器2的连接实现电连接，电极环11通过进气连接件10与传感器2的连接与电源装置1电连接。形成一个完成的闭合回路，如图4中所示。传感器在其中起到的作用是根据气体流动情况导通或断开整个电路。当用户吸气时，电子烟内部气体产生流动，这时传感器导通电路启动电加热体5加热，当停止吸气气体不流动时，则断开电路停止电加热体5加热。在第一壳体8的开口处安装有与电极环10相对应电极环柱13，电极环柱13沿轴向延伸出接触部131，电极环柱13与电源装置1连接，当第一壳体8与第二壳体8'



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拼接后，基础部131伸入第二壳体8’内部与电极环11接触，从而形成一个完整闭合的回路。

在本实施例中，第一壳体8和第二壳体8’之间通过进气连接件10与传感器2的连接相拼接，进气连接件10与传感器2之间插接、螺纹连接或卡接。这种可拆卸更换的分体式结构，通过拆卸、安装第一壳体8与第二壳体8’即可实现部件的更换、也便于携带。本实施例公开的是螺纹连接的结构。

如图1所示，进气连接件10也具有一通气孔101，传感器2与通气孔101、通孔51、通道31相连通并与辅助进气孔4形成气流回路。第二壳体8’上开有吸气口a，传感器2与通气孔101、通孔51、通道31及吸气口a相连通并与辅助进气孔4形成气流回路。

储液部件3采用微孔陶瓷、泡沫陶瓷、天然纤维、人造纤维、或泡沫金属材料制成，液体渗透件6采用陶瓷纤维、石英纤维、玻璃纤维、芳纶纤维、普通纤维、纸、布、或无纺布材料制成，液体渗透件6的厚度在0.5至5mm之间，电加热体5为电热丝螺旋缠绕形成，螺旋缠绕而成的电加热体形成通孔51，通孔51的直径在0.5至4mm之间。在本实施例中，液体渗透件6的厚度为1mm，通孔51的直径为1mm。

雾化芯组件中的液体渗透件6直接套于电加热体5上，储液部件3中的烟液由液体传导件7传导渗透至液体渗透件6中，液体渗透件6的厚度为1mm，其所渗透的烟液更加容易被电加热体5气化透彻。当用户吸气时，由于传感器2与通气孔101、通孔51、通道31及吸气口a相连通并与辅助进气孔4形成气流回路，电子烟内部产生气体流动，传感器3导通电路，电



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加热体5开始加热，使液体渗透件6中的烟液达到沸点而汽化，同时，由于电加热体5及储液部件3有相连通的通孔51和通道31，使雾化产生的烟雾在气流的推动下流动并进一步冷却，最后由吸气口a被吸入用户的口腔。

在本实用新型提供的另一优选实施例中，如图6所示，液体渗透件6与储液部件3相接触，雾化芯组件套于储液部件3的通道31内，液体渗透件6的外周面与通道31的内壁相贴合。

储液部件3采用微孔陶瓷、泡沫陶瓷、天然纤维、人造纤维、或泡沫金属材料制成，液体渗透件6采用陶瓷纤维、石英纤维、玻璃纤维、芳纶纤维、普通纤维、纸、布、或无纺布材料制成，液体渗透件6的厚度在0.5至5mm之间，电加热体5为电热丝螺旋缠绕形成，螺旋缠绕而成的电加热体形成通孔51，通孔51的直径在0.5至4mm之间。在本实施例中，液体渗透件6的厚度为1mm，通孔51的直径为1mm。

本实施例中，将雾化芯组件整体套于储液部件3的通道31内，使液体渗透件6的外周面直接与储液部件3的通道31内壁相接触，接触面积更大、烟液的渗透传导更加充分快速，使雾化的烟雾更充足，而且该结构简单、节省空间使整个雾化电子烟的体积更小。



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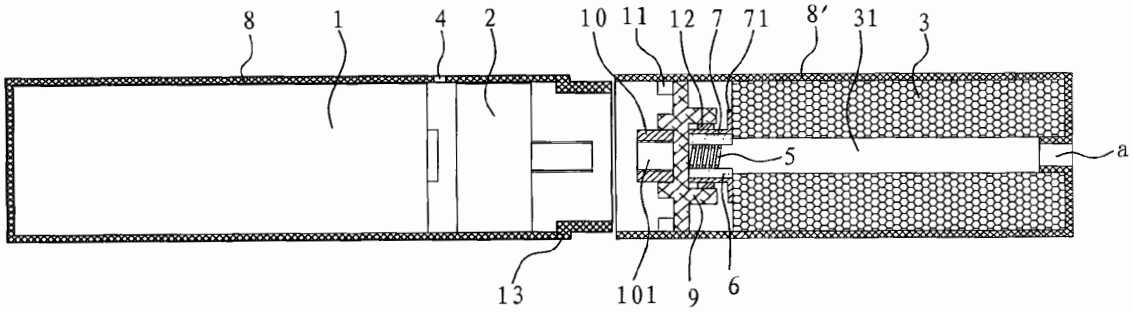



图1

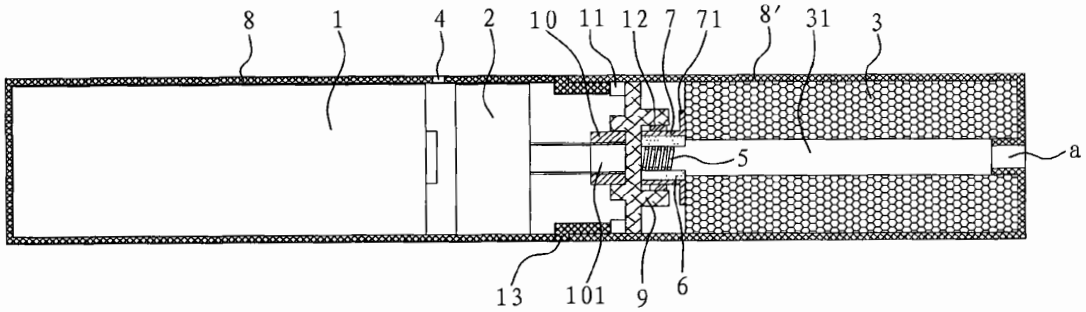



图2

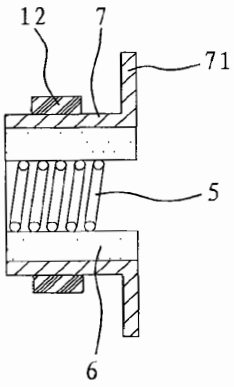



图3

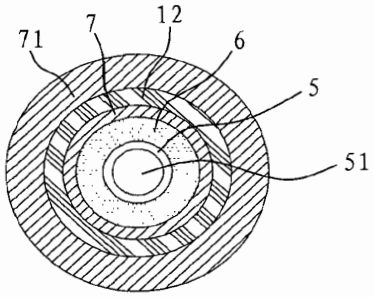



图4



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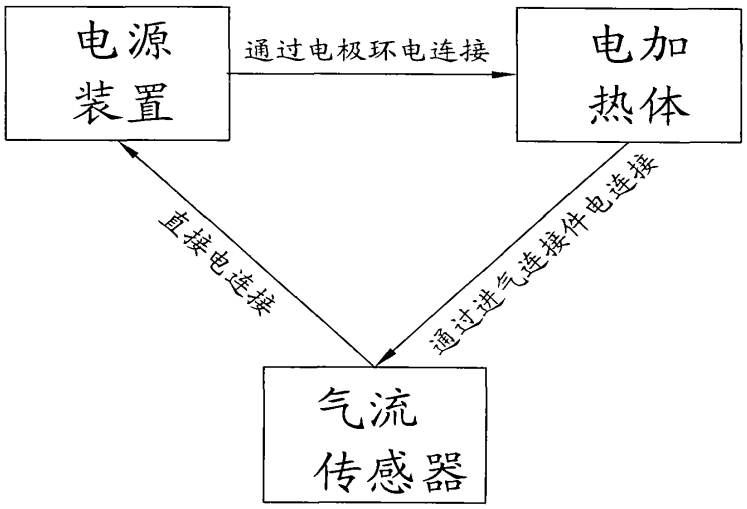



图5

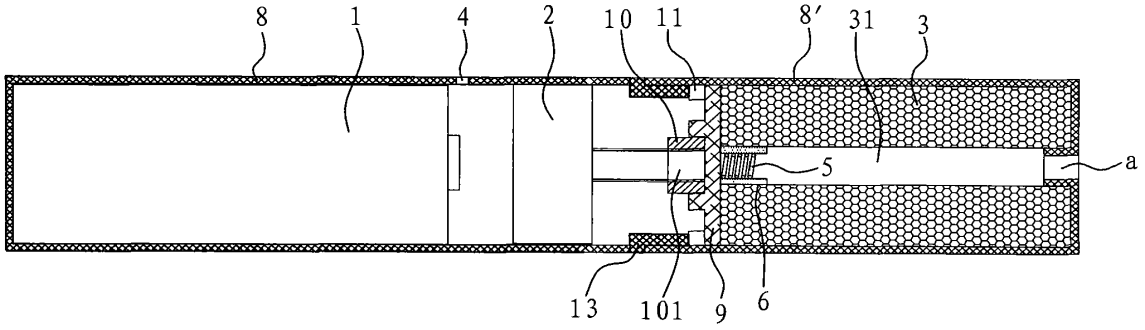



图6



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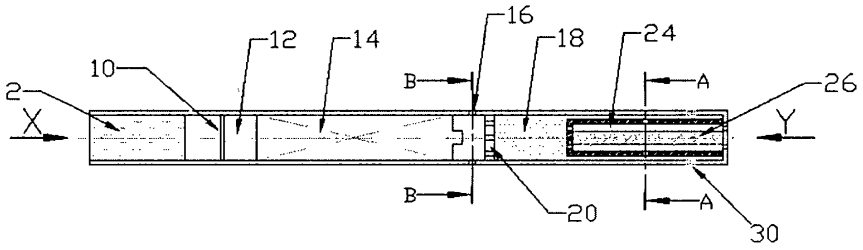
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**Published:**
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*For two-letter codes and other abbreviations, refer to the "Guidance Notes on Codes and Abbreviations" appearing at the beginning of each regular issue of the PCT Gazette.*

(54) Title: NO-TAR ELECTRONIC SMOKING UTENSILS




(57) Abstract: No-tar electronic smoking utensils includes a container (18) formed of a porous material for storing a liquid mixture. The container communicates with a heater vapouriser (24) via a series of small apertures (28). The heater is in the form of a spirally wound electrical heater (26) mounted on an electrical insulating support. Battery supply means are provided for the heater. The heater vapouriser communicates with a mouthpiece. In use, suction on the mouthpiece by the user causes air to be drawn through the porous container for liquid, over the heated vapouriser, into the mouthpiece and into the mouth of the user.

WO 2007/078273 A1

# NO-TAR ELECTRONIC SMOKING UTENSILS

## TECHNICAL FIELD

The present invention relates to no-tar electronic smoking utensils such as, for example, cigarettes, cigars and cigarette holders.

## BACKGROUND

Cigarettes are well known in which one end of a tobacco filled cigarette is held in the mouth of the user and the other end of the cigarette is ignited by a match or a lighter and the user draws on one end of the cigarette to draw the tobacco smoke through the cigarette into the mouth/lungs of the user. The health dangers of tobacco smoking are well documented and many products have appeared on the market in an attempt to assist smokers to cease smoking tobacco products or to provide a more healthy tobacco substitute.

One such product is a "flameless electronic atomising cigarette" described in Malaysian patent application 03111582.9. The product is a non-combustible simulated cigarette and the user draws on one end of the "cigarette" to draw a nicotine vapour through the cigarette via a solution having a controlled amount of nicotine. The lack of a flame avoids inhaling tar and other unhealthy tobacco products, and the user can also control the amount of nicotine inhaled. The nicotine mixture of the prior art electronic cigarette is pumped through the device and is atomised by the use of a high frequency generator, a piezoelectric ultrasonic atomiser and a high-temperature gasification jet tube. The resulting vapour, lacking the



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conventional tar and unhealthy by- products, but including a controlled amount of nicotine, is inhaled by the user.

## SUMMARY OF INVENTION

It is an object of the present invention to provide a no-tar electronic smoking utensils which is a suitable alternative to known products and/or is of a simpler construction in comparison to known products.

In accordance with one aspect of the invention, there is provided a no-tar electronic smoking utensils including:
a container for a liquid,
a vapouriser including heater means adapted to vapourise the liquid,
wherein air can be drawn by the suction of the user over the container and vapouriser to form a simulated smoke vapour.

Preferably, in contrast to the above prior art device the vapourisation is effected solely or principally by the air distribution through the container in combination with the heat from the heating means.

Preferably, in contrast to the above prior art device the flow of fluids through the cigarette is caused solely or principally by the suction of the user.

Thus, the simulated cigarette of the present invention is of a simpler construction, easier to manufacture and more cost effective than the above prior art device.



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Preferably, at least a portion of the container is formed of a porous material to facilitate distribution of the liquid through the container, prior to being fed to the heater means. Suitable materials include, for example, foamed metal, foamed ceramic or special fibre.

In a preferred arrangement the heater means includes an electrical heater mounted on an electrical insulating support, for example a spirally wound heater wire.

The liquid mixture may be formed from any suitable materials/chemicals. The mixture could include a controlled amount of nicotine, however the mixture need not include a nicotine content.

Indicating/monitoring means may be included for the purpose of indicating a range of activities such as when a pre-set level of nicotine has been reached, when the unit is switched on or when the liquid in the container is low.

In a preferred arrangement simulated tobacco is provided in the tip end of the smoking article to give the article the appearance of a conventional smoking article.

The no-tar electronic smoking utensils preferably includes electrical supply means, such as a battery, to supply power to the heater and/or the indicator means. In a preferred arrangement power supply switch means are located adjacent the mouthpiece end of the cigarette, the power supply switch means being adapted to be activated by the lips of the user.

In accordance with another aspect of the invention, there is provided a simulated cigarette including a container formed of a



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porous material for storing a liquid mixture, the container communicating with a heater vapouriser via a series of apertures, said vapouriser including a spirally wound electrical heater mounted on an electrical insulating support, battery supply means for the heater, said heater vapouriser communicating with a mouthpiece, whereby in use, suction on the mouthpiece by the user causes air to be drawn through the porous container for liquid, over the heated vapouriser, into the mouthpiece and into the mouth of the user.

**SPECIFIC EXAMPLE OF THE INVENTION**

In order to better understand the invention, an example will now be described with reference to the following drawings, in which:

FIG 1 is an enlarged side view of a simulated cigarette constructed in accordance with the invention,

FIG 2 is a cross- sectional side view of the simulated cigarette of FIG 1,

FIG 3 is a tip end view of the simulated cigarette of FIG 1 looking in the direction of arrow X,

FIG 4 is a mouthpiece end view of the simulated cigarette of FIG 1 looking in the direction of arrow Y,

FIG 5 is a cross-sectional end view taken along the lines AA of FIG 2,

FIG 6 is a cross-sectional end view taken along the lines BB of FIG 2, and



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FIG 7 is a schematic diagram of the electrical components of the example shown in FIG 1.

Referring to FIG 1 of the example, the simulated cigarette is of the general size and shape of a conventional elongated cylindrical cigarette, having a tip end 2 and a mouthpiece end 4.

In broad terms, the simulated cigarette of the example is provided with a container for a liquid mixture, a heater for vapourising the liquid, apertures for passage of air/mixture vapour through the cigarette into the mouth of the user, and a battery for supplying power to the heater.

Referring to FIGS 1 and 2, the simulated cigarette is provided with an outer casing 6. The tip end 2 of the casing 6 is provided with simulated tobacco to give the simulated cigarette the appearance of a conventional cigarette. Modifications, such as choice and feel of materials, obvious to those skilled in the art, could also be made to give the simulated cigarette the look and feel of a conventional cigarette.

Adjacent and inner the tip end 2 of the cigarette and mounted on the cigarette casing 6 is a light emitting diode (LED) 8. The LED is for the purpose of monitoring/indicating, amongst other things, the level of liquid in the container and when a pre-set level of nicotine has been reached.
Located inner and adjacent of the simulated tobacco is a printed circuit board (PCB) control unit 10 for controlling the electrics of the cigarette.

Adjacent and inner of the PCB 10, is a cylindrical battery chamber 12 for housing a battery 14. The cigarette outer casing 6, adjacent



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the battery chamber 12 is provided with a plurality of apertures 16 to permit entry of air into the battery chamber. Adjacent and inner of the battery chamber 12 is a cylindrical liquid container 18 separated from the battery chamber by a dividing wall 20. The dividing wall 20 is provided with a plurality of apertures 22 to permit entry of air from the battery chamber into the liquid container.

The container liquid mixture can be fed into the container 18 via a one-way valve (not shown) mounted through the wall of the cigarette casing 6. The liquid container 18 is formed of porous inorganic material. The porous material of the liquid container facilitates the distribution and the mixing of the air and liquid mixture.

A cylindrical vapouriser heater assembly housing 24 is mounted within a central bore provided in the mouthpiece end of the liquid container 18. The vapouriser heater assembly housing houses a heater wire 26 spirally wound on a central ceramic insulating rod. The walls of the heater housing 24 are provided with a plurality of apertures 28 to permit entry of the liquid/air from the liquid container 18 into the heater housing 24.

Adjacent the mouthpiece end 4 of the cigarette and mounted on the cigarette outer casing 6 is a switch 30 activated, in use, by the mouth of the user for the purpose of switching on the battery power supply.

As indicated above, the liquid of the container may contain any suitable chemicals, and may be provided with or without nicotine.



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The approximate percentages of ingredients for a mixture containing nicotine are as follows:
1,2 propylene glycol 81%, nicotine 7%, distilled water 6%, glycerol triacetin 5%, formic acid, acetic acid, acetol and fragrance etc. 1%.

The approximate percentages of ingredients for a mixture without nicotine are as follows:
1,2 propylene glycol 88%, distilled water 6%, glycerol triacetin 5%, formic acid, acetic acid, acetol and fragrance etc. 1%.

In operation, the switch 30 is activated by the lips of the user touching the switch 30 thus switching on the battery power supply. As best seen in the electrical schematic diagram of FIG 7, battery power is supplied to the PCB control unit 10, the LED 8 and the vapouriser heater 26.
As the user draws on the cigarette mouthpiece, air is drawn into the battery chamber, into the liquid container to mix with the liquid mixture, and into the heater assembly. The resulting vapour is drawn into the mouth of the user.



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**CLAIMS:**

1. A no-tar electronic smoking utensils including:
a container for a liquid,
a vapouriser including heater means adapted to vapourise the liquid,
wherein air can be drawn by the suction of the user over the container and vapouriser to form a simulated smoke vapour.

2. A no-tar electronic smoking utensils according to Claim 1 wherein the vapourisation is effected solely or principally by the air distribution through the container in combination with the heat from the heating means.

3. A no-tar electronic smoking utensils according to Claim 1 or Claim 2 wherein the flow of fluids through the cigarette is caused solely or principally by the suction of the user.

4. A no-tar electronic smoking utensils according to any preceding claim wherein at least a portion of the container is formed of a porous material to facilitate distribution of the liquid through the container, prior to being fed to the heater means.

5. A no-tar electronic smoking utensils according to any preceding claim wherein the heater means includes an electrical heater mounted on an electrical insulating support.

6. A no-tar electronic smoking utensils according to any preceding claim wherein the liquid includes a controlled amount of nicotine.



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7. A no-tar electronic smoking utensils according to any preceding claim including indicator means for the purpose of indicating when a pre-set level of nicotine has been reached.

8. A no-tar electronic smoking utensils according to any preceding claim including simulated tobacco at a first or tip end of the smoking article to give the article the appearance of a conventional smoking article.

9. A simulated cigarette according to any preceding claim including electrical supply means to supply power to the heater and/or the indicator means, power supply switch means located adjacent the second or mouthpiece end of the cigarette, said power supply switch means being adapted to be activated by the lips of the user.

10. A simulated cigarette including a container formed of a porous material for storing a liquid mixture, the container communicating with a heater vapouriser via a series of apertures, said vapouriser including a spirally wound electrical heater mounted on an electrical insulating support, battery supply means for the heater, said heater vapouriser communicating with a mouthpiece, whereby in use, suction on the mouthpiece by the user causes air to be drawn through the porous container for liquid, over the heated vapouriser, into the mouthpiece and into the mouth of the user.



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FRONT VIEW
(FIG 1)




VIEW ON X
(FIG 3)

FIG 2

VIEW ON Y
(FIG 4)




SECTION
ON B-B
(FIG 6)

SECTION
ON A-A
(FIG 5)

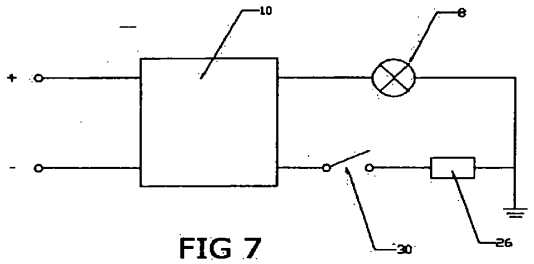



FIG 7

# INTERNATIONAL SEARCH REPORT

International application No.
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A. CLASSIFICATION OF SUBJECT MATTER
IPC: **A 24 F 01/24**

USPC: 131/194,329,347
According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)
U.S. : 131/194,329,347

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)

C. DOCUMENTS CONSIDERED TO BE RELEVANT

| Category * | Citation of document, with indication, where appropriate, of the relevant passages | Relevant to claim No. |
|---|---|---|
| X<br>--<br>Y | US 4,947,874 A (BROOKS et al ) 14 August 1990 (14.08.1990), see entire document. | 1-5<br>---<br>6-10 |

☐ Further documents are listed in the continuation of Box C. ☐ See patent family annex.

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## IMPROVED ATOMIZING ELECTRONIC CIGARETTE

**Inventor(s):** HON LIK [CN] ± (HON, LIK)

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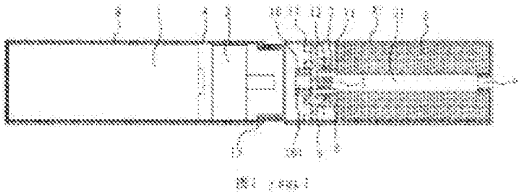
**Classification:** - **international:** *A24F47/00*
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### Abstract of WO2010091593 (A1)



An improved atomizing electronic cigarette has a power device (1), a sensor (2), an atomizing core component and a liquid storage component (3). The cigarette also has a containing shell, an auxiliary air inlet (4) is provided on the shell. The atomizing core component includes an electric heater (5) and a liquid permeating component (6). The electric heater (5) has a through hole (51), the liquid storage component (3) has a channel (31), and the sensor (2) is connected with the through hole (51) and the channel (31), and forms an airflow loop by the auxiliary air inlet. The liquid permeating component (6) in the atomizing core component of the cigarette is directly sleeved on the electric heater (5), so that the cigarette can adequately heat gasified smoke with uniform small drops, and the user can accept easily and the smoke can easily enter lung bubble and can be absorbed conveniently. The electric heater (5) and the liquid storage component (3) are connected with the through hole (51) and the channel (31), so that the smoke generated by atomizing process can be cooled under the push of airflow, and the absorbed smoke meets the

taste of smoker. The cigarette has detachable split structure, so that the cigarette can exchange and carry conveniently.

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根据细则 4.17 的声明:
— 发明人资格(细则 4.17(iv))

本国际公布:
— 包括国际检索报告(条约第 21 条(3))。

(54) Title: IMPROVED ATOMIZING ELECTRONIC CIGARETTE

(54) 发明名称 : 一种改进的雾化电子烟

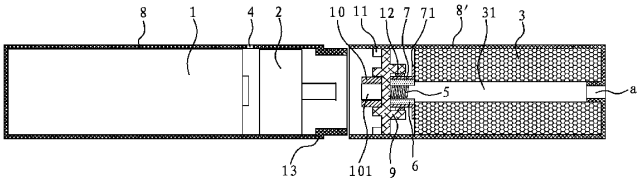



图1 / FIG. 1

(57) Abstract: An improved atomizing electronic cigarette has a power device (1), a sensor (2), an atomizing core component and a liquid storage component (3). The cigarette also has a containing shell, an auxiliary air inlet (4) is provided on the shell. The atomizing core component includes an electric heater (5) and a liquid permeating component (6). The electric heater (5) has a through hole (51), the liquid storage component (3) has a channel (31), and the sensor (2) is connected with the through hole (51) and the channel (31), and forms an airflow loop by the auxiliary air inlet. The liquid permeating component (6) in the atomizing core component of the cigarette is directly sleeved on the electric heater (5), so that the cigarette can adequately heat gasified smoke with uniform small drops, and the user can accept easily and the smoke can easily enter lung bubble and can be absorbed conveniently. The electric heater (5) and the liquid storage component (3) are connected with the through hole (51) and the channel (31), so that the smoke generated by atomizing process can be cooled under the push of airflow, and the absorbed smoke meets the taste of smoker. The cigarette has detachable split structure, so that the cigarette can exchange and carry conveniently.

[见续页]

WO 2010/091593 A1

**(57) 摘要**:

一种改进的雾化电子烟，包括电源装置（1）、传感器（2）、雾化芯组件和储液部件（3）。还包括容置壳体，壳体上开有辅助进气孔（4）。雾化芯组件包括电加热体（5）和液体渗透件（6）。电加热体（5）具有通孔（51），储液部件（3）具有通道（31），传感器（2）与通孔（51）、通道（31）相连通并与辅助进气孔（4）形成气流回路。电子烟雾化芯组件中的液体渗透件（6）直接套于电加热体上（5），加热时气化的烟雾更加充分，液滴更小更均匀，使用者在口感上更易接受，而且更容易到达肺泡而便于吸收。同时，由于电加热体（5）及储液部件（3）有相连通的通孔（51）和通道（31），使雾化产生的烟雾在气流的推动下进一步冷却，使吸入的烟雾更复合吸烟者的口感。电子烟具有可拆卸更换的分体式结构，可实现部件的更换、也便于携带。

# 一种改进的雾化电子烟

## 技术领域

本发明涉及一种雾化电子烟，特别涉及一种改进的雾化电子烟。

## 背景技术

为开发香烟代用品，雾化电子香烟已经在控烟产品市场上占有很高的比重，同时雾化电子烟技术的改进和完善将是普遍使用无害的电子香烟的一个必要前提。

目前，现有的雾化电子烟，还存在诸多问题和不足。如雾化效果不好，最终雾化的烟气中液滴较大、液滴大小不一造成烟雾不均匀、烟雾较湿，吸入口感差。或是烟雾没有被充分足够的冷却使吸入的烟雾温度较高，给吸烟者造成不适。

上述种种问题使吸烟者在吸电子烟时产生与真烟口感上的巨大差异，不利于吸烟者选取电子烟取代真烟。

## 发明内容

为了克服上述现有技术中的不足，本发明提供一种改进的雾化电子烟。将雾化芯组件中的液体渗透件直接套于电加热体上，并通过把储液部件中的烟液渗透至液体渗透件中，当电加热体加热时直接与液体渗透件作用，更加充分的将烟液雾化，使雾化的液滴更小更均匀。同时，由于电加热体及储液部件内有相连通的通孔和通道，使雾化大液滴在气流的推动吸附于储液部件，从而使吸入的烟雾更符合吸烟者的口感。

本发明采用的主要技术方案为：一种改进的雾化电子烟，包括电源装置、传感器、雾化芯组件和储液部件，还包括容置上述各部件的壳体，所述壳体上开有辅助进气孔，壳体的一端设有吸气口，其特征在于：所述雾化芯组件包括电加热体，所述电加热体使储液部件中的液体雾化，



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所述储液部件内具有可使雾化气体流通的通道，所述辅助进气孔、传感器和吸嘴形成气流回路。具有可使气体流通的通孔，所述储液部件内有可使气体流通的通道，使得雾化的气体与构成通道壁的储液部件芯体直接接触，使大颗粒的雾化气体因接触而被吸收，且所述传感器与通道相连通并与辅助进气孔形成气流回路。

本发明还采用如下附属技术方案：所述雾化芯组件包括套于所述电加热体上的液体渗透件，所述雾化芯组件内设有可使气体流通的通道，所述通道由电加热体的结构构成。

所述雾化芯组件的电加热体直接伸入储液部件的通道内，雾化的气体直接通过通道流动。

所述储液部件内设有可使气体流通的通道为中空、通孔、环状通道、截面局部稀疏网状通道或其组合。

所述雾化芯组件还包括与所述液体渗透件相接触的液体传导件，所述液体传导件还与所述储液部件相接触。

所述液体传导件套于所述液体渗透件上，其一端沿径向方向延伸出一传导部，所述传导部与所述储液部件相接触。

所述传感器为气压传感器或气流传感器，所述壳体包括第一壳体、第二壳体，所述电源装置和传感器位于第一壳体内，所述雾化芯组件和储液部件位于第二壳体内，所述第一壳体和/或第二壳体上靠近传感器的区域开有所述辅助进气孔。

所述第二壳体内设有一支架，所述雾化芯组件固定于所述支架上，所述电加热体与所述电源装置、传感器相连接并由传感器根据气体的流动情况启动或停止加热。



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所述支架上设有一进气连接件和电极环，所述进气连接件和电极环分别与电加热体的两个引线电连接，所述进气连接件通过与所述传感器的连接实现电连接，所述电极环通过进气连接件与传感器的连接与电源装置电连接，所述进气连接件也具有一通气孔，所述传感器与通气孔、通孔、通道相连通并与辅助进气孔形成气流回路。

所述第一壳体和第二壳体之间通过所述进气连接件与传感器的连接相拼接，所述进气连接件与传感器之间插接、螺纹连接或卡接。

所述第二壳体上开有吸气口，所述传感器与通气孔、通孔、通道及吸气口相连通并与辅助进气孔形成气流回路。

所述壳体为一整体，前端上开有辅助进气孔，所述传感器与通气孔、通孔、通道及吸气口相连通并与辅助进气孔形成气流回路。

所述液体渗透件与所述储液部件相接触，所述雾化芯组件套于所述储液部件的通道内，所述液体渗透件的外周面与所述通道的内壁相贴合。

所述储液部件采用微孔陶瓷、泡沫陶瓷、天然纤维、人造纤维、或泡沫金属材料制成，所述液体渗透件采用陶瓷纤维、石英纤维、玻璃纤维、芳纶纤维、普通纤维、纸、布、或无纺布材料制成，所述电加热体为电热丝螺旋缠绕形成或设置在液体渗透件内表面的电热膜构成，所述螺旋缠绕而成的电加热体或液体渗透件内表面电热膜中空形成所述通孔。

所述液体渗透件的厚度为0.5至5mm之间，所述通孔的直径为0.5至4mm之间。

所述液体渗透件中添加有沸石颗粒。



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采用本发明带来的有益效果：（1）本发明将雾化芯组件中的液体渗透件直接套于电加热体上，并把储液部件中的烟液渗透至液体渗透件中，而且本发明将液体渗透件设计为厚度仅为1㎜，其中所渗透的烟液更加容易被电加热体气化透彻，当电加热体加热时使液体渗透件中的烟液达到沸点而汽化，使气化的烟雾更加充分，液滴更小更均匀，直径可达0.04μm~0.8μm，这种汽雾在分散度和外观上更接近真实的香烟烟雾，使用者在口感上更易接受，而且更容易到达肺泡而便于吸收。同时，由于电加热体及储液部件有相连通的通孔和通道，使雾化的气体能在储液部件内顺利通过，使雾化大液滴在气流的推动吸附于储液部件，避免现有通道设置在电子烟壳体和储液部件壳体间而无法吸附大颗粒的烟雾气体，使吸入的烟雾更符合吸烟者的口感。（2）在本发明提供的另一方案中，将雾化芯组件套于储液部件的通道内，使液体渗透件直接与储液部件相接触，烟液的渗透传导更加充分快速，使雾化的烟雾更充足，而且该结构简单、节省空间使整个雾化电子烟的体积更小。（3）本发明将电子烟设计为可拆卸更换的分体式结构，通过拆卸、安装第一壳体与第二壳体即可实现部件的更换、也便于携带。

附图说明

图1为本发明电子烟的侧面剖视图；示出第一壳体与第二壳体分离时的状态结构；

图2为本发明电子烟的侧面剖视图；示出第一壳体与第二壳体连接后的状态结构；

图3为本发明电子烟中雾化芯的侧面剖视图；

图4为本发明电子烟雾化芯的俯视结构图；

图5为本发明电子烟的各电器部件之间形成闭合回路的电气连接框图；

图6为本发明另一实施例的电子烟的侧面剖视图。

具体实施方式



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下面结合附图对本发明做进一步的详述：

如图1至图5所示，为本发明提供的一种改进的雾化电子烟，包括依次配合连接的电源装置1、传感器2、雾化芯组件和储液部件3，还包括容置上述各部件的壳体，壳体上靠近传感器2的区域开有辅助进气孔4，雾化芯组件包括电加热体5和套于电加热体5上的液体渗透件6，电加热体5为中空结构，具有可使气体流通的通孔51，储液部件3内（部）具有可使气体流通的通道31，可为中空、通孔、环状通道、截面局部稀疏网状通道或其组合，目的是使通过的雾化气体与构成储液部件的储液芯体接触，储液部件3与液体渗透件6相配合将烟液渗透至液体渗透件6，且传感器2与通孔51、通道31相连通并与辅助进气孔4形成气流回路。

在本实施例中，如图1至图3所示，雾化芯组件还包括与液体渗透件6相接触的液体传导件7，液体传导件7还与储液部件3相接触。液体传导件7套于液体渗透件6上，其一端沿径向方向延伸出一传导部71，传导部71与储液部件3相接触。起到的作用就是将储液部件3上的烟液吸附过来并渗透至液体渗透件上。为了使液体传导件7与液体渗透件6贴合的更紧密而提高液体传导性，可在液体传导件7上套一紧固套12。

如图1所示，传感器2为气压传感器或气流传感器，在本实施例中，采用气流传感器。壳体包括第一壳体8、第二壳体8’，电源装置1和传感器2位于第一壳体8内，雾化芯组件和储液部件3位于第二壳体8’内，第一壳体8和/或第二壳体8’上靠近传感器2的区域开有辅助进气孔4。在本实施例中，辅助进气孔4开于第一壳体8上，并位于靠近传感器2的区域内。电源装置1为电池。电池可为充电电池或一次性电池。

在第二壳体8’内设有一支架9，雾化芯组件固定于支架9上，电加热体5与电源装置1、传感器2相连接并由传感器2根据气体的流动情况启动或停止加热。支架9上设有一进气连接件10和电极环11，进气连接件10和电极环11分别与电加热体5的两个引线电连接，进气连接件10通过与传感器2的连接实现电连接，电极环11通过进气连接件10与传感器2的连接与电源装置1电连接。形成一个完成的闭合回路，如图4中所示。传感器在其中起到的作用是根据气体流动情况导通或断开整个电路。当用户吸气时，电子烟内部气体产生流动，这时传感器导通电路启动电加热体5加热，当停止吸气气体不流动时，则断开电路停止电加热体5加热。在第一壳体8的开口处安装有与电极环10相对应电极环柱13，电极环柱13沿轴向延伸出接触部131，电极环柱13与电源装置1连接，当第一壳体8与第二壳体8’拼接后，基础部131伸入第二壳体8’内部与电极环11接触，从而形成一个完整闭合的回路。

在本实施例中，第一壳体8和第二壳体8’之间通过进气连接件10与传感器2的连接相拼接，进气连接件10与传感器2之间插接、螺纹连接或卡接。这种可拆卸更换的分体式结构，通过拆卸、安装第一壳体8与第二壳体8’即可实现部件的更换、也便于携带。本实施例公开的是螺纹连接的结构。

如图1所示，进气连接件10也具有一通气孔101，传感器2与通气孔101、通孔51、通道31相连通并与辅助进气孔4形成气流回路。第二壳体8’上开有吸气口a，传感器2与通气孔101、通孔51、通道31及吸气口a相连通并与辅助进气孔4形成气流回路。



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储液部件3采用微孔陶瓷、泡沫陶瓷、天然纤维、人造纤维、或泡沫金属材料等储液芯体材料制成，液体渗透件6采用陶瓷纤维、石英纤维、玻璃纤维、芳纶纤维、普通纤维、纸、布、或无纺布材料制成，液体渗透件6的厚度在0.5至5mm之间，电加热体5为电热丝螺旋缠绕形成，螺旋缠绕而成的电加热体形成通孔51，通孔51的直径在0.5至4mm之间。在本实施例中，液体渗透件6的厚度为1mm，通孔51的直径为1mm。

雾化芯组件中的液体渗透件6直接套于电加热体5上，储液部件3中的烟液由液体传导件7传导渗透至液体渗透件6中，液体渗透件6的厚度为1mm，其所渗透的烟液更加容易被电加热体5气化透彻。当用户吸气时，由于传感器2与通气孔101、通孔51、通道31及吸气口a相连通并与辅助进气孔4形成气流回路，电子烟内部产生气体流动，传感器3导通电路，电加热体5开始加热，使液体渗透件6中的烟液达到沸点而汽化，同时，由于电加热体5及储液部件3有相连通的通孔51和通道31，使雾化产生的烟雾在气流的推动下流动并进一步冷却，最后由吸气口a被吸入用户的口腔。

在本发明提供的另一优选实施例中，如图6所示，液体渗透件6与储液部件3相接触，雾化芯组件套于储液部件3的通道31内，液体渗透件6的外周面与通道31的内壁相贴合。

储液部件3采用微孔陶瓷、泡沫陶瓷、天然纤维、人造纤维、或泡沫金属材料制成，液体渗透件6采用陶瓷纤维、石英纤维、玻璃纤维、芳纶纤维、普通纤维、纸、布、或无纺布材料制成，液体渗透件6的厚度在0.5至5mm之间，电加热体5为电热丝螺旋缠绕形成，螺旋缠绕而成的电加热



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体形成通孔51，通孔51的直径在0.5至4mm之间。在本实施例中，液体渗透件6的厚度为1mm，通孔51的直径为1mm。

本实施例中，将雾化芯组件整体套于储液部件3的通道31内，使液体渗透件6的外周面直接与储液部件3的通道31内壁相接触，接触面积更大、烟液的渗透传导更加充分快速，使雾化的烟雾更充足，而且该结构简单、节省空间使整个雾化电子烟的体积更小。



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# 权 利 要 求 书

1、一种改进的雾化电子烟，包括电源装置（1）、传感器（2）、雾化芯组件和储液部件（3），还包括容置上述各部件的壳体，所述壳体上开有辅助进气孔（4），壳体的一端设有吸气口，其特征在于：所述雾化芯组件包括电加热体（5），所述电加热体（5）使储液部件（3）中的液体雾化，所述储液部件（3）内具有可使雾化气体流通的通道（31），所述辅助进气孔（4）、传感器（2）和吸嘴形成气流回路。

2、根据权利要求1所述的雾化电子烟，其特征在于：所述雾化芯组件包括套于所述电加热体（5）上的液体渗透件（6），所述雾化芯组件内设有可使气体流通的通道（51），所述通道（51）由电加热体（5）的结构构成。

3、根据权利要求1所述的雾化电子烟，其特征在于：所述雾化芯组件的电加热体（5）直接伸入储液部件（3）的通道（31）内，雾化的气体直接通过通道（31）流动。

4、根据权利要求1、2或3所述的雾化电子烟，其特征在于所述储液部件（3）内设有可使气体流通的通道（31）为中空、通孔、环状通道、截面局部稀疏网状通道或其组合。

5、根据权利要求4所述的雾化电子烟，其特征在于：所述雾化芯组件还包括与所述液体渗透件（6）相接触的液体传导件（7），所述液体传导件（7）还与所述储液部件（3）相接触。



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6、根据权利要求5所述的雾化电子烟，其特征在于：所述液体传导件（7）套于所述液体渗透件（6）上，其一端沿径向方向延伸出一传导部（71），所述传导部（71）与所述储液部件（3）相接触。

7、根据权利要求6所述的雾化电子烟，其特征在于：所述传感器（2）为气压传感器或气流传感器，所述壳体包括第一壳体（8）、第二壳体（8’），所述电源装置（1）和传感器（2）位于第一壳体（8）内，所述雾化芯组件和储液部件（3）位于第二壳体（8’）内，所述第一壳体（8）和/或第二壳体（8’）上靠近传感器的区域开有所述辅助进气孔（4）。

8、根据权利要求7所述的雾化电子烟，其特征在于：所述第二壳体（8’）内设有一支架（9），所述雾化芯组件固定于所述支架（9）上，所述电加热体（5）与所述电源装置（1）、传感器（2）相连接并由传感器（2）根据气体的流动情况启动或停止加热。

9、根据权利要求8所述的雾化电子烟，其特征在于：所述支架（9）上设有一进气连接件（10）和电极环（11），所述进气连接件（10）和电极环（11）分别与电加热体（5）的两个引线电连接，所述进气连接件（10）通过与所述传感器（2）的连接实现电连接，所述电极环（11）通过进气连接件（10）与传感器（2）的连接与电源装置（1）电连接，所述进气连接件（10）也具有一通气孔（101），所述传感器（2）与通气孔（101）、通孔（51）、通道（31）相连通并与辅助进气孔（4）形成气流回路。

10、根据权利要求9所述的雾化电子烟，其特征在于：所述第一壳体（8）和第二壳体（8’）之间通过所述进气连接件（10）与传感器（2）



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的连接相拼接，所述进气连接件（10）与传感器（2）之间插接、螺纹连接或卡接。

11、根据权利要求9所述的雾化电子烟，其特征在于：所述第二壳体（8’）上开有吸气口（a），所述传感器（2）与通气孔（101）、通孔（51）、通道（31）及吸气口（a）相连通并与辅助进气孔（4）形成气流回路。

12、根据权利要求6所述的雾化电子烟，其特征在于：所述壳体为一整体，前端上开有辅助进气孔(4)，所述传感器（2）与通气孔（101）、通孔（51）、通道（31）及吸气口（a）相连通并与辅助进气孔（4）形成气流回路

13、根据权利要求1、2或3所述的雾化电子烟，其特征在于：所述液体渗透件（6）与所述储液部件（3）相接触，所述雾化芯组件套于所述储液部件（3）的通道（31）内，所述液体渗透件（6）的外周面与所述通道（31）的内壁相贴合。

14、根据权利要求5所述的雾化电子烟，其特征在于：所述储液部件（3）采用微孔陶瓷、泡沫陶瓷、天然纤维、人造纤维、或泡沫金属材料制成，所述液体渗透件（6）采用陶瓷纤维、石英纤维、玻璃纤维、芳纶纤维、普通纤维、纸、布、或无纺布材料制成，所述电加热体（5）为电热丝螺旋缠绕形成或设置在液体渗透件内表面的电热膜构成，所述螺旋缠绕而成的电加热体或液体渗透件内表面电热膜中空形成所述通孔（51）。



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15、根据权利要求14所述的雾化电子烟，其特征在于：所述液体渗透件（6）的厚度为0.5至5mm之间，所述通孔（51）的直径为0.5至4mm之间。

16、根据权利要求2或3所述的雾化电子烟，其特征在于：所述液体渗透件（6）中添加有沸石颗粒。



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Case No. IPR2024-161
Page 124 of 552

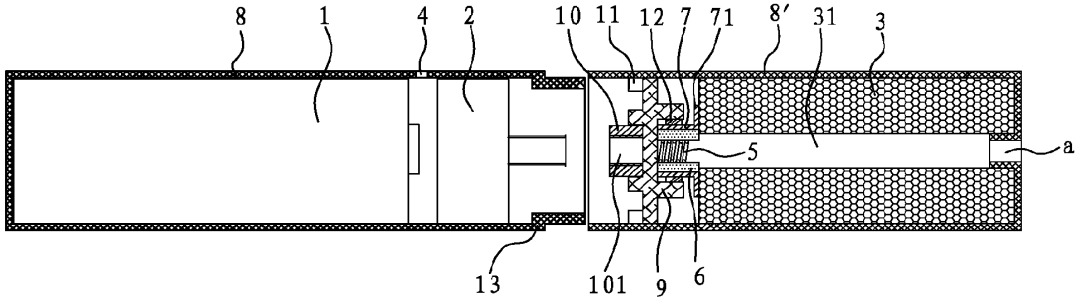

8
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8′
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a
13
101
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6

图1

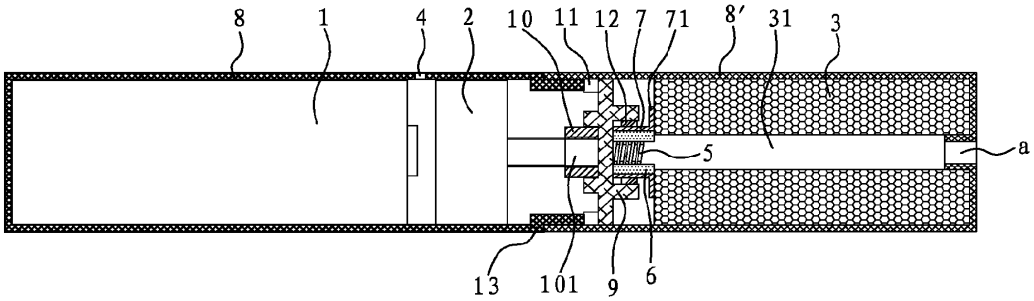

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图2

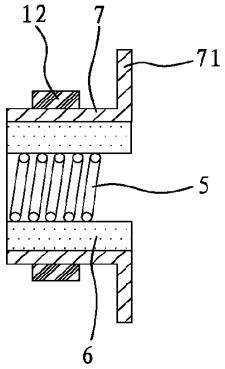

12
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6

图3

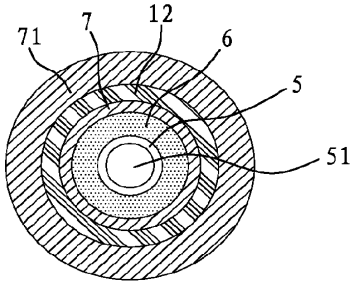

71
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12
6
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51

图4

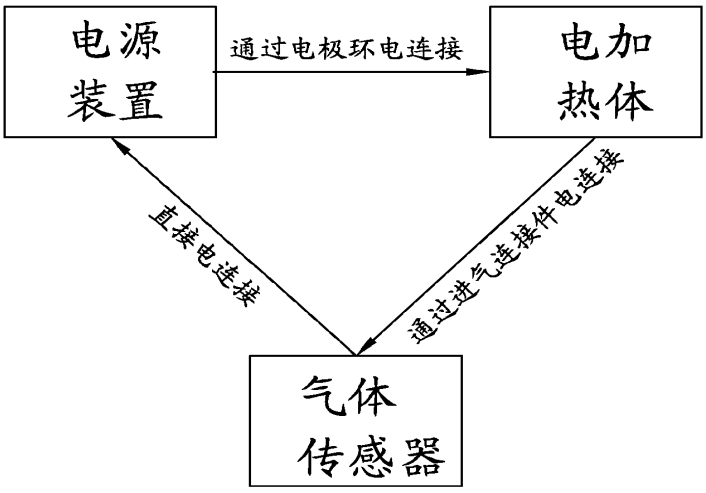

电源装置
通过电极环电连接
电加热体
直接电连接
通过进气连接件电连接
气体传感器

图5

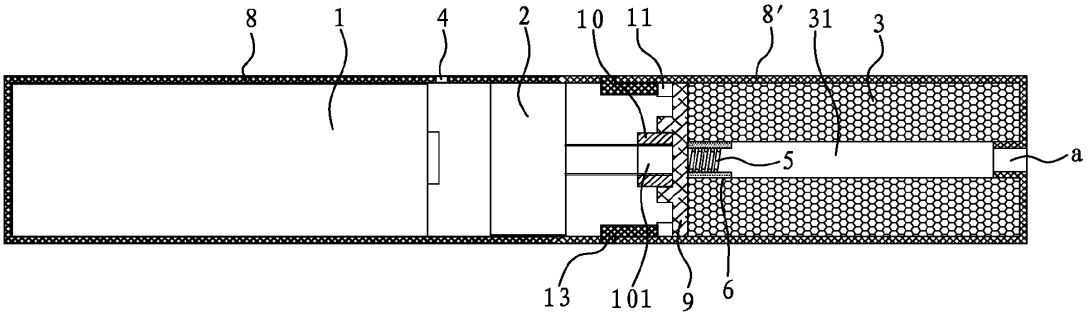

8
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101
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图6

# INTERNATIONAL SEARCH REPORT

International application No.
PCT/CN2010/000125

**A. CLASSIFICATION OF SUBJECT MATTER**

A24F 47/00 (2006.01) i

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

IPC A24 A61M

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)

CNPAT WPI EPODOC

CIGARETTE, ELECTR+, HEAT+

C. DOCUMENTS CONSIDERED TO BE RELEVANT

| Category* | Citation of document, with indication, where appropriate, of the relevant passages | Relevant to claim No. |
|---|---|---|
| PX | CN201379072Y (HAN, Li), 13 Jan. 2010 (13.01.2010), claims 1-12, page 4, line 16 to page 7, line 17 in the specification, figures 1-6. | 1-16 |
| X | CN200966824Y (HAN, Li), 31 Oct. 2007 (31.10.2007), page 2, line 1 to page 3, line 17 in the specification, claims 1-7, figures 1-5. | 1,3-6,13,16 |
| Y | | 7,8 |
| Y | CN200997909Y (WANG, Yumin), 02 Jan. 2008 (02.01.2008), page 2, lines 10-23 in the specification, figures 1-3. | 7,8 |
| A | CN101116542A (CHINESE ACAD TECH INST PHYSICS), 06 Feb. 2008(06.02.2008), the whole document. | 1-16 |
| A | US5144962A(PHILIP MORRIS INC), 08 Sept 1992 (08.09.1992), the whole document. | 1-16 |
| A | US5095921A(PHILIP MORRIS INC), 17 Mar. 1992 (17.03.1992), the whole document | 1-16 |

☐ Further documents are listed in the continuation of Box C. ☒ See patent family annex.

* Special categories of cited documents:

"A" document defining the general state of the art which is not considered to be of particular relevance

"E" earlier application or patent but published on or after the international filing date

"L" document which may throw doubts on priority claim (S) or which is cited to establish the publication date of another citation or other special reason (as specified)

"O" document referring to an oral disclosure, use, exhibition or other means

"P" document published prior to the international filing date but later than the priority date claimed

"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention

"X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone

"Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art

"&" document member of the same patent family

| Date of the actual completion of the international search | Date of mailing of the international search report |
|---|---|
| **15 Mar. 2010(15.03.2010)** | **01 Apr. 2010 (01.04.2010)** |
| Name and mailing address of the ISA/CN<br>The State Intellectual Property Office, the P.R.China<br>6 Xitucheng Rd., Jimen Bridge, Haidian District, Beijing, China 100088<br>Facsimile No. 86-10-62019451 | Authorized officer<br>SUN,Xiaojing<br>Telephone No. (86-10)62085632 |

Form PCT/ISA /210 (second sheet) (July 2009)

**INTERNATIONAL SEARCH REPORT**
Information on patent family members

International application No.
PCT/CN2010/000125

| Patent Documents referred in the Report | Publication Date | Patent Family | Publication Date |
|---|---|---|---|
| CN201379072Y | 13.01.2010 | None | |
| CN200966824Y | 31.10.2007 | WO2008055423A1 | 15.05.2008 |
| | | EP2018886A1 | 28.01.2009 |
| | | US2009188490A | 30.07.2009 |
| CN200997909Y | 02.01.2008 | None | |
| CN101116542A | 06.02.2008 | None | |
| US5095921 A | 17.03.1992 | NO910355 A | 20.05.1992 |
| | | NO176545B | 16.01.1995 |
| | | NO176545C | 26.04.1995 |
| | | CA2035761 A | 20.05.1992 |
| | | AU642460B | 21.10.1993 |
| | | AU7013991 A | 21.05.1992 |
| | | EP0488488 A | 03.06.1992 |
| | | TR25275 A | 01.01.1993 |
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| | | AT108311T | 15.07.1994 |
| | | ES2057751T | 16.10.1994 |
| | | JP6315366A | 15.11.1994 |
| | | JP3078033B2 | 21.08.2000 |
| | | DK0488488T | 21.11.1994 |
| | | DE69102862T | 05.01.1995 |
| US5144962 A | 08.09.1992 | CA2031225 A | 02.06.1991 |
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| | | NO302272B | 16.02.1998 |
| | | NO905150 A | 03.06.1991 |
| | | NO177174B | 24.04.1995 |
| | | NO177174C | 09.08.1995 |
| | | EP0430559 A | 05.06.1991 |
| | | AU6762090 A | 06.06.1991 |
| | | JP3232481 A | 16.10.1991 |

**INTERNATIONAL SEARCH REPORT**
Information on patent family members

International application No.
PCT/CN2010/000125

| Patent Documents referred in the Report | Publication Date | Patent Family | Publication Date |
|---|---|---|---|
| | | JP3392138B2 | 31.03.2003 |
| | | TR25316 A | 01.01.1993 |
| | | AU646415B | 24.02.1994 |
| | | AT118992T | 15.03.1995 |
| | | ES2069027T | 01.05.1995 |
| | | DK0430559T | 01.05.1995 |
| | | DE69017371T | 12.10.1995 |
| | | KR0178388B | 18.02.1999 |

Form PCT/ISA /210 (patent family annex) (July 2009)

# 国际检索报告

国际申请号
**PCT/CN2010/000125**

**A. 主题的分类**

A24F 47/00 (2006.01) i

按照国际专利分类(IPC)或者同时按照国家分类和 IPC 两种分类

**B. 检索领域**

检索的最低限度文献(标明分类系统和分类号)

IPC A24 A61M

包含在检索领域中的除最低限度文献以外的检索文献

在国际检索时查阅的电子数据库(数据库的名称，和使用的检索词（如使用）)

CNPAT WPI EPODOC

烟 电子 电容 加热 CIGARETTE, ELECTR+, HEAT+

**C. 相关文件**

| 类 型* | 引用文件，必要时，指明相关段落 | 相关的权利要求 |
|---|---|---|
| PX | CN201379072Y(韩力), 13.1 月 2010(13.01.2010), 权利要求 1-12，说明书 4 页 16 行至 7 页 17 行，图 1-6。 | 1-16 |
| X | CN200966824Y(韩力), 31.10 月 2007(31.10.2007), 说明书第 2 页第 1 行至第 3 页第 17 行，权利要求 1-7，图 1-5。 | 1,3-6,13,16 |
| Y | | 7,8 |
| Y | CN200997909Y(王玉民), 02.1 月 2008(02.01.2008), 说明书第 2 页 10－23 行，图 1-3。 | 7,8 |
| A | CN101116542A(中科院理化技术研究所), 06.2 月 2008(06.02.2008), 全文。 | 1-16 |
| A | US5144962A(PHILIP MORRIS INC), 08.9 月 1992(08.09.1992), 全文。 | 1-16 |
| A | US5095921A(PHILIP MORRIS INC), 17.3 月 1992(17.03.1992), 全文 | 1-16 |

☐ 其余文件在 C 栏的续页中列出。 ☒ 见同族专利附件。

* 引用文件的具体类型：

"A" 认为不特别相关的表示了现有技术一般状态的文件

"E" 在国际申请日的当天或之后公布的在先申请或专利

"L" 可能对优先权要求构成怀疑的文件，或为确定另一篇引用文件的公布日而引用的或者因其他特殊理由而引用的文件（如具体说明的）

"O" 涉及口头公开、使用、展览或其他方式公开的文件

"P" 公布日先于国际申请日但迟于所要求的优先权日的文件

"T" 在申请日或优先权日之后公布，与申请不相抵触，但为了理解发明之理论或原理的在后文件

"X" 特别相关的文件，单独考虑该文件，认定要求保护的发明不是新颖的或不具有创造性

"Y" 特别相关的文件，当该文件与另一篇或者多篇该类文件结合并且这种结合对于本领域技术人员为显而易见时，要求保护的发明不具有创造性

"&" 同族专利的文件

| 国际检索实际完成的日期 | 国际检索报告邮寄日期 |
|---|---|
| **15.3 月 2010(15.03.2010)** | **01.4 月 2010 (01.04.2010)** |
| ISA/CN 的名称和邮寄地址：<br>中华人民共和国国家知识产权局<br>中国北京市海淀区蓟门桥西土城路 6 号 100088<br>传真号： (86-10)62019451 | 受权官员<br>孙晓静<br>电话号码：(86-10) **62085632** |

PCT/ISA/210 表(第 2 页) (2009 年 7 月)

国际检索报告
关于同族专利的信息

国际申请号
**PCT/CN2010/000125**

| 检索报告中引用的专利文件 | 公布日期 | 同族专利 | 公布日期 |
|---|---|---|---|
| CN201379072Y | 13.01.2010 | 无 | |
| CN200966824Y | 31.10.2007 | WO2008055423A1 | 15.05.2008 |
| | | EP2018886A1 | 28.01.2009 |
| | | US2009188490A | 30.07.2009 |
| CN200997909Y | 02.01.2008 | 无 | |
| CN101116542A | 06.02.2008 | 无 | |
| US5095921 A | 17.03.1992 | NO910355 A | 20.05.1992 |
| | | NO176545B | 16.01.1995 |
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| | | AT108311T | 15.07.1994 |
| | | ES2057751T | 16.10.1994 |
| | | JP6315366A | 15.11.1994 |
| | | JP3078033B2 | 21.08.2000 |
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| | | NO302272B | 16.02.1998 |
| | | NO905150 A | 03.06.1991 |
| | | NO177174B | 24.04.1995 |
| | | NO177174C | 09.08.1995 |
| | | EP0430559 A | 05.06.1991 |
| | | AU6762090 A | 06.06.1991 |
| | | JP3232481 A | 16.10.1991 |
| | | JP3392138B2 | 31.03.2003 |
| | | TR25316 A | 01.01.1993 |
| | | AU646415B | 24.02.1994 |
| | | AT118992T | 15.03.1995 |
| | | ES2069027T | 01.05.1995 |
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| | | DE69017371T | 12.10.1995 |
| | | KR0178388B | 18.02.1999 |

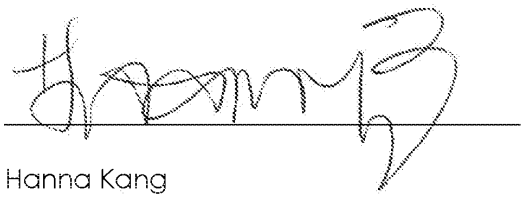
PARK
IP TRANSLATIONS
welocalize

Executed on September 22, 2014

**Certification**

**Park IP Translations**

This is to certify that the attached translation is, to the best of my knowledge and belief, a true and accurate translation from Chinese into English of the patent that is entitled "Aerosolizing Inhalation Device" in English. I declare under penalty of perjury under the laws of the United States of America that the foregoing is true and correct.



Hanna Kang

Project Manager

Project Number: MFIP_1407_091

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New York, NY 10018
212.581.8870
ParkIP.com

[19]Intellectual Property Office of the People's Republic of China

[51] Int. Cl.
*A61M 15/00 (2006. 01)*
*A61M 11/00 (2006. 01)*



# [12] Utility Model Patent Specification

**Patent No.:** ZL 200620094038.0

**[45] Date of Authorized Announcement:** October 31, 2007

**[11] Authorized Announcement No.:** CN 200966824 Y

**[22] Filing date:** November 10, 2006

**[21] Application No.:** 200620094038.0

**[71] Applicant:** HAN, Li

Address: Rooms 1010-12, 10th Floor, West Tower, Shun Tak Center 168-200, Connaught Road, Central Sheung Wan, Hong Kong

**[72] Inventor:** HAN, Li

**[74] Agency :** Shengyang Patent & Trademark Agency Academia Sinica

**Agents:** XU, Zongfu; ZHOU, Xiumei

Claims: 1 page Specifications: 3 pages

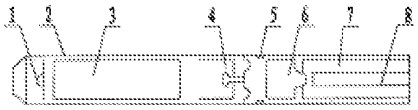
Drawings: 2 pages

**[54] Title of the Utility Model**

AEROSOLIZING INHALATION DEVICE

**[57]Abstract**

The utility model relates to an inhalation device for inhaling into lungs via the oral cavity, and in particular, to an aerosolizing inhalation device for aerosolizing a solution with a substance of physiologic activity into aerosol and delivering it into lungs via the respiratory tract, and the device includes a housing, and a battery, a pneumatic switch, an atomizer and a liquid-supplying bottle, all of which are disposed in the housing, where the liquid-supplying bottle is provided with a ventilate duct, one end of the liquid-supplying bottle is connected to the atomizer, and the pneumatic switch and the battery are disposed in turn at the other side of the atomizer; and the housing is provided with an air orifice. The utility model performs aerosolization uniformly, has small aerosolized particles with an average diameter reaching about 1 micron, which is the optimal technical parameter for absorption in lungs, and the particles can be totally inhaled; the device has a simple structure, is convenient to carry, and is not limited by fields. The atomizer of the utility model aerosolizes liquid infiltrated by the liquid-supplying bottle, dilutes the liquid with inhaled air to form aerosol to be inhaled by a user, and can be used as a cigarette substitute and medical equipment for intrapulmonary delivery.



1. An aerosolizing inhalation device, characterized by comprising: a housing (2), and a battery (3), a pneumatic switch (4), an atomizer (6) and liquid-supplying bottle (7), all of which are disposed in the housing, the liquid-supplying bottle (7) is provided with an ventilate duct (8), one end of the liquid-supplying bottle (7) is connected to the atomizer (6), and the pneumatic switch (4) and the battery (3) are disposed in turn at the other side of the atomizer (6); and the housing (2) is provided with an air orifice (5).

2. The aerosolizing inhalation device according to claim 1, characterized in that: the atomizer (6) is a jet heating atomizer, and comprises a liquid-supplying structural body (101) and a heating body (102), the liquid-supplying structural body (101) is a porous body structure or a fiber structure, with one end provided with a jet hole (103) and the other end provided with a protrusion (104), the heating body (102) is accommodated in the liquid-supplying structural body (101), and solution in the liquid-supplying bottle (7) is fed into the atomizer through the liquid-supplying structural body (101).

3. The aerosolizing inhalation device according to claim 2, characterized in that: the liquid-supplying structural body (101) is a porous body structure or a fiber structure; and the heating body (102) is a microporous ceramic skeleton wound by an ohmic metal electric heating material or a porous body that is made of a conductive ceramic/PTC material and provided with a sintered electrode.

4. The aerosolizing inhalation device according to claim 1, characterized in that: the atomizer (6) is an infiltration heating atomizer, and comprises a liquid-supplying structural body (201) and a heating body (202), the liquid-supplying structural body (201) is a porous body structure or a fiber structure, with one end provided with a protrusion (204) and the other end having the heating body (202) mounted, and solution in the liquid-supplying bottle (7) is fed into the atomizer through the liquid-supplying structural body (201).

5. The aerosolizing inhalation device according to claim 4, characterized in that: the liquid-supplying structural body (201) is a porous body structure or a fiber structure; the heating body (202) is a microporous ceramic skeleton wound by an ohmic metal electric heating material or a porous body that is made of a conductive ceramic/PTC material and provided with a sintered electrode.

6. The aerosolizing inhalation device according to claim 1, characterized in that: the pneumatic switch (4) is a mechanical switch that is made of metal and uses pressure difference as power, a Hall device, a semiconductor force sensitive chip, a silicon matrix bridge chip, or a capacitive and inductive sensor.

7. The aerosolizing inhalation device according to claim 1, characterized in that: the liquid-supplying bottle (7) is a porous body structure or a fiber structure, and is filled with imbibition.



CB/DR Dist Exhibit 1005 Page 3

JUUL Ex. 1002
Case No. IPR2024-161
Page 134 of 552

# AEROSOLIZING INHALATION DEVICE

## Technical Field

The utility model relates to an inhalation device for inhaling into lungs via the oral cavity, and in particular, to an aerosolizing inhalation device which aerosolizes a solution with a physiological active substance into aerosol and inhales into lungs through a respiratory tract.

## Related Art

Currently, intrapulmonary inhalation devices for medical purposes have many ultraphonic atomizers for clinical use and home use. Particles aerosolized by an existing intrapulmonary aerosolizing inhalation device has overlarge diameters, and most aerosolized particles are intercepted by the upper respiratory tract and bronchus, cannot effectively reach the bronchiole and pulmonary alveoli; moreover, the atomizer is inconvenient to carry.

## SUMMARY

The utility model is directed to provide an aerosolizing inhalation device, where when the device is used, aerosolized particles are small, aerosolization is uniform, and the device is convenient to carry.

The objective of the utility model is implemented through the following technical solutions:

The utility model includes a housing, and a battery, a pneumatic switch, an atomizer and a liquid-supplying bottle, all of which are disposed in the housing, the liquid-supplying bottle is provided with an ventilate duct, one end of the liquid-supplying bottle is connected to the atomizer, and the pneumatic switch and the battery are disposed in turn at the other side of the atomizer; and the housing is provided with an air orifice.

The atomizer is a jet heating atomizer, and includes a liquid-supplying structural body and a heating body, the liquid-supplying structural body is a porous body structure or a fiber structure, with one end provided with a jet hole and the other end provided with a protrusion, the heating body is accommodated in the liquid-supplying structural body, and solution in the liquid-supplying bottle is fed into the atomizer through the liquid-supplying structural body; the atomizer is an infiltration heating atomizer, and includes a liquid-supplying structural body and a heating body, the liquid-supplying structural body is a porous body structure or a fiber structure, with one end provided with a protrusion and the other end having the heating body mounted, and solution in the liquid-supplying bottle is fed into the atomizer through the liquid-supplying structural body; the liquid-supplying structural body is a porous body structure or a fiber structure; the heating body may be a microporous ceramic skeleton wound by an ohmic metal electric heating material or a porous body that is made of a conductive ceramic/PTC material and provided with a sintered electrode; the pneumatic switch is a mechanical switch that is made of metal and uses pressure difference as power, a Hall device, a semiconductor force sensitive chip, a silicon matrix bridge chip, or a capacitive and inductive sensor; and the liquid-supplying bottle is a porous body structure or a fiber structure, and is filled with imbibition.

The utility model has the following advantages and positive effects:

1. The utility model performs aerosolization uniformly, has small aerosolized particles with an average diameter reaching about 1 micron, which is the optimal technical parameter for absorption in lungs, and the particles can be totally inhaled.

2. The device has a simple structure, is convenient to carry, and is not limited by fields.



CB/DR Dist Exhibit 1005 Page 4

JUUL Ex. 1002
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## DESCRIPTION OF THE DRAWINGS

FIG. 1 is a schematic structural view of the utility model;

FIG. 2 is a schematic structural view of a jet heating atomizer of the utility model;

FIG. 3 is a right view of FIG. 2;

FIG. 4 is a schematic structural view of an infiltration heating atomizer of the utility model;

FIG. 5 is a right view of FIG. 4.

## DETAILED DESCRIPTION

The utility model is further described through accompanying drawings.

As shown in FIG. 1, the utility model includes a housing 2, and a battery 3, a pneumatic switch 4, an atomizer 6 and a liquid-supplying bottle 7, all of which are disposed in the housing, the housing 7 is a long cylinder, and a front end of the housing may be provided with an indicator 1. The liquid-supplying bottle 7 is a porous body structure or a fiber structure, and is filled with replaceable imbibition; the liquid-supplying bottle 7 is provided with a ventilate duct 8, and one end of the liquid-supplying bottle 7 is connected to the atomizer 6. The pneumatic switch 4 and the battery 3 are disposed in turn at the other side of the atomizer 6; the battery 3, the pneumatic switch 4 and the atomizer are connected in series to form a loop. The pneumatic switch 4 is a mechanical switch that is made of metal and uses pressure difference as power, and may also be replaced with a Hall device, a semiconductor force sensitive chip, a silicon matrix bridge chip, or a capacitive and inductive sensor. The housing 2 is provided with an air orifice 5 for inhaling external air.

As shown in FIG. 2 and FIG. 3, the atomizer 6 may be a jet heating atomizer, and includes a liquid-supplying structural body 101 and a heating body 102. The liquid-supplying structural body 101 is a porous body structure or a fiber structure, with one end provided with a jet hole 103 and the other end provided with a protrusion 104, and the jet hole 103 is formed by opening a hole on foamed ceramic, microporous ceramic, foamed metal, stainless steel fibrofelt or chemical fibers. The heating body 102 is accommodated in the liquid-supplying structural body 101, and solution in the liquid-supplying bottle 7 is fed into the atomizer through the liquid-supplying structural body 101. The heating body 102 may be a microporous ceramic skeleton wound by an ohmic metal electric heating material or a porous body that is made of a conductive ceramic/PTC material and provided with a sintered electrode. The jet heating atomizer performs primary aerosolization in the jet hole 103 by using an inhaling air flow, and sprays to perform secondary aerosolization on the heating body 102.

As shown in FIG. 4 and FIG. 5, the atomizer 6 may be an infiltration heating atomizer, and includes a liquid-supplying structural body 201 and a heating body 202, the liquid-supplying structural body 201 is a porous body structure or a fiber structure, with one end provided with a protrusion 204 and the other end having the heating body 202 mounted, and solution in the liquid-supplying bottle 7 is fed into the atomizer through the liquid-supplying structural body 201. The heating body 102 may be a microporous ceramic skeleton wound by an ohmic metal electric heating material or a porous body that is made of a conductive ceramic/PTC (positive temperature thermal sensitive ceramic) material and provided with a sintered electrode. The infiltration heating atomizer uses the heating body 202 to directly heat the liquid-supplying structural body 201 so as to aerosolize the solution.

In the atomizers of the two structures, the protrusion 104, 204 at one end is connected to the liquid-supplying bottle 7, and the solution in the liquid-supplying bottle 7 is gradually fed into the



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atomizer through the liquid-supplying structural body. The liquid-supplying structural body is formed by opening a hole on foamed ceramic, microporous ceramic, foamed metal, stainless steel fibrofelt or chemical fibers. The heating body is made of a microporous ceramic skeleton wound by an ohmic metal electric heating material, and may also directly adopt a porous body that is made of a conductive ceramic or a PTC ceramic material and provided with a sintered electrode. The surface of the heating body is sintered to form high-temperature glaze so as to fix zeolite particles, and the zeolite particles are made of natural zeolite, artificial inorganic microporous ceramic, or aluminium oxide particles.

The utility model has the following working principles: drug is solved by propanediol, and solution is fed into a replaceable liquid-supplying bottle 7. The liquid-supplying bottle 7 is disposed into the housing 10, and contacts with the atomizer 6 to supply liquid for the atomizer. When a user inhales, the pneumatic switch 4 implements mechanical contact under pressure difference, so that the battery 3 and the atomizer 6 are connected, the battery 3 supplies power for the atomizer 6, and the heating body 102, 202 starts heating. When the user inhales, the indicator 1 emits light, the atomizer 6 capillary sucks out the liquid in the liquid-supplying bottle 7 to aerosolize the liquid, the aerosolized liquid is condensed and diluted by the air inhaled through the air orifice 5 on the housing, and is then aerosolized by the atomizer 6. The aerosol aerosolized by the atomizer 6 is sucked out by the ventilate duct 8 on the liquid-supplying bottle 7.

The fiber structure used for manufacturing the liquid-supplying bottle and the liquid-supplying structural body is made of chemical fibers or nylon fibers.

The atomizer of the utility model aerosolizes the liquid infiltrated by the liquid-supplying bottle, dilutes the liquid with inhaled air to form aerosol to be inhaled by a user, and can be used as a cigarette substitute and medical equipment for intrapulmonary delivery.



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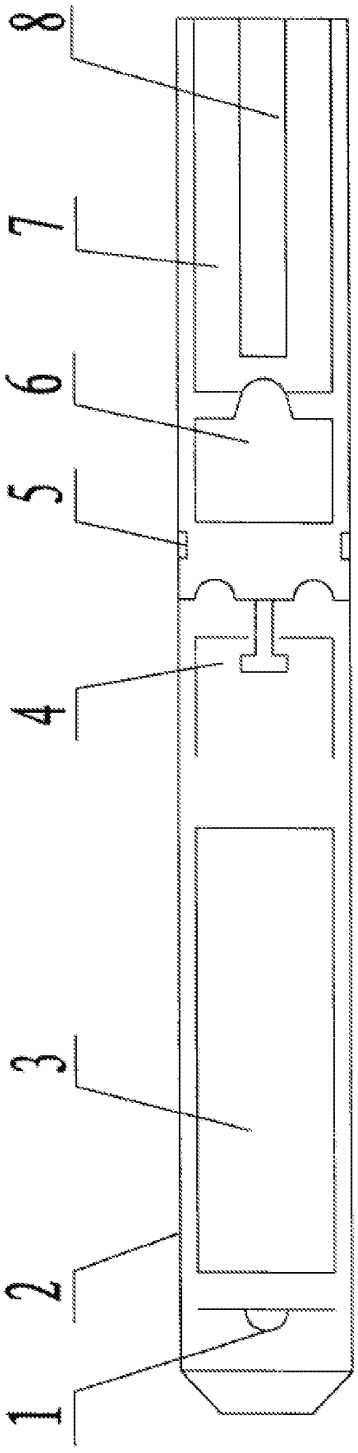



FIG. 1



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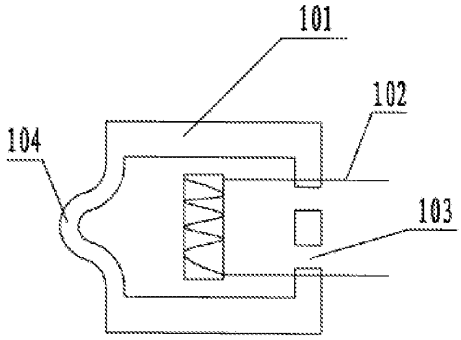



FIG. 2

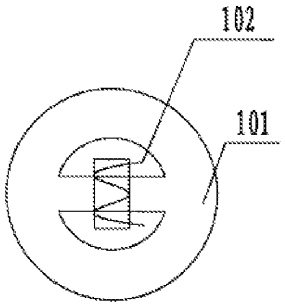



FIG. 3

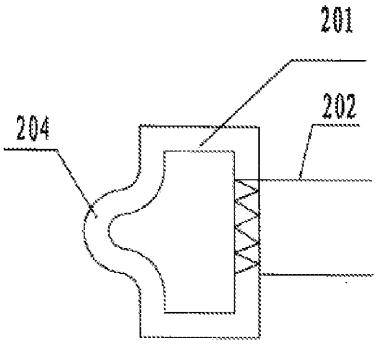



FIG. 4

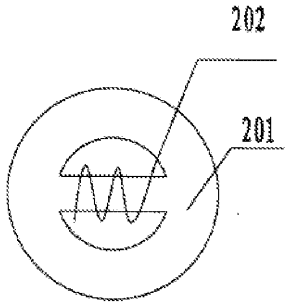



FIG. 5



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[19] 中华人民共和国国家知识产权局

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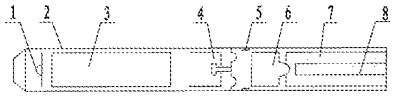
权利要求书 1 页 说明书 3 页 附图 2 页

[54] 实用新型名称

吸入雾化装置

[57] 摘要

本实用新型涉及经口腔吸入到肺内的吸入装置，具体地说是一种将有生理活性物质的溶液雾化成气溶胶后经呼吸道吸入肺内的吸入雾化装置，包括壳体及设在其内的电池、气动开关、雾化器及供液瓶，供液瓶上开有吸气孔道，供液瓶的一端连接雾化器，在雾化器的另一侧依次设有气动开关及电池；壳体上开有进气孔。本实用新型雾化均匀、雾化粒子小，平均直径可达 1 微米左右，是用于肺内吸收的最佳技术参数，可全部被吸入；结构简单、携带方便，使用不受场所的限制。本实用新型的雾化器使供液瓶浸润出的液体雾化，并随着吸入的空气稀释为气溶胶形态而被使用者吸入，可用于香烟替代品及肺内给药的医疗器械。



1. 一种吸入雾化装置，其特征在于：包括壳体（2）及设在其内的电池（3）、气动开关（4）、雾化器（6）及供液瓶（7），供液瓶（7）上开有吸气孔道（8），供液瓶（7）的一端连接雾化器（6），在雾化器（6）的另一侧依次设有气动开关（4）及电池（3）；壳体（2）上开有进气孔（5）。

2. 按权利要求 1 所述的吸入雾化装置，其特征在于：所述雾化器（6）为射流加热雾化器，包括供液结构体（101）及加热体（102），供液结构体（101）为多孔体结构或纤维结构，其一端开有射流孔（103），另一端设有凸起（104），加热体（102）容置于供液结构体（101）内，供液瓶（7）中的药液透过供液结构体（101）进入其体内。

3. 按权利要求 2 所述的吸入雾化装置，其特征在于：所述供液结构体（101）为多孔体结构或纤维结构；加热体（102）可为微孔陶瓷骨架上绕有欧姆金属电热材料或用导电陶瓷/PTC 材料制成的带烧结电极的多孔体。

4. 按权利要求 1 所述的吸入雾化装置，其特征在于：所述雾化器（6）为浸润加热雾化器，包括供液结构体（201）及加热体（202），供液结构体（201）为多孔体结构或纤维结构，其一端设有凸起（204），加热体（202）安装在另一端，供液瓶（7）中的药液透过供液结构体（201）进入其体内。

5. 按权利要求 4 所述的吸入雾化装置，其特征在于：所述供液结构体（201）为多孔体结构或纤维结构；加热体（202）可为微孔陶瓷骨架上绕有欧姆金属电热材料或用导电陶瓷/PTC 材料制成的带烧结电极的多孔体。

6. 按权利要求 1 所述的吸入雾化装置，其特征在于：所述气动开关（4）为金属制成的以压力差为动力的机械开并、霍尔器件、半导体力敏芯片、硅矩阵电桥芯片或电容及电感式传感器。

7. 按权利要求 1 所述的吸入雾化装置，其特征在于：所述供液瓶（7）为多孔体结构或纤维结构，瓶内填充有吸液。



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# 吸入雾化装置

## 技术领域

本实用新型涉及经口腔吸入到肺内的吸入装置，具体地说是一种将有生理活性物质的溶液雾化成气溶胶后经呼吸道吸入肺内的吸入雾化装置。

## 背景技术

现有用于医疗目的的肺内吸入装置已有很多超声雾化器供临床及家庭使用。而现有的肺内吸入雾化装置雾化的粒子直径过大，大部分雾化粒子被上呼吸道及支气管所截留，不能有效的达到细支气管及肺泡，而且携带也不方便。

## 实用新型内容

本实用新型的目的在于提供一种吸入雾化装置，在利用该装置时雾化粒子小，雾化均匀，便于携带。

本实用新型的目的是通过以下技术方案来实现的：

本实用新型包括壳体及设在其内的电池、气动开关、雾化器及供液瓶，供液瓶上开有吸气孔道，供液瓶的一端连接雾化器，在雾化器的另一侧依次设有气动开关及电池；壳体上开有进气孔。

其中：所述雾化器为射流加热雾化器，包括供液结构体及加热体，供液结构体为多孔体结构或纤维结构，其一端开有射流孔，另一端设有凸起，加热体容置于供液结构体内，供液瓶中的药液透过供液结构体进入其体内；所述雾化器为浸润加热雾化器，包括供液结构体及加热体，供液结构体为多孔体结构或纤维结构，其一端设有凸起，加热体安装在另一端，供液瓶中的药液透过供液结构体进入其体内；所述供液结构体为多孔体结构或纤维结构；加热体可为微孔陶瓷骨架上绕有欧姆金属电热材料或用导电陶瓷/PTC 材料制成的带烧结电极的多孔体。；所述气动开关为金属制成的以压力差为动力的机械开并、霍尔器件、半导体力敏芯片、硅矩阵电桥芯片或电容及电感式传感器；所述供液瓶为多孔体结构或纤维结构，瓶内填充有吸液。

本实用新型的优点与积极效果为：

1. 本实用新型雾化均匀、雾化粒子小，平均直径可达 1 微米左右，是用于肺内吸收的最佳技术参数，可全部被吸入。

2. 本实用新型结构简单、携带方便，使用不受场所的限制。



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**附图说明**

图 1 为本实用新型的结构示意图；

图 2 为本实用新型射流加热雾化器的结构示意图；

图 3 为图 2 的右视图；

图 4 为本实用新型浸润加热雾化器的结构示意图；

图 5 为图 4 的右视图。

**具体实施方式**

下面结合附图对本实用新型作进一步详述。

如图 1 所示，本实用新型包括壳体 2 及设在其内的电池 3、气动开关 4、雾化器 6 及供液瓶 7，壳体 7 为长条柱体，前端可配有指示灯 1。供液瓶 7 为多孔体结构或纤维结构，瓶内填充有吸液，可以更换；供液瓶 7 上开有吸气孔道 8，供液瓶 7 的一端连接雾化器 6。在雾化器 6 的另一侧依次设有气动开关 4 及电池 3，电池 3、气动开关 4 与雾化器串联成回路。气动开关 4 是用金属制成的以压力差为动力的机械开并，也可用霍尔器件、半导体力敏芯片、硅矩阵电桥芯片或电容及电感式传感器代替。壳体 2 上开有进气孔 5，用于外界空气的吸入。

如图 2、图 3 所示，雾化器 6 可为射流加热雾化器，包括供液结构体 101 及加热体 102，供液结构体 101 为多孔体结构或纤维结构，其一端开有射流孔 103，另一端设有凸起 104，射流孔 103 是用泡沫陶瓷、微孔陶瓷、发泡金属、不锈钢纤维粘或化学纤维成型开孔制成。加热体 102 容置于供液结构体 101 内，供液瓶 7 中的药液透过供液结构体 101 进入其体内。加热体 102 可为微孔陶瓷骨架上绕有欧姆金属电热材料或用导电陶瓷/PTC 材料制成的带烧结电极的多孔体。射流加热雾化器是利用吸入气流在射流孔 103 内进行一次雾化，喷射在加热体 102 上进行二次雾化。

如图 4、图 5 所示，雾化器 6 可为浸润加热雾化器，包括供液结构体 201 及加热体 202，供液结构体 201 为多孔体结构或纤维结构，其一端设有凸起 204，加热体 202 安装在另一端，供液瓶 7 中的药液透过供液结构体 201 进入其体内。加热体 102 可为微孔陶瓷骨架上绕有欧姆金属电热材料或用导电陶瓷/PTC（正温度系数热敏陶瓷）材料制成的带烧结电极的多孔体。浸润加热雾化器是用加热体 202 直接对供液结构体 201 加热，使药液雾化。

两种结构的雾化器中，位于一端的凸起 104、204 与供液瓶 7 相连接，供液瓶 7 中的药液逐渐透过供液结构体进到其内。供液结构体是用泡沫陶瓷、微孔陶瓷、多孔金属、不锈钢纤维毡或化学纤维成型



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开孔制成。加热体是用微孔陶瓷骨架上绕有欧姆金属电热材料制成，也可直接用导电陶瓷或 PTC 陶瓷材料制成的带烧结电极的多孔体。加热体的表面烧结成高温釉以固定沸石颗粒，沸石颗粒由天然沸石、人造无机微孔陶瓷或氧化铝颗粒制成。

本实用新型的工作原理为：药物经丙二醇溶解后，药液装入可更换的供液瓶 7 中。将供液瓶 7 放入壳体 10 内，与雾化器 6 接触并对雾化器供液。当使用者吸气时，气动开关 4 在有压力差情况下完成机械式接触、接通电池 3 和雾化器 6，电池 3 对雾化器 6 供电，加热体 102、202 开始加热。使用者吸气， 指示灯 1 发光，雾化器 6 把供液瓶 7 中的液体不断的毛细吸出，使之雾化，并由壳体上的进气孔 5 吸入的空气冷凝、稀释，被雾化器 6 雾化。雾化器 6 雾化后的气雾由供液瓶 7 上的吸气孔道 8 吸出。

可用于制作供液瓶及供液结构体的纤维结构是用化学纤维或尼龙纤维制成。

本实用新型的雾化器使供液瓶浸润出的液体雾化，并随着吸入的空气稀释为气溶胶形态而被使用者吸入，可用于香烟替代品及肺内给药的医疗器械。



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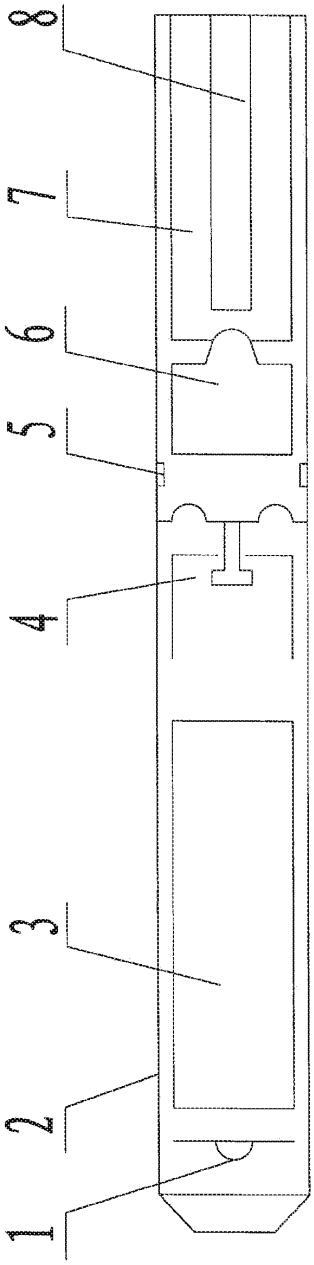



图1



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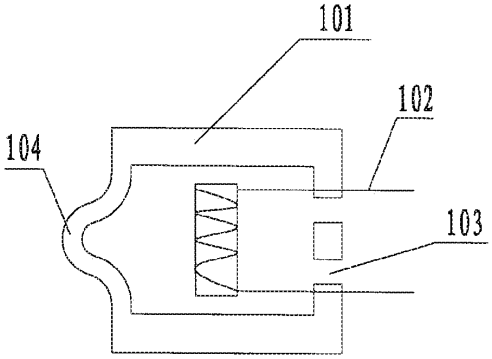



图2

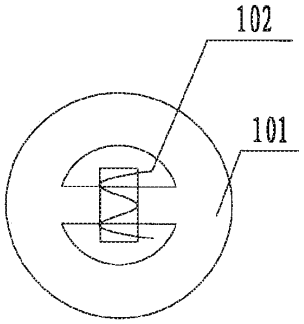



图3

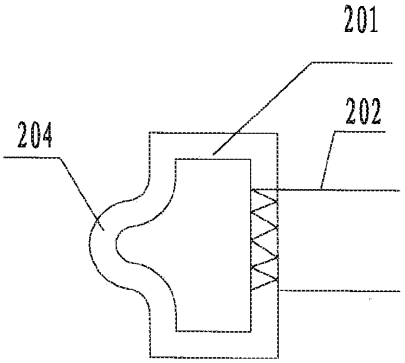



图4

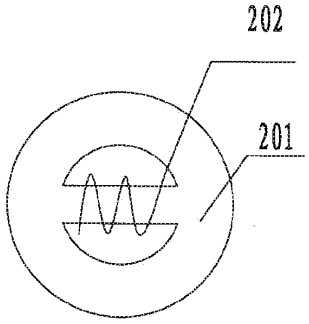



图5



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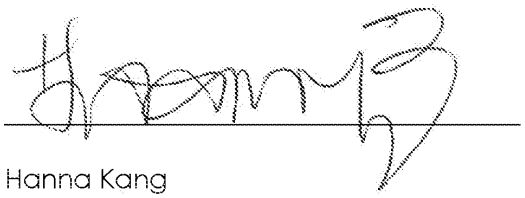
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Executed on September 22, 2014

**Certification**

**Park IP Translations**

This is to certify that the attached translation is, to the best of my knowledge and belief, a true and accurate translation from Chinese into English of the patent that is entitled "Electronic Liquid Cigarette" in English. I declare under penalty of perjury under the laws of the United States of America that the foregoing is true and correct.



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[19]State Intellectual Property Office of the People's Republic of China [51] Int.Cl.

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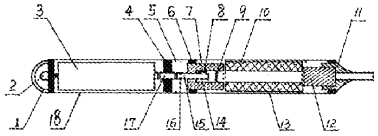
Claims 1 page, Specification 3 pages, Drawings 1 page

**[54] Title of the Invention**

Electronic Liquid Cigarette

**[57] Abstract**

The present utility model provides an electronic liquid cigarette, which has a cigarette case. The cigarette case is installed with a cigarette holder, a filter tip, a tobacco liquid chamber, a heater device, and an air inlet switch device therein. A front end of the cigarette holder is installed with a filter tip. The tobacco liquid chamber contains fiber fill for absorbing liquid tobacco. The air inlet switch device is connected with an ON/OFF element of the heater device, and controls to power on and off the heater device. The air carries heat energy to vaporize the tobacco liquid within the tobacco liquid chamber. The present utility model has advantages of a simple structure, a low cost, producing no tar, being no harmful to human health, portable, and easy to be widely used by the public.



1. An electronic liquid cigarette, comprising: a cigarette case, a cigarette head, a cigarette holder, a switch device, a heater device, and a tobacco liquid chamber, wherein the cigarette holder is installed with a filter tip therein; the tobacco liquid chamber contains fiber fill, and is filled with liquid tobacco; and the switch device controls to power on and off the heater device.

2. The electronic liquid cigarette according to Claim 1, wherein the liquid tobacco filled in the tobacco liquid chamber is extracted from tobacco.



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# Electronic Liquid Cigarette

## Field of the Invention

The present utility model relates to an electronic liquid cigarette.

## Description of the Related Art

Smoking is harmful to human health and causes pollution to the environment, which is a common sense. Unfortunately, someone gets used to smoking, and cannot get rid of it. Once the cigarette is lighted during smoking, it produces a lot of tar. The tobacco tar is constituted by hundreds of ingredients, among which tens of them may cause cancers, which are severely harmful to the one who smokes and also harmful to the ones nearby. Therefore, a novel cigarette product that can replace the traditional cigarettes is proposed in the present utility model.

## Summary of the Invention

An object of the present utility model is to provide an electronic liquid cigarette, which takes a liquid extracted from tobacco as a raw material. It has the advantages of a simple structure, a low cost, being easily manufactured, and turning the traditional burning-type cigarette into a non-burning liquid cigarette. The electronic liquid cigarette of the present utility model overcomes a lot of defects of the electronic cigarette in the prior art, including, especially, less functions, using purified nicotine as a raw material, which is highly toxic and restricted to be used according to state laws and regulations, complicated structures of electronic generators, higher cost, and being difficult to be widely promoted.

The electronic liquid cigarette of the present utility model comprises a cigarette case, a cigarette head, a cigarette holder, a switch device, a heater device, and a tobacco liquid chamber. The cigarette head is installed with a light-emitting diode (LED) therein for emitting red light, and is connected with the cigarette case by screw thread, for fixing a power within the cigarette case. The cigarette case is sequentially installed with a power, a power rack, an air inlet switch device, a heater device, and a tobacco liquid chamber therein, starting from the end where the cigarette head is located. At the part where the air inlet switch device is installed, the cigarette case is opened with air inlets. The air inlet switch device is formed by an inlet pipe and a switch. At a front end, the inlet pipe has small holes for air passing through. The switch is made of memory alloys. The heater device may be electric heating wire or use microwave heating principle. The air inlet switch device controls to power on and off the heater device. The tobacco liquid chamber includes a chamber shell, a fiber fill for absorbing liquid tobacco, and an air duct. The air duct is located at the center of the chamber, and is made of a metal net with small meshes. The fiber fill is filled with liquid tobacco, and the liquid tobacco is an active ingredient extracted from tobacco. The cigarette holder is connected with the cigarette case by screw thread, which is convenient for detaching, replacing a filter tip, and adding liquid tobacco. A front end of the cigarette holder is installed with a filter tip with a filtering function, which can be replaced by a filter tip of a traditional cigarette.



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When a user uses the electronic liquid cigarette, the liquid tobacco is heated and evaporates, and enters the user's mouth. The liquid tobacco is extracted from the tobacco, so that the user can enjoy smoking the electronic liquid cigarette just like lighting a traditional cigarette. However, the electronic liquid cigarette does not burn, produces no tar or cancer-causing substances, and causes no harm to the one who smokes and the ones nearby.

**Brief Description of the Accompanying Drawings**

FIG. 1 is a schematic structural view of the present utility model.

In the drawing, 1 Cigarette head, 2 LED, 3 Battery, 4 Power rack, 5 External air inlet, 6 Rubber seal ring, 7 Air inlet switch, 8 ON/OFF contact, 9 Electric heating wire, 10 Fiber fill, 11 Cigarette holder, 12 Filter tip, 13 Tobacco liquid chamber, 14 Inlet pipe, 15 Inlet duct, 16 Internal air inlet, 17 Electrode, 18 Cigarette case.

**Detailed Description of Preferred Embodiments**

The present utility model is further described below with reference to the accompanying drawings.

Referring to FIG. 1, the electronic liquid cigarette of the present utility is shaped as a cylinder. For the convenience of demonstration, the left side in FIG1 is called a front end, and the right side in FIG1 is called a tail end. At the front end, a cigarette head 1 of the cigarette is a semi-transparent ball-shaped cover made of plastic, and is disposed with an LED 2 therein for emitting red light. An air inlet switch 7 controls ON/OFF of the LED 2. The cigarette head 1 is connected with a cigarette case 18 by screw thread, and a coil spring is disposed therein to press against a battery 3. The cigarette case 18 is a circular tube made of aluminum alloy. A power rack 4 is made of insulated rubber, and has an electrode 17 installed there through.

An inlet pipe 14, the air inlet switch 7, an ON/OFF contact 8, and an electric heating wire 9 are formed into a whole, and they are fixed within the cigarette case 18 by a rubber seal ring 6. The inlet pipe 14 is a circular copper tube with both ends being sealed. During installation, the inlet pipe 14 is connected with the electrode 17. A front end of the inlet pipe 14 is opened with air inlets 16. The air inlet switch 7 is a sheet made of memory alloys. The air inlet switch 7 and the ON/OFF contact 8 constitute the switch for the electric heating wire 9 and the LED 2.

The tobacco liquid chamber 13 is a circular tube made of plastics. The fiber fill 10 is formed into a round annular shape and is filled into the tobacco liquid chamber 13. A round air duct in the middle of the fiber fill 10 is formed by a metal net, to ensure that the fibers are not deformed. The cigarette holder 11 is connected with the cigarette case 18 by screw thread. A front end of the cigarette holder 11 is installed with a filter tip 12, and the filter tip 12 may be replaced by a filter tip of a traditional cigarette.



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When a user uses the cigarette, and absorbs the cigarette holder 11, a negative pressure is generated in the chamber of the cigarette case. At this time, under the pressure, the air inlet switch 7 is turned on. The air enters the duct where the heater device is located. When the air inlet switch 7 is turned on, it is connected with the ON/OFF contact 8, and powers on the electric heating wire 9, so that the electric heating wire 9 produces heat energy. The air carries the heat energy produced by the electric heating wire 9, and vaporizes the tobacco liquid absorbed by the fiber fill within the tobacco liquid chamber 13, and to produce smog. The LED 2 at the front end of the cigarette is turned on, to emit red light, just like the lighted cigarette head sparks. When the user stops using the cigarette, the air inlet switch 7 restores its original position, detaches from the ON/OFF contact 8, so that the electric heating wire 9 and the LED 2 are turned off.



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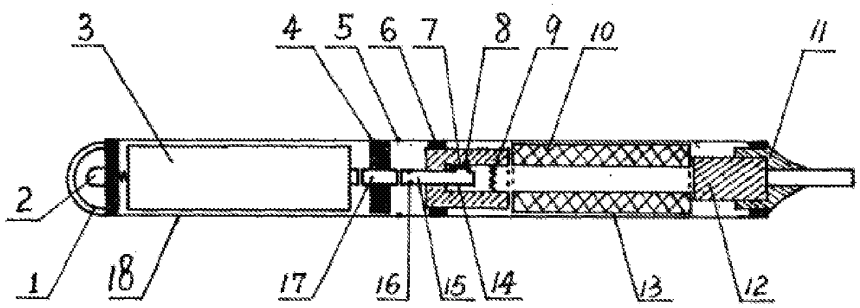



Fig. 1



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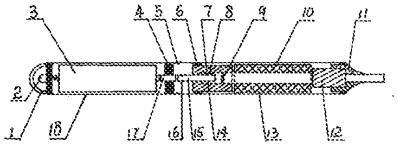
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权利要求书 1 页 说明书 3 页 附图 1 页

[54] 实用新型名称

电子液体香烟

[57] 摘要

本实用新型涉及一种电子液体香烟。香烟壳体内安装有烟嘴、过滤嘴、烟液仓、加热装置、进气开关装置。烟嘴前端安装有过滤嘴，烟液仓内有纤维填充物用来吸附液体香烟。进气开关与加热器开关相连，进气开关控制加热器的电源接通与断开，空气携带热量汽化烟液仓内的香烟液体。本实用新型结构简单、成本低，无传统香烟的焦油等对人体的危害，便于携带，易于推广为广大人群使用。



1. 一种电子液体香烟，包由壳体、烟头、烟嘴、开关装置、加热装置、烟液仓组成，其特征是，烟嘴内安有过滤嘴，烟液仓内装有纤维填充物，内装有液体香烟，进气开关控制加热器的接通和断开。

2. 根据权利要求 1 所述的电子液体香烟，其特征是，烟液仓内的香烟液体从烟草中提取。



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# 电子液体香烟

## 技术领域

本实用新型涉及一种电子液体香烟。

## 背景技术

吸烟危害身体健康和污染环境，这是人们共知的常识。但是有些人吸烟已经形成嗜好，不容易戒掉。香烟在点燃燃烧过程中，产生大量焦油。烟草焦油由数百种成份组成，其中有数十种成份是致癌物，对吸烟者和不吸烟者危害极大。因此，传统香烟的替代品应运而生。

## 发明内容

本实用新型提供一种以烟草萃取的液体为原料、结构简单、易于制造、成本低的电子液体香烟，把传统的燃烧型香烟变为非燃烧型液体香烟。它克服了原有电子香烟的诸多弊端，尤其是功能单一，使用提纯的尼古丁作原料，而尼古丁是国家法律明文规定严格限制使用的剧毒品，电子发生器的结构复杂，成本较高，不易于广泛推广使用的缺点。

本实用新型的电子液体香烟，包括香烟壳体、烟头和烟嘴、开关装置、加热装置、烟液仓构成。烟头内安装有发红色光的二极管，与壳体用螺纹连接，用以固定壳体内的电源。壳体内由烟头端依次安装电源、电源支架、进气开关、加热器、烟液仓。安装进气开关部位处壳体开有进气孔。进气开关由进气管和开关组成。进气管前端设有小



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孔用于进气，开关用记忆合金制成。加热器可以是电加热丝或者用微波原理加热。加热器的电源开关由进气开关控制。烟液仓包括盒体、吸附液体香烟的纤维填充物及通气道。仓体中间是通气道，通气道用网孔密的金属网制成。纤维填充物装有液体香烟，烟液是从烟草中萃取的有效成份。烟嘴部分通过螺纹与壳体相连接，便于拆卸更换香烟滤嘴及添加液体烟液。烟嘴前部安装有过滤功能的过滤嘴，此过滤嘴可以用香烟的过滤嘴替代。

当吸烟者吸该液体香烟时，烟液受热挥发，进入吸烟者口腔，因为此香烟的烟液从烟草中萃取，能使吸烟者得到传统香烟的满足效果。此香烟不燃烧，不产生焦油及致癌物，对吸烟者和不吸烟者无危害。

**附图说明**

图 1 是本实用新型的结构示意图。

图中： 1 烟头、2 二极管、3 电池、4 电源支架、5 外进气孔、6 橡胶密封圈、7 进气开关、8 开关触点、9 电热丝、10 纤维填充物、11 烟嘴、12 过滤嘴、13 烟液仓、14 进气管、15 进气道、16 内进气孔、17 电极、18 壳体。

**具体实施方式**

下面结合附图对本实用新型作进一步的描述。

参照图 1，本实用新型电子液体香烟为圆柱状。为了便于说明，我们把图 1 左侧称为前端，右侧称为末端。香烟的前端烟头 1 是半透明的塑料圆球罩，里面安装有发红色光的二极管 2，二极管 2 的开关由进气开关 7 控制。烟头 1 与壳体 18 靠螺纹连接在一起，并有螺弦



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弹簧压住电池 3。壳体 18 是一铝合金圆管。电源支架 4 是由绝缘橡胶制成，其中心有通透的电极 17。

进气管 14、进气开关 7、开关触点 8、电热丝 9 形成一个整体，由橡胶密封圈 6 固定在壳体 18 里面。进气管 14 是一个两端都封死的圆铜管，安装时与电极 17 相接。进气管 14 前端有进气孔 16，进气开关 7 是由记忆合金制成的薄片，进气开关 7 和开关触点 8 构成了电热丝 9 和二极管 2 的开关。

烟液仓 13 为一塑料圆管。纤维填充物 10 制成圆环状填入香烟盒 13 内。纤维填充物 10 中间的圆孔通气道由金属网制成，支撑纤维不变形。烟嘴 11 通过螺纹与壳体 18 连接，烟嘴 11 前端安装有过滤嘴 12，过滤嘴 12 可以用普通香烟过滤嘴代替。

当吸烟者抽吸烟嘴 11 时，壳体烟腔内产生负压，此时在压力作用下打开进气开关 7，空气进入加热器所在通道内。进气开关 7 打开时与开关触点 8 相接，接通电热丝 9 的电源，电热丝 9 产生热量。空气携带电热丝 9 产生的热量，使烟液仓 13 内纤维填充物饱含的香烟液体汽化，形成烟雾。香烟前端的二极管 2 同时接通电源，发出红光，如点燃的烟头在闪烁。当吸烟者不吸时，进气开关 7 回复原位，离开开关触点 8，使电热丝 9 和二极管 2 的电源切断。



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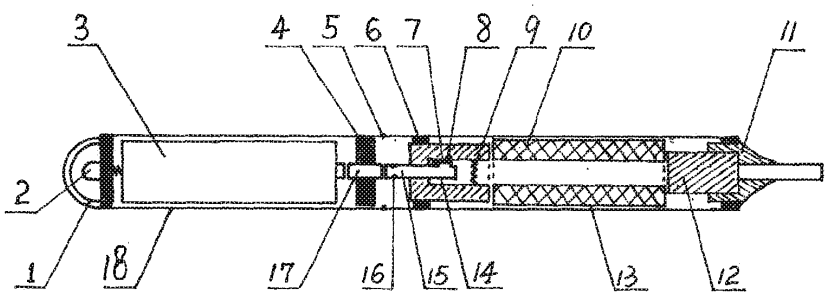



图 1



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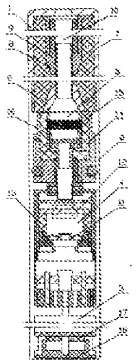
Claims: 2 pages; Specification: 4 pages; Attached Drawings: 2 pages

**[54] Title of the Utility Model**

A Type of Electronic Cigarette

**[57] Abstract**

A type of electronic cigarette, which mainly solves technical problems including complex electronic cigarette structures and circuits and high manufacturing costs. It adopts the following scheme: the nozzle is internally sheathed with an oil storage, the oil storage being centrally sheathed with an air tube; the air tube is connected to an air tube bracket; the air tube and the air tube bracket form a smoking passage that isolates and seals the nozzle center and the oil storage; the other end of the air tube communicates with a nicotine oil fuming device; the fuming device control switch comprises a silicon thin film and a switch circuit board controlled by a Hall component and a field effect tube; the silicon film is installed in the bracket; the silicon thin film forms one end of the bracket into a sealed structure; the other end of the bracket communicates with the smoking passage on the nozzle. The utility model has the benefits of a simple structure, low manufacturing costs, and convenience of use, providing an effect the same as that of tobacco smoking. Nicotine oil fumed gas contains no nicotine that is harmful to the human body. Thus, the adverse impacts of tobacco smoking on health are overcome.



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1. A type of electronic cigarette, comprising a nozzle, a cigarette rod casing, a battery, a nicotine oil fuming device, and a fuming device control switch, characterized in that:

A. The said nozzle (1) is connected to a cigarette rod casing (2); a battery (3), a fuming device control switch (4), and a nicotine oil fuming device (5) are sheathed in the cigarette rod casing (2) in sequence;

B. The said nozzle (1) is internally sheathed with an oil storage (7); the oil storage (7) is centrally sheathed with an air tube (8); the air tube (8) is connected to an air tube bracket (9); the air tube (8) and the air tube bracket (9) form a smoking passage (10) that isolates and seals the nozzle (1) center and the oil storage (7); the other end of the air tube (8) communicates with the nicotine oil fuming device (5);

C. The said fuming device control switch (4) comprises a silicon film (11) and a switch circuit board (12) controlled by a Hall component and a field effect tube; the silicon thin film (11) is installed in the bracket (13); the silicon thin film (11) forms one end of the bracket (13) into a sealed structure; the other end of the bracket (13) communicates with the smoking passage (10) on the nozzle (1);

D. The said nicotine oil fuming device (5) comprises an oil storage (14) consisting of a temporary oil storage (15) formed by a group of capillaries and an electrothermal film wire (16); the oil storage (14) respectively comes into contact with the temporary oil storage (15) and the oil storage (7) in the nozzle (1), the electrothermal film wire (16) is electrically connected to the battery (3) via the fuming device control switch (4).

2. A type of electronic cigarette according to Claim 1, characterized in that, in one end of the cigarette rod casing (2), a light-emitting display panel (17) is set; the light-emitting display panel (17) is fixed to one end of the cigarette rod casing (2) via a lamp cover (18), the light-emitting display panel (17) is electrically connected to the battery (3) via the fuming device control switch (4).



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3. A type of electronic cigarette according to Claim 1 or Claim 2, characterized in that a bell-mouth waterproof jacket (6) is set on the end connecting the said air tube (8) to the nicotine oil fuming device (5).



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# A Type of Electronic Cigarette

## Technical Field

The present utility model relates to a novel electronic cigarette, in particular to an electronic cigarette in which a switch circuit controlled by air pressure difference is used to control a nicotine oil fuming device and the nicotine oil fuming device fumes nicotine to generate nicotine oil fumed gas.

## Background Art

Smoking is a serious threat to human health. China has a large smoking population. In order for smokers to quit smoking, a variety of methods are available for giving up the craving for tobacco, for example, by taking various medicines. With the development of electronic technology, electronic cigarettes have started replacing tobacco smoking by using a nicotine oil fuming device to fume nicotine, generating nicotine oil fumed gas. However, existing electronic cigarettes are expensive to manufacture, have complex circuits, and are inconvenient to use.

## Purpose of the Invention

In order to overcome the defects with the prior art, including complex structures and circuits and high manufacturing costs, the utility model designs an electronic cigarette that is inexpensive to manufacture and convenient to use and produces an effect the same as tobacco smoking. It is an electronic cigarette in which a switch circuit is controlled by air pressure difference; the switch circuit controls a nicotine oil fuming device; and the nicotine oil fuming device fumes nicotine to generate nicotine oil fumed gas for smoking.

The technical scheme adopted by the utility model to achieve the purpose of the invention is as follows: An electronic cigarette, comprising a nozzle, a cigarette rod casing, a battery, a nicotine oil fuming device, and a fuming device control switch; the nozzle is connected to the cigarette rod casing; the battery, the fuming device control switch, and the nicotine oil fuming device are sheathed in the cigarette rod casing in sequence.



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The nozzle is internally sheathed with an oil storage; the oil storage is centrally sheathed with an air tube; the air tube is connected to an air tube bracket; the air tube and the air tube bracket form a smoking passage that isolates and seals the nozzle center and the oil storage; the other end of the air tube communicates with the nicotine oil fuming device.

The fuming device control switch comprises a silicon film and a switch circuit board controlled by a Hall component and a field effect tube; the silicon thin film is installed in the bracket; the silicon thin film forms one end of the bracket into a sealed structure; the other end of the bracket communicates with the smoking passage on the nozzle.

The nicotine oil fuming device comprises an oil storage consisting of a temporary oil storage formed by a group of capillaries and an electrothermal film wire; the oil storage respectively comes into contact with the temporary oil storage and the oil storage in the nozzle, the electrothermal film wire is electrically connected to the battery via the fuming device control switch.

The utility model has the benefits of a simple structure, low manufacturing costs, and convenience of use, providing an effect the same as that of tobacco smoking. Nicotine oil fumed gas contains no nicotine that is harmful to the human body. Thus, the adverse impacts of tobacco smoking on health are overcome.

The following further describes the present utility model in combination with the drawings.

Figure 1 shows a schematic diagram for the utility model.

Figure 2 shows a schematic diagram for a nicotine oil fuming device.

Figure 3 shows a schematic diagram for a fuming device control switch.

Description of the symbols used in the figures is as follows: 1. Nozzle, 2. Cigarette rod casing, 3. Battery, 4. Fuming device control switch, 5. Nicotine oil fuming device, 6. Bell-mouth waterproof jacket, 7. Oil storage, 8. Air tube, 9. Air tube bracket, 10. Smoking passage, 11. Silicon thin film, 12. Switch circuit board, 13. Bracket, 14. Oil storage, 15. Temporary oil storage, 16. Electrothermal film wire, 17. Light-emitting display panel, 18. Lamp cover.

Detailed Implementation



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As shown in the figures, an electronic cigarette, comprising the nozzle 1, the cigarette rod casing 2, the battery 3, the nicotine oil fuming device 5, and the fuming device control switch 4; the nozzle 1 is connected to the cigarette rod casing 2; the battery 3, the fuming device control switch 4, and the nicotine oil fuming device 5 are sheathed in the cigarette rod casing 2 in sequence;

The nozzle 1 is internally sheathed with the oil storage 7; the oil storage 7 is centrally sheathed with the air tube 8; the air tube 8 is connected to the air tube bracket 9; the air tube 8 and the air tube bracket 9 form the smoking passage 10 that isolates and seals the nozzle 1 center and the oil storage 7; the other end of the air tube 8 communicates with the nicotine oil fuming device 5.

The fuming device control switch 4 comprises the silicon thin film 11 with magnet and the switch circuit board 12 controlled by a Hall component and a field effect tube; the silicon thin film 11 with magnet is installed on the bracket 13; the silicon thin film 11 forms one end of the bracket 13 into a sealed structure; the other end of the bracket 13 communicates with the smoking passage 10 on the nozzle 1.

The nicotine oil fuming device 5 comprises the oil storage 14 consisting of the temporary oil storage 15 formed by a group of capillaries and the electrothermal film wire 16; the oil storage 14 respectively comes into contact with the temporary oil storage 15 and the oil storage 7 in the nozzle 1, the electrothermal film wire 16 wraps round the temporary oil storage 15; the electrothermal film wire 16 is electrically connected to the battery 3 via the fuming device control switch 4.

When the present utility model is used, the smoking passage 10, by the smoker's suction, generates negative pressure in the atomizer control switch 4; the silicon thin film 11 is agitated in the bracket 13 towards the switch circuit board 12; controlled by the Hall component and the field effect tube, the switch circuit board 12 connects the electrothermal film wire 16 to the battery 3; under the action of the capillaries, the temporary oil storage 15 sucks up the nicotine oil stored in the oil storage 14; when electrified for heating, the electrothermal film wire 16 fumes the nicotine oil in the temporary oil storage 15 to generate nicotine oil fumed gas; the nicotine oil fumed gas is supplied via the air tube 8 and the smoking passage 10 for smoking.



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In order to increase the amount of the stored nicotine oil, the nozzle 1 is sheathed with the oil storage unit 7; the oil storage unit 7 comes into contact with the oil storage 14 and supplies nicotine oil to the oil storage 14. The oil storage unit 7, the oil storage 14, and the temporary oil storage 15 are made of cotton yarn or sponge materials that can adsorb nicotine oil.

With the present utility model, to show the working state of an electronic cigarette, the light-emitting display panel 17 is arranged in one end of the cigarette rod casing 2; the light-emitting display panel 17 is fixed to one end of the cigarette rod casing 2 via the lamp cover 18, the light-emitting display panel 17 is electrically connected to the battery 3 via the fuming device control switch 4. When the nicotine oil fuming device 5 works, the light-emitting display panel 17 gives out light, and the light is emitted outside the cigarette rod casing 2 via the transparent lamp cover 18.

With the present utility model, in order to prevent the moisture in the nicotine oil fumed gas from being inhaled into the mouth of a user, the bell-mouth waterproof jacket 6 is arranged on the end connecting the air tube 8 to the nicotine oil fuming device 5; the bell-mouth waterproof jacket 6 can adsorb and agglomerate the moisture in the nicotine oil fumed gas.

Embodiments of the present utility model have proved that the nicotine oil fuming device in the electronic cigarette has a high electrothermal conversion efficiency and a long lifecycle. Experiment results show that such a fuming device can save electricity by 40% compared with a fuming device according to the prior art. Such an electronic cigarette, while retaining the excitement and flavor produced by tobacco, thoroughly eliminates the carcinogenic risks of the tar in cigarettes; in addition, it can help smokers to quit smoking gradually.



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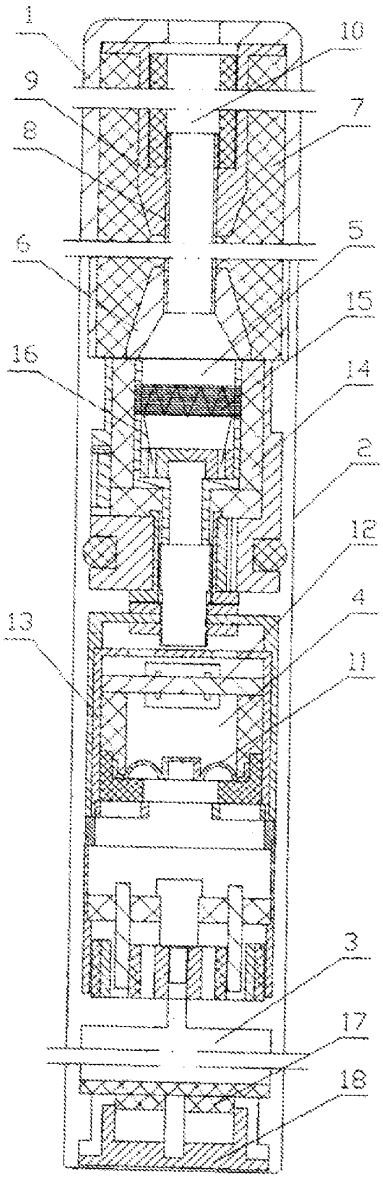



Figure 1



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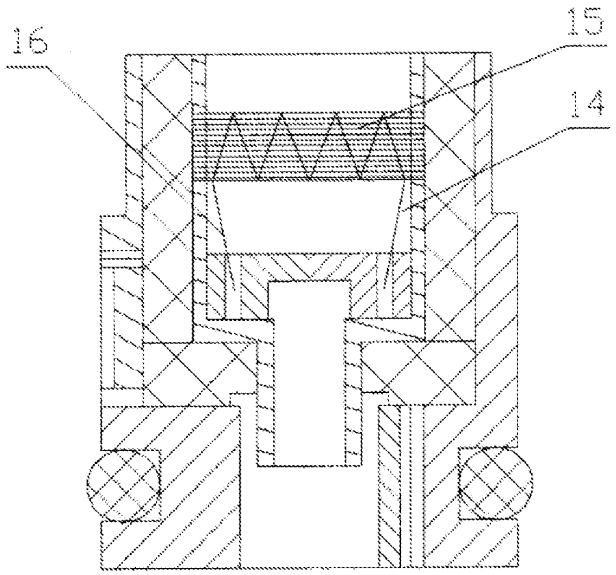



Figure 2

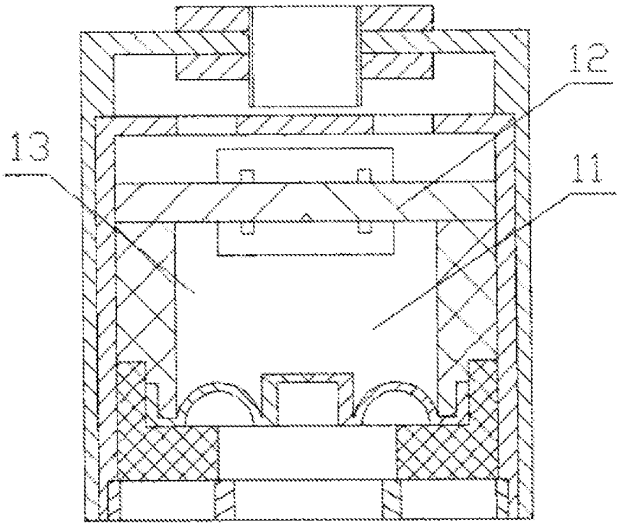



Figure 3



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TRANSPERFECT

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I, Angela Lo, hereby certify that the document "CN201085044Y" is, to the best of my knowledge and belief, a true and accurate translation from Chinese to English.

Angela Lo

Sworn to before me this
June 14, 2016

Signature, Notary Public

ALITASHA YOUNGER
Notary Public - State of New York
No. 01YO6338137
Qualified in KING County
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Stamp, Notary Public

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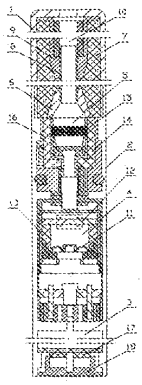
权利要求书 2 页 说明书 4 页 附图 2 页

[54] 实用新型名称

一种电子香烟

[57] 摘要

一种电子香烟，主要解决电子香烟结构和电路复杂，制造成本高等技术问题，采用的方案是，吸咀内套装有，存油器，存油器中心套装有气管，气管与气管支架连接，气管与气管支架构成吸咀中心与存油器隔离封闭的吸烟通道，气管另一端与烟碱油烟化器连通，烟化器控制开关包括，硅薄膜片和有霍尔元件和场效应管控制的开关电路板，硅薄膜片安装在支架内，硅薄膜片将支架一端形成密封结构，支架的另一端与吸咀上的吸烟通道连通。本实用新型优点是，结构简单，制造成本低，使用方便，具有吸食烟草同样的效果，由于烟碱油烟化气中，不含对人体有害的尼古丁成分，克服吸食烟草对人体健康的影响。



1 一种电子香烟，包括：吸咀、烟杆壳体，电池，烟碱油烟化器和烟化器控制开关，其特征在于：

A 所述的吸咀（1）与烟杆壳体（2）连接，电池（3），烟化器控制开关（4）和烟碱油烟化器（5）依此套装在烟杆壳体（2）内；

B 所述的吸咀（1）内套装有，存油器（7），存油器（7）中心套装有气管（8），气管（8）与气管支架（9）连接，气管（8）与气管支架（9）构成吸咀（1）中心与存油器（7）隔离封闭的吸烟通道（10），气管（8）另一端与烟碱油烟化器（5）连通；

C 所述的烟化器控制开关（4）包括，硅薄膜片（11）和有霍尔元件和场效应管控制的开关电路板（12），硅薄膜片（11）安装在支架（13）内，硅薄膜片（11）将支架（13）一端形成密封结构，支架（13）的另一端与吸咀（1）上的吸烟通道（10）连通；

D 所述的烟碱油烟化器（5）包括，油存储器（14），有一组毛细管组成的暂时油存储器（15）和电热膜丝（16），油存储器（14）分别与暂时油存储器（15）和吸咀（1）中存油器（7）接触，电热膜丝（16）经烟化器控制开关（4）与电池（3）电连接。

2 根据权利要求 1 所述的一种电子香烟，其特征在于：所述的烟杆壳体（2）的一端内，设置有可发光显示板（17），发光显示板（17）经灯盖（18）固定在烟杆壳体（2）的一端，发光显示板（17）经烟化器控制开关（4）与电池（3）电连接。



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3 根据权利要求 1 或 2 所述的一种电子香烟，其特征在于：所述的气管（8）与烟碱油烟化器（5）连通端上，设置有带喇叭口的防水套（6）。



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# 一种电子香烟

## 所属技术领域

本实用涉及一种新型电子香烟，特别是一种由气压差控制开关电路控制烟碱油烟化器，通过烟碱油烟化器将烟碱油烟化产生烟碱油烟气的电子香烟。

## 背景技术

吸烟严重威胁人类的健康，在我国具有众多的吸烟者，为使吸烟者戒除烟瘾，现有技术中出现多种戒除烟瘾方法，如使用各种药物戒除烟瘾，随着电子技术的发展，电子香烟通过烟碱油烟化器将烟碱油烟化产生烟碱油烟气代替人们吸食烟草，但现有电子香烟制造成本高，电路复杂，使用不方便。

## 发明目的

为克服现有技术中，结构和电路复杂，制造成本高等技术不足，本实用新型设计一种制造成本底，使用方便，产生与吸食烟草同样效果的电子香烟，它是采用气压差控制开关电路，开关电路控制烟碱油烟化器，通过烟碱油烟化器将烟碱油烟化产生烟碱油烟气，供吸烟者吸食的电子香烟。

本实用新型实现发明目的采用的技术方案是，一种电子香烟，包括：吸咀、烟杆壳体，电池，烟碱油烟化器和烟化器控制开关，吸咀与烟杆壳体连接，电池，烟化器控制开关和烟碱油烟化器依此套装在烟杆



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壳体内。

吸咀内套装有，存油器，存油器中心套装有气管，气管与气管支架连接，气管与气管支架构成吸咀中心与存油器隔离封闭的吸烟通道，气管另一端与烟碱油烟化器连通。

烟化器控制开关包括，硅薄膜片和有霍尔元件和场效应管控制的开关电路板，硅薄膜片安装在支架内，硅薄膜片将支架一端形成密封结构，支架的另一端与吸咀上的吸烟通道连通。

烟碱油烟化器包括，油存储器，有一组毛细管组成的暂时油存储器和电热膜丝，油存储器分别与暂时油存储器和吸咀中存油器接触，电热膜丝经烟化器控制开关与电池电连接。

本实用新型的有益效果是，结构简单，制造成本低，使用方便，具有吸食烟草同样的效果，由于烟碱油烟化气中，不含对人体有害的尼古丁成分，克服吸食烟草对人体健康的影响。

下面结合附图对本实用新型进行详细说明。

附图 1 为本实用新型示意图。

附图 2 为烟碱油烟化器示意图。

附图 3 为烟化器控制开关示意图。

附图中，1 吸咀，2 烟杆壳体，3 电池，4 烟化器控制开关，5 烟碱油烟化器，6 带喇叭口的防水套， 7 存油器，8 气管，9 气管支架，10 吸烟通道，11 硅薄膜片，12 开关电路板。13 支架，14 油存储器，15 暂时油存储器，16 电热膜丝，17 发光显示板，18 灯盖。

具体实施方式



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参看附图，电子香烟，包括：吸咀 1、烟杆壳体 2，电池 3，烟碱油烟化器 5 和烟化器控制开关 4，吸咀 1 与烟杆壳体 2 连接，电池 3，烟化器控制开关 4 和烟碱油烟化器 5 依此套装在烟杆壳体 2 内。

吸咀 1 内套装有，烟碱油储油套 7，蒸发储油套 7 中心套装有气管 8，气管 8 与气管支架 9 连接，气管 8 与气管支架 9 构成吸咀 1 中心与存油器 7 隔离封闭的吸烟通道 10，烟气吸管 8 另一端与烟碱油烟化器 5 连通。

烟化器控制开关 4 包括，带磁铁的硅薄膜片 11 和有霍尔元件和场效应管控制的开关电路板 12，带磁铁的硅薄膜片 11 安装在支架 13 上，硅薄膜片 11 将支架 13 一端形成密封结构，支架 13 的另一端与吸咀 1 上的吸烟通道 10 连通。

烟碱油烟化器 5 包括，油存储器 14，有一组毛细管组成的暂时油存储器 15 和电热膜丝 16，油存储器 14 分别与暂时油存储器 15 和吸咀 1 中存油器 7 接触，电热膜丝 16 缠绕在暂时油存储器 15 上，电热膜丝 16 经烟化器控制开关 4 与电池 3 电连接。

本实用新型在使用时，吸烟通道 10 由使用者吸力在雾化器控制开关 4 内产生负压，硅薄膜片 11 在支架 13 内向开关电路板 12 方向鼓动，经霍尔元件和场效应管的控制，开关电路板 12 将电热膜丝 16 与电池 3 连通，由于毛细管的作用，暂时油存储器 15 将烟油存储器 14 内储存的烟碱油吸入，电热膜丝 16 通电加热时，将暂时油存储器 15 上的烟碱油烟化产生烟碱油烟化气，烟碱油烟化气经气管 8，吸烟通道 10 供使用者吸食。



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为增加烟碱油的储存量，吸咀 1 内套装有存油器 7，存油器 7 与油存储器 14 接触并向油存储器 14 供应烟碱油。存油器 7、油存储器 14 和暂时油存储器 15 是采用可吸附烟碱油的棉纱或海绵体材料制造。

本实用新型为显示电子香烟的工作状态，烟杆壳体 2 的一端内，设置有可发光显示板 17，发光显示板 17 经灯盖 18 固定在烟杆壳体 2 的一端，发光显示板 17 经烟化器控制开关 4 与电池 3 电连接。烟碱油烟化器 5 工作时，发光显示板 17 发光，经透明灯盖 18 向烟杆壳体 2 外发光。

本实用新型为解决碱油烟化气中的水分吸如使用者的口中，在气管 8 与烟碱油烟化器 5 连通端上，设置有防水喇叭口 6，防水喇叭口 6 可对碱油烟化气中的水分产生吸附和凝聚作用。

本实用新型实施例证明，该电子香烟中的烟碱油烟化器，具有电热转换效率高，使用寿命长，实验证明比现有技术的烟化器可省电 40%，该电子香烟在保留烟草可使用者产生兴奋和口感的同时，彻底消除由香烟中焦油对人体致癌的危险，而且可使吸烟者达到逐步戒烟的目的。



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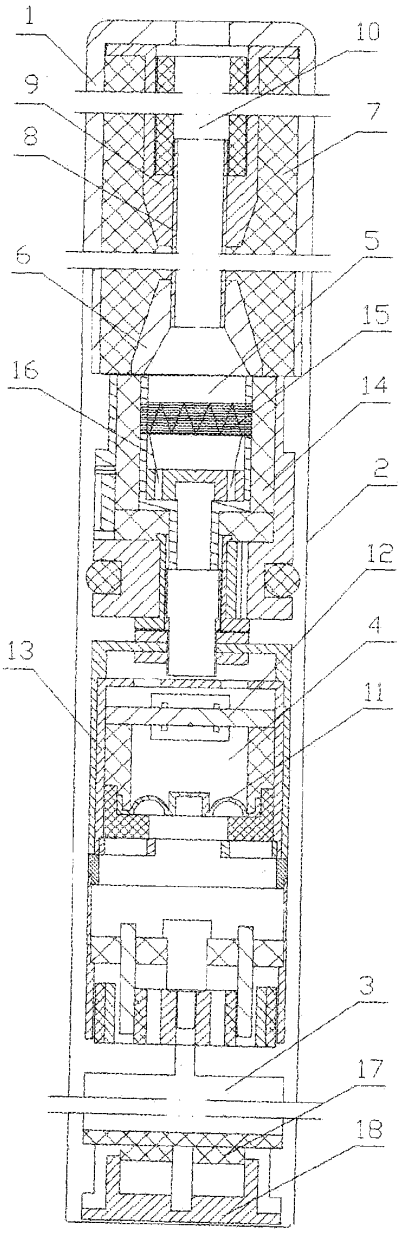



图 1



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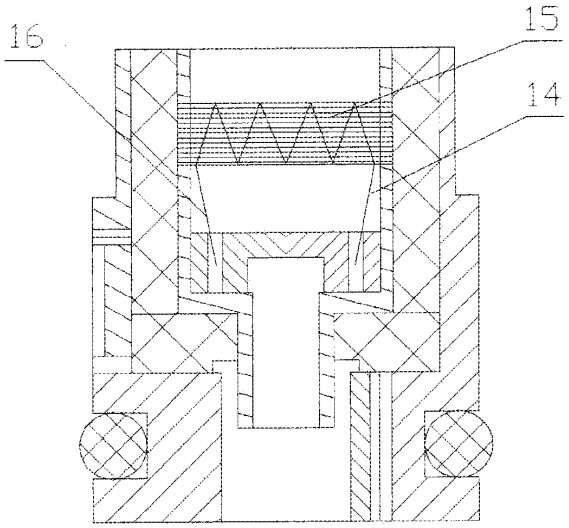



图 2

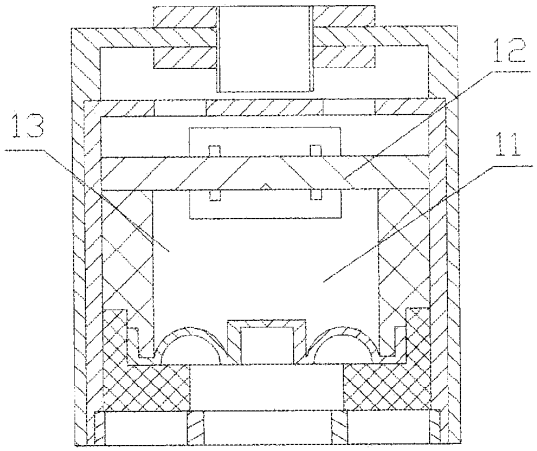



图 3



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(54) Title: SYSTEM FOR SUPPLYING AN INHALABLE AEROSOL

(57) Abstract
[see original]

JTI Exhibit 1022, Page 0001

System for supplying an inhalable aerosol

The invention concerns a system for supplying an inhalable aerosol as well as the components of such a system. This system is suitable in particular as a smoking article for supplying smoke aerosol to smokers.

When conventional cigarettes are smoked, most of the tobacco is burned not during the puffing, but in the intermissions. This leads to the formation of so-called second-hand smoke, which is often felt to be a nuisance by nonsmokers.

To overcome this problem, many new smoking articles have been proposed in which no tobacco is burned during intermissions between puffs. A common principle of such developments is that it is not the heat of combustion of the tobacco, but rather other energy sources are used to release the smoke aerosol. In this way, not only is the formation of secondhand smoke largely prevented, but also thanks to a changed temperature control during the puffs a preferred release of aromatic substances can also be accomplished and the formation of irritating or unwanted by-products reduced. Often the proposed smoking articles for formation of an aerosol make use not of tobacco, but substitute materials such as special homogenized sheet tobaccos or substrates coated with aromatic substances.

Thus, there is known a cigarette-like smoking article in which the thermal energy of a glowing carbon element is transmitted to an aluminum capsule arranged inside the cigarette, containing an aerosol-forming material.

In a modification of this smoking article, the aerosol-forming material used is a special homogenized sheet tobacco coated with large amounts of glycerin.

What is common to both of the aforementioned smoking articles is that the combustion gases of the heating element are inhaled along with the smoke aerosol, which leads to an increased uptake of carbon monoxide by the smoker. The spatial separation of energy source and aerosol former results in a lack of flavor during the first puffs on account of the difficult heat transfer. Furthermore, the entire smoking article, which unlike conventional cigarettes retains its length, must be disposed of after being smoked. This leads to a substantial accrual of complex residual materials and associated disposal problems.

Another known smoking article works by a different principle. Here, a cigarette-shaped article with filter and tobacco component at the tobacco end is inserted into an electronically controlled smoking device. In the smoking device, thanks to electrical heating elements, the tobacco-containing portion is heated at radially successive places with the puffs. This principle requires a complicated design of the smoking device, which has to be outfitted with several heating elements and a complicated electronic control unit. The manipulating of such a device is cumbersome on account of its size and shape and differs considerably from that of a conventional cigarette.

The problem which is solved by the present invention is to create a system for supplying of an inhalable aerosol, which has a simple basic layout and in particular can serve as a smoking article offering a similar taste experience to traditional cigarettes, yet whose use does not generate any secondhand smoke during the puffs.

This problem is solved by a system with the features of claim 1, having an inhalation device with the features of claim 33 and a substrate portion with the features of claim 35 and can have a mouthpiece with the features of claim 39. Advantageous configurations of the invention appear in the dependent claims.

The system according to the invention for supplying an inhalable aerosol is especially suited to smoking articles whose mode of operation is based on the heating of an aerosol-forming material during puffs. A preferably cylindrical substrate portion, which has at least one heating resistor and contains aerosol-forming material inside a sheath, is smoked in a special, preferably cigar or cigarette-shaped inhalation device. The heating resistor is preferably the sheath of the substrate portion, which is electrically conductive for this purpose, at least for part of its length. The substrate portion is heated in the inhalation device during puffs by supplying electric energy to the conductive sheath, so that aerosol is formed, which can be taken up by the smoker by drawing air through the air inlet opening of the sheath and across the aerosol outlet opening of the sheath. Thanks to the use of the smoking article, the formation of secondhand smoke during the pauses between puffs is prevented.

The basic principle of the invention thus relies on the closest possible physical arrangement of heat source and aerosol former. This is accomplished in that the substrate portion itself

has the heating resistor (or also several heating resistors), which is preferably configured as a conductive sheath of the substrate portion and is heated by applying a voltage across the contacts in the inhalation device.

As compared to the aforementioned known smoking articles, the system according to the invention has the advantage that despite a simple design no combustion gases are inhaled and the residues remaining after use can be disposed of in an environmentally compatible manner.

The invention shall be explained below with the help of sample embodiments. The drawings show

Fig. 1a, a perspective view of a substrate portion according to the invention,

Fig. 1b, a longitudinal section through the substrate portion of Fig. 1a,

Fig. 1c, a transverse section through the substrate portion of Fig. 1a,

Fig. 2a, a longitudinal section through another sample embodiment of a substrate portion according to the invention, having an integrated mouthpiece,

Fig. 2b, a perspective view of a sample embodiment of a substrate portion, in which a number of axially spaced zones of electrical conductivity are provided,

Fig. 2c, a perspective view of a sample embodiment of a substrate portion, in which a number of axially spaced zones of electrical conductivity are provided in the circumferential direction,

Fig. 3, a schematic longitudinal section through an inhalation device according to the invention, in which the substrate portion per Fig. 2a is used and which has a separate housing for control components and power supply,

Fig. 4a, a schematic longitudinal section through another sample embodiment of an inhalation device according to the invention, which is designed for the use of a separate mouthpiece and which has a separate housing for control components and power supply, with installed substrate portion and installed mouthpiece,

Fig. 4b, an illustration of the use of the system according to Fig. 4a by a smoker, and

Fig. 5, a schematic longitudinal section through another sample embodiment of an inhalation device according to the invention, which is designed for the use of a separate

mouthpiece and in which has the power supply is located in the housing, with installed substrate portion and installed mouthpiece.

A preferred sample embodiment of a substrate portion 1 is represented in figures 1a to 1c. The substrate portion 1 in the sample embodiment has a cylindrical shape, as can be seen in Fig. 1a to 1c. It contains an aerosol-forming material 2, which is surrounded by a radially arranged (i.e., on the cylindrical envelope) electrically conductive sheath 3.

The aerosol-forming material 2 can consist, for example, of cut lamina tobacco, cut tobacco stems, reconstituted tobacco, or a substrate material coated with aromatic substances. The use of cut lamina and stem can also be done in expanded form, such as is obtained for example by the use of the method described in the patents DE 29 03 300, DE 31 19 330 and DE 34 14 625. As substrate materials for the aromatic substances, one can use both organic materials such as paper and inorganic ones, such as silica gel. Any given mixtures of the mentioned components can also be used.

In the preferred sample embodiment, the material 2 contains a fraction of around 3% to 30% of a volatile polyol, such as glycerin or propylene glycol, in order to intensify the aerosol formation. Another way of intensifying the aerosol formation is the use of aerosol-forming material with a moisture content above the equilibrium moisture content. Thus, e.g., one can use tobacco whose equilibrium moisture content is around 10% to 12%, with a moisture content of 20%. In this case, a suitable packaging will ensure that no moisture loss occurs prior to use.

The electrically conductive sheath 3 can consist of paper provided with conductive additives (such as metals or graphite/carbon) or homogenized sheet tobacco or a plastic film made conductive likewise by additives. A multilayered sheath can also be used, while the inner layer can consist of paper or homogenized sheet tobacco and the outer layer of one of the mentioned conductive materials.

It is likewise possible to form the sheath first from a nonconductive material and then to put in place a conductive film before or after ensheathing the aerosol-forming material, e.g., by vapor deposition or spraying.

The production of substrate portions 1 can occur in simple manner on a traditional continuous cigarette making machine: at first, an endless strand of tobacco or substitute material is formed in a format section; this is surrounded by the conductive sheath material, supplied in the direction of manufacture from a reel, and glued along a seam. After this, the product is cut to length in the desired dimensions. A further option of manufacture is the extrusion of a suitable aerosol-forming material through a circular nozzle with subsequent ensheathing and cutting of

the extruded product to length.

Preferably, the diameter of a substrate portion 1 is in the range of 5 mm to 12 mm and the length in the range of 10 mm to 100 mm. Especially preferable are diameters of 5 mm to 10 mm and lengths of 15 mm to 60 ram.

In one preferred sample embodiment, the substrate portion 1, as shown in Fig. 2a, is connected by a common sheath 11 to a mouthpiece 10. The manufacturing of such a connection is familiar to the person skilled in the manufacture of filter cigarettes. The substrate portion 1 can additionally have a higher electrical conductivity in zones 12 as compared to the rest of the sheath, such as can be accomplished e.g. by winding it with metal foil in the zones 12, in order to improve the electrical contact with the contacts in an inhalation device (see below).

Whereas in the sample embodiment of the substrate portion per Fig. 2a the substrate portion is designed as a single cohesive heating resistor, other sample embodiments of the substrate portion call for a segmented or sectionwise distribution of the electric conductivity of the sheath. This can be done as represented in Figure 2b or as in Fig. 2c, for example.

The sheath of the substrate portion per Figure 2b has a number of annular zones 13 with relatively high electric conductivity, every two neighboring zones 13 being separated by an insulating zone. Each of the zones 13 forms a separate heating resistor, which can be individually provided with power across appropriate contacts in the inhalation device on an inhalation device adapted to the substrate portion. The position of such contacts is indicated in Fig. 2b by arrows as well as the polarities "+" and "-". In one variant of this sample embodiment, the individual zones 13 do not run along the entire periphery of the substrate portion, but instead have each time an insulating interruption. In another variant, the zones 13 are merged in electrically conducting manner in a zone extending along the substrate portion, for example, one running along the contact sites "-" (or the "+" contact sites) per Fig. 2b, so that only one contact need be present in the inhalation device for this pole, as a kind of ground connection.

In the sample embodiment of a substrate portion shown in Fig. 2c, the sheath of the substrate portion has a number of electrically conductive zones 15 insulated against each other and staggered in the circumferential direction. The zones 15 serving as separate heating resistors extend over the length of the substrate portion. In an end region of the substrate portion, they are merged in electrically conducting manner by a ring-shaped contact zone 14,

where the electrical resistance of the contact zone 14 is preferably less than that of a zone 15. An this end, in an inhalation device adapted to the substrate portion, only one "-" contact is required, while at the other end a number of contacts are provided, being shown by arrows in Fig. 2c and designated with "+". The "+" contacts enable a separate actuating of the zones 15. In order to ensure the required orientation of the substrate portion in the inhalation device in a defined angular position, a positioning feature is provided in the sample embodiment in the form of a notch 16, which engages with a corresponding guide shoulder on the inhalation device when the substrate portion is introduced into the inhalation device.

A sample embodiment of an inhalation device (called hereinafter a smoking device) shall be described below with the aid of Fig. 3. This smoking device is designed for use with a substrate portion per Fig. 2a.

As shown by Fig. 3, two contacts (electrodes) 21 and 22 are situated in a housing 20, by which the contact with the conductive sheath of a substrate portion contained in the smoking device is produced. The cavity inside the housing 20 and the contacts 21 and 22 form a receiving mechanism to hold the substrate portion. Through an opening 24, air can be drawn through the substrate portion. By an electrical connection 25, the contact 21 is connected directly to a power supply unit 30 arranged in a separate housing. The connection to the contact 22 runs across a switch 23, by which the circuit can be closed. The power supply unit 30 contains a battery or a storage battery 31 and also optionally a control unit 32. In the case of a storage battery, this can be charged across plug contacts 33.

The smoking device is used as follows: the smoking device is joined to the power supply unit 30 by a cord (connection 25) (also see Fig. 4b). The substrate portion 1 provided with the mouthpiece 10 is shoved into a conically configured opening at one end face of the housing 20, until it stops against the contact 21, see Figure 3. The smoking device is now placed in one's mouth and the switch 23 is operated. By closing the circuit, the substrate portion is heated by the current flowing across the contacts 21 and 22 through the sheath acting as heating resistor, and the resulting aerosol can be removed through the mouthpiece 10. Disconnection is done by releasing the switch 23 or by the control unit 32. In this way, several puffs can be taken. After use, the substrate portion 1 with the mouthpiece 10 is removed from the smoking device and disposed of. From time to time a battery replacement or charging of the storage battery 31 in the power supply unit 30 is necessary.

Figure 4a shows another sample embodiment of the system, differing from the preceding

one in that mouthpiece 10' and substrate portion 1' are not joined together. The mouthpiece 10' is inserted into a base 42, and after the substrate portion 1' is inserted into a smoking device having a housing 40, this is screwed together with the housing 40. The base 42 serves at the same time as a contact. The function and use of this smoking device and the other components of the system otherwise correspond to the previous sample embodiment. In Figure 4a the second contact is designated as 41, the switch as 43, the opening for the air intake as 44, the connection cord as 45, the power supply unit as 30', the battery or the storage battery as 31', the control unit as 32' and the plug contacts as 33'.

The use of the smoking article is shown in Figure 4b. The smoking device with mouthpiece and substrate portion can be handled like a traditional cigarette; the power supply unit is preferably carried in a breast pocket, a belt holder, or the like. The two parts are joined together by a highly flexible cord (connection cord 45) of sufficient length.

A single-piece sample embodiment of the smoking device with cigarette shape is shown in Figure 5. A housing 50 has at the front end a screw-off cap 53, by which it is possible to replace a battery or a storage battery 51. A swiveling flap 52, which is also drawn in the swiveled open state, serves to insert a substrate portion 1". When the flap 52 is opened, at the same time a rod, not shown, moves a receiving section 55 backward against the force of a helical spring 56 in order to facilitate the inserting of the substrate portion 1". The force of the helical spring 56 acting when the flap 52 is closed produces a fixation of the substrate portion 1" between a contact 57 and the receiving section 55, which serves at the same time as a mating contact. By closing a switch 60, current flows between the contacts 55, 57 across the conductive sheath of the substrate portion 1", so that this becomes heated. The smoke aerosol can be removed by puffing on a mouthpiece 10" inserted into the receiving section 55, being configured as a separate component and not connected permanently to the substrate portion 1" in this sample embodiment. Air flows through a channel 54 and enters the substrate portion 1" at its front end.

In a smoking device which is designed for use of a substrate portion per Fig. 2b or per Fig. 2c, there are contacts coordinated in pairs with a zone 13 or 15 serving as a heating resistor. If, as described above, a common pole is provided in electrically conducting manner, only one contact needs to be present for this. By a sequential power supply each time to a zone 13 or 15, a new piece of the substrate portion can be heated each time, which ensures a more uniform aerosol output through the puffs. This produces a largely constant flavor output per puff. The control can occur through a puff detector, for example, which responds to the change in

pressure when the user draws in air and supplies power to one of the zones 13 or 15 through a switching mechanism. During the next puff, the switching mechanism responds once more, but this time an electronic circuit ensures that the heating current is applied across the coordinated contacts to a different, not yet used zone 13 or 15, and so on.

For the design of the mouthpiece 10, 10' or 10", basically all principles familiar to the specialist in the cigarette industry can be used. In the most simple case, the mouthpiece consists of a hollow roll of paper or carton. Preferable, however, is a design as a filter mouthpiece. In this case, a filter material such as cellulose acetate, polypropylene or paper is provided with a single or multiple layered sheath. One can also use a design corresponding to the known multiple filters, in which several segments with different properties are arranged in succession in the axial direction and joined by an outer sheath. In this case, one or more segments can be provided with axial boreholes. In all mentioned designs, furthermore, it is possible to use a zone-perforated sheath or a subsequent perforation of the sheath, for example, by laser beam. In this way, the smoke can be diluted by intake of outside air during the puffs.

Further variants of the system or its components will emerge directly from the claims.

In what follows, a further example is given for a substrate portion with mouthpiece and its use in the system.

Example

An American-Blend tobacco mixture with content

30% Burley tobacco
40% expanded Virginia tobacco
20% nonexpanded Virginia tobacco, and
10% Turkish tobacco

was conditioned and sprayed with 12 wt.-% of an aqueous casing with a glycerin content of 80 wt.-%. Next, the tobacco was cut with a cut width of 0.8 mm and dried to a moisture content of 12%. 180 kg of this cut tobacco was blended with 20 kg of expanded stem cut.

This blend was used to produce an endless strand with a diameter of 6 mm and a packing

density of 200 mg/ml on a continuous cigarette making machine. As the sheath material, air-impermeable paper made conductive by addition of graphite was used. The endless strand was cut into individual portions of 40 mm length, and these were connected to an acetate filter plug in familiar fashion by a mouthpiece joining paper.

The substrate portion so obtained was smoked in a smoking device per Figure 3, without producing any visible amounts of secondhand smoke. The flavor was judged by taste testers as being uniform and equivalent to a that of traditional cigarettes.

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## Patent claims

1. System for supplying an inhalable aerosol, with
   - a substrate portion (1; 1'; 1") , having at least one heating resistor (3; 13; 15) and containing aerosol-forming material (2) inside a sheath (3), wherein the sheath (3) has an air inlet opening and an aerosol outlet opening, and
   - an inhalation device, having a housing (20; 40; 50), a receiving section to hold the substrate portion (1; 1'; 1") and contacts (21, 22; 41, 42; 55, 57) in contact or able to be brought into contact with a voltage source (31; 31'; 51) for supply of electric power to the at least one heating resistor (3; 13; 15) of the substrate portion (1; 1'; 1").

2. System according to claim 1, characterized by a mouthpiece (10; 10'; 10"), which can be connected separately (10'; 10") to the inhalation device or which is connected to the substrate portion (1) and in the operating state stands in communication with the aerosol outlet opening of the substrate portion (1; 1'; 1").

3. System according to claim 1 or 2, characterized in that the sheath (3) of the substrate portion (1; 1'; 1") is electrically conductive at least in sections and is designed as at least one heating resistor (3; 13; 15).

4. System according to claim 3, characterized in that the sheath (3) of the substrate portion is designed as a single cohesive heating resistor.

5. System according to claim 3, characterized in that the substrate portion has a longitudinal axis and the sheath of the substrate portion has a number of axially staggered and mutually insulated heating resistors (13), which are merged in electrically conducting manner preferably in a zone extending along the substrate portion.

6. System according to claim 3, characterized in that the substrate portion has a longitudinal axis and the sheath of the substrate portion has a number of heating resistors (15) staggered in the circumferential direction and insulated from each other, which extend preferably along the length of the substrate portion and which are preferably merged in electrically conducting manner in an end region (14) of the substrate portion, while the substrate portion preferably has a positioning feature (16) adapted to the inhalation device for inserting into the inhalation device in a defined angular position.

7. System according to one of claims 3 to 6, characterized in that the sheath (3) of the substrate portion (1; 1'; 1") has metal foil, metal-coated of metal-containing paper, carbon-

containing paper, graphite-containing paper, an electrically conductive film, plastic film provided with conductive additives and/or homogenized sheet tobacco provided with conductive additives.

8. System according to one of claims 3 to 7, characterized in that the sheath (3) of the substrate portion (1; 1'; 1") has several layers of sheath materials, wherein the outer layer has electrically conductive material and the inner layer consists preferably of paper or homogenized sheet tobacco.

9. System according to one of claims 3 to 8, characterized in that the sheath (3) of the substrate portion (1; 1'; 1") in the region between the contact sites to the two contacts (21, 22; 41, 42; 55, 57) of the inhalation device coordinated with a heating resistor (3; 13; 15) has an electrical resistance of 0.1 Ohm to 1000 Ohm.

10. System according to one of claims 3 to 9, characterized in that the zones (12) of the sheath (3) of the substrate portion (1) which can be brought into contact with the contacts (21, 22; 41, 42; 55, 57) of the inhalation device have an increased electrical conductivity as compared to the other material of the sheath (3), preferably by means of a metal coating.

11. System according to one of claims 1 to 10, characterized in that the substrate portion (1; 1'; 1") has a cylindrical shape with a length of 10 mm to 100 mm, preferably 15 mm to 60 mm, and a diameter of 4 mm to 12 mm, preferably 5 mm to 10 mm.

12. System according to one of claims 3 to 10 and according to claim 11, characterized in that the at least sectionwise electrically conductive sheath (3) of the substrate portion (1; 1' ; 1") is arranged as a cylindrical envelope and the end faces of the cylinder are designed as an air inlet opening and an aerosol outlet opening.

13. System according to one of claims 1 to 12, characterized in that the aerosol-forming material (2) of the substrate portion (1; 1'; 1") has cut tobacco, cut tobacco stems, homogenized sheet tobacco cut and/or an extruded tobacco material.

14. System according to one of claims 1 to 13, characterized in that the aerosol-forming material (2) of the substrate portion (1; 1'; 1") has a substrate material coated with aromatic substances.

15. System according to one of claims 1 to 14, characterized in that the aerosol-forming material (2) of the substrate portion (1; 1'; 1") contains an evaporable polyol, preferably glycerin or propylene glycol, in a fraction of 5 wt.-% to 50 wt.-%, preferably 10 wt.-% to

30 wt.-%.

16. System according to one of claims 1 to 15, characterized in that the inhalation device has at least one switch (23; 43; 60) for the at least one heating resistor (3; 13; 15).

17. System according to one of claims 1 to 16, characterized in that the inhalation device has a puff detector, which together with a switching mechanism is designed to switch the circuit leading through a heating resistor (3; 13; 15) of the substrate portion (1; 1' ; 1") in dependence on the flow rate directed toward the air inlet opening of the substrate portion (1; 1'; 1").

18. System according to one of claims 1 to 17, characterized in that the inhalation device has a circuit, preferably an electronic circuit (32; 32'), for controlling the power put out by the at least one heating resistor (3; 13; 15) of the substrate portion (1; 1'; 1").

19. System according to claim 18 in conjunction with claim 4, characterized in that the circuit (32; 32') of the inhalation device is designed to control the voltage or the current for the heating resistor (3) of the substrate portion (1; 1'; 1") so that the heating power upon the first puff is set to a higher value than for the other puffs, and also to interrupt the power supply after a defined puffing time in order to avoid an overheating.

20. System according to claim 18 in conjunction with claim 5 or 6, characterized in that the circuit (32; 32') of the inhalation device is designed to sequentially activate the contacts coordinated with the individual heating resistors (13; 15) to sequentially turn on the individual heating resistors (13; 15).

21. System according to one of claims 18 to 20, characterized in that the circuit is accommodated inside the housing of the inhalation device.

22. System according to one of claims 18 to 20, characterized in that the circuit (32; 32') is accommodated in a separate housing (30; 30'), which is connected or can be connected to the housing (20; 40) of the inhalation device via a cord (25; 45).

23. System according to one of claims 1 to 22, characterized in that a battery or a storage battery (31; 31'; 51) is provided for the power supply to the contacts (21, 22; 41, 42; 55, 57) of the inhalation device, which is accommodated or can be accommodated in the housing (50) of the inhalation device or in a separate housing (30; 30').

24. System according to one of claims 1 to 23, characterized in that the housing (50) of the inhalation device has the shape of a cigar.

25. System according to one of claims 1 to 23, characterized in that the housing (20; 40) of the inhalation device has the shape of a cigarette.

26. System according to one of claims 2 to 25 in conjunction with claim 2, characterized in that the mouthpiece (10; 10'; 10") has a length of 10 mm to 50 mm and a diameter of 4 mm to 12 mm.

27. System according to one of claims 2 to 26 in conjunction with claim 2, characterized in that the mouthpiece (10; 10'; 10") has a hollow sleeve of paper or carton.

28. System according to one of claims 2 to 26 in conjunction with claim 2, characterized in that the mouthpiece (10; 10'; 10") is configured as a filter mouthpiece, where the filter material has preferably cellulose acetate, paper, myria and/or polypropylene with a single or multiple layer paper sheath.

29. System according to claim 28, characterized in that the mouthpiece (10; 10'; 10") has a filter plug of several partial elements arranged in succession in the axial direction, one or more of which preferably have axial boreholes.

30. System according to one of claims 2 to 29 in conjunction with claim 2, characterized in that the mouthpiece (10; 10'; 10") has one or more perforation zones.

31. System according to one of claims 2 to 30 in conjunction with claim 2, characterized in that the substrate portion (1) and the mouthpiece (10) have a similar diameter and are joined together.

32. System according to claim 31, characterized in that the substrate portion (1) and mouthpiece (10) are connected by a common wrapping (11) with a mouthpiece joining paper.

33. Inhalation device, with a housing (20; 40; 50), with a receiving section for holding a substrate portion (1; 1'; 1") having an aerosol-forming material, and with contacts (21, 22; 41, 42; 55, 57) connected to or able to be connected to a voltage source (31; 31'; 51) for the supplying of electric power to at least one heating resistor of the substrate portion (1; 1'; 1").

34. Inhalation device according to claim 33, characterized by features of the inhalation device from one of claims 16 to 25.

35. Substrate portion, which is designed for use with an inhalation device according to claim 33 or 34 and having at least one heating resistor (3; 13; 15) and containing aerosol-forming material (2) inside a sheath (3), wherein the sheath (3) has an air inlet opening and an aerosol outlet opening.

36. Substrate portion according to claim 35, characterized by features of the substrate portion (1; 1'; 1") from one of claims 3 to 15.

37. Substrate portion according to claim 35 or 36, characterized by a mouthpiece (10), which is connected to the substrate portion (1) and stands in communication with the aerosol outlet opening of the substrate portion (1).

38. Substrate portion according to claim 37, characterized, in that the mouthpiece (10; 10'; 10") has features from one of claims 26 to 32.

39. Mouthpiece, which is designed for use with an inhalation device according to claim 33 or 34, can be connected separately (10'; 10") to the inhalation device and in the operating state stands in communication with the aerosol outlet opening of the substrate portion (1'; 1").

40. Mouthpiece according to claim 39, characterized by features of the mouthpiece (10'; 10") from one of claims 26 to 30.

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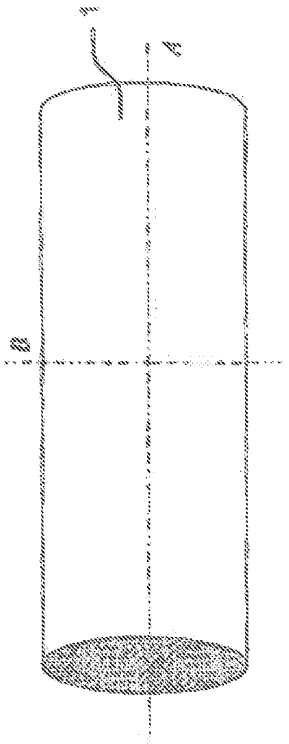



Fig. 1a

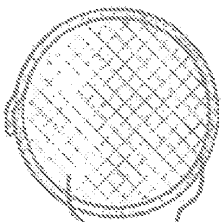



Fig. 1c

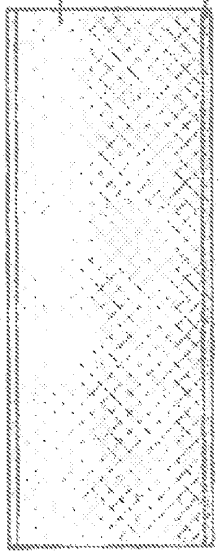



Fig. 1b

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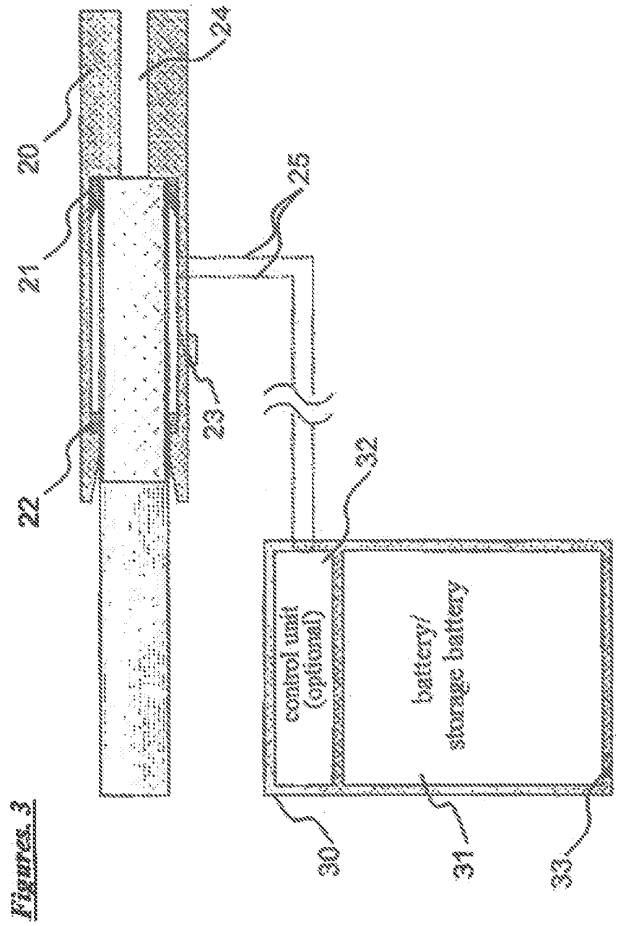

Figure 2a




Figure 2b




Figure 2c


20
24
25
21
23
22
32
control unit (optional)
battery/ storage battery
30
31
33

Figures 3

Figure 4b



Figure 4a

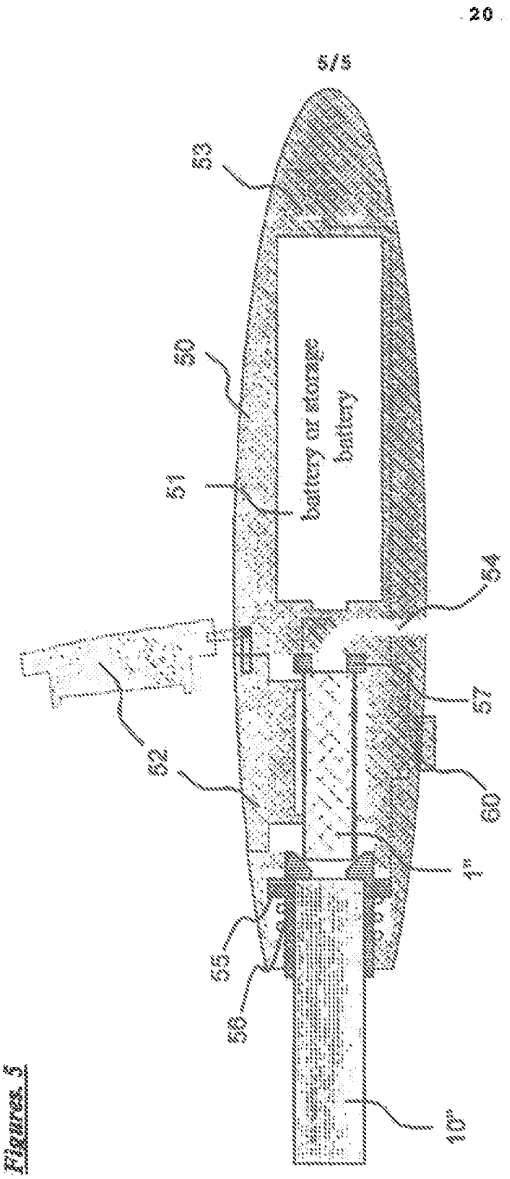



Figure 5

June 9, 2015

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I, Ronald Radzat, hereby declare:

That I possess advanced knowledge of the German and English languages. The attached German into English translation has been translated by me and to the best of my knowledge and belief, it is a true and accurate translation of: wo0028843a1_pienemann

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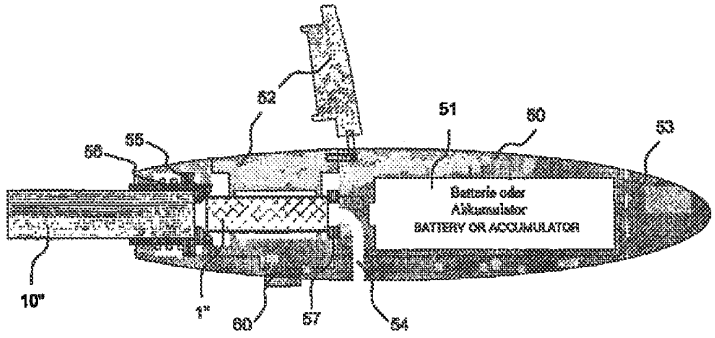
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(54) Title: SYSTEM FOR SUPPLYING AN INHALABLE AEROSOL

(54) Bezeichnung: SYSTEM ZUR BEREITSTELLUNG EINES INHALIERBAREN AEROSOLS




(57) Abstract

A system for supplying an inhalable aerosol contains a substrate portion (1") and an inhaling device. The substrate portion (1") has at least one heat resistor and contains an aerosol-forming material inside a casing which has an air inlet and an aerosol outlet. The casing of the substrate portion (1") is preferably electroconductive at least in sections and forms the at least one heat resistor. The inhaling device has a housing (50), a receiving device for holding the substrate portion (1") and contacts (55, 57) which are or can be connected to a voltage source (51) for supplying electrical power to the at least one heat resistor of the substrate portion (1").

(57) Zusammenfassung

Ein System zur Bereitstellung eines inhalierbaren Aerosols enthält eine Substratportion (1") und eine Inhaliervorrichtung. Die Substratportion (1") weist mindestens einen Heizwiderstand auf und enthält innerhalb einer Umhüllung aerosolbildendes Material, wobei die Umhüllung eine Lufteintrittsöffnung und eine Aerosolaustrittsöffnung hat. Dabei ist vorzugsweise die Umhüllung der Substratportion (1") zumindest abschnittsweise elektrisch leitfähig und bildet den mindestens einen Heizwiderstand. Die Inhaliervorrichtung hat ein Gehäuse (50), eine Aufnahmeeinrichtung zum Halten der Substratportion (1") und mit einer Spannungsquelle (51) in Verbindung stehende oder in Verbindung bringbare Kontakte (55, 57) zum Zuführen von elektrischer Leistung zu dem mindestens einen Heizwiderstand der Substratportion (1").

*LEDIGLICH ZUR INFORMATION*

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# System zur Bereitstellung eines inhalierbaren Aerosols

Die Erfindung betrifft ein System zur Bereitstellung eines inhalierbaren Aerosols sowie die Komponenten eines derartigen Systems. Dieses System ist insbesondere als Rauchartikel zur Bereitstellung von Rauchaerosol für Raucher geeignet.

Beim Abrauchen konventioneller Cigaretten wird der größte Teil des Tabaks nicht während der Züge, sondern in den Zugpausen verbrannt. Dies führt zur Bildung des sogenannten Nebenstromrauchs, der von Nichtrauchern oft als belästigend empfunden wird.

Zur Überwindung dieses Problems sind zahlreiche neue Rauchartikel, in denen während der Zugpausen kein Tabak verbrannt wird, vorgeschlagen worden. Ein gemeinsames Prinzip solcher Entwicklungen ist, daß nicht die Verbrennungswärme des Tabaks, sondern andere Energiequellen zur Freisetzung des Rauchaerosols genutzt werden. Hierdurch wird nicht nur die Entstehung von Nebenstromrauch weitgehend vermieden, sondern durch eine geänderte Temperaturführung während der Züge kann auch eine bevorzugte Freisetzung von Aromasubstanzen erreicht und die Bildung von reizenden oder unerwünschten Nebenprodukten reduziert werden. Häufig kommen in den vorgeschlagenen Rauchartikeln zur Aerosolbildung statt Tabak Ersatzmaterialien wie spezielle Folientabake oder mit Aromasubstanzen beaufschlagte Trägermaterialien zur Anwendung.

So ist ein cigarettenförmiger Rauchartikel bekannt, bei dem die Wärmeenergie eines glimmenden Kohleelements auf eine in Innern der Cigarette angeordnete Aluminiumkapsel übertragen wird, die ein aerosolbildendes Material enthält.

Bei einer Modifikation dieses Rauchartikels kommt als aerosolbildendes Material ein spezieller, mit hohen Mengen an Glycerin beaufschlagter Folientabak zum Einsatz.

Beiden vorgenannten Rauchartikeln ist gemeinsam, daß die Verbrennungsgase des Heizelements mit dem Rauchaerosol inhaliert werden, was zu einer erhöhten Aufnahme von Kohlenmonoxid durch den Raucher führt. Die räumliche Trennung von Energiequelle und Aerosolbildner führt aufgrund der schwierigen Wärmeübertragung zu einem Geschmacksdefizit bei den ersten Zügen. Weiterhin muß der gesamte Rauchartikel, der im Gegensatz zu herkömmlichen Cigaretten seine Länge beibehält, nach dem Abrauchen entsorgt werden. Dies führt zu einem erhöhten Anfall komplex zusammengesetzter Reststoffe und damit verbundenen Entsorgungsproblemen.

Nach einem anderen Prinzip arbeitet ein weiterer vorbekannter Rauchartikel. Dabei wird ein cigarettenförmiger Gegenstand mit Filter- und Tabakteil am tabakseitigen Ende in ein elektronisch gesteuertes Abrauchgerät gesteckt. In dem Abrauchgerät erfolgt mit Hilfe von elektrischen Heizelementen eine Erhitzung des tabakhaltigen Teils an mit den Zügen radial aufeinanderfolgenden Stellen. Dieses Prinzip bedingt eine aufwendige Konstruktion des Abrauchgeräts, das mit mehreren Heizelementen und einer komplizierten elektronischen Steuerung ausgerüstet sein muß. Die Handhabung eines derartigen Geräts ist aufgrund der Größe und Gestaltung aufwendig und unterscheidet sich deutlich von der einer herkömmlichen Cigarette.

Es ist Aufgabe der vorliegenden Erfindung, ein System zur Bereitstellung eines inhalierbaren Aerosols zu schaffen, das einen einfachen Grundaufbau hat und insbesondere als Rauchartikel

dienen kann, der einen ähnlichen Geschmackseindruck wie herkömmliche Cigaretten bietet, bei dessen Gebrauch jedoch zwischen den Zügen kein Nebenstromrauch erzeugt wird.

Diese Aufgabe wird gelöst durch ein System mit den Merkmalen des Anspruchs 1, das eine Inhaliervorrichtung mit den Merkmalen des Anspruchs 33 und eine Substratportion mit den Merkmalen des Anspruchs 35 aufweist und ein Mundstück mit den Merkmalen des Anspruchs 39 aufweisen kann. Vorteilhafte Ausgestaltungen der Erfindung ergeben sich aus den abhängigen Ansprüchen.

Das erfindungsgemäße System zur Bereitstellung eines inhalierbaren Aerosols ist insbesondere als Rauchartikel geeignet, dessen Funktionsweise auf dem Erhitzen eines aerosolbildenden Materials während der Züge beruht. Dabei wird eine vorzugsweise zylindrische Substratportion, die mindestens einen Heizwiderstand aufweist und innerhalb einer Umhüllung das aerosolbildende Material enthält, in einer speziellen, vorzugsweise cigaretten- oder cigarrenförmigen Inhaliervorrichtung abgeraucht. Als Heizwiderstand dient vorzugsweise die Umhüllung der Substratportion, die zu diesem Zweck zumindest abschnittsweise elektrisch leitfähig ist. Die Substratportion wird in der Inhaliervorrichtung während der Züge durch Zuführung elektrischer Energie in die leitfähige Umhüllung erhitzt, so daß sich Aerosol bildet, das durch Ziehen von Luft durch die Lufteintrittsöffnung der Umhüllung über die Aerosolaustrittsöffnung der Umhüllung vom Raucher aufgenommen werden kann. Durch den Gebrauch des Rauchartikels wird die Bildung von Nebenstromrauch in den Zugpausen vermieden.

Das Grundprinzip der Erfindung beruht also auf einer möglichst nahen räumlichen Anordnung von Wärmequelle und Aerosolbildner. Dies wird dadurch erreicht, daß die Substratportion selbst den Heizwiderstand (oder auch mehrere Heizwiderstände) aufweist, der vorzugsweise als leitfähige Umhüllung der Substratportion gestaltet ist und durch Anlegen einer Spannung über die Kontakte in der Inhaliervorrichtung erhitzt wird.

Gegenüber den oben erwähnten vorbekannten Rauchartikeln besitzt das erfindungsgemäße System den Vorteil, daß trotz einfacher Konstruktion keine Verbrennungsgase inhaliert werden und die nach Gebrauch verbleibenden Reststoffe umweltverträglich entsorgbar gestaltet werden können.

Im folgenden wird die Erfindung anhand von Ausführungsbeispielen näher erläutert. Die Zeichnungen zeigen in

Fig. 1a eine perspektivische Ansicht einer Substratportion gemäß der Erfindung,

Fig. 1b einen Längsschnitt durch die Substratportion gemäß Figur 1a,

Fig. 1c einen Querschnitt durch die Substratportion gemäß Figur 1a,

Fig. 2a einen Längsschnitt durch eine andere Ausführungsform einer Substratportion gemäß der Erfindung, die ein integriertes Mundstück aufweist,

Fig. 2b eine perspektivische Ansicht einer Ausführungsform einer Substratportion, bei der eine Anzahl axial beabstandeter Zonen elektrischer Leitfähigkeit vorgesehen ist,

Fig. 2c eine perspektivische Ansicht einer Ausführungsform einer Substratportion, bei der eine Anzahl in Umfangsrichtung beabstandeter Zonen elektrischer Leitfähigkeit vorgesehen ist,

Fig. 3 einen schematischen Längsschnitt durch eine Inhaliervorrichtung gemäß der Erfindung, in die die Substratportion gemäß Figur 2a eingesetzt ist und die ein sepa-

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rates Gehäuse für Steuerungskomponenten und Stromversorgung aufweist,

Fig. 4a einen schematischen Längsschnitt durch eine andere Ausführungsform einer Inhaliervorrichtung gemäß der Erfindung, die für die Verwendung eines separaten Mundstücks konstruiert ist und die ein separates Gehäuse für Steuerungskomponenten und Stromversorgung aufweist, mit eingesetzter Substratportion und eingesetztem Mundstück,

Fig. 4b eine Veranschaulichung der Benutzung des Systems gemäß Figur 4a durch einen Raucher und

Fig. 5 einen schematischen Längsschnitt durch eine weitere Ausführungsform einer Inhaliervorrichtung gemäß der Erfindung, die für die Verwendung eines separaten Mundstücks konstruiert ist und bei der sich die Stromversorgung im Gehäuse befindet, mit eingesetzter Substratportion und eingesetztem Mundstück.

Eine bevorzugte Ausführungsform einer Substratportion 1 ist in den Figuren 1a bis 1c dargestellt. Die Substratportion 1 besitzt im Ausführungsbeispiel eine zylindrische Form, wie aus den Figuren 1a bis 1c ersichtlich. Sie enthält ein aerosolbildendes Material 2, das mit einer radial (d.h. auf dem Zylindermantel) angeordneten elektrisch leitfähigen Umhüllung 3 umgeben ist.

Das aerosolbildende Material 2 kann z.B. aus geschnittenem Blattabak, geschnittenen Tabakrippen, rekonstituiertem Tabak oder aus einem mit Aromasubstanzen behandelten Trägermaterial bestehen. Der Einsatz von Blatt- und Rippenschnitt kann auch in expandierter Form erfolgen, wie sie z.B. durch Anwendung des in den Patentschriften DE 29 03 300, DE 31 19 330 und DE 34 14 625 beschriebenen Verfahrens erhalten wird. Als Trägermaterialien für Aromastoffe können sowohl organische Materialien wie z.B.

Papier, als auch anorganische wie z.B. Kieselgel zur Anwendung kommen. Auch beliebige Mischungen der genannten Komponenten sind einsetzbar.

In der bevorzugten Ausführungsform enthält das Material 2 einen Anteil von etwa 3% bis 30% eines flüchtigen Polyols, z.B. Glycerin oder Propylenglykol, um die Aerosolbildung zu verstärken. Eine andere Möglichkeit, die Aerosolbildung zu verstärken, ist der Einsatz der aerosolbildenden Materialien mit einer Feuchte, die deutlich über der Gleichgewichtsfeuchte liegt. So kann z.B. Tabak, dessen Gleichgewichtsfeuchte bei ca. 10% bis 12% liegt, mit einer Feuchte von 20% verwendet werden. In diesem Fall ist durch eine geeignete Verpackung dafür zu sorgen, daß bis zum Gebrauch kein Feuchteverlust auftritt.

Die elektrisch leitfähige Umhüllung 3 kann aus mit leitenden Additiven (wie Metalle oder Graphit/Kohlenstoff) versehenem Papier oder Folientabak oder einer ebenfalls durch Additive leitfähig gemachten Kunststoffolie bestehen. Auch eine mehrlagige Umhüllung ist verwendbar, wobei die innere Lage aus Papier oder Folientabak bestehten kann und die äußere aus einem der genannten, leitfähigen Materialien.

Ebenfalls möglich ist es, die Umhüllung zunächst aus einem nicht leitfähigen Material zu bilden und anschließend vor oder nach dem Umhüllen des aerosolbildenden Materials einen leitfähigen Film aufzubringen, z.B. durch Bedampfen oder Besprühen.

Die Herstellung von Substratportionen 1 kann in einfacher Weise auf einer herkömmlichen Cigarettenstrangmaschine erfolgen: Zunächst wird in einem Formatteil ein Endlosstrang von Tabak oder Ersatzmaterial gebildet; dieser wird mit dem von einer Bobine in Herstellungsrichtung zugeführten, leitfähigen Umhüllungsmaterial umgeben und an einer Naht verleimt. Anschließend erfolgt ein Ablängen in den gewünschten Abmessungen. Eine weitere Möglichkeit der Herstellung ist das Extrudieren eines geeigneten aero-

solbildenden Materials durch eine Runddüse mit anschließendem Umhüllen und Ablängen des Extrudats.

Vorzugsweise liegt der Durchmesser einer Substratportion 1 im Bereich von 5 mm bis 12 mm und die Länge im Bereich von 10 mm bis 100 mm. Besonders bevorzugt werden Durchmesser von 5 mm bis 10 mm und Längen von 15 mm bis 60 mm.

In einer bevorzugten Ausführungsform ist die Substratportion 1, wie in Figur 2a dargestellt, durch eine gemeinsame Umhüllung 11 mit einem Mundstück 10 verbunden. Die Herstellung eines solchen Verbundes ist dem Fachmann aus der Fertigung von Filtercigaretten vertraut. Die Substratportion 1 kann zusätzlich in Zonen 12 eine im Vergleich zu der übrigen Umhüllung erhöhte elektrische Leitfähigkeit aufweisen, was z.B. durch Umwicklen mit Metallfolie in den Zonen 12 erreicht werden kann, um den elektrischen Kontakt mit den Kontakten in einer Inhaliervorrichtung (siehe unten) zu verbessern.

Während bei der Ausführungsform der Substratportion gemäß Fig. 2a die Substratportion als ein einziger zusammenhängender Heizwiderstand eingerichtet ist, sehen weitere Ausführungsformen der Substratportion eine segmentierte oder abschnittsweise Aufteilung der elektrischen Leitfähigkeit der Umhüllung vor. Dies kann z.B. wie in Figur 2b oder wie in Fig. 2c dargestellt erfolgen.

Die Umhüllung der Substratportion gemäß Figur 2b weist eine Anzahl ringförmiger Zonen 13 mit relativ hoher elektrischer Leitfähigkeit auf, wobei jeweils zwei benachbarte Zonen 13 durch eine isolierende Zone getrennt sind. Jede der Zonen 13 bildet einen separaten Heizwiderstand, der sich in einer auf die Substratportion abgestimmten Inhaliervorrichtung einzeln über entsprechende Kontakte in der Inhaliervorrichtung mit Strom versorgen läßt. Die Lage derartiger Kontakte ist in Fig. 2b durch Pfeile sowie die Polaritäten "+" und "-" gekennzeichnet. Bei einer Varianten dieser Ausführungsform verlaufen die einzelnen

Zonen 13 nicht über den gesamten Umfang der Substratportion, sondern haben jeweils eine isolierende Unterbrechung. Bei einer anderen Varianten sind die Zonen 13 in einer sich längs der Substratportion erstreckenden Zone elektrisch leitend zusammengelegt, die z.B. entlang der Kontaktstellen "-" (oder der Kontaktstellen "+") gemäß Fig. 2b verläuft, so daß in der Inhaliervorrichtung für diesen Pol in Art einer Masseverbindung nur ein Kontakt vorhanden sein muß.

Bei der in Figur 2c gezeigten Ausführungsform einer Substratportion weist die Umhüllung der Substratportion eine Anzahl in Umfangsrichtung gegeneinander versetzter und gegeneinander isolierter elektrisch leitfähiger Zonen 15 auf. Die als separate Heizwiderstände dienenden Zonen 15 erstrecken sich über die Länge der Substratportion. In einem Endbereich der Substratportion sind sie durch eine ringartige Kontaktzone 14 elektrisch leitend zusammengelegt, wobei der elektrische Widerstand der Kontaktzone 14 vorzugsweise kleiner ist als der einer Zone 15. An diesem Ende ist in einer an die Substratportion angepaßten Inhaliervorrichtung nur ein "-"-Kontakt erforderlich, während am anderen Ende eine Anzahl von Kontakten vorgesehen ist, die in Fig. 2c mit Pfeilen gekennzeichnet und mit "+" bezeichnet sind. Die "+"-Kontakte ermöglichen ein separates Ansteuern der Zonen 15. Um die erforderliche Ausrichtung der Substratportion in der Inhaliervorrichtung in definierter Winkelposition zu gewährleisten, ist im Ausführungsbeispiel eine Positioniereinrichtung in Form einer Kerbe 16 vorgesehen, in die beim Einsetzen der Substratportion in die Inhaliervorrichtung ein entsprechender Führungsvorsprung an der Inhaliervorrichtung eingreift.

Ein Ausführungsbeispiel einer Inhaliervorrichtung (nachfolgend Rauchgerät genannt) wird im folgenden anhand der Figur 3 beschrieben. Dieses Rauchgerät ist zur Benutzung mit einer Substratportion gemäß Fig. 2a eingerichtet.

Wie Figur 3 zeigt, befinden sich in einem Gehäuse 20 zwei Kontakte (Elektroden) 21 und 22, über die der Kontakt zur leitfähigen Umhüllung einer von dem Rauchgerät aufgenommenen Substratportion hergestellt wird. Der Hohlraum im Innern des Gehäuses 20 und die Kontakte 21 und 22 bilden dabei eine Aufnahmeeinrichtung zum Halten der Substratportion. Durch eine Öffnung 24 kann Luft durch die Substratportion gezogen werden. Über eine elektrische Verbindung 25 ist der Kontakt 21 direkt mit einer in einem separaten Gehäuse angeordneten Versorgungseinheit 30 verbunden. Die Verbindung zum Kontakt 22 verläuft über einen Schalter 23, mit dem der Stromkreis geschlossen werden kann. Die Versorgungseinheit 30 enthält eine Batterie oder einen Akkumulator 31 sowie optional eine Steuerung 32. Im Falle eines Akkumulators kann dieser über Steckkontakte 33 aufgeladen werden.

Der Gebrauch des Rauchgerätes geht wie folgt vor sich: Das Rauchgerät ist mit der Versorgungseinheit 30 über ein Kabel (Verbindung 25) verbunden (siehe auch Figur 4b). Die mit dem Mundstück 10 versehene Substratportion 1 wird in eine konisch ausgestaltete Öffnung an einer der Stirnseiten des Gehäuses 20 geschoben, bis sie einen Anschlag bei dem Kontakt 21 erreicht, siehe Figur 3. Das Rauchgerät wird nun zum Mund geführt und der Schalter 23 betätigt. Durch Schließen des Stromkreises wird die Substratportion durch den über die Kontakte 21 und 22 durch die als Heizwiderstand wirkende Umhüllung fließenden Strom erhitzt, und das entstehende Aerosol kann durch das Mundstück 10 entnommen werden. Das Abschalten geschieht durch Loslassen des Schalters 23 oder durch die Steuerung 32. Auf diese Weise können mehrere Züge entnommen werden. Nach Gebrauch wird die Substratportion 1 mit dem Mundstück 10 aus dem Rauchgerät entnommen und entsorgt. Von Zeit zu Zeit ist ein Batteriewechsel oder Aufladen des Akkumulators 31 in der Versorgungseinheit 30 notwendig.

Figur 4a zeigt eine andere Ausführungsform des Systems, die sich von der vorhergehenden dadurch unterscheidet, daß Mundstück 10' und Substratportion 1' nicht miteinander verbunden sind. Das

Mundstück 10' wird in einen Sockel 42 eingesteckt, der nach Einlegen der Substratprotion 1' in ein Rauchgerät, das ein Gehäuse 40 aufweist, mit dem Gehäuse 40 verschraubt wird. Der Sockel 42 dient gleichzeitig als Kontakt. Funktion und Gebrauch dieses Rauchgeräts und der übrigen Komponenten des Systems entsprechen ansonsten dem vorherigen Ausführungsbeispiel. In Figur 4a sind der zweite Kontakt mit 41, der Schalter mit 43, die Öffnung für die Luftzuführung mit 44, das Verbindungskabel mit 45, die Versorgungseinheit mit 30', die Batterie oder der Akkumulator mit 31', die Steuerung mit 32' und die Steckkontakte mit 33' bezeichnet.

Der Gebrauch des Rauchartikels ist in Figur 4b dargestellt. Das Rauchgerät mit Mundstück und Substratportion kann wie eine herkömmliche Cigarette gehandhabt werden; die Versorgungseinheit wird bevorzugt in einer Brusttasche, Gürtelhalterung o.ä. getragen. Beide Teile sind durch ein hochflexibles Kabel (Verbindungskabel 45) ausreichender Länge miteinander verbunden.

Eine einteilige Ausführungsform des Rauchgeräts mit cigarrenähnlicher Form ist in Figur 5 dargestellt. Ein Gehäuse 50 besitzt am vorderen Ende eine abschraubbare Kappe 53, durch die ein Wechsel einer Batterie bzw. eines Akkumulators 51 möglich ist. Ein schwenkbare Klappe 52, die auch in aufgeschwenktem Zustand eingezeichnet ist, dient zum Einlegen einer Substratportion 1". Beim Öffnen der Klappe 52 wird über ein nicht dargestelltes Gestänge gleichzeitig ein Aufnahmeteil 55 gegen die Kraft einer Schraubenfeder 56 nach hinten bewegt, um das Einlegen der Substratportion 1" zu erleichtern. Die bei geschlossener Klappe 52 wirkende Kraft der Schraubenfeder 56 bewirkt eine Fixierung der Substratportion 1" zwischen einem Kontakt 57 und dem Aufnahmeteil 55, das gleichtzeitig als Gegenkontakt dient. Durch Schließen eines Schalters 60 fließt zwischen den Kontakten 55, 57 Strom über die leitfähige Umhüllung der Substratportion 1", so daß diese erwärmt wird. Das Rauchaerosol kann durch Ziehen an einem in das Aufnahmeteil 55 eingesteckten Mundstück 10" ent-

nommen werden, das als separate Komponente gestaltet ist und in diesem Ausführungsbeispiel nicht fest mit der Substratportion 1" verbunden ist. Dabei strömt Luft durch einen Kanal 54 nach und tritt an der vorderen Stirnseite der Substratportion 1" in die Substratportion 1" ein.

In einem Rauchgerät, das für die Benutzung einer Substratportion gemäß Fig. 2b oder gemäß Fig. 2c eingerichtet ist, befinden sich Kontakte, die paarweise einer als Heizwiderstand dienenden Zone 13 bzw. 15 zugeordnet sind. Wenn, wie oben beschrieben, ein gemeinsamer Pol elektrisch leitend zusammengelegt ist, braucht dafür nur ein Kontakt vorhanden zu sein. Durch sequentielle Stromversorgung jeweils einer Zone 13 bzw. 15 kann jeweils ein neuer Teil der Substratportion erhitzt werden, wodurch eine gleichmäßigere Aerosolausbeute über die Züge erreicht wird. Dies ergibt ein weitgehend konstantes Geschmacksangebot pro Zug. Die Steuerung kann beispielsweise über einen Zugdetektor erfolgen, der auf die Druckänderung beim Ansagen von Luft durch den Benutzer reagiert und über eine Schalteinrichtung die Stromversorgung einer der Zonen 13 bzw. 15 bewirkt. Beim nächsten Zug spricht die Schalteinrichtung wieder an, aber eine elektronische Schaltung sorgt dafür, daß der Heizstrom über die zugeordneten Kontakte diesmal an eine andere, noch nicht benutzte Zone 13 bzw. 15 gelegt wird, usw.

Für die Konstruktion des Mundstückes 10, 10' oder 10" sind grundsätzlich alle dem Fachmann aus der Cigarettenindustrie bekannten Prinzipien anwendbar. Im einfachsten Fall besteht das Mundstück aus einer hohlen Papier- oder Kartonrolle. Bevorzugt wird jedoch die Ausführung als Filtermundstück. In diesem Fall ist ein Filtermaterial wie Celluloseacetat, Polypropylen oder Papier mit einer ein- oder mehrlagigen Umhüllung versehen. Auch eine den bekannten Mehrfachfiltern entsprechende Konstruktion kann verwendet werden, bei der in axialer Richtung mehrere Segmente mit unterschiedlichen Eigenschaften hintereinander angeordnet und durch eine äußere Umhüllung verbunden sind. In diesem

Fall können ein oder mehrere Segmente mit axialen Bohrungen versehen sein. Bei allen genannten Konstruktionen besteht weiterhin die Möglichkeit des Einsatzes einer zonenperforierten Umhüllung oder einer nachträglichen Perforation der Umhüllung z.B. mit Hilfe eines Laserstrahls. Hierdurch kann bei den Zügen der Rauch durch Hinzuströmen von Außenluft verdünnt werden.

Weitere Varianten des Systems bzw. seiner Komponenten ergeben sich unmittelbar aus den Ansprüchen.

Im folgenden ist ein weiteres Beispiel für eine Substratportion mit Mundstück und seine Benutzung in dem System angegeben.

Beispiel

Eine American-Blend-Tabakmischung mit einem Gehalt von

30% Burley-Tabak
40% expandiertem Virginia-Tabak
20% nicht expandiertem Virginia-Tabak und
10% Orient-Tabak

wurde konditioniert und mit 12 Gew.-% eines wäßrigen Casings mit einem Glyceringehalt von 80 Gew.-% besprüht. Anschließend wurde der Tabak mit 0,8 mm Schnittbreite geschnitten und auf eine Feuchte von 12% abgetrocknet. 180 kg dieses Schnittabaks wurden mit 20 kg expandiertem Rippenschnitt vermischt.

Aus dieser Mischung wurde auf einer Cigarettenstrangmaschine ein Endlosstrang mit einem Durchmesser von 6 mm und einer Stopfdichte von 200 mg/ml hergestellt. Als Umhüllungsmaterial kam ein durch Graphitzusatz leitfähig gemachtes, luftundurchlässiges Papier zum Einsatz. Der Endlosstrang wurde in Einzelportionen von 40 mm LÄnge geschnitten, und diese wurden in bekannter Weise durch ein Mundstückbelagpapier mit einem Acetatfilterstöpsel verbunden.

Die so erhaltene Substratportion wurde in einem Rauchgerät nach Figur 3 abgeraucht, ohne daß sichtbare Mengen Nebenstromrauch entstanden. Der Geschmack wurde von Probanden als gleichmäßig und dem herkömmlicher Cigaretten gleichwertig beurteilt.

Patentansprüche

1. System zur Bereitstellung eines inhalierbaren Aerosols, mit
- einer Substratportion (1; 1'; 1"), die mindestens einen Heizwiderstand (3; 13; 15) aufweist und innerhalb einer Umhüllung (3) aerosolbildendes Material (2) enthält, wobei die Umhüllung (3) eine Lufteintrittsöffnung und eine Aerosolaustrittsöffnung aufweist, und
- einer Inhaliervorrichtung, die ein Gehäuse (20; 40; 50), eine Aufnahmeeinrichtung zum Halten der Substratportion (1; 1'; 1") und mit einer Spannungsquelle (31; 31'; 51) in Verbindung stehende oder in Verbindung bringbare Kontakte (21, 22; 41, 42; 55, 57) zum Zuführen von elektrischer Leistung zu dem mindestens einen Heizwiderstand (3; 13; 15) der Substratportion (1; 1'; 1") aufweist.

2. System nach Anspruch 1, gekennzeichnet durch ein Mundstück (10; 10'; 10"), das separat (10'; 10") mit der Inhaliervorrichtung verbindbar ist oder mit der Substratportion (1) verbunden ist und im Betriebszustand mit der Aerosolaustrittsöffnung der Substratportion (1; 1'; 1") in Verbindung steht.

3. System nach Anspruch 1 oder 2, dadurch gekennzeichnet, daß die Umhüllung (3) der Substratportion (1; 1'; 1") zumindest abschnittsweise elektrisch leitfähig ist und als mindestens ein Heizwiderstand (3; 13; 15) eingerichtet ist.

4. System nach Anspruch 3, dadurch gekennzeichnet, daß die Umhüllung (3) der Substratportion als ein einziger zusammenhängender Heizwiderstand eingerichtet ist.

5. System nach Anspruch 3, dadurch gekennzeichnet, daß die Substratportion eine Längsachse hat und die Umhüllung der Substratportion eine Anzahl axial gegeneinander versetzter und gegeneinander isolierter Heizwiderstände (13) aufweist,

die vorzugsweise in einer sich längs der Substratportion erstreckenden Zone elektrisch leitend zusammengelegt sind.

6. System nach Anspruch 3, dadurch gekennzeichnet, daß die Substratportion eine Längsachse hat und die Umhüllung der Substratportion eine Anzahl in Umfangsrichtung gegeneinander versetzter und gegeneinander isolierter Heizwiderstände (15) aufweist, die sich vorzugsweise über die Länge der Substratportion erstrecken und die vorzugsweise in einem Endbereich (14) der Substratportion elektrisch leitend zusammengelegt sind, wobei die Substratportion vorzugsweise eine an die Inhaliervorrichtung angepaßte Positioniereinrichtung (16) zum Einsetzen in die Inhaliervorrichtung in definierter Winkelposition aufweist.

7. System nach einem der Ansprüche 3 bis 6, dadurch gekennzeichnet, daß die Umhüllung (3) der Substratportion (1; 1'; 1") Metallfolie, metallbeschichtetes oder metallhaltiges Papier, kohlehaltiges Papier, graphithaltiges Papier, einen elektrisch leitfähigen Film, mit leitfähigen Additiven versehene Kunststoffolie und/oder mit leitfähigen Additiven versehenen Folientabak aufweist.

8. System nach einem der Ansprüche 3 bis 7, dadurch gekennzeichnet, daß die Umhüllung (3) der Substratportion (1; 1'; 1") mehrere Lagen von Umhüllungsmaterialien aufweist, wobei die äußere Lage elektrisch leitendes Material aufweist und die innere Lage vorzugsweise aus Papier oder Folientabak besteht.

9. System nach einem der Ansprüche 3 bis 8, dadurch gekennzeichnet, daß die Umhüllung (3) der Substratportion (1; 1'; 1") in dem Bereich zwischen den Kontaktstellen zu den beiden einem Heizwiderstand (3; 13; 15) zugeordneten Kontakten (21, 22; 41, 42; 55, 57) der Inhaliervorrichtung einen elektrischen Widerstand von 0,1 Ohm bis 1000 Ohm aufweist.

10. System nach einem der Ansprüche 3 bis 9, dadurch gekennzeichnet, daß die mit den Kontakten (21, 22; 41, 42; 55, 57) der Inhaliervorrichtung in Kontakt bringbaren Zonen (12) der Umhüllung (3) der Substratportion (1) eine gegenüber dem übrigen Material der Umhüllung (3) erhöhte elektrische Leitfähigkeit aufweisen, vorzugsweise durch Metallbeschichtung.

11. System nach einem der Ansprüche 1 bis 10, dadurch gekennzeichnet, daß die Substratportion (1; 1'; 1") eine zylindrische Form mit einer Länge von 10 mm bis 100 mm, vorzugsweise von 15 mm bis 60 mm, und einem Durchmesser von 4 mm bis 12 mm, vorzugsweise von 5 mm bis 10 mm, aufweist.

12. System nach einem der Ansprüche 3 bis 10 und nach Anspruch 11, dadurch gekennzeichnet, daß die zumindest abschnittsweise elektrisch leitfähige Umhüllung (3) der Substratportion (1; 1'; 1") als Zylindermantel angeordnet ist und die Stirnseiten des Zylinders als Lufteintrittsöffnung und als Aerosolaustrittsöffnung eingerichtet sind.

13. System nach einem der Ansprüche 1 bis 12, dadurch gekennzeichnet, daß das aerosolbildende Material (2) der Substratportion (1; 1'; 1") Schnittabak, geschnittene Tabakrippen, Folientabakschnitt und/oder ein extrudiertes Tabakmaterial aufweist.

14. System nach einem der Ansprüche 1 bis 13, dadurch gekennzeichnet, daß das aerosolbildende Material (2) der Substratportion (1; 1'; 1") ein mit Aromasubstanzen beaufschlagtes Trägermaterial aufweist.

15. System nach einem der Ansprüche 1 bis 14, dadurch gekennzeichnet, daß das aerosolbildende Material (2) der Substratportion (1; 1'; 1") ein verdampfbares Polyol, vorzugsweise Glycerin oder Propylenglykol, zu einem Anteil von 5 Gew.-%

bis 50 Gew.-%, vorzugsweise von 10 Gew.-% bis 30 Gew.-% enthält.

16. System nach einem der Ansprüche 1 bis 15, dadurch gekennzeichnet, daß die Inhaliervorrichtung mindestens einen Schalter (23; 43; 60) für den mindestens einen Heizwiderstand (3; 13; 15) aufweist.

17. System nach einem der Ansprüche 1 bis 16, dadurch gekennzeichnet, daß die Inhaliervorrichtung einen Zugdetektor aufweist, der zusammen mit einer Schalteinrichtung dazu eingerichtet ist, den durch einen Heizwiderstand (3; 13; 15) der Substratportion (1; 1'; 1") führenden Stromkreis in Abhängigkeit von der auf die Lufteintrittsöffnung der Substratportion (1; 1'; 1") gerichteten Strömungsgeschwindigkeit zu schalten.

18. System nach einem der Ansprüche 1 bis 17, dadurch gekennzeichnet, daß die Inhaliervorrichtung eine Schaltung, vorzugsweise eine elektronische Schaltung (32; 32'), zum Steuern der von dem mindestens einen Heizwiderstand (3; 13; 15) der Substratportion (1; 1'; 1") abgegebenen Leistung aufweist.

19. System nach Anspruch 18 in Verbindung mit Anspruch 4, dadurch gekennzeichnet, daß die Schaltung (32; 32') der Inhaliervorrichtung dazu eingerichtet ist, die Spannung oder den Strom für den Heizwiderstand (3) der Substratportion (1; 1'; 1") dergestalt zu steuern, daß die Heizleistung beim ersten Zug auf einen höheren Wert als bei den Folgezügen eingestellt wird, sowie nach einer definierten Zugzeit die Leistungszufuhr zu unterbrechen, um eine Überhitzung zu vermeiden.

20. System nach Anspruch 18 in Verbindung mit Anspruch 5 oder 6, dadurch gekennzeichnet, daß die Schaltung (32; 32') der

Inhaliervorrichtung dazu eingerichtet ist, zum sequentiellen Einschalten der einzelnen Heizwiderstände (13; 15) den einzelnen Heizwiderständen (13; 15) zugeordnete Kontakte sequentiell anzusteuern.

21. System nach einem der Ansprüche 18 bis 20, dadurch gekennzeichnet, daß die Schaltung im Innern des Gehäuses der Inhaliervorrichtung untergebracht ist.

22. System nach einem der Ansprüche 18 bis 20, dadurch gekennzeichnet, daß die Schaltung (32; 32') in einem separaten Gehäuse (30; 30') untergebracht ist, das mit dem Gehäuse (20; 40) der Inhaliervorrichtung über ein Kabel (25; 45) verbunden oder verbindbar ist.

23. System nach einem der Ansprüche 1 bis 22, dadurch gekennzeichnet, daß für die Leistungszufuhr an die Kontakte (21, 22; 41, 42; 55, 57) der Inhaliervorrichtung eine Batterie oder ein Akkumulator (31; 31'; 51) vorgesehen ist, die bzw. der in dem Gehäuse (50) der Inhaliervorrichtung oder in einem separaten Gehäuse (30; 30') untergebracht oder unterbringbar ist.

24. System nach einem der Ansprüche 1 bis 23, dadurch gekennzeichnet, daß das Gehäuse (50) der Inhaliervorrichtung eine cigarrenähnliche Form aufweist.

25. System nach einem der Ansprüche 1 bis 23, dadurch gekennzeichnet, daß das Gehäuse (20; 40) der Inhaliervorrichtung eine cigarettenenähnliche Form aufweist.

26. System nach einem der Ansprüche 2 bis 25 in Verbindung mit Anspruch 2, dadurch gekennzeichnet, daß das Mundstück (10; 10'; 10") eine Länge von 10 mm bis 50 mm und einen Durchmesser von 4 mm bis 12 mm aufweist.

27. System nach einem der Ansprüche 2 bis 26 in Verbindung mit Anspruch 2, dadurch gekennzeichnet, daß das Mundstück (10; 10'; 10") eine hohle Papier- oder Kartonhülse aufweist.

28. System nach einem der Ansprüche 2 bis 26 in Verbindung mit Anspruch 2, dadurch gekennzeichnet, daß das Mundstück (10; 10'; 10") als Filtermundstück ausgebildet ist, wobei das Filtermaterial vorzugsweise Celluloseacetat, Papier, Myria und/oder Polypropylen mit einer ein- oder mehrlagigen Papierumhüllung aufweist.

29. System nach Anspruch 28, dadurch gekennzeichnet, daß das Mundstück (10; 10'; 10") einen Filterstöpsel aus mehreren in axialer Richtung hintereinander angeordneten Teilelementen aufweist, von denen vorzugsweise eines oder mehrere axiale Bohrungen aufweisen.

30. System nach einem der Ansprüche 2 bis 29 in Verbindung mit Anspruch 2, dadurch gekennzeichnet, daß das Mundstück (10; 10'; 10") eine oder mehrere Perforationszonen aufweist.

31. System nach einem der Ansprüche 2 bis 30 in Verbindung mit Anspruch 2, dadurch gekennzeichnet, daß die Substratportion (1) und das Mundstück (10) einen ähnlichen Durchmesser aufweisen und miteinander verbunden sind.

32. System nach Anspruch 31, dadurch gekennzeichnet, daß die Substratportion (1) und das Mundstück (10) durch eine gemeinsame Umwicklung (11) mit einem Mundstückbelagpapier verbunden sind.

33. Inhaliervorrichtung, mit einem Gehäuse (20; 40; 50), mit einer Aufnahmeeinrichtung zum Halten einer ein aerosolbildendes Material aufweisenden Substratportion (1; 1'; 1") und mit mit einer Spannungsquelle (31; 31'; 51) in Verbindung stehenden oder in Verbindung bringbaren Kontakten (21, 22;

41, 42; 55, 57) zum Zuführen von elektrischer Leistung zu mindestens einem Heizwiderstand der Substratportion (1; 1'; 1").

34. Inhaliervorrichtung nach Anspruch 33, gekennzeichnet durch Merkmale der Inhaliervorrichtung aus einem der Ansprüche 16 bis 25.

35. Substratportion, die zur Verwendung mit einer Inhaliervorrichtung nach Anspruch 33 oder 34 eingerichtet ist und die mindestens einen Heizwiderstand (3; 13; 15) aufweist und innerhalb einer Umhüllung (3) aerosolbildendes Material (2) enthält, wobei die Umhüllung (3) eine Lufteintrittsöffnung und eine Aerosolaustrittsöffnung aufweist.

36. Substratportion nach Anspruch 35, gekennzeichnet durch Merkmale der Substratportion (1; 1'; 1") aus einem der Ansprüche 3 bis 15.

37. Substratportion nach Anspruch 35 oder 36, gekennzeichnet durch ein Mundstück (10), das mit der Substratportion (1) verbunden ist und mit der Aerosolaustrittsöffnung der Substratportion (1) in Verbindung steht.

38. Substratportion nach Anspruch 37, dadurch gekennzeichnet, daß das Mundstück (10; 10'; 10") Merkmale aus einem der Ansprüche 26 bis 32 aufweist.

39. Mundstück, das zur Verwendung mit einer Inhaliervorrichtung nach Anspruch 33 oder 34 eingerichtet ist, separat (10'; 10") mit der Inhaliervorrichtung verbindbar ist und im Betriebszustand mit der Aerosolaustrittsöffnung der Substratportion (1'; 1") in Verbindung steht.

40. Mundstück nach Anspruch 39, gekennzeichnet durch Merkmale des Mundstücks (10'; 10") aus einem der Ansprüche 26 bis 30.

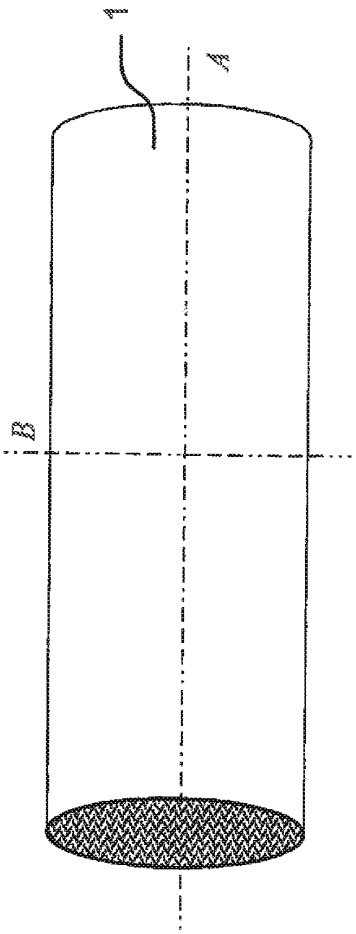



Fig. 1a

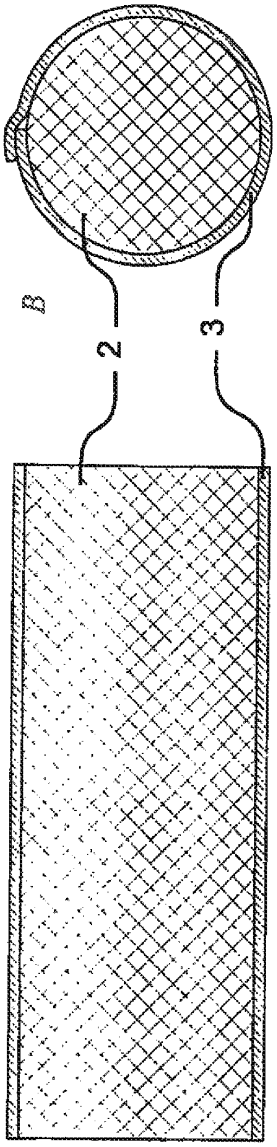



Fig. 1b



Fig. 1c

Fig. 2c




Fig. 2b








Fig. 2a

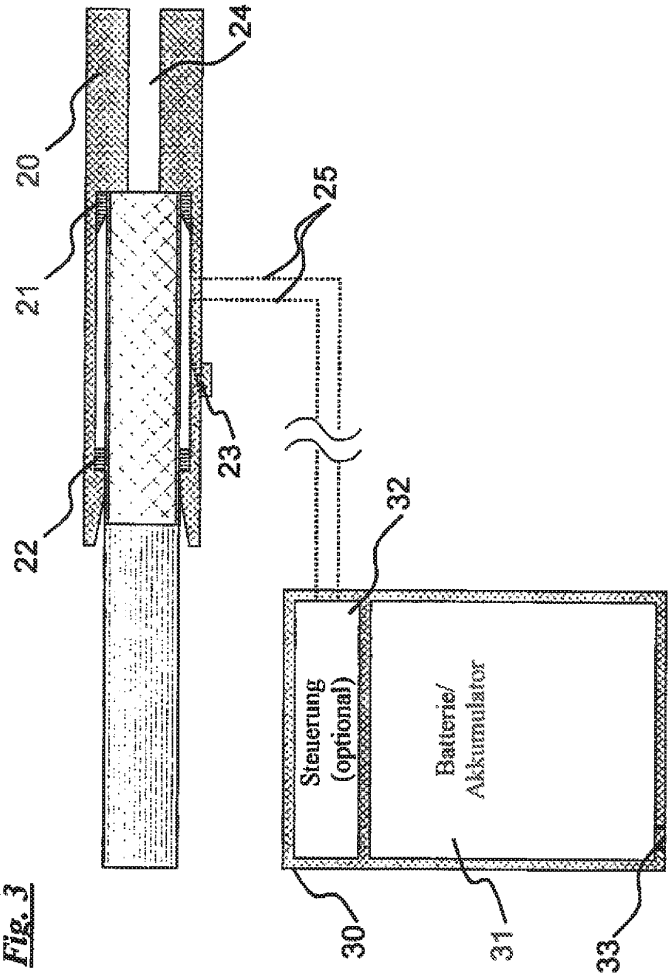



*Fig. 3*

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Fig. 4a

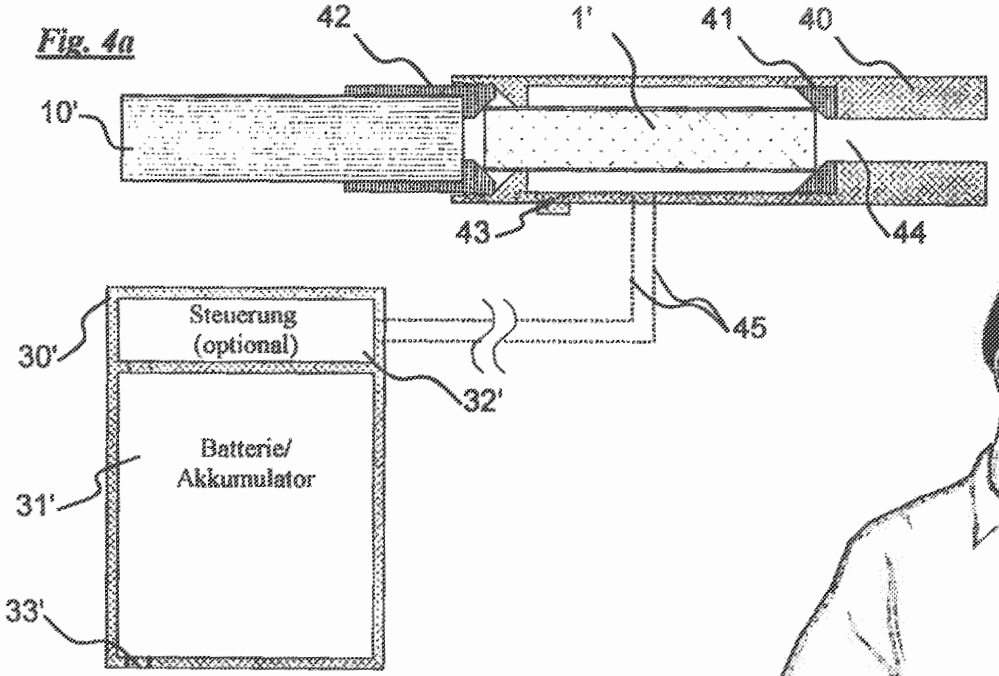
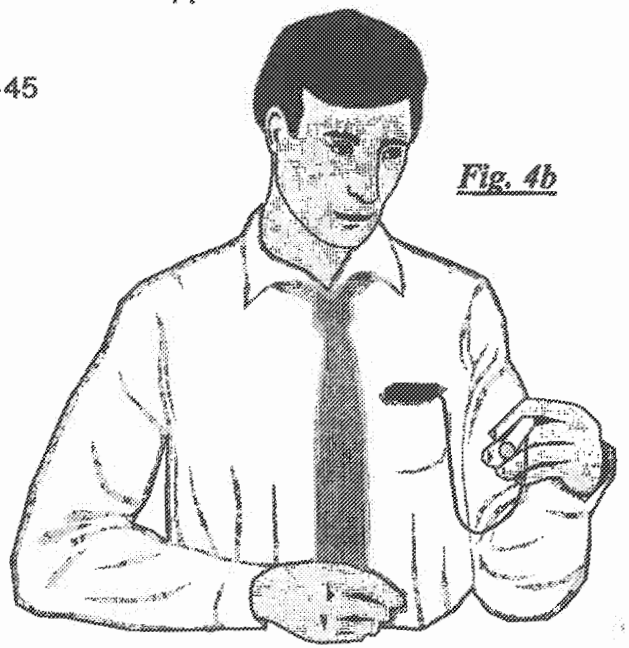

42
1'
41
40
10'
43
44
45
30'
Steuerung
(optional)
32'
Batterie/
Akkumulator
31'
33'

Fig. 4b



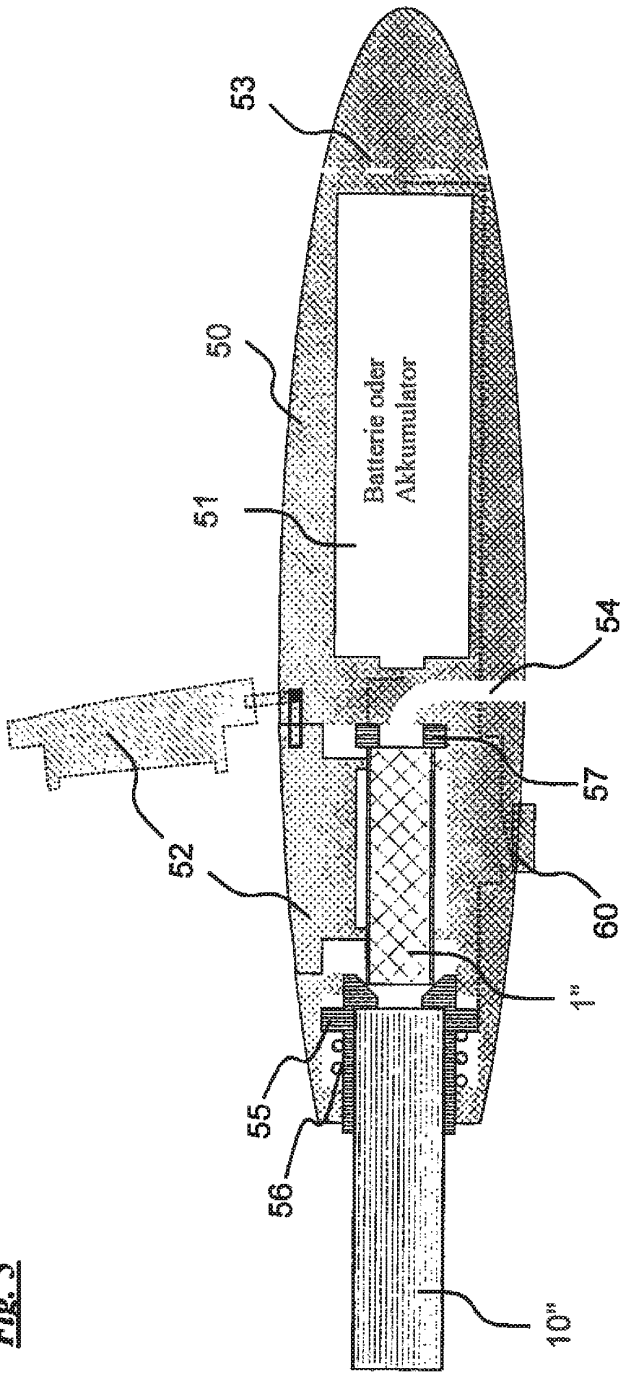



*Fig. 5*

# INTERNATIONAL SEARCH REPORT

Inti ional Application No
PCT/EP 99/08428

A. CLASSIFICATION OF SUBJECT MATTER
IPC 7 A24F47/00

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)
IPC 7 A24F

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practical, search terms used)

C. DOCUMENTS CONSIDERED TO BE RELEVANT

| Category * | Citation of document, with indication, where appropriate, of the relevant passages | Relevant to claim No. |
|---|---|---|
| A | EP 0 503 767 A (PHILIP MORRIS PRODUCTS INC.) 16 September 1992 (1992-09-16)<br><br>the whole document | 1,2,<br>13-16,<br>23,25,<br>28,31,33 |
| A | EP 0 488 488 A (PHILIP MORRIS PRODUCTS INC.) 3 June 1992 (1992-06-03)<br><br>the whole document | 1,2,<br>13-16,<br>23,25,<br>28,31,33 |

☐ Further documents are listed in the continuation of box C.

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| Date of the actual completion of the international search | Date of mailing of the international search report |
|---|---|
| 1 February 2000 | 09/02/2000 |

| Name and mailing address of the ISA | Authorized officer |
|---|---|
| European Patent Office, P.B. 5818 Patentlaan 2<br>NL – 2280 HV Rijswijk<br>Tel. (+31–70) 340–2040, Tx. 31 651 epo nl,<br>Fax: (+31–70) 340–3016 | Riegel, R |

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# INTERNATIONALER RECHERCHENBERICHT

Int. Internes Aktenzeichen
PCT/EP 99/08428

A. KLASSIFIZIERUNG DES ANMELDUNGSGEGENSTANDES
IPK 7 A24F47/00

Nach der Internationalen Patentklassifikation (IPK) oder nach der nationalen Klassifikation und der IPK

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Recherchierter Mindestprüfstoff (Klassifikationssystem und Klassifikationssymbole )
IPK 7 A24F

Recherchierte aber nicht zum Mindestprüfstoff gehörende Veröffentlichungen, soweit diese unter die recherchierten Gebiete fallen

Während der internationalen Recherche konsultierte elektronische Datenbank (Name der Datenbank und evtl. verwendete Suchbegriffe)

C. ALS WESENTLICH ANGESEHENE UNTERLAGEN

| Kategorie* | Bezeichnung der Veröffentlichung, soweit erforderlich unter Angabe der in Betracht kommenden Teile | Betr. Anspruch Nr. |
|---|---|---|
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☐ Weitere Veröffentlichungen sind der Fortsetzung von Feld C zu entnehmen

☒ Siehe Anhang Patentfamilie

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|---|---|
| 1. Februar 2000 | 09/02/2000 |

| Name und Postanschrift der Internationalen Recherchenbehörde | Bevollmächtigter Bediensteter |
|---|---|
| Europäisches Patentamt, P.B. 5818 Patentlaan 2<br>NL - 2280 HV Rijswijk<br>Tel. (+31-70) 340-2040, Tx. 31 651 epo nl,<br>Fax: (+31-70) 340-3016 | Riegel, R |

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PCT/EP 99/08428

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I, Kelly Kim, hereby certify that the following document is, to the best of my knowledge and belief, a true and accurate translation of "WO 2007/131449 A1" from Chinese to English.

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Signature, Notary Public

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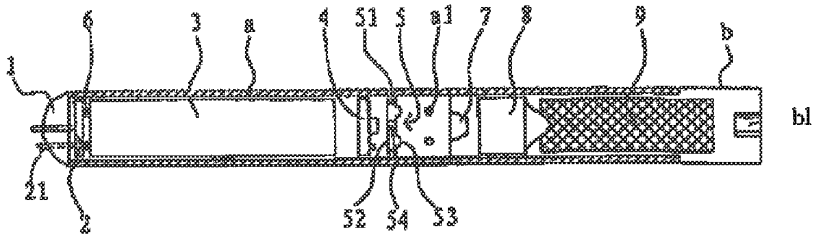


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(54) Title: Aerosol Electronic Cigarette





(57) Abstract: An aerosol electronic cigarette comprises a battery assembly, an atomizer assembly and a cigarette bottle assembly and also comprises a shell (a) which is hollow and integrally formed. Said battery assembly connects with said atomizer assembly and both are located in said shell (a). Said cigarette bottle assembly is located in one end of the shell (a), which is detachable. Said cigarette bottle assembly is fitted with said atomizer assembly. Said shell (a) has through-air-inlets (al).



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# An aerosol electronic cigarette

## Technical Field

The present invention relates to an electronic cigarette, in particular, an aerosol electronic cigarette that doesn't contain tar but only nicotine.

## Background Art

Today when "smoking is harmful to your health" has become a common sense, there are still one billion people smoking cigarettes around the world, and this figure is still rising each year. On March 1, 2003, the World Health Organization (WHO) issued the first international agreement on smoking ban — Framework Convention on Tobacco Control. According to WHO's data, smoking causes 4,900,000 deaths each year. Although smoking causes serious respiratory system diseases and cancers, it is a hard job to persuade the smokers to completely quit smoking.

Nicotine is the effective ingredient of cigarette. At the time of smoking, as the cigarette burns, nicotine produces a lot of tar mist, which accesses the pulmonary alveolus and is quickly absorbed. Once nicotine is absorbed into the blood, it acts on the receptor of the central nervous system, bringing the "euphoria" similar to stimulants to the smokers, who feel lightheaded or high.

Nicotine is a micromolecular alkaloid, which is basically harmless to human bodies with a small dosage. Plus, its half-life period is extremely short in blood. Tar is the major harmful substance in tobacco. Tobacco tar is comprised of several thousands of ingredients, dozens of which are carcinogenic substances. It has now been proven that second hand smoking is even more harmful to those who don't smoke.

To seek the cigarette substitutes that only contain nicotine, but no harmful tobacco tar , many inventions have used the relatively pure nicotine to create products, such as " Smoking cessation Patch", "Nicotine mouthwash", "Aerosol Packed in the High Pressure Tank with Propellant", "Nicotine Chewing Gum", and "Nicotine Beverage". These products do not have the harm of tobacco tar, but since nicotine is absorbed very slowly, its peak concentration can't be effectively established in blood, and the need for the "enjoyment" feeling from nicotine cannot be met. In addition, the smokers are deprived of the "smoking" habit. Therefore, similar products cannot be truly used as smoking cessation products or cigarette substitutes.

Although electronic cigarettes currently available in the market may resolve the above-mentioned issues, they are complicated in structure. Their cigarette bodies can be roughly divided into three sections, and a user has to plug or screw all sections together before use. Moreover, batteries have to be replaced frequently, making it very inconvenient for users. Furthermore, the most important issues are that the electronic cigarettes don't provide the ideal aerosol effects, and the aerosol efficiency is not high.



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Content of Invention

To overcome the above-mentioned disadvantages, the purpose of the present invention is to provide an aerosol electronic cigarette as a smoking cessation product and cigarette substitute.

The purpose of the present invention is realized by the following technical solution: an aerosol electronic cigarette comprises a battery assembly, an atomizer assembly and a cigarette bottle assembly, and further comprises a shell, which is hollow and integrally formed; said battery assembly is connected with said atomizer assembly, and both are located in said shell; said cigarette bottle assembly is detachably installed at one end of said shell, and is fitted with said atomizer assembly within said shell; said shell has air inlets throughout.

The present invention is further characterized in that: said battery assembly comprises a battery, and an operating indicator, electronic circuit board, and airflow sensor, which are connected with said battery; the signal output of said airflow sensor is connected with said electronic circuit board;

It also comprises a check valve; said battery is a rechargeable battery, which has a flexibly connected charging plug; the blades of said plug are extended out from the other end of said shell;

A spring is installed between said charging plug and said rechargeable battery; one end of said spring is abutted against the body of said rechargeable battery; its free end is abutted against said charging plug;

Said battery is a rechargeable battery; a charging slot is set on said rechargeable battery; said operating indicator is an LED;

Said airflow sensor may also be a capacitive sensor or an inductive sensor with a semiconductor force-sensitive chip;

Said electronic circuit board comprises an electronic switch circuit;

A silica gel corrugated membrane is set on said airflow sensor; said silica gel corrugated membrane is connected with a magnet; a reed relay is set on one end of said magnet; both ends of said reed relay correspond to the relay electrodes respectively;

A silica gel corrugated membrane is set on said airflow sensor; said silica gel corrugated membrane is connected with a magnet; a Hall component or a magneto-diode or a magneto-triode is set on one end of said magnet;

Said atomizer assembly is an atomizer; said atomizer comprises a porous component and a heating element;

Said atomizer also comprises an electric heating rod; the body of said porous component has a atomizing cavity throughout; the diameter of said electric heating rod is smaller than the diameter of said atomizing cavity; said electric heating rod is inserted into said atomizing cavity, and a gap is formed between said electric heating rod and the interior wall of said atomizing cavity; said gap forms a negative pressure airflow cavity; one end of said



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porous component is fitted with said cigarette bottle assembly;

Said electric heating rod comprises a cylinder; said heating element is a heating wire; said heating wire is wound on the wall of said cylinder; said porous component has a protuberance on one end; said protuberance is fitted with said cigarette bottle assembly; said protuberance is a half sphere-shaped protuberance; on the side of said half sphere-shaped protuberance there is a through hole connected to said atomizing cavity.

Said electric heating rod comprises a cylinder; said heating element is made of electrically conductive ceramic PTC material; said heating element is set on the wall of said cylinder; mandrels are set on the wall of both ends of said cylinder respectively; said porous component has a protuberance on one end, and said protuberance is fitted with said cigarette bottle assembly; said protuberance is a half sphere-shaped protuberance; on the side of said half sphere-shaped protuberance there is a through hole connected to said atomizing cavity;

Said heating element is a heating wire; said atomizer assembly comprises a frame; said porous component is set on said frame; said porous component is wound with a heating wire; there is a through hole on said frame; the location where said porous component is wound with a heating wire is on the side in the axial direction of said through hole; one end of said porous component is fitted with said cigarette bottle assembly;

Said porous component is made of nickel form, stainless steel fiber felt, macromolecular polymer foam, or ceramic foam;

Said heating wire is made of a platinum wire, nickel-chromium alloy wire or iron-chromium alloy wire containing rare earth elements, or is made as flakes.

A detachable flow restriction component is set on one end of said porous component; there is a flow restriction hole on the body of said flow restriction component; said flow restriction hole corresponds to said atomizing cavity; the hole diameter of said flow restriction hole is smaller than the inner diameter of said atomizing cavity;

Said cigarette bottle assembly comprises a hollow cigarette holder shell, and a porous component for liquid storage located inside said cigarette holder shell; one end of said cigarette holder shell is inserted into said shell; the outer peripheral surface of said cigarette holder shell has a concave ventilating groove; a suction channel extending inward is set on the surface of one end of said cigarette holder shell;

Said suction channel is located in the center on the surface of one end of said cigarette holder shell;

One end of said porous component is abutted against the surface of one end of said porous component for liquid storage, and is in contact with said porous component for liquid storage;

Said porous component for liquid storage is made of materials, such as polypropylene fiber, teryiene



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fiber, or nylon fiber;

Said perforated component for liquid storage is a plastic foam molded piece or a column of multi-layer plates made from plastic injection with polyvinyl chloride, ploypropylene and polycarbonate;

Said electronic cigarette is held in a charging device;

Said charging device comprises a case; an auxiliary charging storage battery is installed inside said case, which holds the electronic cigarette and the charger for the rechargeable battery embedded in the electronic cigarette, as well as the power supply circuit; the power supply inputs of said auxiliary charging storage battery and charger are connected with the power supply circuit respectively;

A spare liquid supply bottle is set inside said case;

The power supply output of said auxiliary charging storage battery is connected with the power input of said charger.

The power supply output of said charger is a charging slot, which is fitted with the charging plug of the rechargeable battery inside said electronic cigarette, or a charging plug, which is fitted with the charging slot of the rechargeable battery;

Said charger is a constant voltage and current charger;

A pair of slideways are set or installed at the position corresponding to the location of said electronic cigarette on the body of said shell; a slide cover is located in said slideways by sliding.

The present invention results in the following benefits: (1) In the present invention, the porous component for liquid storage of the cigarette bottle assembly stores nicotine liquid only, but no cigarette tar, which considerably reduces the carcinogenic risks of smoking. At the same time, the smokers can still enjoy the feel and excitement of smoking at the time of use, and there is no fire hazard since there is no need for ignition. (2) In the present invention, the battery assembly and atomizer assembly are directly installed inside the shell, and then are plugged in the cigarette bottle assembly. There is only one connection between two parts, and the structure is simple. At the time of use or replacement, one only has to plug the cigarette holder into the shell. The use and replacement are convenient. When the nicotine liquid in the cigarette bottle assembly is used up or the cigarette bottle assembly is damaged and has to be replaced, the operation is also extremely easy. (3) In the present invention, a charging plug is set in the rechargeable battery inside the battery assembly. The blades of the charging plug extend out of the shell. When the rechargeable battery inside the electronic cigarette runs out of power, it may be directly plugged into the charger for charging. It is not necessary to remove the rechargeable battery. It is more convenient to use. (4) In the present invention, the charging device includes a charger and an auxiliary charging storage battery inside. The electronic cigarette is placed inside the charger when it is not in use, and the charging device may be plugged into the power supply to charge the electronic cigarette and at the same time charge the auxiliary charging storage battery as well. In the event that power



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supply is unavailable for the charging device; the auxiliary charging storage battery may be used to charge the electronic cigarette. Therefore, the electronic cigarette can be charged when it is carried around. It is very convenient to carry in a business or tourist trip. Furthermore, the charging device comprises a spare liquid supply bottle, which contains nicotine liquid for spare use in a business or tourist trip. (5) In the present invention, a suction channel extending inward is set on one end of the shell of the cigarette bottle assembly. The role such suction channel plays is that after the electronic cigarette works to produce mist, during the course of flowing to the shell, some fine droplets of the mist are condensed into bigger drops; when there are bigger drops, the drops fall along the exterior wall of the suction channel into the cavity of the shell of the cigarette bottle assembly, so that they are not inhaled by the smoker out of the suction channel. (6) Moreover, with slight modification to the liquid storage, the device and the connection structure of the present invention may also be loaded with routine drugs as a pulmonary administration device.

Description of Drawings

Figure 1 is the side sectional view of the electronic cigarette of the present invention;

Figure 2 is the sectional view of the shell a separated from the cigarette bottle assembly of the electronic cigarette of the present invention, illustrating the structure of the cigarette bottle assembly that is detachably installed in the shell a;

Figure 3 is the schematic diagram of the axial direction of the cigarette bottle assembly of the present invention, illustrating the ventilating groove on the peripheral surface of the cigarette holder shell;

Figure 4 is the side sectional view of the cigarette bottle assembly of the present invention, illustrating the structure of the suction channel;

Figure 5 is the side sectional view of the porous component of the atomizer of the present invention, illustrating the atomizing cavity and the protruding half sphere-shaped structure;

Figure 6 is the schematic diagram of the electric heating rod of the atomizer of the present invention;

Figure 7 is the side sectional view of the atomizer of the present invention, illustrating the locations of and connection relation between the electric heating rod and porous component;

Figure 8 is the 3D schematic diagram of the atomizer of the present invention, illustrating the locations of and connection relation between the electric heating rod and porous component;

Figure 9 is the sectional view of the check valve of the present invention;

Figure 10 is the front sectional view of the flow restriction component in the second preferred embodiment of the present invention, illustrating the structure of the flow restriction component;

Figure 11 is the schematic diagram of the axial direction of the cigarette bottle assembly in the third preferred embodiment of the present invention;



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Figure 12 is the A-A sectional view of Figure 11;

Figure 13 is the schematic diagram of the electric heating rod of the atomizer in the fourth preferred embodiment of the present invention.

Figure 14 is the sectional view of the porous component of the atomizer in the fourth preferred embodiment of the present invention;

Figure 15 is the schematic diagram of the axial direction of Figure 14;

Figure 16 is the side sectional view of the atomizer in the fourth preferred embodiment of the present invention, illustrating the locations of and connection relation between the electric heating rod and porous component;

Figure 17 is the schematic diagram of the axial direction of the atomizer in the fifth preferred embodiment of the present invention;

Figure 18 is the side sectional view of the atomizer in the fifth preferred embodiment of the present invention;

Figure 19 is the side sectional view of the electronic cigarette in the sixth preferred embodiment of the present invention, illustrating the schematic diagram of the airflow sensor adopting a Hall component;

Figure 20 is the electric circuit diagram of the electronic cigarette of the present invention, with the airflow sensor adopting a reed relay structure;

Figure 21 is the electric circuit diagram of the electronic cigarette of the present invention, with the airflow sensor adopting a Hall component;

Figure 22 is the 3D schematic diagram of the charging device of the present invention, illustrating the locations and connection relation of various internal parts.

Figure 23 is the side sectional view of the charging device of the present invention, illustrating the structure of slide way and cover.

Figure 24 is the front schematic diagram of the charging device of the present invention, illustrating the structure when the sliding cover slides.

Specific Embodiments

The present invention is further described as follows by combing the drawings.

As shown in Figures 1-10, this utility model provides an aerosol electronic cigarette, which



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comprises a battery assembly, an atomizer assembly, and a cigarette bottle assembly, and also comprises a shell a, which is hollow and integrally formed. The shell a is an integral piece. The battery assembly is connected with the atomizer assembly, and both are located in the shell. The cigarette bottle assembly is detachably installed at one end of the shell, and is fitted with the atomizer assembly inside the shell. The shell has air inlets al throughout.

In the present specific embodiment, the battery assembly comprises a battery, and an operating indicator 1, an electronic circuit board 4, an airflow sensor 5, which are connected with the battery; it also comprises a check valve 7; the signal output of the airflow sensor 5 is connected with said electronic circuit board 4. The battery is a rechargeable battery 3; the rechargeable battery 3 may be either a rechargeable polymer lithium ion battery or a rechargeable lithium ion battery. The airflow sensor 5 may also be a capacitive sensor or an inductive sensor with a semiconductor force-sensitive chip. The rechargeable battery 3 has a flexibly connected charging plug 2. The blades 21 of the charging plug 2 extend out of the other end of the shell a. A spring 6 is installed between the charging plug 2 and rechargeable battery 3; one end of the spring 6 is abutted against the body of the rechargeable battery 3; the free end is abutted against the charging plug 2, forming a flexible structure, which plays a buffering role when the charging plug 2 is plugged in in order to avoid damages to the rechargeable battery 3. Of course, a charging slot may also be set on the rechargeable battery 3 in this embodiment to replace the structure of charging plug 2, which may also realize the charging function and at the same time play a role of avoiding damages to the rechargeable battery 3. The operating indicator 1 is an LED. In this embodiment, the LED quantity is two. The electronic circuit board 4 comprises an electronic switch circuit. The electronic switch circuit controls the electric circuit according to the input signals so that the rechargeable battery 3 supplies power to the electric heating rod 82 inside the atomizer 8 and the LEDs as well.

As shown in Figure 1 and 2, the airflow sensor 5 has a silica gel corrugated membrane 53; the silica gel corrugated membrane 53 is connected with a magnet 54; a reed relay 52 is set on one end of said magnet 54; both ends of said reed relay 52 correspond to the relay electrodes 51 respectively.

As shown in Figures 5-8, the atomizer assembly is an atomizer 8; the atomizer 8 comprises a porous component 81 and a heating rod 82; the body of the porous component 81 has a through atomizing cavity 811; the diameter of the electric heating rod 82 is smaller than the diameter of the atomizing cavity 811; the electric heating rod 82 is inserted into the atomizing cavity 811, and a gap is formed between [the electric heating rod] and interior wall of the atomizing cavity 811; the gap forms a negative pressure cavity 83; one end of said porous component 81 is fitted with said cigarette bottle assembly. As shown in Figures 5, 7 and 8, a protuberance 812 is set on the other end of the porous component 81, and the protuberance 812 is fitted with the cigarette bottle assembly. The protuberance 812 is a half sphere-shaped protuberance; a through hole 813 is opened on the side of the half sphere-shaped protuberance, and is connected with the atomizing cavity 811. Of course, the shape of the protuberance 812 may also be a taper, rectangle or other shapes. The porous component 81 is made of nickel form, stainless steel fiber felt, macromolecular polymer foam or ceramic form, providing remarkable capabilities of liquid absorption and diffusion, and the ability to absorb the liquid stored in the cigarette bottle assembly.



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As shown in Figure 6, the electric heating rod 82 comprises a cylinder 821; the heating wire 822 is wound on the wall of the cylinder 821; mandrels 823 are also set on the wall of both ends of the cylinder 821 respectively, The mandrels 832 is abutted against the interior wall of the atomizing cavity 811 of the porous component 81. A negative pressure cavity 83 is formed between the electric heating rod and interior wall of the atomizing cavity.

The heating wire is made of a platinum wire, nickel-chromium alloy wire or iron-chromium alloy wire containing rare earth elements, or is made as flakes. Of course, it is also an acceptable plan to adopt a heating layer made of electrically conductive ceramic PTC materials on the peripheral wall of the electric heating rod 82 to replace the heating wire.

In this embodiment, the battery assembly and atomizer assembly are connected to each other and then installed inside the integrally formed shell a to form an integral piece. The rechargeable battery 3 may be charged without frequent replacement of batteries. At the time of use, a user only needs to plug the cigarette bottle assembly into the open end of the shell a. It is not only convenient at the time of use, but also very convenient at the time of replacement.

As shown in Figures 3 and 4, the cigarette bottle assembly comprises a hollow cigarette holder shell b, and a porous component for liquid storage 9 located inside the shell b. The porous component for liquid storage 9 is made of materials such as polypropylene fiber, terylene fiber, or nylon fiber, which may store liquid; alternatively, it may be a plastic foam molded piece; it may also be a column of multi-layer plates made from plastic injection with polyvinyl chloride, polypropylene, and polycarbonate. One end of the cigarette holder shell b is inserted into the shell a, and a concave ventilating groove b2 is set on the outer peripheral surface of the cigarette holder shell b. A suction channel b1 extending inward is set on the surface of one end of the cigarette holder shell b. The suction channel b1 is located in the center on the surface of one end of shell b.

As shown in Figures 1-9, one end of the porous component 81 is abutted against the surface of one end of said porous component for liquid storage 9, and is in contact with the porous component for liquid storage 9. It absorbs the cigarette liquid from the porous component for liquid storage 9. When a smoker smokes, the cavity of the cigarette holder shell b is in the negative pressure state. In the shell a, one end of the airflow sensor 5 forms a normal pressure cavity, while the other end forms a negative pressure cavity. The air pressure difference between the normal pressure cavity and negative pressure cavity or the high-speed airflow enables the magnet 54 of the airflow sensor 5 to drive the reed relay 52 to get in contact with the relay electrode 51. As shown in Figure 20, the electric circuit is turned on; the electronic switch circuit on the electronic circuit board 4 is turned on; the rechargeable battery 3 starts to supply power the electric heating rod 82 inside the atomizer 8; and at the same time, the LED, which is powered by the rechargeable battery 3, emits light. Air enters the normal pressure cavity through the air inlet a1, passes through the check valve 7 via the airflow channel in the airflow sensor 5, and flows to the negative pressure cavity 83 in the atomizer 8. Since the interior of the negative pressure cavity 83 is of negative pressure compared with the exterior, the air flow sprays in at the time of entry; the air flow brings the cigarette liquid in the porous component 81 and sprays into the negative pressure cavity 83 in the form of fine droplets. In the meantime, the electric heating rod 82 is powered by the rechargeable battery 3 under the control of electronic circuit board 4, and it heats and atomizes the fine droplets.



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After atomization, the fine droplets of large diameters are re-absorbed by the porous component 81 under the vortex action; the fine droplets of small diameters suspending in the airflow are formed as aerosol, which is discharged via the negative pressure cavity 83 and the through hole 813, flown into the cigarette holder shell b of the cigarette bottle assembly, and is sucked out via the suction channel b1. After the aerosol enters the cigarette holder shell b, multiple smaller droplets are condensed into drops of larger diameters; when drops of larger diameters appear, the drops fall into the gap between the cigarette holder shell b and suction channel bl, and will not be sucked out via the suction channel bl. The porous component for liquid storage 9 of the cigarette bottle assembly and the porous component 81 of the atomizer 8 are in contact with each other to achieve liquid supply via capillary impregnation.

The device and connection structure of the present utility model may also be loaded with routine drugs as a pulmonary administration device.

As shown in Figures 22, 23 and 24, the aerosol electronic cigarette 5 is held in a charging device. The charging device comprises a case 1; an auxiliary charging storage battery 2 is installed in the case 1; [the case] holds the electronic cigarette 5 and the charger 3 for the rechargeable battery inside the electronic cigarette 5; the power inputs of the auxiliary charging storage battery 2 and charger 3 are connected with the power supply respectively. The charger 3 in present embodiment is a constant voltage and current charger. It may be a GY5210 charger, and it may also be any other constant voltage and current charger. A spare liquid supply bottle 4 is located in the case 1. The power output of the auxiliary charging storage battery 2 is connected with the power input of the charger 3. The power output of the charger 3 is a charging slot 31, which is fitted with the charging plug of the rechargeable battery inside the electronic cigarette, or a charging plug, which is fitted with the charging slot of the rechargeable battery.

As shown in Figures 23 and 24, a pair of slideways 12 are set or installed at the position corresponding to the location of the electronic cigarette on the body of the shell 1; a slide cover 11 is located in said slideways by sliding.

In the second preferred embodiment provided according to the present utility model, a detachable flow restriction component 10 is set on one end of the porous component 81. A flow restriction hole 101 is opened on the body of the flow restriction component 10. The flow restriction hole 101 corresponds to the atomizing cavity 811. The diameter of the flow restriction hole is smaller than the inner diameter of the atomizing cavity 811. To the extent that the size of the restriction component 10 installed on the porous component 81 varies, the diameter of the flow restriction hole 101, which is smaller than the inner diameter of the atomizing cavity 811, also varies, playing the role of airflow control. According to actual use conditions, flow restriction components of different sizes and different diameters may also be replaced accordingly.

In the third preferred embodiment provided by the present utility model, as shown in 11 and 12, a protruding rib b2 that is evenly partitioned is set on the outer peripheral wall of the cigarette holder shell b; the porous component for liquid storage 9 is inserted into the cigarette holder shell b, and is abutted against the protruding rib b2. Thus, a gap is formed between the outer peripheral surface of the porous component for liquid storage 9 and the interior wall of the shell b; the



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gap plays a role of connecting the shell a and cigarette holder shell b; when a user smokes, the suction via the suction channel b1 generates airflow inside the shell a, triggering the airflow sensor 5 and then starting the electronic cigarette. Moreover, at the time of use, the atomizer 8 flows the gas generated by the atomization of the cigarette liquid into the cigarette holder shell b.

In the fourth preferred embodiment provided according to the present utility model, as shown in Figures 13, 14, 15 and 16, a fixed plate 84 is set on one end of the cylinder 821; supporting rods 841, spacing apart from each other, are set on the outer peripheral wall of said fixed plate 84; the outer end of a supporting rod 841 is abutted against the interior wall of the shell a, suspending the cylinder 821, which is connected with the fixed plate 84, in the cavity of the shell a. A mandrel 842 is set on the surface of the fixed plate 84; the front end of said mandrel 842 is abutted against one end of the porous component 81, so that the fixed plate 84 is separated from the atomizing cavity 811 of the porous component 81, and the through hole on one end of the atomizing cavity 811 is not blocked while at the same time the mist generated in the atomizing cavity 811 can be dispersed externally. Two pedal-shaped protuberances 812 are set on the one end of the porous component 81 at the outlet of the atomizing cavity 811; a gap is formed between the two protuberances 812; the protuberances 812 are abutted against the porous component for liquid storage 9.

In the fifth preferred embodiment provided according to the present utility model, as shown in Figures 17 and 18, the atomizer assembly is an atomizer 8; the atomizer 8 comprises a frame 82; a porous component 81 is set on the frame 82; a heating wire 83 is wound on the porous component 81; a through hole 821 is opened on the frame 82; the location where the heating wire 83 is wound on the porous component 81 is on the side of the axial direction of the through hole 821; one end of the porous component 81 is fitted with the cigarette bottle assembly. The porous component 81 is made of nickel form, stainless steel fiber felt, macromolecular polymer foam, or ceramic form.

In the sixth preferred embodiment provided according to the present utility model, as shown in Figure 19, a silica gel corrugated membrane 53 is set on the airflow sensor 5; the silica gel corrugated membrane 53 is connected with a magnet 54; a Hall component 52 is set on one end of the magnet 54. Alternatively a magneto-diode or a magneto-triode may also be set. Figure 21 shows the electric circuit diagram of the electronic cigarette of this solution.



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## Claims

1. An aerosol electronic cigarette, comprising a battery assembly, an atomizer assembly, and a cigarette bottle assembly, characterized in that it also comprises a shell (a) that is hollow and integrally formed; said battery assembly is connected with said atomizer assembly, and both are located in said shell (a); said cigarette bottle assembly is detachably installed on one end of the shell (a), and is also fitted with said atomizer assembly; air inlets (ai) are opened throughout said shell (a).

2. The aerosol electronic cigarette as described in Claim 1, characterized in that said battery assembly comprises a battery, and an operating indicator (1), electronic circuit board (4), and airflow sensor (5), which are connected with said battery; the signal output of said airflow sensor (5) is connected with said electronic circuit board (4).

3. The aerosol electronic cigarette as described in Claim 2, characterized in that it further comprises a check valve (7); said battery is a rechargeable battery (3); a charging plug (2) is flexibly connected with said rechargeable battery (3); the blades (21) of said charging plug (2) extend out of the other end of said shell (a).

4. The aerosol electronic cigarette as described in Claim 3, characterized in that a spring (6) is installed between said charging plug (2) and said rechargeable battery (3); one end of said spring (6) is abutted against the body of said rechargeable battery (3); the free end is abutted against said charging plug (2).

5. The aerosol electronic cigarette as described in Claim 2, characterized in that said battery is a rechargeable battery (3); a charging slot is set on said rechargeable battery (3); said operating indicator (1) is an LED.

6. The aerosol electronic cigarette as described in Claim 2, characterized in that said airflow sensor (5) may also be a capacitive sensor or an inductive sensor with a semiconductor force-sensitive chip.

7. The aerosol electronic cigarette as described in Claim 2, characterized in that said electronic circuit board (4) comprises an electronic switch circuit.

8. The aerosol electronic cigarette as described in Claim 2, characterized in that a silica gel corrugated membrane (53) is set on the airflow sensor (5); said silica gel corrugated membrane (53) is connected with a magnet (54); a reed relay (52) is set on one end of said magnet (54); both ends of said reed relay (52) correspond to the relay electrodes (51) respectively.

9. The aerosol electronic cigarette as described in Claim 2, characterized in that a silica gel corrugated membrane (53) is set on said airflow sensor (5); said silica gel corrugated membrane (53) is connected with a magnet (54); one end of said magnet (54) is connected with a Hall element (52) or a magneto-diode or a magneto-triode.

10. The aerosol electronic cigarette as described in Claim 3 or 5, characterized in that the atomizer assembly is an atomizer (8); said atomizer (8) comprises a porous component (81) and a heating element.

11. The aerosol electronic cigarette as described in Claim 10, characterized in that said atomizer (8) comprises an electric



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heating rod (82); a atomizing cavity (811) is opened through the body of said porous component (81); the diameter of said heating rod (82) is smaller than the diameter of said atomizing cavity (811); said electric heating rod (82) is inserted into said atomizing cavity (811), and a clearance gap is formed between said electric heating rod (82) and interior wall of the atomizing cavity (811); said gap forms a negative pressure cavity (83); one end of said porous component (81) is fitted with said cigarette bottle assembly.

12. The aerosol electronic cigarette as described in Claim 11, characterized in that said electric heating rod (82) comprises a cylinder (821); said heating element is a heating wire (822); said heating wire (822) is wound on the wall of the cylinder (821); mandrels (823) are set on the wall of both ends of the cylinder (821) respectively; a protuberance (812) is set on one end of said porous component (81); said protuberance (812) is fitted with the cigarette bottle assembly; said protuberance (812) is a half sphere-shaped protuberance; a through hole (813), which is connected to the atomizing cavity (811) is opened on the side of said half sphere-shaped protuberance.

13. The aerosol electronic cigarette as described in Claim 11, characterized in that said electric heating rod (82) comprises a cylinder (821); said heating element is made of electrically conductive ceramic PTC materials; said heating element is set on the wall of said cylinder (821); mandrels (823) are set on the wall of both ends of said cylinder (821) respectively; a protuberance (812) is set on one end of said porous component (81); said protuberance (812) is fitted with said cigarette bottle assembly; said protuberance (812) is a half sphere-shaped protuberance; a through hole (813), which is connected to the atomizing cavity (811) is opened on the side of said half sphere-shaped protuberance.

14. The aerosol electronic cigarette as described in Claim 10, characterized in that said heating element is heating wire; said atomizer (8) comprises a frame (82); said porous component (81) is set on the frame (82); the heating wire (83) is wound on the porous component (81); a through hole (821) is opened on the frame (82); the location where the heating wire (83) is wound on said porous component (81) is on the side of the axial direction of said through hole (821); one end of said porous component (81) is fitted with said cigarette bottle assembly.

15. The aerosol electronic cigarette as described in Claim 10, characterized in that said porous component (81) is made of nickel form, stainless steel fiber felt, macromolecular polymer foam, or ceramic form.

16. The aerosol electronic cigarette as described in Claim 10, characterized in that said heating wire is made of a platinum wire, nickel-chromium alloy wire, or iron-chromium alloy wire containing rare earth elements, or is made as flakes.

17. The aerosol electronic cigarette as described in Claim 11, characterized in that a flow restriction component is detachably set on one end of said porous component (81); a flow restriction hole is opened on the body of said flow restriction component; said flow restriction hole corresponds to said atomizing cavity (811); the diameter of said flow restriction hole is smaller than the inner diameter of the atomizing cavity (811).

18. The aerosol electronic cigarette as described in Claim 12 and 14, characterized in that said cigarette bottle assembly



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comprises a hollow cigarette holder shell (b), and a porous component for liquid storage (9) located inside said cigarette holder shell (b); one end of said cigarette holder shell (b) is inserted into said shell (a); a concave ventilating groove (b2) is set on the outer peripheral surface of said cigarette holder shell (b); a suction channel (b1) extending inward is set on the surface of one end of the cigarette holder shell (b).

19. The aerosol electronic cigarette as described in Claim 18, characterized in that said suction channel (b1) is located in the center of the surface on one end of said cigarette holder shell (b).

20. The aerosol electronic cigarette as described in Claim 18, characterized in that one end of the porous component (81) is abutted against the surface of one end surface of said porous component for liquid storage (9), and is in contact with the porous component for liquid storage (9).

21. The aerosol electronic cigarette as described in Claim 18, characterized in that said perforated component for liquid storage (9) is made of such materials as polypropylene fiber, terylene fiber, or nylon fiber.

22. The aerosol electronic cigarette as described in Claim 18, characterized in that said porous component for liquid storage (9) is a plastic foam molded piece or a column of multi-layer plates made from plastic injection with polyvinyl chloride, polypropylene, and polycarbonate.

23. The aerosol electronic cigarette as described in Claim 11 or 14, characterized in that said aerosol electronic cigarette (5) is located in a charging device.

24. The aerosol electronic cigarette as described in Claim 23, characterized in that said charging device comprises a case (1); said case (1) contains an auxiliary charging storage battery (2) installed inside, and holds the electronic cigarette (5) and the charger (3) for the rechargeable battery in the electronic cigarette (5); the power inputs of the auxiliary charging storage battery (2) and charger (3) are connected with the power supply respectively.

25. The aerosol electronic cigarette as described in Claim 24, characterized in that a spare liquid supply bottle (4) is set in said case (1).

26. The aerosol electronic cigarette as described in Claim 24, characterized in that the power output of said auxiliary charging storage battery (2) is connected with the power input of said charger (3).

27. The aerosol electronic cigarette as described in Claim 24, characterized in that the power output of said charger (3) is a charging slot (31), which is fitted with the charging plug of the rechargeable battery inside said electronic cigarette, or a charging plug, which is fitted with the charging slot of the rechargeable battery.

28. The aerosol electronic cigarette as described in Claim 26, characterized in that said charger (3) is a constant voltage and current charger.

29. The aerosol electronic cigarette as described in Claim 24, characterized in that a pair of slideways (12) are set or installed at the position corresponding to the location of said electronic cigarette on the body of said shell (1); a slide cover (11) is located in said slideways (12) by sliding.



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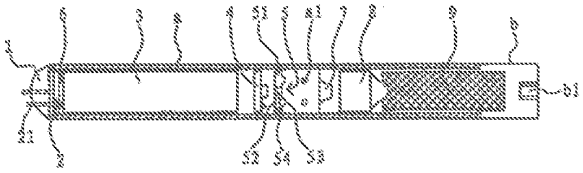


Figure 1

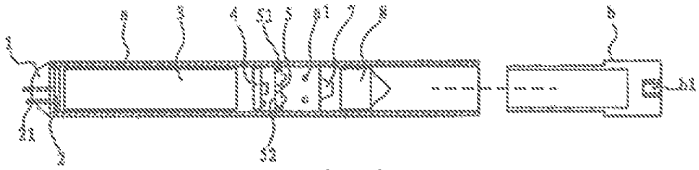


Figure 2

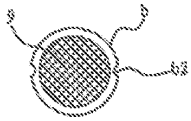


Figure 3

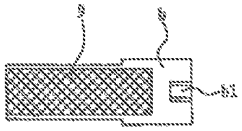


Figure 4

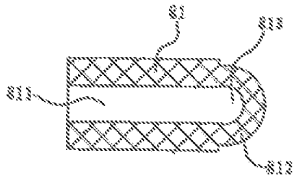



Figure 5

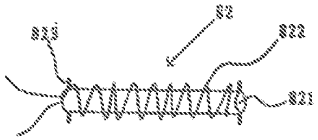



Figure 6

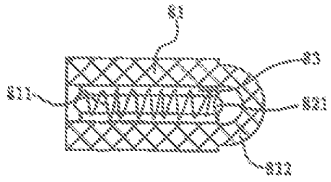



Figure 7

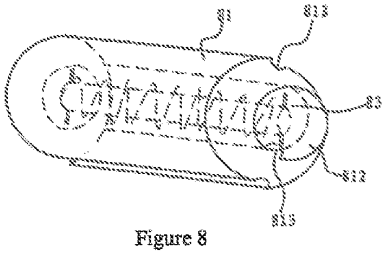



Figure 8

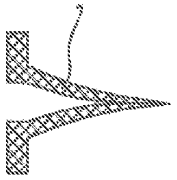


Figure 9

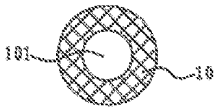



Figure 10

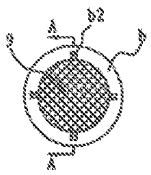



Figure 11

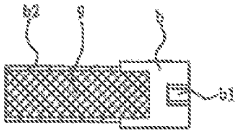



Figure 12

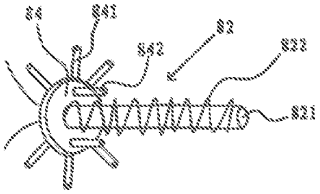



Figure 13

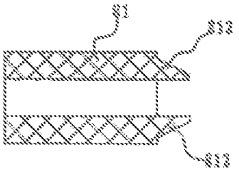



Figure 14




Figure 15

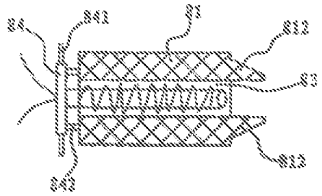



Figure 16

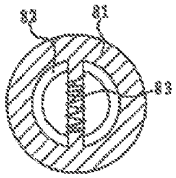



Figure 17

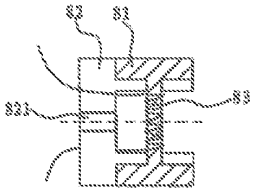



Figure 18

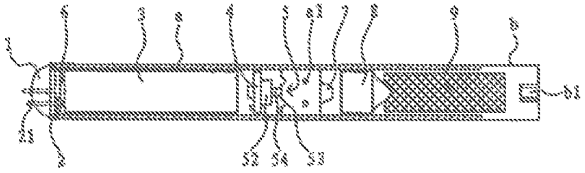



Figure 19

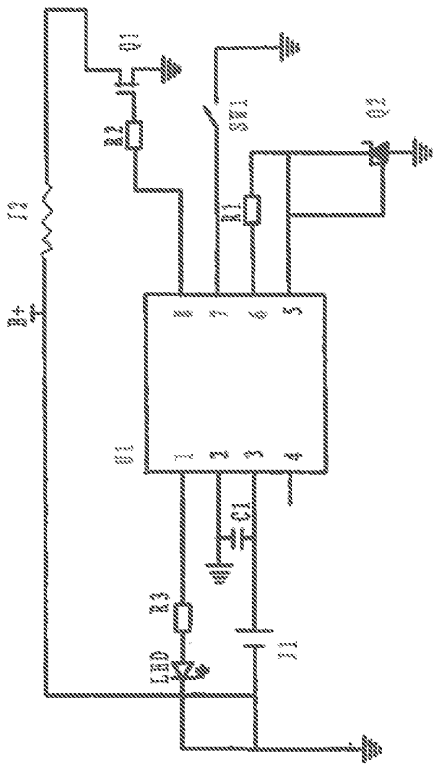



Figure 20

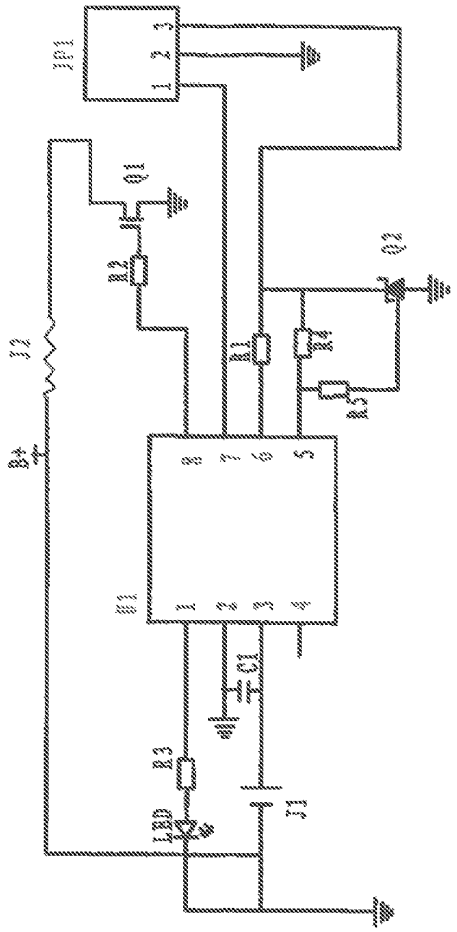



Figure 21

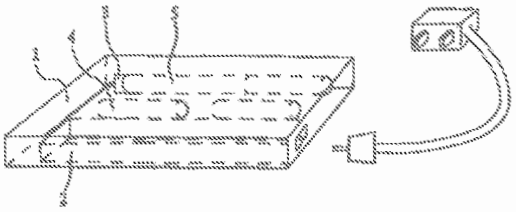


Figure 22

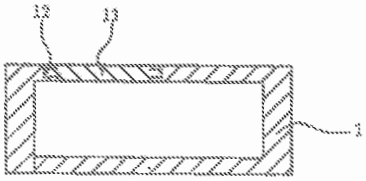



Figure 23

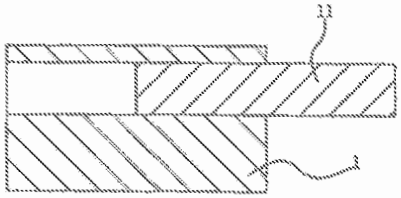



Figure 24

# INTERNATIONAL SEARCH REPORT

International application No.
PCT/CN2007/001575

A. CLASSIFICATION OF SUBJECT MATTER

See extra sheet

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

IPC: A24D, A24F

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)

WPI&EPODOC&PAJ Chinese Patent Document (1985-)

Electronic, pipe, cigarette

C. DOCUMENTS CONSIDERED TO BE RELEVANT

| Category* | Citation of document, with indication, where appropriate, of the relevant passages | Relevant to claim No. |
|---|---|---|
| X | CN2771863Y(HAN Lijin) 12 Apr. 2006(12.04.2006)<br>Page 3 lines 8- page 4 lines 27;figures 1-5 | 1-18 |
| A | CN1253061A(SONG Guoqiang) 17 May 2000(17.05.2000)<br>the whole document | 1-29 |
| A | US4809928A (BRITISH-AMERICAN TOBACCO CO., LTD.) 07 Aug. 1990(07.08.1990)<br>the whole document | 1-29 |
| A | CN1337167A (SEIKO EPSON CORP.) 06 Feb.2002(06.02.2002)<br>the whole document | 1-29 |

☐ Further documents are listed in the continuation of Box C. ☒ See patent family annex.

* Special categories of cited documents:

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"O" document referring to an oral disclosure, use, exhibition or other means

"P" document published prior to the international filing date but later than the priority date claimed

"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention

"X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone

"Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art

"&" document member of the same patent family

| Date of the actual completion of the international search | Date of mailing of the international search report |
|---|---|
| 20 Jul. 2007(20.07.2007) | 16 Aug. 2007 (16.08.2007) |
| Name and mailing address of the ISA/CN<br>The State Intellectual Property Office, the P.R.China<br>6 Xitucheng Rd., Jimen Bridge, Haidian District, Beijing, China<br>100088<br>Facsimile No. 86-10-62019451 | Authorized officer<br>ZHAO,Xiaoyu<br>Telephone No. (86-10)62085853 |

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**INTERNATIONAL SEARCH REPORT**
**Information on patent family members**

International application No.
PCT/CN2007/001575

| Patent Documents referred in the Report | Publication Date | Patent Family | Publication Date |
|---|---|---|---|
| CN2719983Y | 24 Aug. 2005 | AU2007321354A | 27 Oct. 2007 |
| | | WO2008009496A | 27 Oct. 2005 |
| | | CA2563581A | 27 Oct. 2005 |
| | | EP2136698A | 27 Dec. 2008 |
| | | CN1965744A | 04 Apr.2007 |
| | | RRP1020087008A | 22 May 2007 |
| CN1332961A | 17 May 2008 | None | |
| US4640298A | 07 Aug. 1990 | GB2191718A | 23 Dec. 1987 |
| | | DE3719718A | 23 Dec. 1987 |
| | | GB2191718B | 05 Sep. 1990 |
| CN1756473A | 09. Feb.2005 | US20050145580A1 | 07 Jan. 2005 |
| | | JP2005034021A | 10 Feb. 2005 |
| | | CN1284492C | 15 Nov. 2006 |

Form PCT/ISA /210 (patent family annex) (April 2005)

INTERNATIONAL SEARCH REPORT

International application No.
PCT/CN2007/001575

According to International Patent Classification (IPC) or to both national classification and IPC
A24B15/18(2006.01) i
A24F47/00(2006.01) i

Form PCT/ISA/210 (extra sheet) (April 2007)

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(19) 世界知识产权组织
国 际 局

(43) 国际公布日
2007 年 11 月 22 日 (22.11.2007)

PCT

(10) 国际公布号
WO 2007/131449 A1

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200620090805.0
2006 年 5 月 16 日 (16.05.2006) CN

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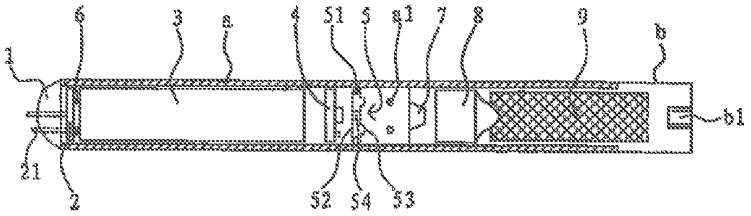
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(54) Title: AEROSOL ELECTRONIC CIGRARETTE

(54) 发明名称：一种雾化电子烟




(57) Abstract: An aerosol electronic cigarette includes a battery assembly,an atomizer assembly and a cigarette bottle assembly and also includes a shell(a) which is hollow and integrally formed. Said battery assembly connects with said atomizer assembly and both are located in said shell(a). Said cigarette bottle assembly is located in one end of the shell(a),which is detachable. Said cigarette bottle assembly fits with said atomizer assembly. Said shell(a) has through-air-inlets(a1).

(57) 摘要：

一种雾化电子烟，包括电池组件、雾化器组件和烟瓶组件，还包括一中空的一体成形的壳体(a)，所述电池组件与所述雾化器组件相连接，并容置于所述壳体(a)内，所述烟瓶组件可拆卸的安装于所述壳体(a)的一端，并与其内的所述雾化器组件相配合，所述壳体(a)上贯穿的开有进气孔(a1)。

WO 2007/131449 A1

# 一种雾化电子烟

## 技术领域

本发明涉及一种电子烟，特别是一种不含有焦油、只含烟碱（尼古丁）的雾化电子烟。

## 背景技术

在当今“吸烟有害健康”已成为常识的情况下，全世界目前仍有 10 亿人吸烟，而且每年这个数字还在扩大。2003 年 3 月 1 日世界卫生组织（WHO）通过的第一个国际禁烟协定《烟草控制框架公约》，据 WHO 提供的数字表明，吸烟每年造成 490 万人死亡，尽管吸烟可导致严重的呼吸系统疾病和癌症，让吸烟者完全戒烟是极其困难的事。

香烟的有效成分是烟碱（即尼古丁），吸烟时烟碱随着香烟燃烧产生的大量焦油雾滴进入肺泡后被迅速吸收，烟碱被吸收入血后作用于中枢神经系统的受体上，引起类似兴奋剂的“陶醉感”，如吸烟者所经历的头晕目眩或飘飘然的感觉。

烟碱是小分子生物碱，在小剂量下对人体基本无害，而且在血液中的半衰期极短。烟草的有害物质主要是焦油，烟草焦油是由数千种成分组成，其中有数十种成分是致癌物。目前证实被动吸烟对不吸烟者的危害更大。

为了寻找只含烟碱而不含有害焦油的香烟代用品，有许多发明是用较纯的烟碱制成诸如“戒烟贴”、“烟碱含漱水”、“包装在有抛射剂的高压气罐喷雾剂”、“烟碱口香糖”、“烟碱饮料”等产品，这些产品虽然没有焦油的危害，但因烟碱吸收缓慢，在血液中不能建立有效的高峰浓度，不能解决需求烟碱“过瘾”的感觉，同时也剥夺了吸烟者已经养成的“抽”、“吸”的习惯，因而类似的产品不能真正的作为戒烟用品或香烟代用品。

现有市面上的电子烟产品，虽然可以解决上述问题，但同时结构比较复杂。烟体大多分为三段，使用者在使用时需将各段插接或螺纹连接在一起才能使用。另外，电池需要频繁的更换，给使用者带来诸多不便。而且，更重要的一点是，电子烟在工作中产生的雾化效果不够理想，雾化效率不高。

发明内容

为了克服上述不足，本发明的目的在于提供一种具有戒烟和香烟代用品作用的雾化电子烟。

本发明的目的是通过以下技术方案来实现的：一种雾化电子烟，包括电池组件，雾化器组件和烟瓶组件，还包括一中空的一体成形的壳体，所述电池组件与所述雾化器组件相连接，并容置于所述壳体内，所述烟瓶组件可拆卸的安装于所述壳体的一端，并与其内的所述雾化器组件相配合，所述壳体上贯穿的开有进气孔。

本发明进一步特征在于：所述电池组件包括电池，与所述电池连接的工作指示灯、电子线路板、气流传感器，所述气流传感器的信号输出端与所述电子线路板相连接；

还包括一单向阀，所述电池为一充电电池，所述充电电池设有一与其相弹性连接的充电插头，所述充电插头上的插片从所述壳体的另一端伸出；

所述充电插头与所述充电电池之间安装有弹簧，所述弹簧的一端顶靠于所述充电电池的本体上，自由端顶靠于所述充电插头上；

所述电池为一充电电池，所述充电电池上设有一充电插槽；所述工作指示灯为发光二极管；

所述气流传感器也可为半导体力敏芯片电容传感器或电感式传感器；

所述电子线路板包括电子开关电路；



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所述气流传感器设有一硅胶件波纹膜，所述硅胶件波纹膜连接一磁钢，所述磁钢的一端设有干簧继电片，所述干簧继电片的两端分别与继电电极相对应；

所述气流传感器设有一硅胶件波纹膜，所述硅胶件波纹膜连接一磁钢，所述磁钢的一端设有霍尔器件或磁敏二极管或磁敏三极管；

所述雾化器组件为一雾化器，所述雾化器包括一多孔渗透件，加热体；

所述雾化器还包括一电加热棒，所述多孔渗透件的本体开有一贯通的雾化腔，所述电加热棒的直径小于所述雾化腔的直径，所述电加热棒伸入所述雾化腔内，并与所述雾化腔内壁之间形成有空隙，所述空隙为负压气流腔，所述多孔渗透件的一端与所述烟瓶组件相配合；

所述电加热棒包括一圆柱体，所述加热体为一加热丝，所述加热丝缠绕于所述圆柱体的周壁上，所述多孔渗透件的一端设有凸起，所述凸起与所述烟瓶组件相配合；所述凸起为半圆形球形凸起，在所述半圆形球形凸起的侧边开有与所述雾化腔相连通的通孔；

所述电加热棒包括一圆柱体，所述加热体采用导电陶瓷PTC材料制成，所述加热体设于所述圆柱体的周壁上，在所述圆柱体两端的周壁上分别设有顶杆，所述多孔渗透件的一端设有凸起，所述凸起与所述烟瓶组件相配合；所述凸起为半圆形球形凸起，在所述半圆形球形凸起的侧边开有与所述雾化腔相连通的通孔；

所述加热体为加热丝，所述雾化器组件包括一架体，所述多孔渗透件设于所述架体上，所述多孔渗透件上缠绕有加热丝，所述架体上开有一通孔，所述多孔渗透件上缠绕加热丝的部位处于所述通孔的轴向方向的一侧，所述多孔渗透件的一端与所述烟瓶组件相配合；

所述多孔渗透件采用泡沫镍、不锈钢纤维毡、高分子多聚物发泡体或泡沫陶瓷制成；

所述加热丝为铂丝、镍铬合金或含有稀土元素的铁铬铝合金丝制成，或制成片状体；



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在所述多孔体渗透件的一端可拆卸的设有一限流件，所述限流件的本体上开有限流孔，所述限流孔与所述雾化腔相对应，所述限流孔的孔径小于所述雾化腔的内径；

所述烟瓶组件包括一中空的烟嘴壳体，容置于所述烟嘴壳体内的贮液多孔体，所述烟嘴壳体的一端插入所述壳体，所述烟嘴壳体的外周面具有向内凹的通气凹槽，在所述烟嘴壳体一端的端面上设有一向内延伸的吸气道；

所述吸气道位于所述烟嘴壳体一端端面的中心处；

所述多孔渗透件的一端抵靠于所述贮液多孔体一端的端面，与所述贮液多孔体相接触；

所述贮液多孔体的材料为聚丙纤维、涤纶纤维或尼龙纤维；

所述贮液多孔体采用塑料发泡成形体；或用聚氯乙烯、聚丙烯、聚碳酸酯注塑成多层板的柱状体；

所述电子烟容置于一充电装置中；

所述充电装置包括一盒体，所述盒体内安装有辅助充电蓄电池，容置电子烟并给电子烟内部的充电电池充电的充电器，以及电源电路，所述辅助充电蓄电池和充电器的电源输入端分别与电源电路相连接；

所述盒体内设有备用供液瓶；

所述辅助充电蓄电池的电源输出端与所述充电器的电源输入端相连接；

所述充电器的电源输出端为一与所述电子烟内部充电电池上的充电插头相配合的充电插槽，或与充电电池上的充电插槽相配合的充电插头；

所述充电器为一恒压恒流充电器；

在所述壳体的本体上，对应于放置所述电子烟的位置开有或安装有一对滑槽，所述滑槽内滑动的容置有一滑盖。

采用本发明带来的有益效果：（1）本发明在烟瓶组件内的贮液多孔体上只贮存有烟碱液，而不含焦油，大大降低了吸烟带来的致癌风险，同时吸烟者在使用时仍有吸烟的感觉和兴奋，无需点燃，无火灾危害。（2）



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本发明将电池组件和雾化器组件直接安装于壳体内，之后与烟瓶组件相插接，只有两个部件之间的相互连接，结构简单。在使用或更换时只需将烟嘴插入壳体即可，使用更换方便。当烟瓶组件内部的烟碱液用完或烟瓶组件损坏需要更换时，操作亦十分方便。（3）本发明的电池组件内部的充电电池设有充电插头，充电插头的插片从壳体内伸出，当电子烟内的充电电池电量用完时可直接插在充电器上进行充电，而无需将充电电池拆卸下来，使用更加方便。（4）本发明的充电装置内部包括充电器和辅助充电蓄电池，电子烟在不使用时放在充电器里，充电装置接上电源即可对电子烟进行充电，并同时对辅助充电蓄电池充电。当没有供充电装置使用的电源时，辅助充电蓄电池则会对电子烟进行充电。在携带的过程中即可完成对电子烟的充电，而且出差或旅行时携带方便。另外，充电装置内还有备用供液瓶，备用供液瓶内装有烟碱液，当出差或旅行时，可以做备用。（5）本发明烟瓶组件的壳体一端设有向内延伸的吸气道，该吸气道的作用是当电子烟工作产生雾气后，雾气在向壳体流动的过程中有些细小的液滴会相互凝结成较大的液滴，当出现较大的液滴时，液滴就会顺着吸气道的外壁落入烟瓶组件壳体的内腔中，而不会从吸气道中被吸烟者吸走。（6）另外，本发明的装置和连接结构在贮液器稍加改动后可装入常规药物供肺内给药器械。

附图说明

图1为本发明电子烟的侧面剖视图；

图2为本发明电子烟的烟瓶组件壳体a分离后的剖视图；示出烟瓶组件可拆卸的安装于壳体a的结构；

图3为本发明烟瓶组件的轴向结构示意图，示出烟嘴壳体周壁上的通气凹槽结构

图4为本发明烟瓶组件的侧面剖视图；示出吸气道的结构；



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图5为本发明雾化器的多孔渗透件的侧面剖视图，示出雾化腔，半圆形球形凸起的结构；

图6为本发明雾化器的电加热棒的结构示意图；

图7为本发明雾化器的侧面剖视图，示出电加热棒与多孔渗透件的位置连接关系；

图8为本发明雾化器的立体结构示意图，示出电加热棒与多孔渗透件的位置连接关系；

图9为本发明单向阀的剖视图；

图10为本发明第二优选实施例中限流件的正面剖视图，示出限流孔的结构；

图11为本发明第三优选实施例中烟瓶组件的轴向结构示意图；

图12为图11的A-A向剖视图；

图13为本发明第四优选实施例雾化器中的电加热棒的结构示意图；

图14为本发明第四优选实施例雾化器中的多孔渗透件的剖视图，

图15为图14的轴向结构示意图；

图16为本发明第四优选实施例雾化器的侧面剖视图，示出电加热棒与多孔渗透件的连接位置关系；

图17为本发明第五优选实施例雾化器轴向结构示意图；

图18为本发明第五优选实施例雾化器的侧面剖视图；

图19为本发明第六优选实施例电子烟的侧面剖视图，示出气流传感器采用霍尔器件的结构示意图；

图20为本发明气流传感器采用干簧继电片结构的电子烟的电路图；



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图21为本发明气流传感器采用霍尔器件的电子烟的电路图；

图22为本发明充电装置的立体结构示意图，示出内部各部件的位置和连接关系；

图23为本发明充电装置侧面剖视图，示出滑盖和滑槽的结构；

图24为本发明充电装置的正面结构示意图，示出滑盖滑动时的结构；

具体实施方式

下面结合附图对本发明做进一步的详述：

如图1至图10所示，本实用新型提供的一种雾化电子烟，包括电池组件，雾化器组件和烟瓶组件，还包括一中空的一体成形的壳体a，壳体a为一整体件，一体成形。电池组件与雾化器组件相连接，并容置于壳体内，烟瓶组件可拆卸的安装于壳体的一端，并与其内的雾化器组件相配合，壳体a上贯穿的开有进气孔a1。

在本具体实施例中，电池组件包括电池，与电池连接的工作指示灯1、电子线路板4、气流传感器5，还包括一单向阀7，气流传感器5的信号输出端与电子线路板4相连接。本实施例中的电池为一充电电池3，充电电池3为可充电的聚合物锂电池，也可为可充电的锂离子电池。气流传感器5也可为半导体力敏芯片电容传感器或电感式传感器。充电电池3设有一与其相弹性连接的充电插头2，充电插头2上的插片21从壳体a的另一端伸出。充电插头2与充电电池3之间安装有弹簧6，弹簧6的一端顶靠于充电电池3的本体上，自由端顶靠于充电插头2上，形成一种弹性结构，在充电时，插接充电插头2的时候起到缓冲的作用，避免损坏充电电池3。当然，本实施例的充电电池3上也可设有位于充电电池3上的充电插槽，代



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普充电插头2的结构，一样可以实现充电的功能，同时起到避免损坏充电电池3的作用。工作指示灯1为发光二极管，本实施例发光二极管的数量为2个。电子线路板4包括电子开关电路。电子开关电路根据输入的信号进行电路的通断控制，以便实现充电电池3对雾化器8内的电加热棒82进行供电以及对发光二极管供电。

如图1，图2所示，气流传感器5设有一硅胶件波纹膜53，硅胶件波纹膜53连接一磁钢54，所述磁钢54的一端设有干簧继电片52，所述干簧继电片52的两端分别与继电电极51相对应。

如图5至图8所示，雾化器组件为一雾化器8，雾化器8包括一多孔渗透件81，电加热棒82，多孔渗透件81的本体开有一贯通的雾化腔811，电加热棒82的直径小于雾化腔811的直径，电加热棒82伸入雾化腔811内，并与雾化腔811内壁之间形成有空隙，空隙为负压气流腔83，多孔渗透件81的一端与烟瓶组件相配合。如图5，图7和图8所示，多孔渗透件81的另一端设有凸起812，凸起812与烟瓶组件相配合。凸起812为半圆形球形凸起，在半圆形球形凸起的侧边开有与雾化腔811相连通的通孔813。当然，凸起812的形状还可为圆锥形、矩形等其他形状。多孔渗透件81采用泡沫镍、不锈钢纤维毡、高分子多聚物发泡体或泡沫陶瓷制成，具有很好的液体吸附及扩散能力，可以将烟瓶组件中存储的烟液吸附过来。

如图6所示，电加热棒82包括一圆柱体821，加热丝822缠绕于圆柱体821的周壁上，在圆柱体821两端的周壁上还分别设有顶杆823。顶杆823抵靠于多孔渗透件81的雾化腔811内壁上，在电加热棒与雾化腔内壁之间形成负压气流腔83。



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加热丝为铂丝、镍铬合金或含有稀土元素的铁铬铝合金丝制成，或制成片状体。当然，在电加热棒82的周壁上设有采用导电陶瓷PTC材料制成的加热层来代替加热丝的方案也是可以的。

本实施例的电池组件与雾化器组件相互连接后安装于一体成形的壳体a内，形成一个整体部件，充电电池3可进行充电而无需再频繁的更换电池。在使用时，使用者只需将烟瓶组件插接到壳体a的一端开口处即可使用，不仅使用时方便，而且在更换时也十分方便。

如图3，图4所示，烟瓶组件包括一中空的烟嘴壳体b，容置于壳体b内的贮液多孔体9。贮液多孔体9的材料为聚丙纤维、涤纶纤维或尼龙纤维等可以存储液体的材料，或采用塑料发泡成形体；或用聚氯乙烯、聚丙烯、聚碳酸酯注塑成多层板的柱状体。烟嘴壳体b的一端插入壳体a，烟嘴壳体b的外周面具有向内凹的通气凹槽b2，在烟嘴壳体b一端的端面上设有一向内延伸的吸气道b1。吸气道b1位于壳体b一端端面的中心处。

如图1至图9，多孔渗透件81的一端抵靠于贮液多孔体9一端的端面，与贮液多孔体9相接触。将贮液多孔体9中存储的烟液吸附过来。当吸烟者吸烟时，烟嘴壳体b的内腔处于负压状态。在壳体a内，气流传感器5的一端形成常压腔，另一端形成负压腔，常压腔与负压腔之间的气压差或高速气流导致气流传感器5上的磁钢54带动干簧继电片52动作，与继电电极51相接触，如图20所示，电路导通，电子线路板4内的电子开关电路导通，充电电池3开始对雾化器8内的电加热棒82供电，同时发光二极管在充电电池3的供电下发光。大气由进气孔a1进入到常压腔内，经气流传感器5内的气流通道通过单向阀7，流到雾化器8内的负压气流腔83，由于负



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压气流腔83内部较于外部为负压，气流进入时为喷射状进入，气流带动多孔渗透件81中的烟液以微滴形式喷射到负压气流腔83内，此时，电加热棒82在电子线路板4的控制下与充电电池3通电，对微滴进行加热雾化，雾化后的大直径微滴在涡流的作用下被多孔渗透件81重吸收，小直径微滴悬浮在气流中形成气溶胶经由负压气流腔83和通孔813排出，继而流入烟瓶组件的烟嘴壳体b中，被吸气道b1吸出。在气溶胶进入烟嘴壳体b内后，会出现由于多个较小的液滴相互凝结而形成直径较大的液滴，当出现直径较大的液滴后，液滴会落入烟嘴壳体b与吸气道b1的空隙处，而不会被吸气道b1吸走。烟瓶组件中的贮液多孔体9与雾化器8中的多孔渗透件81相接触实现毛细浸润供液。

本实用新型的装置和连接结构还可装入常规药物作为肺内吸入式给药器械。

如图22，图23和图24所示，雾化电子烟5容置于一充电装置中。充电装置包括一盒体1，盒体1内安装有辅助充电蓄电池2，容置电子烟5并给电子烟5内部的充电电池充电的充电器3，辅助充电蓄电池2和充电器3的电源输入端分别与电源相连接。本实施例中的充电器3为一恒压恒流充电器，可以采用GY5210型号充电器，也可为其他恒流恒压充电器。盒体1内还设有备用供液瓶4。辅助充电蓄电池2的电源输出端与充电器3的电源输入端相连接。充电器3的电源输出端为一与电子烟内部充电电池上的充电插头相配合的充电插槽31，或与充电电池上的充电插槽相配合的充电插头。



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如图23和图24所示，在壳体1的本体上，对应于放置电子烟的位置开有或安装有一对滑槽12，滑槽内滑动的容置有一滑盖11。

按照本实用新型提供的第二优选实施例中：在多孔体渗透件81的一端可拆卸的设有一限流件10，限流件10的本体上开有限流孔101，限流孔101与雾化腔811相对应，限流孔的孔径小于雾化腔811的内径。限流孔101的孔径根据安装于多孔体渗透件81上的限流件10的尺寸的不同，小于雾化腔811内径的尺寸也不同，起到限制气体流量的作用，并根据实际使用情况可相应的更换不同尺寸，不同孔径的限流件。

本实用新型提供的第三优选实施例中：如图11，图12所示，在烟嘴壳体b的外壁上设有均分相间隔分部的凸肋b2，贮液多孔体9伸入烟嘴壳体b内后抵靠于凸肋b2上。这样，贮液多孔体9的外周面与壳体b的内壁之间就形成有空隙，该空隙起的作用是连通壳体a与烟嘴壳体b，在使用者吸烟时，通过吸气道b1吸气使壳体a内部产生气流流动，触动气流传感器5，进而启动电子烟工作。另外，在雾化器8工作时将烟液雾化后产生的气体流入到烟嘴壳体b内。

本实用新型提供的第四优选实施例中：如图13，图14，图15和图16所示，圆柱体821的一端设有一固定板84，所述固定板84的外周壁相间隔的设有支撑杆841，支撑杆841的外端顶靠与壳体a的内壁上，把与固定板84连接的圆柱体821悬空在壳体a的空腔内。在固定板84的板面上设有顶杆842，所述顶杆842的前端与多孔渗透件81的一端相抵靠，使固定板84与多孔渗透件81中的雾化腔811隔开，不至于将雾化腔811一端的通孔堵住，同时也便于雾化腔811产生的气雾向外扩散。多孔渗透件81的一端在



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雾化腔811的腔口处设有两个翅状的凸起812，这两个凸起812之间形成间隙，凸起812抵靠于贮液多孔体9。

按照本实用新型提供的第五优选实施例中：如图17，图18所示，雾化器组件为一雾化器8，雾化器8包括一架体82，设于架体82上的多孔渗透件81，多孔渗透件81上缠绕有加热丝83，架体82上开有一通孔821，多孔渗透件81上缠绕加热丝83的部位处于通孔821的轴向方向的一侧，多孔渗透件81的一端与烟瓶组件相配合。多孔渗透件81采用泡沫镍、不锈钢纤维毡、高分子多聚物发泡体或泡沫陶瓷制成。

按照本实用新型提供的第六优选实施例中，如图19所示，气流传感器5设有一硅胶件波纹膜53，硅胶件波纹膜53连接一磁钢54，磁钢54的一端设有霍尔器件52。或也可设磁敏二极管或磁敏三极管。图21为采用该方案的电子烟电路图。



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# 权 利 要 求

1、一种雾化电子烟，包括电池组件，雾化器组件和烟瓶组件，其特征在于：还包括一中空的一体成形的壳体（a），所述电池组件与所述雾化器组件相连接，并容置于所述壳体（a）内，所述烟瓶组件可拆卸的安装于所述壳体（a）的一端，并与其内的所述雾化器组件相配合，所述壳体（a）上贯穿的开有进气孔（a1）。

2、根据权力要求1所述的雾化电子烟，其特征在于：所述电池组件包括电池，与所述电池连接的工作指示灯（1）、电子线路板（4）、气流传感器（5），所述气流传感器（5）的信号输出端与所述电子线路板（4）相连接。

3、根据权力要求2所述的雾化电子烟，其特征在于：还包括一单向阀（7），所述电池为一充电电池（3），所述充电电池（3）设有一与其弹性连接的充电插头（2），所述充电插头（2）上的插片（21）从所述壳体（a）的另一端伸出。

4、根据权力要求3所述的雾化电子烟，其特征在于：所述充电插头（2）与所述充电电池（3）之间安装有弹簧（6），所述弹簧（6）的一端顶靠于所述充电电池（3）的本体上，自由端顶靠于所述充电插头（2）上。

5、根据权力要求2所述的雾化电子烟，其特征在于：所述电池为一充电电池（3），所述充电电池（3）上设有一充电插槽，所述工作指示灯（1）为发光二极管。

6、根据权力要求2所述的雾化电子烟，其特征在于：所述气流传感器（5）也可为半导体力敏芯片电容传感器或电感式传感器。

7、根据权力要求2所述的雾化电子烟，其特征在于：所述电子线路板（4）包括电子开关电路。

8、根据权力要求2所述的雾化电子烟，其特征在于：所述气流传感器（5）设有一硅胶件波纹膜（53），所述硅胶件波纹膜（53）连接一磁



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钢（54），所述磁钢（54）的一端设有干簧继电片（52），所述干簧继电片（52）的两端分别与继电电极（51）相对应。

9、根据权力要求2所述的雾化电子烟，其特征在于：所述气流传感器（5）设有一硅胶件波纹膜（53），所述硅胶件波纹膜（53）连接一磁钢（54），所述磁钢（54）的一端设有霍尔器件（52）或磁敏二极管或磁敏三极管。

10、根据权力要求3或5所述的雾化电子烟，其特征在于：所述雾化器组件为一雾化器（8），所述雾化器（8）包括一多孔渗透件（81），加热体。

11、根据权利要求10所述的雾化电子烟，其特征在于：所述雾化器（8）还包括一电加热棒（82），所述多孔渗透件（81）的本体开有一贯通的雾化腔（811），所述电加热棒（82）的直径小于所述雾化腔（811）的直径，所述电加热棒（82）伸入所述雾化腔（811）内，并与所述雾化腔（811）内壁之间形成有空隙，所述空隙为负压气流腔（83），所述多孔渗透件（81）的一端与所述烟瓶组件相配合。

12、根据权力要求11所述的雾化电子烟，其特征在于：所述电加热棒（82）包括一圆柱体（821），所述加热体为一加热丝（822），所述加热丝（822）缠绕于所述圆柱体（821）的周壁上，在所述圆柱体（821）两端的周壁上分别设有顶杆（823），所述多孔渗透件（81）的一端设有凸起（812），所述凸起（812）与所述烟瓶组件相配合；所述凸起（812）为半圆形球形凸起，在所述半圆形球形凸起的侧边开有与所述雾化腔（811）相连通的通孔（813）。

13、根据权利要求11所述的雾化电子烟，其特征在于：所述电加热棒（82）包括一圆柱体（821），所述加热体采用导电陶瓷PTC材料制成，所述加热体设于所述圆柱体（821）的周壁上，在所述圆柱体（821）两端的周壁上分别设有顶杆（823），所述多孔渗透件（81）的一端设有凸起（812），所述凸起（812）与所述烟瓶组件相配合；所述凸起（812）为半圆形球形凸起，在所述半圆形球形凸起的侧边开有与所述雾化腔（811）相连通的通孔（813）。



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14、根据权力要求10所述的雾化电子烟，其特征在于：所述加热体为加热丝，所述雾化器（8）包括一架体（82），所述多孔渗透件（81）设于所述架体（82）上，所述多孔渗透件（81）上缠绕有所述加热丝（83），所述架体（82）上开有一通孔（821），所述多孔渗透件（81）上缠绕加热丝（83）的部位处于所述通孔（821）的轴向方向的一侧，所述多孔渗透件（81）的一端与所述烟瓶组件相配合。

15、根据权利要求10所述的雾化电子烟，其特征在于：所述多孔渗透件（81）采用泡沫镍、不锈钢纤维毡、高分子多聚物发泡体或泡沫陶瓷制成。

16、根据权利要求10所述的雾化电子烟，其特征在于：所述加热丝为铂丝、镍铬合金或含有稀土元素的铁铬铝合金丝制成，或制成片状体。

17、根据权利要求11所述的雾化电子烟，其特征在于：在所述多孔体渗透件（81）的一端可拆卸的设有一限流件，所述限流件的本体上开有限流孔，所述限流孔与所述雾化腔（811）相对应，所述限流孔的孔径小于所述雾化腔（811）的内径。

18、根据权利要求12或14所述的雾化电子烟，其特征在于：所述烟瓶组件包括一中空的烟嘴壳体（b），容置于所述烟嘴壳体（b）内的贮液多孔体（9），所述烟嘴壳体（b）的一端插入所述壳体（a），所述烟嘴壳体（b）的外周面具有向内凹的通气凹槽（b2），在所述烟嘴壳体（b）一端的端面上设有一向内延伸的吸气道（b1）。

19、根据权利要求18所述的雾化电子烟，其特征在于：所述吸气道（b1）位于所述烟嘴壳体（b）一端端面的中心处。

20、根据权利要求18所述的雾化电子烟，其特征在于：所述多孔渗透件（81）的一端抵靠于所述贮液多孔体（9）一端的端面，与所述贮液多孔体（9）相接触。

21、根据权利要求18所述的雾化电子烟，其特征在于：所述贮液多孔体（9）的材料为聚丙纤维、涤纶纤维或尼龙纤维。



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22、根据权利要求18所述的雾化电子烟，其特征在于：所述贮液多孔体（9）采用塑料发泡成形体；或用聚氯乙烯、聚丙烯、聚碳酸酯注塑成多层板的柱状体。

23、根据权利要求11或14所述的雾化电子烟，其特征在于：所述雾化电子烟（5）容置于一充电装置中。

24、根据权利要求23所述的雾化电子烟，其特征在于：所述充电装置包括一盒体（1），所述盒体（1）内安装有辅助充电蓄电池（2），容置电子烟（5）并给电子烟（5）内部的充电电池充电的充电器（3），所述辅助充电蓄电池（2）和充电器（3）的电源输入端分别与电源相连接。

25、根据权利要求24所述的雾化电子烟，其特征在于：所述盒体（1）内还设有备用供液瓶（4）。

26、根据权利要求24所述的雾化电子烟，其特征在于：所述辅助充电蓄电池（2）的电源输出端与所述充电器（3）的电源输入端相连接。

27、根据权利要求24所述的雾化电子烟，其特征在于：所述充电器（3）的电源输出端为一与所述电子烟内部充电电池上的充电插头相配合的充电插槽（31），或与充电电池上的充电插槽相配合的充电插头。

28、根据权利要求26所述的雾化电子烟，其特征在于：所述充电器（3）为一恒压恒流充电器。

29、根据权利要求24所述的雾化电子烟，其特征在于：在所述壳体（1）的本体上，对应于放置所述电子烟的位置开有或安装有一对滑槽（12），所述滑槽（12）内滑动的容置有一滑盖（11）。



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Case No. IPR2024-161
Page 273 of 552

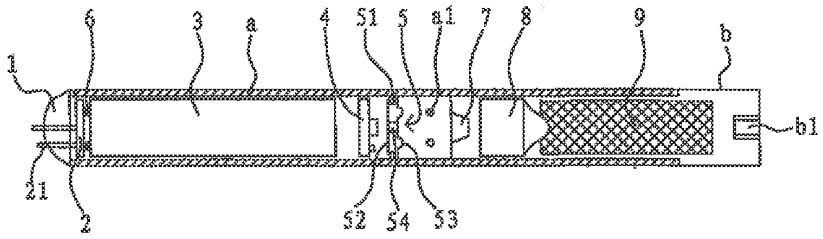

6
3
a
4
51
5
a1
7
8
9
b
1
b1
21
2
52
54
53

图1

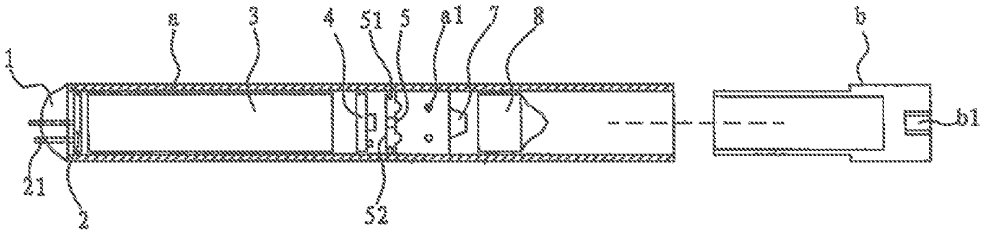

a
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b
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b1
21
2
52

图2

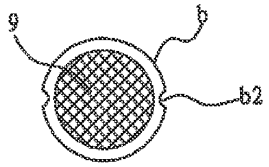

9
b
b2

图3

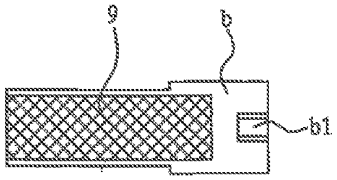

9
b
b1

图4

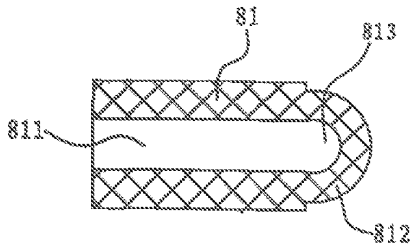



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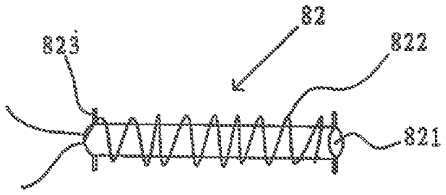



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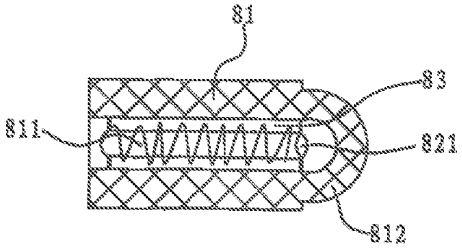



图7

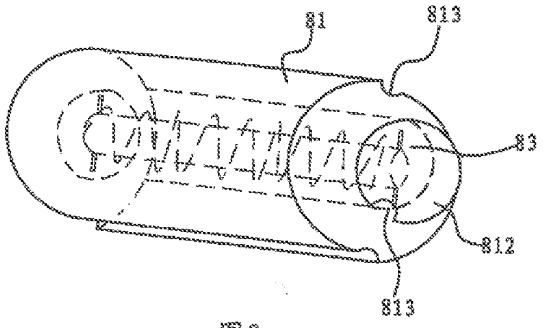



图8

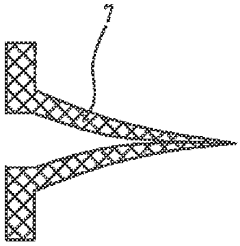



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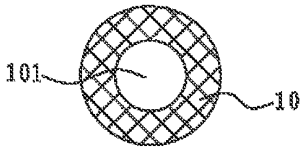



图10

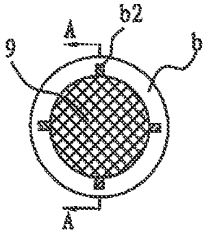



图11

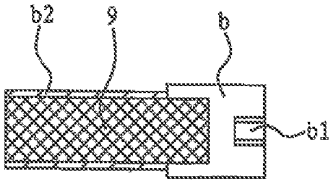



图12

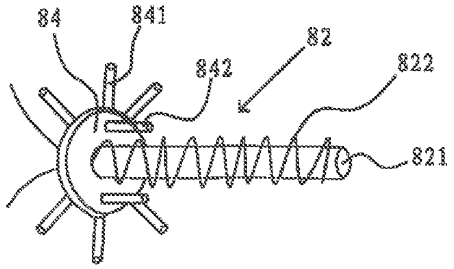



图13

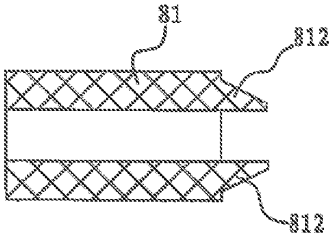



图14

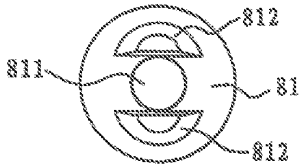



图15

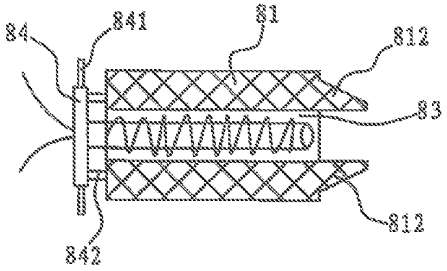



图16

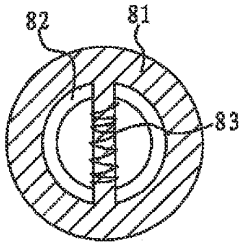



图17

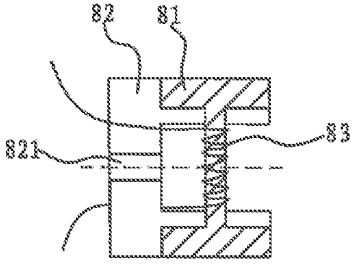



图18

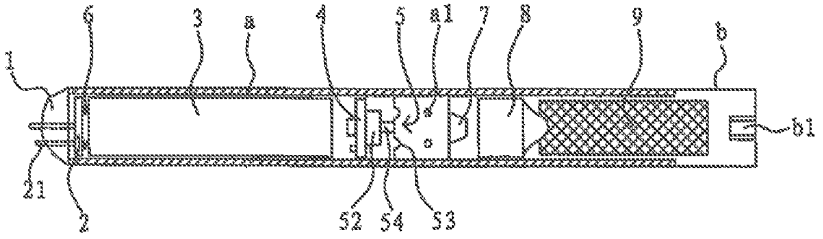



图19

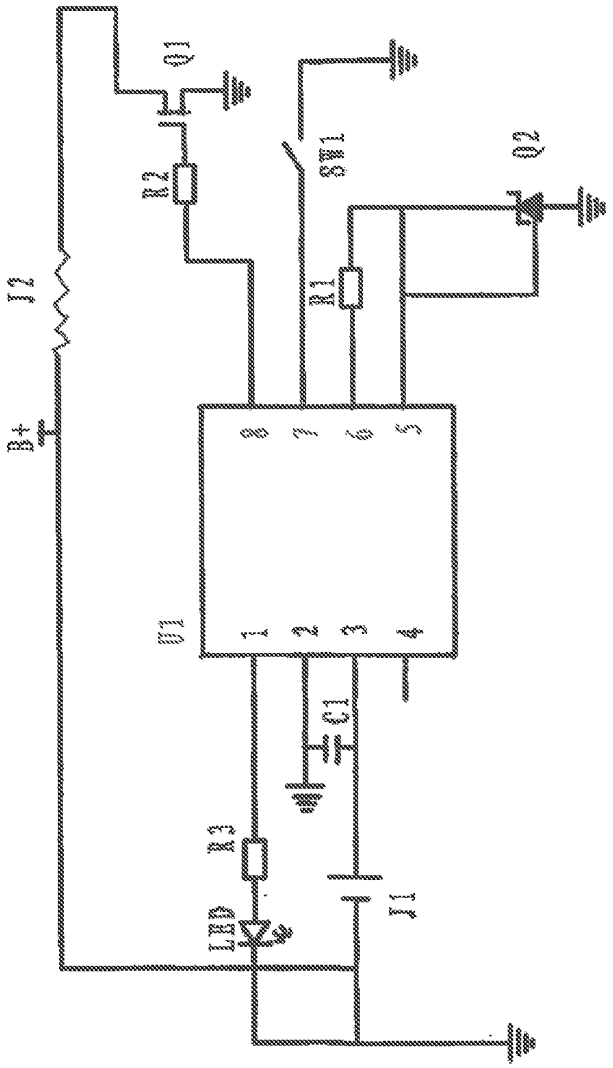



图 20

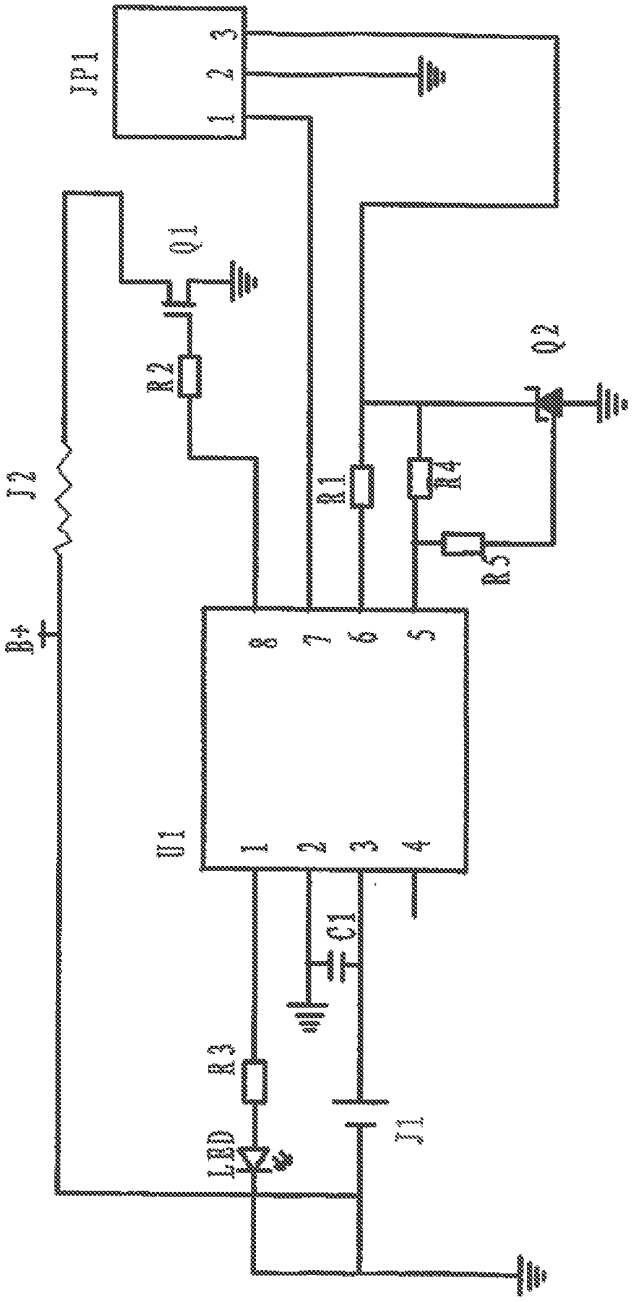



图21

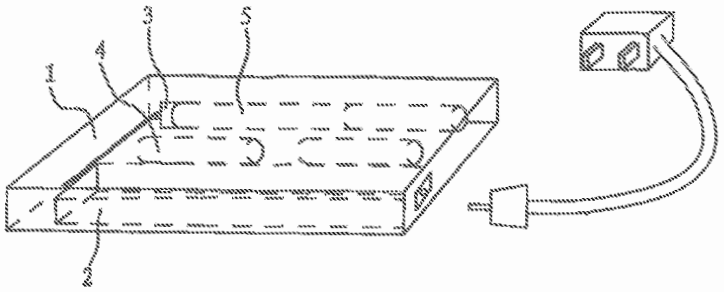



图22

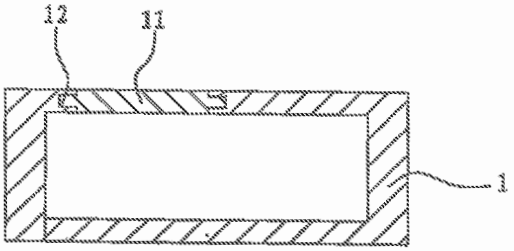



图23

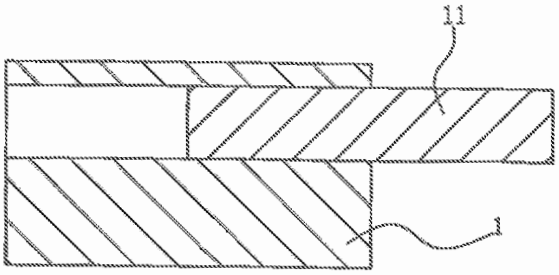



图24

# INTERNATIONAL SEARCH REPORT

International application No.
PCT/CN2007/001575

A. CLASSIFICATION OF SUBJECT MATTER

See extra sheet

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

IPC: A24D, A24F

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)

WPI&EPODOC&PAJ Chinese Patent Document (1985~)

Electronic, pipe, cigarette

C. DOCUMENTS CONSIDERED TO BE RELEVANT

| Category* | Citation of document, with indication, where appropriate, of the relevant passages | Relevant to claim No. |
|---|---|---|
| X | CN2719043Y(HAN LI)24 Aug. 2005(24.8.2005)<br>Page 3 lines 5- page 4 lines 27;figures 1-5 | 1-10 |
| A | CN1252961A(SONG Guoqiang)17 May 2000(17.05.2000)<br>the whole document | 1-29 |
| A | US4945929A (BRITISH-AMERICAN TOBACCO CO., LTD.) 07 Aug. 1990(07.08.1990)<br>the whole document | 1-29 |
| A | CN1575673A (SEIKO EPSON COR) 09 Feb.2005(09.02.2005)<br>the whole document | 1-29 |

☐ Further documents are listed in the continuation of Box C. ☒ See patent family annex.

* Special categories of cited documents:

"A" document defining the general state of the art which is not considered to be of particular relevance

"E" earlier application or patent but published on or after the international filing date

"L" document which may throw doubts on priority claim (S) or which is cited to establish the publication date of another citation or other special reason (as specified)

"O" document referring to an oral disclosure, use, exhibition or other means

"P" document published prior to the international filing date but later than the priority date claimed

"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention

"X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone

"Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art

"&" document member of the same patent family

| Date of the actual completion of the international search | Date of mailing of the international search report |
|---|---|
| 20 Jul. 2007(20.07.2007) | 16 Aug. 2007 (16.08.2007) |

| Name and mailing address of the ISA/CN | Authorized officer |
|---|---|
| The State Intellectual Property Office, the P.R.China<br>6 Xitucheng Rd., Jimen Bridge, Haidian District, Beijing, China<br>100088<br>Facsimile No. 86-10-62019451 | ZHAO,Xiaoyu<br>Telephone No. (86-10)62085853 |

Form PCT/ISA /210 (second sheet) (April 2007)

# INTERNATIONAL SEARCH REPORT
Information on patent family members

International application No.
PCT/CN2007/001575

| Patent Documents referred in the Report | Publication Date | Patent Family | Publication Date |
|---|---|---|---|
| CN2719043Y | 24 Aug.2005 | AU2005232354A | 27 Oct. 2005 |
| | | WO2005099494A | 27 Oct. 2005 |
| | | CA2562581A | 27 Oct. 2005 |
| | | EP1736065A | 27 Dec. 2006 |
| | | CN1942114A | 04 Apr.2007 |
| | | BRPI0506780A | 22 May 2007 |
| CN1252961A | 17 May 2000 | None | |
| US4945929A | 07 Aug. 1990 | GB2191718A | 23 Dec. 1987 |
| | | DE3719718A | 23 Dec. 1987 |
| | | GB2191718B | 05 Sep. 1990 |
| CN1575673A | 09. Feb.2005 | US2005016550A1 | 27 Jan. 2005 |
| | | JP2005034021A | 10 Feb. 2005 |
| | | CN1284493C | 15 Nov. 2006 |

Form PCT/ISA /210 (patent family annex) (April 2007)

# INTERNATIONAL SEARCH REPORT

International application No.
PCT/CN2007/001575

According to International Patent Classification (IPC) or to both national classification and IPC
A24D1/18(2006.01) i
A24F47/00(2006.01) i

Form PCT/ISA/210 (extra sheet) (April 2007)

# 国际检索报告

国际申请号
PCT/CN2007/001575

A. 主题的分类

参见附加页

按照国际专利分类表(IPC)或者同时按照国家分类和 IPC 两种分类

B. 检索领域

检索的最低限度文献(标明分类系统和分类号)

IPC: A24D, A24F

包含在检索领域中的除最低限度文献以外的检索文献

在国际检索时查阅的电子数据库(数据库的名称，和使用的检索词（如使用）)

WPI&EPODOC&PAJ 中国专利文献（1985～）

Electronic, pipe, cigarette 电子、烟斗、烟

C. 相关文件

| 类 型* | 引用文件，必要时，指明相关段落 | 相关的权利要求 |
|---|---|---|
| X | CN2719043Y(韩方)24.8 月 2005(24.8.2005)<br>说明书第 3 页第 5 行－第 4 页 27 行；图 1－5 | 1－10 |
| A | CN1252961A(宋国强)17.5 月 2000(17.5.2000)<br>全文 | 1－29 |
| A | US4945929A (BRITISH-AMERICAN TOBACCO CO., LTD.) 07.8 月 1990(07.08.1990) 全文 | 1－29 |
| A | CN1575673A（精工爱普生株式会社）09.2 月 2005(09.02.2005) 全文 | 1－29 |

☐ 其余文件在 C 栏的续页中列出。　　☒ 见同族专利附件。

* 引用文件的具体类型：

"A" 认为不特别相关的表示了现有技术一般状态的文件

"E" 在国际申请日的当天或之后公布的在先申请或专利

"L" 可能对优先权要求构成怀疑的文件，或为确定另一篇引用文件的公布日而引用的或者因其他特殊理由而引用的文件

"O" 参及口头公开、使用、展览或其他方式公开的文件

"P" 公布日先于国际申请日但迟于所要求的优先权日的文件

"T" 在申请日或优先权日之后公布，与申请不相抵触，但为了理解发明之理论或原理的在后文件

"X" 特别相关的文件，单独考虑该文件，认定要求保护的发明不是新颖的或不具有创造性

"Y" 特别相关的文件，当该文件与另一篇或者多篇该类文件结合并且这种结合对于本领域技术人员为显而易见时，要求保护的发明不具有创造性

"&" 同族专利的文件

| 国际检索实际完成的日期 | 国际检索报告邮寄日期 |
|---|---|
| 20.7 月 2007(20.07.2007) | 16.8 月 2007 (16.08.2007) |
| 中华人民共和国国家知识产权局(ISA/CN)<br>中国北京市海淀区蓟门桥西土城路 6 号 100088<br>传真号： (86-10)62019451 | 受权官员<br>赵晓宇<br>电话号码：(86-10) 62085853 |

PCT/ISA/210 表(第 2 页) (2007 年 4 月)

国际检索报告
关于同族专利的信息

国际申请号
PCT/CN2007/001575

| 检索报告中引用的专利文件 | 公布日期 | 同族专利 | 公布日期 |
|---|---|---|---|
| CN2719043Y | 24.8 月 2005 | AU2005232354A | 27.10 月 2005 |
| | | WO2005099494A | 27.10 月 2005 |
| | | CA2562581A | 27.10 月 2005 |
| | | EP1736065A | 27.12 月 2006 |
| | | CN1942114A | 04.4 月 2007 |
| | | BRPI0506780A | 22.5 月 2007 |
| CN1252961A | 17.5 月 2000 | 无 | |
| US4945929A | 07.8 月 1990 | GB2191718A | 23.12 月 1987 |
| | | DE3719718A | 23.12 月 1987 |
| | | GB2191718B | 05.9 月 1990 |
| CN1575673A | 09.2 月 2005 | US2005016550A1 | 27.1 月 2005 |
| | | JP2005034021A | 10.2 月 2005 |
| | | CN1284493C | 15.11 月 2006 |

国际检索报告

国际申请号
PCT/CN2007/001575

按照国际专利分类表(IPC)或者同时按照国家分类和 IPC 两种分类：

A24D1/18(2006.01)i

A24F47/00(2006.01)i



JUUL Ex. 1002
Case No. IPR2024-161
Page 287 of 552

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

| | | |
|---|---|---|
| In re Application of: | ) | Confirmation No.: 1065 |
| Gregory D. Conley et al. | ) | |
| Serial No.: 15/377,522 | ) | Group Art Unit: 3742 |
| Filed: December 13, 2016 | ) | Examiner: Thor S. Campbell |
| For: ELECTRONIC VAPORIZER | ) | |

Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Sir:

**AMENDMENT**

Prior to the examination of the above-identified application, the following amendments and remarks are submitted:

**Amendments to the Claims** are reflected in the listing of claims, which begins on page 2 of this paper.

**Remarks** begin on page 10 of this paper.

**Amendments to the Claims:**

This listing of claims will replace all prior versions, and listings, of claims in the application:

**Listing of Claims**:

Claims 1-20 (Cancelled).

21. (new) An apparatus comprising:

a power source,

wherein the power source includes a battery,

wherein the power source includes an electrically conductive portion; and

a cartridge having a housing that comprises an interior,

wherein the housing includes a first end and a second end that is opposite the first end, wherein the housing includes a first aperture on the first end and a second aperture on the second end,

wherein the housing includes an airflow passageway that extends centrally and axially with respect to the housing intermediate of the first aperture on the first end of the housing and the second aperture on the second end of the housing,

wherein the airflow passageway is configured to allow an airflow through the cartridge from the first aperture to the second aperture of the housing,

wherein the first end of the housing includes an electrically conductive portion that is adapted to mechanically and electrically couple to the electrically conductive portion of the power source,

wherein the housing includes a solution holding medium adapted to hold a solution in the interior of the housing,

wherein the housing includes a heating element located in the interior of the housing, wherein the heating element extends transversely

across the airflow passageway, wherein the airflow through the passageway passes on both transverse sides of the element,

wherein the solution holding medium surrounds the airflow passageway and the heating element in the interior of the housing and intermediate of the first end and the second end,

wherein the heating element is electrically configured to vaporize at least a portion of the solution to be contained in the solution holding medium for oral provision to an individual in an airflow from the second aperture responsive to electrical power received from the battery through the electrically conductive portions of the cartridge and the power source.

22. (new) The cartridge of claim 21, wherein the heating element is a coil having a maximum diameter, the airflow passageway having a length having a circular cross section having a diameter along a majority of the length, the maximum diameter of the coil being smaller than the diameter of the circular cross section of the length of the airflow passageway.

23. (new) The cartridge of claim 22, wherein the first aperture on the first end is located centrally and axially with respect to the housing, the first aperture having a cross-sectional area measured perpendicular to a central longitudinal axis of the housing, the interior of the airflow passageway between the heating element and the second aperture being no smaller in cross-sectional area than the cross-sectional area of the first aperture.

24. (new) The cartridge of claim 23, wherein the first aperture on the first end is smaller than the second aperture on the second end.

25. (new) The cartridge of claim 21, wherein the solution holding medium includes at least one of an absorbent material and a reservoir.

26. (new) The cartridge of claim 21, further comprising a solution in the solution holding medium, the solution comprising one of propylene glycol and nicotine.

27. (new) The cartridge of claim 21, wherein the airflow passageway has a uniform cross-sectional area measured perpendicular to a central longitudinal axis of the housing between the heating element and the second aperture.

28. (new) A cartridge configured to mechanically and electrically couple to a power source of an electronic vaporizer, the cartridge comprising:

a housing having an interior and a solution holding medium reservoir adapted to hold a solution, the housing having a first end and a second end that is opposite the first end, the housing having a first aperture on the first end and a second aperture on the second end, the first end of the housing having an electrically conductive portion adapted to mechanically and electrically couple to the electrically conductive portion of the power source;

an airflow passageway in the interior of the housing extending centrally and axially with respect to the housing intermediate of the first aperture on the first end of the housing and the second aperture on the second end of the housing, the airflow passageway being configured to allow an airflow through the cartridge from the first aperture to the second aperture of the housing; and

a heating element located in the interior of the housing, the heating element being located within and extending transversely across the airflow passageway, the airflow through the passageway passing on both transverse sides of the heating element, both the heating element and the airflow passageway being surrounded by the solution holding medium reservoir, the heating element being electrically configured to vaporize at least a portion of the solution to be contained in the solution holding medium reservoir for oral provision to an individual in an airflow from the second aperture responsive to electrical power received from the battery through the electrically conductive portions of the cartridge and the power source.

29. (new) The cartridge of claim 28, further in combination with the power source including a battery and the electrically conductive portion, the electrically conductive portion of the power source being mechanically and electrically coupled to the electrically conductive portion of the first end of the housing.

30. (new) The cartridge of claim 29, wherein the heating element is a coil having a maximum diameter, the airflow passageway having a length having a circular cross section having a diameter along a majority of the length, the maximum diameter of the coil being smaller than the diameter of the circular cross section of the length of the airflow passageway.

31. (new) The cartridge of claim 30, wherein the first aperture on the first end is located centrally and axially with respect to the housing, the first aperture having a cross-sectional area measured perpendicular to a central longitudinal axis of the housing, the interior of the airflow passageway between the heating element and the second aperture being no smaller in cross-sectional area than the cross-sectional area of the first aperture.

32. (new) The cartridge of claim 31, wherein the first aperture on the first end is smaller than the second aperture on the second end.

33. (new) The cartridge of claim 28, wherein the solution holding medium reservoir includes an absorbent material.

34. (new) The cartridge of claim 28, further comprising a solution in the solution holding medium reservoir, the solution comprising one of propylene glycol and nicotine.

35. (new) The cartridge of claim 28, wherein the airflow passageway has a uniform cross-sectional area measured perpendicular to a central longitudinal axis of the housing between the heating element and the second aperture.

36. (new) A cartridge configured to mechanically and electrically couple to a power source of an electronic vaporizer, the cartridge comprising:

a housing having an interior and a solution holding medium adapted to hold a solution in the interior of the housing, the housing having a first end and a second end that is opposite the first end, the housing having a central longitudinal axis extending through the first end and the second end, the housing having a first aperture on the first end and a second aperture on the second end, the first aperture having a cross-sectional area measured perpendicular to the central longitudinal axis of the housing, the first end of the housing having an

electrically conductive portion adapted to mechanically and electrically couple to an electrically conductive portion of the power source;

an airflow passageway in the interior of the housing, the airflow passageway having a length extending centrally and axially with respect to the housing intermediate of the first aperture on the first end of the housing and the second aperture on the second end of the housing, the airflow passageway being configured to allow an airflow through the cartridge from the first aperture to the second aperture of the housing, the airflow passageway having an exterior adjacent to the solution holding medium along a majority of the length of the airflow passageway, the airflow passageway having an interior having a uniform cross-sectional area measured perpendicular to the central longitudinal axis of the housing and extending continuously along a majority of the length of the airflow passageway; and

a heating element located in the interior of the housing and extending transversely across the airflow passageway, the airflow through the passageway passing on both transverse sides of the heating element, a plane perpendicular to the central longitudinal axis of the housing passing through the heating element and the solution holding medium, the airflow passageway having an interior between the heating element and the second aperture no smaller in cross-sectional area than the cross-sectional area of the first aperture, the heating element being connected to the electrically conductive portion of the first end of the housing, the heating element being electrically configured to vaporize at least a portion of the solution to be contained in the solution holding medium for oral provision to an individual in an airflow from the second aperture responsive to electrical power received from the power source through the electrically conductive portion of the cartridge.

37. (new) The cartridge of claim 36, further in combination with the power source including a battery and the electrically conductive portion, the electrically conductive portion of the power source being mechanically and electrically coupled to the electrically conductive portion of the first end of the housing.

38. (new) The cartridge of claim 36, wherein the heating element is a coil having a maximum diameter and the uniform cross-sectional area of the airflow passageway is a circle having a diameter, the maximum diameter of the coil being smaller than the diameter of the circle of the uniform cross-sectional area of the airflow passageway.
39. (new) The cartridge of claim 38, wherein the first aperture on the first end is located centrally and axially with respect to the housing.
40. (new) The cartridge of claim 39, wherein the first aperture on the first end is smaller than the second aperture on the second end.
41. (new) The cartridge of claim 36, wherein the heating element is a coil having a maximum diameter and the uniform cross-sectional area of the airflow passageway is a circle having a diameter, the maximum diameter of the coil being smaller than the diameter of the circle of the uniform cross-sectional area of the airflow passageway.
42. (new) The cartridge of claim 36, wherein the first aperture on the first end is located centrally and axially with respect to the housing.
43. (new) The cartridge of claim 36, wherein the first aperture on the first end is smaller than the second aperture on the second end.
44. (new) The cartridge of claim 36, wherein the solution holding medium includes at least one of an absorbent material and a reservoir.
45. (new) The cartridge of claim 36, further comprising a solution, wherein the solution comprises one of propylene glycol and nicotine.
46. (new) The cartridge of claim 36, wherein the heating element is in operative connection with a wicking material, and the wicking material is operative to attract a portion of the solution from the solution holding medium located immediately adjacent opposite ends of the heating element toward the heating element.
47. (new) The cartridge of claim 36, wherein the airflow passageway has a uniform cross-sectional area measured perpendicular to the central longitudinal axis of the housing between the heating element and the second aperture.

48. (new) An apparatus comprising:

a power source,

wherein the power source includes a battery,

wherein the power source includes an electrically conductive portion; and

a cartridge having a housing that comprises an interior,

wherein the housing includes a first end and a second end that is opposite the first end, wherein the housing includes a first aperture on the first end and a second aperture on the second end,

wherein the housing includes an airflow passageway that extends centrally and axially with respect to the housing intermediate of the first aperture on the first end of the housing and the second aperture on the second end of the housing,

wherein the airflow passageway is configured to allow an airflow through the cartridge from the first aperture to the second aperture of the housing,

wherein the first end of the housing includes an electrically conductive portion that is adapted to mechanically and electrically couple to the electrically conductive portion of the power source,

wherein the housing includes a solution holding medium adapted to hold a solution in the interior of the housing,

wherein the solution holding medium surrounds the airflow passageway in the interior of the housing and intermediate of the first end and the second end,

wherein the housing includes a heating element located in the interior of the housing, wherein the heating element is configured as a helical coil that wraps around the airflow passageway,

wherein the heating element is electrically configured to vaporize at least a portion of the solution to be contained in the solution holding

medium for oral provision to an individual in an airflow from the second aperture responsive to electrical power received from the battery through the electrically conductive portions of the cartridge and power source.

49. (new) The apparatus of claim 48, wherein at least a portion of the helical coil is within the solution holding medium.

50. (new) The apparatus of claim 49, wherein the airflow passageway is defined by a wall extending intermediate of the first aperture on the first end of the housing and the second aperture on the second end of the housing, the wall having at least one perforation there through to permit vapor to pass from the solution holding medium into the airflow passageway when the solution is heated by the helical coil.

51. (new) The apparatus of claim 48, wherein the airflow passageway is defined by a wall extending intermediate of the first aperture on the first end of the housing and the second aperture on the second end of the housing, the wall having at least one perforation there through to permit vapor to pass from the solution holding medium into the airflow passageway when the solution is heated by the helical coil.

## REMARKS

Applicant cancelled claims 1-20 without prejudice or disclaimer of their subject matter, and added new claims 21-51 to further define Applicant's invention.

Applicant is filing a Request for Correction of Inventorship concurrently with the filing of this amendment. The reason for revising the named inventors is because all of pending claims 21-51, after entry of this Amendment, are fully supported by the disclosure in the original application (serial no. 12/843,917 filed July 27, 2010) from which the present continuation (which is a continuation of a continuation of a continuation-in-part) claims priority, and that original application properly named Greg Conley and Dan Hillenbrandt as the only inventors.

We are relying on an actual reduction to practice in the U.S. as evidenced by the Rule 1.131 declaration filed concurrently with this amendment in order to antedate the Hon Lik Chinese Utility Model Patent CN201379072 and expedite prosecution of the present application, because the early commercial devices provide a clear and compelling embodiment of all the recited claim elements of claims 21-47. As such, use of the Rule 1.131 declaration is not a concession that the provisional applications filed in July 2009 fail to support the claims.

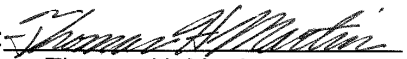
Entry and consideration of this Amendment prior to the examination of the above-identified application is respectfully requested.

If there are any fees due in connection with the filing of this Amendment, please charge the fee to our Deposit Account No. 50-1068.

Respectfully submitted,

MARTIN & FERRARO, LLP

Dated: November 2, 2018

By: 
Thomas H. Martin
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OMB 0651-0031

| Substitute for FORM PTO-1449 | Attorney Docket Number 269.0003-02000 | Customer No. 22882 | |
|---|---|---|---|
| **INFORMATION DISCLOSURE STATEMENT IN AN APPLICATION** | Applicant Gregory D. Conley et al. | Application Number 15/377,522 | |
| *(Use several sheets if necessary)* **Sheet 1 of 4** | Filing Date December 13, 2016 | Group Art Unit 3742 | Examiner T.S. Campbell |

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| | | | | | | |
| **EXAMINER** | | **DATE CONSIDERED** | | | | |
| EXAMINER: Initial if citation considered, whether or not citation is in conformance with MPEP § 609; Draw line through citation if not in conformance and not considered. Include copy of this form with next communication to the applicant. | | | | | | |

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

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|---|---|---|
| In re Application of: | ) | Confirmation No.: 1065 |
| Gregory D. Conley et al. | ) | |
| Serial No.: 15/377,522 | ) | Group Art Unit: 3742 |
| Filed: December 13, 2016 | ) | Examiner: Thor S. Campbell |
| For: ELECTRONIC VAPORIZER | ) | |

Mail Stop AMENDMENT
Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Sir:

**INFORMATION DISCLOSURE STATEMENT UNDER 37 C.F.R. § 1.97(b)**

Pursuant to 37 C.F.R. §§ 1.56 and 1.97(b), Applicant brings to the attention of the Examiner the documents listed on the attached Form PTO/SB/08. This Information Disclosure Statement is being filed before the mailing date of a first Office Action on the merits for the above-referenced application.

Copies of the listed non-U.S. patent documents are attached with English language translations where indicated.

As noted in the remarks of the concurrently filed amendment, Applicant is relying on an actual reduction to practice in the U.S. as evidenced by the Rule 1.131 declaration also filed concurrently herewith in order to antedate the Hon Lik Chinese Utility Model Patent CN201379072 and expedite prosecution of the present application, because the early commercial devices provide a clear and compelling embodiment of all the recited claim elements of claims 21-47. In addition, Applicant brings to the Examiner's attention that U.S. Patent No. 8,689,805 to Hon (cited on the attached Form PTO/SB/08) was the subject of Inter Partes Reviews IPR2014-01529, IPR2015-01027, IPR2015-01578, and IPR2016-01298 in the United States Patent Trial and Appeal Board; all of which have now been terminated and/or denied. The references asserted

in the grounds of rejection in these IPRs have been identified by an asterisk (*) on the attached Form PTO/SB/08 in the column for the Examiner's initials.

Applicant respectfully requests that the Examiner consider the listed documents and indicate that they were considered by making appropriate notations on the attached form.

This submission does not represent that a search has been made or that no better art exists and does not constitute an admission that each or all of the listed documents are material or constitute "prior art." If the Examiner applies any of the documents as prior art against any claim in the application and Applicant determines that the cited documents do not constitute "prior art" under United States law, Applicant reserves the right to present to the office the relevant facts and law regarding the appropriate status of such documents.

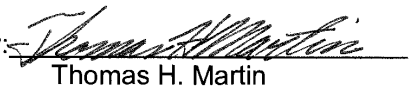
Applicant further reserves the right to take appropriate action to establish the patentability of the disclosed invention over the listed documents, should one or more of the documents be applied against the claims of the present application.

If there is any fee due in connection with the filing of this Statement, please charge the fee to our Deposit Account No. 50-1068.

Respectfully submitted,

MARTIN & FERRARO, LLP

Date: November 2, 2018

By: 
Thomas H. Martin
Registration No. 34,383

1557 Lake O'Pines Street, NE
Hartville, Ohio 44632
Telephone: (330) 877-0700

PATENT
Attorney Docket No. 269.0003-02000
Customer No. 22882

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

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|---|---|---|
| In re Design Application of: | ) | Confirmation No.: 1065 |
| Gregory D. Conley et al. | ) | |
| Serial No.: 15/377,522 | ) | Group Art Unit: 3742 |
| Filed: December 13, 2016 | ) | Examiner: Thor S. Campbell |
| For: ELECTRONIC VAPORIZER | ) | |

Mail Stop PETITION
Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Sir:

**REQUEST FOR CORRECTION OF INVENTORSHIP UNDER 37 C.F.R. § 1.48(a)**

Pursuant to 37 C.F.R. § 1.48(a), it is requested that the inventorship be corrected to delete inventor Rebecca L. Conley as a co-inventor in the above-identified application. A corrected Application Data Sheet in compliance with 37 C.F.R. § 1.76 is being submitted concurrently herewith.

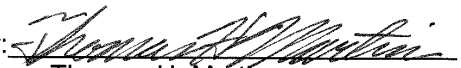
The reason for revising the named inventors is because all the pending claims, after entry of the concurrently-filed Amendment, are fully supported by the disclosure in the original application (serial no. 12/843,917 filed July 27, 2010) from which the present continuation (which is a continuation of a continuation of a continuation-in-part) claims priority, and that original application properly named Greg Conley and Dan Hillenbrandt as the only inventors.

The total amount of $70 to cover the requisite processing fee of $70 (as set forth in 37 CFR § 1.17(i)) is being submitted via EFS.

If there is any additional fee due in connection with the filing of this Request, please charge the fee to our Deposit Account No. 50-1068.

Respectfully submitted,
MARTIN & FERRARO, LLP

Dated: November 2, 2018

By: 
Thomas H. Martin
Registration No. 34,383

1557 Lake O'Pines Street, NE
Hartville, Ohio 44632
Telephone: (330) 877-0700

PATENT
Attorney Docket No. 269.0003-02000
Customer No. 22882

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

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| In re Design Application of: | ) | Confirmation No.: 1065 |
| Gregory D. Conley et al. | ) | |
| Serial No.: 15/377,522 | ) | Group Art Unit: 3742 |
| Filed: December 13, 2016 | ) | Examiner: Thor S. Campbell |
| For: ELECTRONIC VAPORIZER | ) | |

Mail Stop PETITION
Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Sir:

**REQUEST FOR CORRECTION OF INVENTORSHIP UNDER 37 C.F.R. § 1.48(a)**

Pursuant to 37 C.F.R. § 1.48(a), it is requested that the inventorship be corrected to delete inventor Rebecca L. Conley as a co-inventor in the above-identified application. A corrected Application Data Sheet in compliance with 37 C.F.R. § 1.76 is being submitted concurrently herewith.

The reason for revising the named inventors is because all the pending claims, after entry of the concurrently-filed Amendment, are fully supported by the disclosure in the original application (serial no. 12/843,917 filed July 27, 2010) from which the present continuation (which is a continuation of a continuation of a continuation-in-part) claims priority, and that original application properly named Greg Conley and Dan Hillenbrandt as the only inventors.

The total amount of $70 to cover the requisite processing fee of $70 (as set forth in 37 CFR § 1.17(i)) is being submitted via EFS.

If there is any additional fee due in connection with the filing of this Request, please charge the fee to our Deposit Account No. 50-1068.

Respectfully submitted,
MARTIN & FERRARO, LLP

Dated: November 2, 2018

By: _____
Thomas H. Martin
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IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

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| In re Application of: | ) | Confirmation No.: 1065 |
| Gregory D. Conley et al. | ) | |
| Serial No.: 15/377,522 | ) | Group Art Unit: 3742 |
| Filed: December 13, 2016 | ) | Examiner: Thor S. Campbell |
| For: ELECTRONIC VAPORIZER | ) | |

Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450
Sir:

**DECLARATION UNDER 37 C.F.R. § 1.131**

I, Gregory D. Conley, declare as follows:

1. I am one of the named inventors of the above-identified application, and the other named inventor and I are the sole inventors of the subject mater described and claimed therein.

2. The present application was filed on December 13, 2016 and claims priority as a continuation of U.S. Application No. 14/510,955 (now U.S. Patent No. 9,532,604), filed on October 9, 2014, which claims priority as continuation of U.S. Application No. 13/594,813 (now U.S. Patent No. 8,897,628), filed on August 25, 2012, which claims priority as continuation in part of U.S. Application No. 12/843,917, filed on July 27, 2010. U.S. Application No. 12/843,917 claims the benefit of U.S. Provisional Application No. 61/273,097, filed on July 31, 2009, and claims the benefit of U.S. Provisional Application No. 61/271,819, filed on July 27, 2009. U.S. Application No. 13/594,813 claims the benefit of U.S. Provisional Application No. 61/527,434, filed on August 25, 2011.

3. Prior to January 13, 2010 (the publication date listed on the face page of CN201379072), the other named inventor and I reduced to practice in this country the invention as described and claimed in the above-identified application. Evidence of our reduction to practice is set forth below and attached hereto as Exhibit A.

4. Exhibit A includes Figs. 1-17 that depict the product and the componentry thereof that embody the reduction to practice of the invention as described and claimed in the above-identified application. The figures of Exhibit A depict an Electronic

Cigarette Starter Kit (including an electronic cigarette having a cartridge (yellow portion of electronic cigarette in Exhibit A)) and replacement Cartridges (sold separately from the Electronic Cigarette Starter Kit). As depicted in Exhibit A, the electronic cigarette is provided to vaporize at least a portion of a vaping liquid contained in a holding medium contained in the cartridge. The vaporization is facilitated using a heating element included in the cartridge responsive to electrical power received from a battery (white portion of electronic cigarette in Exhibit A), and the vaporized liquid is for oral provisioning to an individual in an airflow that travels through the electronic cigarette.

5. The relationship of the subject matter of the claims to the product and the componentry thereof shown in Exhibit A is set forth below.

(a) Independent claim 21

Preamble: an apparatus (see Fig. 2 of Exhibit A showing an electronic cigarette).

Recitation 1: a power source,

wherein the power source including a battery (see Fig. 2 of Exhibit A showing the white battery of the electronic cigarette),

wherein the power source includes an electrically conductive portion (see Fig. 2 of Exhibit A showing the electrical conductive threaded portion on the white battery of the electronic cigarette).

Recitation 2: a cartridge having a housing that comprises an interior (see Fig. 2 of Exhibit A showing a yellow cartridge of the electronic cigarette),

wherein the housing includes a first end and a second end that is opposite the first end (see Figs. 6, 7, and 15 of Exhibit A showing the first end and the second end of the yellow cartridge),

wherein the housing includes a first aperture on the first end and a second aperture on the second end (see Fig. 15 of Exhibit A showing a first aperture at the first end of the yellow cartridge and a second aperture at the second end of the yellow cartridge),

wherein the housing includes an airflow passageway that extends centrally and axially with respect to the housing intermediate of the first aperture on the first end of the housing and the second aperture on the second end of the

housing (see Figs. 5-13 and 15-17 of Exhibit A showing the air flow passageway through the yellow cartridge),

wherein the airflow passageway is configured to allow an airflow through the cartridge from the first aperture to the second aperture of the housing (see Figs. 5-13 of Exhibit A showing the air flow passageway through the yellow cartridge),

wherein the first end of the housing includes an electrically conductive portion that is adapted to mechanically and electrically couple to the electrically conductive portion of the power source (see Figs. 2 and 15 of Exhibit A showing the electrical conductive threaded portion of the yellow cartridge for mechanically and electrically coupling with the electrical conductive threaded portion on the white battery),

wherein the housing includes a solution holding medium adapted to hold a solution in the interior of the housing (see Figs. 7-12 of Exhibit A showing the batting material that is a solution holding medium),

wherein the housing includes a heating element located in the interior of the housing (see Figs. 6-14 of Exhibit A showing the heating element coil), wherein the heating element extends transversely across the airflow passageway (see Figs. 6-14 of Exhibit A showing the heating element coil), wherein the airflow through the passageway passes on both transverse sides of the element (see Figs. 6-14 of Exhibit A showing the heating element coil),

wherein the solution holding medium surrounds the airflow passageway and the heating element in the interior of the housing and intermediate of the first end and the second end (see Figs. 7-9 of Exhibit A showing the batting material surrounding the airflow passageway and the heating element),

wherein the heating element is electrically configured to vaporize at least a portion of the solution to be contained in the solution holding medium for oral provision to an individual in an airflow from the second aperture responsive to electrical power received from the battery through the electrically conductive portions of the cartridge and the power source (this corresponds to the purpose of the electronic cigarette of Exhibit A).

(b) Dependent claim 22

Recitation: wherein the heating element is a coil having a maximum diameter, the airflow passageway having a length having a circular cross section having a diameter along a majority of the length, the maximum diameter of the coil being smaller than the diameter of the circular cross section of the length of the airflow passageway (see Figs. 14 and 15 of Exhibit A showing the coil having a maximum diameter being smaller than the diameter of the airflow passageway).

(c) Dependent claim 23

Recitation: wherein the first aperture on the first end is located centrally and axially with respect to the housing (see Figs. 2 and 15 of Exhibit A for the first aperture on the first end being located centrally and axially with respect to the housing), the first aperture having a cross-sectional area measured perpendicular to a central longitudinal axis of the housing, the interior of the airflow passageway between the heating element and the second aperture being no smaller in cross-sectional area than the cross-sectional area of the first aperture (see Figs. 6-10 and 15 of Exhibit A for the interior of the airflow passageway between the heating element and the second aperture being no smaller in cross-sectional area than the cross-sectional area of the first aperture).

(d) Dependent claim 24

Recitation: wherein the first aperture on the first end is smaller than the second aperture on the second end (see Fig. 15 of Exhibit A showing the opposite ends of the cartridge).

(e) Dependent claim 25

Recitation: wherein the solution holding medium includes at least one of an absorbent material and a reservoir (see Figs. 5, 7, 8, 11 and 12 of Exhibit A showing the absorbent material inside a reservoir of the cartridge).

(f) Dependent claim 26

Recitation: further comprising a solution in the solution holding medium, the solution comprising one of propylene glycol and nicotine (the solution holding medium of Figs. 6 and 12 of Exhibit A held a solution comprising propylene glycol and nicotine).

(g) Dependent claim 27

Recitation: wherein the airflow passageway has a uniform cross-sectional area measured perpendicular to a central longitudinal axis of the housing between the heating element and the second aperture (see Figs. 6-10 and 15 of Exhibit A for the airflow passageway having a uniform cross-sectional area between the heating element and the second aperture).

(h) Independent claim 28

Preamble: a cartridge configured to mechanically and electrically couple to a power source of an electronic vaporizer (see Fig. 2 of Exhibit A showing a yellow cartridge of the electronic cigarette).

Recitation 1: a housing having an interior (see Figs. 2, 3, and 11 of Exhibit A showing a yellow cartridge of the electronic cigarette and the interior thereof) and a solution holding medium reservoir adapted to hold a solution (see Figs. 7-12 of Exhibit A showing the batting material that is a solution holding medium), the housing having a first end and a second end that is opposite the first end, the housing having a first aperture on the first end and a second aperture on the second end (see Figs. 1, 6, 7, and 15 of Exhibit A showing a first aperture at the first end of the yellow cartridge and a second aperture at the second end of the yellow cartridge), the first end of the housing having an electrically conductive portion adapted to mechanically and electrically couple to the electrically conductive portion of the power source (see Figs. 2 and 15 of Exhibit A showing the electrical conductive threaded portion on the white battery of the electronic cigarette and the electrical conductive threaded portion of the yellow cartridge for mechanically and electrically coupling with the electrical conductive threaded portion on the white battery);

Recitation 2: an airflow passageway in the interior of the housing extending centrally and axially with respect to the housing intermediate of the first aperture on the first end of the housing and the second aperture on the second end of the housing (see Figs. 5-13 and 15-17 of Exhibit A showing the air flow passageway through the yellow cartridge), the airflow passageway being configured to allow an airflow through the cartridge from the first aperture to the second aperture of the housing (see Figs. 5-13 and 15-17 of Exhibit A showing the air flow passageway through the yellow cartridge); and

Recitation 3: a heating element located in the interior of the housing (see Figs. 6-14 of Exhibit A showing the heating element coil), the heating element being located within and extending transversely across the airflow passageway (see Figs. 6-14 of Exhibit A showing the heating element coil), the airflow through the passageway passing on both transverse sides of the heating element (see Figs. 6-14 of Exhibit A showing the heating element coil), both the heating element and the airflow passageway being surrounded by the solution holding medium reservoir (see Figs. 6-11 of Exhibit A showing the heating element coil), the heating element being electrically configured to vaporize at least a portion of the solution to be contained in the solution holding medium reservoir for oral provision to an individual in an airflow from the second aperture responsive to electrical power received from the battery through the electrically conductive portions of the cartridge and the power source (this corresponds to the purpose of the electronic cigarette of Exhibit A).

(i) Dependent claim 29

Recitation: further in combination with the power source including a battery and the electrically conductive portion, the electrically conductive portion of the power source being mechanically and electrically coupled to the electrically conductive portion of the first end of the housing portion (see Fig. 2 of Exhibit A showing the electrical conductive threaded portion on the white battery of the electronic cigarette).

(j) Dependent claim 30

Recitation: wherein the heating element is a coil having a maximum diameter, the airflow passageway having a length having a circular cross section having a diameter along a majority of the length, the maximum diameter of the coil being smaller than the diameter of the circular cross section of the length of the airflow passageway (see Figs. 14 and 15 of Exhibit A showing the coil having a maximum diameter being smaller than the diameter of the airflow passageway).

(k) Dependent claim 31

Recitation: wherein the first aperture on the first end is located centrally and axially with respect to the housing (see Figs. 2 and 15 of Exhibit A for the first aperture on the first end being located centrally and axially with respect to the housing), the first aperture having a cross-sectional area measured perpendicular to a central longitudinal axis of the housing, the interior of the airflow passageway between the heating element and the second aperture being no smaller in cross-sectional area than the cross-sectional area of the first aperture (see Figs. 6-10 and 15 of Exhibit A for the interior of the airflow passageway between the heating element and the second aperture being no smaller in cross-sectional area than the cross-sectional area of the first aperture).

(l) Dependent claim 32

Recitation: wherein the first aperture on the first end is smaller than the second aperture on the second end (see Fig. 15 of Exhibit A showing the opposite ends of the cartridge).

(m) Dependent claim 33

Recitation: wherein the solution holding medium reservoir includes an absorbent material (see Figs. 5, 7, 8, 11 and 12 of Exhibit A showing the absorbent material inside a reservoir of the cartridge).

(n) Dependent claim 34

Recitation: further comprising a solution in the solution holding medium reservoir, the solution comprising one of propylene glycol and nicotine (the absorbent material of Figs. 6 and 12 of Exhibit A holds a solution comprising propylene glycol and nicotine).

(o) Dependent claim 35

Recitation: wherein the airflow passageway has a uniform cross-sectional area measured perpendicular to a central longitudinal axis of the housing between the heating element and the second aperture (see Figs. 6-10 and 15 of Exhibit A for the airflow passageway having a uniform cross-sectional area between the heating element and the second aperture).

(p) Independent claim 36

Preamble: a cartridge configured to mechanically and electrically couple to a power source of an electronic vaporizer.

Recitation 1: a housing having an interior (see Figs. 2, 3, and 11 of Exhibit A showing a yellow cartridge of the electronic cigarette and the interior thereof) and a solution holding medium adapted to hold a solution in the interior of the housing (see Figs. 7-12 of Exhibit A showing the batting material that is a solution holding medium), the housing having a first end and a second end that is opposite the first end, the housing having a central longitudinal axis extending through the first end and the second end, the housing having a first aperture on the first end and a second aperture on the second end, the first aperture having a cross-sectional area measured perpendicular to the central longitudinal axis of the housing (see Figs. 1, 6, 7, and 15 of Exhibit A showing a first aperture at the first end of the yellow cartridge and a second aperture at the second end of the yellow cartridge), the first end of the housing having an electrically conductive portion adapted to mechanically and electrically couple to an electrically conductive portion of the power source (see Fig. 2 of Exhibit A showing the electrical conductive threaded portion on the white battery of the electronic cigarette and the electrical conductive threaded portion of the yellow cartridge for

mechanically and electrically coupling with the electrical conductive threaded portion on the white battery);

Recitation 2: an airflow passageway in the interior of the housing, the airflow passageway having a length extending centrally and axially with respect to the housing intermediate of the first aperture on the first end of the housing and the second aperture on the second end of the housing, the airflow passageway being configured to allow an airflow through the cartridge from the first aperture to the second aperture of the housing (see Figs. 5-13 and 15-17 of Exhibit A showing the air flow passageway through the yellow cartridge), the airflow passageway having an exterior adjacent to the solution holding medium along a majority of the length of the airflow passageway (see Figs. 7-9 of Exhibit A showing the airflow passageway adjacent and along the batting material), the airflow passageway having an interior having a uniform cross-sectional area measured perpendicular to the central longitudinal axis of the housing and extending continuously along the majority of the length of the airflow passageway (see Figs. 15-17 of Exhibit A showing the configuration of the airflow passageway); and

Recitation 3: a heating element located in the interior of the housing (see Figs. 6-14 of Exhibit A showing the heating element coil) and extending transversely across the airflow passageway (see Figs. 6-14 of Exhibit A showing the heating element coil), the airflow through the passageway passing on both transverse sides of the element (see Figs. 6-14 of Exhibit A showing the heating element coil), a plane perpendicular to the central longitudinal axis of the housing passing through the heating element and the solution holding medium(see Figs. 7-10 of Exhibit A noting that a plane perpendicular to the central longitudinal axis of the housing would pass through both the heating element and the solution holding medium of the assembled cartridge), the airflow passageway having an interior between the heating element and the second aperture no smaller in cross-sectional area than the cross-sectional area of the first aperture (see Figs. 6-10 and 15 of Exhibit A for the interior of the airflow passageway between the heating element and the second aperture being no smaller in cross-

sectional area than the cross-sectional area of the first aperture), the heating element being connected to the electrically conductive portion of the first end of the housing (see Figs. 12-15 showing the heating element electrically connected to the electrical conductive threaded portion of the yellow cartridge), the heating element being electrically configured to vaporize at least a portion of the solution to be contained in the solution holding medium for oral provision to an individual in an airflow from the second aperture responsive to electrical power received from the power source through the electrically conductive portion of the cartridge (this corresponds to the purpose of the electronic cigarette of Exhibit A).

(q) Dependent claim 37

Recitation: further in combination with the power source including a battery and the electrically conductive portion, the electrically conductive portion of the power source being mechanically and electrically coupled to the electrically conductive portion of the first end of the housing portion (see Fig. 2 of Exhibit A showing the electrical conductive threaded portion on the white battery of the electronic cigarette).

(r) Dependent claims 38 and 41

Recitation: wherein the heating element is a coil having a maximum diameter and the uniform cross-sectional area of the airflow passageway is a circle having a diameter, the maximum diameter of the coil being smaller than the diameter of the circle of the uniform cross-sectional area of the airflow passageway (see Figs. 14 and 15 of Exhibit A showing the coil having a maximum diameter being smaller than the diameter of the airflow passageway).

(s) Dependent claims 39 and 42

Recitation: wherein the first aperture on the first end is located centrally and axially with respect to the housing (see Figs. 2 and 15 of Exhibit A for the first aperture on the first end being located centrally and axially with respect to the housing.

(t) Dependent claims 40 and 43

Recitation: wherein the first aperture on the first end is smaller than the second aperture on the second end (see Fig. 15 of Exhibit A showing the opposite ends of the cartridge).

(u) Dependent claim 44

Recitation: wherein the solution holding medium includes at least one of an absorbent material and a reservoir (see Figs. 5, 7, 8, 11 and 12 of Exhibit A showing the absorbent material inside a reservoir of the cartridge).

(v) Dependent claim 45

Recitation: further comprising a solution, wherein the solution comprises one of propylene glycol and nicotine (the solution holding medium of Figs. 7-9 and 12 of Exhibit A incudes a solution comprising propylene glycol and nicotine).

(w) Dependent claim 46

Recitation: wherein the heating element is in operative connection with a wicking material, and the wicking material is operative to attract a portion of the solution from the solution holding medium located immediately adjacent opposite ends of the heating element toward the heating element (Figs. 6- 14 of Exhibit A show the wicking material passing through the heating element and being operative to attract a portion of the solution from the solution holding medium located immediately adjacent opposite ends of the heating element toward the heating element).

(x) Dependent claim 47

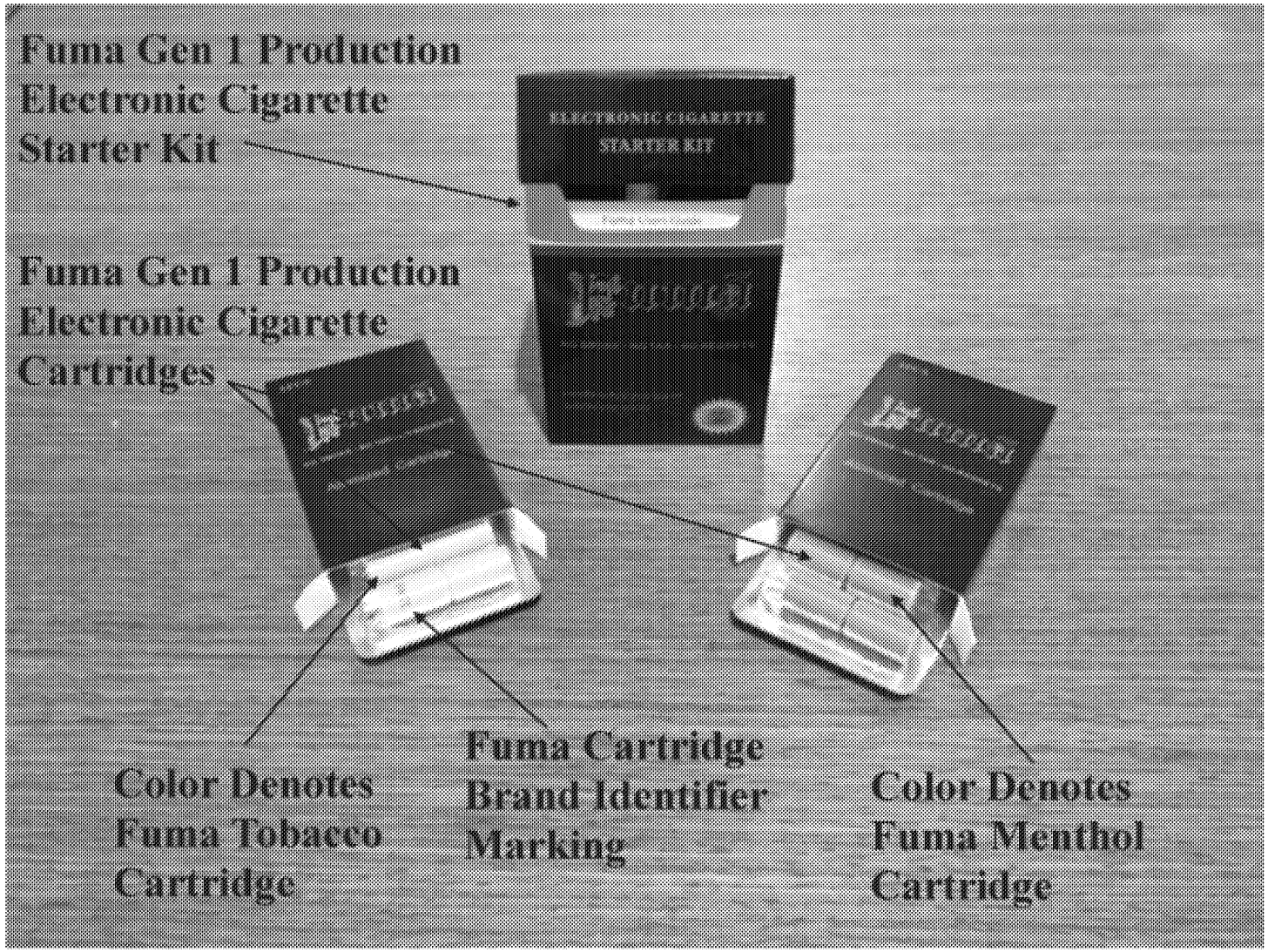
Recitation: wherein the airflow passageway has a uniform cross-sectional area measured perpendicular to a central longitudinal axis of the housing between the heating element and the second aperture (see Figs. 6-10 and 15 of Exhibit A for the airflow passageway having a uniform cross-sectional area between the heating element and the second aperture).

6. The product and the componentry thereof shown in Exhibit A and embodied in independent claims 21, 28, and 36 was sold to customers of Fuma International LLC before January 13, 2010, as evidenced by Exhibit B. To illustrate, page 1 of Exhibit B depicts Invoice No. 41 and shows Deluxe Starter Kits and various Cartridges (corresponding to those shown in Figs. 1-17 of Exhibit A) were sold before January 13, 2010, and page 2 of Exhibit B depicts Invoice No. 44 and shows that Deluxe Starter Kits and various Cartridges (corresponding to those shown in Figs. 1-17 of Exhibit A) also were sold before January 13, 2010.

We declare further that all statements made herein of our own knowledge are true and that all statements made on information and belief are believed to be true; and further, that the statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code, and that such willful false statements may jeopardize the validity of the application or any patents issuing thereon.

Dated: 11/03/18 By: Gregory D. Conley
Gregory D. Conley

**Figure: 1**

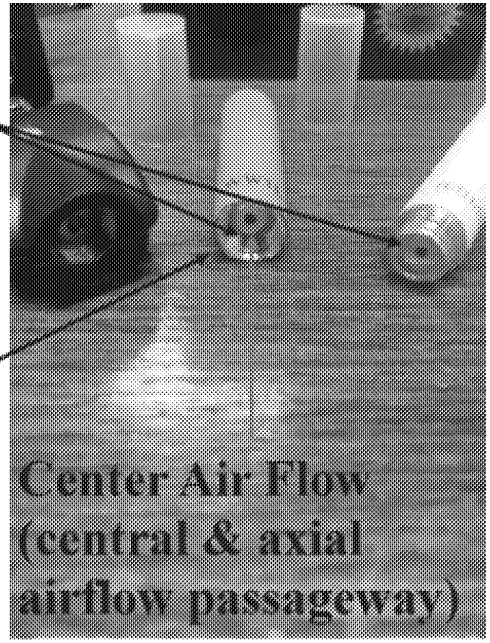



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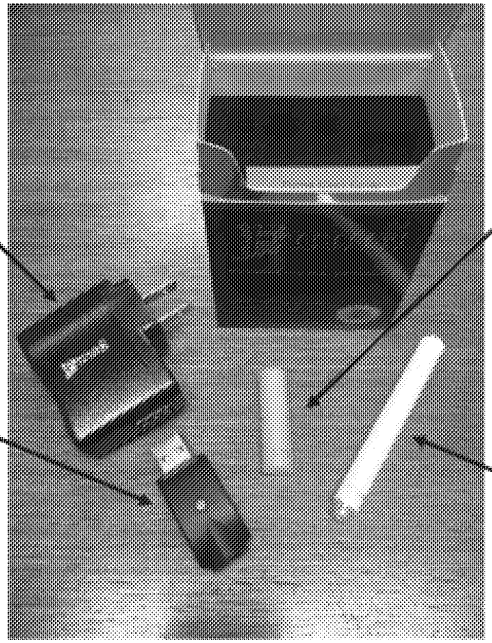

Electrical Conductive Threaded Portion

Fuma Cartridge Screw (first end of the Cartridge housing)




Fuma Wall Charger

Fuma USB Charger



Fuma Cartridge

Fuma Battery

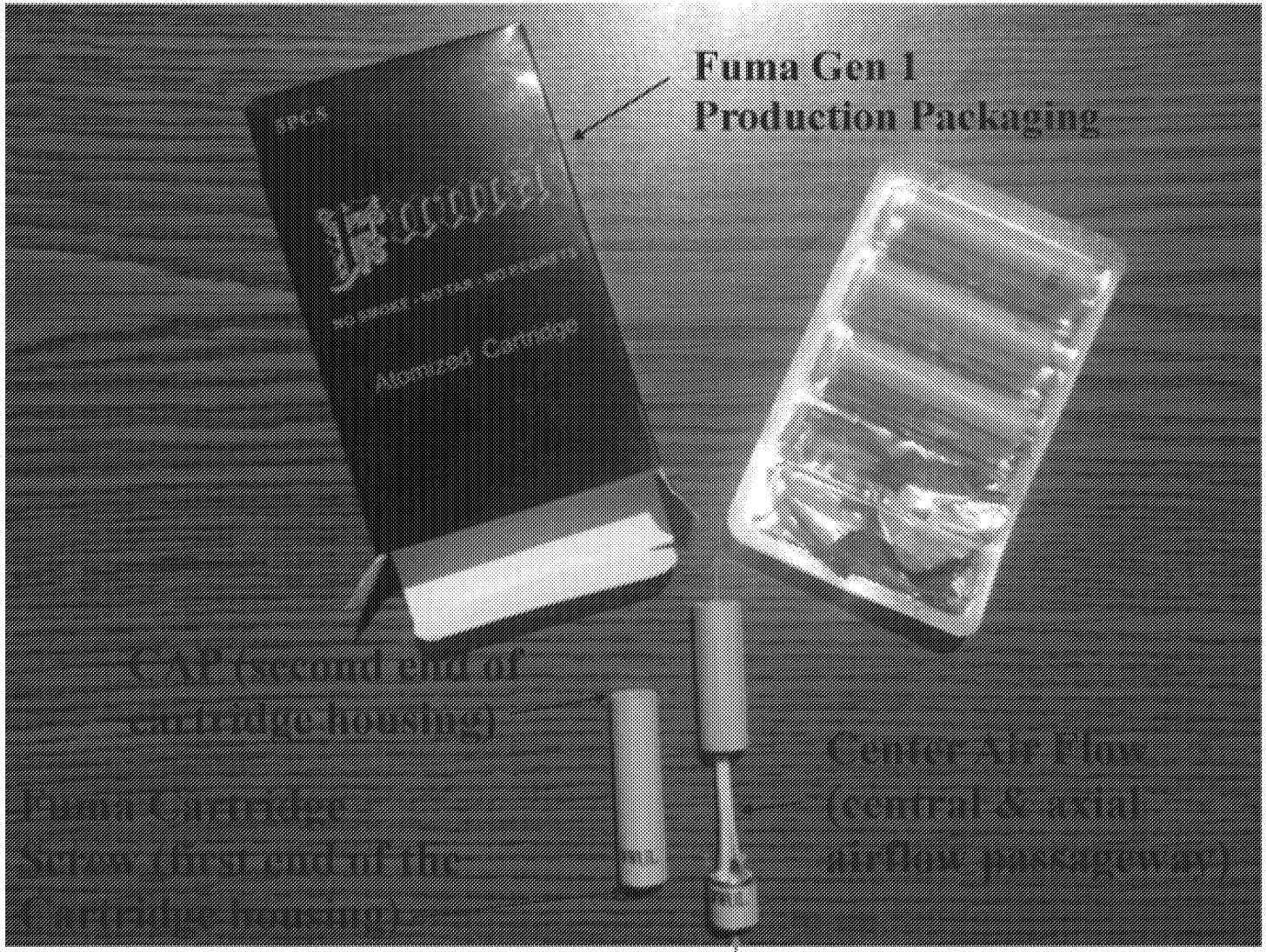
Figure: 2

**Figure: 3**



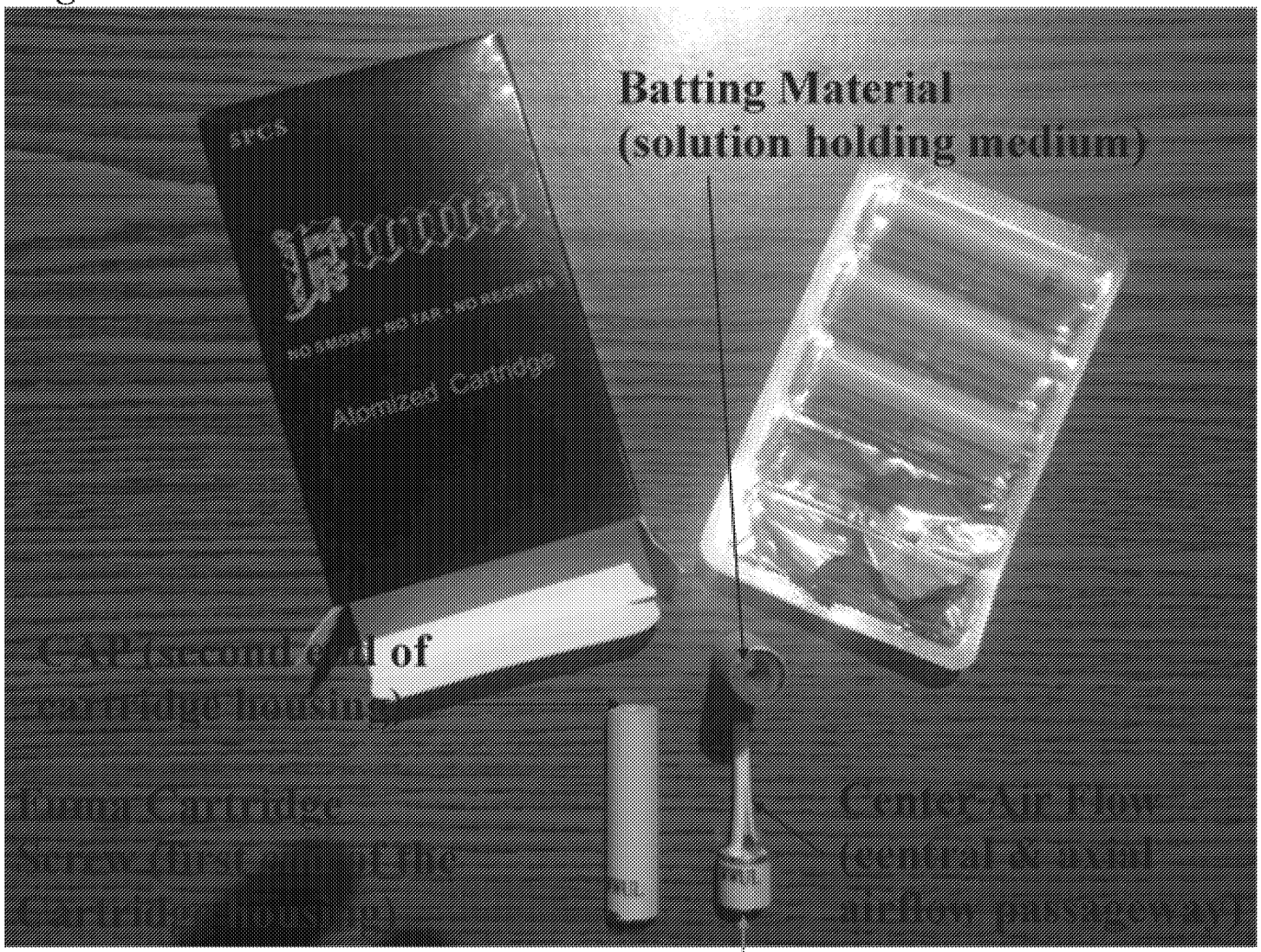

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**Figure: 4**



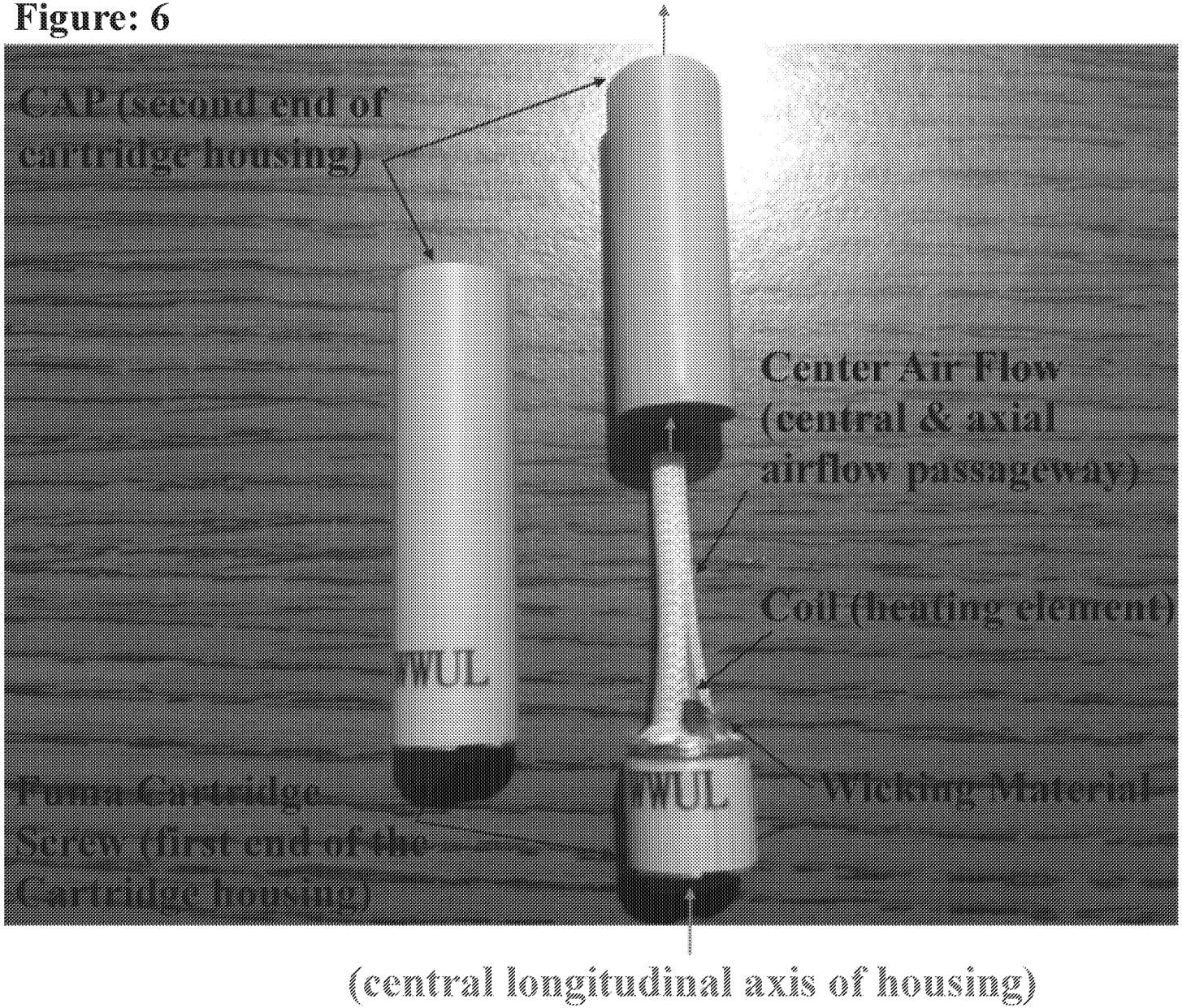

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**Figure: 5**



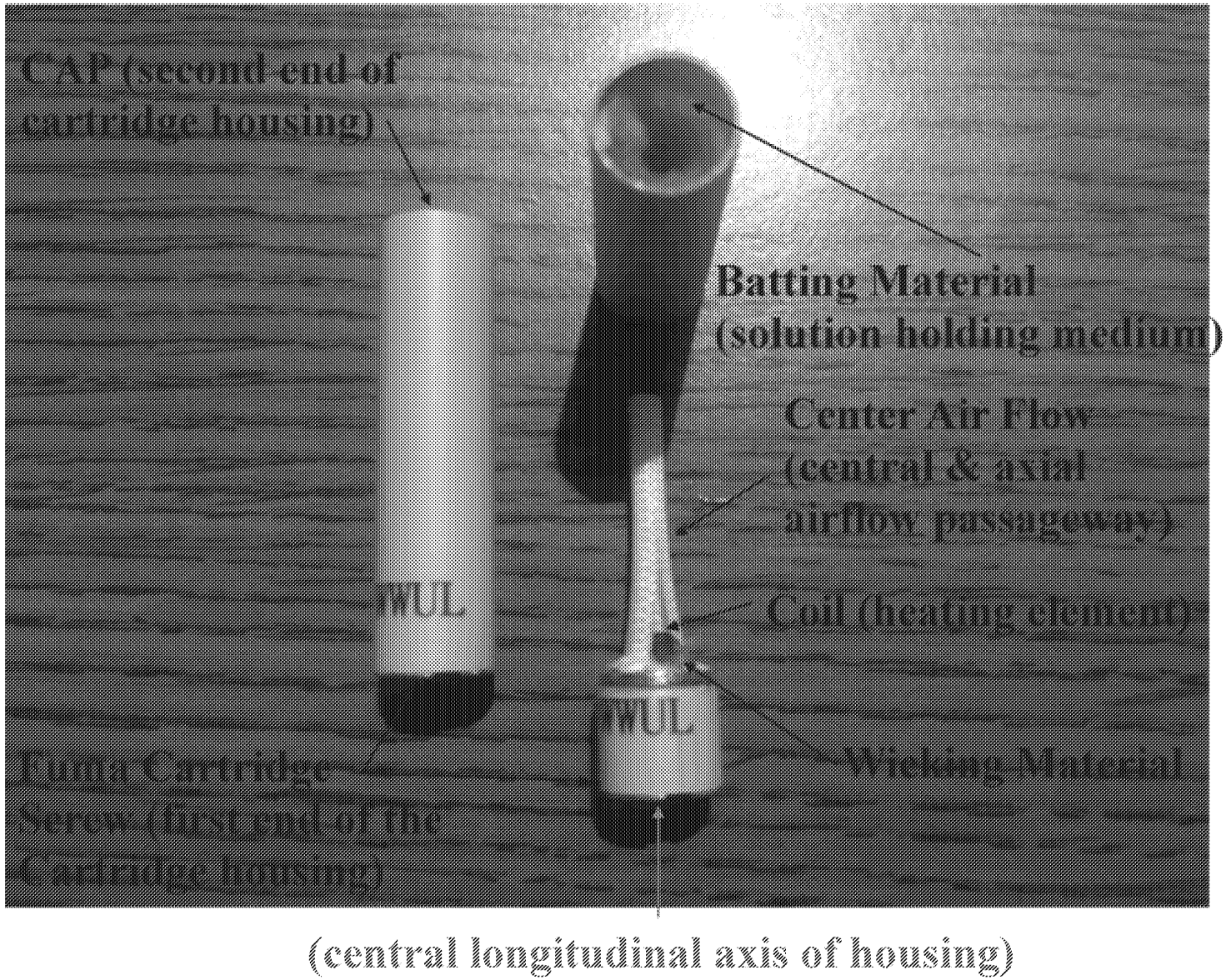

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**Figure: 6**



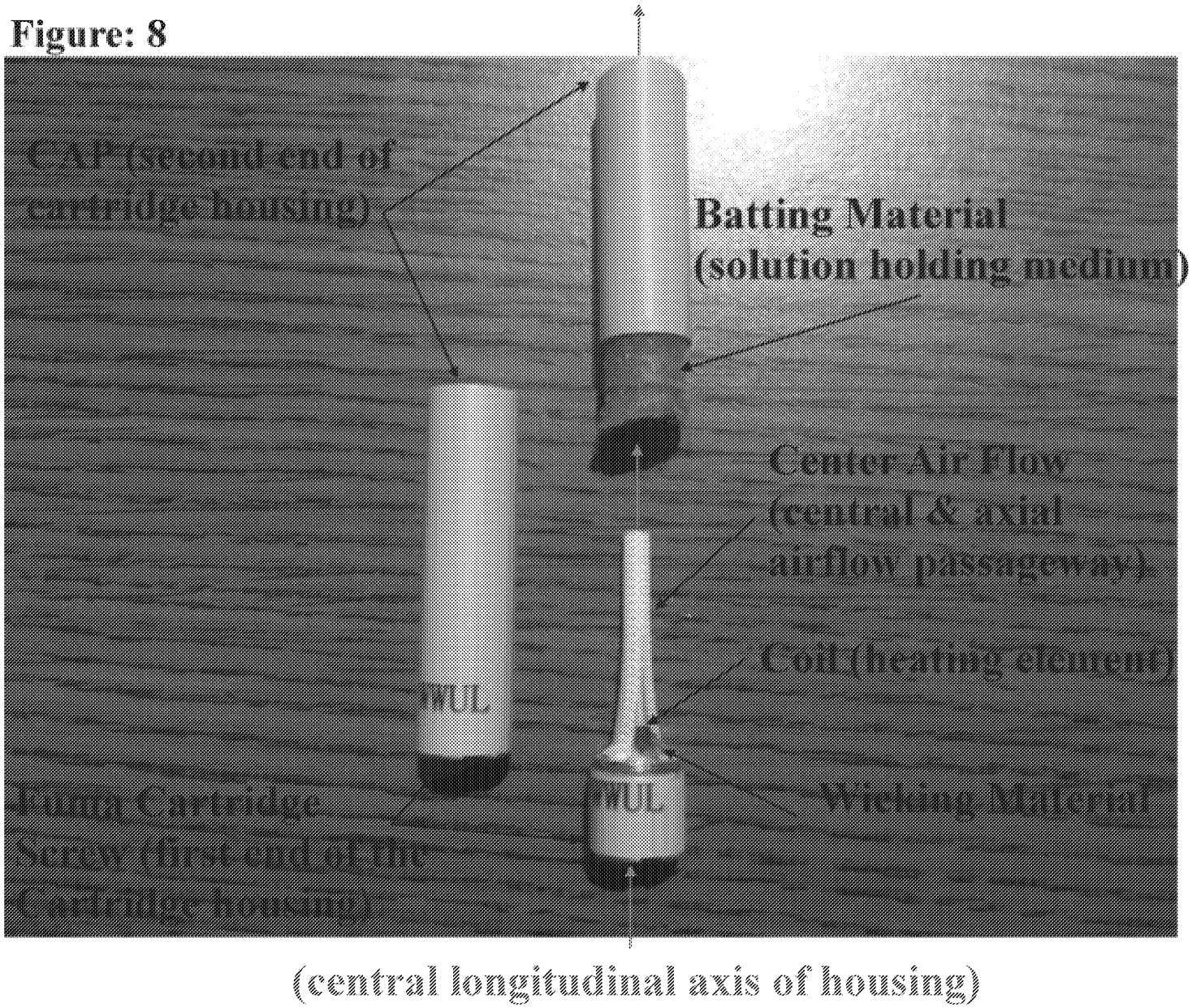

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**Figure: 7**



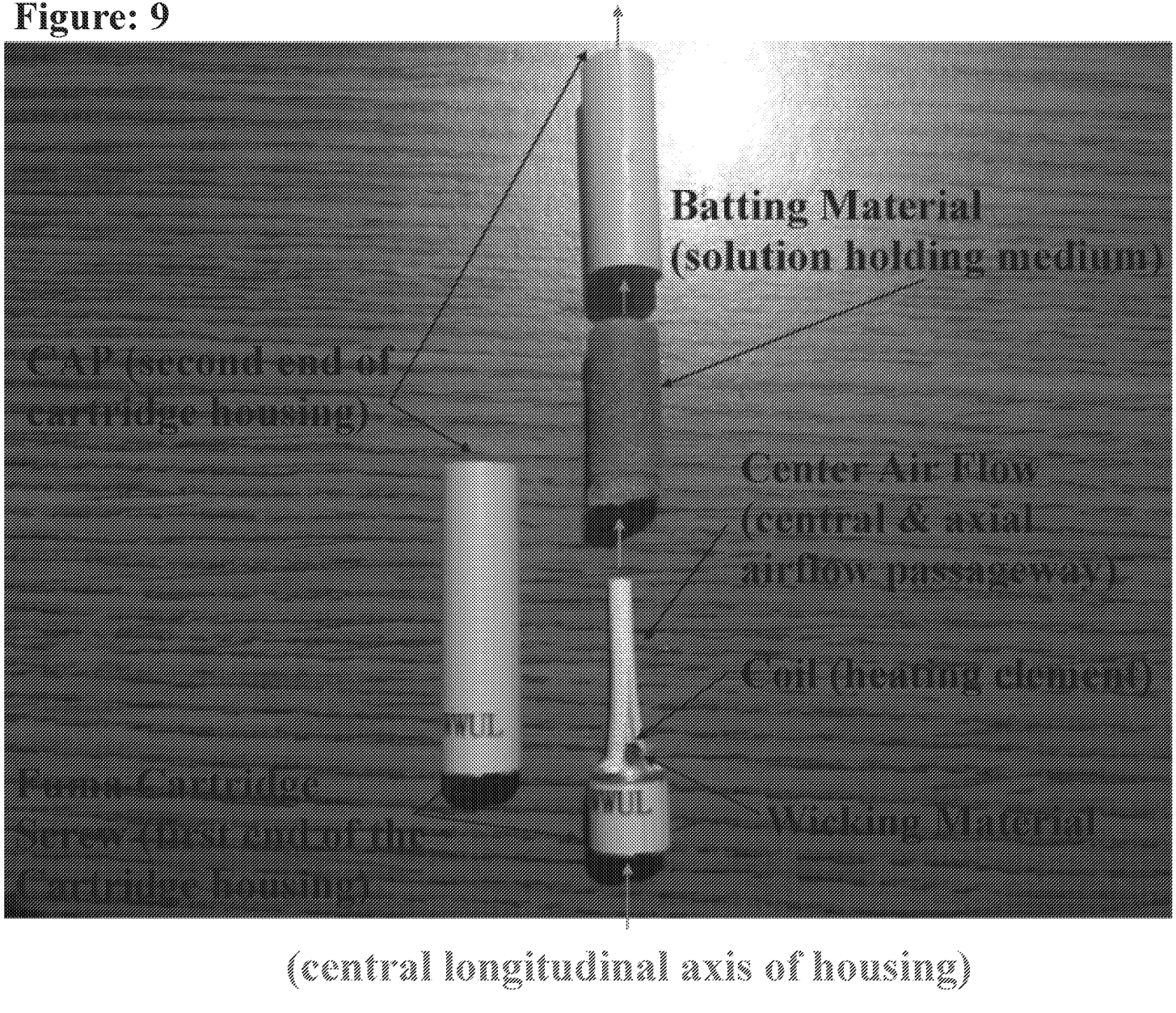

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**Figure: 8**




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**Figure: 9**




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**Figure: 10**

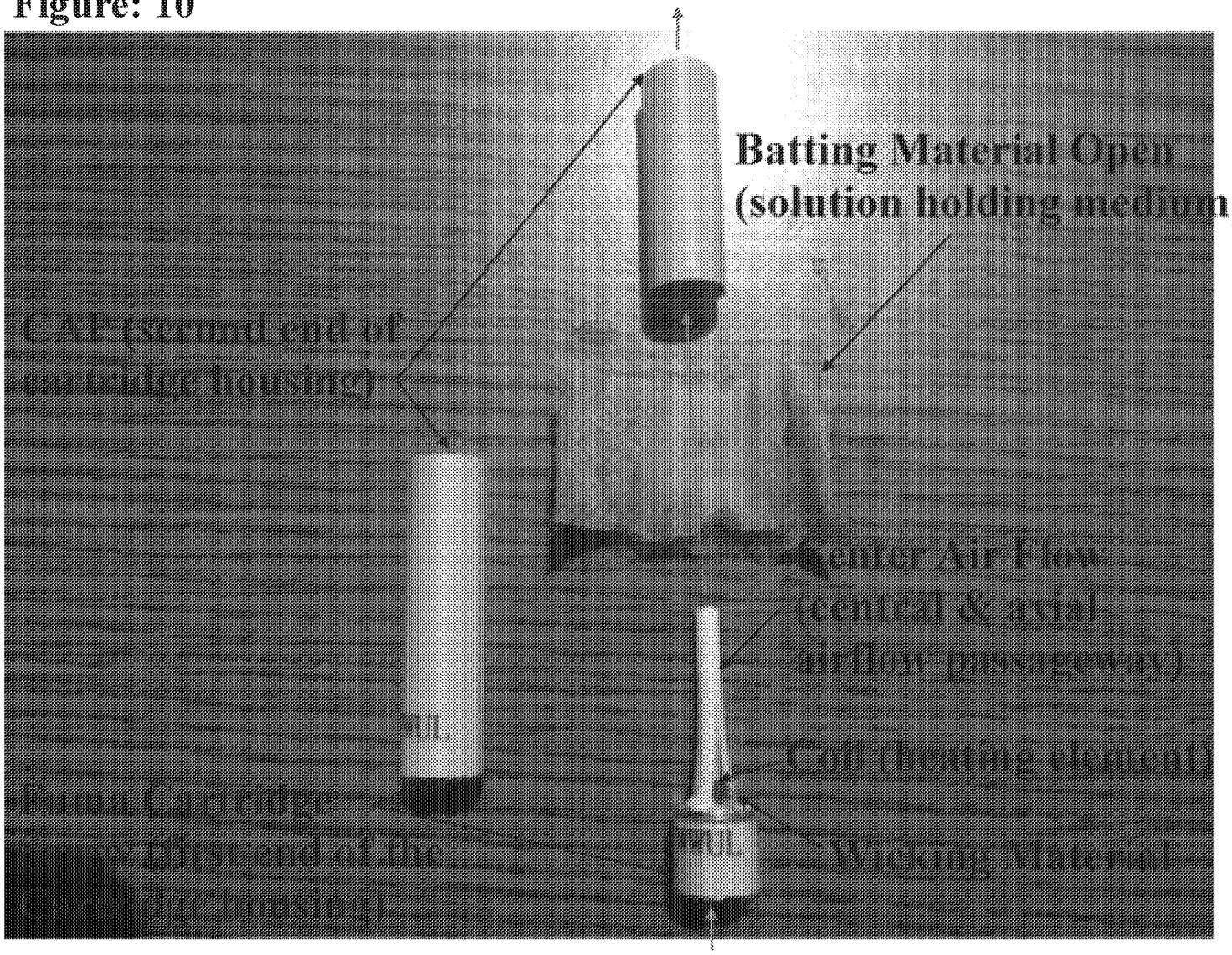
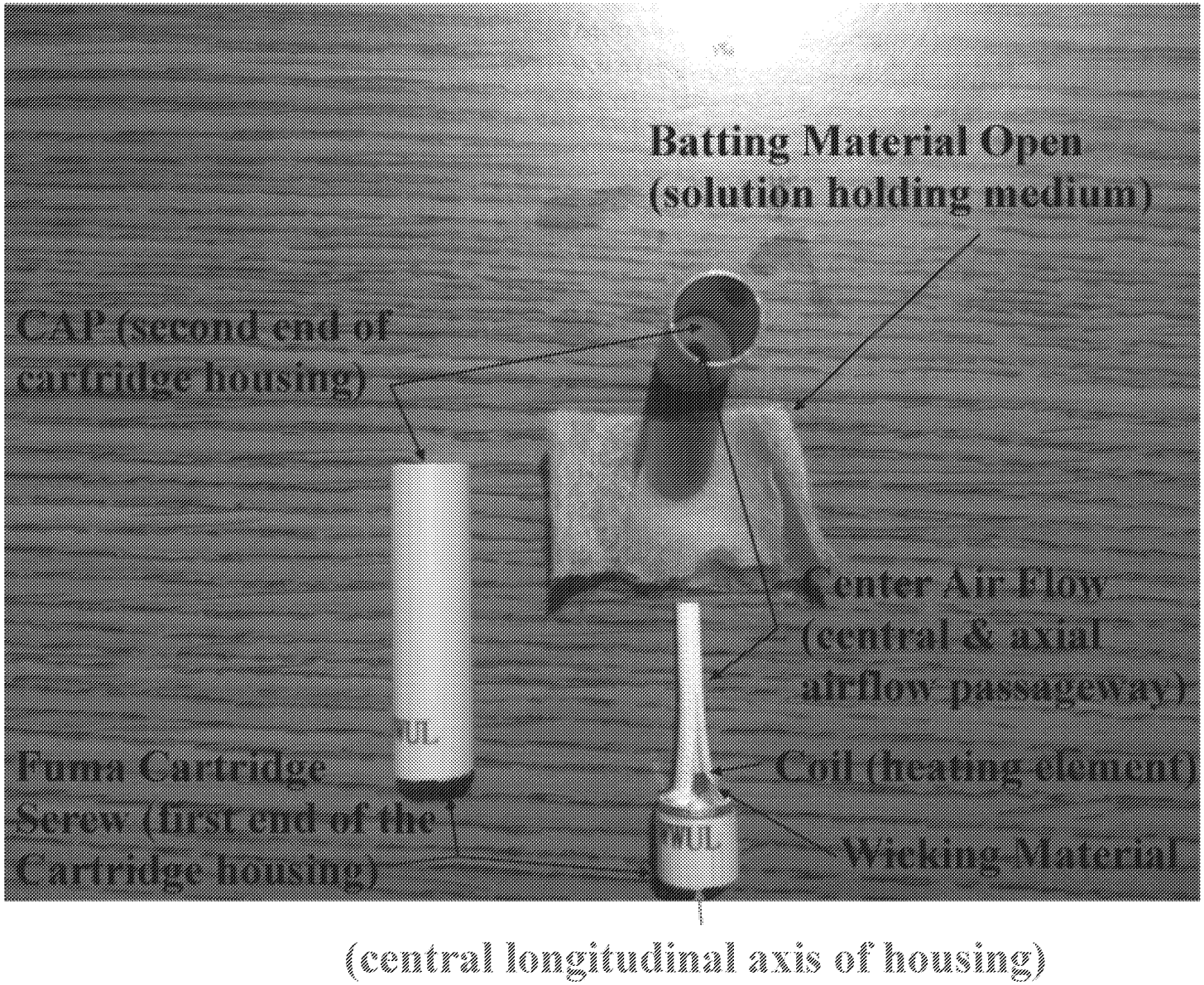
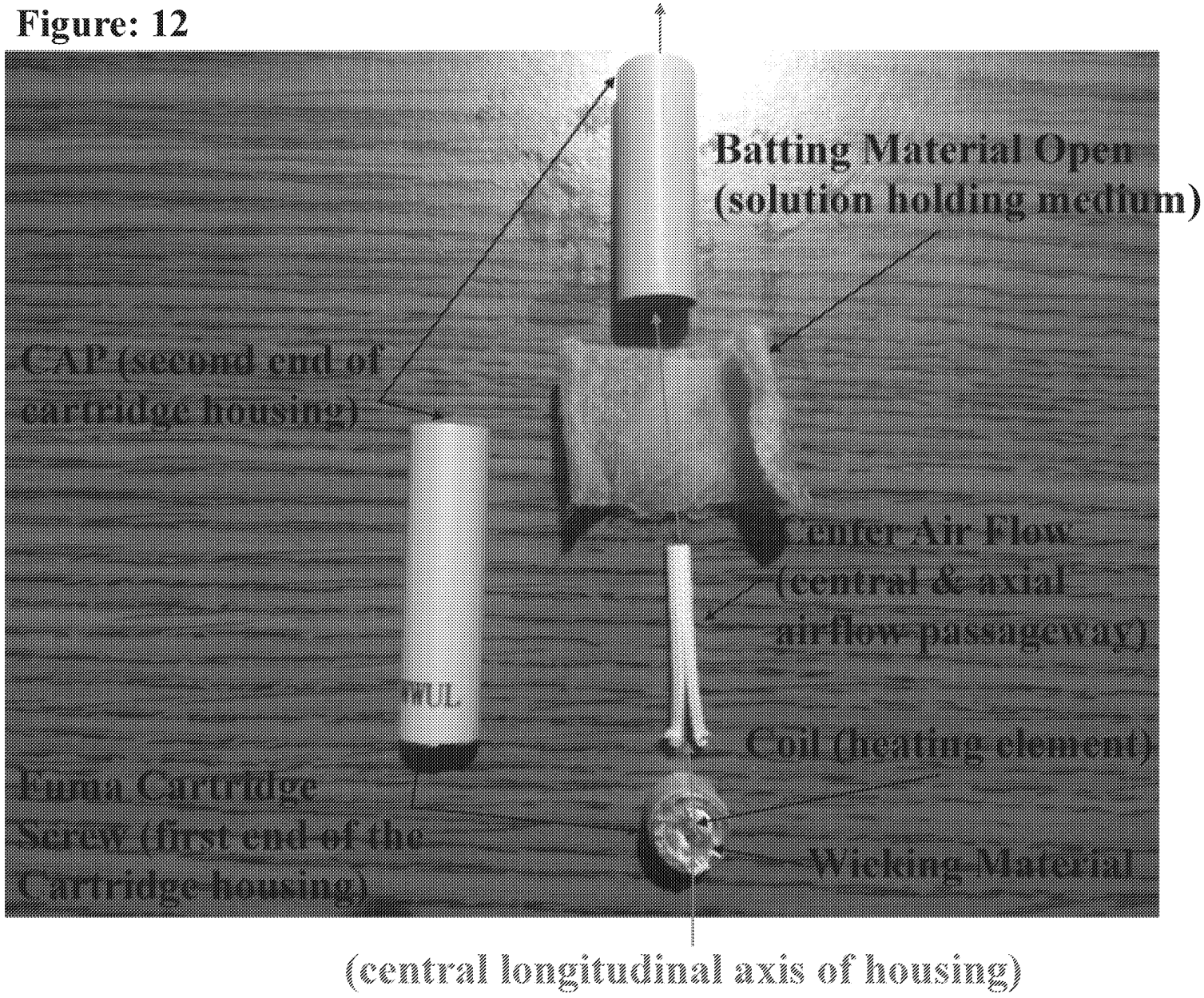


**Figure: 11**



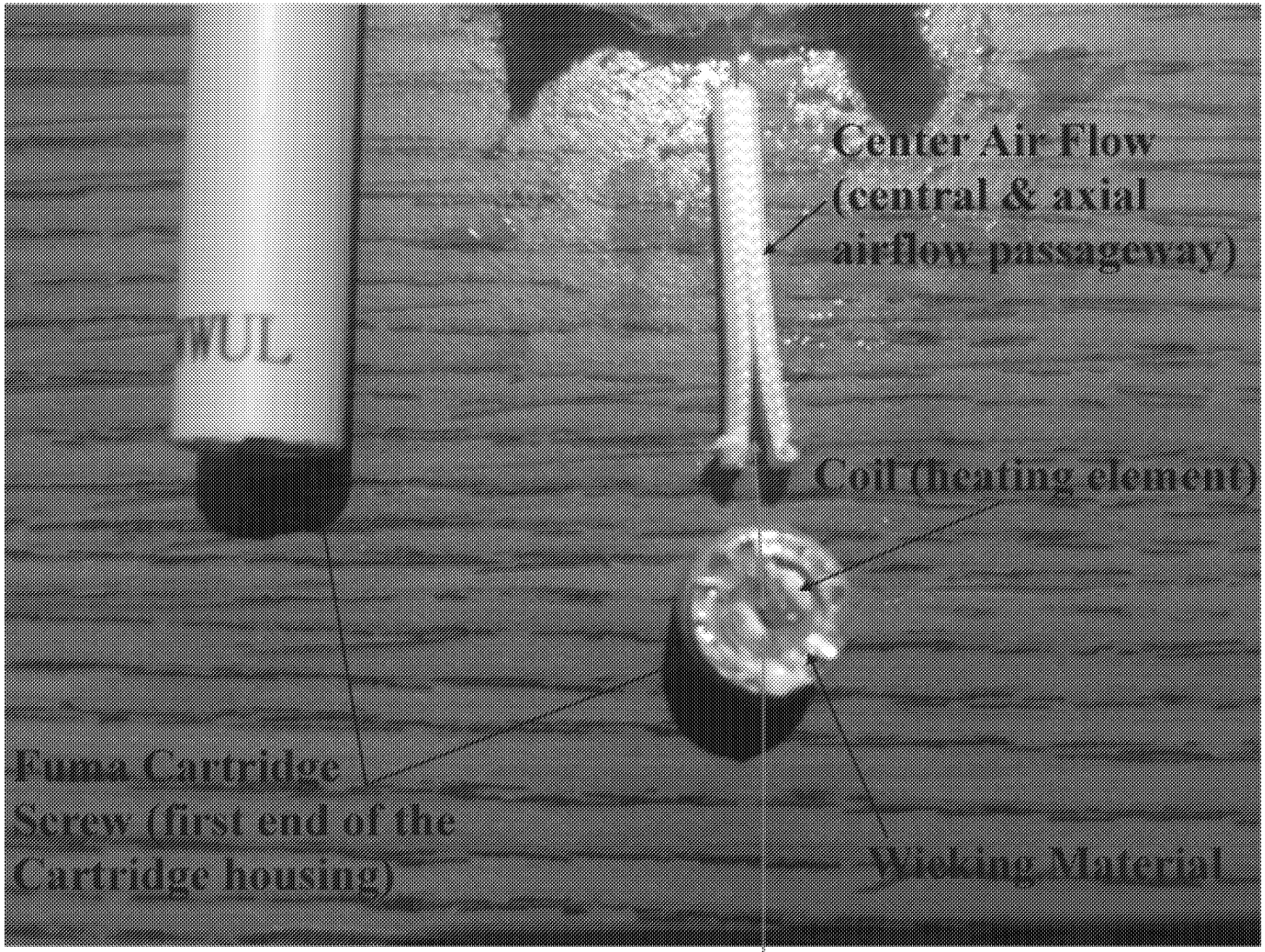

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**Figure: 12**




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**Figure: 13**




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**Figure: 14**

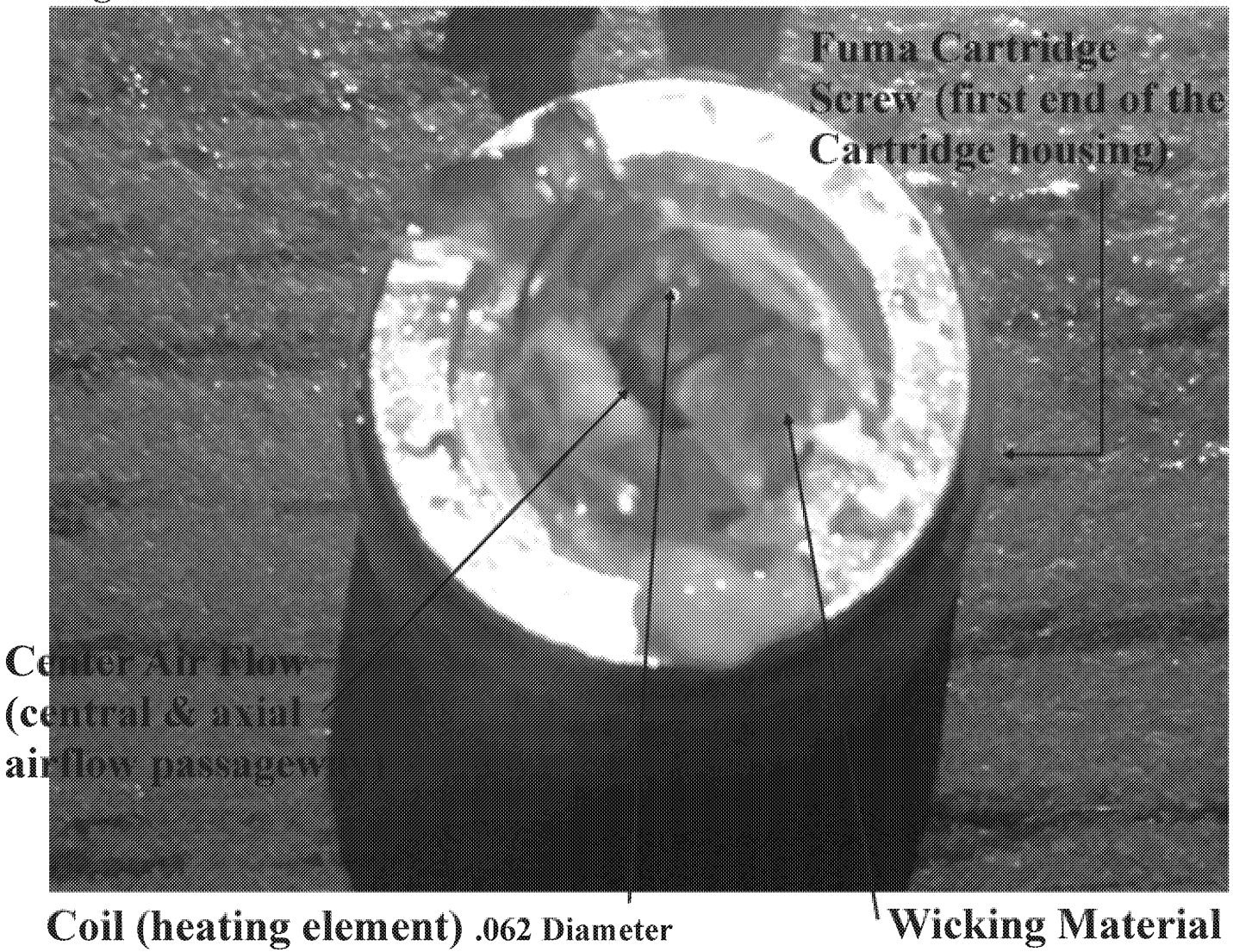

Fuma Cartridge
Screw (first end of the
Cartridge housing)
Center Air Flow
(central & axial
airflow passagew
Coil (heating element) .062 Diameter
Wicking Material

**Figure: 15**

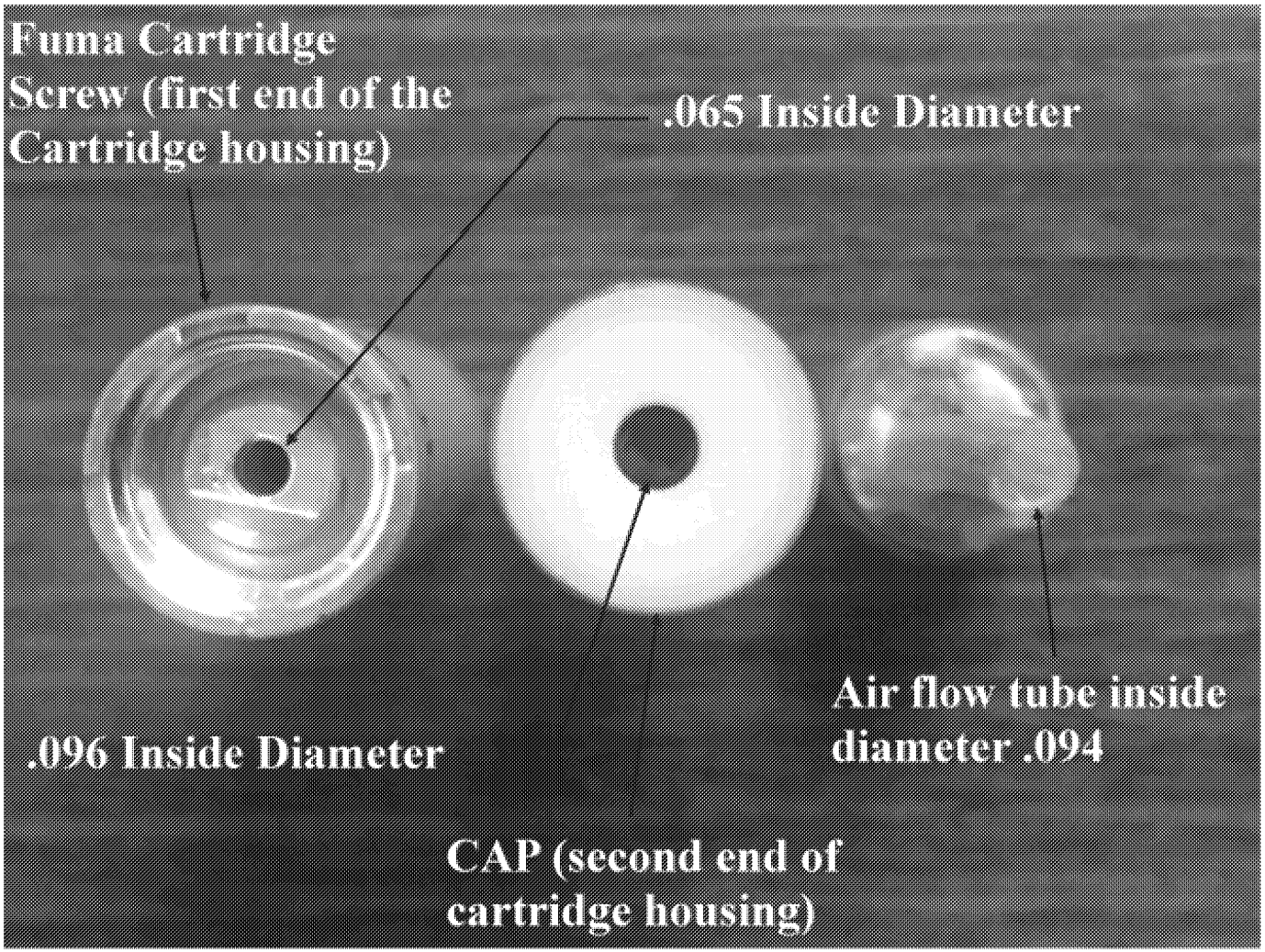
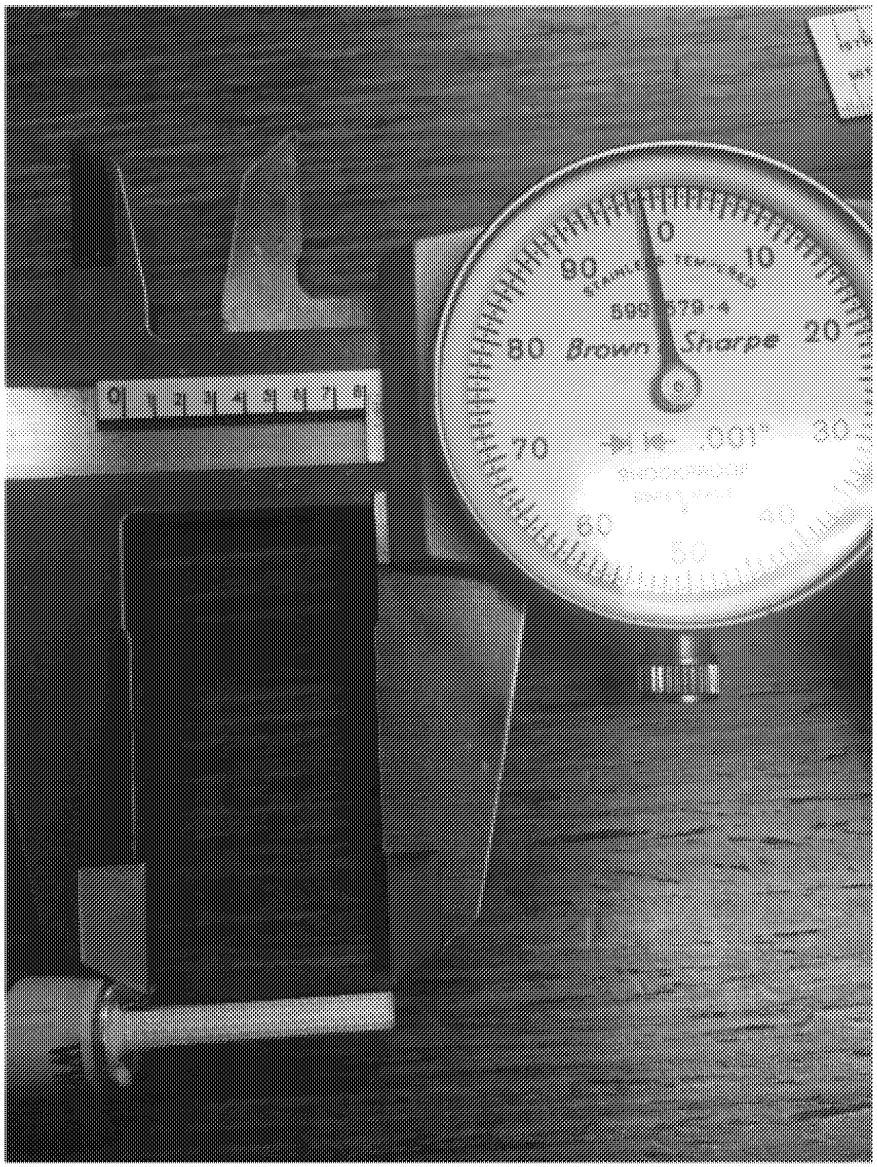

Fuma Cartridge
Screw (first end of the
Cartridge housing)
.065 Inside Diameter
.096 Inside Diameter
Air flow tube inside
diameter .094
CAP (second end of
cartridge housing)

**Figure: 16**




**Measurement from the top of the coil to the top of air flow tube is approximately .798**

**Figure: 17**

**Measurement from the top of the air flow tube to the edge of the slit is approximately .414**

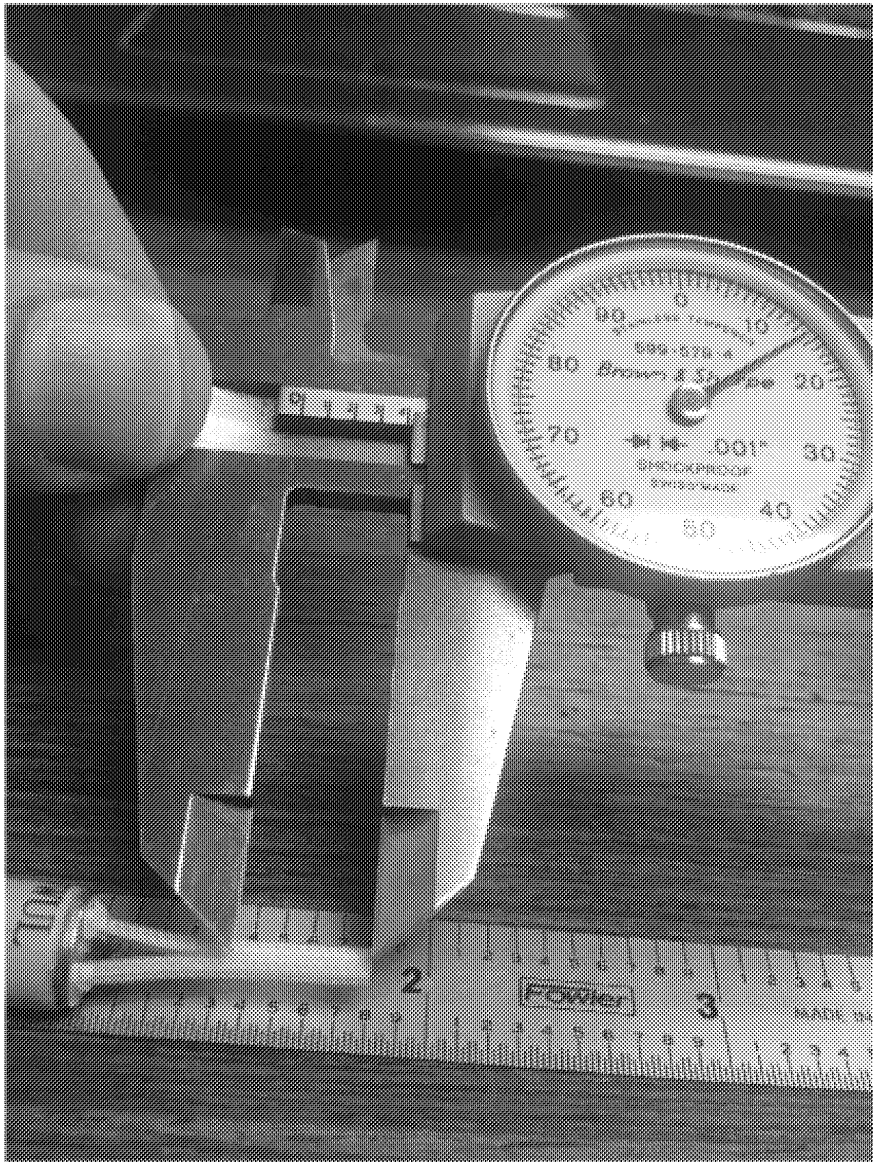


**EXHIBIT B**

PAID

Fuma International LLC

879 S. Progress Drive
Suite D
Medina, OH 44256

# Invoice

| Date | Invoice # |
|---|---|
| 11/20/2009 | 41 |

| Bill To | Ship To |
|---|---|
| Adco Distributing<br>221 Cherry Ave. NE<br>Canton, Ohio 44702 | |

| P.O. Number | Terms | Rep | Ship | Via | F.O.B. | Project |
|---|---|---|---|---|---|---|
| adco-2 | Due on receipt | | 11/20/2009 | | | |

| Quantity | Item Code | Description | Price Each | Amount |
|---|---|---|---|---|
| 2 | Deluxe SK WWTL | Deluxe Starter Kit WWTL | 18.54 | 37.08 |
| 2 | Deluxe SK MCBL | Deluxe Starter Kit MCBL | 18.54 | 37.08 |
| 3 | Cartridges-WWTF | Wild West Tobacco Full Cartridges 5 pack | 6.85 | 20.55 |
| 7 | Cartridges-WWTL | Wild West Tobacco Lights Cartridges 5 pack | 6.85 | 47.95 |
| 6 | Cartridges-WWTUL | Wild West Ultra Lights Cartridges 5 pack | 6.85 | 41.10 |
| 1 | Cartridges-MFF | Menthol Full Freeze Cartridges 5 pack | 6.85 | 6.85 |
| 1 | Cartridges-MCBUL | Menthol Clean Breeze Ultra Lights Cartridges 5 pack | 6.85 | 6.85 |
| 4 | X-Car Charger | Car Charger | 5.00 | 20.00 |
| 1 | X-Travel Charger ... | Travel Charger Carrying Case | 19.95 | 19.95 |
| 1 | Shipping | Shipping & Handling Charge | 0.00 | 0.00 |

**Total** $237.41

PAID
Check # 13065

...ternational LLC
...s. Progress Drive
...ite D
Medina, OH 44256

PAID

# Invoice

| Date | Invoice # |
|---|---|
| 11/5/2009 | 44 |

| Bill To | Ship To |
|---|---|
| Great Midwest Tobacco<br>10825 Medallion Dr.<br>Evendale, Ohio 45241 | |

| P.O. Number | Terms | Rep | Ship | Via | F.O.B. | Project |
|---|---|---|---|---|---|---|
| GMT-1 | Due on receipt | | 11/30/2009 | Puma Truck | | |

| Quantity | Item Code | Description | Price Each | Amount |
|---|---|---|---|---|
| 313 | Deluxe SK WWTL | Deluxe Starter Kit WWTL | 18.2619 | 5,715.97 |
| 159 | Deluxe SK MCBL | Deluxe Starter Kit MCBL | 18.2619 | 2,903.64 |
| 500 | Cartridges-WWTF | Wild West Tobacco Full Cartridges 5 pack | 6.74725 | 3,373.63 |
| 500 | Cartridges-WWTL | Wild West Tobacco Lights Cartridges 5 pack | 6.74725 | 3,373.63 |
| 400 | Cartridges-WWTUL | Wild West Ultra Lights Cartridges 5 pack | 6.74725 | 2,698.90 |
| 400 | Cartridges-MFF | Menthol Full Freeze Cartridges 5 pack | 6.74725 | 2,698.90 |
| 500 | Cartridges-MCBL | Menthol Clean Breeze Lights Cartridges 5 pack | 6.74725 | 3,373.63 |
| | | **Total** | | $24,138.30 |

PTO/SB/06 (09-11)
Approved for use through 1/31/2014. OMB 0651-0032
U.S. Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE
Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it displays a valid OMB control number.

| PATENT APPLICATION FEE DETERMINATION RECORD<br>Substitute for Form PTO-875 | Application or Docket Number<br>15/377,522 | Filing Date<br>12/13/2016 | ☐ To be Mailed |
|---|---|---|---|

**ENTITY:** ☐ LARGE ☒ SMALL ☐ MICRO

## APPLICATION AS FILED – PART I

| FOR | (Column 1) NUMBER FILED | (Column 2) NUMBER EXTRA | RATE ($) | FEE ($) |
|---|---|---|---|---|
| ☐ BASIC FEE (37 CFR 1.16(a), (b), or (c)) | N/A | N/A | N/A | |
| ☐ SEARCH FEE (37 CFR 1.16(k), (i), or (m)) | N/A | N/A | N/A | |
| ☐ EXAMINATION FEE (37 CFR 1.16(o), (p), or (q)) | N/A | N/A | N/A | |
| TOTAL CLAIMS (37 CFR 1.16(i)) | minus 20 = | * | X $ = | |
| INDEPENDENT CLAIMS (37 CFR 1.16(h)) | minus 3 = | * | X $ = | |
| ☐ APPLICATION SIZE FEE (37 CFR 1.16(s)) | If the specification and drawings exceed 100 sheets of paper, the application size fee due is $310 ($155 for small entity) for each additional 50 sheets or fraction thereof. See 35 U.S.C. 41(a)(1)(G) and 37 CFR 1.16(s). | | | |
| ☐ MULTIPLE DEPENDENT CLAIM PRESENT (37 CFR 1.16(j)) | | | | |
| * If the difference in column 1 is less than zero, enter "0" in column 2. | | | TOTAL | |

## APPLICATION AS AMENDED – PART II

| AMENDMENT | 11/02/2018 | (Column 1) CLAIMS REMAINING AFTER AMENDMENT | | (Column 2) HIGHEST NUMBER PREVIOUSLY PAID FOR | (Column 3) PRESENT EXTRA | RATE ($) | ADDITIONAL FEE ($) |
|---|---|---|---|---|---|---|---|
| | Total (37 CFR 1.16(i)) | * 31 | Minus | ** 20 | = 11 | X $50 = | 550 |
| | Independent (37 CFR 1.16(h)) | * 4 | Minus | ***3 | = 1 | X $230 = | 230 |
| | ☐ Application Size Fee (37 CFR 1.16(s)) | | | | | | |
| | ☐ FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM (37 CFR 1.16(j)) | | | | | | |
| | | | | | | TOTAL ADD'L FEE | **780** |

| AMENDMENT | | (Column 1) CLAIMS REMAINING AFTER AMENDMENT | | (Column 2) HIGHEST NUMBER PREVIOUSLY PAID FOR | (Column 3) PRESENT EXTRA | RATE ($) | ADDITIONAL FEE ($) |
|---|---|---|---|---|---|---|---|
| | Total (37 CFR 1.16(i)) | * | Minus | ** | = | X $ = | |
| | Independent (37 CFR 1.16(h)) | * | Minus | *** | = | X $ = | |
| | ☐ Application Size Fee (37 CFR 1.16(s)) | | | | | | |
| | ☐ FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM (37 CFR 1.16(j)) | | | | | | |
| | | | | | | TOTAL ADD'L FEE | |

* If the entry in column 1 is less than the entry in column 2, write "0" in column 3.
** If the "Highest Number Previously Paid For" IN THIS SPACE is less than 20, enter "20".
*** If the "Highest Number Previously Paid For" IN THIS SPACE is less than 3, enter "3".
The "Highest Number Previously Paid For" (Total or Independent) is the highest number found in the appropriate box in column 1.

LIE
ANGELONA JONES

This collection of information is required by 37 CFR 1.16. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 12 minutes to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. **SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.**

*If you need assistance in completing the form, call 1-800-PTO-9199 and select option 2.*

UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

| APPLICATION NUMBER | FILING OR 371(C) DATE | FIRST NAMED APPLICANT | ATTY. DOCKET NO./TITLE |
|---|---|---|---|
| 15/377,522 | 12/13/2016 | Gregory D. Conley | 269.0003-02000 |

**CONFIRMATION NO. 1065**

22882
MARTIN & FERRARO, LLP
1557 LAKE O'PINES STREET, NE
HARTVILLE, OH 44632

**37 CFR 1.48 ACKNOWLEDGEMENT LETTER**

*OC000000103677892*

Date Mailed: 11/13/2018

## IMPROPER SUBMISSION OF REQUEST UNDER 37 CFR 1.48(a)

The request under 37 CFR 1.48(a) (request to change inventorship) submitted on 11/02/2018 in the above-identified application is not accepted because:

- The request to correct inventorship under 37 CFR 1.48(a) is deficient because a corrected or updated application data sheet (ADS) in compliance with 37 CFR 1.76 (including markings showing the changes) has not been submitted. Any renewed request must include a corrected or updated ADS in compliance with 37 CFR 1.76 that identifies the information being changed, with underlining for insertions, and strike-through or brackets for text removed.

Questions about the contents of this notice and the requirements it sets forth should be directed to the Office of Data Management, Application Assistance Unit, at **(571) 272-4000** or **(571) 272-4200** or **1-888-786-0101**.

/mmasfaw/

PATENT
Attorney Docket No. 269.0003-02000
Customer No. 22882

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

| | | |
|---|---|---|
| In re Design Application of: | ) | Confirmation No.: 1065 |
| Gregory D. Conley et al. | ) | |
| Serial No.: 15/377,522 | ) | Group Art Unit: 3742 |
| Filed: December 13, 2016 | ) | Examiner: Thor S. Campbell |
| For: ELECTRONIC VAPORIZER | ) | |

Mail Stop PETITION
Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Sir:

**RENEWED REQUEST FOR CORRECTION OF INVENTORSHIP UNDER 37 C.F.R. § 1.48(a)**

In response to the Communication of November 13, 2018, and pursuant to 37 C.F.R. § 1.48(a), it is requested that the inventorship be corrected to delete inventor Rebecca L. Conley as a co-inventor in the above-identified application. A corrected Application Data Sheet in compliance with 37 C.F.R. § 1.76 is being submitted concurrently herewith.

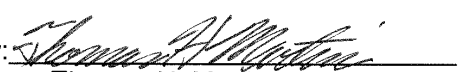
The reason for revising the named inventors is because all the pending claims, after entry of the concurrently-filed Amendment, are fully supported by the disclosure in the original application (serial no. 12/843,917 filed July 27, 2010) from which the present continuation (which is a continuation of a continuation of a continuation-in-part) claims priority, and that original application properly named Greg Conley and Dan Hillenbrandt as the only inventors.

The total amount of $70 to cover the requisite processing fee of $70 (as set forth in 37 CFR § 1.17(i)) was previously paid on November 2, 2018.

If there is any additional fee due in connection with the filing of this Request, please charge the fee to our Deposit Account No. 50-1068.

Respectfully submitted,
MARTIN & FERRARO, LLP

Dated: November 13, 2018

By: 
Thomas H. Martin
Registration No. 34,383

1557 Lake O'Pines Street, NE
Hartville, Ohio 44632
Telephone: (330) 877-0700

PTO/AIA/14 (11-15)
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| Application Data Sheet 37 CFR 1.76 | Attorney Docket Number | ~~FUMA-1001-CIP2C~~ 269.0003-02000 |
|---|---|---|
| | Application Number | 15/377,522 |
| Title of Invention | ELECTRONIC VAPORIZER | |

The application data sheet is part of the provisional or nonprovisional application for which it is being submitted. The following form contains the bibliographic data arranged in a format specified by the United States Patent and Trademark Office as outlined in 37 CFR 1.76.
This document may be completed electronically and submitted to the Office in electronic format using the Electronic Filing System (EFS) or the document may be printed and included in a paper filed application.

## Secrecy Order 37 CFR 5.2:

☐ Portions or all of the application associated with this Application Data Sheet may fall under a Secrecy Order pursuant to 37 CFR 5.2 (Paper filers only. Applications that fall under Secrecy Order may not be filed electronically.)

## Inventor Information:

**Inventor 1** — Remove

**Legal Name**

| Prefix | Given Name | Middle Name | Family Name | Suffix |
|---|---|---|---|---|
| | Gregory | D. | Conley | |

**Residence Information (Select One)** • US Residency  Non US Residency  Active US Military Service

| City | State/Province | Country of Residence |
|---|---|---|
| Medina | OH | US |

**Mailing Address of Inventor:**

| | |
|---|---|
| Address 1 | ~~644 Tremain Place~~ 664 Tremain Place |
| Address 2 | |

| City | State/Province | Postal Code | Country |
|---|---|---|---|
| Medina | OH | 44256 | US |

**Inventor 2** — Remove

**Legal Name**

| Prefix | Given Name | Middle Name | Family Name | Suffix |
|---|---|---|---|---|
| | Daniel | C. | Hillenbrandt | Jr. |

**Residence Information (Select One)** ◉ US Residency  Non US Residency  Active US Military Service

| City | State/Province | Country of Residence |
|---|---|---|
| Brunswick | OH | US |

**Mailing Address of Inventor:**

| | |
|---|---|
| Address 1 | 1920 George Drive |
| Address 2 | |

| City | State/Province | Postal Code | Country |
|---|---|---|---|
| Brunswick | OH | 44212 | US |

**Inventor 3** — Remove

**Legal Name**

| Prefix | Given Name | Middle Name | Family Name | Suffix |
|---|---|---|---|---|
| | ~~Rebecca~~ | ~~L.~~ | ~~Conley~~ | |

**Residence Information (Select One)** ◉ US Residency  Non US Residency  Active US Military Service

PTO/AIA/14 (11-15)
Approved for use through 04/30/2017. OMB 0651-0032
U.S. Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE
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| Application Data Sheet 37 CFR 1.76 | Attorney Docket Number | ~~FUMA-1001 CIP2C~~ 269.0003-02000 |
|---|---|---|
| | Application Number | 15/377,522 |
| Title of Invention | ELECTRONIC VAPORIZER | |

| City | ~~Medina~~ | State/Province | ~~OH~~ | Country of Residence | ~~US~~ |
|---|---|---|---|---|---|

**Mailing Address of Inventor:**

| Address 1 | ~~644 Tremain Place~~ | | |
|---|---|---|---|
| Address 2 | | | |
| City | ~~Medina~~ | State/Province | ~~OH~~ |
| Postal Code | ~~44256~~ | Country | ~~US~~ |

All Inventors Must Be Listed - Additional Inventor Information blocks may be generated within this form by selecting the **Add** button. Add

## Correspondence Information:

**Enter either Customer Number or complete the Correspondence Information section below.**
**For further information see 37 CFR 1.33(a).**

☐ **An Address is being provided for the correspondence Information of this application.**

| Customer Number | ~~07733~~ 22882 | | |
|---|---|---|---|
| Email Address | ~~iplaw@walkerandjocke.com~~ USPTO-docketing@martinferraro.com | Add Email | Remove Email |

## Application Information:

| Title of the Invention | ELECTRONIC VAPORIZER | | |
|---|---|---|---|
| Attorney Docket Number | ~~FUMA-1001 CIP2C~~ 269.0003-02000 | Small Entity Status Claimed | ☒ |
| Application Type | Nonprovisional | | |
| Subject Matter | Utility | | |
| Total Number of Drawing Sheets (if any) | 6 | Suggested Figure for Publication (if any) | 1 |

## Filing By Reference:

Only complete this section when filing an application by reference under 35 U.S.C. 111(c) and 37 CFR 1.57(a). Do not complete this section if application papers including a specification and any drawings are being filed. Any domestic benefit or foreign priority information must be provided in the appropriate section(s) below (i.e., "Domestic Benefit/National Stage Information" and "Foreign Priority Information").

For the purposes of a filing date under 37 CFR 1.53(b), the description and any drawings of the present application are replaced by this reference to the previously filed application, subject to conditions and requirements of 37 CFR 1.57(a).

| Application number of the previously filed application | Filing date (YYYY-MM-DD) | Intellectual Property Authority or Country |
|---|---|---|
| | | |

## Publication Information:

☐ Request Early Publication (Fee required at time of Request 37 CFR 1.219)

☒ **Request Not to Publish.** I hereby request that the attached application not be published under 35 U.S.C. 122(b) and certify that the invention disclosed in the attached application **has not and will not** be the subject of an application filed in another country, or under a multilateral international agreement, that requires publication at eighteen months after filing.

| Application Data Sheet 37 CFR 1.76 | Attorney Docket Number | ~~FUMA-1001 CIP2C~~ 269.0003-02000 |
|---|---|---|
| | Application Number | 15/377,522 |
| Title of Invention | ELECTRONIC VAPORIZER | |

## Representative Information:

Representative information should be provided for all practitioners having a power of attorney in the application. Providing this information in the Application Data Sheet does not constitute a power of attorney in the application (see 37 CFR 1.32).
Either enter Customer Number or complete the Representative Name section below. If both sections are completed the customer Number will be used for the Representative Information during processing.

| Please Select One: | ● Customer Number | US Patent Practitioner | ○ Limited Recognition (37 CFR 11.9) |
|---|---|---|---|
| Customer Number | ~~07733~~ 22882 | | |

## Domestic Benefit/National Stage Information:

This section allows for the applicant to either claim benefit under 35 U.S.C. 119(e), 120, 121, 365(c), or 386(c) or indicate National Stage entry from a PCT application. Providing benefit claim information in the Application Data Sheet constitutes the specific reference required by 35 U.S.C. 119(e) or 120, and 37 CFR 1.78.
When referring to the current application, please leave the "Application Number" field blank.

| Prior Application Status | Pending | | Remove |
|---|---|---|---|
| Application Number | Continuity Type | Prior Application Number | Filing or 371(c) Date (YYYY-MM-DD) |
| | Continuation of | 14510955 | 2014-10-09 |
| Prior Application Status | Pending | | Remove |
| Application Number | Continuity Type | Prior Application Number | Filing or 371(c) Date (YYYY-MM-DD) |
| 14510955 | Continuation of | 13594813 | 2012-08-25 |
| Prior Application Status | Pending | | Remove |
| Application Number | Continuity Type | Prior Application Number | Filing or 371(c) Date (YYYY-MM-DD) |
| 13594813 | Continuation in part of | 12843917 | 2010-07-27 |
| Prior Application Status | Expired | | Remove |
| Application Number | Continuity Type | Prior Application Number | Filing or 371(c) Date (YYYY-MM-DD) |
| 12843917 | Claims benefit of provisional | 61273097 | 2009-07-31 |
| Prior Application Status | Expired | | Remove |
| Application Number | Continuity Type | Prior Application Number | Filing or 371(c) Date (YYYY-MM-DD) |
| 12843917 | Claims benefit of provisional | 61271819 | 2009-07-27 |

| Application Data Sheet 37 CFR 1.76 | Attorney Docket Number | ~~FUMA-1001-CIP2C~~ 269.0003-02000 |
|---|---|---|
| | Application Number | 15/377,522 |
| Title of Invention | ELECTRONIC VAPORIZER | |

| Prior Application Status | Expired | | Remove |
|---|---|---|---|
| Application Number | Continuity Type | Prior Application Number | Filing or 371(c) Date (YYYY-MM-DD) |
| 13594813 | Claims benefit of provisional | 61527434 | 2011-08-25 |
| Additional Domestic Benefit/National Stage Data may be generated within this form by selecting the **Add** button. | | | Add |

## Foreign Priority Information:

This section allows for the applicant to claim priority to a foreign application. Providing this information in the application data sheet constitutes the claim for priority as required by 35 U.S.C. 119(b) and 37 CFR 1.55. When priority is claimed to a foreign application that is eligible for retrieval under the priority document exchange program (PDX)[i] the information will be used by the Office to automatically attempt retrieval pursuant to 37 CFR 1.55(i)(1) and (2). Under the PDX program, applicant bears the ultimate responsibility for ensuring that a copy of the foreign application is received by the Office from the participating foreign intellectual property office, or a certified copy of the foreign priority application is filed, within the time period specified in 37 CFR 1.55(g)(1).

| | | | Remove |
|---|---|---|---|
| Application Number | Country[i] | Filing Date (YYYY-MM-DD) | Access Code[i] (if applicable) |
| | | | |
| Additional Foreign Priority Data may be generated within this form by selecting the **Add** button. | | | Add |

## Statement under 37 CFR 1.55 or 1.78 for AIA (First Inventor to File) Transition Applications

☐ This application (1) claims priority to or the benefit of an application filed before March 16, 2013 and (2) also contains, or contained at any time, a claim to a claimed invention that has an effective filing date on or after March 16, 2013.
NOTE: By providing this statement under 37 CFR 1.55 or 1.78, this application, with a filing date on or after March 16, 2013, will be examined under the first inventor to file provisions of the AIA.

| Application Data Sheet 37 CFR 1.76 | Attorney Docket Number | ~~FUMA-1001-CIP2C~~ 269.0003-02000 |
|---|---|---|
| | Application Number | 15/377,522 |
| Title of Invention | ELECTRONIC VAPORIZER | |

## Authorization or Opt-Out of Authorization to Permit Access:

When this Application Data Sheet is properly signed and filed with the application, applicant has provided written authority to permit a participating foreign intellectual property (IP) office access to the instant application-as-filed (see paragraph A in subsection 1 below) and the European Patent Office (EPO) access to any search results from the instant application (see paragraph B in subsection 1 below).

Should applicant choose not to provide an authorization identified in subsection 1 below, applicant **must opt-out** of the authorization by checking the corresponding box A or B or both in subsection 2 below.

**NOTE**: This section of the Application Data Sheet is **ONLY** reviewed and processed with the **INITIAL** filing of an application. After the initial filing of an application, an Application Data Sheet cannot be used to provide or rescind authorization for access by a foreign IP office(s). Instead, Form PTO/SB/39 or PTO/SB/69 must be used as appropriate.

**1. Authorization to Permit Access by a Foreign Intellectual Property Office(s)**

**A. Priority Document Exchange (PDX)** - Unless box A in subsection 2 (opt-out of authorization) is checked, the undersigned hereby **grants the USPTO authority** to provide the European Patent Office (EPO), the Japan Patent Office (JPO), the Korean Intellectual Property Office (KIPO), the State Intellectual Property Office of the People's Republic of China (SIPO), the World Intellectual Property Organization (WIPO), and any other foreign intellectual property office participating with the USPTO in a bilateral or multilateral priority document exchange agreement in which a foreign application claiming priority to the instant patent application is filed, access to: (1) the instant patent application-as-filed and its related bibliographic data, (2) any foreign or domestic application to which priority or benefit is claimed by the instant application and its related bibliographic data, and (3) the date of filing of this Authorization. See 37 CFR 1.14(h)(1).

**B. Search Results from U.S. Application to EPO** - Unless box B in subsection 2 (opt-out of authorization) is checked, the undersigned hereby **grants the USPTO authority** to provide the EPO access to the bibliographic data and search results from the instant patent application when a European patent application claiming priority to the instant patent application is filed. See 37 CFR 1.14(h)(2).

The applicant is reminded that the EPO's Rule 141(1) EPC (European Patent Convention) requires applicants to submit a copy of search results from the instant application without delay in a European patent application that claims priority to the instant application.

**2. Opt-Out of Authorizations to Permit Access by a Foreign Intellectual Property Office(s)**

☒ A. Applicant **DOES NOT** authorize the USPTO to permit a participating foreign IP office access to the instant application-as-filed. If this box is checked, the USPTO will not be providing a participating foreign IP office with any documents and information identified in subsection 1A above.

☒ B. Applicant **DOES NOT** authorize the USPTO to transmit to the EPO any search results from the instant patent application. If this box is checked, the USPTO will not be providing the EPO with search results from the instant application.

**NOTE:** Once the application has published or is otherwise publicly available, the USPTO may provide access to the application in accordance with 37 CFR 1.14.

PTO/AIA/14 (11-15)
Approved for use through 04/30/2017. OMB 0651-0032
U.S. Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE
Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it contains a valid OMB control number.

| Application Data Sheet 37 CFR 1.76 | Attorney Docket Number | ~~FUMA-1001 CIP2C~~ 269.0003-02000 |
|---|---|---|
| | Application Number | 15/377,522 |
| Title of Invention | ELECTRONIC VAPORIZER | |

## Applicant Information:

Providing assignment information in this section does not substitute for compliance with any requirement of part 3 of Title 37 of CFR to have an assignment recorded by the Office.

**Applicant** 1 Remove

If the applicant is the inventor (or the remaining joint inventor or inventors under 37 CFR 1.45), this section should not be completed. The information to be provided in this section is the name and address of the legal representative who is the applicant under 37 CFR 1.43; or the name and address of the assignee, person to whom the inventor is under an obligation to assign the invention, or person who otherwise shows sufficient proprietary interest in the matter who is the applicant under 37 CFR 1.46. If the applicant is an applicant under 37 CFR 1.46 (assignee, person to whom the inventor is obligated to assign, or person who otherwise shows sufficient proprietary interest) together with one or more joint inventors, then the joint inventor or inventors who are also the applicant should be identified in this section.

Clear

| ● Assignee | Legal Representative under 35 U.S.C. 117 | Joint Inventor |
|---|---|---|
| Person to whom the inventor is obligated to assign. | Person who shows sufficient proprietary interest | |

If applicant is the legal representative, indicate the authority to file the patent application, the inventor is:

Name of the Deceased or Legally Incapacitated Inventor:

If the Applicant is an Organization check here. ☒

| Organization Name | FUMA International, LLC | | |
|---|---|---|---|
| **Mailing Address Information For Applicant:** | | | |
| **Address 1** | 879 Progress Drive, Suite C | | |
| Address 2 | | | |
| **City** | Medina | **State/Province** | OH |
| **Country** | US | Postal Code | 44256 |
| Phone Number | | Fax Number | |
| Email Address | | | |

Additional Applicant Data may be generated within this form by selecting the Add button. Add

## Assignee Information including Non-Applicant Assignee Information:

Providing assignment information in this section does not substitute for compliance with any requirement of part 3 of Title 37 of CFR to have an assignment recorded by the Office.

| Application Data Sheet 37 CFR 1.76 | Attorney Docket Number | ~~FUMA-1001-CIP2C~~ 269.0003-02000 |
|---|---|---|
| | Application Number | 15/377,522 |
| Title of Invention | ELECTRONIC VAPORIZER | |

**Assignee** 1

Complete this section if assignee information, including non-applicant assignee information, is desired to be included on the patent application publication. An assignee-applicant identified in the "Applicant Information" section will appear on the patent application publication as an applicant. For an assignee-applicant, complete this section only if identification as an assignee is also desired on the patent application publication.

Remove

If the Assignee or Non-Applicant Assignee is an Organization check here. ☐

| Prefix | **Given Name** | Middle Name | **Family Name** | Suffix |
|---|---|---|---|---|
| | | | | |

**Mailing Address Information For Assignee including Non-Applicant Assignee:**

| | | | |
|---|---|---|---|
| **Address 1** | | | |
| Address 2 | | | |
| **City** | | **State/Province** | |
| **Country** i | | Postal Code | |
| Phone Number | | Fax Number | |
| Email Address | | | |

Additional Assignee or Non-Applicant Assignee Data may be generated within this form by selecting the Add button. Add

## Signature:

Remove

**NOTE:** This Application Data Sheet must be signed in accordance with 37 CFR 1.33(b). **However, if this Application Data Sheet is submitted with the INITIAL filing of the application and either box A or B is not checked in subsection 2 of the "Authorization or Opt-Out of Authorization to Permit Access" section, then this form must also be signed in accordance with 37 CFR 1.14(c).**

This Application Data Sheet **must** be signed by a patent practitioner if one or more of the applicants is a **juristic entity** (e.g., corporation or association). If the applicant is two or more joint inventors, this form must be signed by a patent practitioner, **all** joint inventors who are the applicant, or one or more joint inventor-applicants who have been given power of attorney (e.g., see USPTO Form PTO/AIA/81) on behalf of **all** joint inventor-applicants.

See 37 CFR 1.4(d) for the manner of making signatures and certifications.

| **Signature** | /Thomas H. Martin/ | | | Date (YYYY-MM-DD) | 2018-11-13 |
|---|---|---|---|---|---|
| First Name | Thomas | Last Name | Martin | Registration Number | 34383 |

Additional Signature may be generated within this form by selecting the Add button. Add

| Application Data Sheet 37 CFR 1.76 | | Attorney Docket Number | ~~FUMA-1001-CIP2C~~ 269.0003-02000 |
|---|---|---|---|
| | | Application Number | 15/377,522 |
| Title of Invention | ELECTRONIC VAPORIZER | | |

This collection of information is required by 37 CFR 1.76. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 23 minutes to complete, including gathering, preparing, and submitting the completed application data sheet form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. **SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.**

| Electronic Acknowledgement Receipt | |
|---|---|
| **EFS ID:** | 34290060 |
| **Application Number:** | 15377522 |
| **International Application Number:** | |
| **Confirmation Number:** | 1065 |
| **Title of Invention:** | ELECTRONIC VAPORIZER |
| **First Named Inventor/Applicant Name:** | Gregory D. Conley |
| **Customer Number:** | 22882 |
| **Filer:** | Thomas H. Martin/Sandra Blackmon |
| **Filer Authorized By:** | Thomas H. Martin |
| **Attorney Docket Number:** | 269.0003-02000 |
| **Receipt Date:** | 13-NOV-2018 |
| **Filing Date:** | 13-DEC-2016 |
| **Time Stamp:** | 12:49:15 |
| **Application Type:** | Utility under 35 USC 111(a) |

## Payment information:

| Submitted with Payment | no |
|---|---|

## File Listing:

| Document Number | Document Description | File Name | File Size(Bytes)/ Message Digest | Multi Part /.zip | Pages (if appl.) |
|---|---|---|---|---|---|
| 1 | Miscellaneous Incoming Letter | Req_Corr_of_Inventors.pdf | 122463<br>05bf280302d40ac25259576cf58fec22a960d681 | no | 1 |

**Warnings:**

| Information: | | | | | |
|---|---|---|---|---|---|
| 2 | Application Data Sheet | CorrectedADS.pdf | 3924577<br>8d8c0e0652dc9f508d3228eeeb297415aca5e5db | no | 8 |
| **Warnings:** | | | | | |
| **Information:** | | | | | |
| This is not an USPTO supplied ADS fillable form | | | | | |
| | | | **Total Files Size (in bytes):** | 4047040 | |

**This Acknowledgement Receipt evidences receipt on the noted date by the USPTO of the indicated documents, characterized by the applicant, and including page counts, where applicable. It serves as evidence of receipt similar to a Post Card, as described in MPEP 503.**

**New Applications Under 35 U.S.C. 111**
**If a new application is being filed and the application includes the necessary components for a filing date (see 37 CFR 1.53(b)-(d) and MPEP 506), a Filing Receipt (37 CFR 1.54) will be issued in due course and the date shown on this Acknowledgement Receipt will establish the filing date of the application.**
**National Stage of an International Application under 35 U.S.C. 371**
**If a timely submission to enter the national stage of an international application is compliant with the conditions of 35 U.S.C. 371 and other applicable requirements a Form PCT/DO/EO/903 indicating acceptance of the application as a national stage submission under 35 U.S.C. 371 will be issued in addition to the Filing Receipt, in due course.**
**New International Application Filed with the USPTO as a Receiving Office**
**If a new international application is being filed and the international application includes the necessary components for an international filing date (see PCT Article 11 and MPEP 1810), a Notification of the International Application Number and of the International Filing Date (Form PCT/RO/105) will be issued in due course, subject to prescriptions concerning national security, and the date shown on this Acknowledgement Receipt will establish the international filing date of the application.**

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| APPLICATION NUMBER | FILING or 371(c) DATE | GRP ART UNIT | FIL FEE REC'D | ATTY.DOCKET.NO | TOT CLAIMS | IND CLAIMS |
|---|---|---|---|---|---|---|
| 15/377,522 | 12/13/2016 | 3761 | 1580 | 269.0003-02000 | 20 | 3 |

**CONFIRMATION NO. 1065**

**UPDATED FILING RECEIPT**

22882
MARTIN & FERRARO, LLP
1557 LAKE O'PINES STREET, NE
HARTVILLE, OH 44632




Date Mailed: 11/16/2018

Receipt is acknowledged of this non-provisional patent application. The application will be taken up for examination in due course. Applicant will be notified as to the results of the examination. Any correspondence concerning the application must include the following identification information: the U.S. APPLICATION NUMBER, FILING DATE, NAME OF APPLICANT, and TITLE OF INVENTION. Fees transmitted by check or draft are subject to collection. Please verify the accuracy of the data presented on this receipt. **If an error is noted on this Filing Receipt, please submit a written request for a Filing Receipt Correction. Please provide a copy of this Filing Receipt with the changes noted thereon. If you received a "Notice to File Missing Parts" for this application, please submit any corrections to this Filing Receipt with your reply to the Notice. When the USPTO processes the reply to the Notice, the USPTO will generate another Filing Receipt incorporating the requested corrections**

**Inventor(s)**

Gregory D. Conley, Medina, OH;
Daniel C. Hillenbrandt JR., Brunswick, OH;

**Applicant(s)**

FUMA International, LLC, Medina, OH;

**Power of Attorney:** The patent practitioners associated with Customer Number 22882

**Domestic Priority data as claimed by applicant**

This application is a CON of 14/510,955 10/09/2014 PAT 9532604
which is a CON of 13/594,813 08/25/2012 PAT 8897628
which is a CIP of 12/843,917 07/27/2010 ABN
which claims benefit of 61/273,097 07/31/2009
and claims benefit of 61/271,819 07/27/2009
and said 13/594,813 08/25/2012
claims benefit of 61/527,434 08/25/2011

**Foreign Applications** for which priority is claimed (You may be eligible to benefit from the **Patent Prosecution Highway** program at the USPTO. Please see http://www.uspto.gov for more information.) - None.
*Foreign application information must be provided in an Application Data Sheet in order to constitute a claim to foreign priority. See 37 CFR 1.55 and 1.76.*

**Permission to Access Application via Priority Document Exchange:** No

**Permission to Access Search Results:** No

Applicant may provide or rescind an authorization for access using Form PTO/SB/39 or Form PTO/SB/69 as appropriate.

**Projected Publication Date:** Request for Non-Publication Acknowledged

**Non-Publication Request:** Yes

**Early Publication Request:** No
**** SMALL ENTITY ****
**Title**

ELECTRONIC VAPORIZER

**Preliminary Class**

392

**Statement under 37 CFR 1.55 or 1.78 for AIA (First Inventor to File) Transition Applications:** No

## PROTECTING YOUR INVENTION OUTSIDE THE UNITED STATES

Since the rights granted by a U.S. patent extend only throughout the territory of the United States and have no effect in a foreign country, an inventor who wishes patent protection in another country must apply for a patent in a specific country or in regional patent offices. Applicants may wish to consider the filing of an international application under the Patent Cooperation Treaty (PCT). An international (PCT) application generally has the same effect as a regular national patent application in each PCT-member country. The PCT process **simplifies** the filing of patent applications on the same invention in member countries, but **does not result** in a grant of "an international patent" and does not eliminate the need of applicants to file additional documents and fees in countries where patent protection is desired.

Almost every country has its own patent law, and a person desiring a patent in a particular country must make an application for patent in that country in accordance with its particular laws. Since the laws of many countries differ in various respects from the patent law of the United States, applicants are advised to seek guidance from specific foreign countries to ensure that patent rights are not lost prematurely.

Applicants also are advised that in the case of inventions made in the United States, the Director of the USPTO must issue a license before applicants can apply for a patent in a foreign country. The filing of a U.S. patent application serves as a request for a foreign filing license. The application's filing receipt contains further information and guidance as to the status of applicant's license for foreign filing.

Applicants may wish to consult the USPTO booklet, "General Information Concerning Patents" (specifically, the section entitled "Treaties and Foreign Patents") for more information on timeframes and deadlines for filing foreign patent applications. The guide is available either by contacting the USPTO Contact Center at 800-786-9199, or it can be viewed on the USPTO website at http://www.uspto.gov/web/offices/pac/doc/general/index.html.

For information on preventing theft of your intellectual property (patents, trademarks and copyrights), you may wish to consult the U.S. Government website, http://www.stopfakes.gov. Part of a Department of Commerce initiative, this website includes self-help "toolkits" giving innovators guidance on how to protect intellectual property in specific countries such as China, Korea and Mexico. For questions regarding patent enforcement issues, applicants may call the U.S. Government hotline at 1-866-999-HALT (1-866-999-4258).

## LICENSE FOR FOREIGN FILING UNDER

## Title 35, United States Code, Section 184

## Title 37, Code of Federal Regulations, 5.11 & 5.15

**GRANTED**

The applicant has been granted a license under 35 U.S.C. 184, if the phrase "IF REQUIRED, FOREIGN FILING LICENSE GRANTED" followed by a date appears on this form. Such licenses are issued in all applications where the conditions for issuance of a license have been met, regardless of whether or not a license may be required as set forth in 37 CFR 5.15. The scope and limitations of this license are set forth in 37 CFR 5.15(a) unless an earlier license has been issued under 37 CFR 5.15(b). The license is subject to revocation upon written notification. The date indicated is the effective date of the license, unless an earlier license of similar scope has been granted under 37 CFR 5.13 or 5.14.

This license is to be retained by the licensee and may be used at any time on or after the effective date thereof unless it is revoked. This license is automatically transferred to any related applications(s) filed under 37 CFR 1.53(d). This license is not retroactive.

The grant of a license does not in any way lessen the responsibility of a licensee for the security of the subject matter as imposed by any Government contract or the provisions of existing laws relating to espionage and the national security or the export of technical data. Licensees should apprise themselves of current regulations especially with respect to certain countries, of other agencies, particularly the Office of Defense Trade Controls, Department of State (with respect to Arms, Munitions and Implements of War (22 CFR 121-128)); the Bureau of Industry and Security, Department of Commerce (15 CFR parts 730-774); the Office of Foreign AssetsControl, Department of Treasury (31 CFR Parts 500+) and the Department of Energy.

**NOT GRANTED**

No license under 35 U.S.C. 184 has been granted at this time, if the phrase "IF REQUIRED, FOREIGN FILING LICENSE GRANTED" DOES NOT appear on this form. Applicant may still petition for a license under 37 CFR 5.12, if a license is desired before the expiration of 6 months from the filing date of the application. If 6 months has lapsed from the filing date of this application and the licensee has not received any indication of a secrecy order under 35 U.S.C. 181, the licensee may foreign file the application pursuant to 37 CFR 5.15(b).

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### *SelectUSA*

The United States represents the largest, most dynamic marketplace in the world and is an unparalleled location for business investment, innovation, and commercialization of new technologies. The U.S. offers tremendous resources and advantages for those who invest and manufacture goods here. Through SelectUSA, our nation works to promote and facilitate business investment. SelectUSA provides information assistance to the international investor community; serves as an ombudsman for existing and potential investors; advocates on behalf of U.S. cities, states, and regions competing for global investment; and counsels U.S. economic development organizations on investment attraction best practices. To learn more about why the United States is the best country in the world to develop technology, manufacture products, deliver services, and grow your business, visit http://www.SelectUSA.gov or call +1-202-482-6800.

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| APPLICATION NUMBER | FILING OR 371(C) DATE | FIRST NAMED APPLICANT | ATTY. DOCKET NO./TITLE |
|---|---|---|---|
| 15/377,522 | 12/13/2016 | Gregory D. Conley | 269.0003-02000 |

**CONFIRMATION NO. 1065**

22882
MARTIN & FERRARO, LLP
1557 LAKE O'PINES STREET, NE
HARTVILLE, OH 44632

**37 CFR 1.48 ACKNOWLEDGEMENT LETTER**

*OC000000103861213*

Date Mailed: 11/16/2018

## NOTICE OF ACCEPTANCE OF REQUEST UNDER 37 CFR 1.48(a)

This is in response to the applicant's request under 37 CFR 1.48(a) submitted on 11/13/2018.

The request under 37 CFR 1.48(a) to correct the inventorship, to correct or update the name of an inventor, or to correct the order of names of joint inventors is accepted.

Questions about the contents of this notice and the requirements it sets forth should be directed to the Office of Data Management, Application Assistance Unit, at **(571) 272-4000** or **(571) 272-4200** or **1-888-786-0101**.

/ttran/

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# NOTICE OF ALLOWANCE AND FEE(S) DUE

22882 7590 02/26/2019

MARTIN & FERRARO, LLP
1557 LAKE O'PINES STREET, NE
HARTVILLE, OH 44632

| EXAMINER |
|---|
| CAMPBELL, THOR S |

| ART UNIT | PAPER NUMBER |
|---|---|
| 3761 | |

DATE MAILED: 02/26/2019

| APPLICATION NO. | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
|---|---|---|---|---|
| 15/377,522 | 12/13/2016 | Gregory D. Conley | 269.0003-02000 | 1065 |

TITLE OF INVENTION: ELECTRONIC VAPORIZER

| APPLN. TYPE | ENTITY STATUS | ISSUE FEE DUE | PUBLICATION FEE DUE | PREV. PAID ISSUE FEE | TOTAL FEE(S) DUE | DATE DUE |
|---|---|---|---|---|---|---|
| nonprovisional | SMALL | $500 | $0.00 | $0.00 | $500 | 05/28/2019 |

**THE APPLICATION IDENTIFIED ABOVE HAS BEEN EXAMINED AND IS ALLOWED FOR ISSUANCE AS A PATENT. PROSECUTION ON THE MERITS IS CLOSED. THIS NOTICE OF ALLOWANCE IS NOT A GRANT OF PATENT RIGHTS. THIS APPLICATION IS SUBJECT TO WITHDRAWAL FROM ISSUE AT THE INITIATIVE OF THE OFFICE OR UPON PETITION BY THE APPLICANT. SEE 37 CFR 1.313 AND MPEP 1308.**

**THE ISSUE FEE AND PUBLICATION FEE (IF REQUIRED) MUST BE PAID WITHIN THREE MONTHS FROM THE MAILING DATE OF THIS NOTICE OR THIS APPLICATION SHALL BE REGARDED AS ABANDONED. THIS STATUTORY PERIOD CANNOT BE EXTENDED. SEE 35 U.S.C. 151. THE ISSUE FEE DUE INDICATED ABOVE DOES NOT REFLECT A CREDIT FOR ANY PREVIOUSLY PAID ISSUE FEE IN THIS APPLICATION. IF AN ISSUE FEE HAS PREVIOUSLY BEEN PAID IN THIS APPLICATION (AS SHOWN ABOVE), THE RETURN OF PART B OF THIS FORM WILL BE CONSIDERED A REQUEST TO REAPPLY THE PREVIOUSLY PAID ISSUE FEE TOWARD THE ISSUE FEE NOW DUE.**

**HOW TO REPLY TO THIS NOTICE:**

I. Review the ENTITY STATUS shown above. If the ENTITY STATUS is shown as SMALL or MICRO, verify whether entitlement to that entity status still applies.

If the ENTITY STATUS is the same as shown above, pay the TOTAL FEE(S) DUE shown above.

If the ENTITY STATUS is changed from that shown above, on PART B - FEE(S) TRANSMITTAL, complete section number 5 titled "Change in Entity Status (from status indicated above)".

For purposes of this notice, small entity fees are 1/2 the amount of undiscounted fees, and micro entity fees are 1/2 the amount of small entity fees.

II. PART B - FEE(S) TRANSMITTAL, or its equivalent, must be completed and returned to the United States Patent and Trademark Office (USPTO) with your ISSUE FEE and PUBLICATION FEE (if required). If you are charging the fee(s) to your deposit account, section "4b" of Part B - Fee(s) Transmittal should be completed and an extra copy of the form should be submitted. If an equivalent of Part B is filed, a request to reapply a previously paid issue fee must be clearly made, and delays in processing may occur due to the difficulty in recognizing the paper as an equivalent of Part B.

III. All communications regarding this application must give the application number. Please direct all communications prior to issuance to Mail Stop ISSUE FEE unless advised to the contrary.

**IMPORTANT REMINDER: Maintenance fees are due in utility patents issuing on applications filed on or after Dec. 12, 1980. It is patentee's responsibility to ensure timely payment of maintenance fees when due. More information is available at www.uspto.gov/PatentMaintenanceFees.**



PTOL-85 (Rev. 02/11)

## PART B - FEE(S) TRANSMITTAL

Complete and send this form, together with applicable fee(s), by mail or fax, or via EFS-Web.

By mail, send to: Mail Stop ISSUE FEE
Commissioner for Patents
P.O. Box 1450
Alexandria, Virginia 22313-1450

By fax, send to: (571)-273-2885

INSTRUCTIONS: This form should be used for transmitting the ISSUE FEE and PUBLICATION FEE (if required). Blocks 1 through 5 should be completed where appropriate. All further correspondence including the Patent, advance orders and notification of maintenance fees will be mailed to the current correspondence address as indicated unless corrected below or directed otherwise in Block 1, by (a) specifying a new correspondence address; and/or (b) indicating a separate "FEE ADDRESS" for maintenance fee notifications.

CURRENT CORRESPONDENCE ADDRESS (Note: Use Block 1 for any change of address)

22882 7590 02/26/2019
MARTIN & FERRARO, LLP
1557 LAKE O'PINES STREET, NE
HARTVILLE, OH 44632

Note: A certificate of mailing can only be used for domestic mailings of the Fee(s) Transmittal. This certificate cannot be used for any other accompanying papers. Each additional paper, such as an assignment or formal drawing, must have its own certificate of mailing or transmission.

**Certificate of Mailing or Transmission**

I hereby certify that this Fee(s) Transmittal is being deposited with the United States Postal Service with sufficient postage for first class mail in an envelope addressed to the Mail Stop ISSUE FEE address above, or being transmitted to the USPTO via EFS-Web or by facsimile to (571) 273-2885, on the date below.

| (Typed or printed name) |
|---|
| (Signature) |
| (Date) |

| APPLICATION NO. | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
|---|---|---|---|---|
| 15/377,522 | 12/13/2016 | Gregory D. Conley | 269.0003-02000 | 1065 |

TITLE OF INVENTION: ELECTRONIC VAPORIZER

| APPLN. TYPE | ENTITY STATUS | ISSUE FEE DUE | PUBLICATION FEE DUE | PREV. PAID ISSUE FEE | TOTAL FEE(S) DUE | DATE DUE |
|---|---|---|---|---|---|---|
| nonprovisional | SMALL | $500 | $0.00 | $0.00 | $500 | 05/28/2019 |

| EXAMINER | ART UNIT | CLASS-SUBCLASS |
|---|---|---|
| CAMPBELL, THOR S | 3761 | 392-386000 |

1. Change of correspondence address or indication of "Fee Address" (37 CFR 1.363).

❑ Change of correspondence address (or Change of Correspondence Address form PTO/SB/122) attached.

❑ "Fee Address" indication (or "Fee Address" Indication form PTO/SB/47; Rev 03-09 or more recent) attached. **Use of a Customer Number is required.**

2. For printing on the patent front page, list
(1) The names of up to 3 registered patent attorneys or agents OR, alternatively,
(2) The name of a single firm (having as a member a registered attorney or agent) and the names of up to 2 registered patent attorneys or agents. If no name is listed, no name will be printed.

1 _____
2 _____
3 _____

3. ASSIGNEE NAME AND RESIDENCE DATA TO BE PRINTED ON THE PATENT (print or type)

PLEASE NOTE: Unless an assignee is identified below, no assignee data will appear on the patent. If an assignee is identified below, the document must have been previously recorded, or filed for recordation, as set forth in 37 CFR 3.11 and 37 CFR 3.81(a). Completion of this form is NOT a substitute for filing an assignment.

(A) NAME OF ASSIGNEE (B) RESIDENCE: (CITY and STATE OR COUNTRY)

Please check the appropriate assignee category or categories (will not be printed on the patent) : ❑ Individual ❑ Corporation or other private group entity ❑ Government

4a. Fees submitted: ❑Issue Fee ❑Publication Fee (if required) ❑Advance Order - # of Copies _____

4b. Method of Payment: *(Please first reapply any previously paid fee shown above)*

❑ Electronic Payment via EFS-Web ❑ Enclosed check ❑ Non-electronic payment by credit card (Attach form PTO-2038)

❑ The Director is hereby authorized to charge the required fee(s), any deficiency, or credit any overpayment to Deposit Account No. _____

5. **Change in Entity Status** (from status indicated above)

❑ Applicant certifying micro entity status. See 37 CFR 1.29

❑ Applicant asserting small entity status. See 37 CFR 1.27

❑ Applicant changing to regular undiscounted fee status.

NOTE: Absent a valid certification of Micro Entity Status (see forms PTO/SB/15A and 15B), issue fee payment in the micro entity amount will not be accepted at the risk of application abandonment.
NOTE: If the application was previously under micro entity status, checking this box will be taken to be a notification of loss of entitlement to micro entity status.
NOTE: Checking this box will be taken to be a notification of loss of entitlement to small or micro entity status, as applicable.

NOTE: This form must be signed in accordance with 37 CFR 1.31 and 1.33. See 37 CFR 1.4 for signature requirements and certifications.

Authorized Signature _____ Date _____

Typed or printed name _____ Registration No. _____



JUUL Ex. 1002
Case No. IPR2024-161
Page 356 of 552

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| APPLICATION NO. | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
|---|---|---|---|---|
| 15/377,522 | 12/13/2016 | Gregory D. Conley | 269.0003-02000 | 1065 |

22882 7590 02/26/2019

MARTIN & FERRARO, LLP
1557 LAKE O'PINES STREET, NE
HARTVILLE, OH 44632

| EXAMINER | |
|---|---|
| CAMPBELL, THOR S | |
| ART UNIT | PAPER NUMBER |
| 3761 | |

DATE MAILED: 02/26/2019

**Determination of Patent Term Adjustment under 35 U.S.C. 154 (b)**
(Applications filed on or after May 29, 2000)

The Office has discontinued providing a Patent Term Adjustment (PTA) calculation with the Notice of Allowance.

Section 1(h)(2) of the AIA Technical Corrections Act amended 35 U.S.C. 154(b)(3)(B)(i) to eliminate the requirement that the Office provide a patent term adjustment determination with the notice of allowance. See Revisions to Patent Term Adjustment, 78 Fed. Reg. 19416, 19417 (Apr. 1, 2013). Therefore, the Office is no longer providing an initial patent term adjustment determination with the notice of allowance. The Office will continue to provide a patent term adjustment determination with the Issue Notification Letter that is mailed to applicant approximately three weeks prior to the issue date of the patent, and will include the patent term adjustment on the patent. Any request for reconsideration of the patent term adjustment determination (or reinstatement of patent term adjustment) should follow the process outlined in 37 CFR 1.705.

Any questions regarding the Patent Term Extension or Adjustment determination should be directed to the Office of Patent Legal Administration at (571)-272-7702. Questions relating to issue and publication fee payments should be directed to the Customer Service Center of the Office of Patent Publication at 1-(888)-786-0101 or (571)-272-4200.

| *Notice Requiring Inventor's Oath or Declaration* | Application No.<br>15/377,522 | Applicant(s)<br>Gregory D. Conley | |
|---|---|---|---|
| | Examiner<br>CAMPBELL, THOR S | Art Unit<br>3761 | |

This notice is an attachment to the Notice of Allowability (PTOL-37), or the Notice of Allowability For A Design Application (PTOL-37D).

An inventor's oath or declaration in compliance with 37 CFR 1.63 or 1.64 executed by or with respect to each inventor has not yet been submitted.

An oath or declaration in compliance with 37 CFR 1.63, or a substitute statement in compliance with 37 CFR 1.64, executed by or with respect to each inventor (for any inventor for which a compliant oath, declaration, or substitute statement has not yet been submitted) MUST be filed no later than the date on which the issue fee is paid. See 35 U.S.C. 115(f). Failure to timely comply will result in ABANDONMENT of this application.

A properly executed inventor's oath to declaration has not been received for the following inventor(s):

If applicant previously filed one or more oaths, declarations, or substitute statements, applicant may have received an informational notice regarding deficiencies therein.

The following deficiencies are noted:

INFORMAL ACTION PROBLEMS

- A properly executed inventor's oath or declaration has not been received for the following inventor(s): **Gregory D. Conley** and **Daniel C. Hillenbrandt**.
  Applicant may submit the inventor's oath or declaration at any time before the Notice of Allowance and Fee(s) Due, PTOL-85, is mailed.

Questions relating to this Notice should be directed to the Application Assistance Unit at 571-272-4200.

## OMB Clearance and PRA Burden Statement for PTOL-85 Part B

The Paperwork Reduction Act (PRA) of 1995 requires Federal agencies to obtain Office of Management and Budget approval before requesting most types of information from the public. When OMB approves an agency request to collect information from the public, OMB (i) provides a valid OMB Control Number and expiration date for the agency to display on the instrument that will be used to collect the information and (ii) requires the agency to inform the public about the OMB Control Number's legal significance in accordance with 5 CFR 1320.5(b).

The information collected by PTOL-85 Part B is required by 37 CFR 1.311. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 30 minutes to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, Virginia 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, Virginia 22313-1450. Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it displays a valid OMB control number.

## Privacy Act Statement

**The Privacy Act of 1974 (P.L. 93-579)** requires that you be given certain information in connection with your submission of the attached form related to a patent application or patent. Accordingly, pursuant to the requirements of the Act, please be advised that: (1) the general authority for the collection of this information is 35 U.S.C. 2(b)(2); (2) furnishing of the information solicited is voluntary; and (3) the principal purpose for which the information is used by the U.S. Patent and Trademark Office is to process and/or examine your submission related to a patent application or patent. If you do not furnish the requested information, the U.S. Patent and Trademark Office may not be able to process and/or examine your submission, which may result in termination of proceedings or abandonment of the application or expiration of the patent.

The information provided by you in this form will be subject to the following routine uses:

1. The information on this form will be treated confidentially to the extent allowed under the Freedom of Information Act (5 U.S.C. 552) and the Privacy Act (5 U.S.C 552a). Records from this system of records may be disclosed to the Department of Justice to determine whether disclosure of these records is required by the Freedom of Information Act.
2. A record from this system of records may be disclosed, as a routine use, in the course of presenting evidence to a court, magistrate, or administrative tribunal, including disclosures to opposing counsel in the course of settlement negotiations.
3. A record in this system of records may be disclosed, as a routine use, to a Member of Congress submitting a request involving an individual, to whom the record pertains, when the individual has requested assistance from the Member with respect to the subject matter of the record.
4. A record in this system of records may be disclosed, as a routine use, to a contractor of the Agency having need for the information in order to perform a contract. Recipients of information shall be required to comply with the requirements of the Privacy Act of 1974, as amended, pursuant to 5 U.S.C. 552a(m).
5. A record related to an International Application filed under the Patent Cooperation Treaty in this system of records may be disclosed, as a routine use, to the International Bureau of the World Intellectual Property Organization, pursuant to the Patent Cooperation Treaty.
6. A record in this system of records may be disclosed, as a routine use, to another federal agency for purposes of National Security review (35 U.S.C. 181) and for review pursuant to the Atomic Energy Act (42 U.S.C. 218(c)).
7. A record from this system of records may be disclosed, as a routine use, to the Administrator, General Services, or his/her designee, during an inspection of records conducted by GSA as part of that agency's responsibility to recommend improvements in records management practices and programs, under authority of 44 U.S.C. 2904 and 2906. Such disclosure shall be made in accordance with the GSA regulations governing inspection of records for this purpose, and any other relevant (i.e., GSA or Commerce) directive. Such disclosure shall not be used to make determinations about individuals.
8. A record from this system of records may be disclosed, as a routine use, to the public after either publication of the application pursuant to 35 U.S.C. 122(b) or issuance of a patent pursuant to 35 U.S.C. 151. Further, a record may be disclosed, subject to the limitations of 37 CFR 1.14, as a routine use, to the public if the record was filed in an application which became abandoned or in which the proceedings were terminated and which application is referenced by either a published application, an application open to public inspection or an issued patent.
9. A record from this system of records may be disclosed, as a routine use, to a Federal, State, or local law enforcement agency, if the USPTO becomes aware of a violation or potential violation of law or regulation.

| Notice of Allowability | Application No. 15/377,522 | Applicant(s) Conley et al. | |
|---|---|---|---|
| | Examiner THOR S CAMPBELL | Art Unit 3761 | AIA Status No |

*-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address--*

All claims being allowable, PROSECUTION ON THE MERITS IS (OR REMAINS) CLOSED in this application. If not included herewith (or previously mailed), a Notice of Allowance (PTOL-85) or other appropriate communication will be mailed in due course. **THIS NOTICE OF ALLOWABILITY IS NOT A GRANT OF PATENT RIGHTS.** This application is subject to withdrawal from issue at the initiative of the Office or upon petition by the applicant. See 37 CFR 1.313 and MPEP 1308.

1. ☑ This communication is responsive to preliminary amendments filed 11/02/2018.
   ☐ A declaration(s)/affidavit(s) under **37 CFR 1.130(b)** was/were filed on _____.

2. ☐ An election was made by the applicant in response to a restriction requirement set forth during the interview on _____; the restriction requirement and election have been incorporated into this action.

3. ☑ The allowed claim(s) is/are 21-51 . As a result of the allowed claim(s), you may be eligible to benefit from the **Patent Prosecution Highway** program at a participating intellectual property office for the corresponding application. For more information, please see **http://www.uspto.gov/patents/init_events/pph/index.jsp** or send an inquiry to **PPHfeedback@uspto.gov.**

4. ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

   **Certified copies:**

   a) ☐ All  b) ☐ Some  *c) ☐ None of the:

   1. ☐ Certified copies of the priority documents have been received.
   2. ☐ Certified copies of the priority documents have been received in Application No. _____ .
   3. ☐ Copies of the certified copies of the priority documents have been received in this national stage application from the International Bureau (PCT Rule 17.2(a)).

   * Certified copies not received: _____ .

Applicant has THREE MONTHS FROM THE "MAILING DATE" of this communication to file areply complying with the requirements noted below. Failure to timely comply will result in ABANDONMENT of this application.
**THIS THREE-MONTH PERIOD IS NOT EXTENDABLE.**

5. ☐ CORRECTED DRAWINGS (as "replacement sheets") must be submitted.
   ☐ including changes required by the attached Examiner's Amendment / Comment or in the Office action of Paper No./Mail Date _____ .

   **Identifying indicia such as the application number (see 37 CFR 1.84(c)) should be written on the drawings in the front (not the back) of each sheet. Replacement sheet(s) should be labeled as such in the header according to 37 CFR 1.121(d).**

6. ☐ DEPOSIT OF and/or INFORMATION about the deposit of BIOLOGICAL MATERIAL must be submitted. Note the attached Examiner's comment regarding REQUIREMENT FOR THE DEPOSIT OF BIOLOGICAL MATERIAL.

**Attachment(s)**

1. ☐ Notice of References Cited (PTO-892)
2. ☑ Information Disclosure Statements (PTO/SB/08), Paper No./Mail Date 11/02/2018.
3. ☐ Examiner's Comment Regarding Requirement for Deposit of Biological Material _____.
4. ☐ Interview Summary (PTO-413), Paper No./Mail Date. _____.
5. ☐ Examiner's Amendment/Comment
6. ☐ Examiner's Statement of Reasons for Allowance
7. ☐ Other _____.

/THOR S CAMPBELL/
Primary Examiner, Art Unit 3761

| Search Notes | Application/Control No. | Applicant(s)/Patent Under Reexamination |
|---|---|---|
| | 15/377,522 | Conley et al. |
| | Examiner | Art Unit |
| | THOR S CAMPBELL | 3761 |

| CPC - Searched* | | |
|---|---|---|
| Symbol | Date | Examiner |
| | | |

| CPC Combination Sets - Searched* | | |
|---|---|---|
| Symbol | Date | Examiner |
| | | |

| US Classification - Searched* | | | |
|---|---|---|---|
| Class | Subclass | Date | Examiner |
| | | | |

* See search history printout included with this form or the SEARCH NOTES box below to determine the scope of the search.

| Search Notes | | |
|---|---|---|
| Search Notes | Date | Examiner |
| See EAST search history attached | 02/17/2019 | tsc |

| Interference Search | | | |
|---|---|---|---|
| US Class/CPC Symbol | US Subclass/CPC Group | Date | Examiner |
| | See Attahced EAST Interference search | 02/17/2019 | tsc |



JUUL Ex. 1002
Case No. IPR2024-161
Page 361 of 552

| Issue Classification | Application/Control No. | Applicant(s)/Patent Under Reexamination |
|---|---|---|
| | 15/377,522 | Conley et al. |
| | Examiner | Art Unit |
| | THOR S CAMPBELL | 3761 |

| CPC | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| Symbol | | | | | | | Type | Version |
| A24F | / | 47 | / | 008 | | | F | 2013-01-01 |
| H05B | / | 1 | / | 0244 | | | I | 2013-01-01 |
| A61M | / | 11 | / | 042 | | | I | 2014-02-04 |
| A61M | / | 15 | / | 06 | | | I | 2013-01-01 |
| H05B | / | 2203 | / | 021 | | | A | 2013-01-01 |

| CPC Combination Sets | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| Symbol | | | | | | | Type | Set | Ranking | Version |
| | / | | / | | | | | | | |

| NONE | | Total Claims Allowed: | |
|---|---|---|---|
| (Assistant Examiner) | (Date) | 31 | |
| /THOR S CAMPBELL/<br>Primary Examiner, Art Unit 3761 | 18 February 2019 | O.G. Print Claim(s) | O.G. Print Figure |
| (Primary Examiner) | (Date) | 1 | 2 |

U.S. Patent and Trademark Office — Part of Paper No.: 20190218



JUUL Ex. 1002
Case No. IPR2024-161
Page 362 of 552

| Issue Classification | Application/Control No. | Applicant(s)/Patent Under Reexamination |
|---|---|---|
| | 15/377,522 | Conley et al. |
| | Examiner | Art Unit |
| | THOR S CAMPBELL | 3761 |

| INTERNATIONAL CLASSIFICATION | | | | |
|---|---|---|---|---|
| CLAIMED | | | | |
| A61M | / | 15 | / | 06 |

| NON-CLAIMED | | | | |
|---|---|---|---|---|
| H05B1/02 | / | 1 | / | 02 |
| A24F47/00 | / | 47 | / | 00 |
| A61M11/04 | / | 11 | / | 04 |

| US ORIGINAL CLASSIFICATION | |
|---|---|
| CLASS | SUBCLASS |
| 392 | 391 |

| CROSS REFERENCES(S) | | | | | | |
|---|---|---|---|---|---|---|
| CLASS | SUBCLASS (ONE SUBCLASS PER BLOCK) | | | | | |
| 392 | 386 | 404 | | | | |

| NONE | | Total Claims Allowed: | |
|---|---|---|---|
| (Assistant Examiner) | (Date) | 31 | |
| /THOR S CAMPBELL/<br>Primary Examiner, Art Unit 3761 | 18 February 2019 | O.G. Print Claim(s) | O.G. Print Figure |
| (Primary Examiner) | (Date) | 1 | 2 |

U.S. Patent and Trademark Office — Part of Paper No.: 20190218

| Issue Classification | Application/Control No. | Applicant(s)/Patent Under Reexamination |
|---|---|---|
| | 15/377,522 | Conley et al. |
| | **Examiner** | **Art Unit** |
| | THOR S CAMPBELL | 3761 |

☐ Claims renumbered in the same order as presented by applicant ☐ CPA ☐ T.D. ☐ R.1.47

**CLAIMS**

| Final | Original | Final | Original | Final | Original | Final | Original | Final | Original | Final | Original | Final | Original | Final | Original |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 21 | 10 | 30 | 19 | 39 | 28 | 48 | | | | | | | | |
| 2 | 22 | 11 | 31 | 20 | 40 | 29 | 49 | | | | | | | | |
| 3 | 23 | 12 | 32 | 21 | 41 | 30 | 50 | | | | | | | | |
| 4 | 24 | 13 | 33 | 22 | 42 | 31 | 51 | | | | | | | | |
| 5 | 25 | 14 | 34 | 23 | 43 | | | | | | | | | | |
| 6 | 26 | 15 | 35 | 24 | 44 | | | | | | | | | | |
| 7 | 27 | 16 | 36 | 25 | 45 | | | | | | | | | | |
| 8 | 28 | 17 | 37 | 26 | 46 | | | | | | | | | | |
| 9 | 29 | 18 | 38 | 27 | 47 | | | | | | | | | | |

| | | | |
|---|---|---|---|
| NONE | | **Total Claims Allowed:** | |
| (Assistant Examiner) | (Date) | 31 | |
| /THOR S CAMPBELL/<br>Primary Examiner, Art Unit 3761 | 18 February 2019 | O.G. Print Claim(s) | O.G. Print Figure |
| (Primary Examiner) | (Date) | 1 | 2 |

U.S. Patent and Trademark Office Part of Paper No.: 20190218



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Case No. IPR2024-161
Page 364 of 552

# Bibliographic Data

Application No: 15/377,522

Foreign Priority claimed: ○ Yes ◉ No

35 USC 119 (a-d) conditions met: ☐ Yes ☑ No ☐ Met After Allowance

Verified and Acknowledged: /THOR S CAMPBELL/ (Examiner's Signature) ____ (Initials)

Title: ELECTRONIC VAPORIZER

| FILING or 371(c) DATE | CLASS | GROUP ART UNIT | ATTORNEY DOCKET NO. |
|---|---|---|---|
| 12/13/2016 | 392 | 3761 | 269.0003-02000 |
| RULE | | | |

**APPLICANTS**

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**INVENTORS**

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Daniel C. Hillenbrandt JR., Brunswick, OH, UNITED STATES

**CONTINUING DATA**

This application is a CON of 14510955 10/09/2014 PAT 9532604

14510955 is a CON of 13594813 08/25/2012 PAT 8897628

13594813 has PRO of 61527434 08/25/2011

13594813 is a CIP of 12843917 07/27/2010ABN

12843917 has PRO of 61273097 07/31/2009

12843917 has PRO of 61271819 07/27/2009

**FOREIGN APPLICATIONS**

**IF REQUIRED, FOREIGN LICENSE GRANTED****

**** SMALL ENTITY ****

**STATE OR COUNTRY**

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HARTVILLE, OH 44632

UNITED STATES

**FILING FEE RECEIVED**

$800

**EAST Search History**

**EAST Search History (Prior Art)**

| Ref # | Hits | Search Query | DBs | Default Operator | Plurals | Time Stamp |
|---|---|---|---|---|---|---|
| L1 | 1 | "15377522" | US-PGPUB; USPAT; USOCR | OR | ON | 2019/02/18 21:03 |
| L2 | 113 | ("20050016550" \| "20060196518" \| "20070267031" \| "20080073443" \| "20080092912" \| "20080230052" \| "20080247892" \| "20080257367" \| "20080276947" \| "20080303286" \| "20090095311" \| "20090126745" \| "20090272379" \| "20100031968" \| "20100037903" \| "20100200006" \| "20100200008" \| "20100242974" \| "20110011396" \| "20110192399" \| "20110277757" \| "20110277760" \| "20110304282" \| "20120285475" \| "20130309102" \| "20130312739" \| "20140020696" \| "20140060528" \| "20140069444" \| "20140096781" \| "20140096782" \| "20140150783" \| "20140150784" \| "20140190478" \| "20140190502" \| "20140253144" \| "20140261495" \| "20140305450" \| "20150065929" \| "20150078735" \| "20150090281" \| "20150128966" \| "20150189916" \| "20150215439" \| "20150258289" \| "20150296885" \| "20160374392" \| "3200819" \| "4284089" \| "4945929" \| "4966171" \| "4969476" \| "5050621" \| "5115820" \| "5249586" \| "5865185" \| "5878752" \| "6196218" \| "6443146" \| "7412259" \| "7581540" \| "7726320" \| "7832410" \| "7832655" \| "7984684" \| "8156944" \| "8603397" \| "8689805" \| "8794231" \| "8863753" \| "8897628" \| "8961492" \| "8997753" \| "8997754" \| "9004073" \| "9095175" \| "9148009" \| "9197726" \| "9204670" \| "9259035" \| "9301548" \| "9301549" \| "9332787" \| "9352288" \| "9364024" \| "9364025" \| "9417107" \| "9427711" \| "9486014" \| "9532597" \| "9532604" \| "9555203" \| "9597466" \| "9602646" \| "9609893" \| "D590988" \| "D590989" \| "D590990" \| "D590991" \| "D613903" \| "D613904" \| "D749505" \| "D750320" \| "D752278" \| "D752280" \| "D752727" \| "D763502" \| "D767820" \| "D767822" \| "D776869" \| "D779725" \| "D780993" \| "D782108").PN. | US-PGPUB; USPAT | OR | ON | 2019/02/18 21:03 |
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| S4 | 1 | "12843917" | US-PGPUB; USPAT; EPO; JPO; DERWENT | OR | OFF | 2014/04/07 13:27 |
| S5 | 2 | "20090272379" | US-PGPUB; USPAT; EPO; JPO; DERWENT | OR | OFF | 2014/04/07 13:38 |
| S6 | 4220 | cigarette and generator | US-PGPUB; USPAT; EPO; JPO; DERWENT | OR | OFF | 2014/04/07 13:45 |
| S7 | 3438 | vaporizer and generator | US-PGPUB; USPAT; EPO; JPO; DERWENT | OR | OFF | 2014/04/07 13:45 |
| S8 | 34 | S6 and S7 | US-PGPUB; USPAT; EPO; JPO; DERWENT | OR | OFF | 2014/04/07 13:45 |
| S9 | 1208 | generator same breath | US-PGPUB; USPAT; EPO; JPO; DERWENT | OR | OFF | 2014/04/07 13:47 |
| S10 | 2 | electrical adj generator same breath | US-PGPUB; USPAT; EPO; JPO; DERWENT | OR | OFF | 2014/04/07 13:48 |
| S11 | 15 | miniature adj electrical adj generator | US-PGPUB; USPAT; EPO; JPO; DERWENT | OR | OFF | 2014/04/07 13:48 |
| S12 | 0 | ("2008/0303286").URPN. | USPAT | OR | OFF | 2014/04/07 13:51 |
| S13 | 0 | ("2008/0303286").URPN. | USPAT | OR | OFF | 2014/04/07 13:51 |
| S14 | 9 | miniature adj turbine and electrical adj generator | US-PGPUB; USPAT; EPO; JPO; | OR | OFF | 2014/04/07 13:51 |

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| S15 | 0 | miniature adj turbine same electrical adj generator | US-PGPUB; USPAT; EPO; JPO; DERWENT | OR | OFF | 2014/04/07 13:53 |
| S16 | 263 | vaporizer and photovoltaic | US-PGPUB; USPAT; EPO; JPO; DERWENT | OR | OFF | 2014/04/07 13:55 |
| S17 | 109 | "392"/$.ccls. and photovoltaic | US-PGPUB; USPAT; EPO; JPO; DERWENT | OR | OFF | 2014/04/07 13:56 |
| S18 | 3 | "392"/$.ccls. and photovoltaic and cigarette | US-PGPUB; USPAT; EPO; JPO; DERWENT | OR | OFF | 2014/04/07 13:56 |
| S19 | 0 | e-cigarette and solar | US-PGPUB; USPAT; EPO; JPO; DERWENT | OR | OFF | 2014/04/07 13:57 |
| S20 | 40 | e-cigarette | US-PGPUB; USPAT; EPO; JPO; DERWENT | OR | OFF | 2014/04/07 13:58 |
| S21 | 0 | e-cigarette and photovoltaic | US-PGPUB; USPAT; EPO; JPO; DERWENT | OR | OFF | 2014/04/07 13:58 |
| S22 | 3 | e-cigarette and photo | US-PGPUB; USPAT; EPO; JPO; DERWENT | OR | OFF | 2014/04/07 13:58 |
| S23 | 27048 | vaporizer or (air adj freshener) and solar | US-PGPUB; USPAT; EPO; JPO; DERWENT | OR | OFF | 2014/04/07 14:01 |
| S24 | 27048 | vaporizer or ((air adj freshener) and solar) | US-PGPUB; USPAT; EPO; JPO; DERWENT | OR | OFF | 2014/04/07 14:01 |
| S25 | 1213 | (vaporizer or (air adj freshener)) and solar | US-PGPUB; USPAT; EPO; JPO; DERWENT | OR | OFF | 2014/04/07 14:01 |
| S26 | 159 | (vaporizer or (air adj freshener)) and solar and photovoltaic | US-PGPUB; USPAT; EPO; JPO; | OR | OFF | 2014/04/07 14:02 |

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|---|---|---|---|---|---|---|
| | | | DERWENT | | | |
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| S29 | 0 | (a24f47/008).IPCR. | US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT | OR | OFF | 2014/07/14 12:57 |
| S30 | 0 | (a24f047/008).IPCR. | US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT | OR | OFF | 2014/07/14 12:57 |
| S31 | 0 | (a24f047/008).IPCR. | US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT | OR | OFF | 2014/07/14 12:57 |
| S32 | 0 | (a24f47/08).IPCR. | US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT | OR | OFF | 2014/07/14 12:57 |
| S33 | 6185 | (B60H1/22).IPCR. | US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT | OR | OFF | 2014/07/14 12:58 |
| S34 | 0 | (A24F47/08).IPCR. | US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT | OR | OFF | 2014/07/14 12:59 |
| S35 | 0 | (A24F47/10).IPCR. | US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT | OR | OFF | 2014/07/14 12:59 |
| S36 | 5800 | (f24h3/00).IPCR. | US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT | OR | OFF | 2014/07/14 12:59 |
| S37 | 3612 | (a24f47/00).IPCR. | US-PGPUB; USPAT; USOCR; | OR | OFF | 2014/07/14 13:00 |

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| | | | EPO; JPO; DERWENT | | | |
| S38 | 11045 | (a61m15/00).IPCR. | US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT | OR | OFF | 2014/07/14 13:03 |
| S39 | 41 | S38 and "392"/$.ccls. | US-PGPUB; USPAT; EPO; JPO; DERWENT | OR | OFF | 2014/07/14 13:04 |
| S40 | 6 | S39 and breath | US-PGPUB; USPAT; EPO; JPO; DERWENT | OR | OFF | 2014/07/14 13:04 |
| S41 | 12 | S39 and generator | US-PGPUB; USPAT; EPO; JPO; DERWENT | OR | OFF | 2014/07/14 13:05 |
| S42 | 47 | ("20050016550" \| "20060196518" \| "20110011396" \| "20110192399" \| "20110277757" \| "20110277760" \| "3200819" \| "4284089" \| "4945929" \| "4966171" \| "4969476" \| "5050621" \| "5115820" \| "5249586" \| "5865185" \| "7412259" \| "7726320" \| "8156944").PN. | US-PGPUB; USPAT; EPO; JPO; DERWENT | OR | OFF | 2014/07/14 13:11 |
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| S46 | 1 | ("2008/0303286").URPN. | USPAT | OR | OFF | 2016/01/11 20:22 |
| S47 | 1 | ("2008/0303286").URPN. | USPAT | OR | OFF | 2016/01/11 20:22 |
| S49 | 0 | miniature adj turbine same electrical adj generator | US-PGPUB; USPAT; EPO; JPO; DERWENT | OR | OFF | 2016/01/11 20:22 |
| S50 | 375 | vaporizer and photovoltaic | US-PGPUB; USPAT; EPO; JPO; DERWENT | OR | OFF | 2016/01/11 20:22 |
| S53 | 6 | e-cigarette and solar | US-PGPUB; USPAT; EPO; JPO; DERWENT | OR | OFF | 2016/01/11 20:22 |
| S54 | 229 | e-cigarette | US-PGPUB; USPAT; EPO; JPO; DERWENT | OR | OFF | 2016/01/11 20:22 |

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| S56 | 33 | ("20070267031" \| "20080092912" \| "20080230052" \| "20080247892" \| "20080257367" \| "20080276947" \| "20090095311" \| "20090126745" \| "20100031968" \| "20100037903" \| "20100200006" \| "20100200008" \| "20100242974" \| "7832410" \| "D590988" \| "D590989" \| "D590990" \| "D590991" \| "D613903" \| "D613904").PN. | US-PGPUB; USPAT; EPO; JPO; DERWENT | OR | OFF | 2016/01/11 20:23 |
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| S58 | 3 | "12843917" | US-PGPUB; USPAT; EPO; JPO; DERWENT | OR | OFF | 2016/01/11 20:23 |
| S59 | 3 | "20090272379" | US-PGPUB; USPAT; EPO; JPO; DERWENT | OR | OFF | 2016/01/11 20:23 |
| S60 | 4818 | cigarette and generator | US-PGPUB; USPAT; EPO; JPO; DERWENT | OR | OFF | 2016/01/11 20:23 |
| S61 | 4030 | vaporizer and generator | US-PGPUB; USPAT; EPO; JPO; DERWENT | OR | OFF | 2016/01/11 20:23 |
| S62 | 50 | S60 and S61 | US-PGPUB; USPAT; EPO; JPO; DERWENT | OR | OFF | 2016/01/11 20:23 |
| S63 | 1430 | generator same breath | US-PGPUB; USPAT; EPO; JPO; DERWENT | OR | OFF | 2016/01/11 20:23 |
| S64 | 3 | electrical adj generator same breath | US-PGPUB; USPAT; EPO; JPO; DERWENT | OR | OFF | 2016/01/11 20:23 |
| S65 | 16 | miniature adj electrical adj generator | US-PGPUB; USPAT; EPO; JPO; DERWENT | OR | OFF | 2016/01/11 20:23 |
| S66 | 1 | ("2008/0303286").URPN. | USPAT | OR | OFF | 2016/01/11 |

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|---|---|---|---|---|---|---|
| | | | | | | 20:23 |
| S67 | 1 | ("2008/0303286").URPN. | USPAT | OR | OFF | 2016/01/11 20:23 |
| S68 | 9 | miniature adj turbine and electrical adj generator | US-PGPUB; USPAT; EPO; JPO; DERWENT | OR | OFF | 2016/01/11 20:23 |
| S69 | 0 | miniature adj turbine same electrical adj generator | US-PGPUB; USPAT; EPO; JPO; DERWENT | OR | OFF | 2016/01/11 20:23 |
| S70 | 375 | vaporizer and photovoltaic | US-PGPUB; USPAT; EPO; JPO; DERWENT | OR | OFF | 2016/01/11 20:23 |
| S71 | 140 | "392"/$.ccls. and photovoltaic | US-PGPUB; USPAT; EPO; JPO; DERWENT | OR | OFF | 2016/01/11 20:23 |
| S72 | 4 | "392"/$.ccls. and photovoltaic and cigarette | US-PGPUB; USPAT; EPO; JPO; DERWENT | OR | OFF | 2016/01/11 20:23 |
| S73 | 6 | e-cigarette and solar | US-PGPUB; USPAT; EPO; JPO; DERWENT | OR | OFF | 2016/01/11 20:23 |
| S74 | 229 | e-cigarette | US-PGPUB; USPAT; EPO; JPO; DERWENT | OR | OFF | 2016/01/11 20:23 |
| S75 | 1 | e-cigarette and photovoltaic | US-PGPUB; USPAT; EPO; JPO; DERWENT | OR | OFF | 2016/01/11 20:23 |
| S76 | 6 | e-cigarette and photo | US-PGPUB; USPAT; EPO; JPO; DERWENT | OR | OFF | 2016/01/11 20:23 |
| S77 | 30819 | vaporizer or (air adj freshener) and solar | US-PGPUB; USPAT; EPO; JPO; DERWENT | OR | OFF | 2016/01/11 20:23 |
| S78 | 30819 | vaporizer or ((air adj freshener) and solar) | US-PGPUB; USPAT; EPO; JPO; DERWENT | OR | OFF | 2016/01/11 20:23 |
| S79 | 1500 | (vaporizer or (air adj freshener)) and | US- | OR | OFF | 2016/01/11 |

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|---|---|---|---|---|---|---|
| | | solar | PGPUB; USPAT; EPO; JPO; DERWENT | | | 20:23 |
| S80 | 207 | (vaporizer or (air adj freshener)) and solar and photovoltaic | US-PGPUB; USPAT; EPO; JPO; DERWENT | OR | OFF | 2016/01/11 20:23 |
| S81 | 1 | ("2013/0309102").URPN. | USPAT | OR | OFF | 2016/01/11 20:23 |
| S82 | 64010 | a01b 12/006 | US-PGPUB; USPAT; EPO; JPO; DERWENT | OR | OFF | 2016/01/11 20:23 |
| S83 | 0 | (a24f47/008).IPCR. | US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT | OR | OFF | 2016/01/11 20:23 |
| S84 | 0 | (a24f047/008).IPCR. | US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT | OR | OFF | 2016/01/11 20:23 |
| S85 | 0 | (a24f047/008).IPCR. | US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT | OR | OFF | 2016/01/11 20:23 |
| S86 | 0 | (a24f47/08).IPCR. | US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT | OR | OFF | 2016/01/11 20:23 |
| S87 | 6905 | (B60H1/22).IPCR. | US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT | OR | OFF | 2016/01/11 20:23 |
| S88 | 0 | (A24F47/08).IPCR. | US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT | OR | OFF | 2016/01/11 20:23 |
| S89 | 0 | (A24F47/10).IPCR. | US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT | OR | OFF | 2016/01/11 20:23 |
| S90 | 6238 | (f24h3/00).IPCR. | US-PGPUB; | OR | OFF | 2016/01/11 20:23 |

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| | | | USPAT; USOCR; EPO; JPO; DERWENT | | | |
| S91 | 7267 | (a24f47/00).IPCR. | US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT | OR | OFF | 2016/01/11 20:23 |
| S92 | 12379 | (a61m15/00).IPCR. | US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT | OR | OFF | 2016/01/11 20:23 |
| S93 | 52 | S92 and "392"/$.ccls. | US-PGPUB; USPAT; EPO; JPO; DERWENT | OR | OFF | 2016/01/11 20:23 |
| S94 | 8 | S93 and breath | US-PGPUB; USPAT; EPO; JPO; DERWENT | OR | OFF | 2016/01/11 20:23 |
| S95 | 14 | S93 and generator | US-PGPUB; USPAT; EPO; JPO; DERWENT | OR | OFF | 2016/01/11 20:23 |
| S96 | 48 | ("20050016550" \| "20060196518" \| "20110011396" \| "20110192399" \| "20110277757" \| "20110277760" \| "3200819" \| "4284089" \| "4945929" \| "4966171" \| "4969476" \| "5050621" \| "5115820" \| "5249586" \| "5865185" \| "7412259" \| "7726320" \| "8156944").PN. | US-PGPUB; USPAT; EPO; JPO; DERWENT | OR | OFF | 2016/01/11 20:23 |
| S97 | 6 | S96 and generator | US-PGPUB; USPAT; EPO; JPO; DERWENT | OR | OFF | 2016/01/11 20:23 |
| S98 | 1 | ("2008/0303286").URPN. | USPAT | OR | OFF | 2016/01/11 20:23 |
| S99 | 1 | ("2008/0303286").URPN. | USPAT | OR | OFF | 2016/01/11 20:23 |
| S100 | 0 | miniature adj turbine same electrical adj generator | US-PGPUB; USPAT; EPO; JPO; DERWENT | OR | OFF | 2016/01/11 20:23 |
| S101 | 375 | vaporizer and photovoltaic | US-PGPUB; USPAT; EPO; JPO; DERWENT | OR | OFF | 2016/01/11 20:23 |
| S102 | 6 | e-cigarette and solar | US-PGPUB; | OR | OFF | 2016/01/11 20:23 |

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| | | | USPAT; EPO; JPO; DERWENT | | | |
| S103 | 229 | e-cigarette | US-PGPUB; USPAT; EPO; JPO; DERWENT | OR | OFF | 2016/01/11 20:23 |
| S104 | 81 | ("3200819" \| "20100031968" \| "8156944" \| "20080230052" \| "20100037903" \| "20100242974" \| "D590988" \| "D590990" \| "7412259" \| "20050016550" \| "7832410" \| "D613903" \| "20080257367" \| "20100200006" \| "20110011396" \| "20110277757" \| "7726320" \| "3200819" \| "20080257367" \| "20080092912" \| "20080230052" \| "20100200008" \| "5050621" \| "20060196518" \| "20080092912" \| "20100200008" \| "D590991" \| "20090272379" \| "7726320" \| "20070267031" \| "20100200006" \| "D613904" \| "4969476" \| "20110192399" \| "20050016550" \| "20060196518" \| "20080276947" \| "20090095311" \| "20090126745" \| "D590989" \| "20100242974" \| "5249586" \| "5865185" \| "20080247892" \| "20100031968" \| "20080276947" \| "20110277760" \| "4284089" \| "4945929" \| "4966171" \| "5115820").PN. | US-PGPUB; USPAT; EPO; JPO; DERWENT | OR | OFF | 2016/01/11 20:23 |
| S105 | 33 | ("20070267031" \| "20080092912" \| "20080230052" \| "20080247892" \| "20080257367" \| "20080276947" \| "20090095311" \| "20090126745" \| "20100031968" \| "20100037903" \| "20100200006" \| "20100200008" \| "20100242974" \| "7832410" \| "D590988" \| "D590989" \| "D590990" \| "D590991" \| "D613903" \| "D613904").PN. | US-PGPUB; USPAT; EPO; JPO; DERWENT | OR | OFF | 2016/07/25 10:48 |
| S106 | 3 | "12843917" | US-PGPUB; USPAT; EPO; JPO; DERWENT | OR | OFF | 2016/07/25 10:48 |
| S107 | 3 | "12843917" | US-PGPUB; USPAT; EPO; JPO; DERWENT | OR | OFF | 2016/07/25 10:48 |
| S108 | 3 | "20090272379" | US-PGPUB; USPAT; EPO; JPO; DERWENT | OR | OFF | 2016/07/25 10:48 |
| S109 | 5028 | cigarette and generator | US-PGPUB; USPAT; EPO; JPO; DERWENT | OR | OFF | 2016/07/25 10:48 |
| S110 | 4232 | vaporizer and generator | US- | OR | OFF | 2016/07/25 |

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| | | | PGPUB; USPAT; EPO; JPO; DERWENT | | | 10:48 |
| S111 | 56 | S109 and S110 | US-PGPUB; USPAT; EPO; JPO; DERWENT | OR | OFF | 2016/07/25 10:48 |
| S112 | 1491 | generator same breath | US-PGPUB; USPAT; EPO; JPO; DERWENT | OR | OFF | 2016/07/25 10:48 |
| S113 | 3 | electrical adj generator same breath | US-PGPUB; USPAT; EPO; JPO; DERWENT | OR | OFF | 2016/07/25 10:48 |
| S114 | 16 | miniature adj electrical adj generator | US-PGPUB; USPAT; EPO; JPO; DERWENT | OR | OFF | 2016/07/25 10:48 |
| S115 | 1 | ("2008/0303286").URPN. | USPAT | OR | OFF | 2016/07/25 10:48 |
| S116 | 1 | ("2008/0303286").URPN. | USPAT | OR | OFF | 2016/07/25 10:48 |
| S117 | 9 | miniature adj turbine and electrical adj generator | US-PGPUB; USPAT; EPO; JPO; DERWENT | OR | OFF | 2016/07/25 10:48 |
| S118 | 0 | miniature adj turbine same electrical adj generator | US-PGPUB; USPAT; EPO; JPO; DERWENT | OR | OFF | 2016/07/25 10:48 |
| S119 | 427 | vaporizer and photovoltaic | US-PGPUB; USPAT; EPO; JPO; DERWENT | OR | OFF | 2016/07/25 10:48 |
| S120 | 146 | "392"/$.ccls. and photovoltaic | US-PGPUB; USPAT; EPO; JPO; DERWENT | OR | OFF | 2016/07/25 10:48 |
| S121 | 4 | "392"/$.ccls. and photovoltaic and cigarette | US-PGPUB; USPAT; EPO; JPO; DERWENT | OR | OFF | 2016/07/25 10:48 |
| S122 | 7 | e-cigarette and solar | US-PGPUB; USPAT; EPO; JPO; DERWENT | OR | OFF | 2016/07/25 10:48 |
| S123 | 319 | e-cigarette | US- | OR | OFF | 2016/07/25 |

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| | | | PGPUB; USPAT; EPO; JPO; DERWENT | | | 10:48 |
| S124 | 1 | e-cigarette and photovoltaic | US-PGPUB; USPAT; EPO; JPO; DERWENT | OR | OFF | 2016/07/25 10:48 |
| S125 | 7 | e-cigarette and photo | US-PGPUB; USPAT; EPO; JPO; DERWENT | OR | OFF | 2016/07/25 10:48 |
| S126 | 32023 | vaporizer or (air adj freshener) and solar | US-PGPUB; USPAT; EPO; JPO; DERWENT | OR | OFF | 2016/07/25 10:48 |
| S127 | 32023 | vaporizer or ((air adj freshener) and solar) | US-PGPUB; USPAT; EPO; JPO; DERWENT | OR | OFF | 2016/07/25 10:48 |
| S128 | 1605 | (vaporizer or (air adj freshener)) and solar | US-PGPUB; USPAT; EPO; JPO; DERWENT | OR | OFF | 2016/07/25 10:48 |
| S129 | 225 | (vaporizer or (air adj freshener)) and solar and photovoltaic | US-PGPUB; USPAT; EPO; JPO; DERWENT | OR | OFF | 2016/07/25 10:48 |
| S130 | 2 | ("2013/0309102").URPN. | USPAT | OR | OFF | 2016/07/25 10:48 |
| S131 | 67756 | a01b 12/006 | US-PGPUB; USPAT; EPO; JPO; DERWENT | OR | OFF | 2016/07/25 10:48 |
| S132 | 0 | (a24f47/008).IPCR. | US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT | OR | OFF | 2016/07/25 10:48 |
| S133 | 0 | (a24f047/008).IPCR. | US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT | OR | OFF | 2016/07/25 10:48 |
| S134 | 0 | (a24f047/008).IPCR. | US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT | OR | OFF | 2016/07/25 10:48 |
| S135 | 0 | (a24f47/08).IPCR. | US- | OR | OFF | 2016/07/25 |

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| | | | PGPUB; USPAT; USOCR; EPO; JPO; DERWENT | | | 10:48 |
| S136 | 7163 | (B60H1/22).IPCR. | US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT | OR | OFF | 2016/07/25 10:48 |
| S137 | 0 | (A24F47/08).IPCR. | US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT | OR | OFF | 2016/07/25 10:48 |
| S138 | 0 | (A24F47/10).IPCR. | US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT | OR | OFF | 2016/07/25 10:48 |
| S139 | 6419 | (f24h3/00).IPCR. | US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT | OR | OFF | 2016/07/25 10:48 |
| S140 | 8665 | (a24f47/00).IPCR. | US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT | OR | OFF | 2016/07/25 10:48 |
| S141 | 12932 | (a61m15/00).IPCR. | US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT | OR | OFF | 2016/07/25 10:48 |
| S142 | 57 | S141 and "392"/$.ccls. | US-PGPUB; USPAT; EPO; JPO; DERWENT | OR | OFF | 2016/07/25 10:48 |
| S143 | 9 | S142 and breath | US-PGPUB; USPAT; EPO; JPO; DERWENT | OR | OFF | 2016/07/25 10:48 |
| S144 | 15 | S142 and generator | US-PGPUB; USPAT; EPO; JPO; DERWENT | OR | OFF | 2016/07/25 10:48 |
| S145 | 49 | ("20050016550" \| "20060196518" \| "20110011396" \| "20110192399" \| "20110277757" \| "20110277760" \| "3200819" \| "4284089" \| "4945929" \| | US-PGPUB; USPAT; EPO; JPO; | OR | OFF | 2016/07/25 10:48 |

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|---|---|---|---|---|---|---|
| | | "4966171" \| "4969476" \| "5050621" \| "5115820" \| "5249586" \| "5865185" \| "7412259" \| "7726320" \| "8156944").PN. | DERWENT | | | |
| S146 | 6 | S145 and generator | US-PGPUB; USPAT; EPO; JPO; DERWENT | OR | OFF | 2016/07/25 10:48 |
| S147 | 1 | ("2008/0303286").URPN. | USPAT | OR | OFF | 2016/07/25 10:48 |
| S148 | 1 | ("2008/0303286").URPN. | USPAT | OR | OFF | 2016/07/25 10:48 |
| S149 | 0 | miniature adj turbine same electrical adj generator | US-PGPUB; USPAT; EPO; JPO; DERWENT | OR | OFF | 2016/07/25 10:48 |
| S150 | 427 | vaporizer and photovoltaic | US-PGPUB; USPAT; EPO; JPO; DERWENT | OR | OFF | 2016/07/25 10:48 |
| S151 | 7 | e-cigarette and solar | US-PGPUB; USPAT; EPO; JPO; DERWENT | OR | OFF | 2016/07/25 10:48 |
| S152 | 319 | e-cigarette | US-PGPUB; USPAT; EPO; JPO; DERWENT | OR | OFF | 2016/07/25 10:48 |
| S153 | 3 | "13594813" | US-PGPUB; USPAT; EPO; JPO; DERWENT | OR | OFF | 2016/07/25 10:48 |
| S154 | 33 | ("20070267031" \| "20080092912" \| "20080230052" \| "20080247892" \| "20080257367" \| "20080276947" \| "20090095311" \| "20090126745" \| "20100031968" \| "20100037903" \| "20100200006" \| "20100200008" \| "20100242974" \| "7832410" \| "D590988" \| "D590989" \| "D590990" \| "D590991" \| "D613903" \| "D613904").PN. | US-PGPUB; USPAT; EPO; JPO; DERWENT | OR | OFF | 2016/07/25 10:48 |
| S155 | 3 | "12843917" | US-PGPUB; USPAT; EPO; JPO; DERWENT | OR | OFF | 2016/07/25 10:48 |
| S156 | 3 | "12843917" | US-PGPUB; USPAT; EPO; JPO; DERWENT | OR | OFF | 2016/07/25 10:48 |
| S157 | 3 | "20090272379" | US-PGPUB; USPAT; | OR | OFF | 2016/07/25 10:48 |

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| | | | EPO; JPO; DERWENT | | | |
| S158 | 5028 | cigarette and generator | US-PGPUB; USPAT; EPO; JPO; DERWENT | OR | OFF | 2016/07/25 10:48 |
| S159 | 4232 | vaporizer and generator | US-PGPUB; USPAT; EPO; JPO; DERWENT | OR | OFF | 2016/07/25 10:48 |
| S160 | 56 | S158 and S159 | US-PGPUB; USPAT; EPO; JPO; DERWENT | OR | OFF | 2016/07/25 10:48 |
| S161 | 1491 | generator same breath | US-PGPUB; USPAT; EPO; JPO; DERWENT | OR | OFF | 2016/07/25 10:48 |
| S162 | 3 | electrical adj generator same breath | US-PGPUB; USPAT; EPO; JPO; DERWENT | OR | OFF | 2016/07/25 10:48 |
| S163 | 16 | miniature adj electrical adj generator | US-PGPUB; USPAT; EPO; JPO; DERWENT | OR | OFF | 2016/07/25 10:48 |
| S164 | 1 | ("2008/0303286").URPN. | USPAT | OR | OFF | 2016/07/25 10:48 |
| S165 | 1 | ("2008/0303286").URPN. | USPAT | OR | OFF | 2016/07/25 10:48 |
| S166 | 9 | miniature adj turbine and electrical adj generator | US-PGPUB; USPAT; EPO; JPO; DERWENT | OR | OFF | 2016/07/25 10:48 |
| S167 | 0 | miniature adj turbine same electrical adj generator | US-PGPUB; USPAT; EPO; JPO; DERWENT | OR | OFF | 2016/07/25 10:48 |
| S168 | 427 | vaporizer and photovoltaic | US-PGPUB; USPAT; EPO; JPO; DERWENT | OR | OFF | 2016/07/25 10:48 |
| S169 | 146 | "392"/$.ccls. and photovoltaic | US-PGPUB; USPAT; EPO; JPO; DERWENT | OR | OFF | 2016/07/25 10:48 |
| S170 | 4 | "392"/$.ccls. and photovoltaic and cigarette | US-PGPUB; USPAT; | OR | OFF | 2016/07/25 10:48 |

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| | | | EPO; JPO; DERWENT | | | |
| S171 | 7 | e-cigarette and solar | US-PGPUB; USPAT; EPO; JPO; DERWENT | OR | OFF | 2016/07/25 10:48 |
| S172 | 319 | e-cigarette | US-PGPUB; USPAT; EPO; JPO; DERWENT | OR | OFF | 2016/07/25 10:48 |
| S173 | 1 | e-cigarette and photovoltaic | US-PGPUB; USPAT; EPO; JPO; DERWENT | OR | OFF | 2016/07/25 10:48 |
| S174 | 7 | e-cigarette and photo | US-PGPUB; USPAT; EPO; JPO; DERWENT | OR | OFF | 2016/07/25 10:48 |
| S175 | 32023 | vaporizer or (air adj freshener) and solar | US-PGPUB; USPAT; EPO; JPO; DERWENT | OR | OFF | 2016/07/25 10:48 |
| S176 | 32023 | vaporizer or ((air adj freshener) and solar) | US-PGPUB; USPAT; EPO; JPO; DERWENT | OR | OFF | 2016/07/25 10:48 |
| S177 | 1605 | (vaporizer or (air adj freshener)) and solar | US-PGPUB; USPAT; EPO; JPO; DERWENT | OR | OFF | 2016/07/25 10:48 |
| S178 | 225 | (vaporizer or (air adj freshener)) and solar and photovoltaic | US-PGPUB; USPAT; EPO; JPO; DERWENT | OR | OFF | 2016/07/25 10:48 |
| S179 | 2 | ("2013/0309102").URPN. | USPAT | OR | OFF | 2016/07/25 10:48 |
| S180 | 67756 | a01b 12/006 | US-PGPUB; USPAT; EPO; JPO; DERWENT | OR | OFF | 2016/07/25 10:48 |
| S181 | 0 | (a24f47/008).IPCR. | US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT | OR | OFF | 2016/07/25 10:48 |
| S182 | 0 | (a24f047/008).IPCR. | US-PGPUB; USPAT; USOCR; EPO; JPO; | OR | OFF | 2016/07/25 10:48 |

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|---|---|---|---|---|---|---|
| | | | DERWENT | | | |
| S183 | 0 | (a24f047/008).IPCR. | US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT | OR | OFF | 2016/07/25 10:48 |
| S184 | 0 | (a24f47/08).IPCR. | US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT | OR | OFF | 2016/07/25 10:48 |
| S185 | 7163 | (B60H1/22).IPCR. | US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT | OR | OFF | 2016/07/25 10:48 |
| S186 | 0 | (A24F47/08).IPCR. | US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT | OR | OFF | 2016/07/25 10:48 |
| S187 | 0 | (A24F47/10).IPCR. | US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT | OR | OFF | 2016/07/25 10:48 |
| S188 | 6419 | (f24h3/00).IPCR. | US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT | OR | OFF | 2016/07/25 10:48 |
| S189 | 8665 | (a24f47/00).IPCR. | US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT | OR | OFF | 2016/07/25 10:48 |
| S190 | 12932 | (a61m15/00).IPCR. | US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT | OR | OFF | 2016/07/25 10:48 |
| S191 | 57 | S190 and "392"/$.ccls. | US-PGPUB; USPAT; EPO; JPO; DERWENT | OR | OFF | 2016/07/25 10:48 |
| S192 | 9 | S191 and breath | US-PGPUB; USPAT; EPO; JPO; DERWENT | OR | OFF | 2016/07/25 10:48 |
| S193 | 15 | S191 and generator | US- | OR | OFF | 2016/07/25 |

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|---|---|---|---|---|---|---|
| | | | PGPUB; USPAT; EPO; JPO; DERWENT | | | 10:48 |
| S194 | 49 | ("20050016550" \| "20060196518" \| "20110011396" \| "20110192399" \| "20110277757" \| "20110277760" \| "3200819" \| "4284089" \| "4945929" \| "4966171" \| "4969476" \| "5050621" \| "5115820" \| "5249586" \| "5865185" \| "7412259" \| "7726320" \| "8156944").PN. | US-PGPUB; USPAT; EPO; JPO; DERWENT | OR | OFF | 2016/07/25 10:48 |
| S195 | 6 | S194 and generator | US-PGPUB; USPAT; EPO; JPO; DERWENT | OR | OFF | 2016/07/25 10:48 |
| S196 | 1 | ("2008/0303286").URPN. | USPAT | OR | OFF | 2016/07/25 10:48 |
| S197 | 1 | ("2008/0303286").URPN. | USPAT | OR | OFF | 2016/07/25 10:48 |
| S198 | 0 | miniature adj turbine same electrical adj generator | US-PGPUB; USPAT; EPO; JPO; DERWENT | OR | OFF | 2016/07/25 10:48 |
| S199 | 427 | vaporizer and photovoltaic | US-PGPUB; USPAT; EPO; JPO; DERWENT | OR | OFF | 2016/07/25 10:48 |
| S200 | 7 | e-cigarette and solar | US-PGPUB; USPAT; EPO; JPO; DERWENT | OR | OFF | 2016/07/25 10:48 |
| S201 | 319 | e-cigarette | US-PGPUB; USPAT; EPO; JPO; DERWENT | OR | OFF | 2016/07/25 10:48 |
| S202 | 82 | ("3200819" \| "20100031968" \| "8156944" \| "20080230052" \| "20100037903" \| "20100242974" \| "D590988" \| "D590990" \| "7412259" \| "20050016550" \| "7832410" \| "D613903" \| "20080257367" \| "20100200006" \| "20110011396" \| "20110277757" \| "7726320" \| "3200819" \| "20080257367" \| "20080092912" \| "20080230052" \| "20100200008" \| "5050621" \| "20060196518" \| "20080092912" \| "20100200008" \| "D590991" \| "20090272379" \| "7726320" \| "20070267031" \| "20100200006" \| "D613904" \| "4969476" \| "20110192399" \| "20050016550" \| "20060196518" \| "20080276947" \| "20090095311" \| "20090126745" \| "D590989" \| "20100242974" \| "5249586" \| "5865185" \| "20080247892" \| "20100031968" \| | US-PGPUB; USPAT; EPO; JPO; DERWENT | OR | OFF | 2016/07/25 10:48 |

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| | | "20080276947" \| "20110277760" \| "4284089" \| "4945929" \| "4966171" \| "5115820").PN. | | | | |
| S203 | 3 | "20090272379" | US-PGPUB; USPAT; EPO; JPO; DERWENT | OR | OFF | 2016/07/25 10:51 |
| S204 | 33 | ("20070267031" \| "20080092912" \| "20080230052" \| "20080247892" \| "20080257367" \| "20080276947" \| "20090095311" \| "20090126745" \| "20100031968" \| "20100037903" \| "20100200006" \| "20100200008" \| "20100242974" \| "7832410" \| "D590988" \| "D590989" \| "D590990" \| "D590991" \| "D613903" \| "D613904").PN. | US-PGPUB; USPAT; EPO; JPO; DERWENT | OR | OFF | 2016/08/20 13:49 |
| S205 | 3 | "12843917" | US-PGPUB; USPAT; EPO; JPO; DERWENT | OR | OFF | 2016/08/20 13:49 |
| S206 | 3 | "12843917" | US-PGPUB; USPAT; EPO; JPO; DERWENT | OR | OFF | 2016/08/20 13:49 |
| S207 | 3 | "20090272379" | US-PGPUB; USPAT; EPO; JPO; DERWENT | OR | OFF | 2016/08/20 13:49 |
| S208 | 5052 | cigarette and generator | US-PGPUB; USPAT; EPO; JPO; DERWENT | OR | OFF | 2016/08/20 13:49 |
| S209 | 4261 | vaporizer and generator | US-PGPUB; USPAT; EPO; JPO; DERWENT | OR | OFF | 2016/08/20 13:49 |
| S210 | 59 | S208 and S209 | US-PGPUB; USPAT; EPO; JPO; DERWENT | OR | OFF | 2016/08/20 13:49 |
| S211 | 1499 | generator same breath | US-PGPUB; USPAT; EPO; JPO; DERWENT | OR | OFF | 2016/08/20 13:49 |
| S212 | 3 | electrical adj generator same breath | US-PGPUB; USPAT; EPO; JPO; DERWENT | OR | OFF | 2016/08/20 13:49 |
| S213 | 16 | miniature adj electrical adj generator | US-PGPUB; USPAT; | OR | OFF | 2016/08/20 13:49 |

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| | | | EPO; JPO; DERWENT | | | |
| S214 | 1 | ("2008/0303286").URPN. | USPAT | OR | OFF | 2016/08/20 13:49 |
| S215 | 1 | ("2008/0303286").URPN. | USPAT | OR | OFF | 2016/08/20 13:49 |
| S216 | 9 | miniature adj turbine and electrical adj generator | US-PGPUB; USPAT; EPO; JPO; DERWENT | OR | OFF | 2016/08/20 13:49 |
| S217 | 0 | miniature adj turbine same electrical adj generator | US-PGPUB; USPAT; EPO; JPO; DERWENT | OR | OFF | 2016/08/20 13:49 |
| S218 | 432 | vaporizer and photovoltaic | US-PGPUB; USPAT; EPO; JPO; DERWENT | OR | OFF | 2016/08/20 13:49 |
| S219 | 146 | "392"/$.ccls. and photovoltaic | US-PGPUB; USPAT; EPO; JPO; DERWENT | OR | OFF | 2016/08/20 13:49 |
| S220 | 4 | "392"/$.ccls. and photovoltaic and cigarette | US-PGPUB; USPAT; EPO; JPO; DERWENT | OR | OFF | 2016/08/20 13:49 |
| S221 | 9 | e-cigarette and solar | US-PGPUB; USPAT; EPO; JPO; DERWENT | OR | OFF | 2016/08/20 13:49 |
| S222 | 340 | e-cigarette | US-PGPUB; USPAT; EPO; JPO; DERWENT | OR | OFF | 2016/08/20 13:49 |
| S223 | 1 | e-cigarette and photovoltaic | US-PGPUB; USPAT; EPO; JPO; DERWENT | OR | OFF | 2016/08/20 13:49 |
| S224 | 7 | e-cigarette and photo | US-PGPUB; USPAT; EPO; JPO; DERWENT | OR | OFF | 2016/08/20 13:49 |
| S225 | 32204 | vaporizer or (air adj freshener) and solar | US-PGPUB; USPAT; EPO; JPO; DERWENT | OR | OFF | 2016/08/20 13:49 |
| S226 | 32204 | vaporizer or ((air adj freshener) and solar) | US-PGPUB; USPAT; | OR | OFF | 2016/08/20 13:49 |

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| | | | EPO; JPO; DERWENT | | | |
| S227 | 1620 | (vaporizer or (air adj freshener)) and solar | US-PGPUB; USPAT; EPO; JPO; DERWENT | OR | OFF | 2016/08/20 13:49 |
| S228 | 226 | (vaporizer or (air adj freshener)) and solar and photovoltaic | US-PGPUB; USPAT; EPO; JPO; DERWENT | OR | OFF | 2016/08/20 13:49 |
| S229 | 2 | ("2013/0309102").URPN. | USPAT | OR | OFF | 2016/08/20 13:49 |
| S230 | 68328 | a01b 12/006 | US-PGPUB; USPAT; EPO; JPO; DERWENT | OR | OFF | 2016/08/20 13:49 |
| S231 | 0 | (a24f47/008).IPCR. | US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT | OR | OFF | 2016/08/20 13:49 |
| S232 | 0 | (a24f047/008).IPCR. | US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT | OR | OFF | 2016/08/20 13:49 |
| S233 | 0 | (a24f047/008).IPCR. | US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT | OR | OFF | 2016/08/20 13:49 |
| S234 | 0 | (a24f47/08).IPCR. | US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT | OR | OFF | 2016/08/20 13:49 |
| S235 | 7197 | (B60H1/22).IPCR. | US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT | OR | OFF | 2016/08/20 13:49 |
| S236 | 0 | (A24F47/08).IPCR. | US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT | OR | OFF | 2016/08/20 13:49 |
| S237 | 0 | (A24F47/10).IPCR. | US-PGPUB; USPAT; USOCR; EPO; JPO; | OR | OFF | 2016/08/20 13:49 |

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| | | | DERWENT | | | |
| S238 | 6451 | (f24h3/00).IPCR. | US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT | OR | OFF | 2016/08/20 13:49 |
| S239 | 8906 | (a24f47/00).IPCR. | US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT | OR | OFF | 2016/08/20 13:49 |
| S240 | 13008 | (a61m15/00).IPCR. | US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT | OR | OFF | 2016/08/20 13:49 |
| S241 | 58 | S240 and "392"/$.ccls. | US-PGPUB; USPAT; EPO; JPO; DERWENT | OR | OFF | 2016/08/20 13:49 |
| S242 | 9 | S241 and breath | US-PGPUB; USPAT; EPO; JPO; DERWENT | OR | OFF | 2016/08/20 13:49 |
| S243 | 15 | S241 and generator | US-PGPUB; USPAT; EPO; JPO; DERWENT | OR | OFF | 2016/08/20 13:49 |
| S244 | 49 | ("20050016550" \| "20060196518" \| "20110011396" \| "20110192399" \| "20110277757" \| "20110277760" \| "3200819" \| "4284089" \| "4945929" \| "4966171" \| "4969476" \| "5050621" \| "5115820" \| "5249586" \| "5865185" \| "7412259" \| "7726320" \| "8156944").PN. | US-PGPUB; USPAT; EPO; JPO; DERWENT | OR | OFF | 2016/08/20 13:49 |
| S245 | 6 | S244 and generator | US-PGPUB; USPAT; EPO; JPO; DERWENT | OR | OFF | 2016/08/20 13:49 |
| S246 | 1 | ("2008/0303286").URPN. | USPAT | OR | OFF | 2016/08/20 13:49 |
| S247 | 1 | ("2008/0303286").URPN. | USPAT | OR | OFF | 2016/08/20 13:49 |
| S248 | 0 | miniature adj turbine same electrical adj generator | US-PGPUB; USPAT; EPO; JPO; DERWENT | OR | OFF | 2016/08/20 13:49 |
| S249 | 432 | vaporizer and photovoltaic | US-PGPUB; USPAT; EPO; JPO; | OR | OFF | 2016/08/20 13:49 |

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| | | | DERWENT | | | |
| S250 | 9 | e-cigarette and solar | US-PGPUB; USPAT; EPO; JPO; DERWENT | OR | OFF | 2016/08/20 13:49 |
| S251 | 340 | e-cigarette | US-PGPUB; USPAT; EPO; JPO; DERWENT | OR | OFF | 2016/08/20 13:49 |
| S252 | 3 | "13594813" | US-PGPUB; USPAT; EPO; JPO; DERWENT | OR | OFF | 2016/08/20 13:49 |
| S253 | 33 | ("20070267031" \| "20080092912" \| "20080230052" \| "20080247892" \| "20080257367" \| "20080276947" \| "20090095311" \| "20090126745" \| "20100031968" \| "20100037903" \| "20100200006" \| "20100200008" \| "20100242974" \| "7832410" \| "D590988" \| "D590989" \| "D590990" \| "D590991" \| "D613903" \| "D613904").PN. | US-PGPUB; USPAT; EPO; JPO; DERWENT | OR | OFF | 2016/08/20 13:49 |
| S254 | 3 | "12843917" | US-PGPUB; USPAT; EPO; JPO; DERWENT | OR | OFF | 2016/08/20 13:49 |
| S255 | 3 | "12843917" | US-PGPUB; USPAT; EPO; JPO; DERWENT | OR | OFF | 2016/08/20 13:49 |
| S256 | 3 | "20090272379" | US-PGPUB; USPAT; EPO; JPO; DERWENT | OR | OFF | 2016/08/20 13:49 |
| S257 | 5052 | cigarette and generator | US-PGPUB; USPAT; EPO; JPO; DERWENT | OR | OFF | 2016/08/20 13:49 |
| S258 | 4261 | vaporizer and generator | US-PGPUB; USPAT; EPO; JPO; DERWENT | OR | OFF | 2016/08/20 13:49 |
| S259 | 59 | S257 and S258 | US-PGPUB; USPAT; EPO; JPO; DERWENT | OR | OFF | 2016/08/20 13:49 |
| S260 | 1499 | generator same breath | US-PGPUB; USPAT; EPO; JPO; DERWENT | OR | OFF | 2016/08/20 13:49 |

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| S261 | 3 | electrical adj generator same breath | US-PGPUB; USPAT; EPO; JPO; DERWENT | OR | OFF | 2016/08/20 13:49 |
| S262 | 16 | miniature adj electrical adj generator | US-PGPUB; USPAT; EPO; JPO; DERWENT | OR | OFF | 2016/08/20 13:49 |
| S263 | 1 | ("2008/0303286").URPN. | USPAT | OR | OFF | 2016/08/20 13:49 |
| S264 | 1 | ("2008/0303286").URPN. | USPAT | OR | OFF | 2016/08/20 13:49 |
| S265 | 9 | miniature adj turbine and electrical adj generator | US-PGPUB; USPAT; EPO; JPO; DERWENT | OR | OFF | 2016/08/20 13:49 |
| S266 | 0 | miniature adj turbine same electrical adj generator | US-PGPUB; USPAT; EPO; JPO; DERWENT | OR | OFF | 2016/08/20 13:49 |
| S267 | 432 | vaporizer and photovoltaic | US-PGPUB; USPAT; EPO; JPO; DERWENT | OR | OFF | 2016/08/20 13:49 |
| S268 | 146 | "392"/$.ccls. and photovoltaic | US-PGPUB; USPAT; EPO; JPO; DERWENT | OR | OFF | 2016/08/20 13:49 |
| S269 | 4 | "392"/$.ccls. and photovoltaic and cigarette | US-PGPUB; USPAT; EPO; JPO; DERWENT | OR | OFF | 2016/08/20 13:49 |
| S270 | 9 | e-cigarette and solar | US-PGPUB; USPAT; EPO; JPO; DERWENT | OR | OFF | 2016/08/20 13:49 |
| S271 | 340 | e-cigarette | US-PGPUB; USPAT; EPO; JPO; DERWENT | OR | OFF | 2016/08/20 13:49 |
| S272 | 1 | e-cigarette and photovoltaic | US-PGPUB; USPAT; EPO; JPO; DERWENT | OR | OFF | 2016/08/20 13:49 |
| S273 | 7 | e-cigarette and photo | US-PGPUB; USPAT; EPO; JPO; DERWENT | OR | OFF | 2016/08/20 13:49 |

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| S274 | 32204 | vaporizer or (air adj freshener) and solar | US-PGPUB; USPAT; EPO; JPO; DERWENT | OR | OFF | 2016/08/20 13:49 |
| S275 | 32204 | vaporizer or ((air adj freshener) and solar) | US-PGPUB; USPAT; EPO; JPO; DERWENT | OR | OFF | 2016/08/20 13:49 |
| S276 | 1620 | (vaporizer or (air adj freshener)) and solar | US-PGPUB; USPAT; EPO; JPO; DERWENT | OR | OFF | 2016/08/20 13:49 |
| S277 | 226 | (vaporizer or (air adj freshener)) and solar and photovoltaic | US-PGPUB; USPAT; EPO; JPO; DERWENT | OR | OFF | 2016/08/20 13:49 |
| S278 | 2 | ("2013/0309102").URPN. | USPAT | OR | OFF | 2016/08/20 13:49 |
| S279 | 68328 | a01b 12/006 | US-PGPUB; USPAT; EPO; JPO; DERWENT | OR | OFF | 2016/08/20 13:49 |
| S280 | 0 | (a24f47/008).IPCR. | US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT | OR | OFF | 2016/08/20 13:49 |
| S281 | 0 | (a24f047/008).IPCR. | US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT | OR | OFF | 2016/08/20 13:49 |
| S282 | 0 | (a24f047/008).IPCR. | US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT | OR | OFF | 2016/08/20 13:49 |
| S283 | 0 | (a24f47/08).IPCR. | US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT | OR | OFF | 2016/08/20 13:49 |
| S284 | 7197 | (B60H1/22).IPCR. | US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT | OR | OFF | 2016/08/20 13:49 |
| S285 | 0 | (A24F47/08).IPCR. | US-PGPUB; USPAT; | OR | OFF | 2016/08/20 13:49 |

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| | | | USOCR; EPO; JPO; DERWENT | | | |
| S286 | 0 | (A24F47/10).IPCR. | US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT | OR | OFF | 2016/08/20 13:49 |
| S287 | 6451 | (f24h3/00).IPCR. | US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT | OR | OFF | 2016/08/20 13:49 |
| S288 | 8906 | (a24f47/00).IPCR. | US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT | OR | OFF | 2016/08/20 13:49 |
| S289 | 13008 | (a61m15/00).IPCR. | US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT | OR | OFF | 2016/08/20 13:49 |
| S290 | 58 | S289 and "392"/$.ccls. | US-PGPUB; USPAT; EPO; JPO; DERWENT | OR | OFF | 2016/08/20 13:49 |
| S291 | 9 | S290 and breath | US-PGPUB; USPAT; EPO; JPO; DERWENT | OR | OFF | 2016/08/20 13:49 |
| S292 | 15 | S290 and generator | US-PGPUB; USPAT; EPO; JPO; DERWENT | OR | OFF | 2016/08/20 13:49 |
| S293 | 49 | ("20050016550" \| "20060196518" \| "20110011396" \| "20110192399" \| "20110277757" \| "20110277760" \| "3200819" \| "4284089" \| "4945929" \| "4966171" \| "4969476" \| "5050621" \| "5115820" \| "5249586" \| "5865185" \| "7412259" \| "7726320" \| "8156944").PN. | US-PGPUB; USPAT; EPO; JPO; DERWENT | OR | OFF | 2016/08/20 13:49 |
| S294 | 6 | S293 and generator | US-PGPUB; USPAT; EPO; JPO; DERWENT | OR | OFF | 2016/08/20 13:49 |
| S295 | 1 | ("2008/0303286").URPN. | USPAT | OR | OFF | 2016/08/20 13:49 |
| S296 | 1 | ("2008/0303286").URPN. | USPAT | OR | OFF | 2016/08/20 13:49 |
| S297 | 0 | miniature adj turbine same electrical adj | US- | OR | OFF | 2016/08/20 |

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|---|---|---|---|---|---|---|
| | | generator | PGPUB; USPAT; EPO; JPO; DERWENT | | | 13:49 |
| S298 | 432 | vaporizer and photovoltaic | US-PGPUB; USPAT; EPO; JPO; DERWENT | OR | OFF | 2016/08/20 13:49 |
| S299 | 9 | e-cigarette and solar | US-PGPUB; USPAT; EPO; JPO; DERWENT | OR | OFF | 2016/08/20 13:49 |
| S300 | 340 | e-cigarette | US-PGPUB; USPAT; EPO; JPO; DERWENT | OR | OFF | 2016/08/20 13:49 |
| S301 | 82 | ("3200819" \| "20100031968" \| "8156944" \| "20080230052" \| "20100037903" \| "20100242974" \| "D590988" \| "D590990" \| "7412259" \| "20050016550" \| "7832410" \| "D613903" \| "20080257367" \| "20100200006" \| "20110011396" \| "20110277757" \| "7726320" \| "3200819" \| "20080257367" \| "20080092912" \| "20080230052" \| "20100200008" \| "5050621" \| "20060196518" \| "20080092912" \| "20100200008" \| "D590991" \| "20090272379" \| "7726320" \| "20070267031" \| "20100200006" \| "D613904" \| "4969476" \| "20110192399" \| "20050016550" \| "20060196518" \| "20080276947" \| "20090095311" \| "20090126745" \| "D590989" \| "20100242974" \| "5249586" \| "5865185" \| "20080247892" \| "20100031968" \| "20080276947" \| "20110277760" \| "4284089" \| "4945929" \| "4966171" \| "5115820").PN. | US-PGPUB; USPAT; EPO; JPO; DERWENT | OR | OFF | 2016/08/20 13:49 |
| S302 | 33 | ("20070267031" \| "20080092912" \| "20080230052" \| "20080247892" \| "20080257367" \| "20080276947" \| "20090095311" \| "20090126745" \| "20100031968" \| "20100037903" \| "20100200006" \| "20100200008" \| "20100242974" \| "7832410" \| "D590988" \| "D590989" \| "D590990" \| "D590991" \| "D613903" \| "D613904").PN. | US-PGPUB; USPAT; EPO; JPO; DERWENT | OR | OFF | 2016/08/20 13:49 |
| S303 | 3 | "12843917" | US-PGPUB; USPAT; EPO; JPO; DERWENT | OR | OFF | 2016/08/20 13:49 |
| S304 | 3 | "12843917" | US-PGPUB; USPAT; EPO; JPO; DERWENT | OR | OFF | 2016/08/20 13:49 |

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| S305 | 3 | "20090272379" | US-PGPUB; USPAT; EPO; JPO; DERWENT | OR | OFF | 2016/08/20 13:49 |
| S306 | 5052 | cigarette and generator | US-PGPUB; USPAT; EPO; JPO; DERWENT | OR | OFF | 2016/08/20 13:49 |
| S307 | 4261 | vaporizer and generator | US-PGPUB; USPAT; EPO; JPO; DERWENT | OR | OFF | 2016/08/20 13:49 |
| S308 | 59 | S306 and S307 | US-PGPUB; USPAT; EPO; JPO; DERWENT | OR | OFF | 2016/08/20 13:49 |
| S309 | 1499 | generator same breath | US-PGPUB; USPAT; EPO; JPO; DERWENT | OR | OFF | 2016/08/20 13:49 |
| S310 | 3 | electrical adj generator same breath | US-PGPUB; USPAT; EPO; JPO; DERWENT | OR | OFF | 2016/08/20 13:49 |
| S311 | 16 | miniature adj electrical adj generator | US-PGPUB; USPAT; EPO; JPO; DERWENT | OR | OFF | 2016/08/20 13:49 |
| S312 | 1 | ("2008/0303286").URPN. | USPAT | OR | OFF | 2016/08/20 13:49 |
| S313 | 1 | ("2008/0303286").URPN. | USPAT | OR | OFF | 2016/08/20 13:49 |
| S314 | 9 | miniature adj turbine and electrical adj generator | US-PGPUB; USPAT; EPO; JPO; DERWENT | OR | OFF | 2016/08/20 13:49 |
| S315 | 0 | miniature adj turbine same electrical adj generator | US-PGPUB; USPAT; EPO; JPO; DERWENT | OR | OFF | 2016/08/20 13:49 |
| S316 | 432 | vaporizer and photovoltaic | US-PGPUB; USPAT; EPO; JPO; DERWENT | OR | OFF | 2016/08/20 13:49 |
| S317 | 146 | "392"/$.ccls. and photovoltaic | US-PGPUB; USPAT; EPO; JPO; DERWENT | OR | OFF | 2016/08/20 13:49 |

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| S318 | 4 | "392"/$.ccls. and photovoltaic and cigarette | US-PGPUB; USPAT; EPO; JPO; DERWENT | OR | OFF | 2016/08/20 13:49 |
| S319 | 9 | e-cigarette and solar | US-PGPUB; USPAT; EPO; JPO; DERWENT | OR | OFF | 2016/08/20 13:49 |
| S320 | 340 | e-cigarette | US-PGPUB; USPAT; EPO; JPO; DERWENT | OR | OFF | 2016/08/20 13:49 |
| S321 | 1 | e-cigarette and photovoltaic | US-PGPUB; USPAT; EPO; JPO; DERWENT | OR | OFF | 2016/08/20 13:49 |
| S322 | 7 | e-cigarette and photo | US-PGPUB; USPAT; EPO; JPO; DERWENT | OR | OFF | 2016/08/20 13:49 |
| S323 | 32204 | vaporizer or (air adj freshener) and solar | US-PGPUB; USPAT; EPO; JPO; DERWENT | OR | OFF | 2016/08/20 13:49 |
| S324 | 32204 | vaporizer or ((air adj freshener) and solar) | US-PGPUB; USPAT; EPO; JPO; DERWENT | OR | OFF | 2016/08/20 13:49 |
| S325 | 1620 | (vaporizer or (air adj freshener)) and solar | US-PGPUB; USPAT; EPO; JPO; DERWENT | OR | OFF | 2016/08/20 13:49 |
| S326 | 226 | (vaporizer or (air adj freshener)) and solar and photovoltaic | US-PGPUB; USPAT; EPO; JPO; DERWENT | OR | OFF | 2016/08/20 13:49 |
| S327 | 2 | ("2013/0309102").URPN. | USPAT | OR | OFF | 2016/08/20 13:49 |
| S328 | 68328 | a01b 12/006 | US-PGPUB; USPAT; EPO; JPO; DERWENT | OR | OFF | 2016/08/20 13:49 |
| S329 | 0 | (a24f47/008).IPCR. | US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT | OR | OFF | 2016/08/20 13:49 |
| S330 | 0 | (a24f047/008).IPCR. | US-PGPUB; | OR | OFF | 2016/08/20 13:49 |

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|---|---|---|---|---|---|---|
| | | | USPAT; USOCR; EPO; JPO; DERWENT | | | |
| S331 | 0 | (a24f047/008).IPCR. | US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT | OR | OFF | 2016/08/20 13:49 |
| S332 | 0 | (a24f47/08).IPCR. | US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT | OR | OFF | 2016/08/20 13:49 |
| S333 | 7197 | (B60H1/22).IPCR. | US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT | OR | OFF | 2016/08/20 13:49 |
| S334 | 0 | (A24F47/08).IPCR. | US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT | OR | OFF | 2016/08/20 13:49 |
| S335 | 0 | (A24F47/10).IPCR. | US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT | OR | OFF | 2016/08/20 13:49 |
| S336 | 6451 | (f24h3/00).IPCR. | US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT | OR | OFF | 2016/08/20 13:49 |
| S337 | 8906 | (a24f47/00).IPCR. | US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT | OR | OFF | 2016/08/20 13:49 |
| S338 | 13008 | (a61m15/00).IPCR. | US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT | OR | OFF | 2016/08/20 13:49 |
| S339 | 58 | S338 and "392"/$.ccls. | US-PGPUB; USPAT; EPO; JPO; DERWENT | OR | OFF | 2016/08/20 13:49 |
| S340 | 9 | S339 and breath | US-PGPUB; USPAT; | OR | OFF | 2016/08/20 13:49 |

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| | | | EPO; JPO; DERWENT | | | |
| S341 | 15 | S339 and generator | US-PGPUB; USPAT; EPO; JPO; DERWENT | OR | OFF | 2016/08/20 13:49 |
| S342 | 49 | ("20050016550" \| "20060196518" \| "20110011396" \| "20110192399" \| "20110277757" \| "20110277760" \| "3200819" \| "4284089" \| "4945929" \| "4966171" \| "4969476" \| "5050621" \| "5115820" \| "5249586" \| "5865185" \| "7412259" \| "7726320" \| "8156944").PN. | US-PGPUB; USPAT; EPO; JPO; DERWENT | OR | OFF | 2016/08/20 13:49 |
| S343 | 6 | S342 and generator | US-PGPUB; USPAT; EPO; JPO; DERWENT | OR | OFF | 2016/08/20 13:49 |
| S344 | 1 | ("2008/0303286").URPN. | USPAT | OR | OFF | 2016/08/20 13:49 |
| S345 | 1 | ("2008/0303286").URPN. | USPAT | OR | OFF | 2016/08/20 13:49 |
| S346 | 0 | miniature adj turbine same electrical adj generator | US-PGPUB; USPAT; EPO; JPO; DERWENT | OR | OFF | 2016/08/20 13:49 |
| S347 | 432 | vaporizer and photovoltaic | US-PGPUB; USPAT; EPO; JPO; DERWENT | OR | OFF | 2016/08/20 13:49 |
| S348 | 9 | e-cigarette and solar | US-PGPUB; USPAT; EPO; JPO; DERWENT | OR | OFF | 2016/08/20 13:49 |
| S349 | 340 | e-cigarette | US-PGPUB; USPAT; EPO; JPO; DERWENT | OR | OFF | 2016/08/20 13:49 |
| S350 | 3 | "13594813" | US-PGPUB; USPAT; EPO; JPO; DERWENT | OR | OFF | 2016/08/20 13:49 |
| S351 | 33 | ("20070267031" \| "20080092912" \| "20080230052" \| "20080247892" \| "20080257367" \| "20080276947" \| "20090095311" \| "20090126745" \| "20100031968" \| "20100037903" \| "20100200006" \| "20100200008" \| "20100242974" \| "7832410" \| "D590988" \| "D590989" \| "D590990" \| "D590991" \| "D613903" \| "D613904").PN. | US-PGPUB; USPAT; EPO; JPO; DERWENT | OR | OFF | 2016/08/20 13:49 |
| S352 | 3 | "12843917" | US-PGPUB; | OR | OFF | 2016/08/20 13:49 |

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| | | | USPAT; EPO; JPO; DERWENT | | | |
| S353 | 3 | "12843917" | US-PGPUB; USPAT; EPO; JPO; DERWENT | OR | OFF | 2016/08/20 13:49 |
| S354 | 3 | "20090272379" | US-PGPUB; USPAT; EPO; JPO; DERWENT | OR | OFF | 2016/08/20 13:49 |
| S355 | 5052 | cigarette and generator | US-PGPUB; USPAT; EPO; JPO; DERWENT | OR | OFF | 2016/08/20 13:49 |
| S356 | 4261 | vaporizer and generator | US-PGPUB; USPAT; EPO; JPO; DERWENT | OR | OFF | 2016/08/20 13:49 |
| S357 | 59 | S355 and S356 | US-PGPUB; USPAT; EPO; JPO; DERWENT | OR | OFF | 2016/08/20 13:49 |
| S358 | 1499 | generator same breath | US-PGPUB; USPAT; EPO; JPO; DERWENT | OR | OFF | 2016/08/20 13:49 |
| S359 | 3 | electrical adj generator same breath | US-PGPUB; USPAT; EPO; JPO; DERWENT | OR | OFF | 2016/08/20 13:49 |
| S360 | 16 | miniature adj electrical adj generator | US-PGPUB; USPAT; EPO; JPO; DERWENT | OR | OFF | 2016/08/20 13:49 |
| S361 | 1 | ("2008/0303286").URPN. | USPAT | OR | OFF | 2016/08/20 13:49 |
| S362 | 1 | ("2008/0303286").URPN. | USPAT | OR | OFF | 2016/08/20 13:49 |
| S363 | 9 | miniature adj turbine and electrical adj generator | US-PGPUB; USPAT; EPO; JPO; DERWENT | OR | OFF | 2016/08/20 13:49 |
| S364 | 0 | miniature adj turbine same electrical adj generator | US-PGPUB; USPAT; EPO; JPO; DERWENT | OR | OFF | 2016/08/20 13:49 |
| S365 | 432 | vaporizer and photovoltaic | US-PGPUB; | OR | OFF | 2016/08/20 13:49 |

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| | | | USPAT; EPO; JPO; DERWENT | | | |
| S366 | 146 | "392"/$.ccls. and photovoltaic | US-PGPUB; USPAT; EPO; JPO; DERWENT | OR | OFF | 2016/08/20 13:49 |
| S367 | 4 | "392"/$.ccls. and photovoltaic and cigarette | US-PGPUB; USPAT; EPO; JPO; DERWENT | OR | OFF | 2016/08/20 13:49 |
| S368 | 9 | e-cigarette and solar | US-PGPUB; USPAT; EPO; JPO; DERWENT | OR | OFF | 2016/08/20 13:49 |
| S369 | 340 | e-cigarette | US-PGPUB; USPAT; EPO; JPO; DERWENT | OR | OFF | 2016/08/20 13:49 |
| S370 | 1 | e-cigarette and photovoltaic | US-PGPUB; USPAT; EPO; JPO; DERWENT | OR | OFF | 2016/08/20 13:49 |
| S371 | 7 | e-cigarette and photo | US-PGPUB; USPAT; EPO; JPO; DERWENT | OR | OFF | 2016/08/20 13:49 |
| S372 | 32204 | vaporizer or (air adj freshener) and solar | US-PGPUB; USPAT; EPO; JPO; DERWENT | OR | OFF | 2016/08/20 13:49 |
| S373 | 32204 | vaporizer or ((air adj freshener) and solar) | US-PGPUB; USPAT; EPO; JPO; DERWENT | OR | OFF | 2016/08/20 13:49 |
| S374 | 1620 | (vaporizer or (air adj freshener)) and solar | US-PGPUB; USPAT; EPO; JPO; DERWENT | OR | OFF | 2016/08/20 13:49 |
| S375 | 226 | (vaporizer or (air adj freshener)) and solar and photovoltaic | US-PGPUB; USPAT; EPO; JPO; DERWENT | OR | OFF | 2016/08/20 13:49 |
| S376 | 2 | ("2013/0309102").URPN. | USPAT | OR | OFF | 2016/08/20 13:49 |
| S377 | 68328 | a01b 12/006 | US-PGPUB; USPAT; EPO; JPO; DERWENT | OR | OFF | 2016/08/20 13:49 |

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| S378 | 0 | (a24f47/008).IPCR. | US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT | OR | OFF | 2016/08/20 13:49 |
| S379 | 0 | (a24f047/008).IPCR. | US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT | OR | OFF | 2016/08/20 13:49 |
| S380 | 0 | (a24f047/008).IPCR. | US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT | OR | OFF | 2016/08/20 13:49 |
| S381 | 0 | (a24f47/08).IPCR. | US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT | OR | OFF | 2016/08/20 13:49 |
| S382 | 7197 | (B60H1/22).IPCR. | US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT | OR | OFF | 2016/08/20 13:49 |
| S383 | 0 | (A24F47/08).IPCR. | US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT | OR | OFF | 2016/08/20 13:49 |
| S384 | 0 | (A24F47/10).IPCR. | US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT | OR | OFF | 2016/08/20 13:49 |
| S385 | 6451 | (f24h3/00).IPCR. | US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT | OR | OFF | 2016/08/20 13:49 |
| S386 | 8906 | (a24f47/00).IPCR. | US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT | OR | OFF | 2016/08/20 13:49 |
| S387 | 13008 | (a61m15/00).IPCR. | US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT | OR | OFF | 2016/08/20 13:49 |

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| S388 | 58 | S387 and "392"/$.ccls. | US-PGPUB; USPAT; EPO; JPO; DERWENT | OR | OFF | 2016/08/20 13:49 |
| S389 | 9 | S388 and breath | US-PGPUB; USPAT; EPO; JPO; DERWENT | OR | OFF | 2016/08/20 13:49 |
| S390 | 15 | S388 and generator | US-PGPUB; USPAT; EPO; JPO; DERWENT | OR | OFF | 2016/08/20 13:49 |
| S391 | 49 | ("20050016550" \| "20060196518" \| "20110011396" \| "20110192399" \| "20110277757" \| "20110277760" \| "3200819" \| "4284089" \| "4945929" \| "4966171" \| "4969476" \| "5050621" \| "5115820" \| "5249586" \| "5865185" \| "7412259" \| "7726320" \| "8156944").PN. | US-PGPUB; USPAT; EPO; JPO; DERWENT | OR | OFF | 2016/08/20 13:49 |
| S392 | 6 | S391 and generator | US-PGPUB; USPAT; EPO; JPO; DERWENT | OR | OFF | 2016/08/20 13:49 |
| S393 | 1 | ("2008/0303286").URPN. | USPAT | OR | OFF | 2016/08/20 13:49 |
| S394 | 1 | ("2008/0303286").URPN. | USPAT | OR | OFF | 2016/08/20 13:49 |
| S395 | 0 | miniature adj turbine same electrical adj generator | US-PGPUB; USPAT; EPO; JPO; DERWENT | OR | OFF | 2016/08/20 13:49 |
| S396 | 432 | vaporizer and photovoltaic | US-PGPUB; USPAT; EPO; JPO; DERWENT | OR | OFF | 2016/08/20 13:49 |
| S397 | 9 | e-cigarette and solar | US-PGPUB; USPAT; EPO; JPO; DERWENT | OR | OFF | 2016/08/20 13:49 |
| S398 | 340 | e-cigarette | US-PGPUB; USPAT; EPO; JPO; DERWENT | OR | OFF | 2016/08/20 13:49 |
| S399 | 82 | ("3200819" \| "20100031968" \| "8156944" \| "20080230052" \| "20100037903" \| "20100242974" \| "D590988" \| "D590990" \| "7412259" \| "20050016550" \| "7832410" \| "D613903" \| "20080257367" \| "20100200006" \| "20110011396" \| "20110277757" \| "7726320" \| "3200819" \| "20080257367" | US-PGPUB; USPAT; EPO; JPO; DERWENT | OR | OFF | 2016/08/20 13:49 |

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|---|---|---|---|---|---|---|
| | | \| "20080092912" \| "20080230052" \| "20100200008" \| "5050621" \| "20060196518" \| "20080092912" \| "20100200008" \| "D590991" \| "20090272379" \| "7726320" \| "20070267031" \| "20100200006" \| "D613904" \| "4969476" \| "20110192399" \| "20050016550" \| "20060196518" \| "20080276947" \| "20090095311" \| "20090126745" \| "D590989" \| "20100242974" \| "5249586" \| "5865185" \| "20080247892" \| "20100031968" \| "20080276947" \| "20110277760" \| "4284089" \| "4945929" \| "4966171" \| "5115820").PN. | | | | |
| S400 | 3 | "20090272379" | US-PGPUB; USPAT; EPO; JPO; DERWENT | OR | OFF | 2016/08/20 13:49 |
| S401 | 1 | ("2015/0020833").URPN. | USPAT | OR | OFF | 2016/08/20 13:59 |
| S403 | 33 | ("20070267031" \| "20080092912" \| "20080230052" \| "20080247892" \| "20080257367" \| "20080276947" \| "20090095311" \| "20090126745" \| "20100031968" \| "20100037903" \| "20100200006" \| "20100200008" \| "20100242974" \| "7832410" \| "D590988" \| "D590989" \| "D590990" \| "D590991" \| "D613903" \| "D613904").PN. | US-PGPUB; USPAT; EPO; JPO; DERWENT | OR | OFF | 2019/02/18 18:55 |
| S404 | 4 | "12843917" | US-PGPUB; USPAT; EPO; JPO; DERWENT | OR | OFF | 2019/02/18 18:55 |
| S405 | 4 | "12843917" | US-PGPUB; USPAT; EPO; JPO; DERWENT | OR | OFF | 2019/02/18 18:55 |
| S406 | 3 | "20090272379" | US-PGPUB; USPAT; EPO; JPO; DERWENT | OR | OFF | 2019/02/18 18:55 |
| S407 | 6117 | cigarette and generator | US-PGPUB; USPAT; EPO; JPO; DERWENT | OR | OFF | 2019/02/18 18:55 |
| S408 | 5386 | vaporizer and generator | US-PGPUB; USPAT; EPO; JPO; DERWENT | OR | OFF | 2019/02/18 18:55 |
| S409 | 200 | S407 and S408 | US-PGPUB; USPAT; EPO; JPO; DERWENT | OR | OFF | 2019/02/18 18:55 |

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| S410 | 1870 | generator same breath | US-PGPUB; USPAT; EPO; JPO; DERWENT | OR | OFF | 2019/02/18 18:55 |
| S411 | 6 | electrical adj generator same breath | US-PGPUB; USPAT; EPO; JPO; DERWENT | OR | OFF | 2019/02/18 18:55 |
| S412 | 19 | miniature adj electrical adj generator | US-PGPUB; USPAT; EPO; JPO; DERWENT | OR | OFF | 2019/02/18 18:55 |
| S413 | 2 | ("2008/0303286").URPN. | USPAT | OR | OFF | 2019/02/18 18:55 |
| S414 | 2 | ("2008/0303286").URPN. | USPAT | OR | OFF | 2019/02/18 18:55 |
| S415 | 9 | miniature adj turbine and electrical adj generator | US-PGPUB; USPAT; EPO; JPO; DERWENT | OR | OFF | 2019/02/18 18:55 |
| S416 | 0 | miniature adj turbine same electrical adj generator | US-PGPUB; USPAT; EPO; JPO; DERWENT | OR | OFF | 2019/02/18 18:55 |
| S417 | 700 | vaporizer and photovoltaic | US-PGPUB; USPAT; EPO; JPO; DERWENT | OR | OFF | 2019/02/18 18:55 |
| S418 | 152 | "392"/$.ccls. and photovoltaic | US-PGPUB; USPAT; EPO; JPO; DERWENT | OR | OFF | 2019/02/18 18:55 |
| S419 | 4 | "392"/$.ccls. and photovoltaic and cigarette | US-PGPUB; USPAT; EPO; JPO; DERWENT | OR | OFF | 2019/02/18 18:55 |
| S420 | 71 | e-cigarette and solar | US-PGPUB; USPAT; EPO; JPO; DERWENT | OR | OFF | 2019/02/18 18:55 |
| S421 | 1314 | e-cigarette | US-PGPUB; USPAT; EPO; JPO; DERWENT | OR | OFF | 2019/02/18 18:55 |
| S422 | 6 | e-cigarette and photovoltaic | US-PGPUB; USPAT; EPO; JPO; DERWENT | OR | OFF | 2019/02/18 18:55 |

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| S423 | 129 | e-cigarette and photo | US-PGPUB; USPAT; EPO; JPO; DERWENT | OR | OFF | 2019/02/18 18:55 |
| S424 | 38924 | vaporizer or (air adj freshener) and solar | US-PGPUB; USPAT; EPO; JPO; DERWENT | OR | OFF | 2019/02/18 18:55 |
| S425 | 38924 | vaporizer or ((air adj freshener) and solar) | US-PGPUB; USPAT; EPO; JPO; DERWENT | OR | OFF | 2019/02/18 18:55 |
| S426 | 2105 | (vaporizer or (air adj freshener)) and solar | US-PGPUB; USPAT; EPO; JPO; DERWENT | OR | OFF | 2019/02/18 18:55 |
| S427 | 306 | (vaporizer or (air adj freshener)) and solar and photovoltaic | US-PGPUB; USPAT; EPO; JPO; DERWENT | OR | OFF | 2019/02/18 18:55 |
| S428 | 4 | ("2013/0309102").URPN. | USPAT | OR | OFF | 2019/02/18 18:55 |
| S429 | 92996 | a01b 12/006 | US-PGPUB; USPAT; EPO; JPO; DERWENT | OR | OFF | 2019/02/18 18:55 |
| S430 | 0 | (a24f47/008).IPCR. | US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT | OR | OFF | 2019/02/18 18:55 |
| S431 | 0 | (a24f047/008).IPCR. | US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT | OR | OFF | 2019/02/18 18:55 |
| S432 | 0 | (a24f047/008).IPCR. | US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT | OR | OFF | 2019/02/18 18:55 |
| S433 | 0 | (a24f47/08).IPCR. | US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT | OR | OFF | 2019/02/18 18:55 |
| S434 | 9559 | (B60H1/22).IPCR. | US-PGPUB; USPAT; USOCR; | OR | OFF | 2019/02/18 18:55 |

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|---|---|---|---|---|---|---|
| | | | EPO; JPO; DERWENT | | | |
| S435 | 0 | (A24F47/08).IPCR. | US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT | OR | OFF | 2019/02/18 18:55 |
| S436 | 0 | (A24F47/10).IPCR. | US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT | OR | OFF | 2019/02/18 18:55 |
| S437 | 7167 | (f24h3/00).IPCR. | US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT | OR | OFF | 2019/02/18 18:55 |
| S438 | 17594 | (a24f47/00).IPCR. | US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT | OR | OFF | 2019/02/18 18:55 |
| S439 | 15977 | (a61m15/00).IPCR. | US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT | OR | OFF | 2019/02/18 18:55 |
| S440 | 100 | S439 and "392"/$.ccls. | US-PGPUB; USPAT; EPO; JPO; DERWENT | OR | OFF | 2019/02/18 18:55 |
| S441 | 12 | S440 and breath | US-PGPUB; USPAT; EPO; JPO; DERWENT | OR | OFF | 2019/02/18 18:55 |
| S442 | 17 | S440 and generator | US-PGPUB; USPAT; EPO; JPO; DERWENT | OR | OFF | 2019/02/18 18:55 |
| S443 | 50 | ("20050016550" \| "20060196518" \| "20110011396" \| "20110192399" \| "20110277757" \| "20110277760" \| "3200819" \| "4284089" \| "4945929" \| "4966171" \| "4969476" \| "5050621" \| "5115820" \| "5249586" \| "5865185" \| "7412259" \| "7726320" \| "8156944").PN. | US-PGPUB; USPAT; EPO; JPO; DERWENT | OR | OFF | 2019/02/18 18:55 |
| S444 | 6 | S443 and generator | US-PGPUB; USPAT; EPO; JPO; DERWENT | OR | OFF | 2019/02/18 18:55 |

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| S445 | 2 | ("2008/0303286").URPN. | USPAT | OR | OFF | 2019/02/18 18:55 |
| S446 | 2 | ("2008/0303286").URPN. | USPAT | OR | OFF | 2019/02/18 18:56 |
| S447 | 0 | miniature adj turbine same electrical adj generator | US-PGPUB; USPAT; EPO; JPO; DERWENT | OR | OFF | 2019/02/18 18:56 |
| S448 | 700 | vaporizer and photovoltaic | US-PGPUB; USPAT; EPO; JPO; DERWENT | OR | OFF | 2019/02/18 18:56 |
| S449 | 71 | e-cigarette and solar | US-PGPUB; USPAT; EPO; JPO; DERWENT | OR | OFF | 2019/02/18 18:56 |
| S450 | 1314 | e-cigarette | US-PGPUB; USPAT; EPO; JPO; DERWENT | OR | OFF | 2019/02/18 18:56 |
| S451 | 4 | "13594813" | US-PGPUB; USPAT; EPO; JPO; DERWENT | OR | OFF | 2019/02/18 18:56 |
| S452 | 33 | ("20070267031" \| "20080092912" \| "20080230052" \| "20080247892" \| "20080257367" \| "20080276947" \| "20090095311" \| "20090126745" \| "20100031968" \| "20100037903" \| "20100200006" \| "20100200008" \| "20100242974" \| "7832410" \| "D590988" \| "D590989" \| "D590990" \| "D590991" \| "D613903" \| "D613904").PN. | US-PGPUB; USPAT; EPO; JPO; DERWENT | OR | OFF | 2019/02/18 18:56 |
| S453 | 4 | "12843917" | US-PGPUB; USPAT; EPO; JPO; DERWENT | OR | OFF | 2019/02/18 18:56 |
| S454 | 4 | "12843917" | US-PGPUB; USPAT; EPO; JPO; DERWENT | OR | OFF | 2019/02/18 18:56 |
| S455 | 3 | "20090272379" | US-PGPUB; USPAT; EPO; JPO; DERWENT | OR | OFF | 2019/02/18 18:56 |
| S456 | 6117 | cigarette and generator | US-PGPUB; USPAT; EPO; JPO; DERWENT | OR | OFF | 2019/02/18 18:56 |
| S457 | 5386 | vaporizer and generator | US-PGPUB; | OR | OFF | 2019/02/18 18:56 |

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| | | | USPAT; EPO; JPO; DERWENT | | | |
| S458 | 200 | S456 and S457 | US-PGPUB; USPAT; EPO; JPO; DERWENT | OR | OFF | 2019/02/18 18:56 |
| S459 | 1870 | generator same breath | US-PGPUB; USPAT; EPO; JPO; DERWENT | OR | OFF | 2019/02/18 18:56 |
| S460 | 6 | electrical adj generator same breath | US-PGPUB; USPAT; EPO; JPO; DERWENT | OR | OFF | 2019/02/18 18:56 |
| S461 | 19 | miniature adj electrical adj generator | US-PGPUB; USPAT; EPO; JPO; DERWENT | OR | OFF | 2019/02/18 18:56 |
| S462 | 2 | ("2008/0303286").URPN. | USPAT | OR | OFF | 2019/02/18 18:56 |
| S463 | 2 | ("2008/0303286").URPN. | USPAT | OR | OFF | 2019/02/18 18:56 |
| S464 | 9 | miniature adj turbine and electrical adj generator | US-PGPUB; USPAT; EPO; JPO; DERWENT | OR | OFF | 2019/02/18 18:56 |
| S465 | 0 | miniature adj turbine same electrical adj generator | US-PGPUB; USPAT; EPO; JPO; DERWENT | OR | OFF | 2019/02/18 18:56 |
| S466 | 700 | vaporizer and photovoltaic | US-PGPUB; USPAT; EPO; JPO; DERWENT | OR | OFF | 2019/02/18 18:56 |
| S467 | 152 | "392"/$.ccls. and photovoltaic | US-PGPUB; USPAT; EPO; JPO; DERWENT | OR | OFF | 2019/02/18 18:56 |
| S468 | 4 | "392"/$.ccls. and photovoltaic and cigarette | US-PGPUB; USPAT; EPO; JPO; DERWENT | OR | OFF | 2019/02/18 18:56 |
| S469 | 71 | e-cigarette and solar | US-PGPUB; USPAT; EPO; JPO; DERWENT | OR | OFF | 2019/02/18 18:56 |
| S470 | 1314 | e-cigarette | US-PGPUB; | OR | OFF | 2019/02/18 18:56 |

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| | | | USPAT; EPO; JPO; DERWENT | | | |
| S471 | 6 | e-cigarette and photovoltaic | US-PGPUB; USPAT; EPO; JPO; DERWENT | OR | OFF | 2019/02/18 18:56 |
| S472 | 129 | e-cigarette and photo | US-PGPUB; USPAT; EPO; JPO; DERWENT | OR | OFF | 2019/02/18 18:56 |
| S473 | 38924 | vaporizer or (air adj freshener) and solar | US-PGPUB; USPAT; EPO; JPO; DERWENT | OR | OFF | 2019/02/18 18:56 |
| S474 | 38924 | vaporizer or ((air adj freshener) and solar) | US-PGPUB; USPAT; EPO; JPO; DERWENT | OR | OFF | 2019/02/18 18:56 |
| S475 | 2105 | (vaporizer or (air adj freshener)) and solar | US-PGPUB; USPAT; EPO; JPO; DERWENT | OR | OFF | 2019/02/18 18:56 |
| S476 | 306 | (vaporizer or (air adj freshener)) and solar and photovoltaic | US-PGPUB; USPAT; EPO; JPO; DERWENT | OR | OFF | 2019/02/18 18:56 |
| S477 | 4 | ("2013/0309102").URPN. | USPAT | OR | OFF | 2019/02/18 18:56 |
| S478 | 92996 | a01b 12/006 | US-PGPUB; USPAT; EPO; JPO; DERWENT | OR | OFF | 2019/02/18 18:56 |
| S479 | 0 | (a24f47/008).IPCR. | US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT | OR | OFF | 2019/02/18 18:56 |
| S480 | 0 | (a24f047/008).IPCR. | US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT | OR | OFF | 2019/02/18 18:56 |
| S481 | 0 | (a24f047/008).IPCR. | US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT | OR | OFF | 2019/02/18 18:56 |
| S482 | 0 | (a24f47/08).IPCR. | US-PGPUB; | OR | OFF | 2019/02/18 18:56 |

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| | | | USPAT; USOCR; EPO; JPO; DERWENT | | | |
| S483 | 9559 | (B60H1/22).IPCR. | US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT | OR | OFF | 2019/02/18 18:56 |
| S484 | 0 | (A24F47/08).IPCR. | US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT | OR | OFF | 2019/02/18 18:56 |
| S485 | 0 | (A24F47/10).IPCR. | US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT | OR | OFF | 2019/02/18 18:56 |
| S486 | 7167 | (f24h3/00).IPCR. | US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT | OR | OFF | 2019/02/18 18:56 |
| S487 | 17594 | (a24f47/00).IPCR. | US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT | OR | OFF | 2019/02/18 18:56 |
| S488 | 15977 | (a61m15/00).IPCR. | US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT | OR | OFF | 2019/02/18 18:56 |
| S489 | 100 | S488 and "392"/$.ccls. | US-PGPUB; USPAT; EPO; JPO; DERWENT | OR | OFF | 2019/02/18 18:56 |
| S490 | 12 | S489 and breath | US-PGPUB; USPAT; EPO; JPO; DERWENT | OR | OFF | 2019/02/18 18:56 |
| S491 | 17 | S489 and generator | US-PGPUB; USPAT; EPO; JPO; DERWENT | OR | OFF | 2019/02/18 18:56 |
| S492 | 50 | ("20050016550" \| "20060196518" \| "20110011396" \| "20110192399" \| "20110277757" \| "20110277760" \| "3200819" \| "4284089" \| "4945929" \| "4966171" \| "4969476" \| "5050621" \| | US-PGPUB; USPAT; EPO; JPO; DERWENT | OR | OFF | 2019/02/18 18:56 |

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| | | "5115820" \| "5249586" \| "5865185" \| "7412259" \| "7726320" \| "8156944").PN. | | | | |
| S493 | 6 | S492 and generator | US-PGPUB; USPAT; EPO; JPO; DERWENT | OR | OFF | 2019/02/18 18:56 |
| S494 | 2 | ("2008/0303286").URPN. | USPAT | OR | OFF | 2019/02/18 18:56 |
| S495 | 2 | ("2008/0303286").URPN. | USPAT | OR | OFF | 2019/02/18 18:56 |
| S496 | 0 | miniature adj turbine same electrical adj generator | US-PGPUB; USPAT; EPO; JPO; DERWENT | OR | OFF | 2019/02/18 18:56 |
| S497 | 700 | vaporizer and photovoltaic | US-PGPUB; USPAT; EPO; JPO; DERWENT | OR | OFF | 2019/02/18 18:56 |
| S498 | 71 | e-cigarette and solar | US-PGPUB; USPAT; EPO; JPO; DERWENT | OR | OFF | 2019/02/18 18:56 |
| S499 | 1314 | e-cigarette | US-PGPUB; USPAT; EPO; JPO; DERWENT | OR | OFF | 2019/02/18 18:56 |
| S500 | 83 | ("3200819" \| "20100031968" \| "8156944" \| "20080230052" \| "20100037903" \| "20100242974" \| "D590988" \| "D590990" \| "7412259" \| "20050016550" \| "7832410" \| "D613903" \| "20080257367" \| "20100200006" \| "20110011396" \| "20110277757" \| "7726320" \| "3200819" \| "20080257367" \| "20080092912" \| "20080230052" \| "20100200008" \| "5050621" \| "20060196518" \| "20080092912" \| "20100200008" \| "D590991" \| "20090272379" \| "7726320" \| "20070267031" \| "20100200006" \| "D613904" \| "4969476" \| "20110192399" \| "20050016550" \| "20060196518" \| "20080276947" \| "20090095311" \| "20090126745" \| "D590989" \| "20100242974" \| "5249586" \| "5865185" \| "20080247892" \| "20100031968" \| "20080276947" \| "20110277760" \| "4284089" \| "4945929" \| "4966171" \| "5115820").PN. | US-PGPUB; USPAT; EPO; JPO; DERWENT | OR | OFF | 2019/02/18 18:56 |
| S501 | 33 | ("20070267031" \| "20080092912" \| "20080230052" \| "20080247892" \| "20080257367" \| "20080276947" \| "20090095311" \| "20090126745" \| "20100031968" \| "20100037903" \| "20100200006" \| "20100200008" \| | US-PGPUB; USPAT; EPO; JPO; DERWENT | OR | OFF | 2019/02/18 18:56 |

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| | | "20100242974" \| "7832410" \| "D590988" \| "D590989" \| "D590990" \| "D590991" \| "D613903" \| "D613904").PN. | | | | |
| S502 | 4 | "12843917" | US-PGPUB; USPAT; EPO; JPO; DERWENT | OR | OFF | 2019/02/18 18:56 |
| S503 | 4 | "12843917" | US-PGPUB; USPAT; EPO; JPO; DERWENT | OR | OFF | 2019/02/18 18:56 |
| S504 | 3 | "20090272379" | US-PGPUB; USPAT; EPO; JPO; DERWENT | OR | OFF | 2019/02/18 18:56 |
| S505 | 6117 | cigarette and generator | US-PGPUB; USPAT; EPO; JPO; DERWENT | OR | OFF | 2019/02/18 18:56 |
| S506 | 5386 | vaporizer and generator | US-PGPUB; USPAT; EPO; JPO; DERWENT | OR | OFF | 2019/02/18 18:56 |
| S507 | 200 | S505 and S506 | US-PGPUB; USPAT; EPO; JPO; DERWENT | OR | OFF | 2019/02/18 18:56 |
| S508 | 1870 | generator same breath | US-PGPUB; USPAT; EPO; JPO; DERWENT | OR | OFF | 2019/02/18 18:56 |
| S509 | 6 | electrical adj generator same breath | US-PGPUB; USPAT; EPO; JPO; DERWENT | OR | OFF | 2019/02/18 18:56 |
| S510 | 19 | miniature adj electrical adj generator | US-PGPUB; USPAT; EPO; JPO; DERWENT | OR | OFF | 2019/02/18 18:56 |
| S511 | 2 | ("2008/0303286").URPN. | USPAT | OR | OFF | 2019/02/18 18:56 |
| S512 | 2 | ("2008/0303286").URPN. | USPAT | OR | OFF | 2019/02/18 18:56 |
| S513 | 9 | miniature adj turbine and electrical adj generator | US-PGPUB; USPAT; EPO; JPO; DERWENT | OR | OFF | 2019/02/18 18:56 |
| S514 | 0 | miniature adj turbine same electrical adj generator | US-PGPUB; | OR | OFF | 2019/02/18 18:56 |

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| | | | USPAT; EPO; JPO; DERWENT | | | |
| S515 | 700 | vaporizer and photovoltaic | US-PGPUB; USPAT; EPO; JPO; DERWENT | OR | OFF | 2019/02/18 18:56 |
| S516 | 152 | "392"/$.ccls. and photovoltaic | US-PGPUB; USPAT; EPO; JPO; DERWENT | OR | OFF | 2019/02/18 18:56 |
| S517 | 4 | "392"/$.ccls. and photovoltaic and cigarette | US-PGPUB; USPAT; EPO; JPO; DERWENT | OR | OFF | 2019/02/18 18:56 |
| S518 | 71 | e-cigarette and solar | US-PGPUB; USPAT; EPO; JPO; DERWENT | OR | OFF | 2019/02/18 18:56 |
| S519 | 1314 | e-cigarette | US-PGPUB; USPAT; EPO; JPO; DERWENT | OR | OFF | 2019/02/18 18:56 |
| S520 | 6 | e-cigarette and photovoltaic | US-PGPUB; USPAT; EPO; JPO; DERWENT | OR | OFF | 2019/02/18 18:56 |
| S521 | 129 | e-cigarette and photo | US-PGPUB; USPAT; EPO; JPO; DERWENT | OR | OFF | 2019/02/18 18:56 |
| S522 | 38924 | vaporizer or (air adj freshener) and solar | US-PGPUB; USPAT; EPO; JPO; DERWENT | OR | OFF | 2019/02/18 18:56 |
| S523 | 38924 | vaporizer or ((air adj freshener) and solar) | US-PGPUB; USPAT; EPO; JPO; DERWENT | OR | OFF | 2019/02/18 18:56 |
| S524 | 2105 | (vaporizer or (air adj freshener)) and solar | US-PGPUB; USPAT; EPO; JPO; DERWENT | OR | OFF | 2019/02/18 18:56 |
| S525 | 306 | (vaporizer or (air adj freshener)) and solar and photovoltaic | US-PGPUB; USPAT; EPO; JPO; DERWENT | OR | OFF | 2019/02/18 18:56 |
| S526 | 4 | ("2013/0309102").URPN. | USPAT | OR | OFF | 2019/02/18 18:56 |

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|---|---|---|---|---|---|---|
| S527 | 92996 | a01b 12/006 | US-PGPUB; USPAT; EPO; JPO; DERWENT | OR | OFF | 2019/02/18 18:56 |
| S528 | 0 | (a24f47/008).IPCR. | US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT | OR | OFF | 2019/02/18 18:56 |
| S529 | 0 | (a24f047/008).IPCR. | US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT | OR | OFF | 2019/02/18 18:56 |
| S530 | 0 | (a24f047/008).IPCR. | US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT | OR | OFF | 2019/02/18 18:56 |
| S531 | 0 | (a24f47/08).IPCR. | US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT | OR | OFF | 2019/02/18 18:56 |
| S532 | 9559 | (B60H1/22).IPCR. | US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT | OR | OFF | 2019/02/18 18:56 |
| S533 | 0 | (A24F47/08).IPCR. | US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT | OR | OFF | 2019/02/18 18:56 |
| S534 | 0 | (A24F47/10).IPCR. | US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT | OR | OFF | 2019/02/18 18:56 |
| S535 | 7167 | (f24h3/00).IPCR. | US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT | OR | OFF | 2019/02/18 18:56 |
| S536 | 17594 | (a24f47/00).IPCR. | US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT | OR | OFF | 2019/02/18 18:56 |
| S537 | 15977 | (a61m15/00).IPCR. | US- | OR | OFF | 2019/02/18 |

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| | | | PGPUB; USPAT; USOCR; EPO; JPO; DERWENT | | | 18:56 |
| S538 | 100 | S537 and "392"/$.ccls. | US-PGPUB; USPAT; EPO; JPO; DERWENT | OR | OFF | 2019/02/18 18:56 |
| S539 | 12 | S538 and breath | US-PGPUB; USPAT; EPO; JPO; DERWENT | OR | OFF | 2019/02/18 18:56 |
| S540 | 17 | S538 and generator | US-PGPUB; USPAT; EPO; JPO; DERWENT | OR | OFF | 2019/02/18 18:56 |
| S541 | 50 | ("20050016550" \| "20060196518" \| "20110011396" \| "20110192399" \| "20110277757" \| "20110277760" \| "3200819" \| "4284089" \| "4945929" \| "4966171" \| "4969476" \| "5050621" \| "5115820" \| "5249586" \| "5865185" \| "7412259" \| "7726320" \| "8156944").PN. | US-PGPUB; USPAT; EPO; JPO; DERWENT | OR | OFF | 2019/02/18 18:56 |
| S542 | 6 | S541 and generator | US-PGPUB; USPAT; EPO; JPO; DERWENT | OR | OFF | 2019/02/18 18:56 |
| S543 | 2 | ("2008/0303286").URPN. | USPAT | OR | OFF | 2019/02/18 18:56 |
| S544 | 2 | ("2008/0303286").URPN. | USPAT | OR | OFF | 2019/02/18 18:56 |
| S545 | 0 | miniature adj turbine same electrical adj generator | US-PGPUB; USPAT; EPO; JPO; DERWENT | OR | OFF | 2019/02/18 18:56 |
| S546 | 700 | vaporizer and photovoltaic | US-PGPUB; USPAT; EPO; JPO; DERWENT | OR | OFF | 2019/02/18 18:56 |
| S547 | 71 | e-cigarette and solar | US-PGPUB; USPAT; EPO; JPO; DERWENT | OR | OFF | 2019/02/18 18:56 |
| S548 | 1314 | e-cigarette | US-PGPUB; USPAT; EPO; JPO; DERWENT | OR | OFF | 2019/02/18 18:56 |
| S549 | 4 | "13594813" | US-PGPUB; USPAT; | OR | OFF | 2019/02/18 18:56 |

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| | | | EPO; JPO; DERWENT | | | |
| S550 | 33 | ("20070267031" \| "20080092912" \| "20080230052" \| "20080247892" \| "20080257367" \| "20080276947" \| "20090095311" \| "20090126745" \| "20100031968" \| "20100037903" \| "20100200006" \| "20100200008" \| "20100242974" \| "7832410" \| "D590988" \| "D590989" \| "D590990" \| "D590991" \| "D613903" \| "D613904").PN. | US-PGPUB; USPAT; EPO; JPO; DERWENT | OR | OFF | 2019/02/18 18:56 |
| S551 | 4 | "12843917" | US-PGPUB; USPAT; EPO; JPO; DERWENT | OR | OFF | 2019/02/18 18:56 |
| S552 | 4 | "12843917" | US-PGPUB; USPAT; EPO; JPO; DERWENT | OR | OFF | 2019/02/18 18:56 |
| S553 | 3 | "20090272379" | US-PGPUB; USPAT; EPO; JPO; DERWENT | OR | OFF | 2019/02/18 18:56 |
| S554 | 6117 | cigarette and generator | US-PGPUB; USPAT; EPO; JPO; DERWENT | OR | OFF | 2019/02/18 18:56 |
| S555 | 5386 | vaporizer and generator | US-PGPUB; USPAT; EPO; JPO; DERWENT | OR | OFF | 2019/02/18 18:56 |
| S556 | 200 | S554 and S555 | US-PGPUB; USPAT; EPO; JPO; DERWENT | OR | OFF | 2019/02/18 18:56 |
| S557 | 1870 | generator same breath | US-PGPUB; USPAT; EPO; JPO; DERWENT | OR | OFF | 2019/02/18 18:56 |
| S558 | 6 | electrical adj generator same breath | US-PGPUB; USPAT; EPO; JPO; DERWENT | OR | OFF | 2019/02/18 18:56 |
| S559 | 19 | miniature adj electrical adj generator | US-PGPUB; USPAT; EPO; JPO; DERWENT | OR | OFF | 2019/02/18 18:56 |
| S560 | 2 | ("2008/0303286").URPN. | USPAT | OR | OFF | 2019/02/18 18:56 |
| S561 | 2 | ("2008/0303286").URPN. | USPAT | OR | OFF | 2019/02/18 18:56 |

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| S562 | 9 | miniature adj turbine and electrical adj generator | US-PGPUB; USPAT; EPO; JPO; DERWENT | OR | OFF | 2019/02/18 18:56 |
| S563 | 0 | miniature adj turbine same electrical adj generator | US-PGPUB; USPAT; EPO; JPO; DERWENT | OR | OFF | 2019/02/18 18:56 |
| S564 | 700 | vaporizer and photovoltaic | US-PGPUB; USPAT; EPO; JPO; DERWENT | OR | OFF | 2019/02/18 18:56 |
| S565 | 152 | "392"/$.ccls. and photovoltaic | US-PGPUB; USPAT; EPO; JPO; DERWENT | OR | OFF | 2019/02/18 18:56 |
| S566 | 4 | "392"/$.ccls. and photovoltaic and cigarette | US-PGPUB; USPAT; EPO; JPO; DERWENT | OR | OFF | 2019/02/18 18:56 |
| S567 | 71 | e-cigarette and solar | US-PGPUB; USPAT; EPO; JPO; DERWENT | OR | OFF | 2019/02/18 18:56 |
| S568 | 1314 | e-cigarette | US-PGPUB; USPAT; EPO; JPO; DERWENT | OR | OFF | 2019/02/18 18:56 |
| S569 | 6 | e-cigarette and photovoltaic | US-PGPUB; USPAT; EPO; JPO; DERWENT | OR | OFF | 2019/02/18 18:56 |
| S570 | 129 | e-cigarette and photo | US-PGPUB; USPAT; EPO; JPO; DERWENT | OR | OFF | 2019/02/18 18:56 |
| S571 | 38924 | vaporizer or (air adj freshener) and solar | US-PGPUB; USPAT; EPO; JPO; DERWENT | OR | OFF | 2019/02/18 18:56 |
| S572 | 38924 | vaporizer or ((air adj freshener) and solar) | US-PGPUB; USPAT; EPO; JPO; DERWENT | OR | OFF | 2019/02/18 18:56 |
| S573 | 2105 | (vaporizer or (air adj freshener)) and solar | US-PGPUB; USPAT; EPO; JPO; DERWENT | OR | OFF | 2019/02/18 18:56 |

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| S574 | 306 | (vaporizer or (air adj freshener)) and solar and photovoltaic | US-PGPUB; USPAT; EPO; JPO; DERWENT | OR | OFF | 2019/02/18 18:56 |
| S575 | 4 | ("2013/0309102").URPN. | USPAT | OR | OFF | 2019/02/18 18:56 |
| S576 | 92996 | a01b 12/006 | US-PGPUB; USPAT; EPO; JPO; DERWENT | OR | OFF | 2019/02/18 18:56 |
| S577 | 0 | (a24f47/008).IPCR. | US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT | OR | OFF | 2019/02/18 18:56 |
| S578 | 0 | (a24f047/008).IPCR. | US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT | OR | OFF | 2019/02/18 18:56 |
| S579 | 0 | (a24f047/008).IPCR. | US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT | OR | OFF | 2019/02/18 18:56 |
| S580 | 0 | (a24f47/08).IPCR. | US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT | OR | OFF | 2019/02/18 18:56 |
| S581 | 9559 | (B60H1/22).IPCR. | US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT | OR | OFF | 2019/02/18 18:56 |
| S582 | 0 | (A24F47/08).IPCR. | US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT | OR | OFF | 2019/02/18 18:56 |
| S583 | 0 | (A24F47/10).IPCR. | US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT | OR | OFF | 2019/02/18 18:56 |
| S584 | 7167 | (f24h3/00).IPCR. | US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT | OR | OFF | 2019/02/18 18:56 |

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| S585 | 17594 | (a24f47/00).IPCR. | US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT | OR | OFF | 2019/02/18 18:56 |
| S586 | 15977 | (a61m15/00).IPCR. | US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT | OR | OFF | 2019/02/18 18:56 |
| S587 | 100 | S586 and "392"/$.ccls. | US-PGPUB; USPAT; EPO; JPO; DERWENT | OR | OFF | 2019/02/18 18:56 |
| S588 | 12 | S587 and breath | US-PGPUB; USPAT; EPO; JPO; DERWENT | OR | OFF | 2019/02/18 18:56 |
| S589 | 17 | S587 and generator | US-PGPUB; USPAT; EPO; JPO; DERWENT | OR | OFF | 2019/02/18 18:56 |
| S590 | 50 | ("20050016550" \| "20060196518" \| "20110011396" \| "20110192399" \| "20110277757" \| "20110277760" \| "3200819" \| "4284089" \| "4945929" \| "4966171" \| "4969476" \| "5050621" \| "5115820" \| "5249586" \| "5865185" \| "7412259" \| "7726320" \| "8156944").PN. | US-PGPUB; USPAT; EPO; JPO; DERWENT | OR | OFF | 2019/02/18 18:56 |
| S591 | 6 | S590 and generator | US-PGPUB; USPAT; EPO; JPO; DERWENT | OR | OFF | 2019/02/18 18:56 |
| S592 | 2 | ("2008/0303286").URPN. | USPAT | OR | OFF | 2019/02/18 18:56 |
| S593 | 2 | ("2008/0303286").URPN. | USPAT | OR | OFF | 2019/02/18 18:56 |
| S594 | 0 | miniature adj turbine same electrical adj generator | US-PGPUB; USPAT; EPO; JPO; DERWENT | OR | OFF | 2019/02/18 18:56 |
| S595 | 700 | vaporizer and photovoltaic | US-PGPUB; USPAT; EPO; JPO; DERWENT | OR | OFF | 2019/02/18 18:56 |
| S596 | 71 | e-cigarette and solar | US-PGPUB; USPAT; EPO; JPO; DERWENT | OR | OFF | 2019/02/18 18:56 |
| S597 | 1314 | e-cigarette | US- | OR | OFF | 2019/02/18 |

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| | | | PGPUB; USPAT; EPO; JPO; DERWENT | | | 18:56 |
| S598 | 83 | ("3200819" \| "20100031968" \| "8156944" \| "20080230052" \| "20100037903" \| "20100242974" \| "D590988" \| "D590990" \| "7412259" \| "20050016550" \| "7832410" \| "D613903" \| "20080257367" \| "20100200006" \| "20110011396" \| "20110277757" \| "7726320" \| "3200819" \| "20080257367" \| "20080092912" \| "20080230052" \| "20100200008" \| "5050621" \| "20060196518" \| "20080092912" \| "20100200008" \| "D590991" \| "20090272379" \| "7726320" \| "20070267031" \| "20100200006" \| "D613904" \| "4969476" \| "20110192399" \| "20050016550" \| "20060196518" \| "20080276947" \| "20090095311" \| "20090126745" \| "D590989" \| "20100242974" \| "5249586" \| "5865185" \| "20080247892" \| "20100031968" \| "20080276947" \| "20110277760" \| "4284089" \| "4945929" \| "4966171" \| "5115820").PN. | US-PGPUB; USPAT; EPO; JPO; DERWENT | OR | OFF | 2019/02/18 18:56 |
| S599 | 3 | "20090272379" | US-PGPUB; USPAT; EPO; JPO; DERWENT | OR | OFF | 2019/02/18 18:56 |
| S600 | 33 | ("20070267031" \| "20080092912" \| "20080230052" \| "20080247892" \| "20080257367" \| "20080276947" \| "20090095311" \| "20090126745" \| "20100031968" \| "20100037903" \| "20100200006" \| "20100200008" \| "20100242974" \| "7832410" \| "D590988" \| "D590989" \| "D590990" \| "D590991" \| "D613903" \| "D613904").PN. | US-PGPUB; USPAT; EPO; JPO; DERWENT | OR | OFF | 2019/02/18 18:56 |
| S601 | 4 | "12843917" | US-PGPUB; USPAT; EPO; JPO; DERWENT | OR | OFF | 2019/02/18 18:56 |
| S602 | 4 | "12843917" | US-PGPUB; USPAT; EPO; JPO; DERWENT | OR | OFF | 2019/02/18 18:56 |
| S603 | 3 | "20090272379" | US-PGPUB; USPAT; EPO; JPO; DERWENT | OR | OFF | 2019/02/18 18:56 |
| S604 | 6117 | cigarette and generator | US-PGPUB; USPAT; EPO; JPO; DERWENT | OR | OFF | 2019/02/18 18:56 |
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| S605 | 5386 | vaporizer and generator | US-PGPUB; USPAT; EPO; JPO; DERWENT | OR | OFF | 2019/02/18 18:56 |
| S606 | 200 | S604 and S605 | US-PGPUB; USPAT; EPO; JPO; DERWENT | OR | OFF | 2019/02/18 18:56 |
| S607 | 1870 | generator same breath | US-PGPUB; USPAT; EPO; JPO; DERWENT | OR | OFF | 2019/02/18 18:56 |
| S608 | 6 | electrical adj generator same breath | US-PGPUB; USPAT; EPO; JPO; DERWENT | OR | OFF | 2019/02/18 18:56 |
| S609 | 19 | miniature adj electrical adj generator | US-PGPUB; USPAT; EPO; JPO; DERWENT | OR | OFF | 2019/02/18 18:56 |
| S610 | 2 | ("2008/0303286").URPN. | USPAT | OR | OFF | 2019/02/18 18:56 |
| S611 | 2 | ("2008/0303286").URPN. | USPAT | OR | OFF | 2019/02/18 18:56 |
| S612 | 9 | miniature adj turbine and electrical adj generator | US-PGPUB; USPAT; EPO; JPO; DERWENT | OR | OFF | 2019/02/18 18:56 |
| S613 | 0 | miniature adj turbine same electrical adj generator | US-PGPUB; USPAT; EPO; JPO; DERWENT | OR | OFF | 2019/02/18 18:56 |
| S614 | 700 | vaporizer and photovoltaic | US-PGPUB; USPAT; EPO; JPO; DERWENT | OR | OFF | 2019/02/18 18:56 |
| S615 | 152 | "392"/$.ccls. and photovoltaic | US-PGPUB; USPAT; EPO; JPO; DERWENT | OR | OFF | 2019/02/18 18:56 |
| S616 | 4 | "392"/$.ccls. and photovoltaic and cigarette | US-PGPUB; USPAT; EPO; JPO; DERWENT | OR | OFF | 2019/02/18 18:56 |
| S617 | 71 | e-cigarette and solar | US-PGPUB; USPAT; EPO; JPO; DERWENT | OR | OFF | 2019/02/18 18:56 |

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| S618 | 1314 | e-cigarette | US-PGPUB; USPAT; EPO; JPO; DERWENT | OR | OFF | 2019/02/18 18:56 |
| S619 | 6 | e-cigarette and photovoltaic | US-PGPUB; USPAT; EPO; JPO; DERWENT | OR | OFF | 2019/02/18 18:56 |
| S620 | 129 | e-cigarette and photo | US-PGPUB; USPAT; EPO; JPO; DERWENT | OR | OFF | 2019/02/18 18:56 |
| S621 | 38924 | vaporizer or (air adj freshener) and solar | US-PGPUB; USPAT; EPO; JPO; DERWENT | OR | OFF | 2019/02/18 18:56 |
| S622 | 38924 | vaporizer or ((air adj freshener) and solar) | US-PGPUB; USPAT; EPO; JPO; DERWENT | OR | OFF | 2019/02/18 18:56 |
| S623 | 2105 | (vaporizer or (air adj freshener)) and solar | US-PGPUB; USPAT; EPO; JPO; DERWENT | OR | OFF | 2019/02/18 18:56 |
| S624 | 306 | (vaporizer or (air adj freshener)) and solar and photovoltaic | US-PGPUB; USPAT; EPO; JPO; DERWENT | OR | OFF | 2019/02/18 18:56 |
| S625 | 4 | ("2013/0309102").URPN. | USPAT | OR | OFF | 2019/02/18 18:56 |
| S626 | 92996 | a01b 12/006 | US-PGPUB; USPAT; EPO; JPO; DERWENT | OR | OFF | 2019/02/18 18:56 |
| S627 | 0 | (a24f47/008).IPCR. | US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT | OR | OFF | 2019/02/18 18:56 |
| S628 | 0 | (a24f047/008).IPCR. | US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT | OR | OFF | 2019/02/18 18:56 |
| S629 | 0 | (a24f047/008).IPCR. | US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT | OR | OFF | 2019/02/18 18:56 |

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| S630 | 0 | (a24f47/08).IPCR. | US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT | OR | OFF | 2019/02/18 18:56 |
| S631 | 9559 | (B60H1/22).IPCR. | US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT | OR | OFF | 2019/02/18 18:56 |
| S632 | 0 | (A24F47/08).IPCR. | US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT | OR | OFF | 2019/02/18 18:56 |
| S633 | 0 | (A24F47/10).IPCR. | US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT | OR | OFF | 2019/02/18 18:56 |
| S634 | 7167 | (f24h3/00).IPCR. | US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT | OR | OFF | 2019/02/18 18:56 |
| S635 | 17594 | (a24f47/00).IPCR. | US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT | OR | OFF | 2019/02/18 18:56 |
| S636 | 15977 | (a61m15/00).IPCR. | US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT | OR | OFF | 2019/02/18 18:56 |
| S637 | 100 | S636 and "392"/$.ccls. | US-PGPUB; USPAT; EPO; JPO; DERWENT | OR | OFF | 2019/02/18 18:56 |
| S638 | 12 | S637 and breath | US-PGPUB; USPAT; EPO; JPO; DERWENT | OR | OFF | 2019/02/18 18:56 |
| S639 | 17 | S637 and generator | US-PGPUB; USPAT; EPO; JPO; DERWENT | OR | OFF | 2019/02/18 18:56 |
| S640 | 50 | ("20050016550" \| "20060196518" \| "20110011396" \| "20110192399" \| "20110277757" \| "20110277760" \| | US-PGPUB; USPAT; | OR | OFF | 2019/02/18 18:56 |

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|---|---|---|---|---|---|---|
| | | "3200819" \| "4284089" \| "4945929" \| "4966171" \| "4969476" \| "5050621" \| "5115820" \| "5249586" \| "5865185" \| "7412259" \| "7726320" \| "8156944").PN. | EPO; JPO; DERWENT | | | |
| S641 | 6 | S640 and generator | US-PGPUB; USPAT; EPO; JPO; DERWENT | OR | OFF | 2019/02/18 18:56 |
| S642 | 2 | ("2008/0303286").URPN. | USPAT | OR | OFF | 2019/02/18 18:56 |
| S643 | 2 | ("2008/0303286").URPN. | USPAT | OR | OFF | 2019/02/18 18:56 |
| S644 | 0 | miniature adj turbine same electrical adj generator | US-PGPUB; USPAT; EPO; JPO; DERWENT | OR | OFF | 2019/02/18 18:56 |
| S645 | 700 | vaporizer and photovoltaic | US-PGPUB; USPAT; EPO; JPO; DERWENT | OR | OFF | 2019/02/18 18:56 |
| S646 | 71 | e-cigarette and solar | US-PGPUB; USPAT; EPO; JPO; DERWENT | OR | OFF | 2019/02/18 18:56 |
| S647 | 1314 | e-cigarette | US-PGPUB; USPAT; EPO; JPO; DERWENT | OR | OFF | 2019/02/18 18:56 |
| S648 | 4 | "13594813" | US-PGPUB; USPAT; EPO; JPO; DERWENT | OR | OFF | 2019/02/18 18:56 |
| S649 | 33 | ("20070267031" \| "20080092912" \| "20080230052" \| "20080247892" \| "20080257367" \| "20080276947" \| "20090095311" \| "20090126745" \| "20100031968" \| "20100037903" \| "20100200006" \| "20100200008" \| "20100242974" \| "7832410" \| "D590988" \| "D590989" \| "D590990" \| "D590991" \| "D613903" \| "D613904").PN. | US-PGPUB; USPAT; EPO; JPO; DERWENT | OR | OFF | 2019/02/18 18:56 |
| S650 | 4 | "12843917" | US-PGPUB; USPAT; EPO; JPO; DERWENT | OR | OFF | 2019/02/18 18:56 |
| S651 | 4 | "12843917" | US-PGPUB; USPAT; EPO; JPO; DERWENT | OR | OFF | 2019/02/18 18:57 |
| S652 | 3 | "20090272379" | US-PGPUB; | OR | OFF | 2019/02/18 18:57 |

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| | | | USPAT; EPO; JPO; DERWENT | | | |
| S653 | 6117 | cigarette and generator | US-PGPUB; USPAT; EPO; JPO; DERWENT | OR | OFF | 2019/02/18 18:57 |
| S654 | 5386 | vaporizer and generator | US-PGPUB; USPAT; EPO; JPO; DERWENT | OR | OFF | 2019/02/18 18:57 |
| S655 | 200 | S653 and S654 | US-PGPUB; USPAT; EPO; JPO; DERWENT | OR | OFF | 2019/02/18 18:57 |
| S656 | 1870 | generator same breath | US-PGPUB; USPAT; EPO; JPO; DERWENT | OR | OFF | 2019/02/18 18:57 |
| S657 | 6 | electrical adj generator same breath | US-PGPUB; USPAT; EPO; JPO; DERWENT | OR | OFF | 2019/02/18 18:57 |
| S658 | 19 | miniature adj electrical adj generator | US-PGPUB; USPAT; EPO; JPO; DERWENT | OR | OFF | 2019/02/18 18:57 |
| S659 | 2 | ("2008/0303286").URPN. | USPAT | OR | OFF | 2019/02/18 18:57 |
| S660 | 2 | ("2008/0303286").URPN. | USPAT | OR | OFF | 2019/02/18 18:57 |
| S661 | 9 | miniature adj turbine and electrical adj generator | US-PGPUB; USPAT; EPO; JPO; DERWENT | OR | OFF | 2019/02/18 18:57 |
| S662 | 0 | miniature adj turbine same electrical adj generator | US-PGPUB; USPAT; EPO; JPO; DERWENT | OR | OFF | 2019/02/18 18:57 |
| S663 | 700 | vaporizer and photovoltaic | US-PGPUB; USPAT; EPO; JPO; DERWENT | OR | OFF | 2019/02/18 18:57 |
| S664 | 152 | "392"/$.ccls. and photovoltaic | US-PGPUB; USPAT; EPO; JPO; DERWENT | OR | OFF | 2019/02/18 18:57 |
| S665 | 4 | "392"/$.ccls. and photovoltaic and cigarette | US-PGPUB; | OR | OFF | 2019/02/18 18:57 |

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| | | | USPAT; EPO; JPO; DERWENT | | | |
| S666 | 71 | e-cigarette and solar | US-PGPUB; USPAT; EPO; JPO; DERWENT | OR | OFF | 2019/02/18 18:57 |
| S667 | 1314 | e-cigarette | US-PGPUB; USPAT; EPO; JPO; DERWENT | OR | OFF | 2019/02/18 18:57 |
| S668 | 6 | e-cigarette and photovoltaic | US-PGPUB; USPAT; EPO; JPO; DERWENT | OR | OFF | 2019/02/18 18:57 |
| S669 | 129 | e-cigarette and photo | US-PGPUB; USPAT; EPO; JPO; DERWENT | OR | OFF | 2019/02/18 18:57 |
| S670 | 38924 | vaporizer or (air adj freshener) and solar | US-PGPUB; USPAT; EPO; JPO; DERWENT | OR | OFF | 2019/02/18 18:57 |
| S671 | 38924 | vaporizer or ((air adj freshener) and solar) | US-PGPUB; USPAT; EPO; JPO; DERWENT | OR | OFF | 2019/02/18 18:57 |
| S672 | 2105 | (vaporizer or (air adj freshener)) and solar | US-PGPUB; USPAT; EPO; JPO; DERWENT | OR | OFF | 2019/02/18 18:57 |
| S673 | 306 | (vaporizer or (air adj freshener)) and solar and photovoltaic | US-PGPUB; USPAT; EPO; JPO; DERWENT | OR | OFF | 2019/02/18 18:57 |
| S674 | 4 | ("2013/0309102").URPN. | USPAT | OR | OFF | 2019/02/18 18:57 |
| S675 | 92996 | a01b 12/006 | US-PGPUB; USPAT; EPO; JPO; DERWENT | OR | OFF | 2019/02/18 18:57 |
| S676 | 0 | (a24f47/008).IPCR. | US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT | OR | OFF | 2019/02/18 18:57 |
| S677 | 0 | (a24f047/008).IPCR. | US-PGPUB; USPAT; USOCR; | OR | OFF | 2019/02/18 18:57 |

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|---|---|---|---|---|---|---|
| | | | EPO; JPO; DERWENT | | | |
| S678 | 0 | (a24f047/008).IPCR. | US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT | OR | OFF | 2019/02/18 18:57 |
| S679 | 0 | (a24f47/08).IPCR. | US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT | OR | OFF | 2019/02/18 18:57 |
| S680 | 9559 | (B60H1/22).IPCR. | US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT | OR | OFF | 2019/02/18 18:57 |
| S681 | 0 | (A24F47/08).IPCR. | US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT | OR | OFF | 2019/02/18 18:57 |
| S682 | 0 | (A24F47/10).IPCR. | US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT | OR | OFF | 2019/02/18 18:57 |
| S683 | 7167 | (f24h3/00).IPCR. | US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT | OR | OFF | 2019/02/18 18:57 |
| S684 | 17594 | (a24f47/00).IPCR. | US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT | OR | OFF | 2019/02/18 18:57 |
| S685 | 15977 | (a61m15/00).IPCR. | US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT | OR | OFF | 2019/02/18 18:57 |
| S686 | 100 | S685 and "392"/$.ccls. | US-PGPUB; USPAT; EPO; JPO; DERWENT | OR | OFF | 2019/02/18 18:57 |
| S687 | 12 | S686 and breath | US-PGPUB; USPAT; EPO; JPO; DERWENT | OR | OFF | 2019/02/18 18:57 |

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|---|---|---|---|---|---|---|
| S688 | 17 | S686 and generator | US-PGPUB; USPAT; EPO; JPO; DERWENT | OR | OFF | 2019/02/18 18:57 |
| S689 | 50 | ("20050016550" \| "20060196518" \| "20110011396" \| "20110192399" \| "20110277757" \| "20110277760" \| "3200819" \| "4284089" \| "4945929" \| "4966171" \| "4969476" \| "5050621" \| "5115820" \| "5249586" \| "5865185" \| "7412259" \| "7726320" \| "8156944").PN. | US-PGPUB; USPAT; EPO; JPO; DERWENT | OR | OFF | 2019/02/18 18:57 |
| S690 | 6 | S689 and generator | US-PGPUB; USPAT; EPO; JPO; DERWENT | OR | OFF | 2019/02/18 18:57 |
| S691 | 2 | ("2008/0303286").URPN. | USPAT | OR | OFF | 2019/02/18 18:57 |
| S692 | 2 | ("2008/0303286").URPN. | USPAT | OR | OFF | 2019/02/18 18:57 |
| S693 | 0 | miniature adj turbine same electrical adj generator | US-PGPUB; USPAT; EPO; JPO; DERWENT | OR | OFF | 2019/02/18 18:57 |
| S694 | 700 | vaporizer and photovoltaic | US-PGPUB; USPAT; EPO; JPO; DERWENT | OR | OFF | 2019/02/18 18:57 |
| S695 | 71 | e-cigarette and solar | US-PGPUB; USPAT; EPO; JPO; DERWENT | OR | OFF | 2019/02/18 18:57 |
| S696 | 1314 | e-cigarette | US-PGPUB; USPAT; EPO; JPO; DERWENT | OR | OFF | 2019/02/18 18:57 |
| S697 | 83 | ("3200819" \| "20100031968" \| "8156944" \| "20080230052" \| "20100037903" \| "20100242974" \| "D590988" \| "D590990" \| "7412259" \| "20050016550" \| "7832410" \| "D613903" \| "20080257367" \| "20100200006" \| "20110011396" \| "20110277757" \| "7726320" \| "3200819" \| "20080257367" \| "20080092912" \| "20080230052" \| "20100200008" \| "5050621" \| "20060196518" \| "20080092912" \| "20100200008" \| "D590991" \| "20090272379" \| "7726320" \| "20070267031" \| "20100200006" \| "D613904" \| "4969476" \| "20110192399" \| "20050016550" \| "20060196518" \| "20080276947" \| "20090095311" \| "20090126745" \| "D590989" \| "20100242974" \| "5249586" \| "5865185" | US-PGPUB; USPAT; EPO; JPO; DERWENT | OR | OFF | 2019/02/18 18:57 |

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|---|---|---|---|---|---|---|
| | | \| "20080247892" \| "20100031968" \| "20080276947" \| "20110277760" \| "4284089" \| "4945929" \| "4966171" \| "5115820").PN. | | | | |
| S698 | 33 | ("20070267031" \| "20080092912" \| "20080230052" \| "20080247892" \| "20080257367" \| "20080276947" \| "20090095311" \| "20090126745" \| "20100031968" \| "20100037903" \| "20100200006" \| "20100200008" \| "20100242974" \| "7832410" \| "D590988" \| "D590989" \| "D590990" \| "D590991" \| "D613903" \| "D613904").PN. | US-PGPUB; USPAT; EPO; JPO; DERWENT | OR | OFF | 2019/02/18 18:57 |
| S699 | 4 | "12843917" | US-PGPUB; USPAT; EPO; JPO; DERWENT | OR | OFF | 2019/02/18 18:57 |
| S700 | 4 | "12843917" | US-PGPUB; USPAT; EPO; JPO; DERWENT | OR | OFF | 2019/02/18 18:57 |
| S701 | 3 | "20090272379" | US-PGPUB; USPAT; EPO; JPO; DERWENT | OR | OFF | 2019/02/18 18:57 |
| S702 | 6117 | cigarette and generator | US-PGPUB; USPAT; EPO; JPO; DERWENT | OR | OFF | 2019/02/18 18:57 |
| S703 | 5386 | vaporizer and generator | US-PGPUB; USPAT; EPO; JPO; DERWENT | OR | OFF | 2019/02/18 18:57 |
| S704 | 200 | S702 and S703 | US-PGPUB; USPAT; EPO; JPO; DERWENT | OR | OFF | 2019/02/18 18:57 |
| S705 | 1870 | generator same breath | US-PGPUB; USPAT; EPO; JPO; DERWENT | OR | OFF | 2019/02/18 18:57 |
| S706 | 6 | electrical adj generator same breath | US-PGPUB; USPAT; EPO; JPO; DERWENT | OR | OFF | 2019/02/18 18:57 |
| S707 | 19 | miniature adj electrical adj generator | US-PGPUB; USPAT; EPO; JPO; DERWENT | OR | OFF | 2019/02/18 18:57 |
| S708 | 2 | ("2008/0303286").URPN. | USPAT | OR | OFF | 2019/02/18 18:57 |

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|---|---|---|---|---|---|---|
| S709 | 2 | ("2008/0303286").URPN. | USPAT | OR | OFF | 2019/02/18 18:57 |
| S710 | 9 | miniature adj turbine and electrical adj generator | US-PGPUB; USPAT; EPO; JPO; DERWENT | OR | OFF | 2019/02/18 18:57 |
| S711 | 0 | miniature adj turbine same electrical adj generator | US-PGPUB; USPAT; EPO; JPO; DERWENT | OR | OFF | 2019/02/18 18:57 |
| S712 | 700 | vaporizer and photovoltaic | US-PGPUB; USPAT; EPO; JPO; DERWENT | OR | OFF | 2019/02/18 18:57 |
| S713 | 152 | "392"/$.ccls. and photovoltaic | US-PGPUB; USPAT; EPO; JPO; DERWENT | OR | OFF | 2019/02/18 18:57 |
| S714 | 4 | "392"/$.ccls. and photovoltaic and cigarette | US-PGPUB; USPAT; EPO; JPO; DERWENT | OR | OFF | 2019/02/18 18:57 |
| S715 | 71 | e-cigarette and solar | US-PGPUB; USPAT; EPO; JPO; DERWENT | OR | OFF | 2019/02/18 18:57 |
| S716 | 1314 | e-cigarette | US-PGPUB; USPAT; EPO; JPO; DERWENT | OR | OFF | 2019/02/18 18:57 |
| S717 | 6 | e-cigarette and photovoltaic | US-PGPUB; USPAT; EPO; JPO; DERWENT | OR | OFF | 2019/02/18 18:57 |
| S718 | 129 | e-cigarette and photo | US-PGPUB; USPAT; EPO; JPO; DERWENT | OR | OFF | 2019/02/18 18:57 |
| S719 | 38924 | vaporizer or (air adj freshener) and solar | US-PGPUB; USPAT; EPO; JPO; DERWENT | OR | OFF | 2019/02/18 18:57 |
| S720 | 38924 | vaporizer or ((air adj freshener) and solar) | US-PGPUB; USPAT; EPO; JPO; DERWENT | OR | OFF | 2019/02/18 18:57 |
| S721 | 2105 | (vaporizer or (air adj freshener)) and solar | US-PGPUB; USPAT; | OR | OFF | 2019/02/18 18:57 |

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|---|---|---|---|---|---|---|
| | | | EPO; JPO; DERWENT | | | |
| S722 | 306 | (vaporizer or (air adj freshener)) and solar and photovoltaic | US-PGPUB; USPAT; EPO; JPO; DERWENT | OR | OFF | 2019/02/18 18:57 |
| S723 | 4 | ("2013/0309102").URPN. | USPAT | OR | OFF | 2019/02/18 18:57 |
| S724 | 92996 | a01b 12/006 | US-PGPUB; USPAT; EPO; JPO; DERWENT | OR | OFF | 2019/02/18 18:57 |
| S725 | 0 | (a24f47/008).IPCR. | US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT | OR | OFF | 2019/02/18 18:57 |
| S726 | 0 | (a24f047/008).IPCR. | US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT | OR | OFF | 2019/02/18 18:57 |
| S727 | 0 | (a24f047/008).IPCR. | US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT | OR | OFF | 2019/02/18 18:57 |
| S728 | 0 | (a24f47/08).IPCR. | US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT | OR | OFF | 2019/02/18 18:57 |
| S729 | 9559 | (B60H1/22).IPCR. | US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT | OR | OFF | 2019/02/18 18:57 |
| S730 | 0 | (A24F47/08).IPCR. | US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT | OR | OFF | 2019/02/18 18:57 |
| S731 | 0 | (A24F47/10).IPCR. | US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT | OR | OFF | 2019/02/18 18:57 |
| S732 | 7167 | (f24h3/00).IPCR. | US-PGPUB; USPAT; USOCR; | OR | OFF | 2019/02/18 18:57 |

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| | | | EPO; JPO; DERWENT | | | |
| S733 | 17594 | (a24f47/00).IPCR. | US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT | OR | OFF | 2019/02/18 18:57 |
| S734 | 15977 | (a61m15/00).IPCR. | US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT | OR | OFF | 2019/02/18 18:57 |
| S735 | 100 | S734 and "392"/$.ccls. | US-PGPUB; USPAT; EPO; JPO; DERWENT | OR | OFF | 2019/02/18 18:57 |
| S736 | 12 | S735 and breath | US-PGPUB; USPAT; EPO; JPO; DERWENT | OR | OFF | 2019/02/18 18:57 |
| S737 | 17 | S735 and generator | US-PGPUB; USPAT; EPO; JPO; DERWENT | OR | OFF | 2019/02/18 18:57 |
| S738 | 50 | ("20050016550" \| "20060196518" \| "20110011396" \| "20110192399" \| "20110277757" \| "20110277760" \| "3200819" \| "4284089" \| "4945929" \| "4966171" \| "4969476" \| "5050621" \| "5115820" \| "5249586" \| "5865185" \| "7412259" \| "7726320" \| "8156944").PN. | US-PGPUB; USPAT; EPO; JPO; DERWENT | OR | OFF | 2019/02/18 18:57 |
| S739 | 6 | S738 and generator | US-PGPUB; USPAT; EPO; JPO; DERWENT | OR | OFF | 2019/02/18 18:57 |
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| S741 | 2 | ("2008/0303286").URPN. | USPAT | OR | OFF | 2019/02/18 18:57 |
| S742 | 0 | miniature adj turbine same electrical adj generator | US-PGPUB; USPAT; EPO; JPO; DERWENT | OR | OFF | 2019/02/18 18:57 |
| S743 | 700 | vaporizer and photovoltaic | US-PGPUB; USPAT; EPO; JPO; DERWENT | OR | OFF | 2019/02/18 18:57 |
| S744 | 71 | e-cigarette and solar | US-PGPUB; USPAT; EPO; JPO; | OR | OFF | 2019/02/18 18:57 |

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| S745 | 1314 | e-cigarette | US-PGPUB; USPAT; EPO; JPO; DERWENT | OR | OFF | 2019/02/18 18:57 |
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| S749 | 4 | "12843917" | US-PGPUB; USPAT; EPO; JPO; DERWENT | OR | OFF | 2019/02/18 18:57 |
| S750 | 3 | "20090272379" | US-PGPUB; USPAT; EPO; JPO; DERWENT | OR | OFF | 2019/02/18 18:57 |
| S751 | 6117 | cigarette and generator | US-PGPUB; USPAT; EPO; JPO; DERWENT | OR | OFF | 2019/02/18 18:57 |
| S752 | 5386 | vaporizer and generator | US-PGPUB; USPAT; EPO; JPO; DERWENT | OR | OFF | 2019/02/18 18:57 |
| S753 | 200 | S751 and S752 | US-PGPUB; USPAT; EPO; JPO; DERWENT | OR | OFF | 2019/02/18 18:57 |
| S754 | 1870 | generator same breath | US-PGPUB; USPAT; EPO; JPO; DERWENT | OR | OFF | 2019/02/18 18:57 |
| S755 | 6 | electrical adj generator same breath | US-PGPUB; USPAT; EPO; JPO; DERWENT | OR | OFF | 2019/02/18 18:57 |

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| S756 | 19 | miniature adj electrical adj generator | US-PGPUB; USPAT; EPO; JPO; DERWENT | OR | OFF | 2019/02/18 18:57 |
| S757 | 2 | ("2008/0303286").URPN. | USPAT | OR | OFF | 2019/02/18 18:57 |
| S758 | 2 | ("2008/0303286").URPN. | USPAT | OR | OFF | 2019/02/18 18:57 |
| S759 | 9 | miniature adj turbine and electrical adj generator | US-PGPUB; USPAT; EPO; JPO; DERWENT | OR | OFF | 2019/02/18 18:57 |
| S760 | 0 | miniature adj turbine same electrical adj generator | US-PGPUB; USPAT; EPO; JPO; DERWENT | OR | OFF | 2019/02/18 18:57 |
| S761 | 700 | vaporizer and photovoltaic | US-PGPUB; USPAT; EPO; JPO; DERWENT | OR | OFF | 2019/02/18 18:57 |
| S762 | 152 | "392"/$.ccls. and photovoltaic | US-PGPUB; USPAT; EPO; JPO; DERWENT | OR | OFF | 2019/02/18 18:57 |
| S763 | 4 | "392"/$.ccls. and photovoltaic and cigarette | US-PGPUB; USPAT; EPO; JPO; DERWENT | OR | OFF | 2019/02/18 18:57 |
| S764 | 71 | e-cigarette and solar | US-PGPUB; USPAT; EPO; JPO; DERWENT | OR | OFF | 2019/02/18 18:57 |
| S765 | 1314 | e-cigarette | US-PGPUB; USPAT; EPO; JPO; DERWENT | OR | OFF | 2019/02/18 18:57 |
| S766 | 6 | e-cigarette and photovoltaic | US-PGPUB; USPAT; EPO; JPO; DERWENT | OR | OFF | 2019/02/18 18:57 |
| S767 | 129 | e-cigarette and photo | US-PGPUB; USPAT; EPO; JPO; DERWENT | OR | OFF | 2019/02/18 18:57 |
| S768 | 38924 | vaporizer or (air adj freshener) and solar | US-PGPUB; USPAT; EPO; JPO; DERWENT | OR | OFF | 2019/02/18 18:57 |

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| S769 | 38924 | vaporizer or ((air adj freshener) and solar) | US-PGPUB; USPAT; EPO; JPO; DERWENT | OR | OFF | 2019/02/18 18:57 |
| S770 | 2105 | (vaporizer or (air adj freshener)) and solar | US-PGPUB; USPAT; EPO; JPO; DERWENT | OR | OFF | 2019/02/18 18:57 |
| S771 | 306 | (vaporizer or (air adj freshener)) and solar and photovoltaic | US-PGPUB; USPAT; EPO; JPO; DERWENT | OR | OFF | 2019/02/18 18:57 |
| S772 | 4 | ("2013/0309102").URPN. | USPAT | OR | OFF | 2019/02/18 18:57 |
| S773 | 92996 | a01b 12/006 | US-PGPUB; USPAT; EPO; JPO; DERWENT | OR | OFF | 2019/02/18 18:57 |
| S774 | 0 | (a24f47/008).IPCR. | US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT | OR | OFF | 2019/02/18 18:57 |
| S775 | 0 | (a24f047/008).IPCR. | US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT | OR | OFF | 2019/02/18 18:57 |
| S776 | 0 | (a24f047/008).IPCR. | US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT | OR | OFF | 2019/02/18 18:57 |
| S777 | 0 | (a24f47/08).IPCR. | US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT | OR | OFF | 2019/02/18 18:57 |
| S778 | 9559 | (B60H1/22).IPCR. | US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT | OR | OFF | 2019/02/18 18:57 |
| S779 | 0 | (A24F47/08).IPCR. | US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT | OR | OFF | 2019/02/18 18:57 |
| S780 | 0 | (A24F47/10).IPCR. | US-PGPUB; | OR | OFF | 2019/02/18 18:57 |

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|---|---|---|---|---|---|---|
| | | | USPAT; USOCR; EPO; JPO; DERWENT | | | |
| S781 | 7167 | (f24h3/00).IPCR. | US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT | OR | OFF | 2019/02/18 18:57 |
| S782 | 17594 | (a24f47/00).IPCR. | US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT | OR | OFF | 2019/02/18 18:57 |
| S783 | 15977 | (a61m15/00).IPCR. | US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT | OR | OFF | 2019/02/18 18:57 |
| S784 | 100 | S783 and "392"/$.ccls. | US-PGPUB; USPAT; EPO; JPO; DERWENT | OR | OFF | 2019/02/18 18:57 |
| S785 | 12 | S784 and breath | US-PGPUB; USPAT; EPO; JPO; DERWENT | OR | OFF | 2019/02/18 18:57 |
| S786 | 17 | S784 and generator | US-PGPUB; USPAT; EPO; JPO; DERWENT | OR | OFF | 2019/02/18 18:57 |
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| S788 | 6 | S787 and generator | US-PGPUB; USPAT; EPO; JPO; DERWENT | OR | OFF | 2019/02/18 18:57 |
| S789 | 2 | ("2008/0303286").URPN. | USPAT | OR | OFF | 2019/02/18 18:57 |
| S790 | 2 | ("2008/0303286").URPN. | USPAT | OR | OFF | 2019/02/18 18:57 |
| S791 | 0 | miniature adj turbine same electrical adj generator | US-PGPUB; USPAT; EPO; JPO; DERWENT | OR | OFF | 2019/02/18 18:57 |
| S792 | 700 | vaporizer and photovoltaic | US- | OR | OFF | 2019/02/18 |

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| | | | PGPUB; USPAT; EPO; JPO; DERWENT | | | 18:57 |
| S793 | 71 | e-cigarette and solar | US-PGPUB; USPAT; EPO; JPO; DERWENT | OR | OFF | 2019/02/18 18:57 |
| S794 | 1314 | e-cigarette | US-PGPUB; USPAT; EPO; JPO; DERWENT | OR | OFF | 2019/02/18 18:57 |
| S795 | 83 | ("3200819" \| "20100031968" \| "8156944" \| "20080230052" \| "20100037903" \| "20100242974" \| "D590988" \| "D590990" \| "7412259" \| "20050016550" \| "7832410" \| "D613903" \| "20080257367" \| "20100200006" \| "20110011396" \| "20110277757" \| "7726320" \| "3200819" \| "20080257367" \| "20080092912" \| "20080230052" \| "20100200008" \| "5050621" \| "20060196518" \| "20080092912" \| "20100200008" \| "D590991" \| "20090272379" \| "7726320" \| "20070267031" \| "20100200006" \| "D613904" \| "4969476" \| "20110192399" \| "20050016550" \| "20060196518" \| "20080276947" \| "20090095311" \| "20090126745" \| "D590989" \| "20100242974" \| "5249586" \| "5865185" \| "20080247892" \| "20100031968" \| "20080276947" \| "20110277760" \| "4284089" \| "4945929" \| "4966171" \| "5115820").PN. | US-PGPUB; USPAT; EPO; JPO; DERWENT | OR | OFF | 2019/02/18 18:57 |
| S796 | 3 | "20090272379" | US-PGPUB; USPAT; EPO; JPO; DERWENT | OR | OFF | 2019/02/18 18:57 |
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**EAST Search History (Interference)**

| Ref # | Hits | Search Query | DBs | Default Operator | Plurals | Time Stamp |
|---|---|---|---|---|---|---|
| S402 | 9 | vaporizer and cartridge and breath and airflow and threaded and battery | US-PGPUB; USPAT | OR | OFF | 2016/08/20 13:57 |
| S798 | 17 | vaporizer and cartridge and breath and airflow and threaded and battery | US-PGPUB; USPAT | OR | OFF | 2019/02/18 18:57 |

**2/18/2019 9:14:30 PM**
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OMB 0651-0031

| Substitute for FORM PTO-1449 | Attorney Docket Number 269.0003-02000 | Customer No. 22882 | |
|---|---|---|---|
| **INFORMATION DISCLOSURE STATEMENT IN AN APPLICATION** | Applicant Gregory D. Conley et al. | Application Number 15/377,522 | |
| *(Use several sheets if necessary)* **Sheet 1 of 4** | Filing Date December 13, 2016 | Group Art Unit 3742 | Examiner T.S. Campbell |

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| | **DOCUMENT NUMBER** | **DATE** | **COUNTRY** | **CLASS** | **SUBCLASS** | **TRANSLATION (YES/NO)** |
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| * | CN201018927 | 02/2008 | China | | | Yes |
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| **EXAMINER** /THOR S CAMPBELL/ (02/10/2019) | | **DATE CONSIDERED** | | | | |

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|---|---|
| Electronic Petition Request | **TERMINAL DISCLAIMER TO OBVIATE A DOUBLE PATENTING REJECTION OVER A "PRIOR" PATENT** |
| Application Number | 15377522 |
| Filing Date | 13-Dec-2016 |
| First Named Inventor | Gregory Conley |
| Attorney Docket Number | 269.0003-02000 |
| Title of Invention | ELECTRONIC VAPORIZER |

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| FUMA INTERNATIONAL, LLC | 100% |

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- is reissued; or
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| ○ | I certify, in accordance with 37 CFR 1.4(d)(4), that the terminal disclaimer fee under 37 CFR 1.20(d) required for this terminal disclaimer has already been paid in the above-identified application. |

Applicant claims the following fee status:

◉ Small Entity

○ Micro Entity

○ Regular Undiscounted

I hereby declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code and that such willful false statements may jeopardize the validity of the application or any patent issued thereon.

THIS PORTION MUST BE COMPLETED BY THE SIGNATORY OR SIGNATORIES

I certify, in accordance with 37 CFR 1.4(d)(4) that I am:

◉ An attorney or agent registered to practice before the Patent and Trademark Office who is of record in this application

Registration Number 34383

○ A sole inventor

○ A joint inventor; I certify that I am authorized to sign this submission on behalf of all of the inventors as evidenced by the power of attorney in the application

○ A joint inventor; all of whom are signing this request

| | |
|---|---|
| Signature | /Thomas H. Martin/ |
| Name | Thomas H. Martin |

*Statement under 37 CFR 3.73(b) is required if terminal disclaimer is signed by the assignee (owner).
Form PTO/SB/96 may be used for making this certification. See MPEP § 324.

# Electronic Patent Application Fee Transmittal

| | |
|---|---|
| **Application Number:** | 15377522 |
| **Filing Date:** | 13-Dec-2016 |
| **Title of Invention:** | ELECTRONIC VAPORIZER |
| **First Named Inventor/Applicant Name:** | Gregory D. Conley |
| **Filer:** | Thomas H. Martin/Sandra Blackmon |
| **Attorney Docket Number:** | 269.0003-02000 |

Filed as Small Entity

**Filing Fees for Utility under 35 USC 111(a)**

| Description | Fee Code | Quantity | Amount | Sub-Total in USD($) |
|---|---|---|---|---|
| **Basic Filing:** | | | | |
| STATUTORY OR TERMINAL DISCLAIMER | 2814 | 1 | 160 | 160 |
| **Pages:** | | | | |
| **Claims:** | | | | |
| **Miscellaneous-Filing:** | | | | |
| **Petition:** | | | | |
| **Patent-Appeals-and-Interference:** | | | | |
| **Post-Allowance-and-Post-Issuance:** | | | | |

| Description | Fee Code | Quantity | Amount | Sub-Total in USD($) |
|---|---|---|---|---|
| **Extension-of-Time:** | | | | |
| **Miscellaneous:** | | | | |
| | | **Total in USD ($)** | | **160** |

Doc Code: DISQ.E.FILE
Document Description: Electronic Terminal Disclaimer – Approved

Application No.: 15377522

Filing Date: 13-Dec-2016

Applicant/Patent under Reexamination: Conley

Electronic Terminal Disclaimer filed on February 26, 2019

☒ APPROVED

**This patent is subject to a terminal disclaimer**

☐ DISAPPROVED

Approved/Disapproved by: Electronic Terminal Disclaimer automatically approved by EFS-Web

U.S. Patent and Trademark Office

| Electronic Acknowledgement Receipt | |
|---|---|
| **EFS ID:** | 35257489 |
| **Application Number:** | 15377522 |
| **International Application Number:** | |
| **Confirmation Number:** | 1065 |
| **Title of Invention:** | ELECTRONIC VAPORIZER |
| **First Named Inventor/Applicant Name:** | Gregory D. Conley |
| **Customer Number:** | 22882 |
| **Filer:** | Thomas H. Martin/Sandra Blackmon |
| **Filer Authorized By:** | Thomas H. Martin |
| **Attorney Docket Number:** | 269.0003-02000 |
| **Receipt Date:** | 26-FEB-2019 |
| **Filing Date:** | 13-DEC-2016 |
| **Time Stamp:** | 16:21:53 |
| **Application Type:** | Utility under 35 USC 111(a) |

## Payment information:

| | |
|---|---|
| Submitted with Payment | yes |
| Payment Type | CARD |
| Payment was successfully received in RAM | $160 |
| RAM confirmation Number | 022719INTEFSW16215100 |
| Deposit Account | 501068 |
| Authorized User | Sandra Blackmon |
| The Director of the USPTO is hereby authorized to charge indicated fees and credit any overpayment as follows:<br>37 CFR 1.16 (National application filing, search, and examination fees)<br>37 CFR 1.17 (Patent application and reexamination processing fees) | |

37 CFR 1.21 (Miscellaneous fees and charges)

## File Listing:

| Document Number | Document Description | File Name | File Size(Bytes)/ Message Digest | Multi Part /.zip | Pages (if appl.) |
|---|---|---|---|---|---|
| 1 | Terminal Disclaimer-Filed (Electronic) | eTerminal-Disclaimer.pdf | 33442<br>938c23f14ead46f265052ef6affaf617f7180a<br>db | no | 2 |
| **Warnings:** | | | | | |
| **Information:** | | | | | |
| 2 | Fee Worksheet (SB06) | fee-info.pdf | 30571<br>194e3faa347fb4cf0fe88ca5cd9378268adf2<br>383 | no | 2 |
| **Warnings:** | | | | | |
| **Information:** | | | | | |
| | | **Total Files Size (in bytes):** | 64013 | | |

**This Acknowledgement Receipt evidences receipt on the noted date by the USPTO of the indicated documents, characterized by the applicant, and including page counts, where applicable. It serves as evidence of receipt similar to a Post Card, as described in MPEP 503.**

**New Applications Under 35 U.S.C. 111**
**If a new application is being filed and the application includes the necessary components for a filing date (see 37 CFR 1.53(b)-(d) and MPEP 506), a Filing Receipt (37 CFR 1.54) will be issued in due course and the date shown on this Acknowledgement Receipt will establish the filing date of the application.**
**National Stage of an International Application under 35 U.S.C. 371**
**If a timely submission to enter the national stage of an international application is compliant with the conditions of 35 U.S.C. 371 and other applicable requirements a Form PCT/DO/EO/903 indicating acceptance of the application as a national stage submission under 35 U.S.C. 371 will be issued in addition to the Filing Receipt, in due course.**
**New International Application Filed with the USPTO as a Receiving Office**
**If a new international application is being filed and the international application includes the necessary components for an international filing date (see PCT Article 11 and MPEP 1810), a Notification of the International Application Number and of the International Filing Date (Form PCT/RO/105) will be issued in due course, subject to prescriptions concerning national security, and the date shown on this Acknowledgement Receipt will establish the international filing date of the application.**

PATENT
Attorney Docket No. 269.0003-02000
Customer No. 22882

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

| | | |
|---|---|---|
| In re Application of: | ) | Confirmation No.: 1065 |
| Gregory D. Conley et al. | ) | |
| Serial No.: 15/377,522 | ) | Group Art Unit: 3761 |
| Filed: December 13, 2016 | ) | Examiner: Thor S. Campbell |
| For: ELECTRONIC VAPORIZER | ) | Allowed: February 26, 2019 |

Mail Stop ISSUE FEE
Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Sir:

**RESPONSE TO INFORMATIONAL NOTICE TO APPLICANT**

In response to the Notice Requiring Inventor's Oath or Declaration dated February 26, 2019, Applicant submits newly executed Declarations for inventors Gregory D. Conley and Daniel C. Hillenbrandt in compliance with 37 C.F.R. § 1.63 for filing in the above-identified application.

Please associate the enclosed documents with the above-identified application.

Respectfully submitted,

MARTIN & FERRARO LLP

Dated: February 26, 2019

By: 
Thomas H. Martin
Registration No. 34,383

1557 Lake O'Pines Street, NE
Hartville, Ohio 44632
Telephone: (330) 877-0700

PTO/AIA/01 (06-12)
Approved for use through 11/30/2020. OMB 0651-0032
U.S. Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE
Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it displays a valid OMB control number.

# DECLARATION (37 CFR 1.63) FOR UTILITY OR DESIGN APPLICATION USING AN APPLICATION DATA SHEET (37 CFR 1.76)

| Title of Invention | ELECTRONIC VAPORIZER |
|---|---|

As the below named inventor, I hereby declare that:

This declaration is directed to:

☐ The attached application, or

☒ United States application or PCT international application number 15/377,522

filed on December 13, 2016.

The above-identified application was made or authorized to be made by me.

I believe that I am the original inventor or an original joint inventor of a claimed invention in the application.

I hereby acknowledge that any willful false statement made in this declaration is punishable under 18 U.S.C. 1001 by fine or imprisonment of not more than five (5) years, or both.

## WARNING:

Petitioner/applicant is cautioned to avoid submitting personal information in documents filed in a patent application that may contribute to identity theft. Personal information such as social security numbers, bank account numbers, or credit card numbers (other than a check or credit card authorization form PTO-2038 submitted for payment purposes) is never required by the USPTO to support a petition or an application. If this type of personal information is included in documents submitted to the USPTO, petitioners/applicants should consider redacting such personal information from the documents before submitting them to the USPTO. Petitioner/applicant is advised that the record of a patent application is available to the public after publication of the application (unless a non-publication request in compliance with 37 CFR 1.213(a) is made in the application) or issuance of a patent. Furthermore, the record from an abandoned application may also be available to the public if the application is referenced in a published application or an issued patent (see 37 CFR 1.14). Checks and credit card authorization forms PTO-2038 submitted for payment purposes are not retained in the application file and therefore are not publicly available.

LEGAL NAME OF INVENTOR

Inventor: Gregory D. Conley Date (Optional): 2019-02-26

Signature: Gregory D. Conley

Note: An application data sheet (PTO/SB/14 or equivalent), including naming the entire inventive entity, must accompany this form or must have been previously filed. Use an additional PTO/AIA/01 form for each additional inventor.

This collection of information is required by 35 U.S.C. 115 and 37 CFR 1.63. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.11 and 1.14. This collection is estimated to take 1 minute to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. **SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.**

*If you need assistance in completing the form, call 1-800-PTO-9199 and select option 2.*

PTO/AIA/01 (06-12)
Approved for use through 11/30/2020. OMB 0651-0032
U.S. Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE
Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it displays a valid OMB control number.

# DECLARATION (37 CFR 1.63) FOR UTILITY OR DESIGN APPLICATION USING AN APPLICATION DATA SHEET (37 CFR 1.76)

| Title of Invention | ELECTRONIC VAPORIZER |
|---|---|

As the below named inventor, I hereby declare that:

This declaration is directed to:

☐ The attached application, or

☒ United States application or PCT international application number 15/377,522

filed on December 13, 2016.

The above-identified application was made or authorized to be made by me.

I believe that I am the original inventor or an original joint inventor of a claimed invention in the application.

I hereby acknowledge that any willful false statement made in this declaration is punishable under 18 U.S.C. 1001 by fine or imprisonment of not more than five (5) years, or both.

## WARNING:

Petitioner/applicant is cautioned to avoid submitting personal information in documents filed in a patent application that may contribute to identity theft. Personal information such as social security numbers, bank account numbers, or credit card numbers (other than a check or credit card authorization form PTO-2038 submitted for payment purposes) is never required by the USPTO to support a petition or an application. If this type of personal information is included in documents submitted to the USPTO, petitioners/applicants should consider redacting such personal information from the documents before submitting them to the USPTO. Petitioner/applicant is advised that the record of a patent application is available to the public after publication of the application (unless a non-publication request in compliance with 37 CFR 1.213(a) is made in the application) or issuance of a patent. Furthermore, the record from an abandoned application may also be available to the public if the application is referenced in a published application or an issued patent (see 37 CFR 1.14). Checks and credit card authorization forms PTO-2038 submitted for payment purposes are not retained in the application file and therefore are not publicly available.

LEGAL NAME OF INVENTOR

Inventor: Daniel C. Hillenbrandt Date (Optional): 2019-02-26

Signature: David C. Hillenbrandt

Note: An application data sheet (PTO/SB/14 or equivalent), including naming the entire inventive entity, must accompany this form or must have been previously filed. Use an additional PTO/AIA/01 form for each additional inventor.

This collection of information is required by 35 U.S.C. 115 and 37 CFR 1.63. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.11 and 1.14. This collection is estimated to take 1 minute to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. **SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.**

*If you need assistance in completing the form, call 1-800-PTO-9199 and select option 2.*

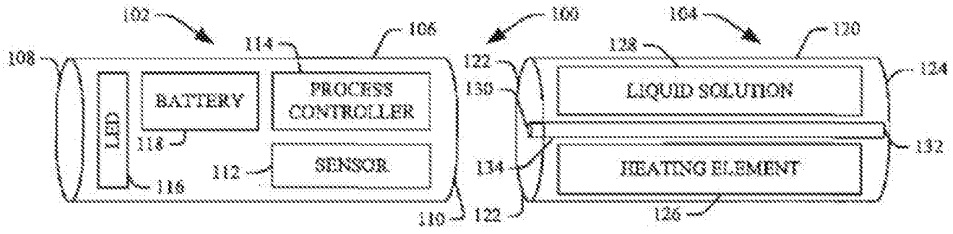

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BATTERY
PROCESS CONTROLLER
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112
SENSOR
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104
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120
LIQUID SOLUTION
124
132
HEATING ELEMENT
126

FIG. 1

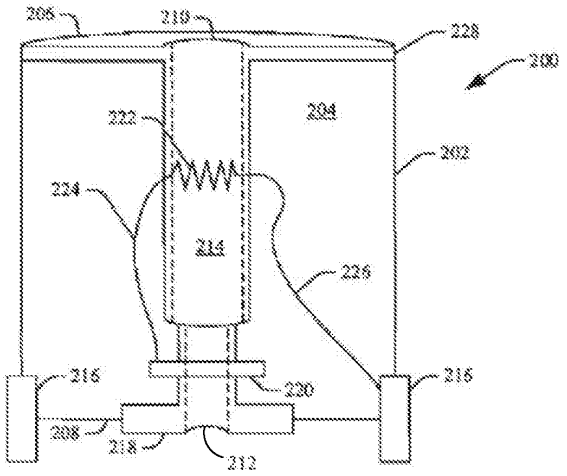

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FIG. 2

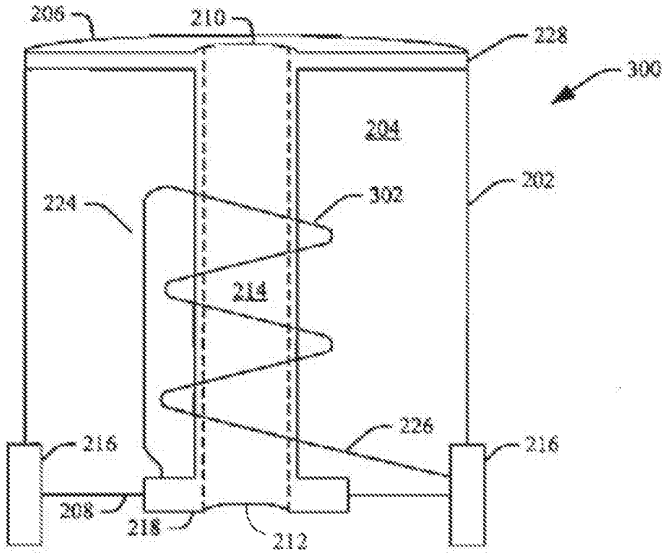



FIG. 3

| Electronic Acknowledgement Receipt | |
|---|---|
| **EFS ID:** | 35257667 |
| **Application Number:** | 15377522 |
| **International Application Number:** | |
| **Confirmation Number:** | 1065 |
| **Title of Invention:** | ELECTRONIC VAPORIZER |
| **First Named Inventor/Applicant Name:** | Gregory D. Conley |
| **Customer Number:** | 22882 |
| **Filer:** | Thomas H. Martin/Sandra Blackmon |
| **Filer Authorized By:** | Thomas H. Martin |
| **Attorney Docket Number:** | 269.0003-02000 |
| **Receipt Date:** | 26-FEB-2019 |
| **Filing Date:** | 13-DEC-2016 |
| **Time Stamp:** | 16:25:14 |
| **Application Type:** | Utility under 35 USC 111(a) |

## Payment information:

| Submitted with Payment | no |
|---|---|

## File Listing:

| Document Number | Document Description | File Name | File Size(Bytes)/ Message Digest | Multi Part /.zip | Pages (if appl.) |
|---|---|---|---|---|---|
| 1 | Applicant Response to Pre-Exam Formalities Notice | Response.pdf | 106116<br>7770c7d04ccc306bae5583a1794988fc20ce6758 | no | 1 |

**Warnings:**

| | | | | | |
|---|---|---|---|---|---|
| **Information:** | | | | | |
| 2 | Oath or Declaration filed | Declarations.pdf | 156908<br>d762e2569bd3f580dcb49500a2241db1704cd785 | no | 2 |
| **Warnings:** | | | | | |
| **Information:** | | | | | |
| 3 | Amendment after Notice of Allowance (Rule 312) | 312Amendment.pdf | 231271<br>9220a109d7016d21e9bec63e581be6828915f313 | no | 3 |
| **Warnings:** | | | | | |
| **Information:** | | | | | |
| 4 | Drawings-only black and white line drawings | ReplacementSheets.pdf | 490207<br>352d30802d0901a1d70bd1fc1660cf1b378a30eb | no | 2 |
| **Warnings:** | | | | | |
| **Information:** | | | | | |
| | | **Total Files Size (in bytes):** | 984502 | | |

**This Acknowledgement Receipt evidences receipt on the noted date by the USPTO of the indicated documents, characterized by the applicant, and including page counts, where applicable. It serves as evidence of receipt similar to a Post Card, as described in MPEP 503.**

**New Applications Under 35 U.S.C. 111**

**If a new application is being filed and the application includes the necessary components for a filing date (see 37 CFR 1.53(b)-(d) and MPEP 506), a Filing Receipt (37 CFR 1.54) will be issued in due course and the date shown on this Acknowledgement Receipt will establish the filing date of the application.**

**National Stage of an International Application under 35 U.S.C. 371**

**If a timely submission to enter the national stage of an international application is compliant with the conditions of 35 U.S.C. 371 and other applicable requirements a Form PCT/DO/EO/903 indicating acceptance of the application as a national stage submission under 35 U.S.C. 371 will be issued in addition to the Filing Receipt, in due course.**

**New International Application Filed with the USPTO as a Receiving Office**

**If a new international application is being filed and the international application includes the necessary components for an international filing date (see PCT Article 11 and MPEP 1810), a Notification of the International Application Number and of the International Filing Date (Form PCT/RO/105) will be issued in due course, subject to prescriptions concerning national security, and the date shown on this Acknowledgement Receipt will establish the international filing date of the application.**

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

| | | |
|---|---|---|
| In re Application of: | ) | Confirmation No.: 1065 |
| Gregory D. Conley et al. | ) | |
| Serial No.: 15/377,522 | ) | Group Art Unit: 3742 |
| Filed: December 13, 2016 | ) | Examiner: Thor S. Campbell |
| For: ELECTRONIC VAPORIZER | ) | Allowed: February 26, 2019 |

MS ISSUE FEE
Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Sir:

**AMENDMENT AFTER ALLOWANCE**

Pursuant to 37 C.F.R. § 1.312 and subject to the approval of the Commissioner, and without withdrawing the case from issue, kindly amend the subject application as follows:

**Amendments to the Drawings** begin on page 2 of this paper and include both an attached replacement sheet and an annotated sheet showing changes.

**Remarks** begin on page 3 of this paper.

An **Appendix** including amended drawing figures is attached following page 4 of this paper.

**Amendments to the Drawings:**

The attached replacement sheets of drawings includes changes to Figs. 2 and 3, which add previously omitted element 212.

Attachment: Replacement Sheets

## REMARKS

The above-identified application was allowed in the Notice of Allowance mailed February 26, 2019. The issue fee has not been paid.

Subsequent to the receipt of the Notice of Allowance, applicant noted that element 212 as disclosed in the specification at paragraphs [0030] and [0031] was missing from the drawing figures. The requested amendment is submitted to add missing element 212 to Figs. 2 and 3.

Each of the requested amendments is fully supported by the specification, will not require an additional search, and does not raise new issues. Therefore, applicant respectfully requests that this Amendment be entered and the requested changes made.

To the extent any extension of time under 37 C.F.R. § 1.136 is required to obtain entry of this reply, such extension is hereby respectfully requested. If there are any fees due under 37 C.F.R. §§ 1.16 or 1.17 which are not enclosed herewith, including any fees required for an extension of time under 37 C.F.R. § 1.136, please charge such fees to our Deposit Account No. 50-1068.

Respectfully submitted,

MARTIN & FERRARO, LLP

Dated: February 26, 2019

By: _____
Thomas H. Martin
Registration No. 34,383

1557 Lake O'Pines Street, NE
Hartville, Ohio 44632
Telephone: (330) 877-0700

## PART B - FEE(S) TRANSMITTAL

Complete and send this form, together with applicable fee(s), by mail or fax, or via EFS-Web.

By mail, send to: Mail Stop ISSUE FEE
Commissioner for Patents
P.O. Box 1450
Alexandria, Virginia 22313-1450

By fax, send to: (571)-273-2885

INSTRUCTIONS: This form should be used for transmitting the ISSUE FEE and PUBLICATION FEE (if required). Blocks 1 through 5 should be completed where appropriate. All further correspondence including the Patent, advance orders and notification of maintenance fees will be mailed to the current correspondence address as indicated unless corrected below or directed otherwise in Block 1, by (a) specifying a new correspondence address; and/or (b) indicating a separate "FEE ADDRESS" for maintenance fee notifications.

CURRENT CORRESPONDENCE ADDRESS (Note: Use Block 1 for any change of address)

22882 7590 02/26/2019
MARTIN & FERRARO, LLP
1557 LAKE O'PINES STREET, NE
HARTVILLE, OH 44632

Note: A certificate of mailing can only be used for domestic mailings of the Fee(s) Transmittal. This certificate cannot be used for any other accompanying papers. Each additional paper, such as an assignment or formal drawing, must have its own certificate of mailing or transmission.

**Certificate of Mailing or Transmission**

I hereby certify that this Fee(s) Transmittal is being deposited with the United States Postal Service with sufficient postage for first class mail in an envelope addressed to the Mail Stop ISSUE FEE address above, or being transmitted to the USPTO via EFS-Web or by facsimile to (571) 273-2885, on the date below.

| (Typed or printed name) |
|---|
| (Signature) |
| (Date) |

| APPLICATION NO. | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
|---|---|---|---|---|
| 15/377,522 | 12/13/2016 | Gregory D. Conley | 269.0003-02000 | 1065 |

TITLE OF INVENTION: ELECTRONIC VAPORIZER

| APPLN. TYPE | ENTITY STATUS | ISSUE FEE DUE | PUBLICATION FEE DUE | PREV. PAID ISSUE FEE | TOTAL FEE(S) DUE | DATE DUE |
|---|---|---|---|---|---|---|
| nonprovisional | SMALL | $500 | $0.00 | $0.00 | $500 | 05/28/2019 |

| EXAMINER | ART UNIT | CLASS-SUBCLASS |
|---|---|---|
| CAMPBELL, THOR S | 3761 | 392-386000 |

1. Change of correspondence address or indication of "Fee Address" (37 CFR 1.363).

☐ Change of correspondence address (or Change of Correspondence Address form PTO/SB/122) attached.

☐ "Fee Address" indication (or "Fee Address" Indication form PTO/SB/47; Rev 03-09 or more recent) attached. **Use of a Customer Number is required.**

2. For printing on the patent front page, list
(1) The names of up to 3 registered patent attorneys or agents OR, alternatively,
(2) The name of a single firm (having as a member a registered attorney or agent) and the names of up to 2 registered patent attorneys or agents. If no name is listed, no name will be printed.

1 Martin & Ferraro, LLP
2
3

3. ASSIGNEE NAME AND RESIDENCE DATA TO BE PRINTED ON THE PATENT (print or type)

PLEASE NOTE: Unless an assignee is identified below, no assignee data will appear on the patent. If an assignee is identified below, the document must have been previously recorded, or filed for recordation, as set forth in 37 CFR 3.11 and 37 CFR 3.81(a). Completion of this form is NOT a substitute for filing an assignment.

(A) NAME OF ASSIGNEE: FUMA INTERNATIONAL, LLC

(B) RESIDENCE: (CITY and STATE OR COUNTRY): Medina, OH

Please check the appropriate assignee category or categories (will not be printed on the patent) : ☐ Individual ☐ Corporation or other private group entity ☐ Government

4a. Fees submitted: ☒ Issue Fee ☐ Publication Fee (if required) ☐ Advance Order - # of Copies _____

4b. Method of Payment: *(Please first reapply any previously paid fee shown above)*

☒ Electronic Payment via EFS-Web ☐ Enclosed check ☐ Non-electronic payment by credit card (Attach form PTO-2038)

☐ The Director is hereby authorized to charge the required fee(s), any deficiency, or credit any overpayment to Deposit Account No. _____

5. **Change in Entity Status** (from status indicated above)

☐ Applicant certifying micro entity status. See 37 CFR 1.29

☐ Applicant asserting small entity status. See 37 CFR 1.27

☐ Applicant changing to regular undiscounted fee status.

NOTE: Absent a valid certification of Micro Entity Status (see forms PTO/SB/15A and 15B), issue fee payment in the micro entity amount will not be accepted at the risk of application abandonment.
NOTE: If the application was previously under micro entity status, checking this box will be taken to be a notification of loss of entitlement to micro entity status.
NOTE: Checking this box will be taken to be a notification of loss of entitlement to small or micro entity status, as applicable.

NOTE: This form must be signed in accordance with 37 CFR 1.31 and 1.33. See 37 CFR 1.4 for signature requirements and certifications.

Authorized Signature: Thomas H Martin Date: February 27, 2019

Typed or printed name: Thomas H. Martin Registration No.: 34383



PTOL-85 Part B (08-18) Approved for use through 01/31/2020 OMB 0651-0033 U.S. Patent and Trademark Office: U.S. DEPARTMENT OF COMMERCE

JUUL Ex. 1002
Case No. IPR2024-161
Page 457 of 552

# Electronic Patent Application Fee Transmittal

| | |
|---|---|
| **Application Number:** | 15377522 |
| **Filing Date:** | 13-Dec-2016 |
| **Title of Invention:** | ELECTRONIC VAPORIZER |
| **First Named Inventor/Applicant Name:** | Gregory D. Conley |
| **Filer:** | Thomas H. Martin/Sandra Blackmon |
| **Attorney Docket Number:** | 269.0003-02000 |

Filed as Small Entity

**Filing Fees for Utility under 35 USC 111(a)**

| Description | Fee Code | Quantity | Amount | Sub-Total in USD($) |
|---|---|---|---|---|
| **Basic Filing:** | | | | |
| **Pages:** | | | | |
| **Claims:** | | | | |
| **Miscellaneous-Filing:** | | | | |
| **Petition:** | | | | |
| **Patent-Appeals-and-Interference:** | | | | |
| **Post-Allowance-and-Post-Issuance:** | | | | |
| UTILITY APPL ISSUE FEE | 2501 | 1 | 500 | 500 |

| Description | Fee Code | Quantity | Amount | Sub-Total in USD($) |
|---|---|---|---|---|
| **Extension-of-Time:** | | | | |
| **Miscellaneous:** | | | | |
| | | **Total in USD ($)** | | **500** |

| Electronic Acknowledgement Receipt | |
|---|---|
| **EFS ID:** | 35270955 |
| **Application Number:** | 15377522 |
| **International Application Number:** | |
| **Confirmation Number:** | 1065 |
| **Title of Invention:** | ELECTRONIC VAPORIZER |
| **First Named Inventor/Applicant Name:** | Gregory D. Conley |
| **Customer Number:** | 22882 |
| **Filer:** | Thomas H. Martin/Sandra Blackmon |
| **Filer Authorized By:** | Thomas H. Martin |
| **Attorney Docket Number:** | 269.0003-02000 |
| **Receipt Date:** | 27-FEB-2019 |
| **Filing Date:** | 13-DEC-2016 |
| **Time Stamp:** | 15:36:08 |
| **Application Type:** | Utility under 35 USC 111(a) |

## Payment information:

| | |
|---|---|
| Submitted with Payment | yes |
| Payment Type | CARD |
| Payment was successfully received in RAM | $500 |
| RAM confirmation Number | 022819INTEFSW15370900 |
| Deposit Account | 501068 |
| Authorized User | Sandra Blackmon |
| The Director of the USPTO is hereby authorized to charge indicated fees and credit any overpayment as follows:<br>37 CFR 1.16 (National application filing, search, and examination fees)<br>37 CFR 1.17 (Patent application and reexamination processing fees) | |

37 CFR 1.21 (Miscellaneous fees and charges)

## File Listing:

| Document Number | Document Description | File Name | File Size(Bytes)/ Message Digest | Multi Part /.zip | Pages (if appl.) |
|---|---|---|---|---|---|
| 1 | Issue Fee Payment (PTO-85B) | IssueFee.pdf | 778902<br>f12180d36493254dbf728490e41a7cc98847eae5 | no | 1 |
| **Warnings:** | | | | | |
| **Information:** | | | | | |
| 2 | Fee Worksheet (SB06) | fee-info.pdf | 30255<br>698bb1a802a66db962d6d55682f4120911cf2dc1 | no | 2 |
| **Warnings:** | | | | | |
| **Information:** | | | | | |
| | | **Total Files Size (in bytes):** | 809157 | | |

**This Acknowledgement Receipt evidences receipt on the noted date by the USPTO of the indicated documents, characterized by the applicant, and including page counts, where applicable. It serves as evidence of receipt similar to a Post Card, as described in MPEP 503.**

**New Applications Under 35 U.S.C. 111**
**If a new application is being filed and the application includes the necessary components for a filing date (see 37 CFR 1.53(b)-(d) and MPEP 506), a Filing Receipt (37 CFR 1.54) will be issued in due course and the date shown on this Acknowledgement Receipt will establish the filing date of the application.**
**National Stage of an International Application under 35 U.S.C. 371**
**If a timely submission to enter the national stage of an international application is compliant with the conditions of 35 U.S.C. 371 and other applicable requirements a Form PCT/DO/EO/903 indicating acceptance of the application as a national stage submission under 35 U.S.C. 371 will be issued in addition to the Filing Receipt, in due course.**
**New International Application Filed with the USPTO as a Receiving Office**
**If a new international application is being filed and the international application includes the necessary components for an international filing date (see PCT Article 11 and MPEP 1810), a Notification of the International Application Number and of the International Filing Date (Form PCT/RO/105) will be issued in due course, subject to prescriptions concerning national security, and the date shown on this Acknowledgement Receipt will establish the international filing date of the application.**

UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

# CORRECTED
# NOTICE OF ALLOWANCE AND FEE(S) DUE

22882 7590 03/08/2019
MARTIN & FERRARO, LLP
1557 LAKE O'PINES STREET, NE
HARTVILLE, OH 44632

| EXAMINER | |
|---|---|
| CAMPBELL, THOR S | |
| ART UNIT | PAPER NUMBER |
| 3761 | |

DATE MAILED: 03/08/2019

| APPLICATION NO. | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
|---|---|---|---|---|
| 15/377,522 | 12/13/2016 | Gregory D. Conley | 269.0003-02000 | 1065 |

TITLE OF INVENTION: ELECTRONIC VAPORIZER

| APPLN. TYPE | ENTITY STATUS | ISSUE FEE DUE | PUBLICATION FEE DUE | PREV. PAID ISSUE FEE | TOTAL FEE(S) DUE | DATE DUE |
|---|---|---|---|---|---|---|
| nonprovisional | SMALL | $500 | $0 | $500 | $500 | 06/10/2019 |

**THE APPLICATION IDENTIFIED ABOVE HAS BEEN EXAMINED AND IS ALLOWED FOR ISSUANCE AS A PATENT. PROSECUTION ON THE MERITS IS CLOSED. THIS NOTICE OF ALLOWANCE IS NOT A GRANT OF PATENT RIGHTS. THIS APPLICATION IS SUBJECT TO WITHDRAWAL FROM ISSUE AT THE INITIATIVE OF THE OFFICE OR UPON PETITION BY THE APPLICANT. SEE 37 CFR 1.313 AND MPEP 1308.**

**THE ISSUE FEE AND PUBLICATION FEE (IF REQUIRED) MUST BE PAID WITHIN THREE MONTHS FROM THE MAILING DATE OF THIS NOTICE OR THIS APPLICATION SHALL BE REGARDED AS ABANDONED. THIS STATUTORY PERIOD CANNOT BE EXTENDED. SEE 35 U.S.C. 151. THE ISSUE FEE DUE INDICATED ABOVE DOES NOT REFLECT A CREDIT FOR ANY PREVIOUSLY PAID ISSUE FEE IN THIS APPLICATION. IF AN ISSUE FEE HAS PREVIOUSLY BEEN PAID IN THIS APPLICATION (AS SHOWN ABOVE), THE RETURN OF PART B OF THIS FORM WILL BE CONSIDERED A REQUEST TO REAPPLY THE PREVIOUSLY PAID ISSUE FEE TOWARD THE ISSUE FEE NOW DUE.**

**HOW TO REPLY TO THIS NOTICE:**

I. Review the ENTITY STATUS shown above. If the ENTITY STATUS is shown as SMALL or MICRO, verify whether entitlement to that entity status still applies.

If the ENTITY STATUS is the same as shown above, pay the TOTAL FEE(S) DUE shown above.

If the ENTITY STATUS is changed from that shown above, on PART B - FEE(S) TRANSMITTAL, complete section number 5 titled "Change in Entity Status (from status indicated above)".

For purposes of this notice, small entity fees are 1/2 the amount of undiscounted fees, and micro entity fees are 1/2 the amount of small entity fees.

II. PART B - FEE(S) TRANSMITTAL, or its equivalent, must be completed and returned to the United States Patent and Trademark Office (USPTO) with your ISSUE FEE and PUBLICATION FEE (if required). If you are charging the fee(s) to your deposit account, section "4b" of Part B - Fee(s) Transmittal should be completed and an extra copy of the form should be submitted. If an equivalent of Part B is filed, a request to reapply a previously paid issue fee must be clearly made, and delays in processing may occur due to the difficulty in recognizing the paper as an equivalent of Part B.

III. All communications regarding this application must give the application number. Please direct all communications prior to issuance to Mail Stop ISSUE FEE unless advised to the contrary.

**IMPORTANT REMINDER: Maintenance fees are due in utility patents issuing on applications filed on or after Dec. 12, 1980. It is patentee's responsibility to ensure timely payment of maintenance fees when due. More information is available at www.uspto.gov/PatentMaintenanceFees.**



PTOL-85 (Rev. 02/11)

## PART B - FEE(S) TRANSMITTAL

**Complete and send this form, together with applicable fee(s), by mail or fax, or via EFS-Web.**

**By mail, send to:** **Mail Stop ISSUE FEE**
**Commissioner for Patents**
**P.O. Box 1450**
**Alexandria, Virginia 22313-1450**

**By fax, send to: (571)-273-2885**

INSTRUCTIONS: This form should be used for transmitting the ISSUE FEE and PUBLICATION FEE (if required). Blocks 1 through 5 should be completed where appropriate. All further correspondence including the Patent, advance orders and notification of maintenance fees will be mailed to the current correspondence address as indicated unless corrected below or directed otherwise in Block 1, by (a) specifying a new correspondence address; and/or (b) indicating a separate "FEE ADDRESS" for maintenance fee notifications.

CURRENT CORRESPONDENCE ADDRESS (Note: Use Block 1 for any change of address)

22882 7590 03/08/2019
MARTIN & FERRARO, LLP
1557 LAKE O'PINES STREET, NE
HARTVILLE, OH 44632

Note: A certificate of mailing can only be used for domestic mailings of the Fee(s) Transmittal. This certificate cannot be used for any other accompanying papers. Each additional paper, such as an assignment or formal drawing, must have its own certificate of mailing or transmission.

**Certificate of Mailing or Transmission**
I hereby certify that this Fee(s) Transmittal is being deposited with the United States Postal Service with sufficient postage for first class mail in an envelope addressed to the Mail Stop ISSUE FEE address above, or being transmitted to the USPTO via EFS-Web or by facsimile to (571) 273-2885, on the date indicated below.

| |
|---|
| (Typed or printed name) |
| (Signature) |
| (Date) |

| APPLICATION NO. | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
|---|---|---|---|---|
| 15/377,522 | 12/13/2016 | Gregory D. Conley | 269.0003-02000 | 1065 |

TITLE OF INVENTION: ELECTRONIC VAPORIZER

| APPLN. TYPE | ENTITY STATUS | ISSUE FEE DUE | PUBLICATION FEE DUE | PREV. PAID ISSUE FEE | TOTAL FEE(S) DUE | DATE DUE |
|---|---|---|---|---|---|---|
| nonprovisional | SMALL | $500 | $0 | $500 | $500 | 06/10/2019 |

| EXAMINER | ART UNIT | CLASS-SUBCLASS |
|---|---|---|
| CAMPBELL, THOR S | 3761 | 392-386000 |

1. Change of correspondence address or indication of "Fee Address" (37 CFR 1.363).
☐ Change of correspondence address (or Change of Correspondence Address form PTO/SB/122) attached.
☐ "Fee Address" indication (or "Fee Address" Indication form PTO/SB/47; Rev 03-09 or more recent) attached. **Use of a Customer Number is required.**

2. For printing on the patent front page, list
(1) The names of up to 3 registered patent attorneys or agents OR, alternatively,
(2) The name of a single firm (having as a member a registered attorney or agent) and the names of up to 2 registered patent attorneys or agents. If no name is listed, no name will be printed.
1 _____
2 _____
3 _____

3. ASSIGNEE NAME AND RESIDENCE DATA TO BE PRINTED ON THE PATENT (print or type)

PLEASE NOTE: Unless an assignee is identified below, no assignee data will appear on the patent. If an assignee is identified below, the document must have been previously recorded, or filed for recordation, as set forth in 37 CFR 3.11 and 37 CFR 3.81(a). Completion of this form is NOT a substitute for filing an assignment.

(A) NAME OF ASSIGNEE (B) RESIDENCE: (CITY and STATE OR COUNTRY)

Please check the appropriate assignee category or categories (will not be printed on the patent) : ☐ Individual ☐ Corporation or other private group entity ☐ Government

4a. Fees submitted: ☐ Issue Fee ☐ Publication Fee (if required) ☐ Advance Order - # of Copies _____

4b. Method of Payment: *(Please first reapply any previously paid fee shown above)*
☐ Electronic Payment via EFS-Web ☐ Enclosed check ☐ Non-electronic payment by credit card (Attach form PTO-2038)
☐ The Director is hereby authorized to charge the required fee(s), any deficiency, or credit any overpayment to Deposit Account No. _____

5. **Change in Entity Status** (from status indicated above)

☐ Applicant certifying micro entity status. See 37 CFR 1.29
NOTE: Absent a valid certification of Micro Entity Status (see forms PTO/SB/15A and 15B), issue fee payment in the micro entity amount will not be accepted at the risk of application abandonment.

☐ Applicant asserting small entity status. See 37 CFR 1.27
NOTE: If the application was previously under micro entity status, checking this box will be taken to be a notification of loss of entitlement to micro entity status.

☐ Applicant changing to regular undiscounted fee status.
NOTE: Checking this box will be taken to be a notification of loss of entitlement to small or micro entity status, as applicable.

NOTE: This form must be signed in accordance with 37 CFR 1.31 and 1.33. See 37 CFR 1.4 for signature requirements and certifications.

Authorized Signature _____ Date _____

Typed or printed name _____ Registration No. _____



PTOL-85 Part B (08-18) Approved for use through 01/31/2020 OMB 0651-0033 U.S. Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE

UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

| APPLICATION NO. | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
|---|---|---|---|---|
| 15/377,522 | 12/13/2016 | Gregory D. Conley | 269.0003-02000 | 1065 |

22882 7590 03/08/2019

MARTIN & FERRARO, LLP
1557 LAKE O'PINES STREET, NE
HARTVILLE, OH 44632

| EXAMINER | |
|---|---|
| CAMPBELL, THOR S | |
| **ART UNIT** | **PAPER NUMBER** |
| 3761 | |

DATE MAILED: 03/08/2019

**Determination of Patent Term Adjustment under 35 U.S.C. 154 (b)**
(Applications filed on or after May 29, 2000)

The Office has discontinued providing a Patent Term Adjustment (PTA) calculation with the Notice of Allowance.

Section 1(h)(2) of the AIA Technical Corrections Act amended 35 U.S.C. 154(b)(3)(B)(i) to eliminate the requirement that the Office provide a patent term adjustment determination with the notice of allowance. See Revisions to Patent Term Adjustment, 78 Fed. Reg. 19416, 19417 (Apr. 1, 2013). Therefore, the Office is no longer providing an initial patent term adjustment determination with the notice of allowance. The Office will continue to provide a patent term adjustment determination with the Issue Notification Letter that is mailed to applicant approximately three weeks prior to the issue date of the patent, and will include the patent term adjustment on the patent. Any request for reconsideration of the patent term adjustment determination (or reinstatement of patent term adjustment) should follow the process outlined in 37 CFR 1.705.

Any questions regarding the Patent Term Extension or Adjustment determination should be directed to the Office of Patent Legal Administration at (571)-272-7702. Questions relating to issue and publication fee payments should be directed to the Customer Service Center of the Office of Patent Publication at 1-(888)-786-0101 or (571)-272-4200.

## OMB Clearance and PRA Burden Statement for PTOL-85 Part B

The Paperwork Reduction Act (PRA) of 1995 requires Federal agencies to obtain Office of Management and Budget approval before requesting most types of information from the public. When OMB approves an agency request to collect information from the public, OMB (i) provides a valid OMB Control Number and expiration date for the agency to display on the instrument that will be used to collect the information and (ii) requires the agency to inform the public about the OMB Control Number's legal significance in accordance with 5 CFR 1320.5(b).

The information collected by PTOL-85 Part B is required by 37 CFR 1.311. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 30 minutes to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, Virginia 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, Virginia 22313-1450. Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it displays a valid OMB control number.

## Privacy Act Statement

**The Privacy Act of 1974 (P.L. 93-579)** requires that you be given certain information in connection with your submission of the attached form related to a patent application or patent. Accordingly, pursuant to the requirements of the Act, please be advised that: (1) the general authority for the collection of this information is 35 U.S.C. 2(b)(2); (2) furnishing of the information solicited is voluntary; and (3) the principal purpose for which the information is used by the U.S. Patent and Trademark Office is to process and/or examine your submission related to a patent application or patent. If you do not furnish the requested information, the U.S. Patent and Trademark Office may not be able to process and/or examine your submission, which may result in termination of proceedings or abandonment of the application or expiration of the patent.

The information provided by you in this form will be subject to the following routine uses:

1. The information on this form will be treated confidentially to the extent allowed under the Freedom of Information Act (5 U.S.C. 552) and the Privacy Act (5 U.S.C 552a). Records from this system of records may be disclosed to the Department of Justice to determine whether disclosure of these records is required by the Freedom of Information Act.
2. A record from this system of records may be disclosed, as a routine use, in the course of presenting evidence to a court, magistrate, or administrative tribunal, including disclosures to opposing counsel in the course of settlement negotiations.
3. A record in this system of records may be disclosed, as a routine use, to a Member of Congress submitting a request involving an individual, to whom the record pertains, when the individual has requested assistance from the Member with respect to the subject matter of the record.
4. A record in this system of records may be disclosed, as a routine use, to a contractor of the Agency having need for the information in order to perform a contract. Recipients of information shall be required to comply with the requirements of the Privacy Act of 1974, as amended, pursuant to 5 U.S.C. 552a(m).
5. A record related to an International Application filed under the Patent Cooperation Treaty in this system of records may be disclosed, as a routine use, to the International Bureau of the World Intellectual Property Organization, pursuant to the Patent Cooperation Treaty.
6. A record in this system of records may be disclosed, as a routine use, to another federal agency for purposes of National Security review (35 U.S.C. 181) and for review pursuant to the Atomic Energy Act (42 U.S.C. 218(c)).
7. A record from this system of records may be disclosed, as a routine use, to the Administrator, General Services, or his/her designee, during an inspection of records conducted by GSA as part of that agency's responsibility to recommend improvements in records management practices and programs, under authority of 44 U.S.C. 2904 and 2906. Such disclosure shall be made in accordance with the GSA regulations governing inspection of records for this purpose, and any other relevant (i.e., GSA or Commerce) directive. Such disclosure shall not be used to make determinations about individuals.
8. A record from this system of records may be disclosed, as a routine use, to the public after either publication of the application pursuant to 35 U.S.C. 122(b) or issuance of a patent pursuant to 35 U.S.C. 151. Further, a record may be disclosed, subject to the limitations of 37 CFR 1.14, as a routine use, to the public if the record was filed in an application which became abandoned or in which the proceedings were terminated and which application is referenced by either a published application, an application open to public inspection or an issued patent.
9. A record from this system of records may be disclosed, as a routine use, to a Federal, State, or local law enforcement agency, if the USPTO becomes aware of a violation or potential violation of law or regulation.

## Letter Withdrawing the Notice of Allowance and Fee(s) Due

This application is being withdrawn from issue because an inventor's oath or declaration, executed by or with respect to each inventor, in compliance with 35 U.S.C. § 115 and 37 CFR 1.63 or 1.64 has not been submitted. While the claims remain allowed and prosecution on the merits remains closed, the Notice of Allowance and Fee(s) Due is hereby withdrawn. The Notice of Allowability is not being withdrawn. As a result, any time period set forth in the Notice of Allowability continues to run from the mailing date of the Notice of Allowability.

Oath/Declaration:

An inventor's oath or declaration in compliance with 35 U.S.C. § 115 and 37 CFR 1.63 or 1.64, executed by or with respect to each inventor MUST be filed **no later than the date on which the issue fee is paid.** See 35 U.S.C. 115(f). In this instance, a compliant inventor's oath or declaration must be submitted before, or at the time, the signed part B of the attached "Notice of Allowance and Fee(s) Due" (PTOL-85) is returned (see below). Failure to timely comply will result in ABANDONMENT of this application. To ensure compliance with 35 U.S.C. § 115 and 37 CFR 1.63 or 1.64, the Office suggests using the appropriate USPTO form(s) available on the USPTO Web site (e.g., PTO/AIA/01 for a declaration under 37 CFR 1.63 or PTO/AIA/02 for a substitute statement under 37 CFR 1.64).

An inventor's oath or declaration in compliance with 35 U.S.C. § 115 and 37 CFR 1.63 or 1.64 must include the following (in addition to meeting the other requirements of 35 U.S.C. § 115 and 37 CFR 1.63 or 1.64):

(1) a statement that the application was made or was authorized to be made by the affiant or declarant;

(2) a statement that such individual believes himself or herself to be the original inventor or an original joint inventor of a claimed invention in the application; and

(3) an acknowledgment that any willful false statement made in such declaration or statement is punishable under section 1001 of title 18 by fine or imprisonment of not more than 5 years, or both.

Reapplication of Issue Fee and Publication Fee:

A new Notice of Allowance and Fee(s) Due is being issued herewith. The issue fee and any required publication fee set forth in the new Notice of Allowance and Fee(s) Due, including any fee adjustment since the fees were previously paid, must be paid within three months from the mailing date of the new Notice of Allowance and Fee(s) Due. Since fees were previously paid, applicant may request that the previously submitted issue fee and publication fee be applied toward payment of the issue fee and publication fee in the amount identified on the new Notice of Allowance and Fee(s) Due. The return of part B of the new Notice of Allowance and Fee(s) Due will be considered a request to apply any previously submitted issue fee and publication fee toward the issue fee and any publication fee now due. Failure to timely comply will result in ABANDONMENT of this application. This three-month time period is not extendable under 37 CFR 1.136(a).

Diane Terry
Application Assistance Unit
571-272-4200

## PART B - FEE(S) TRANSMITTAL

**Complete and send this form, together with applicable fee(s), by mail or fax, or via EFS-Web.**

**By mail, send to:** **Mail Stop ISSUE FEE**
**Commissioner for Patents**
**P.O. Box 1450**
**Alexandria, Virginia 22313-1450**

**By fax, send to:** **(571)-273-2885**

INSTRUCTIONS: This form should be used for transmitting the ISSUE FEE and PUBLICATION FEE (if required). Blocks 1 through 5 should be completed where appropriate. All further correspondence including the Patent, advance orders and notification of maintenance fees will be mailed to the current correspondence address as indicated unless corrected below or directed otherwise in Block 1, by (a) specifying a new correspondence address; and/or (b) indicating a separate "FEE ADDRESS" for maintenance fee notifications.

CURRENT CORRESPONDENCE ADDRESS (Note: Use Block 1 for any change of address)

22882 7590 03/08/2019
MARTIN & FERRARO, LLP
1557 LAKE O'PINES STREET, NE
HARTVILLE, OH 44632




Note: A certificate of mailing can only be used for domestic mailings of the Fee(s) Transmittal. This certificate cannot be used for any other accompanying papers. Each additional paper, such as an assignment or formal drawing, must have its own certificate of mailing or transmission.

**Certificate of Mailing or Transmission**

I hereby certify that this Fee(s) Transmittal is being deposited with the United States Postal Service with sufficient postage for first class mail in an envelope addressed to the Mail Stop ISSUE FEE address above, or being transmitted to the USPTO via EFS-Web or by facsimile to (571) 273-2885, on the date indicated below.

(Typed or printed name)
(Signature)
(Date)

| APPLICATION NO. | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
|---|---|---|---|---|
| 15/377,522 | 12/13/2016 | Gregory D. Conley | 269.0003-02000 | 1065 |

TITLE OF INVENTION: ELECTRONIC VAPORIZER

| APPLN. TYPE | ENTITY STATUS | ISSUE FEE DUE | PUBLICATION FEE DUE | PREV. PAID ISSUE FEE | TOTAL FEE(S) DUE | DATE DUE |
|---|---|---|---|---|---|---|
| nonprovisional | SMALL | $500 | $0 | $500 | $500 | 06/10/2019 |

| EXAMINER | ART UNIT | CLASS-SUBCLASS |
|---|---|---|
| CAMPBELL, THOR S | 3761 | 392-386000 |

1. Change of correspondence address or indication of "Fee Address" (37 CFR 1.363).
- ☐ Change of correspondence address (or Change of Correspondence Address form PTO/SB/122) attached.
- ☐ "Fee Address" indication (or "Fee Address" Indication form PTO/SB/47; Rev 03-09 or more recent) attached. Use of a Customer Number is required.

2. For printing on the patent front page, list
(1) The names of up to 3 registered patent attorneys or agents OR, alternatively,
(2) The name of a single firm (having as a member a registered attorney or agent) and the names of up to 2 registered patent attorneys or agents. If no name is listed, no name will be printed.

1 Martin & Ferraro, LLP
2
3

3. ASSIGNEE NAME AND RESIDENCE DATA TO BE PRINTED ON THE PATENT (print or type)

PLEASE NOTE: Unless an assignee is identified below, no assignee data will appear on the patent. If an assignee is identified below, the document must have been previously recorded, or filed for recordation, as set forth in 37 CFR 3.11 and 37 CFR 3.81(a). Completion of this form is NOT a substitute for filing an assignment.

(A) NAME OF ASSIGNEE: FUMA INTERNATIONAL, LLC
(B) RESIDENCE: (CITY and STATE OR COUNTRY): Medina, OH

Please check the appropriate assignee category or categories (will not be printed on the patent): ☐ Individual ☒ Corporation or other private group entity ☐ Government

4a. Fees submitted: ☒ Issue Fee ☐ Publication Fee (if required) ☐ Advance Order - # of Copies _____

4b. Method of Payment: *(Please first reapply any previously paid fee shown above)*
☐ Electronic Payment via EFS-Web ☐ Enclosed check ☐ Non-electronic payment by credit card (Attach form PTO-2038)
☐ The Director is hereby authorized to charge the required fee(s), any deficiency, or credit any overpayment to Deposit Account No. _____

5. Change in Entity Status (from status indicated above)
- ☐ Applicant certifying micro entity status. See 37 CFR 1.29 — NOTE: Absent a valid certification of Micro Entity Status (see forms PTO/SB/15A and 15B), issue fee payment in the micro entity amount will not be accepted at the risk of application abandonment.
- ☐ Applicant asserting small entity status. See 37 CFR 1.27 — NOTE: If the application was previously under micro entity status, checking this box will be taken to be a notification of loss of entitlement to micro entity status.
- ☐ Applicant changing to regular undiscounted fee status. — NOTE: Checking this box will be taken to be a notification of loss of entitlement to small or micro entity status, as applicable.

NOTE: This form must be signed in accordance with 37 CFR 1.31 and 1.33. See 37 CFR 1.4 for signature requirements and certifications.

Authorized Signature: Thomas H. Martin Date: March 11, 2019

Typed or printed name: Thomas H. Martin Registration No.: 34,383



PTOL-85 Part B (08-18) Approved for use through 01/31/2020 OMB 0651-0033 U.S. Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE

United States Patent and Trademark Office

- Sales Receipt -

Adjustment date: 03/12/2019 CCHAU2

02/28/2019 INTEFSW 00002473 15377522

01 FC:2501 -500.00 OP

United States Patent and Trademark Office

- Sales Receipt -

03/12/2019 CCHAU2 00000019 15377522

01 FC:2501 500.00 OP

PATENT
Attorney Docket No. 269.0003-02000
Customer No. 22882

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

| | | |
|---|---|---|
| In re Application of: | ) | Confirmation No.: 1065 |
| Gregory D. Conley et al. | ) | |
| Serial No.: 15/377,522 | ) | Group Art Unit: 3761 |
| Filed: December 13, 2016 | ) | Examiner: Thor S. Campbell |
| For: ELECTRONIC VAPORIZER | ) | Allowed: February 26, 2019 |

Mail Stop ISSUE FEE
Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Sir:

**SUPPLEMENTAL RESPONSE TO INFORMATIONAL NOTICE TO APPLICANT**

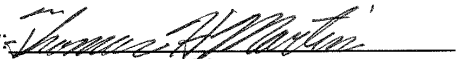
Further to the Response dated February 26, 2019 and in response to the Letter attached to the Corrected Notice of Allowance dated March 8, 2019, Applicant submits a newly executed Declaration for inventor Daniel C. Hillenbrandt Jr. in compliance with 37 C.F.R. § 1.63 for filing in the above-identified application.

Please associate the enclosed documents with the above-identified application.

Respectfully submitted,

MARTIN & FERRARO LLP

Dated: March 11, 2019

By: 
Thomas H. Martin
Registration No. 34,383

1557 Lake O'Pines Street, NE
Hartville, Ohio 44632
Telephone: (330) 877-0700

PTO/AIA/01 (06-12)
Approved for use through 11/30/2020. OMB 0651-0032
U.S. Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE
Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it displays a valid OMB control number.

# DECLARATION (37 CFR 1.63) FOR UTILITY OR DESIGN APPLICATION USING AN APPLICATION DATA SHEET (37 CFR 1.76)

| Title of Invention | ELECTRONIC VAPORIZER |
|---|---|

As the below named inventor, I hereby declare that:

This declaration is directed to:

☐ The attached application, or

☒ United States application or PCT international application number 15/377,522 filed on December 13, 2016.

The above-identified application was made or authorized to be made by me.

I believe that I am the original inventor or an original joint inventor of a claimed invention in the application.

I hereby acknowledge that any willful false statement made in this declaration is punishable under 18 U.S.C. 1001 by fine or imprisonment of not more than five (5) years, or both.

## WARNING:

Petitioner/applicant is cautioned to avoid submitting personal information in documents filed in a patent application that may contribute to identity theft. Personal information such as social security numbers, bank account numbers, or credit card numbers (other than a check or credit card authorization form PTO-2038 submitted for payment purposes) is never required by the USPTO to support a petition or an application. If this type of personal information is included in documents submitted to the USPTO, petitioners/applicants should consider redacting such personal information from the documents before submitting them to the USPTO. Petitioner/applicant is advised that the record of a patent application is available to the public after publication of the application (unless a non-publication request in compliance with 37 CFR 1.213(a) is made in the application) or issuance of a patent. Furthermore, the record from an abandoned application may also be available to the public if the application is referenced in a published application or an issued patent (see 37 CFR 1.14). Checks and credit card authorization forms PTO-2038 submitted for payment purposes are not retained in the application file and therefore are not publicly available.

LEGAL NAME OF INVENTOR

Inventor: Daniel C. Hillenbrandt Jr. Date (Optional): 2019-03-11

Signature: Daniel C Hillenbrandt Jr.

Note: An application data sheet (PTO/SB/14 or equivalent), including naming the entire inventive entity, must accompany this form or must have been previously filed. Use an additional PTO/AIA/01 form for each additional inventor.

This collection of information is required by 35 U.S.C. 115 and 37 CFR 1.63. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.11 and 1.14. This collection is estimated to take 1 minute to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. **SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.**

*If you need assistance in completing the form, call 1-800-PTO-9199 and select option 2.*

| Electronic Acknowledgement Receipt | |
|---|---|
| **EFS ID:** | 35380450 |
| **Application Number:** | 15377522 |
| **International Application Number:** | |
| **Confirmation Number:** | 1065 |
| **Title of Invention:** | ELECTRONIC VAPORIZER |
| **First Named Inventor/Applicant Name:** | Gregory D. Conley |
| **Customer Number:** | 22882 |
| **Filer:** | Thomas H. Martin/Sandra Blackmon |
| **Filer Authorized By:** | Thomas H. Martin |
| **Attorney Docket Number:** | 269.0003-02000 |
| **Receipt Date:** | 11-MAR-2019 |
| **Filing Date:** | 13-DEC-2016 |
| **Time Stamp:** | 13:45:17 |
| **Application Type:** | Utility under 35 USC 111(a) |

## Payment information:

| Submitted with Payment | no |
|---|---|

## File Listing:

| Document Number | Document Description | File Name | File Size(Bytes)/ Message Digest | Multi Part /.zip | Pages (if appl.) |
|---|---|---|---|---|---|
| 1 | Issue Fee Payment (PTO-85B) | IF_Request.pdf | 942289<br>a753f0c09362c17607aad1af13956aaa5aabd4e0 | no | 2 |

**Warnings:**

| | | | | | |
|---|---|---|---|---|---|
| **Information:** | | | | | |
| 2 | Applicant Response to Pre-Exam Formalities Notice | Suppl_Resp.pdf | 91098<br>00598644b72e98fd1f3c2548236a8aaf9c90909b | no | 1 |
| **Warnings:** | | | | | |
| **Information:** | | | | | |
| 3 | Oath or Declaration filed | Declaration.pdf | 206859<br>fcf5f6e434eeb0758790baa198edbdfaca35e408 | no | 1 |
| **Warnings:** | | | | | |
| **Information:** | | | | | |
| | | **Total Files Size (in bytes):** | 1240246 | | |

**This Acknowledgement Receipt evidences receipt on the noted date by the USPTO of the indicated documents, characterized by the applicant, and including page counts, where applicable. It serves as evidence of receipt similar to a Post Card, as described in MPEP 503.**

**New Applications Under 35 U.S.C. 111**

**If a new application is being filed and the application includes the necessary components for a filing date (see 37 CFR 1.53(b)-(d) and MPEP 506), a Filing Receipt (37 CFR 1.54) will be issued in due course and the date shown on this Acknowledgement Receipt will establish the filing date of the application.**

**National Stage of an International Application under 35 U.S.C. 371**

**If a timely submission to enter the national stage of an international application is compliant with the conditions of 35 U.S.C. 371 and other applicable requirements a Form PCT/DO/EO/903 indicating acceptance of the application as a national stage submission under 35 U.S.C. 371 will be issued in addition to the Filing Receipt, in due course.**

**New International Application Filed with the USPTO as a Receiving Office**

**If a new international application is being filed and the international application includes the necessary components for an international filing date (see PCT Article 11 and MPEP 1810), a Notification of the International Application Number and of the International Filing Date (Form PCT/RO/105) will be issued in due course, subject to prescriptions concerning national security, and the date shown on this Acknowledgement Receipt will establish the international filing date of the application.**

PATENT
Attorney Docket No. 269.0003-02000
Customer No. 22882

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

| | | |
|---|---|---|
| In re Application of: | ) | Confirmation No.: 1065 |
| Gregory D. Conley et al. | ) | Group Art Unit: 3761 |
| Serial No.: 15/377,522 | ) | Examiner: Thor S. Campbell |
| Filed: December 13, 2016 | ) | (Issue Fee previously paid on: |
| For: ELECTRONIC VAPORIZER | ) | February 27, 2019) |

MS ISSUE FEE
Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Sir:

**REQUEST TO APPLY ISSUE FEE**

Submitted herewith is an Issue Fee Transmittal Form for the above-identified application. It is requested that the Issue Fee in the amount of $500 (paid on February 27, 2019) be applied to this submission.

If there is any deficiency or additional fee due in connection with the filing of this submission, please charge the fee to our Deposit Account No. 50-1068.

Respectfully submitted,

MARTIN & FERRARO, LLP

Date: March 11, 2019

By: 
Thomas H. Martin
Registration No. 34,383

1557 Lake O'Pines Street, NE
Hartville, Ohio 44632
Telephone: (330) 877-0700

## PART B - FEE(S) TRANSMITTAL

**Complete and send this form, together with applicable fee(s), by mail or fax, or via EFS-Web.**

**By mail, send to:** **Mail Stop ISSUE FEE**
**Commissioner for Patents**
**P.O. Box 1450**
**Alexandria, Virginia 22313-1450**

**By fax, send to:** **(571)-273-2885**

INSTRUCTIONS: This form should be used for transmitting the ISSUE FEE and PUBLICATION FEE (if required). Blocks 1 through 5 should be completed where appropriate. All further correspondence including the Patent, advance orders and notification of maintenance fees will be mailed to the current correspondence address as indicated unless corrected below or directed otherwise in Block 1, by (a) specifying a new correspondence address; and/or (b) indicating a separate "FEE ADDRESS" for maintenance fee notifications.

CURRENT CORRESPONDENCE ADDRESS (Note: Use Block 1 for any change of address)

22882 7590 03/08/2019
MARTIN & FERRARO, LLP
1557 LAKE O'PINES STREET, NE
HARTVILLE, OH 44632

Note: A certificate of mailing can only be used for domestic mailings of the Fee(s) Transmittal. This certificate cannot be used for any other accompanying papers. Each additional paper, such as an assignment or formal drawing, must have its own certificate of mailing or transmission.

**Certificate of Mailing or Transmission**
I hereby certify that this Fee(s) Transmittal is being deposited with the United States Postal Service with sufficient postage for first class mail in an envelope addressed to the Mail Stop ISSUE FEE address above, or being transmitted to the USPTO via EFS-Web or by facsimile to (571) 273-2885, on the date indicated below.

| |
|---|
| (Typed or printed name) |
| (Signature) |
| (Date) |

| APPLICATION NO. | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
|---|---|---|---|---|
| 15/377,522 | 12/13/2016 | Gregory D. Conley | 269.0003-02000 | 1065 |

TITLE OF INVENTION: ELECTRONIC VAPORIZER

| APPLN. TYPE | ENTITY STATUS | ISSUE FEE DUE | PUBLICATION FEE DUE | PREV. PAID ISSUE FEE | TOTAL FEE(S) DUE | DATE DUE |
|---|---|---|---|---|---|---|
| nonprovisional | SMALL | $500 | $0 | $500 | $500 | 06/10/2019 |

| EXAMINER | ART UNIT | CLASS-SUBCLASS |
|---|---|---|
| CAMPBELL, THOR S | 3761 | 392-386000 |

1. Change of correspondence address or indication of "Fee Address" (37 CFR 1.363).
☐ Change of correspondence address (or Change of Correspondence Address form PTO/SB/122) attached.
☐ "Fee Address" indication (or "Fee Address" Indication form PTO/SB/47; Rev 03-09 or more recent) attached. Use of a Customer Number is required.

2. For printing on the patent front page, list
(1) The names of up to 3 registered patent attorneys or agents OR, alternatively,
(2) The name of a single firm (having as a member a registered attorney or agent) and the names of up to 2 registered patent attorneys or agents. If no name is listed, no name will be printed.
1 Martin & Ferraro, LLP
2
3

3. ASSIGNEE NAME AND RESIDENCE DATA TO BE PRINTED ON THE PATENT (print or type)

PLEASE NOTE: Unless an assignee is identified below, no assignee data will appear on the patent. If an assignee is identified below, the document must have been previously recorded, or filed for recordation, as set forth in 37 CFR 3.11 and 37 CFR 3.81(a). Completion of this form is NOT a substitute for filing an assignment.

| (A) NAME OF ASSIGNEE | (B) RESIDENCE: (CITY and STATE OR COUNTRY) |
|---|---|
| FUMA INTERNATIONAL, LLC | Medina, OH |

Please check the appropriate assignee category or categories (will not be printed on the patent) : ☐ Individual ☒ Corporation or other private group entity ☐ Government

4a. Fees submitted: ☒ Issue Fee ☐ Publication Fee (if required) ☐ Advance Order - # of Copies _____

4b. Method of Payment: *(Please first reapply any previously paid fee shown above)*
☐ Electronic Payment via EFS-Web ☐ Enclosed check ☐ Non-electronic payment by credit card (Attach form PTO-2038)
☐ The Director is hereby authorized to charge the required fee(s), any deficiency, or credit any overpayment to Deposit Account No. _____

5. **Change in Entity Status** (from status indicated above)

☐ Applicant certifying micro entity status. See 37 CFR 1.29
NOTE: Absent a valid certification of Micro Entity Status (see forms PTO/SB/15A and 15B), issue fee payment in the micro entity amount will not be accepted at the risk of application abandonment.

☐ Applicant asserting small entity status. See 37 CFR 1.27
NOTE: If the application was previously under micro entity status, checking this box will be taken to be a notification of loss of entitlement to micro entity status.

☐ Applicant changing to regular undiscounted fee status.
NOTE: Checking this box will be taken to be a notification of loss of entitlement to small or micro entity status, as applicable.

NOTE: This form must be signed in accordance with 37 CFR 1.31 and 1.33. See 37 CFR 1.4 for signature requirements and certifications.

Authorized Signature Thomas H. Martin Date March 11, 2019

Typed or printed name Thomas H. Martin Registration No. 34,383



PTOL-85 Part B (08-18) Approved for use through 01/31/2020 OMB 0651-0033 U.S. Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE

# Electronic Acknowledgement Receipt

| | |
|---|---|
| **EFS ID:** | 35428909 |
| **Application Number:** | 15377522 |
| **International Application Number:** | |
| **Confirmation Number:** | 1065 |
| **Title of Invention:** | ELECTRONIC VAPORIZER |
| **First Named Inventor/Applicant Name:** | Gregory D. Conley |
| **Customer Number:** | 22882 |
| **Filer:** | Thomas H. Martin/Sandra Blackmon |
| **Filer Authorized By:** | Thomas H. Martin |
| **Attorney Docket Number:** | 269.0003-02000 |
| **Receipt Date:** | 14-MAR-2019 |
| **Filing Date:** | 13-DEC-2016 |
| **Time Stamp:** | 17:31:51 |
| **Application Type:** | Utility under 35 USC 111(a) |

## Payment information:

| | |
|---|---|
| Submitted with Payment | no |

## File Listing:

| Document Number | Document Description | File Name | File Size(Bytes)/ Message Digest | Multi Part /.zip | Pages (if appl.) |
|---|---|---|---|---|---|
| 1 | Miscellaneous Incoming Letter | Statement_with_Attachment.pdf | 23215564<br>b5d3c52696fa86731906ba0f428020fe9efd80e | no | 197 |

**Warnings:**

| Information: | |
|---|---|
| Total Files Size (in bytes): | 23215564 |

**This Acknowledgement Receipt evidences receipt on the noted date by the USPTO of the indicated documents, characterized by the applicant, and including page counts, where applicable. It serves as evidence of receipt similar to a Post Card, as described in MPEP 503.**

**New Applications Under 35 U.S.C. 111**
**If a new application is being filed and the application includes the necessary components for a filing date (see 37 CFR 1.53(b)-(d) and MPEP 506), a Filing Receipt (37 CFR 1.54) will be issued in due course and the date shown on this Acknowledgement Receipt will establish the filing date of the application.**
**National Stage of an International Application under 35 U.S.C. 371**
**If a timely submission to enter the national stage of an international application is compliant with the conditions of 35 U.S.C. 371 and other applicable requirements a Form PCT/DO/EO/903 indicating acceptance of the application as a national stage submission under 35 U.S.C. 371 will be issued in addition to the Filing Receipt, in due course.**
**New International Application Filed with the USPTO as a Receiving Office**
**If a new international application is being filed and the international application includes the necessary components for an international filing date (see PCT Article 11 and MPEP 1810), a Notification of the International Application Number and of the International Filing Date (Form PCT/RO/105) will be issued in due course, subject to prescriptions concerning national security, and the date shown on this Acknowledgement Receipt will establish the international filing date of the application.**

PATENT
Attorney Docket No. 269.0003-02000
Customer No. 22882

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

| | | |
|---|---|---|
| In re Application of: | ) | Confirmation No.: 1065 |
| Gregory D. Conley et al. | ) | |
| Serial No.: 15/377,522 | ) | Group Art Unit: 3761 |
| Filed: December 13, 2016 | ) | Examiner: Thor S. Campbell |
| For: ELECTRONIC VAPORIZER | ) | |

Mail Stop ISSUE FEE
Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Sir:

**STATEMENT UNDER 37 CFR 1.56**

Pursuant to 37 CFR 1.56 and MPEP 2001.06(c), Applicant brings to the attention of the Examiner the existence of a newly filed litigation proceeding, i.e., Civil Action No. 19-260 in the U.S. District Court for the Middle District of North Carolina, asserting infringement of U.S. Patent No. 9,532,604. The '604 patent issued from application serial no.14/510,955, which is the parent of application serial no. 15/377,522.

In addition to filing this statement, Applicant's undersigned representative called Examiner Campbell today and left a voicemail message informing him of the existence of the litigation and advising him that the present statement under 37 CFR 1.56 and in accordance with MPEP 2001.06(c) was being filed today with a copy of the complaint for patent infringement. The Examiner was invited to call the undersigned back if he had any questions, comments, or desired any additional information.

Applicant requests this Statement be made of record in the above-identified application.

Respectfully submitted,
MARTIN & FERRARO LLP

Dated: March 14, 2019

By: _____
Thomas H. Martin
Registration No. 34,383

1557 Lake O'Pines Street, NE
Hartville, Ohio 44632
Telephone: (330) 877-0700

UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

| APPLICATION NO. | ISSUE DATE | PATENT NO. | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
|---|---|---|---|---|
| 15/377,522 | 05/07/2019 | 10278425 | 269.0003-02000 | 1065 |

22882 7590 04/17/2019

MARTIN & FERRARO, LLP
1557 LAKE O'PINES STREET, NE
HARTVILLE, OH 44632

# ISSUE NOTIFICATION

The projected patent number and issue date are specified above.

**Determination of Patent Term Adjustment under 35 U.S.C. 154 (b)**
(application filed on or after May 29, 2000)

The Patent Term Adjustment is 307 day(s). Any patent to issue from the above-identified application will include an indication of the adjustment on the front page.

If a Continued Prosecution Application (CPA) was filed in the above-identified application, the filing date that determines Patent Term Adjustment is the filing date of the most recent CPA.

Applicant will be able to obtain more detailed information by accessing the Patent Application Information Retrieval (PAIR) WEB site (http://pair.uspto.gov).

Any questions regarding the Patent Term Extension or Adjustment determination should be directed to the Office of Patent Legal Administration at (571)-272-7702. Questions relating to issue and publication fee payments should be directed to the Application Assistance Unit (AAU) of the Office of Data Management (ODM) at (571)-272-4200.

APPLICANT(s) (Please see PAIR WEB site http://pair.uspto.gov for additional applicants):

Gregory D. Conley, Medina, OH;
FUMA International, LLC, Medina, OH;
Daniel C. Hillenbrandt JR., Brunswick, OH;

The United States represents the largest, most dynamic marketplace in the world and is an unparalleled location for business investment, innovation, and commercialization of new technologies. The USA offers tremendous resources and advantages for those who invest and manufacture goods here. Through SelectUSA, our nation works to encourage and facilitate business investment. To learn more about why the USA is the best country in the world to develop technology, manufacture products, and grow your business, visit SelectUSA.gov.

Document code: WFEE

United States Patent and Trademark Office
Sales Receipt for Accounting Date: 05/03/2019

KWHITE1 SALE #00000004 Mailroom Dt: 05/01/2019 501068 15377522
01 FC : 2806 120.00 DA

Doc code: RCEX
Doc description: Request for Continued Examination (RCE)

PTO/SB/30EFS (02-18)
Approved for use through 11/30/2020. OMB 0651-0031
U.S. Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE
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# REQUEST FOR CONTINUED EXAMINATION(RCE)TRANSMITTAL
## (Submitted Only via EFS-Web)

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| Application Number | 15/377,522 | Filing Date | 2016-12-13 | Docket Number (if applicable) | 269-0003-02000 | Art Unit | 3761 |
| First Named Inventor | Gregory D. Conley | | | Examiner Name | Thor S. Campbell | | |

**This is a Request for Continued Examination (RCE) under 37 CFR 1.114 of the above-identified application.**
Request for Continued Examination (RCE) practice under 37 CFR 1.114 does not apply to any utility or plant application filed prior to June 8, 1995, or to any design application. The Instruction Sheet for this form is located at WWW.USPTO.GOV

### SUBMISSION REQUIRED UNDER 37 CFR 1.114

Note: If the RCE is proper, any previously filed unentered amendments and amendments enclosed with the RCE will be entered in the order in which they were filed unless applicant instructs otherwise. If applicant does not wish to have any previously filed unentered amendment(s) entered, applicant must request non-entry of such amendment(s).

☐ Previously submitted. If a final Office action is outstanding, any amendments filed after the final Office action may be considered as a submission even if this box is not checked.

☐ Consider the arguments in the Appeal Brief or Reply Brief previously filed on _____

☐ Other _____

☒ Enclosed

☐ Amendment/Reply

☒ Information Disclosure Statement (IDS)

☐ Affidavit(s)/ Declaration(s)

☒ Other Certification and Request of IDS Under QPIDS Program (Form PTO/SB/09)

### MISCELLANEOUS

☐ Suspension of action on the above-identified application is requested under 37 CFR 1.103(c) for a period of months _____ (Period of suspension shall not exceed 3 months; Fee under 37 CFR 1.17(i) required)

☐ Other _____

### FEES

☒ **The RCE fee under 37 CFR 1.17(e) is required by 37 CFR 1.114 when the RCE is filed.**
The Director is hereby authorized to charge any underpayment of fees, or credit any overpayments, to Deposit Account No 501068

### SIGNATURE OF APPLICANT, ATTORNEY, OR AGENT REQUIRED

X Patent Practitioner Signature

Applicant Signature

EFS - Web 2.1.16

PTO/SB/30EFS (02-18)
Approved for use through 11/30/2020. OMB 0651-0031
U.S. Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE

Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it contains a valid OMB control number.

| Signature of Registered U.S. Patent Practitioner | | | |
|---|---|---|---|
| Signature | /Thomas H. Martin/ | Date (YYYY-MM-DD) | 2019-05-01 |
| Name | Thomas H. Martin | Registration Number | 34383 |

This collection of information is required by 37 CFR 1.114. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.11 and 1.14. This collection is estimated to take 12 minutes to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450.

*If you need assistance in completing the form, call 1-800-PTO-9199 and select option 2.*

# Privacy Act Statement

The Privacy Act of 1974 (P.L. 93-579) requires that you be given certain information in connection with your submission of the attached form related to a patent application or patent. Accordingly, pursuant to the requirements of the Act, please be advised that: (1) the general authority for the collection of this information is 35 U.S.C. 2(b)(2); (2) furnishing of the information solicited is voluntary; and (3) the principal purpose for which the information is used by the U.S. Patent and Trademark Office is to process and/or examine your submission related to a patent application or patent. If you do not furnish the requested information, the U.S. Patent and Trademark Office may not be able to process and/or examine your submission, which may result in termination of proceedings or abandonment of the application or expiration of the patent.

The information provided by you in this form will be subject to the following routine uses:

1. The information on this form will be treated confidentially to the extent allowed under the Freedom of Information Act (5 U.S.C. 552) and the Privacy Act (5 U.S.C. 552a). Records from this system of records may be disclosed to the Department of Justice to determine whether the Freedom of Information Act requires disclosure of these records.

2. A record from this system of records may be disclosed, as a routine use, in the course of presenting evidence to a court, magistrate, or administrative tribunal, including disclosures to opposing counsel in the course of settlement negotiations.

3. A record in this system of records may be disclosed, as a routine use, to a Member of Congress submitting a request involving an individual, to whom the record pertains, when the individual has requested assistance from the Member with respect to the subject matter of the record.

4. A record in this system of records may be disclosed, as a routine use, to a contractor of the Agency having need for the information in order to perform a contract. Recipients of information shall be required to comply with the requirements of the Privacy Act of 1974, as amended, pursuant to 5 U.S.C. 552a(m).

5. A record related to an International Application filed under the Patent Cooperation Treaty in this system of records may be disclosed, as a routine use, to the International Bureau of the World Intellectual Property Organization, pursuant to the Patent Cooperation Treaty.

6. A record in this system of records may be disclosed, as a routine use, to another federal agency for purposes of National Security review (35 U.S.C. 181) and for review pursuant to the Atomic Energy Act (42 U.S.C. 218(c)).

7. A record from this system of records may be disclosed, as a routine use, to the Administrator, General Services, or his/her designee, during an inspection of records conducted by GSA as part of that agency's responsibility to recommend improvements in records management practices and programs, under authority of 44 U.S.C. 2904 and 2906. Such disclosure shall be made in accordance with the GSA regulations governing inspection of records for this purpose, and any other relevant (i.e., GSA or Commerce) directive. Such disclosure shall not be used to make determinations about individuals.

8. A record from this system of records may be disclosed, as a routine use, to the public after either publication of the application pursuant to 35 U.S.C. 122(b) or issuance of a patent pursuant to 35 U.S.C. 151. Further, a record may be disclosed, subject to the limitations of 37 CFR 1.14, as a routine use, to the public if the record was filed in an application which became abandoned or in which the proceedings were terminated and which application is referenced by either a published application, an application open to public inspections or an issued patent.

9. A record from this system of records may be disclosed, as a routine use, to a Federal, State, or local law enforcement agency, if the USPTO becomes aware of a violation or potential violation of law or regulation.

OMB 0651-0031

| Substitute for FORM PTO-1449 | Attorney Docket Number 269.0003-02000 | Customer No. 22882 | |
|---|---|---|---|
| **INFORMATION DISCLOSURE STATEMENT IN AN APPLICATION** | Applicant Gregory D. Conley et al. | Application Number 15/377,522 | |
| *(Use several sheets if necessary)* **Sheet 1 of 1** | Filing Date December 13, 2016 | Group Art Unit 3761 | Examiner T.S. Campbell |

**U.S. PATENT DOCUMENTS**

| EXAMINER INITIAL | DOCUMENT NUMBER | DATE | NAME | CLASS | SUBCLASS | FILING DATE IF APPROPRIATE |
|---|---|---|---|---|---|---|
| | 2057353 | 9/1935 | Whittemore, Jr. | | | |
| | 4947874 | 8/1990 | Brooks | | | |
| | | | | | | |

**U.S. PATENT PUBLICATION DOCUMENTS**

| EXAMINER INITIAL | DOCUMENT NUMBER | DATE | NAME | CLASS | SUBCLASS | FILING DATE IF APPROPRIATE |
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**FOREIGN PATENT DOCUMENTS**

| | DOCUMENT NUMBER | DATE | COUNTRY | CLASS | SUBCLASS | TRANSLATION (YES/NO) |
|---|---|---|---|---|---|---|
| | 201238610 | 5/2009 | CN | | | Abstract Only |
| | 20090033311 | 4/2009 | KR | | | Abstract Only |
| | WO2005099494 | 10/2005 | WIPO | | | Abstract Only |
| | WO2007131450 | 11/2007 | WIPO | | | Abstract Only |
| | | | | | | |

| | **NON PATENT LITERATURE DOCUMENTS** ***(Including Author, Title, Date, Pertinent Pages, Etc.)*** |
|---|---|
| | Complaint for Patent Infringement with exhibits as filed 06MAR2019; United States District Court for the Middle District of North Carolina; Civil Action No. 1:19-cv-00260. |
| | Defendant R.J. Reynolds Vapor Company's Answer, Affirmative Defenses and Counterclaim to Complaint for Patent Infringement with exhibits as filed 29APR2019; United States District Court for the Middle District of North Carolina; Civil Action No. 1:19-cv-00260. |
| | Crown 7 HYDRO device; *https://www.youtube.com/watch?v=tQNFFw8A_DI* (YouTube video published on 10DEC2008). |
| | NJOY NPRO device; https://www.youtube.com/watch?v=TBdX24ALpLY (YouTube video published on 5DEC2008). |
| | Smoke 51 Devices as disclosed on page 53 and listed on page 54 of the 29APR2019 Defendant's Answer in Civil Action No. 1:19-cv-00260. |
| | |

| **EXAMINER** | **DATE CONSIDERED** |
|---|---|

EXAMINER: Initial if citation considered, whether or not citation is in conformance with MPEP § 609; Draw line through citation if not in conformance and not considered. Include copy of this form with next communication to the applicant.

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# Bibliographic data: CN201238610 (Y) — 2009-05-20

## Environmental-protecting type non-ignitability atomizing electronic cigarette with function of cigarette substitute article

**Inventor(s):** HAORAN XIA [CN] ± (XIA HAORAN)

**Applicant(s):** HAORAN XIA [CN] ± (XIA HAORAN)

**Classification:** **- international:*A24F47/00; B05B17/04; G05B19/04; H04R19/01; H04R19/04***

**- cooperative:**

**Application number:** CN20082132275U 20080819

**Priority number(s):** CN20082132275U 20080819

### Abstract of CN201238610 (Y)

The utility model discloses an environment-friendly incombustible atomizing electronic cigarette with the function of a cigarette substitute, which relates to a cigarette substitute and comprises a detachable controller and a generator; the inner part of the controller is provided with an indicating lamp cover, a signal indicating lamp, a chargeable lithium battery, an integrated circuit board, an electret microphone and a hollow connecting conductor B in sequence; the inner part of the generator is provided with a connecting conductor A, a vibrating diaphragm, a liquid-blocking plate, a secondary liquid storage chamber, a heater, a liquid-guiding mechanism, a liquid storage chamber and a soft suction nozzle in sequence; the connecting conductor A is provided with an air inlet; a gap which is used as a gas channel is left between the soft nozzle and the liquid storage chamber; and a space which is needed by the electret microphone is left between the electret microphone and the connector conductor B. The utility model has similar shape with the cigarette, is small, easy to carry, simple in structure and low in cost, meets the using habits of smokers, does not have noxious substances of tar and carbon monoxide, and the like, reduces the cancerogenic risk, and does not have fire hazard; in addition, the aspirated smoke does not cause environmental pollution.



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# Bibliographic data: KR20090033311 (A) — 2009-04-02

## NONFLAMMABLE ELECTRONIC CIGARETTE


**Inventor(s):** LI DE LIN [CN] ± (LI DE LIN)

**Applicant(s):** EBACO CO LTD [KR] ± (EBACO CO., LTD)



**Classification:** **- international:** ***A24B15/00; A24B15/16***
**- cooperative:**

**Application number:** KR20080060788 20080626 Global Dossier

**Priority number(s):** KR20080060788 20080626

**Also published as:** KR100918785 (B1)



**Abstract of KR20090033311 (A)**

A nonflammable electronic cigarette is provided, which gives reliability to the function of the electronic cigarette by controlling function of the electronic cigarette using the IC. A nonflammable electronic cigarette comprises: a controller(100) including a signal light lid, a signal light, a battery(2), a circuit board(3), a fine gas operating switch(4), and a first connection conductor; and a smoke generator(200) including a second connection conductor, a pressure room, a moisture suppression assembly(8), a second liquid store chamber(10), a heater(9), a liquid induction unit(11), a liquid store chamber(12), and a nozzle(13).




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(12) 按照专利合作条约所公布的国际申请

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(81) 指定国(除另有指明, 要求每一种可提供的国家保护): AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BW, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, EG, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NA, NI, NO, NZ, OM, PG, PH, PL, PT, RO, RU, SC, SD, SE, SG, SK, SL, SM, SY, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, YU, ZA, ZM, ZW

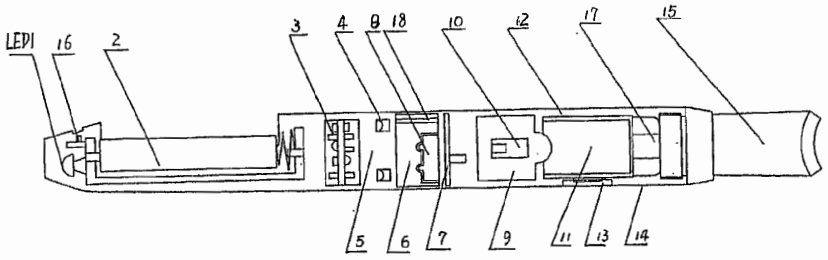
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(54) Title: AN AEROSOL ELECTRONIC CIGARETTE

(54) 发明名称: 雾化电子烟




(57) **Abstract:** This invention relates to an aerosol electronic cigarette just containing nicotine without tar, which includes a shell and a suction nozzle. On the exterior wall of the shell, there is an air orifice, while there are an electronic circuit board, a constant pressure cavity, a sensor, a gasliquid separator, an atomizer, and a supplying bottle orderly located in the interior of the shell, wherein the electronic circuit board consists of an electronic switching circuit and a high-frequency generator. At one side of the sensor there is an air duct. A negative pressure cavity is located in the sensor. The atomizer connects with the supplying bottle, and there is an atomizing cavity located in the atomizer. An antiextrusion ring used to fix the supplying bottle is located between the shell and one side of the supplying bottle. At the other side of the supplying bottle there is a mirage duct. The air orifice, the constant pressure, the sensor, the gasliquid separator, the atomizer, and the mirage duct connect orderly and throughout. Without tar, this invention reduces the risk of suffering cancer, meets the requirement of the smoker, need no ignition, and has no endanger of fire.

[见续页]

WO 2005/099494 A1

(57) 摘要

本发明涉及一种不含有焦油、只含烟碱（尼古丁）的雾化电子烟，包括壳体及吸嘴，壳体的外壁上开有进气孔，壳体内依次设有电子线路板、常压腔、传感器、气液分离器、雾化器、供液瓶；其中电子线路板由电子开关电路及高频发生器组成；在传感器的一侧开有传感器气流通道，传感器内设有负压腔；雾化器与供液瓶相接触，在雾化器的内部设有雾化腔；供液瓶的一侧与壳体之间设有锁定供液瓶的挡圈，供液瓶的另一侧开有雾汽通道；进气孔、常压腔、传感器、气液分离器、雾化器、雾汽通道、导气孔、吸嘴依次相连通。本发明无焦油，大大降低致癌风险，使用者仍有吸烟的感觉和兴奋，无需点燃，无火灾危害。

# 雾化电子烟

## 技术领域

本发明涉及一种电子烟，特别是一种不含有焦油、只含烟碱（尼古丁）的雾化电子烟。

## 背景技术

在当今“吸烟有害健康”已成为常识的情况下，全世界目前仍有 10 亿人吸烟，而且每年这个数字还在扩大。2003 年 3 月 1 日世界卫生组织（WHO）通过的第一个国际禁烟协定《烟草控制框架公约》，据 WHO 提供的数字表明，吸烟每年造成 490 万人死亡，尽管吸烟可导致严重的呼吸系统疾病和癌症，让吸烟者完全戒烟是极其困难的事。

香烟的有效成分是烟碱（即尼古丁），吸烟时烟碱随着香烟燃烧产生的大量焦油雾滴进入肺泡后被迅速吸收，烟碱被吸收入血后作用于中枢神经系统的受体上，引起类似兴奋剂的“陶醉感”，如吸烟者所经历的头晕目眩或飘飘然的感觉。

烟碱是小分子生物碱，在小剂量下对人体基本无害，而且在血液中的半衰期极短。烟草的有害物质主要是焦油，烟草焦油是由数千种成分组成，其中有数十种成分是致癌物。目前证实被动吸烟对不吸烟者的危害更大。

为了寻找只含烟碱而不含有害焦油的香烟代用品，有许多发明是用较纯的烟碱制成诸如“戒烟贴”、“烟碱含漱水”、“包装在有抛射剂的高压气罐喷雾剂”、“烟碱口香糖”、“烟碱饮料”等产品，这些产品虽然没有焦油的危害，但因烟碱吸收缓慢，在血液中不能建立有效的高峰浓度，不能解决需求烟碱“过瘾”的感觉，同时也剥夺了吸烟者已经养成的“抽”、“吸”的习惯，因而类似的产品不能真正的作为戒烟用品或香烟代用品。

## 发明内容

为了克服上述不足，本发明的目的在于提供一种具有戒烟和香烟代用品作用的雾化电子烟。

本发明的目的是通过以下技术方案来实现的：

本发明包括壳体及吸嘴，壳体的外壁上开有进气孔，壳体内依次设有电子线路板、



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常压腔、传感器、气液分离器、雾化器、供液瓶；其中电子线路板由电子开关电路及高频振荡器组成；在传感器的一侧开有传感器气流通道，与壳体内腔相通，传感器内设有负压腔；雾化器与供液瓶相接触，与壳体之间留有空隙，在雾化器的内部设有雾化腔；供液瓶的一侧与壳体之间设有锁定供液瓶的挡圈，供液瓶的另一侧留有雾汽通道；进气孔、常压腔、传感器、气液分离器、雾化器、雾汽通道、导气孔、吸嘴依次相连通；壳体内的前端还包括一个发光二极管和电池，共同构成一个烟嘴形、雪茄形或烟斗形的整体。

其中：在壳体的内壁上加设有显示屏，与电子线路板连接；在壳体内与传感器并联的有用于手动清洁的微动开关；传感器与其内部的负压腔之间设有波纹膜，传感器内还设有第一磁钢、第二磁钢及置于两者之间的干簧管，第二磁钢固接在波纹膜上；传感器内置有硅胶件逆止阀，阀内设有第三磁钢，阀外靠近第三磁钢的一侧设有干簧管；气液分离器上开有通孔，在气液分离器上的通孔外套有硅胶件逆止阀；雾化腔的雾化腔壁上开有溢流孔，雾化腔腔内设有加热体，在加热体的一侧开有第一气流喷射孔，多孔体包在雾化腔壁外，雾化器的一侧设有第一压电片，另一侧设有凸起；雾化器中加设第二压电片；雾化器中的多孔体可用泡沫镍、不锈钢纤维毡、高分子多聚物发泡体及泡沫陶瓷制成；加热体可用铂丝、镍铬合金或含有稀土元素的铁铬铝合金丝制成，也可制成片状体；雾化腔壁可用氧化铝或陶瓷制成；气液分离器可用塑料或硅橡胶制成；供液瓶内装有贮液多孔体，其可用聚丙纤维、涤纶纤维或尼龙纤维充填，或用塑料发泡成形体充填；也可用聚氯乙烯、聚丙烯、聚碳酸酯注塑成多层板的柱状物；干簧管、第一磁钢、第二磁钢、波纹膜可用有封闭膜的半导体应变片来代替，安装在传感器波纹膜位置。

本发明还公开了另一种结构的雾化电子烟，在壳体内，雾化器后置，供液瓶设在气液分离器和雾化器之间，在供液瓶的一端加设有将供液瓶压紧在雾化器上的弹片。

本发明的优点是：吸烟无焦油，大大降低致癌风险，使用者仍有吸烟的感觉和兴奋，无需点燃，无火灾危害。

本发明的装置和连接结构在贮液器稍加改动后可装入常规药物供肺内给药器械。

附图说明

图 1 为本发明的一种整体结构示意图；

图 2 为本发明的另一种整体结构示意图；



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图 3 为本发明带显示屏的整体结构示意图；

图 4 为本发明传感器的结构图；

图 5 为本发明带有硅胶件逆止阀的传感器结构图；

图 6 为本发明一种雾化器的结构图；

图 7 为本发明雾化器中陶瓷件的结构图；

图 8 为本发明另一种雾化器的结构图；

图 9 为本发明一种气液分离器的结构图；

图 10 为本发明另一种气液分离器的结构图；

图 11 为本发明供液瓶及吸嘴的连接结构图；

图 12 为本发明的电路原理图。

具体实施方式

下面结合附图对本发明作进一步详述。

实施例 1

如图 1 所示，本发明可构成一个烟嘴形、雪茄形或烟斗形的整体。壳体 14 的外壁上开有进气孔 4，壳体 14 内顺序设置有发光二极管 LED1、电池 2、电子线路板 3、常压腔 5、传感器 6、气液分离器 7、雾化器 9、供液瓶 11、吸嘴 15。电子线路板 3 由电子开关电路及高频振荡器组成，在传感器 6 的一侧开有传感器气流通道 18，与壳体 14 内腔相通。如图 4 所示，传感器 6 内设有负压腔 8，由波纹膜 22 与传感器 6 隔开。传感器 6 内还设有第一磁钢 20、第二磁钢 21 及置于两者之间的干簧管 K1，第二磁钢 21 固接在波纹膜 22 上。雾化器 9 通过凸起 36 与供液瓶 11 相接触，与壳体 14 之间留有空隙，雾化器 9 内部设有雾化腔 10。如图 6、图 7 所示，雾化腔 10 的雾化腔壁 25 上开有溢流孔 29，腔内设有加热体 RL，可用铂丝、镍铬合金或含有稀土元素的铁铬铝合金丝制成，也可制成片状体。正对加热体 RL 的一侧开有喷射孔，喷射孔可根据雾化腔壁 25 的材料而选用第一气流喷射孔 24 或第二气流喷射孔 30。第一气流喷射孔 24 可采用 0.1mm~1.3mm 狭缝结构或Φ0.2mm~1.3mm 圆孔的单孔及多孔结构；第二气流喷射孔 30 的直径在 0.3mm~1.3mm。雾化腔壁 25 外包有多孔体 27，可用泡沫镍、不锈钢纤维毡、高分子多聚物发泡体及泡沫陶瓷制成。在雾化器 9 上还设有第一压电片 M1。雾化腔壁 25 可用氧化铝或陶瓷制成。如图 9 所示，气液分离器 7 上开有通孔，可用塑料或硅橡胶制成。如图 11 所示，供液瓶 11 的一侧与壳体



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14 之间设有锁定供液瓶 11 的挡圈 13，另一侧开有雾汽通道 12，瓶内装有贮液多孔体 28，可用聚丙纤维、涤纶纤维或尼龙纤维充填，或用塑料发泡成形体如聚胺酯泡沫柱或聚丙泡沫柱充填，也可用聚氯乙烯、聚丙烯、聚碳酸酯注塑成多层板的柱状物。进气孔 4、常压腔 5、传感器 6、气液分离器 7、雾化器 9、雾汽通道 12、导气孔 17、吸嘴 15 依次相连通。

如图 12 电路原理图所示，电子开关电路以场效应功率管 U1 为核心。K1 为干簧管（位于传感器 6 中）、RL 为加热体（位于雾化器 9 中）、LED1 为发光二极管、U2 为低电压检测片（用于对锂电池的过放电保护）、M1 为第一压电片，第一电容 C1、第二电容 C2、第三电阻 R3、第一电感 L1、第三电容 C3、三极管 BG1、第一压电片 M1 构成三点式电容振荡器，即高频振荡器。其电路原理为：当干簧管 K1 闭合时，场效应功率管 U1 开启，加热体 RL 工作，同时三点式电容振荡器起振，第一压电片 M1 为雾化器 9 提供高频机械振动波，达到雾化效果。

当吸烟者吸烟时，吸嘴 15 处于负压状态，常压腔 5 与负压腔 8 之间的气压差或高速气流导致传感器 6 输出启动信号，与之相连接的电子线路板 3 工作。此时传感器 6 内的波纹膜 22 变形，带动第二磁钢 21 远离干簧管 K1，干簧管 K1 在第一磁钢 20 的过量磁力线作用下闭合（即 K1 闭合），启动作为电子开关的场效应功率管 U1，高频振荡器采用三点式电容振荡器，频率在 550KHz至 8MHz，电路中频率自动微调与环形的第一压电片 M1 谐振，对液体分子供能，同时发光二极管 LED1 在可充电电池 2 供电下发光。大气由进气孔 4 进到常压腔 5 内，经传感器气流通道 18、再经气液分离器 7 上的通孔流到雾化器 9 内的雾化腔 10，经过喷射孔的高速气流带动多孔体 27 中的烟液以微滴形式喷射进雾化腔 10 内，通过第一压电片 M1 的超声雾化，再在加热体 RL 的作用下进一步雾化，雾化后的大直径微滴在涡流的作用下附壁经溢流孔 29 被多孔体 27 重吸收，小直径微滴悬浮在气流中形成气溶胶经雾汽通道 12、导气孔 17、吸嘴 15 被吸出。供液瓶 11 中的贮液多孔体 28 与雾化器 9 上的凸起 36 接触实现毛细浸润供液。

吸嘴 15 上制有螺纹，当供液瓶 11 中的烟液用尽时，可旋转吸嘴 15 将其拧下，取出供液瓶 11，将烟液注入供液瓶 11 内，重新装入壳体 14 内，拧紧吸嘴 15。

干簧管 K1、第一磁钢 20、第二磁钢 21、波纹膜 22 还可用有封闭膜的半导体应变片来代替，安装在传感器波纹膜位置。

为了简化设计，可取消雾化器 9 上的第一压电片 M1，仅靠加热体 RL 将烟液雾



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化。这种雾化器的尺寸可做的较小，整支雾化电子烟的连接结构与实施例一相同。此外，还可如图 8 所示，将雾化器 9 中的第一压电片 M1、加热体 RL 取消，在雾化腔内加设单层或多叠层、平板形的第二压电片 35，通过喷射孔的气流在其中心振动聚焦点雾化，达到强超声雾化的效果。

如图 10 所示，气液分离器 7 的通孔外还可套有硅胶件逆止阀 31。吸烟时，气流到达通孔，由于通孔内的气压升高，使硅胶件逆止阀 31 开启，气流通过；不吸烟时，硅胶件逆止阀 31 关闭。

如图 5 所示，传感器 6 还可设计成带有硅胶件逆止阀 31 的结构。吸烟时，气流汇聚在硅胶件逆止阀 31 内，气压升高、气体膨胀，阀内的第三磁钢 34 逐渐靠近干簧管 K1，直至干簧管 K1 闭合、开启电路，随着气压差继续增大，硅胶件逆止阀 31 的出气口开启。干簧管 K1 也可以用霍尔器件或磁敏二极管或磁敏三极管代替。

实施例 2

如图 2 所示，为了改善供液状态，在壳体 14 内，雾化器 9 后置，供液瓶 11 设在气液分离器 7 和雾化器 9 之间，在供液瓶 11 的一端加设有将供液瓶 11 压紧在雾化器 9 上的弹片 33，其他部件及工作原理与实施例 1 同。

在实施例 1、实施例 2 所述的雾化电子烟的壳体 14 的内壁上，还可加设数字显示屏 32，与电子开关电路中场效应功率管 U1 输出端相连，用来显示每天吸烟的次数、电池容量。传感器 6 为线性信号输出，与吸力的强弱成正比（即吸力越大、工作的时间越长），雾化器 9 按线性方式工作，以模拟更真实的人性化香烟。

在壳体 14 内与传感器 6 还并联有用于手动清洁的微动开关 16。在不吸烟时，按下微动开关 16，与其并联的传感器 6 工作，或将壳体 14 内的残留物及其他杂质清除干净。

用于雾化的烟液含有 0.4~3.5％的烟碱，烟用香精 0.05~2％，有机酸 0.1~3.1％，抗氧剂 0.1~0.5％，余量为 1，2-丙二醇。



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# 权 利 要 求 书

1．一种雾化电子烟，包括壳体及吸嘴，其特征在于：所述壳体（14）的外壁上开有进气孔（4），壳体（14）内依次设有电子线路板（3）、常压腔（5）、传感器（6）、气液分离器（7）、雾化器（9）、供液瓶（11）；其中电子线路板（3）由电子开关电路及高频振荡器组成；在传感器（6）的一侧开有传感器气流通道（18），与壳体（14）内腔相通，传感器（6）内设有负压腔（8）；雾化器（9）与供液瓶（11）相接触，与壳体（14）之间留有空隙，在雾化器（9）的内部设有雾化腔（10）；供液瓶（11）的一侧与壳体（14）之间设有锁定供液瓶（11）的挡圈（13），供液瓶（11）的另一侧留有雾汽通道（12）；进气孔（4）、常压腔（5）、传感器（6）、气液分离器（7）、雾化器（9）、雾汽通道（12）、导气孔（17）、吸嘴（15）依次相连通；壳体（14）内的前端还包括一个发光二极管（LED1）和电池（2），共同构成一个烟嘴形、雪茄形或烟斗形的整体。

2．按照权利要求 1 所述的雾化电子烟，其特征在于：在壳体（14）内，雾化器（9）后置，供液瓶（11）设在气液分离器（7）和雾化器（9）之间，在供液瓶（11）的一端加设有将供液瓶（11）压紧在雾化器（9）上的弹片（33）。

3．按照权利要求 1 或 2 所述的雾化电子烟，其特征在于：在壳体（14）的内壁上加设有显示屏（32），与电子线路板（3）连接。

4．按照权利要求 1 或 2 所述的雾化电子烟，其特征在于：在壳体（14）内与传感器（6）并联的有用于手动清洁的微动开关（16）。

5．按照权利要求 1 或 2 所述的雾化电子烟，其特征在于：所述的传感器（6）与其内部的负压腔（8）之间设有波纹膜（22），传感器（6）内还设有第一磁钢（20）、第二磁钢（21）及置于两者之间的干簧管（K1），第二磁钢（21）固接在波纹膜（22）上。

6．按照权利要求 1 或 2 所述的雾化电子烟，其特征在于：所述的传感器（6）内置有硅胶件逆止阀（31），阀内设有第三磁钢（34），阀外靠近第三磁钢（34）的一侧设有干簧管（K1）。

7．按照权利要求 1 或 2 所述的雾化电子烟，其特征在于：所述的气液分离器（7）上开有通孔。

8．按照权利要求 7 所述的雾化电子烟，其特征在于：在气液分离器（7）上的通



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孔外套有硅胶件逆止阀（31）。

9．按照权利要求 1 或 2 所述的雾化电子烟，其特征在于：所述雾化腔（10）的雾化腔壁（25）上开有溢流孔（29），雾化腔（10）腔内设有加热体（RL），在加热体（RL）的一侧开有第一气流喷射孔（24），多孔体（27）包在雾化腔壁（25）外，雾化器（9）的一侧设有第一压电片（M1），另一侧设有凸起（36）。

10．按照权利要求 1 或 2 所述的雾化电子烟，其特征在于：所述的雾化器（9）中加设第二压电片（35）。

11．按照权利要求 9 所述的雾化电子烟，其特征在于：所述的雾化器（9）中的多孔体（27）可用泡沫镍、不锈钢纤维毡、高分子多聚物发泡体及泡沫陶瓷制成；加热体（RL）可用铂丝、镍铬合金或含有稀土元素的铁铬铝合金丝制成，也可制成片状体；雾化腔壁（25）可用氧化铝或陶瓷制成。

12．按照权利要求 7 所述的雾化电子烟，其特征在于：所述的气液分离器（7）可用塑料或硅橡胶制成。

13．按照权利要求 1 或 2 所述的雾化电子烟，其特征在于：所述供液瓶（11）内装有贮液多孔体（28），其可用聚丙纤维、涤纶纤维或尼龙纤维充填，或用塑料发泡成形体充填；也可用聚氯乙烯、聚丙烯、聚碳酸酯注塑成多层板的柱状物。

14．按照权利要求 5 所述的雾化电子烟，其特征在于：干簧管（K1）、第一磁钢（20）、第二磁钢（21）、波纹膜（22）可用有封闭膜的半导体应变片来代替，安装在传感器波纹膜位置。

15．按照权利要求 1 或 2 所述的雾化电子烟，其特征在于：注入供液瓶（11）内用于雾化的烟液含有 0.4~3.5%的烟碱，烟用香精 0.05~2%，有机酸 0.1~3.1%，抗氧剂 0.1~0.5%，余量为 1，2-丙二醇。



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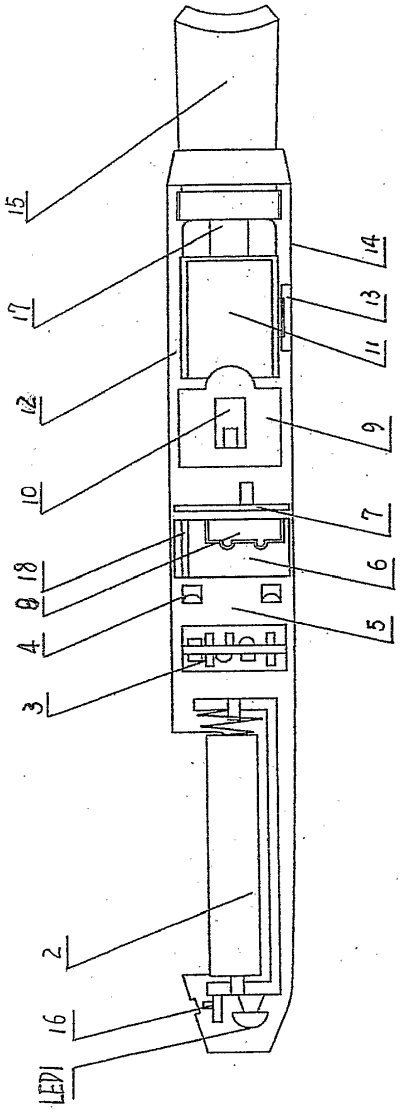



图 1

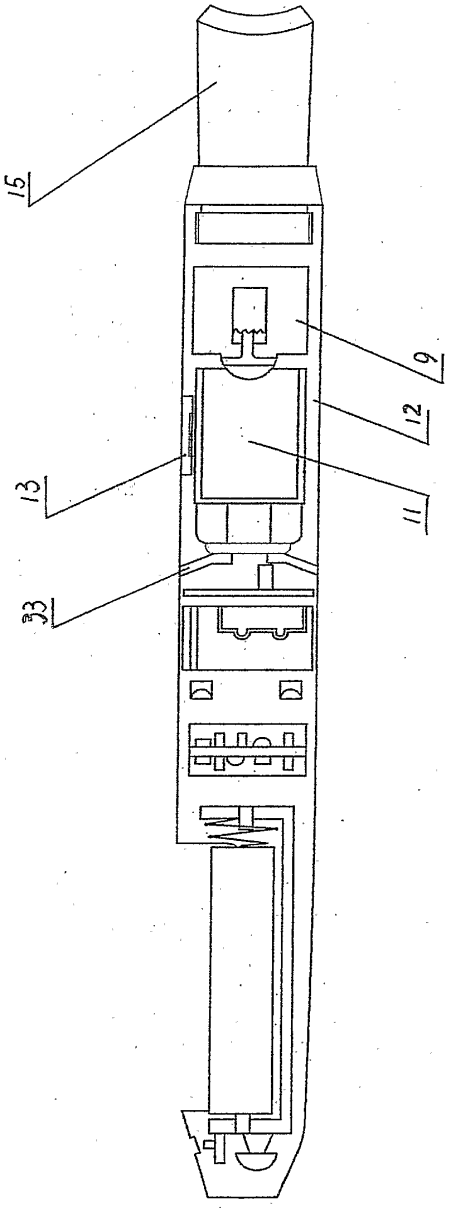



图 2



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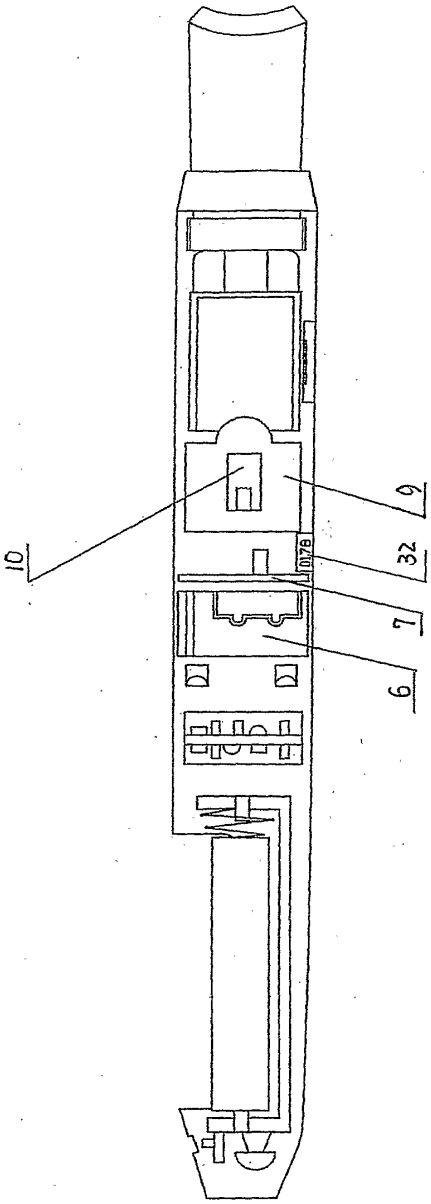



图 3

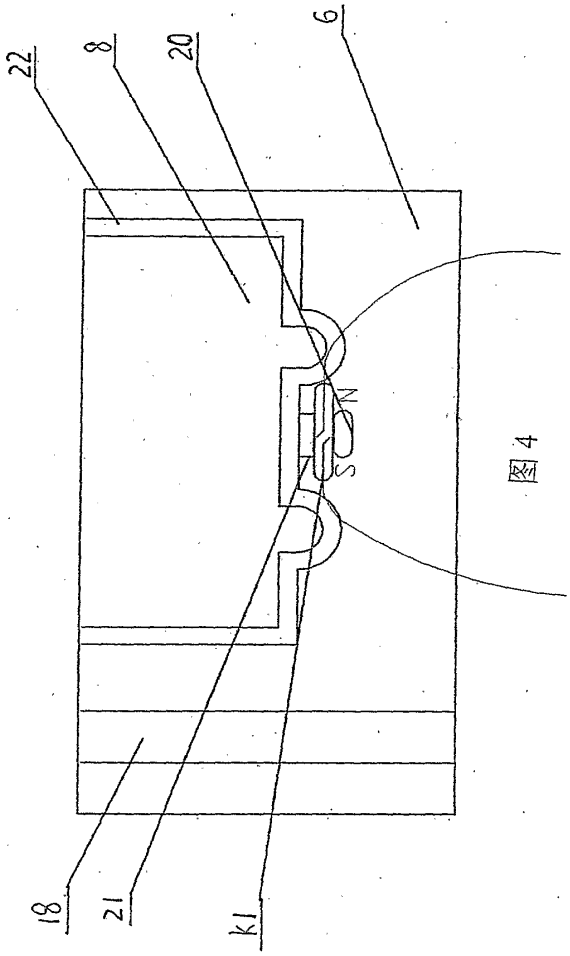



图 4



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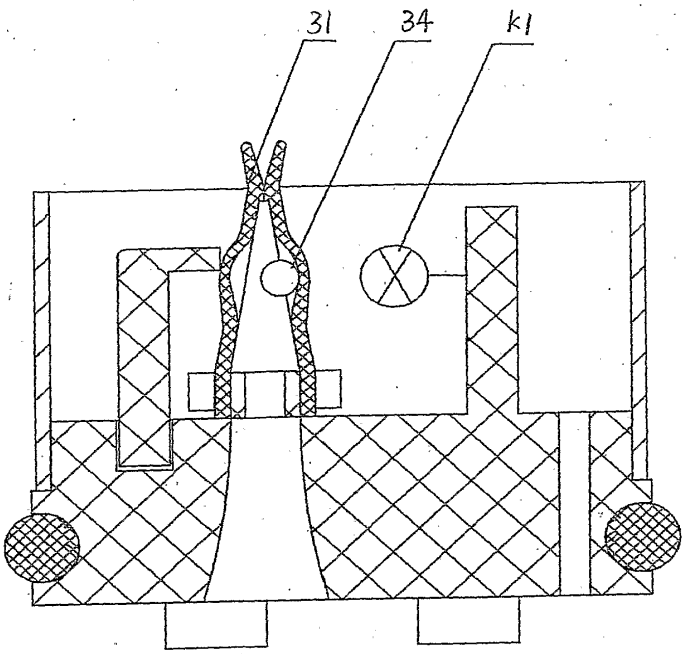



图 5

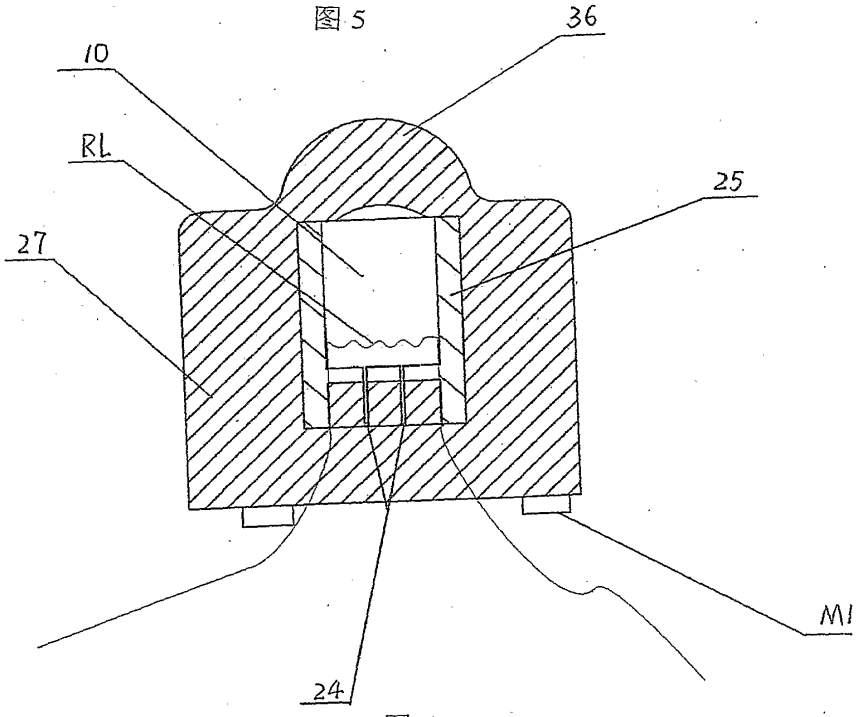



图 6



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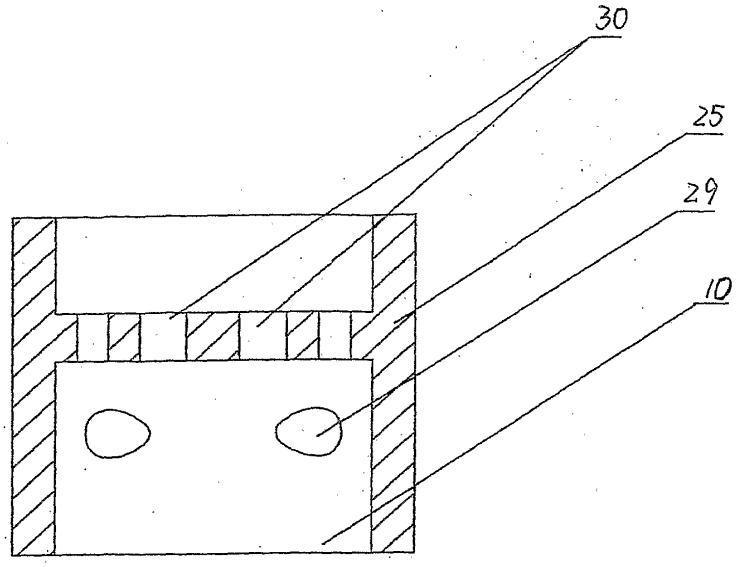



图 7

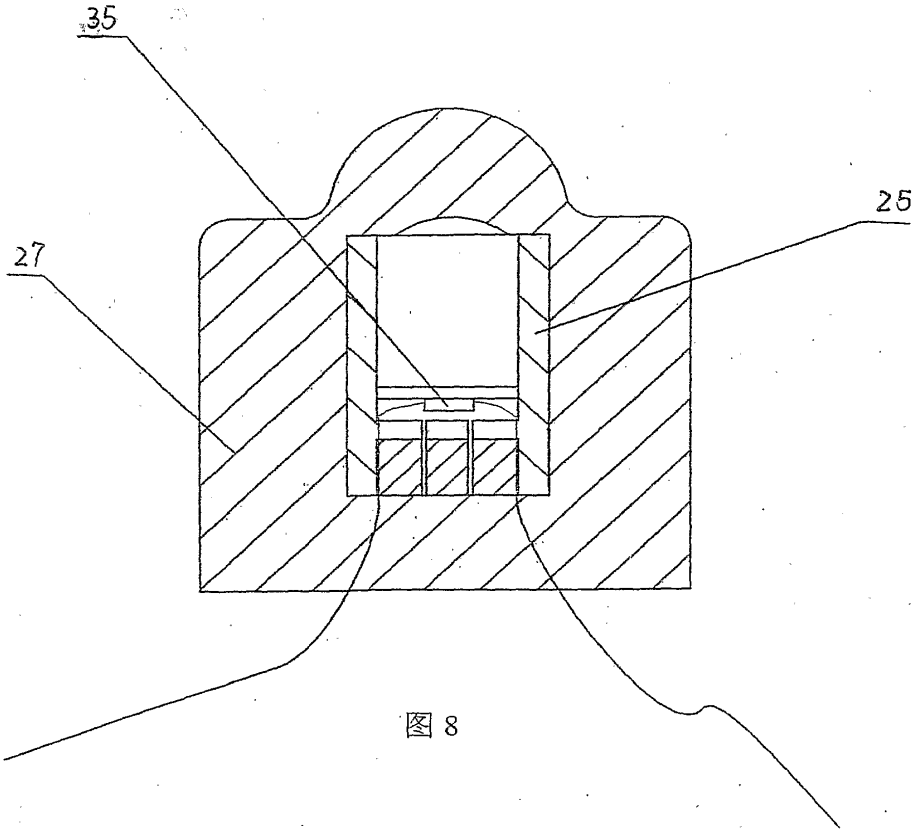



图 8



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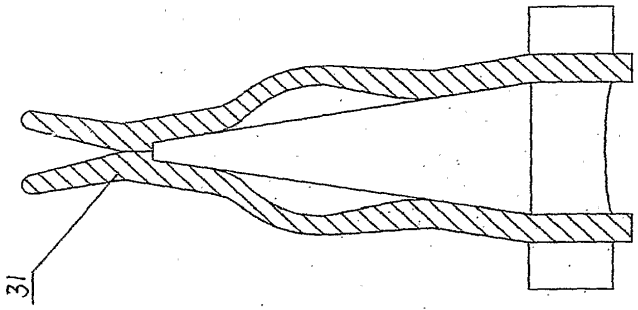



图 10

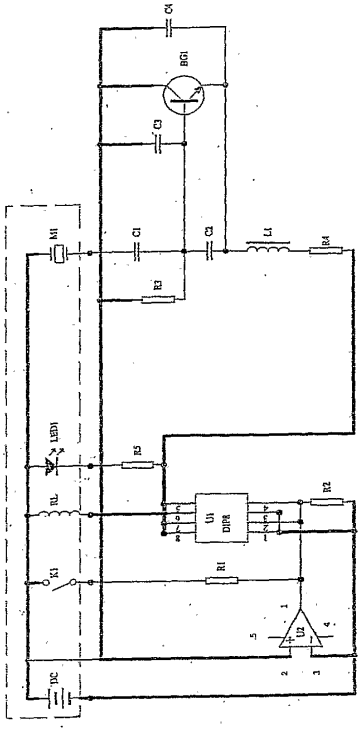



图 12

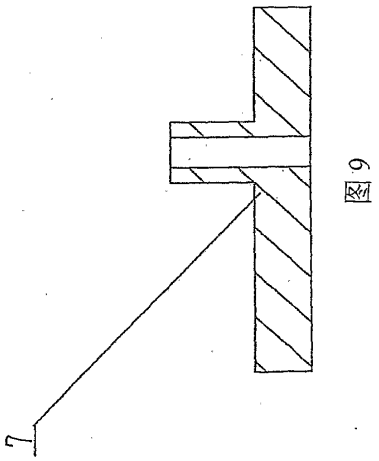



图 9

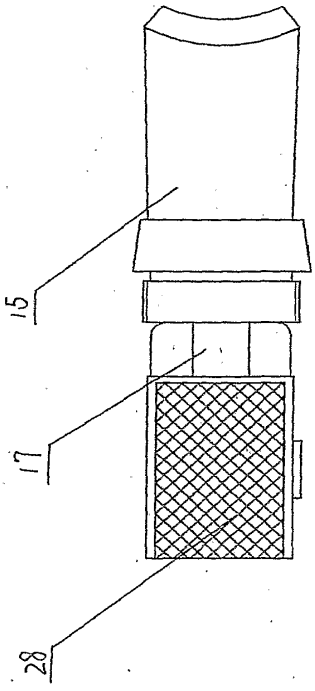



图 11



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# INTERNATIONAL SEARCH REPORT

International application No.
PCT/CN2005/000337

A. CLASSIFICATION OF SUBJECT MATTER

A24F47 / 00

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

IPC7: A24F+

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Chinese document patent:(1985-)

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)

CNPAT, EPO, WPI, PAJ: atomiz+ aerosol cigar or cigarette electronic nicotine or nicotinamide

C. DOCUMENTS CONSIDERED TO BE RELEVANT

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| A | CN1252961A (SONG Huoqiang) 17.May 2000 (17.05.2000) page 1, line 26—38 | 1—15 |
| A | EP0342538A (REYNOLDS TOBACCO CO R J ) 23.Nov 1989(23.11.1989)page 5, line 10 to page 12, line 38 | 1—15 |
| A | EP0545186A (REYNOLDS TOBACCO CO R J ) 09.Jun 1993(09.06.0993)page 5, line 43to page 24, line 57 | 1—15 |
| A | US4945929 (BOC GROUP PLC & BRITISH AMERICAN TOBACCO CO LTD ) 07.Aug 1990(07.08.1990) column 2, line 63 to column 4, line 6 | 1—15 |

☐ Further documents are listed in the continuation of Box C. ☒ See patent family annex.

* Special categories of cited documents:

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"E" earlier application or patent but published on or after the international filing date

"L" document which may throw doubts on priority claim (S) or which is cited to establish the publication date of another citation or other special reason (as specified)

"O" document referring to an oral disclosure, use, exhibition or other means

"P" document published prior to the international filing date but later than the priority date claimed

"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention

"X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone

"Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art

"&"document member of the same patent family

| Date of the actual completion of the international search | Date of mailing of the international search report |
|---|---|
| 16.Jun.2005(16.06.2005) | 14 JUL 2005 (14·07·2005) |
| Name and mailing address of the ISA/CN<br>The State Intellectual Property Office, the P.R.China<br>6 Xitucheng Rd., Jimen Bridge, Haidian District, Beijing, China<br>100088<br>Facsimile No. 86-10-62019451 | Authorized officer<br>NI Xiaohong<br>Telephone No. 86-10-62085753 |

Form PCT/ISA /210 (second sheet) (April 2005)

**INTERNATIONAL SEARCH REPORT**
Information on patent family members

International application No.
PCT/CN2005/000337

| Patent Documents referred in the Report | Publication Date | Patent Family | Publication Date |
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| | | ZA9208271A | 05.May.1993 |
| | | NO924577A | 28.May.1993 |
| | | NO302394B | 02.Mar .1998 |

Form PCT/ISA /210 (patent family annex) (April 2005)

| | | | |
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| | | FI97941C | 25.Mar..1997 |
| | | BR9204581A | 01.Jun..1993 |
| | | CN1072576A | 02.Jun .1993 |
| | | CN1037318B | 11.Feb.1998 |
| | | AU2967292A | 03.Jun.1996 |
| | | SI9200348A | 30.Jun.1993 |
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| | | PL170199B | 29.Nov.1996 |
| | | CZ9203500A | 15.Sep.1993 |
| | | JP6046818A | 22.Feb.1994 |
| | | JP3506722B | 15.Mar.2004 |
| | | US5327917A | 12.Jul.1994 |
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| | | LT3188B | 27.Mar.1995 |
| | | RO109272B | 30.Jan.1995 |
| | | US5396911A | 14.Mar.19995 |
| | | HR921342A | 30.Apr.1995 |
| | | US5415186A | 16.May.1995 |
| | | SK350092A | 07.Jun.1995 |
| | | HU69944A | 28.Sep.1995 |
| | | AU664870B | 07.Dec.1995 |
| | | IL103536A | 16.Oct.1996 |
| | | EG19959A | 31.Oct.1996 |
| | | PH30648A | 16.Sep.1997 |
| | | RU2097996C | 10.Dec.1997 |
| | | BG61549B | 30.Dec.1997 |
| | | HU215694B | 01.Feb.1999 |
| | | KR270913B | 01.Nov.2000 |
| US4945929A | 07.Aug. 1990 | GB2191718A | 23.Dec.1987 |
| | | DE3719718A | 23.Dec.1987 |

# 国际检索报告

国际申请号
PCT/CN2005/000337

**A. 主题的分类**

Ä24F47 / 00

按照国际专利分类表(IPC)或者同时按照国家分类和 IPC 两种分类

**B. 检索领域**

检索的最低限度文献(标明分类系统和分类号)

- IPC7：A24F47+

包含在检索领域中的除最低限度文献以外的检索文献

中国专利文献（1985－）

在国际检索时查阅的电子数据库(数据库的名称，和使用的检索词（如使用）)

EPO，WPI，PAJ： atomiz+ aerosol cigar or cigarette electronic nicotine or nicotinamide

CNPAT：雾化+喷雾 烟 电 尼古丁+烟碱

**C. 相关文件**

| 类 型* | 引用文件，必要时，指明相关段落 | 相关的权利要求 |
|---|---|---|
| A | CN1135860A(徐度) 20.11 月.1996(20.11.1996)第 2 页第 13 行至第 4 页第 3 行 | 1－15 |
| A | CN1252961A（宋国强）17.05 月 2000（17.05.2000）说明书第 1 页第 26－38 行 | 1－15 |
| A | EP0342538A（REYNOLDS TOBACCO CO R J ）23.11 月 1989（23.11.1989）说明书第 5 页第 10 行至第 12 页第 38 行 | 1－15 |
| A | EP0545186A（REYNOLDS TOBACCO CO R J ）09.06 月 1993（09.06.1993）说明书第 5 页第 43 行至第 24 页第 57 行 | 1－15 |
| A | US4945929A（BOC GROUP PLC 和 BRITISH AMERICAN TOBACCO CO LTD ）07.8 月 1990（07.08.1990）说明书第 2 页第 63 行至第 4 栏第 6 行 | 1－15 |

☐ 其余文件在 C 栏的续页中列出。 ☒ 见同族专利附件。

* 引用文件的具体类型：

"A" 认为不特别相关的表示了现有技术一般状态的文件

"E" 在国际申请日的当天或之后公布的在先申请或专利

"L" 可能对优先权要求构成怀疑的文件，或为确定另一篇引用文件的公布日而引用的或者因其他特殊理由而引用的文件

"O" 涉及口头公开、使用、展览或其他方式公开的文件

"P" 公布日先于国际申请日但迟于所要求的优先权日的文件

"T" 在申请日或优先权日之后公布，与申请不相抵触，但为了理解发明之理论或原理的在后文件

"X" 特别相关的文件，单独考虑该文件，认定要求保护的发明不是新颖的或不具有创造性

"Y" 特别相关的文件，当该文件与另一篇或者多篇该类文件结合并且这种结合对于本领域技术人员为显而易见时，要求保护的发明不具有创造性

"&" 同族专利的文件

| 国际检索实际完成的日期 | 国际检索报告邮寄日期 |
|---|---|
| 16.6 月.2005(16.06.2005) | 14 · 7月 2005 (14 · 07 · 2005) |
| 中华人民共和国国家知识产权局(ISA/CN)<br>中国北京市海淀区蓟门桥西土城路 6 号 100088<br>传真号： (86-10)62019451 | 受权官员<br>红倪倪晔红<br>电话号码：(86-10)62085753 |



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国际检索报告
关于同族专利的信息

国际申请号
PCT/CN2005/000337

| 检索报告中引用的专利文件 | 公布日期 | 同族专利 | 公布日期 |
|---|---|---|---|
| CN1135860A | 20.11 月 1996 | 无 | |
| CN1252961A | 17.05 月 2000 | 无 | |
| EP0342538A | 23.11 月 1989 | AU3468589A | 16.11 月 1989 |
| | | Fi892321 A | 17.11 月 1989 |
| | | FI81950B | 28.09 月 1990 |
| | | FI81950C | 10.01 月 1991 |
| | | DK233489A | 17.11 月 1989 |
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| | | NO167952C | 02.01 月 1992 |
| | | PT90558A | 30.11 月 1989 |
| | | CN1038014A | 20.12 月 1989 |
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| | | BR8902236A | 09.01 月 1990 |
| | | PL279423A | 22.01 月 1990 |
| | | PL159798B | 29.02 月 1993 |
| | | JP2053476A | 22.02 月 1990 |
| | | HU50434A | 28.02 月 1990 |
| | | YU100189A | 30.06 月 1990 |
| | | AU614364B | 29.02 月 1991 |
| | | HU203961B | 28.11 月 1991 |
| | | DD298202A | 13.02 月 1992 |
| | | US5137034A | 11.08 月 1992 |
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| | | SU1812955A | 30.04 月 1993 |
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| | | PH27614A | 31.08 月 1993 |
| | | BG60140A | 15.11 月 1993 |
| | | LV5377A | 10.03 月 1994 |
| | | US5360023A | 01.11 月 1994 |
| EP0545186A | 09.06 月 1993 | MX9206462A | 01.05 月 1993 |
| | | ZA9208271A | 05.05 月 1993 |
| | | NO924577A | 28.05 月 1993 |
| | | NO302394B | 02.03 月 1998 |



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国际检索报告
关于同族专利的信息

国际申请号
PCT/CN2005/000337

| 检索报告中引用的专利文件 | 公布日期 | 同族专利 | 公布日期 |
|---|---|---|---|
| | | CA2081283A | 28.05 月 1993 |
| | | FI925319A | 28.05 月 1993 |
| | | FI97941B | 13.12 月 1996 |
| | | FI97941C | 25.03 月.1997 |
| | | BR9204581A | 01.06 月.1993 |
| | | CN1072576A | 02.06 月 1993 |
| | | CN1037318B | 11.02 月 1998 |
| | | AU2967292A | 03.06 月 1996 |
| | | SI9200348A | 30.06 月 1993 |
| | | PL296752A | 09.08 月 1993 |
| | | PL170199B | 29.11 月 1996 |
| | | CZ9203500A | 15.09 月 1993 |
| | | JP6046818A | 22.02 月 1994 |
| | | JP3506722B | 15.03 月 2004 |
| | | US5327917A | 12.07 月 1994 |
| | | LT231A | 25.09 月 1994 |
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| | | HR921342A | 30.04 月 1995 |
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| | | BG61549B | 30.12 月 1997 |
| | | HU215694B | 01.02 月.1999 |
| | | KR270913B | 01.11 月.2000 |
| US4945929A | 07.08 月 1990 | GB2191718A | 23.12 月.1987 |
| | | DE3719718A | 23.12 月 1987 |



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(12) 按照专利合作条约所公布的国际申请

(19) 世界知识产权组织
国 际 局

(43) 国际公布日
2007 年11 月22 日 (22.11.2007)

PCT

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(25) 申请语言: 中文

(26) 公布语言: 中文

(30) 优先权:
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2006 年5 月16 日 (16.05.2006) CN

(71) 申请人及
(72) 发明人: 韩力(HON, Lik) [CN/CN]; 中国香港中环干诺道中168号信德中心西翼1010室, Hong Kong (CN)。

(74) 代理人: 沈阳科苑专利商标代理有限公司 (SHENYANG PATENT & TRADEMARK AGENCY ACADEMIA SINICA); 中国辽宁省沈阳市和平区三好街24号, Liaoning 110004 (CN)。

(81) 指定国 (除另有指明, 要求每一种可提供的国家保护): AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BH, BR, BW, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, EG, ES, FI, GB, GD, GE, GH, GM, GT, HN, HR, HU, ID, IL, IN, IS, JP, KE, KG, KM, KN, KP, KR, KZ, LA, LC, LK, LR, LS, LT, LU, LY, MA, MD, MG, MK, MN, MW, MX, MY, MZ, NA, NG, NI, NO, NZ, OM, PG, PH, PL, PT, RO, RS, RU, SC, SD, SE, SG, SK, SL, SM, SV, SY, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, ZA, ZM, ZW。

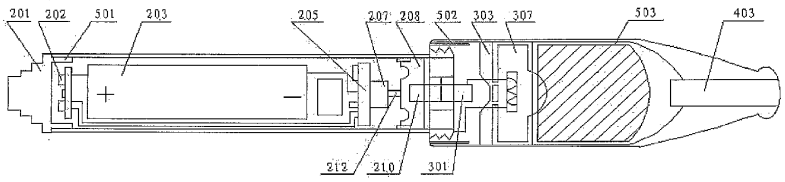
(84) 指定国 (除另有指明, 要求每一种可提供的地区保护): ARIPO (BW, GH, GM, KE, LS, MW, MZ, NA, SD, SL, SZ, TZ, UG, ZM, ZW), 欧亚 (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), 欧洲 (AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HU, IE, IS, IT, LT, LU, LV, MC, MT, NL, PL, PT, RO, SE, SI, SK, TR), OAPI (BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG)。

本国际公布:
— 包括国际检索报告。

所引用双字母代码及其它缩写符号, 请参考刊登在每期PCT公报期刊起始的"代码及缩写符号简要说明"。

(54) **Title:** EMULATION AEROSOL SUCKER

(54) **发明名称:** 仿真气溶胶吸入器




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

(57) 摘要:

一种仿真气溶胶吸入器, 包括电池组件、雾化器组件及烟瓶组件, 电池组件的一端设有外螺纹电极, 雾化器组件的一端设有内螺纹电极, 两者通过螺纹电极相连接, 烟瓶组件插接在雾化器组件的另一端, 共同构成一个香烟型或雪茄型的整体。

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# 仿真气溶胶吸入器

## 技术领域

本发明涉及电子吸入装置，具体地说是一种不含有焦油、只含烟碱(尼古丁)的仿真气溶胶吸入器。

## 背景技术

在当今“吸烟有害健康”已成为常识的情况下，全世界目前仍有 10 亿人吸烟，而且每年这个数字还在扩大。2003 年 3 月 1 日世界卫生组织(WHO)通过了的第一个国际禁烟协定《烟草控制框架公约》，据 WHO 提供的数字表明，吸烟每年造成 490 万人死亡，尽管吸烟可导致严重的呼吸系统疾病和癌症，让吸烟者完全戒烟是极其困难的事。

香烟的有效成分是烟碱(即尼古丁)，吸烟时烟碱随着香烟燃烧产生的大量焦油雾滴进入肺泡后被迅速吸收，烟碱被吸收入血后作用于中枢神经系统的受体上，引起类似兴奋剂的“陶醉感”，如吸烟者所经历的头晕目眩或飘飘然的感觉。

烟碱是小分子生物碱，在小剂量下对人体基本无害，而且在血液中的半衰期极短。烟草的有害物质主要是焦油，烟草焦油是由数千种成分组成，其中有数十种成分是致癌物。目前证实被动吸烟对不吸烟者的危害更大。

为了寻找只含烟碱而不含有害焦油的香烟代用品，有许多发明是用较纯的烟碱制成诸如“戒烟贴”、“烟碱含漱水”、“包装在有抛射剂的高压气罐喷雾剂”、“烟碱口香糖”、“烟碱饮料”等产品，这些产品虽然没有焦油的危害，但因烟碱吸收缓慢，在血液中不能建立有效的高峰浓度，不能解决需求烟碱“过瘾”的感觉，同时也剥夺了吸烟者已经养成的“抽”、“吸”的习惯，因而类似的产品不能真正的作为戒烟用品或香烟代用品。

## 发明内容

本发明的目的在于提供一种有戒烟和香烟替代品作用的仿真气溶胶吸入器，针对本申请气溶胶可以看成是一种空气中悬浮的液态颗粒。

本发明的技术方案是发明人于 2000 年 4 月 14 日在中国知识产权局申请的申请号为： 200420031182.0 国际申请号为：PCT / CN2005 / 000337 的实用新型名称为“雾化电子烟”专利的进一步创新发明。

本发明的目的是通过以下技术方案来实现的：本发明包括电池组件、雾化器组件及烟瓶组件，电池组件与雾化器组件的一端相连接，烟瓶组件插接在雾化器组件的另一端，共同构成一个香烟型或雪茄型的整体。

其中：电池组件的一端设有外螺纹电极，雾化器组件的一端设有内螺纹

电极，两者通过螺纹电极相连接，电池组件包括指示灯、电池、MOSFET 电路板、传感器、硅橡胶波纹隔膜、第一螺纹电极、第一负压腔孔及第一壳体，第一壳体的一端设有外螺纹电极，另一端安装有指示灯，其一侧罩有指示灯罩，指示灯罩上开有微孔，另一侧依次连接电池及 MOSFET 电路板，MOSFET 电路板上设有传感器，在第一螺纹电极与传感器之间安装有硅橡胶波纹隔膜，其上开有第一负压腔孔，传感器通过固接在其上的簧片开关与硅橡胶波纹隔膜相连接；在 MOSFET 电路板与传感器之间加设有 MCU；第一壳体表面加设有显示屏；所述 MCU 是以脉冲的省电模式扫描传感器，根据传感器的信号参数实现以频率对单次工作时间的积分函数做雾化剂量限制；同时，MCU 完成对电流恒功率输出的脉宽调制及过放电保护、每工作数千次自动清洗功能、指示灯的渐亮渐熄控制、工作次数及电池容量显示、传感器误动作停机自动恢复等控制；所述传感器可为用弹性合金片制成的开关式传感器、线性输出的霍尔器件、半导体力敏芯片、半导体矩阵热电桥芯片或电容及电感式传感器；所述指示灯为两只红色的发光二极管；所述硅橡胶波纹隔膜还可用氟橡胶、丁腈橡胶或弹性合金膜制成；所述外螺纹电极为不锈钢或黄铜件镀金开中孔制成；所述电池为锂电池，所述锂电池为可充电的聚合物锂电池或可充电的锂离子电池；所述雾化器组件包括内螺纹电极、气液分离器、雾化器及第二壳体，第二壳体的一端与烟瓶组件相插接，另一端设有内螺纹电极，其上设有第二负压腔孔，气液分离器与雾化器依次与内螺纹电极相连接；在第二壳体上开有进气孔道；所述内螺纹电极为不锈钢或黄铜件镀金开中孔制成；所述气液分离器是用不锈钢或塑料开孔制成；所述雾化器可为毛细浸润式雾化器或喷射式雾化器，雾化器内设有加热体；喷射式雾化器上开有喷射孔；所述喷射孔是用泡沫陶瓷、微孔陶瓷、发泡金属、不锈钢纤维毡或化学纤维成型开孔制成；所述加热体是用微孔陶瓷骨架上绕有镍铬合金丝、铁铬铝合金丝或铂丝等电热材料制成，也可直接用导电陶瓷或 PTC 陶瓷材料制成的带烧结电极的多孔体；加热体的表面烧结成高温釉以固定沸石颗粒，沸石颗粒由天然沸石、人造无机微孔陶瓷或氧化铝颗粒制成；所述烟瓶组件包括烟液瓶、纤维及吸嘴，带有烟液的纤维容置在烟液瓶的一端，该端插接在第二壳体内、抵接在雾化器上，吸嘴位于烟液瓶的另一端，在纤维与烟液瓶的内壁间留有吸气孔道；所述烟液瓶、吸嘴是用无毒塑料制成：所述纤维是用聚丙烯纤维或尼龙纤维制成：所述纤维中用于雾化的烟液含有 0.1—3.5%的烟碱，0.05—5%的烟用香精，0.1—3%的有机酸，0.1—0.5%的稳定剂，余量为丙二醇；所述吸入器及其连接结构可装入常规药物作为肺内吸入式给药器械。

本发明的优点与积极效果为：本发明吸烟无焦油，大大降低了致癌风险，使用者仍有吸烟的感觉和兴奋，无需点燃，无火灾危害。本发明的装置和连



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接结构可装入常规药物作为肺内吸入式给药器械。

附图说明

图 1 为本发明香烟型的外观示意图；

图 2A 为本发明电池组件的一种结构示意图；

图 2B 为本发明电池组件的另一种结构示意图；

图 3 为本发明雾化器组件的示意图；

图 4 为本发明烟瓶组件的示意图；

图 5A 为本发明的一种内部结构示意图；

图 5B 为本发明的另一种内部结构示意图；

图 6 为本发明充电器的结构示意图；

图 7 为本发明 MCU 及 MOSFET 的电路原理图；

图 8 为本发明毛细浸润式雾化器的结构示意图；

图 9 为图 8 的左视图；

图 10 为本发明喷射式雾化器的结构示意图；

图 11 为图 10 的左视图；

图 12 为本发明雪茄式外形的结构示意图。

具体实施方式

下面结合附图对本发明作进一步详述。

实施例 1

如图 1 所示，本发明的外观与插入烟嘴的卷烟外形相似，包括电池组件、雾化器组件及烟瓶组件，电池组件的一端设有外螺纹电极 209，雾化器组件的一端设有内螺纹电极 302，两者通过螺纹电极相连接成模拟烟体，烟瓶组件插接在雾化器组件的另一端，共同构成一个香烟型仿真气溶胶吸入器。

如图 2A 所示，电池组件包括指示灯 202、锂电池 203、MOSFET 电路板 205、传感器 207、硅橡胶波纹隔膜 208、第一螺纹电极 209、第一负压腔孔 210 及第一壳体 211，第一壳体 211 的一端设有外螺纹电极 209，另一端安装有指示灯 202，其一侧罩有指示灯罩 201，指示灯罩 201 上开有微孔 501，另一侧依次连接锂电池 203 及 MOSFET(金属氧化物半导体场效应管)电路板 205，MOSFET 电路板 205 上设有传感器 207，在第一螺纹电极 209 与传感器 207 之间安装有硅橡胶波纹隔膜 208，其上开有第一负压腔孔 210，传感器 207 通过固接在其上的簧片开关 212 与硅橡胶波纹隔膜 208 相连接。

其中：传感器 207 可为用弹性合金片制成的开关式传感器、线性输出的霍尔器件、半导体力敏芯片、半导体矩阵热电桥芯片或电容及电感式传感器。指示灯 202 为两只红色的发光二极管。锂电池 203 可为可充电的聚合物锂电池或可充电的锂离子电池。外螺纹电极 209 为不锈钢或黄铜件镀金开中孔制成。硅橡胶波纹隔膜 208 还可用氟橡胶、丁腈橡胶或弹性合金膜制成。



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如图 3 所示，雾化器组件包括内螺纹电极 302、气液分离器 303、雾化器 307 及第二壳体 306，第二壳体 306 的一端与烟瓶组件相插接，另一端设有内螺纹电极 302，其上设有第二负压腔孔 301，气液分离器 303 与雾化器 307 依次与内螺纹电极 302 相连接；在第二壳体 306 上开有进气孔道 502。其中：气液分离器 303 是用不锈钢或塑料开孔制成；内螺纹电极 302 为不锈钢或黄铜件镀金开中孔制成。

雾化器 307 可如图 8、图 9 所示，为毛细浸润式雾化器，或如图 10、图 11 所示，为喷射式雾化器。本实施例为喷射式雾化器。

如图 4 所示，烟瓶组件包括烟液瓶 401、纤维 402 及吸嘴 403，带有烟液的纤维 402 容置在烟液瓶 401 的一端，该端插接在第二壳体 306 内、抵接在雾化器 307 上，吸嘴 403 位于烟液瓶 401 的另一端，在纤维 402 与烟液瓶 401 的内壁间留有吸气孔道 503。

如图 5A 所示，本发明的待工作状态是将图 2A 所示的、充完电的电池组件旋紧在图 3 所示的雾化器组件上，再插入图 4 所示的烟瓶组件。当使用者用口轻吸吸嘴 403 时，经吸气孔道 503 和第一、二负压腔孔 210、301 在硅橡胶波纹隔膜 208 上形成负压，硅橡胶波纹隔膜 208 在吸气压差的作用下变形带动簧片开关 212 及传感器 207，启动 MOSFET 电路板 205。此时，指示灯 202 逐渐亮起，锂电池 203 通过 MOSFET 电路板 205 及内、外螺纹电极 302、209 向雾化器 307 内的加热体 305 供电，使雾化器 307 内的加热体 305 产生热量。烟液瓶 401 内的纤维 402 中含有烟液，烟液经纤维 402 浸润雾化器中的微孔陶瓷 801；空气由进气孔道 502 进入，经气液分离器 303 上的通气孔、在雾化器 307 的喷射孔 304 中形成气液混合物，气液混合物喷射到加热体 305 上汽化，并迅速被吸入气体的气流中冷凝成气溶胶，经吸气孔道 503 由吸嘴 403 吸出成白雾状气溶胶。

当吸气停止时，簧片开关 212 及传感器 207 复位，雾化器 307 停止工作，指示灯 202 逐渐熄灭，在工作次数达到预设的数值时，雾化器 307 工作延时 5 至 20 秒一次，以清洁加热体 305 上的微量积垢。

雾化器 307 的供液材料除微孔陶瓷外还可选用泡沫陶瓷、微孔玻璃、发泡金属、不锈钢纤维毡、涤纶纤维、尼龙纤维、腈纶纤维、芳伦纤维或硬质多孔塑料。加热体 305 可采用微孔陶瓷骨架上绕有镍铬合金丝、铁铬铝合金丝、铂丝等电热材料，也可直接用导电陶瓷或 PTC(正温度系数热敏陶瓷)材料制成的带烧结电极的多孔体。加热体 305 的表面烧结成高温釉以固定沸石颗粒，沸石颗粒由天然沸石、人造无机微孔陶瓷或氧化铝颗粒制成。烟瓶组件中的烟液瓶 401、吸嘴 403 是用无毒塑料制成，内粘有用聚丙烯纤维或尼龙纤维制成的纤维 402 以吸附烟液。在电池组件中，指示灯罩 201 上开有微孔 501，用于平衡硅橡胶波纹隔膜 208 两侧的压差。



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用于雾化的烟液含有 0.1～3.5%的烟碱，0.05～5%的烟用香精，0.1～3%的有机酸，0.1～0.5%的稳定剂，余量为丙二醇。

本发明的第一、二外壳 211、306 由不锈钢管或铜合金管制成，外饰仿真卷烟的烤漆颜色。

如图 12 所示，本发明还可按比例加大电池组件的直径，使之与雾化器组件的直径一致，并在外壳上饰以植物叶脉纹理及亚光棕黄色烤漆，成为雪茄型仿真气溶胶吸入器。

本发明的锂电池 203 的再充电可用图 6 所示的带有与电池组件上外螺纹电极 209 相匹配的螺纹电极 601 做接口充电。

实施例 2

如图 2B 所示，本实施例与实施例 1 不同之处在于：在 MOSFET 电路板 205 与传感器 207 之间加设有 MCU206；第一壳体 211 表面加设有显示屏 204，用于显示锂电池 203 的电量以及吸烟的次数。

如图 5B 所示，本发明的待工作状态是将图 2B 所示的、充完电的电池组件旋紧在图 3 所示的雾化器组件上，再插入图 4 所示的烟瓶组件。当使用者用口轻吸吸嘴 403 时，经吸气孔道 503 和第一、二负压腔孔 210、301 在硅橡胶波纹隔膜 208 上形成负压，硅橡胶波纹隔膜 208 在吸气压差的作用下变形带动簧片开关 212 及传感器 207，启动 MCU206 及 MOSFET 电路板 205。此时，指示灯 202 逐渐亮起，锂电池 203 通过 MOSFET 电路板 205 及内、外螺纹电极 302、209 向雾化器 307 内的加热体 305 供电，使雾化器 307 内的加热体 305 产生热量。烟液瓶 401 内的纤维 402 中含有烟液，烟液经纤维 402 浸润雾化器中的微孔陶瓷 801，空气由进气孔道 502 进入，经气液分离器 303 上的通气孔、在雾化器 307 的喷射孔 304 中形成气液混合物，气液混合物喷射到加热体 305 上汽化，并迅速被吸入气体的气流中冷凝成气溶胶，经吸气孔道 503 由吸嘴 403 吸出成白雾状气溶胶。

如图 7 所示，在吸气动作引致传感器启动时，MCU206 以脉冲的省电模式扫描传感器 207，根据传感器 207 的信号参数实现以频率对单次工作时间的积分函数做雾化剂量限制。同时，MCU206 完成对电源恒功率输出的脉宽调制及过放电保护、每工作数千次自动清洁功能、指示灯的渐亮渐熄控制、工作次数及电池容量显示、传感器误动作停机自恢复等控制功能。

本发明的装置和连接结构还可装入常规药物作为肺内吸入式给药器械。

另外，上述仅对本发明的一具体实施例及应用实施例加以说明，但并不能以此限定本发明的保护范围，凡是依据本发明的设计精神所作出的等效变化或修饰，均应认为落入本发明的保护范围。



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# 权 利 要 求

1．一种仿真气溶胶吸入器，其特征在于包括电池组件、雾化器组件及烟瓶组件，所述烟瓶组件包括烟液瓶，所述雾化器组件包括雾化器，其烟瓶组件插接在雾化器组件的一端，共同构成一个香烟型或雪茄型的整体。

2、根据权利要求 1 所述的仿真气溶胶吸入器，其特征在于：所述电池组件的一端设有外螺纹电极，雾化器组件的一端设有内螺纹电极，两者通过螺纹电极相连接。

3、根据权利要求 1 所述的仿真气溶胶吸入器，其特征在于：所述电池组件包括电池、MOSFET 电路板、传感器、第一螺纹电极、第一负压腔孔及第一壳体，第一壳体的一端设有外螺纹电极，另一侧依次连接电池及 MOSFET 电路板，在 MOSFET 电路板上设有传感器。

4、根据权利要求 3 所述的仿真气溶胶吸入器，其特征在于：所述电池组件还包括硅橡胶波纹隔膜，在第一螺纹电极与传感器之间安装有硅橡胶波纹隔膜，其上开有第一负压腔孔，传感器通过固接在其上的簧片开关与硅橡胶波纹隔膜相连接。

5、根据权利要求 3 所述的仿真气溶胶吸入器，其特征在于：所述电池组件还包括指示灯、第一壳体的另一端安装有指示灯，其一侧罩有指示灯罩，指示灯罩上开有微孔；在 MOSFET 电路板与传感器之间加设有 MCU；第一壳体表面加设有显示屏。

6、根据权利要求 5 所述的仿真气溶胶吸入器，其特征在于：所述 MCU 是以脉冲的省电模式扫描传感器，根据传感器的信号参数实现以频率对单次工作时间的积分函数做雾化剂量限制；同时，MCU 完成对电流恒功率输出的脉宽调制及过放电保护、每工作数千次自动清洗功能、指示灯的渐亮渐熄控制、工作次数及电池容量显示、传感器误动作停机自动恢复控制；所述指示灯为两只红色的发光二极管。

7、根据权利要求 3 所述的仿真气溶胶吸入器，其特征在于所述传感器为用弹性合金片制成的开关式传感器、线性输出的霍尔器件、半导体力敏芯片、半导体矩阵热电桥芯片或电容及电感式传感器。

8、根据权利要求 4 所述的仿真气溶胶吸入器，其特征在于所述硅橡胶



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波纹隔膜用氟橡胶、丁腈橡胶或弹性合金膜制成。

9、根据权利要求 3 所述的仿真气溶胶吸入器，其特征在于所述外螺纹电极为不锈钢或黄铜件镀金开中孔制成；所述电池为锂电池，所述锂电池为可充电的聚合物锂电池或可充电的锂离子电池。

10、根据权利要求 1 所述的仿真气溶胶吸入器，其特征在于所述雾化器组件包括内螺纹电极、雾化器及第二壳体，第二壳体的一端与烟瓶组件相插接，另一端设有内螺纹电极，其上设有第二负压腔孔。

11、根据权利要求 3 所述的仿真气溶胶吸入器，其特征在于所述雾化器组件包括内螺纹电极、雾化器及第二壳体，第二壳体的一端与烟瓶组件相插接，另一端设有内螺纹电极，其上设有第二负压腔孔。

12、根据权利要求 6 所述的仿真气溶胶吸入器，其特征在于所述雾化器组件包括内螺纹电极、雾化器及第二壳体，第二壳体的一端与烟瓶组件相插接，另一端设有内螺纹电极，其上设有第二负压腔孔。

13、根据权利要求 7 所述的仿真气溶胶吸入器，其特征在于所述雾化器组件包括内螺纹电极、雾化器及第二壳体，第二壳体的一端与烟瓶组件相插接，另一端设有内螺纹电极，其上设有第二负压腔孔。

14、根据权利要求 10、11、12 或 13 所述的仿真气溶胶吸入器，其特征在于所述雾化器组件包括气液分离器，气液分离器与雾化器依次与内螺纹电极相连接；在第二壳体上开有进气孔道。

15、根据权利要求 14 所述的仿真气溶胶吸入器，其特征在于所述内螺纹电极为不锈钢或黄铜件镀金开中孔制成；所述气液分离器是用不锈钢或塑料开孔制成。

16、根据权利要求 10、11、12 或 13 所述的仿真气溶胶吸入器，其特征在于所述雾化器为毛细浸润式雾化器或喷射式雾化器，雾化器内设有加热体；喷射式雾化器上开有喷射孔。

17、根据权利要求 15 所述的仿真气溶胶吸入器，其特征在于所述雾化器为毛细浸润式雾化器或喷射式雾化器，雾化器内设有加热体；喷射式雾化器上开有喷射孔。

18、根据权利要求 16 所述的仿真气溶胶吸入器，其特征在于所述喷射孔是用泡沫陶瓷、微孔陶瓷、发泡金属、不锈钢纤维毡或化学纤维成型开孔



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制成。

19、根据权利要求 16 所述的仿真气溶胶吸入器，其特征在于所述加热体是用微孔陶瓷骨架上绕有镍铬合金丝、铁铬铝合金丝或铂丝电热材料制成，或直接用导电陶瓷或 PTC 陶瓷材料制成的带烧结电极的多孔体；加热体的表面烧结成高温釉以固定沸石颗粒，沸石颗粒由天然沸石、人造无机微孔陶瓷或氧化铝颗粒制成。

20、根据权利要求 3 所述的仿真气溶胶吸入器，其特征在于所述烟瓶组件包括烟液瓶、纤维及吸嘴，带有烟液的纤维容置在烟液瓶的一端，该端插接在第二壳体内、抵接在雾化器上，吸嘴位于烟液瓶的另一端，在纤维与烟液瓶的内壁间留有吸气孔道

21、根据权利要求 10、11、12 或 13 所述的仿真气溶胶吸入器，其特征在于所述烟瓶组件包括烟液瓶、纤维及吸嘴，带有烟液的纤维容置在烟液瓶的一端，该端插接在第二壳体内、抵接在雾化器上，吸嘴位于烟液瓶的另一端，在纤维与烟液瓶的内壁间留有吸气孔道。

22、根据权利要求 21 所述的仿真气溶胶吸入器，其特征在于：所述烟液瓶、吸嘴是用无毒塑料制成：所述纤维是用聚丙烯纤维或尼龙纤维制成。

23、根据权利要求 22 所述的仿真气溶胶吸入器，其特征在于：所述纤维中用于雾化的烟液含有 0.1—3.5%的烟碱，0.05—5%的烟用香精，0.1—3%的有机酸，0.1—0.5%的稳定剂，余量为丙二醇。



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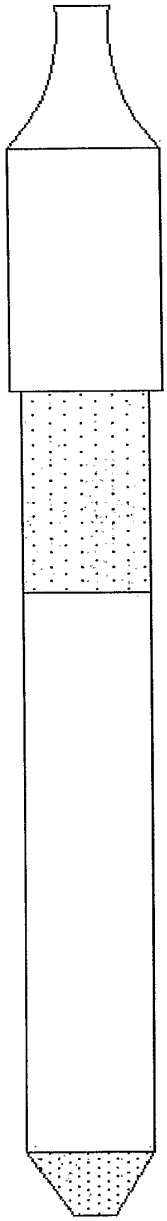


图 1



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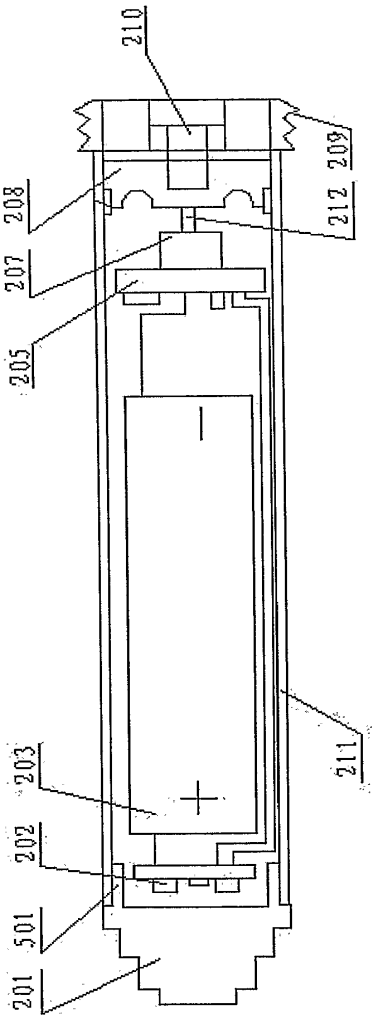



图 2A



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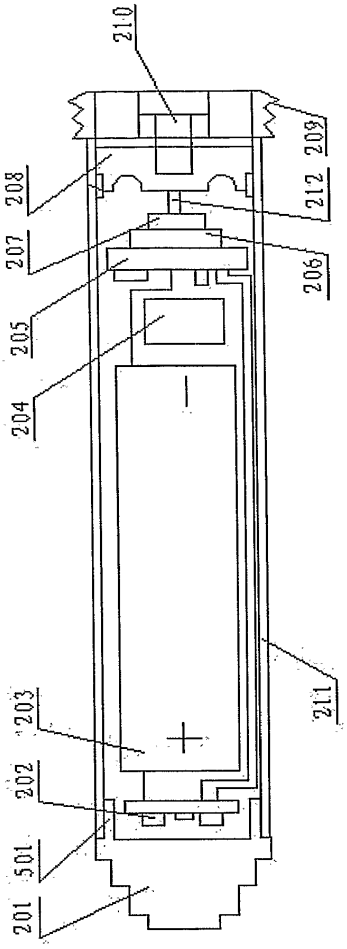



图 2B

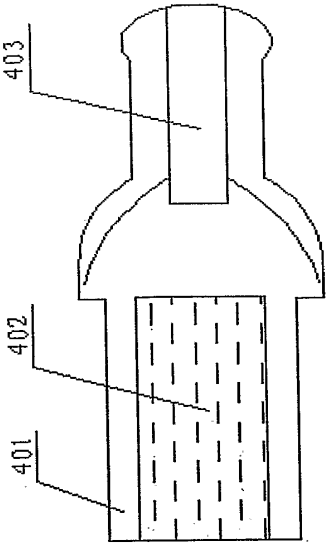



图 4

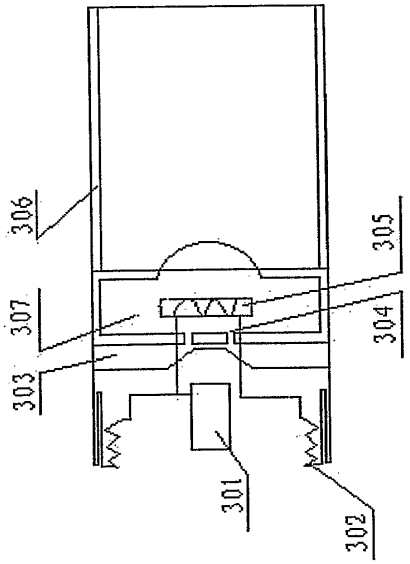



图 3



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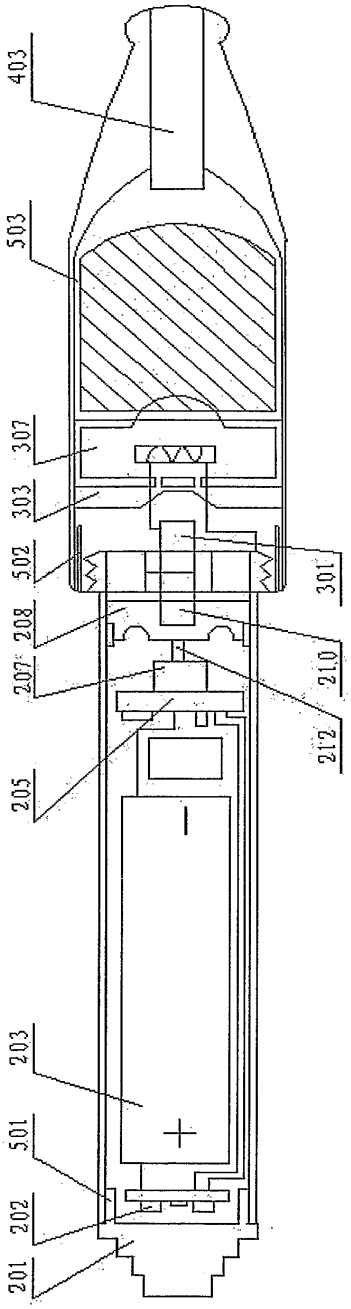



图 5A

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Case No. IPR2024-161
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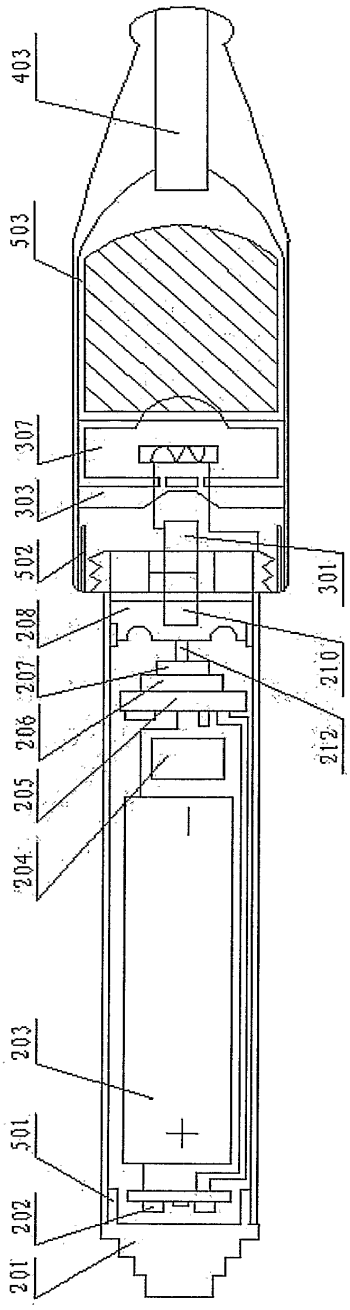



图 5B

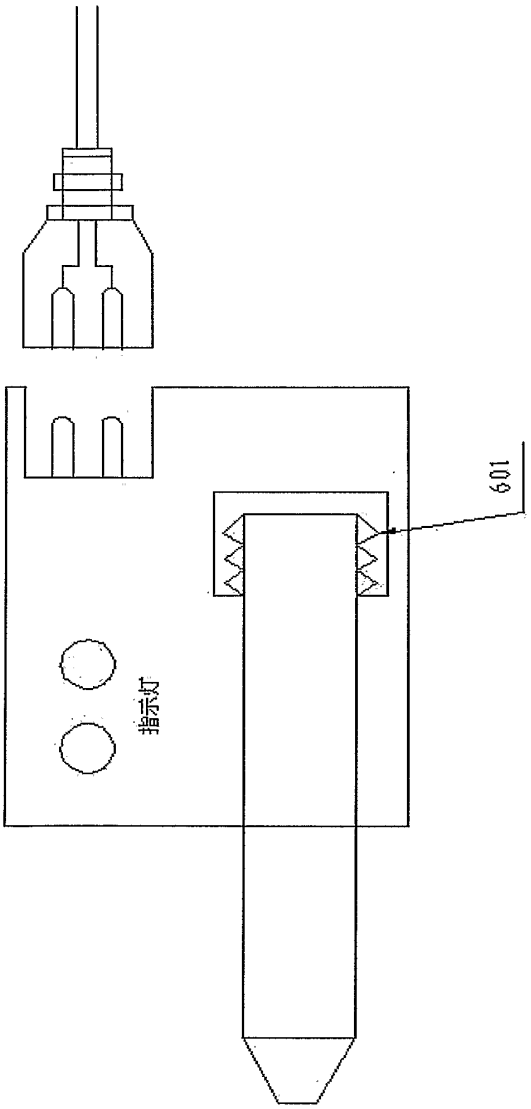



图 6



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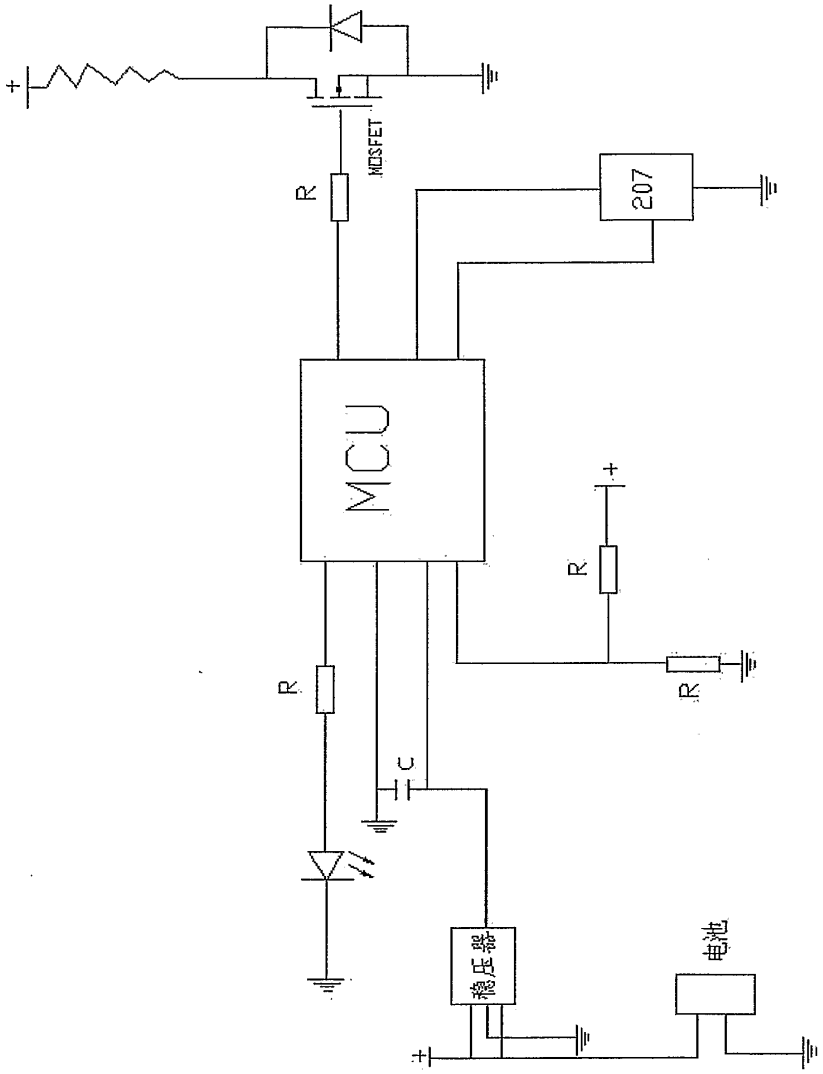



图 7

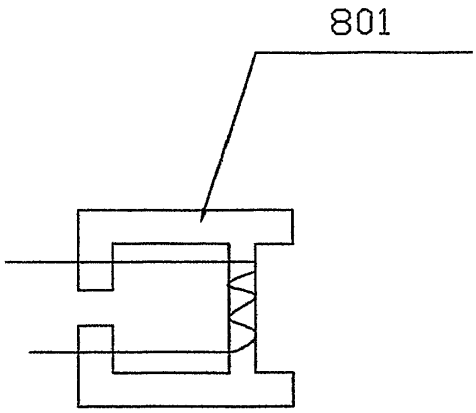



图 8

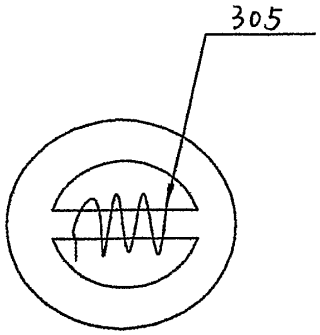



图 9

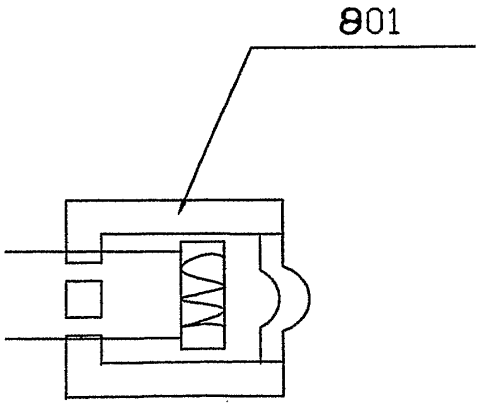



图 10

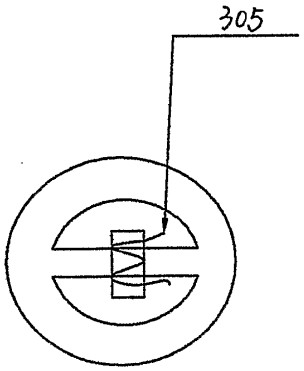



图 11



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Case No. IPR2024-161
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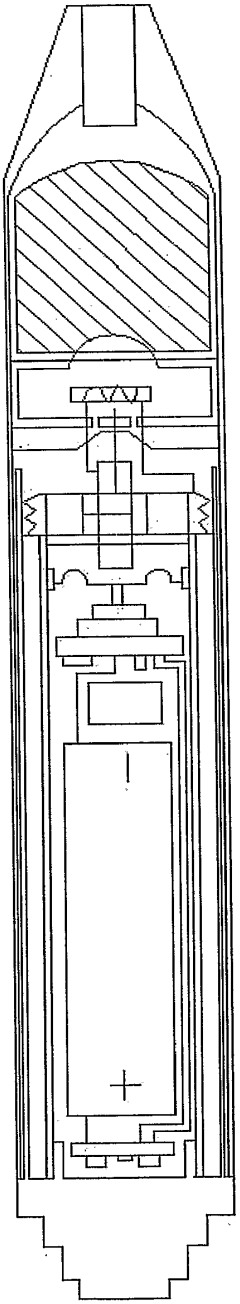


图 12



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Case No. IPR2024-161
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# INTERNATIONAL SEARCH REPORT

International application No.
PCT/CN2007/001576

A. CLASSIFICATION OF SUBJECT MATTER

**See extra sheet**

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

IPC: A24D, A24F

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)

WPI&EPODOC&PAJ Chinese Patent Document (1985~)

Electronic, pipe, cigarette

C. DOCUMENTS CONSIDERED TO BE RELEVANT

| Category* | Citation of document, with indication, where appropriate, of the relevant passages | Relevant to claim No. |
|---|---|---|
| X | CN2719043Y(HAN Li)24 Aug. 2005(24.8.2005)Page 3 lines 5- page 4 lines 27;figures 1-5 | 1-23 |
| X | CN2777995Y(HAN Li)10 May 2006(10.05.2006)Page 3 lines 1- page 5 lines 11;figures 1-8 | 1-23 |
| X | CN1530041A(HAN Li)22 Sep. 2004(22.09.2004)Page 2 lines 15- 18;figure 1 | 1 |
| X | CN1541577A(HAN Li)03 Nov. 2004(03.11.2004)Page 1 lines 22- page 2 line 13;figure 1 | 1 |
| A | CN1252961A(SONG Guoqiang)17 May 2000(17.05.2000)the whole document | 1-23 |
| A | US4945929A (BRITISH-AMERICAN TOBACCO CO., LTD.) 07 Aug. 1990(07.08.1990) the whole document | 1-23 |
| A | CN1575673A (SEIKO EPSON COR) 09 Feb.2005(09.02.2005)the whole document | 1-23 |

☐ Further documents are listed in the continuation of Box C. ☒ See patent family annex.

* Special categories of cited documents:

"A" document defining the general state of the art which is not considered to be of particular relevance

"E" earlier application or patent but published on or after the international filing date

"L" document which may throw doubts on priority claim (S) or which is cited to establish the publication date of another citation or other special reason (as specified)

"O" document referring to an oral disclosure, use, exhibition or other means

"P" document published prior to the international filing date but later than the priority date claimed

"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention

"X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone

"Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art

"&"document member of the same patent family

| Date of the actual completion of the international search | Date of mailing of the international search report |
|---|---|
| 20 Jul. 2007(20.07.2007) | **16 Aug. 2007 (16.08.2007)** |
| Name and mailing address of the ISA/CN<br>The State Intellectual Property Office, the P.R.China<br>6 Xitucheng Rd., Jimen Bridge, Haidian District, Beijing, China 100088<br>Facsimile No. 86-10-62019451 | Authorized officer<br>ZHAO,Xiaoyu<br>Telephone No. (86-10)62085853 |

Form PCT/ISA /210 (second sheet) (April 2007)

**INTERNATIONAL SEARCH REPORT**
Information on patent family members

International application No.
PCT/CN2007/001576

| Patent Documents referred in the Report | Publication Date | Patent Family | Publication Date |
|---|---|---|---|
| CN2719043Y | 24 Aug. 2005 | AU2005232354A | 27 Oct. 2005 |
| | | WO2005099494A | 27 Oct. 2005 |
| | | CA2562581A | 27 Oct. 2005 |
| | | EP1736065A | 27 Dec. 2006 |
| | | CN1942114A | 04 Apr.2007 |
| | | BRPI0506780A | 22 May 2007 |
| CN2777995Y | 10 May 2006 | None | |
| CN1530041A | 22 Sep. 2004 | WO2004080216A | 23 Sep. 2004 |
| | | KR20050107739A | 15 Nov. 2005 |
| | | RU2005115957A | 20 Jan. 2006 |
| CN1541577A | 03 Nov. 2004 | CA2518174A | 11 Nov. 2004 |
| | | WO2004095955A | 11 Nov.2004 |
| | | AU2004234199A | 11 Nov.2004 |
| | | RU2005115958A | 10 Nov.2004 |
| | | EP1618803A | 25 Jan.2006 |
| | | BRPI0407944A | 07 Mar.2006 |
| | | MXPA05009191A | 10 Mar.2006 |
| | | US2006196518A | 07 Sep. 2006 |
| | | JP2006524494T | 02 Nov.2006 |
| CN1252961A | 17 May 2000 | None | |
| US4945929A | 07 Aug. 1990 | GB2191718A | 23 Dec. 1987 |
| | | DE3719718A | 23 Dec.1987 |
| | | GB2191718B | 05 Sep. 1990 |
| CN1575673A | 09 Feb. 2005 | US2005016550A1 | 27 Jan. 2005 |
| | | JP2005034021A | 10 Feb. 2005 |
| | | CN1284493C | 15 Nov.2006 |

Form PCT/ISA /210 (patent family annex) (April 2007)

# INTERNATIONAL SEARCH REPORT

International application No.
PCT/CN2007/001576

According to International Patent Classification (IPC) or to both national classification and IPC

**A24D1/18(2006.01) i**

**A24F47/00(2006.01) i**



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# 国际检索报告

国际申请号
**PCT/CN2007/001576**

**A. 主题的分类**

**参见附加页**

按照国际专利分类表(IPC)或者同时按照国家分类和 IPC 两种分类

**B. 检索领域**

检索的最低限度文献(标明分类系统和分类号)

IPC: A24D, A24F

包含在检索领域中的除最低限度文献以外的检索文献

在国际检索时查阅的电子数据库(数据库的名称，和使用的检索词（如使用）)

WPI&EPODOC&PAJ 中国专利文献（1985～）

Electronic, pipe, cigarette 电子、烟斗、烟

**C. 相关文件**

| 类　型* | 引用文件，必要时，指明相关段落 | 相关的权利要求 |
|---|---|---|
| X | CN2719043Y(韩力)24. 8 月 2005(24.8.2005)<br>说明书第 3 页第 5 行－第 4 页 27 行；图 1－5 | 1－23 |
| X | CN2777995Y(韩力)10. 5 月 2006(10.05.2006)<br>说明书第 3 页第 1 行－第 5 页 11 行；图 1－8 | 1－23 |
| X | CN1530041A(韩力)22. 9 月 2004(22.09.2004)<br>说明书第 2 页第 15－18 行；图 1 | 1 |
| X | CN1541577A(韩力)03. 11 月 2004(03.11.2004)<br>说明书第 1 页第 22 行－第 2 页 13 行；图 1 | 1 |
| A | CN1252961A(宋国强)17. 5 月 2000(17.5.2000)全文 | 1－23 |
| A | US4945929A (BRITISH-AMERICAN TOBACCO CO., LTD.）7. 8 月 1990(07.081990) 全文 | 1－23 |
| A | CN1575673A（精工爱普生株式会社）09. 2 月 2005(09.02.2005) 全文 | 1－23 |

☐ 其余文件在 C 栏的续页中列出。　　☒ 见同族专利附件。

* 引用文件的具体类型：

"A" 认为不特别相关的表示了现有技术一般状态的文件

"E" 在国际申请日的当天或之后公布的在先申请或专利

"L" 可能对优先权要求构成怀疑的文件，或为确定另一篇引用文件的公布日而引用的或者因其他特殊理由而引用的文件

"O" 涉及口头公开、使用、展览或其他方式公开的文件

"P" 公布日先于国际申请日但迟于所要求的优先权日的文件

"T" 在申请日或优先权日之后公布，与申请不相抵触，但为了理解发明之理论或原理的在后文件

"X" 特别相关的文件，单独考虑该文件，认定要求保护的发明不是新颖的或不具有创造性

"Y" 特别相关的文件，当该文件与另一篇或者多篇该类文件结合并且这种结合对于本领域技术人员为显而易见时，要求保护的发明不具有创造性

"&" 同族专利的文件

| 国际检索实际完成的日期 | 国际检索报告邮寄日期 |
|---|---|
| 20.7 月 2007(20.07.2007) | **16.8 月 2007 (16.08.2007)** |
| 中华人民共和国国家知识产权局(ISA/CN)<br>中国北京市海淀区蓟门桥西土城路 6 号 100088<br>传真号：(86-10)62019451 | 受权官员<br>赵晓宇<br>电话号码：(86-10) **62085853** |

PCT/ISA/210 表(第 2 页) (2007 年 4 月)

国际检索报告
关于同族专利的信息

国际申请号
PCT/CN2007/001576

| 检索报告中引用的专利文件 | 公布日期 | 同族专利 | 公布日期 |
|---|---|---|---|
| CN2719043Y | 24. 8 月 2005 | AU2005232354A | 27.10 月 2005 |
| | | WO2005099494A | 27.10 月 2005 |
| | | CA2562581A | 27.10 月 2005 |
| | | EP1736065A | 27.12 月 2006 |
| | | CN1942114A | 04.4 月 2007 |
| | | BRPI0506780A | 22.5 月 2007 |
| CN2777995Y | 10. 5 月 2006 | 无 | |
| CN1530041A | 22. 9 月 2004 | WO2004080216A | 23. 9 月 2004 |
| | | KR20050107739A | 15. 11 月 2005 |
| | | RU2005115957A | 20. 1 月 2006 |
| CN1541577A | 03.11 月 2004 | CA2518174A | 11. 11 月 2004 |
| | | WO2004095955A | 11. 11 月 2004 |
| | | AU2004234199A | 11. 11 月 2004 |
| | | RU2005115958A | 10. 11 月 2004 |
| | | EP1618803A | 25. 1 月 2006 |
| | | BRPI0407944A | 07. 3 月 2006 |
| | | MXPA05009191A | 10. 3 月 2006 |
| | | US2006196518A | 07. 9 月 2006 |
| | | JP2006524494T | 02. 11 月 2006 |
| CN1252961A | 17. 5 月 2000 | 无 | |
| US4945929A | 07. 8 月 1990 | GB2191718A | 23.12 月 1987 |
| | | DE3719718A | 23.12 月 1987 |
| | | GB2191718B | 05.9 月 1990 |
| CN1575673A | 09. 2 月 2005 | US2005016550A1 | 27.1 月 2005 |
| | | JP2005034021A | 10.2 月 2005 |
| | | CN1284493C | 15.11 月 2006 |



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按照国际专利分类表(IPC)或者同时按照国家分类和 IPC 两种分类：

**A24D1/18(2006.01) i**

**A24F47/00(2006.01) i**



JUUL Ex. 1002
Case No. IPR2024-161
Page 531 of 552

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

| | | |
|---|---|---|
| In re Application of: | ) | Confirmation No.: 1065 |
| Gregory D. Conley et al. | ) | |
| Serial No.: 15/377,522 | ) | Group Art Unit: 3761 |
| Filed: December 13, 2016 | ) | Examiner: Thor S. Campbell |
| For: ELECTRONIC VAPORIZER | ) | |

Mail Stop AMENDMENT
Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Sir:

**INFORMATION DISCLOSURE STATEMENT UNDER 37 C.F.R. § 1.97(b)**

Pursuant to 37 C.F.R. §§ 1.56 and 1.97(b), Applicant brings to the attention of the Examiner the documents listed on the attached Form PTO/SB/08. This Information Disclosure Statement is being filed concurrently with a Certification and Request for Consideration of an Information Disclosure Statement Filed After Payment of the Issue Fee Under the QPIDS Program (Form PTO/SB/09) and Request for Continued Examination (RCE) for the above-referenced application.

Applicant brings to the attention of the Examiner the existence of a recently filed litigation proceeding, i.e., Civil Action No. 19-260 in the U.S. District Court for the Middle District of North Carolina, asserting infringement of U.S. Patent No. 9,532,604. The '604 patent issued from application serial no.14/510,955, which is the parent of application serial no. 15/377,522. Applicant is providing a copy of the initial Complaint as originally filed, as well as the recently filed Answer (with Exhibits) to bring to the Examiner's attention at least the references identified by the defendant at pages 53 and 54 of the Answer as being allegedly pertinent as identified at least in part on attached form PTO/SB/08, and defendant's affirmative defenses and counterclaims for inequitable conduct related to inventorship and misnaming of inventors. Applicant notes that a number of the listed references on page 54 of the Answer were previously

cited/considered and are not being relisted in order to be compliant with the certification filed herewith. Applicant encourages the Examiner to again consider the references identified in the Answer even if not relisted on form PTO/SB/08.

Copies of the listed non-U.S. patent documents are attached with English-language abstracts/translations (if available) as indicated. Applicant respectfully requests that the Examiner consider the listed documents and indicate that they were considered by making appropriate notations on the attached form.

This submission does not represent that a search has been made or that no better art exists and does not constitute an admission that each or all of the listed documents are material or constitute "prior art." If the Examiner applies any of the documents as prior art against any claim in the application and Applicant determines that the cited documents do not constitute "prior art" under United States law, Applicant reserves the right to present to the office the relevant facts and law regarding the appropriate status of such documents.

Applicant further reserves the right to take appropriate action to establish the patentability of the disclosed invention over the listed documents, should one or more of the documents be applied against the claims of the present application.

If there is any fee due in connection with the filing of this Statement, please charge the fee to our Deposit Account No. 50-1068.

Respectfully submitted,

MARTIN & FERRARO, LLP

Date: May 1, 2019

By: /Thomas H. Martin/
Thomas H. Martin
Registration No. 34,383

1557 Lake O'Pines Street, NE
Hartville, Ohio 44632
Telephone: (330) 877-0700

# Electronic Patent Application Fee Transmittal

| | |
|---|---|
| **Application Number:** | 15377522 |
| **Filing Date:** | 13-Dec-2016 |
| **Title of Invention:** | ELECTRONIC VAPORIZER |
| **First Named Inventor/Applicant Name:** | Gregory D. Conley |
| **Filer:** | Thomas H. Martin/Sandra Blackmon |
| **Attorney Docket Number:** | 269.0003-02000 |

Filed as Small Entity

**Filing Fees for Utility under 35 USC 111(a)**

| Description | Fee Code | Quantity | Amount | Sub-Total in USD($) |
|---|---|---|---|---|
| **Basic Filing:** | | | | |
| PETITION FEE-37CFR 1.17(H) (GROUP II) | 2464 | 1 | 70 | 70 |
| RCE- 1ST REQUEST | 2801 | 1 | 650 | 650 |
| **Pages:** | | | | |
| **Claims:** | | | | |
| **Miscellaneous-Filing:** | | | | |
| **Petition:** | | | | |
| **Patent-Appeals-and-Interference:** | | | | |

| Description | Fee Code | Quantity | Amount | Sub-Total in USD($) |
|---|---|---|---|---|
| **Post-Allowance-and-Post-Issuance:** | | | | |
| **Extension-of-Time:** | | | | |
| **Miscellaneous:** | | | | |
| | | **Total in USD ($)** | | **720** |

UNITED STATES PATENT AND TRADEMARK OFFICE

Commissioner for Patents
United States Patent and Trademark Office
P.O. Box 1450
Alexandria, VA 22313-1450
www.uspto.gov

Decision Date : May 1, 2019

In re Application of :

Gregory Conley

DECISION ON PETITION
UNDER CFR 1.313(c)(2)

Application No : 15377522

Filed : 13-Dec-2016

Attorney Docket No : 269.0003-02000

This is an electronic decision on the petition under 37 CFR 1.313(c)(2), filed May 1, 2019 , to withdraw the above-identified application from issue after payment of the issue fee.

The petition is **GRANTED.**

The above-identified application is withdrawn from issue for consideration of a submission under 37 CFR 1.114 (request for continued examination). See 37 CFR 1.313(c)(2).

**Petitioner is advised that the issue fee paid in this application cannot be refunded. If, however, this application is again allowed, petitioner may request that it be applied towards the issue fee required by the new Notice of Allowance.**

Telephone inquiries concerning this decision should be directed to the Patent Electronic Business Center (EBC) at 866-217-9197.

This application file is being referred to Technology Center AU 3761 for processing of the request for continuing examination under 37 CFR 1.114 .

Office of Petitions

| Electronic Acknowledgement Receipt | |
|---|---|
| **EFS ID:** | 35892798 |
| **Application Number:** | 15377522 |
| **International Application Number:** | |
| **Confirmation Number:** | 1065 |
| **Title of Invention:** | ELECTRONIC VAPORIZER |
| **First Named Inventor/Applicant Name:** | Gregory D. Conley |
| **Customer Number:** | 22882 |
| **Filer:** | Thomas H. Martin/Sandra Blackmon |
| **Filer Authorized By:** | Thomas H. Martin |
| **Attorney Docket Number:** | 269.0003-02000 |
| **Receipt Date:** | 01-MAY-2019 |
| **Filing Date:** | 13-DEC-2016 |
| **Time Stamp:** | 17:44:42 |
| **Application Type:** | Utility under 35 USC 111(a) |

## Payment information:

| | |
|---|---|
| Submitted with Payment | yes |
| Payment Type | CARD |
| Payment was successfully received in RAM | $720 |
| RAM confirmation Number | 050219INTEFSW17443800 |
| Deposit Account | 501068 |
| Authorized User | Sandra Blackmon |
| The Director of the USPTO is hereby authorized to charge indicated fees and credit any overpayment as follows:<br>37 CFR 1.16 (National application filing, search, and examination fees)<br>37 CFR 1.17 (Patent application and reexamination processing fees) | |

37 CFR 1.19 (Document supply fees)

37 CFR 1.21 (Miscellaneous fees and charges)

## File Listing:

| Document Number | Document Description | File Name | File Size(Bytes)/ Message Digest | Multi Part /.zip | Pages (if appl.) |
|---|---|---|---|---|---|
| 1 | Petition automatically granted by EFS | petition-request.pdf | 31546<br>4ad019ed960c5201c82cc57a09a2d44294734b24 | no | 2 |
| **Warnings:** | | | | | |
| **Information:** | | | | | |
| 2 | Quick Path Information Disclosure Statement | QPIDS.pdf | 189293<br>9cb5f13117eee0712cf4d7b4fbf5f169752a5b82 | no | 2 |
| **Warnings:** | | | | | |
| **Information:** | | | | | |
| 3 | Request for Continued Examination (RCE) | RCE.pdf | 1349973<br>ce2edf6509bd6456f06cfe1a20f03ebfb5ccfdd4 | no | 3 |
| **Warnings:** | | | | | |
| **Information:** | | | | | |
| 4 | Information Disclosure Statement (IDS) Form (SB08) | SB08.pdf | 112393<br>ca4a6df114379f06ce09fa9fc75d3e6666e20106 | no | 1 |
| **Warnings:** | | | | | |
| **Information:** | | | | | |
| This is not an USPTO supplied IDS fillable form | | | | | |
| 5 | Foreign Reference | CN201238610_Xia-with-Abstract.pdf | 123296<br>0fc80410588f96b7121b3eab514f3cb2dd07f51b | no | 1 |
| **Warnings:** | | | | | |
| **Information:** | | | | | |
| 6 | Foreign Reference | KR20090033311A_Li-with-Abstract.pdf | 122330<br>77c3903336cbc0d676c14e47b2c7ca4c2817f6e6 | no | 1 |
| **Warnings:** | | | | | |

| | | | | | |
|---|---|---|---|---|---|
| **Information:** | | | | | |
| 7 | Foreign Reference | WO2005099494A1_Hon-with_Abstract.pdf | 905893<br>53ad5615a80c9db1eed79b1df4427bce3953281d | no | 20 |
| **Warnings:** | | | | | |
| **Information:** | | | | | |
| 8 | Foreign Reference | WO2007131450A1_Hon-with_Abstract.pdf | 1056323<br>8f47aeb534328465d8637229fc9ef74737e6d304 | no | 25 |
| **Warnings:** | | | | | |
| **Information:** | | | | | |
| 9 | Non Patent Literature | Complaint_with_Exhibits.pdf | 23083149<br>dd5052f5a0d130cea2e6a00015b53edb3deead81 | no | 196 |
| **Warnings:** | | | | | |
| **Information:** | | | | | |
| 10 | Non Patent Literature | Answer_with_Exhibits-29APR2019.pdf | 14329147<br>123ee5a04f747501b62b74801d5ea3915c36ab50 | no | 246 |
| **Warnings:** | | | | | |
| **Information:** | | | | | |
| 11 | Transmittal Letter | IDS.pdf | 83311<br>35fcf159023 4281db4a2b021b8e9b17bf6c611e7 | no | 2 |
| **Warnings:** | | | | | |
| **Information:** | | | | | |
| 12 | Fee Worksheet (SB06) | fee-info.pdf | 32184<br>3b9c53293dd60dd4147d24868f91d65f96ea3c05 | no | 2 |
| **Warnings:** | | | | | |
| **Information:** | | | | | |
| | | | **Total Files Size (in bytes):** | 41418838 | |

**This Acknowledgement Receipt evidences receipt on the noted date by the USPTO of the indicated documents, characterized by the applicant, and including page counts, where applicable. It serves as evidence of receipt similar to a Post Card, as described in MPEP 503.**

**New Applications Under 35 U.S.C. 111**

**If a new application is being filed and the application includes the necessary components for a filing date (see 37 CFR 1.53(b)-(d) and MPEP 506), a Filing Receipt (37 CFR 1.54) will be issued in due course and the date shown on this Acknowledgement Receipt will establish the filing date of the application.**

**National Stage of an International Application under 35 U.S.C. 371**

**If a timely submission to enter the national stage of an international application is compliant with the conditions of 35 U.S.C. 371 and other applicable requirements a Form PCT/DO/EO/903 indicating acceptance of the application as a national stage submission under 35 U.S.C. 371 will be issued in addition to the Filing Receipt, in due course.**

**New International Application Filed with the USPTO as a Receiving Office**

**If a new international application is being filed and the international application includes the necessary components for an international filing date (see PCT Article 11 and MPEP 1810), a Notification of the International Application Number and of the International Filing Date (Form PCT/RO/105) will be issued in due course, subject to prescriptions concerning national security, and the date shown on this Acknowledgement Receipt will establish the international filing date of the application.**

| Doc Code: PET.AUTO<br>Document Description: Petition automatically granted by EFS-Web | PTO/SB/140<br>U.S. Patent and Trademark Office<br>Department of Commerce |
|---|---|

| | |
|---|---|
| Electronic Petition Request | **PETITION TO WITHDRAW AN APPLICATION FROM ISSUE AFTER PAYMENT OF THE ISSUE FEE UNDER 37 CFR 1.313(c)** |
| Application Number | 15377522 |
| Filing Date | 13-Dec-2016 |
| First Named Inventor | Gregory Conley |
| Art Unit | 3761 |
| Examiner Name | THOR CAMPBELL |
| Attorney Docket Number | 269.0003-02000 |
| Title | ELECTRONIC VAPORIZER |

An application may be withdrawn from issue for further action upon petition by the applicant. To request that the Office withdraw an application from issue, applicant must file a petition under this section including the fee set forth in § 1.17(h) and a showing of good and sufficient reasons why withdrawal of the application from issue is necessary.

APPLICANT HEREBY PETITIONS TO WITHDRAW THIS APPLICATION FROM ISSUE UNDER 37 CFR 1.313(c).

A grantable petition requires the following items:
(1) Petition fee; and
(2) One of the following reasons:
(a) Unpatentability of one or more claims, which must be accompanied by an unequivocal statement that one or more claims are unpatentable, an amendment to such claim or claims, and an explanation as to how the amendment causes such claim or claims to be patentable;
(b) Consideration of a request for continued examination in compliance with § 1.114 (for a utility or plant application only); or
(c) Express abandonment of the application. Such express abandonment may be in favor of a continuing application, but not a CPA under 37 CFR 1.53(d).

Petition Fee

| | |
|---|---|
| ◉ | Small Entity |
| ○ | Micro Entity |
| ○ | Regular Undiscounted |

Reason for withdrawal from issue

| |
|---|
| ◯ One or more claims are unpatentable<br><br>◉ Consideration of a request for continued examination (RCE) (List of Required Documents and Fees)<br><br>◯ Applicant hereby expressly abandons the instant application (any attorney/agent signing for this reason must have power of attorney pursuant to 37 CFR 1.32(b)). |
| RCE request,submission, and fee.<br><br>☐ I certify, in accordance with 37 CFR 1.4(d)(4) that :<br>The RCE request ,submission, and fee have already been filed in the above-identified application on<br><br>☒ Are attached. |
| THIS PORTION MUST BE COMPLETED BY THE SIGNATORY OR SIGNATORIES<br><br>I certify, in accordance with 37 CFR 1.4(d)(4) that I am:<br><br>◉ An attorney or agent registered to practice before the Patent and Trademark Office who has been given power of attorney in this application.<br><br>◯ An attorney or agent registered to practice before the Patent and Trademark Office, acting in a representative capacity.<br><br>◯ A sole inventor<br><br>◯ A joint inventor; I certify that I am authorized to sign this submission on behalf of all of the inventors as evidenced by the power of attorney in the application<br><br>◯ A joint inventor; all of whom are signing this e-petition |

| | |
|---|---|
| Signature | /Thomas H. Martin/ |
| Name | Thomas H. Martin |
| Registration Number | 34383 |

| Electronic Acknowledgement Receipt | |
|---|---|
| **EFS ID:** | 35896603 |
| **Application Number:** | 15377522 |
| **International Application Number:** | |
| **Confirmation Number:** | 1065 |
| **Title of Invention:** | ELECTRONIC VAPORIZER |
| **First Named Inventor/Applicant Name:** | Gregory D. Conley |
| **Customer Number:** | 22882 |
| **Filer:** | Thomas H. Martin/Sandra Blackmon |
| **Filer Authorized By:** | Thomas H. Martin |
| **Attorney Docket Number:** | 269.0003-02000 |
| **Receipt Date:** | 02-MAY-2019 |
| **Filing Date:** | 13-DEC-2016 |
| **Time Stamp:** | 10:45:45 |
| **Application Type:** | Utility under 35 USC 111(a) |

## Payment information:

| Submitted with Payment | no |
|---|---|

## File Listing:

| Document Number | Document Description | File Name | File Size(Bytes)/ Message Digest | Multi Part /.zip | Pages (if appl.) |
|---|---|---|---|---|---|
| 1 | Non Patent Literature | Answer_Exhibits_13-26.pdf | 24458375<br>e9b2c4adcb7655659f303422ff41ba69fa17dcf3 | no | 160 |

**Warnings:**

| Information: | |
|---|---|
| Total Files Size (in bytes): | 24458375 |

**This Acknowledgement Receipt evidences receipt on the noted date by the USPTO of the indicated documents, characterized by the applicant, and including page counts, where applicable. It serves as evidence of receipt similar to a Post Card, as described in MPEP 503.**

**New Applications Under 35 U.S.C. 111**

**If a new application is being filed and the application includes the necessary components for a filing date (see 37 CFR 1.53(b)-(d) and MPEP 506), a Filing Receipt (37 CFR 1.54) will be issued in due course and the date shown on this Acknowledgement Receipt will establish the filing date of the application.**

**National Stage of an International Application under 35 U.S.C. 371**

**If a timely submission to enter the national stage of an international application is compliant with the conditions of 35 U.S.C. 371 and other applicable requirements a Form PCT/DO/EO/903 indicating acceptance of the application as a national stage submission under 35 U.S.C. 371 will be issued in addition to the Filing Receipt, in due course.**

**New International Application Filed with the USPTO as a Receiving Office**

**If a new international application is being filed and the international application includes the necessary components for an international filing date (see PCT Article 11 and MPEP 1810), a Notification of the International Application Number and of the International Filing Date (Form PCT/RO/105) will be issued in due course, subject to prescriptions concerning national security, and the date shown on this Acknowledgement Receipt will establish the international filing date of the application.**

UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

| APPLICATION NO. | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
|---|---|---|---|---|
| 15/377,522 | 12/13/2016 | Gregory D. Conley | 269.0003-02000 | 1065 |

22882 7590 05/30/2019

MARTIN & FERRARO, LLP
1557 LAKE O'PINES STREET, NE
HARTVILLE, OH 44632

| EXAMINER | |
|---|---|
| CAMPBELL, THOR S | |

| ART UNIT | PAPER NUMBER |
|---|---|
| 3761 | |

| NOTIFICATION DATE | DELIVERY MODE |
|---|---|
| 05/30/2019 | ELECTRONIC |

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

USPTO-docketing@martinferraro.com

| ***Corrected*** ***Notice of Allowability*** | **Application No.** 15/377,522 | **Applicant(s)** Conley et al. | |
|---|---|---|---|
| | **Examiner** THOR S CAMPBELL | **Art Unit** 3761 | **AIA (FITF) Status** No |

***-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address--***

All claims being allowable, PROSECUTION ON THE MERITS IS (OR REMAINS) CLOSED in this application. If not included herewith (or previously mailed), a Notice of Allowance (PTOL-85) or other appropriate communication will be mailed in due course. **THIS NOTICE OF ALLOWABILITY IS NOT A GRANT OF PATENT RIGHTS.** This application is subject to withdrawal from issue at the initiative of the Office or upon petition by the applicant. See 37 CFR 1.313 and MPEP 1308.

1. ☑ This communication is responsive to QPIDS filed 05/01/2019.
   ☐ A declaration(s)/affidavit(s) under **37 CFR 1.130(b)** was/were filed on _____.

2. ☐ An election was made by the applicant in response to a restriction requirement set forth during the interview on _____; the restriction requirement and election have been incorporated into this action.

3. ☑ The allowed claim(s) is/are 21-51 . As a result of the allowed claim(s), you may be eligible to benefit from the **Patent Prosecution Highway** program at a participating intellectual property office for the corresponding application. For more information, please see **http://www.uspto.gov/patents/init_events/pph/index.jsp** or send an inquiry to **PPHfeedback@uspto.gov.**

4. ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

   **Certified copies:**

   a) ☐ All  b) ☐ Some  *c) ☐ None of the:

   1. ☐ Certified copies of the priority documents have been received.
   2. ☐ Certified copies of the priority documents have been received in Application No. _____ .
   3. ☐ Copies of the certified copies of the priority documents have been received in this national stage application from the International Bureau (PCT Rule 17.2(a)).

   * Certified copies not received: _____ .

Applicant has THREE MONTHS FROM THE "MAILING DATE" of this communication to file areply complying with the requirements noted below. Failure to timely comply will result in ABANDONMENT of this application.
**THIS THREE-MONTH PERIOD IS NOT EXTENDABLE.**

5. ☐ CORRECTED DRAWINGS (as "replacement sheets") must be submitted.
   ☐ including changes required by the attached Examiner's Amendment / Comment or in the Office action of Paper No./Mail Date _____ .

   **Identifying indicia such as the application number (see 37 CFR 1.84(c)) should be written on the drawings in the front (not the back) of each sheet. Replacement sheet(s) should be labeled as such in the header according to 37 CFR 1.121(d).**

6. ☐ DEPOSIT OF and/or INFORMATION about the deposit of BIOLOGICAL MATERIAL must be submitted. Note the attached Examiner's comment regarding REQUIREMENT FOR THE DEPOSIT OF BIOLOGICAL MATERIAL.

**Attachment(s)**

1. ☐ Notice of References Cited (PTO-892)
2. ☑ Information Disclosure Statements (PTO/SB/08), Paper No./Mail Date 05/01/2019.
3. ☐ Examiner's Comment Regarding Requirement for Deposit of Biological Material _____.
4. ☐ Interview Summary (PTO-413), Paper No./Mail Date. _____.
5. ☐ Examiner's Amendment/Comment
6. ☐ Examiner's Statement of Reasons for Allowance
7. ☐ Other _____.

/THOR S CAMPBELL/
Primary Examiner, Art Unit 3761

OMB 0651-0031

| Substitute for FORM PTO-1449 | Attorney Docket Number 269.0003-02000 | Customer No. 22882 | |
|---|---|---|---|
| INFORMATION DISCLOSURE STATEMENT IN AN APPLICATION | Applicant Gregory D. Conley et al. | Application Number 15/377,522 | |
| (Use several sheets if necessary) Sheet 1 of 1 | Filing Date December 13, 2016 | Group Art Unit 3761 | Examiner T.S. Campbell |

**U.S. PATENT DOCUMENTS**

| EXAMINER INITIAL | DOCUMENT NUMBER | DATE | NAME | CLASS | SUBCLASS | FILING DATE IF APPROPRIATE |
|---|---|---|---|---|---|---|
| | 2057353 | 9/1935 | Whittemore, Jr. | | | |
| | 4947874 | 8/1990 | Brooks | | | |
| | | | | | | |

**U.S. PATENT PUBLICATION DOCUMENTS**

| EXAMINER INITIAL | DOCUMENT NUMBER | DATE | NAME | CLASS | SUBCLASS | FILING DATE IF APPROPRIATE |
|---|---|---|---|---|---|---|
| | | | | | | |

**FOREIGN PATENT DOCUMENTS**

| | DOCUMENT NUMBER | DATE | COUNTRY | CLASS | SUBCLASS | TRANSLATION (YES/NO) |
|---|---|---|---|---|---|---|
| | 201238610 | 5/2009 | CN | | | Abstract Only |
| | 20090033311 | 4/2009 | KR | | | Abstract Only |
| | WO2005099494 | 10/2005 | WIPO | | | Abstract Only |
| | WO2007131450 | 11/2007 | WIPO | | | Abstract Only |
| | | | | | | |

**NON PATENT LITERATURE DOCUMENTS** ***(Including Author, Title, Date, Pertinent Pages, Etc.)***

| | |
|---|---|
| | Complaint for Patent Infringement with exhibits as filed 06MAR2019; United States District Court for the Middle District of North Carolina; Civil Action No. 1:19-cv-00260. |
| | Defendant R.J. Reynolds Vapor Company's Answer, Affirmative Defenses and Counterclaim to Complaint for Patent Infringement with exhibits as filed 29APR2019; United States District Court for the Middle District of North Carolina; Civil Action No. 1:19-cv-00260. |
| | Crown 7 HYDRO device; *https://www.youtube.com/watch?v=tQNFFw8A_DI* (YouTube video published on 10DEC2008). |
| | NJOY NPRO device; https://www.youtube.com/watch?v=TBdX24ALpLY (YouTube video published on 5DEC2008). |
| | Smoke 51 Devices as disclosed on page 53 and listed on page 54 of the 29APR2019 Defendant's Answer in Civil Action No. 1:19-cv-00260. |
| | |

| EXAMINER /THOR S CAMPBELL/ (05/28/2019) | DATE CONSIDERED |
|---|---|

EXAMINER: Initial if citation considered, whether or not citation is in conformance with MPEP § 609; Draw line through citation if not in conformance and not considered. Include copy of this form with next communication to the applicant.

ALL REFERENCES CONSIDERED EXCEPT WHERE LINED THROUGH. /T.S.C/

| Electronic Acknowledgement Receipt | |
|---|---|
| **EFS ID:** | 35892798 |
| **Application Number:** | 15377522 |
| **International Application Number:** | |
| **Confirmation Number:** | 1065 |
| **Title of Invention:** | ELECTRONIC VAPORIZER |
| **First Named Inventor/Applicant Name:** | Gregory D. Conley |
| **Customer Number:** | 22882 |
| **Filer:** | Thomas H. Martin/Sandra Blackmon |
| **Filer Authorized By:** | Thomas H. Martin |
| **Attorney Docket Number:** | 269.0003-02000 |
| **Receipt Date:** | 01-MAY-2019 |
| **Filing Date:** | 13-DEC-2016 |
| **Time Stamp:** | 17:44:42 |
| **Application Type:** | Utility under 35 USC 111(a) |

## Payment information:

| | |
|---|---|
| Submitted with Payment | yes |
| Payment Type | CARD |
| Payment was successfully received in RAM | $720 |
| RAM confirmation Number | 050219INTEFSW17443800 |
| Deposit Account | 501068 |
| Authorized User | Sandra Blackmon |
| The Director of the USPTO is hereby authorized to charge indicated fees and credit any overpayment as follows:<br>37 CFR 1.16 (National application filing, search, and examination fees)<br>37 CFR 1.17 (Patent application and reexamination processing fees) | |

United States Patent and Trademark Office

- Sales Receipt -

Adjustment date: 06/05/2019 SDIRETA1

05/02/2019 INTEFSW 00004403 15377522

02 FC:2801 -650.00 OP

United States Patent and Trademark Office

- Sales Receipt -

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06/05/2019 0030231400

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Credit Card Refund Total: $650.00

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UNITED STATES DEPARTMENT OF COMMERCE
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P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

| APPLICATION NO. | ISSUE DATE | PATENT NO. | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
|---|---|---|---|---|
| 15/377,522 | 07/02/2019 | 10334881 | 269.0003-02000 | 1065 |

22882 7590 06/12/2019

MARTIN & FERRARO, LLP
1557 LAKE O'PINES STREET, NE
HARTVILLE, OH 44632

# ISSUE NOTIFICATION

The projected patent number and issue date are specified above.

**Determination of Patent Term Adjustment under 35 U.S.C. 154 (b)**
(application filed on or after May 29, 2000)

The Patent Term Adjustment is 284 day(s). Any patent to issue from the above-identified application will include an indication of the adjustment on the front page.

If a Continued Prosecution Application (CPA) was filed in the above-identified application, the filing date that determines Patent Term Adjustment is the filing date of the most recent CPA.

Applicant will be able to obtain more detailed information by accessing the Patent Application Information Retrieval (PAIR) WEB site (http://pair.uspto.gov).

Any questions regarding the Patent Term Extension or Adjustment determination should be directed to the Office of Patent Legal Administration at (571)-272-7702. Questions relating to issue and publication fee payments should be directed to the Application Assistance Unit (AAU) of the Office of Data Management (ODM) at (571)-272-4200.

APPLICANT(s) (Please see PAIR WEB site http://pair.uspto.gov for additional applicants):

Gregory D. Conley, Medina, OH;
FUMA International, LLC, Medina, OH;
Daniel C. Hillenbrandt JR., Brunswick, OH;

The United States represents the largest, most dynamic marketplace in the world and is an unparalleled location for business investment, innovation, and commercialization of new technologies. The USA offers tremendous resources and advantages for those who invest and manufacture goods here. Through SelectUSA, our nation works to encourage and facilitate business investment. To learn more about why the USA is the best country in the world to develop technology, manufacture products, and grow your business, visit SelectUSA.gov.

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UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

| APPLICATION NUMBER | FILING OR 371(C) DATE | FIRST NAMED APPLICANT | ATTY.DOCKET NO./TITLE | REQUEST ID |
|---|---|---|---|---|
| 15/377,522 | 12/13/2016 | Gregory D. Conley | 269.0003-02000 | 180924 |

## Acknowledgement of Loss of Entitlement to Entity Status Discount

The entity status change request below filed through Private PAIR on 12/28/2022 has been accepted.

**CERTIFICATIONS:**

**Change of Entity Status:**

X Applicant changing to regular undiscounted fee status.

NOTE: Checking this box will be taken to be notification of loss of entitlement to small or micro entity status, as applicable.

**This portion must be completed by the signatory or signatories making the entity status change in accordance with 37 CFR 1.4(d)(4).**

| | |
|---|---|
| **Signature:** | /Wesley C. Meinerding/ |
| **Name:** | Wesley C. Meinerding |
| **Registration Number:** | 57925 |