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STATE INTELLECTUAL PROPERTY OFFICE OF THE PEOPLE'S REPUBLIC OF CHINA

Proof

The attachment to the proof is a copy of the following patent application submitted to the patent office.

Filing date: May 16, 2006

Application Number: 200620090805.0

Application type: Utility model

Title: Emulation aerosol sucker

Applicant: Han Li

Inventor or designer: Han Li

Commissioner of the State Intellectual Property Office of the People's Republic of China

Tian Lipu [signature]

July 4, 2007

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Claims

1. An emulation aerosol sucker, characterized in that it comprises a battery assembly, an atomizer assembly, and a cigarette bottle assembly, a male-threaded electrode (209) is set at one end of the battery assembly, a female-threaded electrode (302) is set at one end of the atomizer assembly, the battery assembly and the atomizer assembly are connected together through the threaded electrodes, the cigarette bottle assembly is inserted into the other end of the atomizer assembly to jointly form a cigarette-type or cigar-type integral body.

2. The emulation aerosol sucker according to claim 1, characterized in that said battery assembly comprises an indicator (202), a lithium battery (203), a MOSFET circuit board (205), a sensor (207), a silicon rubber corrugated diaphragm (208), a first threaded electrode (209), a first negative pressure cavity (210), and a first casing (211), the male-threaded electrode (211) is set at one end of the first casing (211), the indicator (202) is installed at the other end, one side of the indicator is covered with an indicator shade (201) and a micropore (501) is opened in the indicator shade (201), the other side of the indicator is connected to the lithium battery (203) and the MOSFET circuit board (205) in turn, the sensor (207) is set on the metal-oxide semiconductor field-effect transistor (MOSFET) circuit board (205), the silicon rubber corrugated diaphragm (208) is installed between the first threaded electrode (209) and the sensor (207), the first negative pressure cavity (210) is opened on the silicon rubber corrugated diaphragm, and the sensor (207) is connected to the silicon rubber corrugated diaphragm (208) through the reed switch (212) fixed on the sensor.

3. The emulation aerosol sucker according to claim 2, characterized in that an MCU (206) is additionally set between the MOSFET circuit board (205) and the sensor (207) and a display screen (204) is additionally set on the surface of the first casing (211).

4. The emulation aerosol sucker according to claim 3, characterized in that said MCU (206) scans the sensor in the pulsed power saving mode and implements atomized dose restriction of the frequency-to-single-operating-time integral function according to the signal parameters of the sensor and in addition, the MCU (206) controls pulse width modulation of current constant power output, overdischarge protection, automatic cleaning function after thousands of operations, gradual brightening and gradual extinction of the indicator, display of number of operations and battery capacity, and automatic recovery of sensor out-of-operation caused by a misoperation.

5. The emulation aerosol sucker according to claim 2 or claim 3, characterized in that said sensor (207) is a switch sensor made of elastic alloy sheets, a linear Hall device, a semiconductor force-sensitive chip, a semiconductor matrix thermoelectric bridge chip, or a capacitive or inductive sensor.

6. The emulation aerosol sucker according to claim 2 or claim 3, characterized in that said indicator (202) consists of two red light-emitting diodes (LEDs).

7. The emulation aerosol sucker according to claim 2 or claim 3, characterized in that said silicon rubber corrugated diaphragm (208) is made of be made of fluororubber, nitrile butadiene rubber, or elastic alloy films.

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8. The emulation aerosol sucker according to claim 2 or claim 3, characterized in that said male-threaded electrode (209) is made of a stainless steel or brass piece which is gilded and at the center of which a hole is opened.

9. The emulation aerosol sucker according to claim 2 or claim 3, characterized in that said battery (203) is a rechargeable polymer lithium battery or rechargeable lithium ion battery.

10. The emulation aerosol sucker according to claim 1, characterized in that said atomizer assembly comprises a female-threaded electrode (302), a gas-liquid separator (303), an atomizer (307), and a second casing (306), the cigarette bottle assembly is inserted into one end of the second casing (306), the female-threaded electrode (302) is set at the other end, a second negative pressure cavity (301) is set on the female-threaded electrode, the gas-liquid separator (303) and the atomizer (307) are connected to the female-threaded electrode (302) in turn, and an air inlet hole (502) is opened in the second casing (306).

11. The emulation aerosol sucker according to claim 10, characterized in that said female-threaded electrode (302) is made of a stainless steel or brass piece which is gilded and at the center of which a hole is opened.

12. The emulation aerosol sucker according to claim 10, characterized in that said gas-liquid separator (303) is made of holed stainless steel or plastic.

13. The emulation aerosol sucker according to claim 10, characterized in that said atomizer (307) is a capillary infiltration atomizer or spray atomizer, a heating element (305) is set in the atomizer (307), and a spray hole (304) is opened in the spray atomizer.

14. 18. The emulation aerosol sucker according to claim 13, characterized in that said spray hole (304) is formed by opening a hole in a foamed ceramic, microporous ceramic, foamed metal, stainless steel fiber felt, or chemical fiber form.

15. The emulation aerosol sucker according to claim 13, characterized in that said heating element (305) is made of a thermoelectric material such as nichrome wire, aludirome wire, or platinum filament wound on a microporous ceramic frame, or can be a porous body with sintered electrodes which is made of conductive ceramic or PTC ceramic; the surface of the heating element (305) is sintered into high-temperature glaze to fix zeolite grains, and zeolite grains are made of natural zeolite, artificial inorganic microporous ceramic, or aluminum oxide grains.

16. The emulation aerosol sucker according to claim 1, characterized in that said cigarette bottle assembly comprises a cigarette liquid bottle (401), fibers (402), and a suction nozzle (403), the fibers (402) containing cigarette liquid are placed at one end of the cigarette liquid bottle (401) and this end is inserted into the second casing (306) and touches against the atomizer (307), the suction nozzle (403) is located at the other end of the cigarette liquid bottle (401), and an air intake hole (503) is reserved between fibers (402) and the inner wall of the cigarette liquid bottle (401).

17. The emulation aerosol sucker according to claim 16, characterized in that said cigarette liquid bottle (401) and suction nozzle (403) are made of nontoxic plastic.

18. The emulation aerosol sucker according to claim 16, characterized in that said fibers (402) are polypropylene fibers or nylon fibers.

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19. The emulsion aerosol sucker according to claim 16, characterized in that the cigarette liquid used to be atomized in said fibers (402) contains 0.1% to 3.5% nicotinamide, 0.05% to -5% tobacco flavor, 0.1% to 3% organic acid, and 0.1% to -0.5% stabilizer, and remaining percentage propanediol.

20. The emulsion aerosol sucker according to claim 1, characterized in that said sucker and its connection structures can be loaded with conventional drugs to serve as a pulmonary inhalational drug delivery apparatus.

Specification

Emulation Aerosol Sucker

Technical Field

The present utility model relates to an electronic suction device, and in particular to an emulation aerosol sucker containing only nicotinamide (nicotine) but no tar.

Background Art

Nowadays, people already know that smoking does harm to the health. There are still one billion smokers all over the world, however, and the number increases every year. The World Health Organization (WHO) passed its first international anti-smoking agreement Framework Convention on Tobacco Control on March 1, 2003. According to the figures provided by the WHO, smoking causes 4.9 million deaths every year. Although smoking can cause serious diseases of respiratory system and cancers, it is extremely difficult for smokers to completely give up smoking.

The active ingredient of cigarettes is nicotinamide (nicotine). When people smoke, a plenty of tar mist produced from nicotinamide during cigarette burning is quickly absorbed after entering alveoli. After nicotinamide goes into the blood, it acts upon the receptor of the central nervous system to bring euphoria to people as a stimulant does. For example, the smoker feels dizzy or gets high.

A small dose of nicotinamide, which is small-molecule alkaloid, basically does no harm to the human body and its half-life period in blood is extremely short. The major harmful substance of tobaccos is tar. Tobacco tar consists of thousands of ingredients, among which dozens are carcinogens. It has been proven that passive smoking does more harm to non-smokers.

To seek for a cigarette substitute which contains only nicotinamide but no harmful tar, many inventions such as nicotine patch, nicotine mouthwash, spraying agent packed in a high pressure gas can with a propellant, nicotine chewing gum, and nicotine drinking are made of pure nicotinamide. These products contain no harmful tar, but nicotinamide is absorbed too slowly to reach an effective peak concentration in the blood so that they not only fail to address the needs of enjoyment of nicotinamide, but also deprive smokers of the developed smoking habit. Therefore, these similar products cannot be used as real smoking-quitting products or cigarette substitutes.

Summary of the Utility Model

The present utility model is intended to provide an emulation aerosol sucker which can substitute cigarettes to let smokers quit smoking.

The technical solution in the present utility model is a further innovation of the utility model titled "aerosol electronic cigarette" (number of application the inventor submitted to the State Intellectual Property Office of the People's Republic of China in April 14, 2000: 200420031182.0, international application number: PCT/CN2005/000337).

The object of the present utility model is realized by adopting the following technical solution:

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The present utility model comprises a battery assembly, an atomizer assembly, and a cigarette bottle assembly, a male-threaded electrode is set at one end of the battery assembly, a female-threaded electrode is set at one end of the atomizer assembly, the battery assembly and the atomizer assembly are connected together through the threaded electrodes, the cigarette bottle assembly is inserted into the other end of the atomizer assembly to jointly form a cigarette-type or cigar-type integral body.

The battery assembly comprises an indicator, a lithium battery, a MOSFET circuit board, a sensor, a silicon rubber corrugated diaphragm, a first threaded electrode, a first negative pressure cavity, and a first casing, the male-threaded electrode being set at one end of the first casing, the indicator being installed at the other end, one side of the indicator being covered with an indicator shade and a micropore being opened in the indicator shade, the other side of the indicator being connected to the lithium battery and the MOSFET circuit board in turn, the sensor being set on the MOSFET circuit board, the silicon rubber corrugated diaphragm being installed between the first threaded electrode and the sensor, the first negative pressure cavity being opened on the silicon rubber corrugated diaphragm, and the sensor being connected to the silicon rubber corrugated diaphragm through the reed switch fixed on the sensor; an MCU is additionally set between the MOSFET circuit board and the sensor; a display screen is additionally set on the surface of the first casing; said MCU scans the sensor in a pulsed power saving mode and the atomized dose restriction of the frequency-to-single-operating-time integral function is implemented according to the signal parameters of the sensor; in addition, the MCU controls the pulse width modulation of current constant power output, overdischarge protection, automatic cleaning function after thousands of operations, gradual brightening and gradual extinction of the indicator, display of number of operations and battery capacity, and automatic recovery of sensor out-of-operation caused by a misoperation; said sensor can be a switch sensor made of elastic alloy sheets, a linear Hall device, a semiconductor force-sensitive chip, a semiconductor matrix thermoelectric bridge chip, or a capacitive or inductive sensor; said indicator consists of two red light-emitting diodes (LEDs); said silicon rubber corrugated diaphragm can also be made of fluororubber, nitrile butadiene rubber, or elastic alloy films; and said male threaded electrode is made of a stainless steel or brass piece which is gilded and at the center of which a hole is opened; said lithium battery is a rechargeable polymer lithium battery or rechargeable lithium ion battery; said atomizer assembly comprises a female-threaded electrode, a gas-liquid separator, an atomizer, and a second casing, the cigarette bottle assembly being inserted into one end of the second casing, the female-threaded electrode being set at the other end, a second negative pressure cavity being set on the female-threaded electrode, and the gas-liquid separator and the atomizer being connected to the female-threaded electrode in turn; an air inlet hole is opened in the second casing; said female-threaded electrode is made of a stainless or brass piece which is gilded and at the center of which a hole is opened; said gas-liquid separator is made of holed stainless steel or plastic; said atomizer can be a capillary infiltration atomizer or a spray atomizer and a heating element is set in the atomizer; a spray hole is set in the spray atomizer, and said spray hole is formed by opening a hole in a foamed ceramic, microporous ceramic, foamed metal, stainless steel fiber felt, or chemical fiber form; said heating element is made of a thermoelectric material such as nichrome wire or platinum filament wound on a microporous ceramic frame, or can be a porous body with sintered electrodes which is made of conductive ceramic or PTC ceramic; the surface of the heating element is sintered into high-temperature glaze to fix zeolite grains, and zeolite grains are made of

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natural zeolite, artificial inorganic microporous ceramic, or aluminum oxide grains; said cigarette bottle assembly comprises a cigarette liquid bottle, fibers, and a suction nozzle, the fibers containing cigarette liquid being placed at one end of the cigarette liquid bottle and this end being inserted into the second casing and touching against the atomizer, the suction nozzle being located at the other end of the cigarette liquid bottle, and an air intake hole being set between fibers and the inner wall of the cigarette liquid bottle; said cigarette liquid bottle and suction nozzle are made of nontoxic plastic; said fibers are polypropylene fibers or nylon fibers; the cigarette liquid used for atomization in said fibers contains 0.1% to 3.5% nicotinamide, 0.05% to 5% tobacco flavor, 0.1% to 3% organic acid, and 0.1% to 0.5% stabilizer, and remaining percentage propanediol; said sucker and its connection structures can be loaded with conventional drugs to serve as a pulmonary inhalational drug delivery apparatus.

Advantages and Positive Effects of the Present Utility Model

The present utility model produces no tar, which greatly reduces the risk of cancers. The user still has the feeling and excitement of smoking. No ignition is required and therefore, there is no fire hazard. The device and connection structures in the present utility model can also be loaded with conventional drugs to serve as a pulmonary inhalational drug delivery apparatus.

Brief Description of the Drawings

Figure 1 shows the appearance of the cigarette-type emulation aerosol sucker of the present utility model.

Figure 2A shows one structure of the battery assembly of the present utility model.

Figure 2B shows another structure of the battery assembly of the present utility model.

Figure 3 shows the atomizer assembly of the present utility model.

Figure 4 shows the atomizer assembly of the present utility model.

Figure 5A shows one internal structure of the present utility model.

Figure 5B shows another internal structure of the present utility model.

Figure 6 shows the structure of the charger of the present utility model.

Figure 7 shows the circuit of the MCU and MOSFET of the present utility model.

Figure 8 shows the structure of the capillary infiltration atomizer of the present utility model.

Figure 9 is a left view of the capillary infiltration atomizer shown in Figure 8.

Figure 10 shows the structure of the spray atomizer of the present utility model.

Figure 11 is a left view of the spray atomizer shown in Figure 10.

Figure 12 shows the structure of the cigar type appearance of the present utility model.

Detailed Description of the Invention

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

Embodiment 1

As shown in Figure 1, the present utility model, which looks like a cigarette inserted in a cigarette holder, comprises a battery assembly, an atomizer assembly, and a cigarette bottle assembly; a male-threaded electrode (209) is set at one end of the battery assembly, a female-threaded electrode (302) is set at one end of the atomizer assembly, and the battery assembly and the atomizer assembly are connected through the threaded electrodes to form a simulated cigarette; the cigarette bottle assembly is inserted into the other end of the atomizer assembly to jointly form a cigarette-type emulation aerosol sucker.

As shown in Figure 2A, the battery assembly comprises an indicator (202), a lithium battery (203), a

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MOSFET circuit board (205), a sensor (207), a silicon rubber corrugated diaphragm (208), a first threaded electrode (209), a first negative pressure cavity (210), and a first casing (211), the male-threaded electrode (209) is set at one end of the first casing (211), the indicator (202) is installed at the other end, one side of the indicator is covered with an indicator shade (201) and a micropore (501) is opened in the indicator shade (201), the other side of the indicator is connected to the lithium battery (203) and the metal-oxide semiconductor field-effect transistor (MOSFET) circuit board (205) in turn, the sensor (207) is set on the MOSFET circuit board (205), the silicon rubber corrugated diaphragm (208) is installed between the first threaded electrode (209) and the sensor (207), the first negative pressure cavity (210) is opened on the silicon rubber corrugated diaphragm, and the sensor (207) is connected to the silicon rubber corrugated diaphragm (208) through the reed switch (212) fixed on the sensor.

Where, the sensor (207) can be a switch sensor made of elastic alloy sheets, a linear Hall device, a semiconductor force-sensitive chip, a semiconductor matrix thermoelectric bridge chip, or a capacitive or inductive sensor. The indicator (202) consists of two red LEDs. The lithium battery (203) can be a rechargeable polymer lithium battery or rechargeable lithium ion battery. The male-threaded electrode (209) is made of a stainless steel or brass piece which is gilded and at the center of which a hole is opened. The silicon rubber corrugated diaphragm (208) can also be made of fluororubber, nitrile butadiene rubber, or elastic alloy films. As shown in Figure 3, the atomizer assembly (302) comprises a female-threaded electrode (302), a gas-liquid separator (303), an atomizer (307), and a second casing (306), the cigarette bottle assembly is inserted into one end of the second casing (306), the female-threaded electrode (302) is set at the other end, a second negative pressure cavity (301) is set on the female-threaded electrode, the gas-liquid separator (303) and the atomizer (307) are connected to the female-threaded electrode (302) in turn, and an air inlet hole (502) is opened in the second casing (306). Wherein, the gas-liquid separator (303) is made of holed stainless steel or plastic. The female-threaded electrode (302) is made of a stainless steel or brass piece which is gilded and at the center of which a hole is opened.

The atomizer (307) can be a capillary infiltration atomizer shown in Figure 8 and Figure 9, or a spray atomizer shown in Figure 10 and Figure 11. The atomizer in the present embodiment is a spray atomizer.

As shown in Figure 4, the cigarette bottle assembly comprises a cigarette liquid bottle (401), fibers (402), and a suction nozzle (403), the fibers (402) containing cigarette liquid are placed at one end of the cigarette liquid bottle (401) and this end is inserted into the second casing (306) and touches against the atomizer (307), the suction nozzle (403) is located at the other end of the cigarette liquid bottle (401), and an air intake hole (503) is set between fibers (402) and the inner wall of the cigarette liquid bottle (401).

As shown in Figure 5A, in the ready-for-work state of the present utility model, the recharged battery assembly shown in Figure 2A is screwed tight onto the atomizer assembly shown in Figure 3, and then the cigarette bottle assembly shown in Figure 4 is inserted into the atomizer assembly. When the user sucks the suction nozzle (403) lightly, through the air intake hole (503) and the first and second negative pressure cavities (210 and 301), a negative pressure is formed on the silicon rubber corrugated diaphragm (208). The silicon rubber corrugated diaphragm (208) is deformed under the action of the suction pressure difference to drive the reed switch (212) and the sensor (207) to start the MOSFET circuit board (205). At this time, the indicator (202) is gradually brightened up, and the lithium battery (203) supplies power to the heating element

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(305) in the atomizer (307) through the MOSFET circuit board (205) and the female- and male-threaded electrodes (302 and 209) so that the heating element (305) in the atomizer (307) produces heat. The fibers (402) in the cigarette bottle (401) contain a cigarette liquid, which infiltrates the microporous ceramic (801) in the atomizer through fibers (402); air goes into the air inlet hole (502) and passes through the vent hole in the gas-liquid separator (303), and a gas-liquid mixture is formed in the spray hole (304) in the atomizer (307). The gas-liquid mixture is sprayed on to the heating element (305) to be vaporized, then is quickly cooled by the inhaled air flow to form an aerosol, and finally is sucked out of the suction nozzle (403) through the air intake hole (503) to form white mist aerosol.

When the user stops sucking the suction nozzle, the reed switch (212) and the sensor (207) are reset, the atomizer (307) stops working, and the indicator is gradually extinguished. When the number of operations reaches the preset value, the atomizer (307) delays 5s to 20s each time it operates so as to clear a trace of scales on the heating element (305).

Besides microporous ceramic, the liquid supply material of the atomizer (307) can be foamed ceramic, microporous glass, foamed metal, stainless steel fiber felt, polyester fiber, nylon fiber, acrylic fiber, Kevlar fiber, or hard porous plastic. The heating element (305) can be made of a thermoelectric material such as nichrome wire, aludirome wire, or platinum filament wound on a microporous ceramic frame, or can be a porous body with sintered electrodes which is made of conductive ceramic or positive temperature coefficient (PTC) ceramic. The surface of the heating element (305) is sintered into high-temperature glaze to fix zeolite grains, and zeolite grains are made of natural zeolite, artificial inorganic microporous ceramic, or aluminum oxide grains. The cigarette liquid bottle (401) and the suction nozzle (403) in the cigarette bottle assembly are made of nontoxic plastic, and polypropylene or nylon fibers (402) are pasted in the cigarette liquid bottle and the suction nozzle to absorb the cigarette liquid. In the battery assembly, a micropore (501) is opened in the indicator shade (201) to balance the pressure difference between the two sides of the silicon rubber corrugated diaphragm (208).

The cigarette liquid used to be atomized contains 0.1% to 3.5% nicotinamide, 0.05% to -5% tobacco flavor, 0.1% to 3% organic acid, and 0.1% to 0.5% stabilizer, and remaining propanediol.

The first and second casings (211 and 306) of the present utility model are made of stainless steel pipes or copper alloy pipes and are externally decorated with the color of the baking varnish of the emulation cigarettes.

As shown in Figure 12, the diameter of the battery assembly in the present utility model can also be increased proportionally so that it is consistent with the diameter of the atomizer, and in addition, the casings can be decorated with the leaf vein texture of a plant and matte-tan baking varnish to become a cigar type emulation aerosol sucker.

The threaded electrode (601) shown in Figure 6 and matching the male-threaded electrode (209) on the battery assembly can be used as an interface to charge the lithium battery (203) of the present utility model.

Embodiment 2

As shown in Figure 2B, embodiment 2 is different from embodiment 1 in the following aspects: an MCU (206) is additionally set between the MOSFET circuit board (205) and the sensor (207) and a display screen (204) is additionally set on the surface of the first casing (211) to display the energy of the lithium battery (203) and the number of smoking times.

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As shown in Figure 5B, in the ready-for-work state of the present utility model, the recharged battery assembly shown in Figure 2B is screwed tight onto the atomizer assembly shown in Figure 3, and then the cigarette bottle assembly shown in Figure 4 is inserted into the atomizer assembly. When the user sucks the suction nozzle (403) lightly, through the air intake hole (503) and the first and second negative pressure cavities (210 and 301), a negative pressure is formed on the silicon rubber corrugated diaphragm (208). The silicon rubber corrugated diaphragm (208) is deformed under the action of the suction pressure difference to drive the reed switch (212) and the sensor (207) to start the MCU (206) and the MOSFET circuit board (205). At this time, the indicator (202) is gradually brightened up, and the lithium battery (203) supplies power to the heating element (305) in the atomizer (307) through the MOSFET circuit board (205) and the female- and male-threaded electrodes (302 and 209) so that the heating element (305) in the atomizer (307) produces heat. The fibers (402) in the cigarette bottle (401) contain a cigarette liquid, which infiltrates the microporous ceramic (801) in the atomizer through fibers (402); air goes into the air inlet hole (502) and passes through the vent hole in the gas-liquid separator (303), and a gas-liquid mixture is formed in the spray hole (304) in the atomizer (307). The gas-liquid mixture is sprayed on to the heating element (305) to be vaporized, then is quickly cooled by the inhaled air flow to form an aerosol, and finally is sucked out of the suction nozzle (403) through the air intake hole (503) to form white mist aerosol.

As shown in Figure 7, when the sensor is started by an inhalation, the MCU (206) scans the sensor (207) in the pulsed power saving mode and implements the atomized dose restriction of the frequency-to-single-operating-time integral function according to the signal parameters of the sensor. In addition, the MCU (206) controls the pulse width modulation of constant power output of the power supply, overdischarge protection, automatic cleaning function after thousands of operations, gradual brightening and gradual extinction of the indicator, display of number of operations and battery capacity, and automatic recovery of sensor out-of-operation caused by a misoperation.

The device and connection structures in the present utility model can also be loaded with conventional drugs to serve as a pulmonary inhalational drug delivery apparatus.

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Drawings

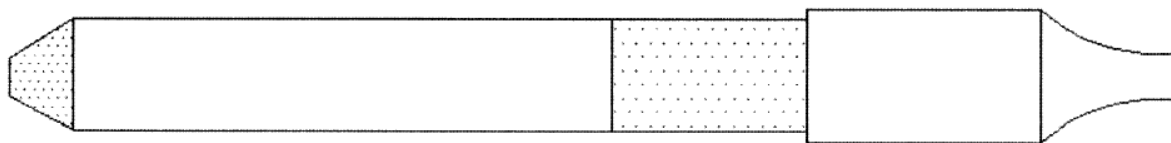


Figure 1

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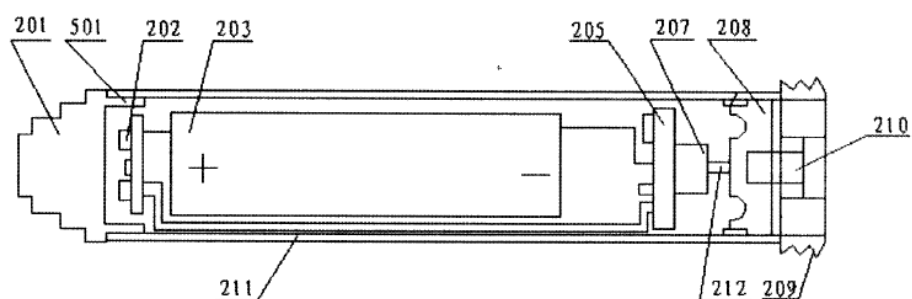


Figure 2A

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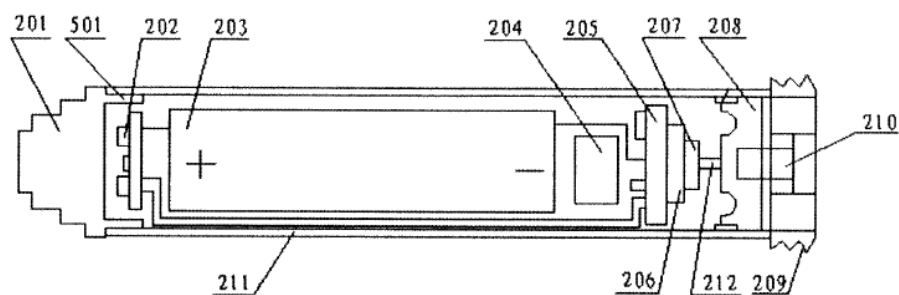


Figure 2B

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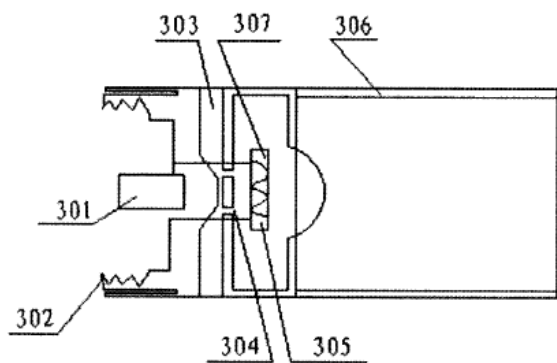


Figure 3

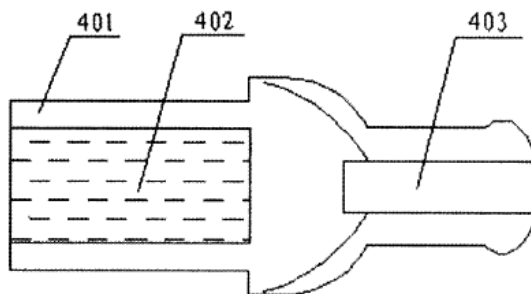


Figure 4

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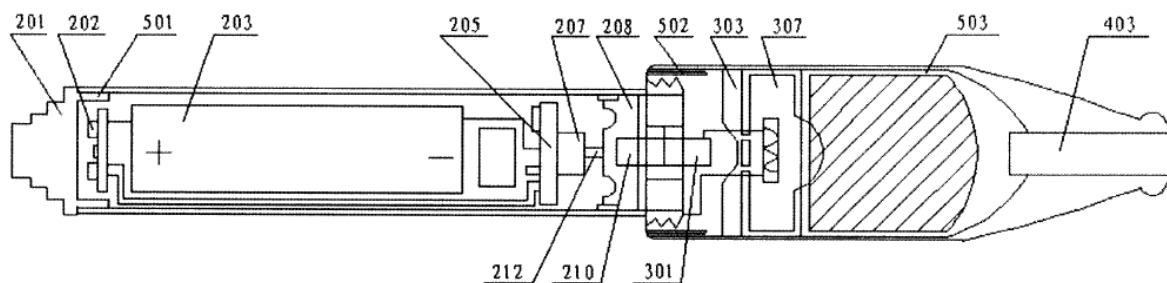


Figure 5A

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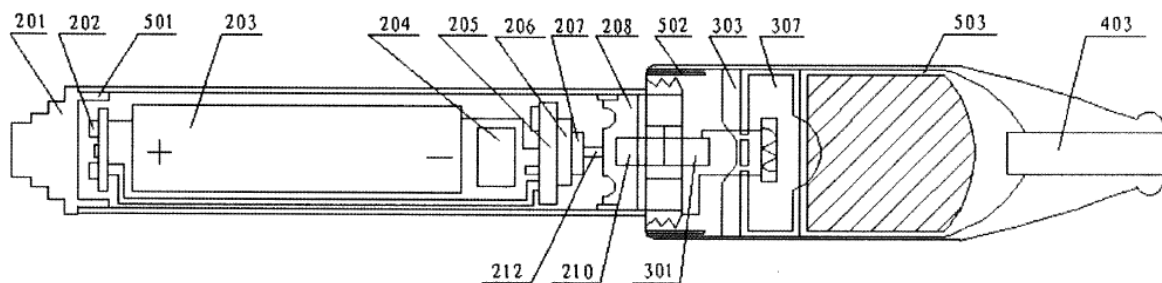


Figure 5B

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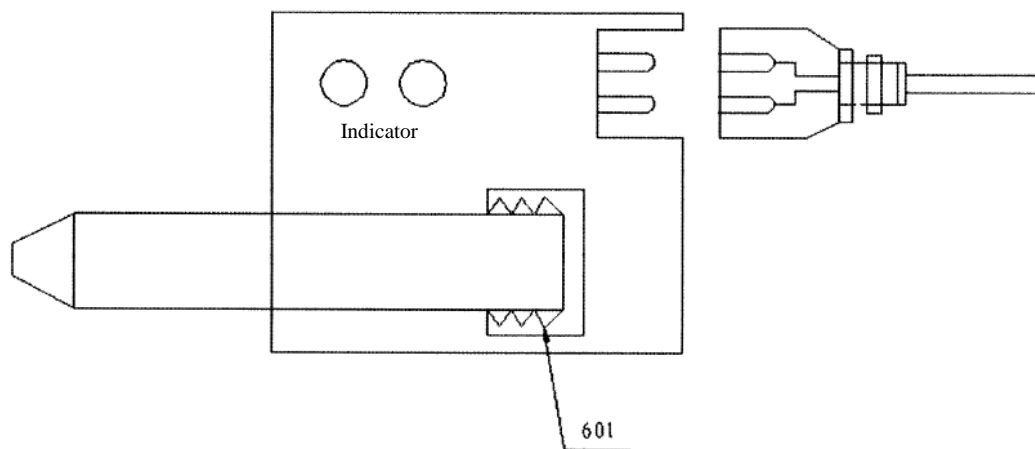
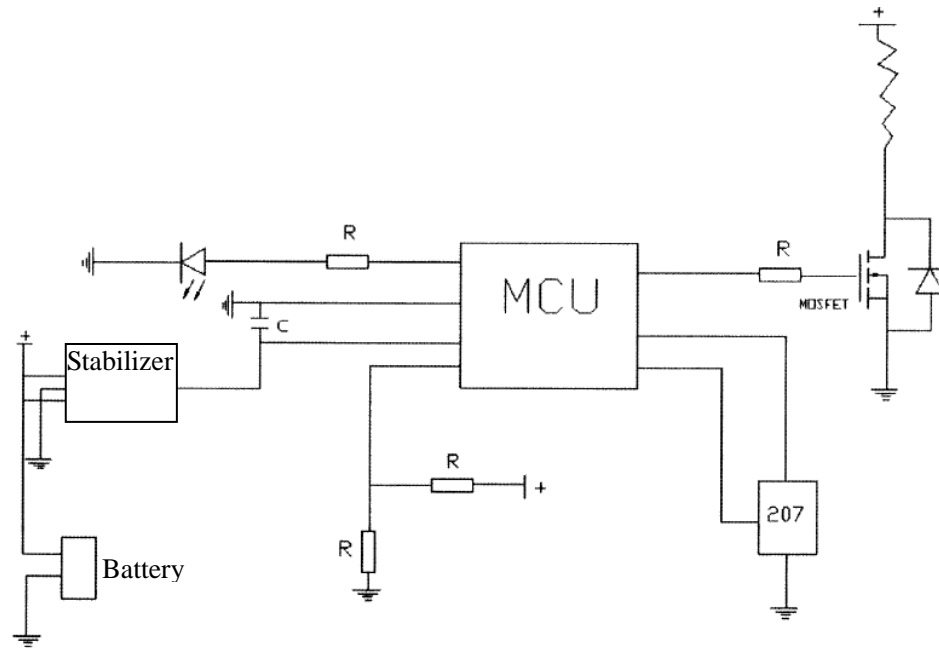


Figure 6

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**Figure 7**

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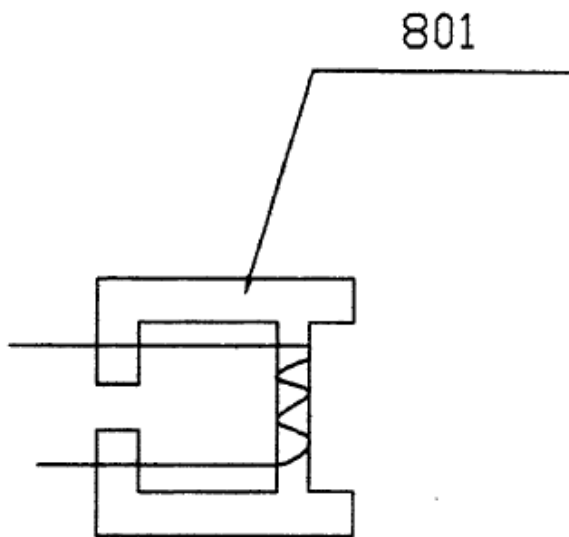


Figure 8

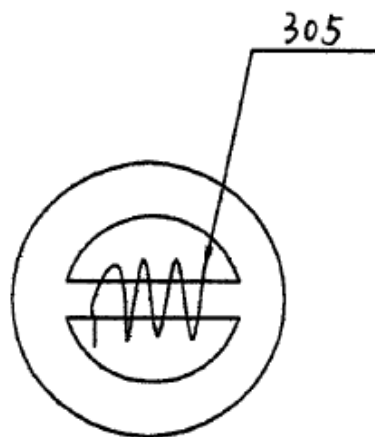


Figure 9

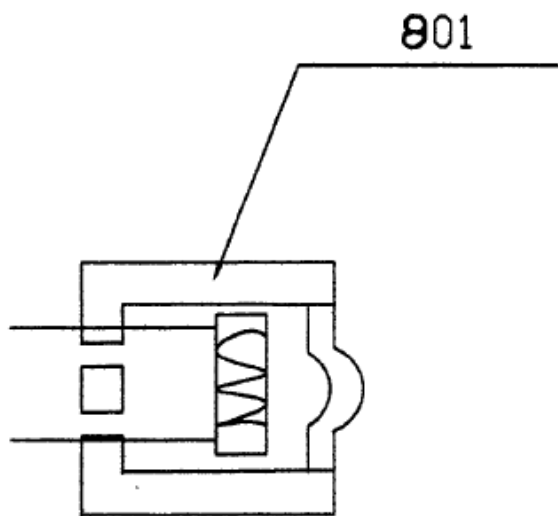


Figure 10

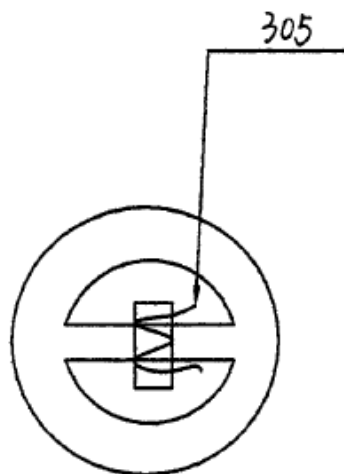


Figure 11

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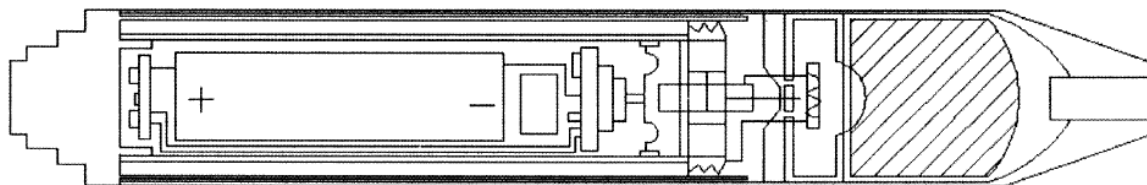


Figure 12

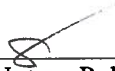
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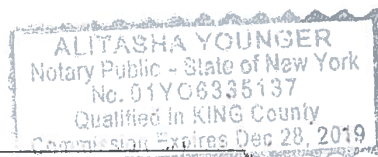


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中华人民共和国国家知识产权局
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证 明

本证明之附件是向本局提交的下列专利申请副本

申 请 日： 2006.05.16

申 请 号： 200620090805.0

申 请 类 别： 实用新型

发 明 创 造 名 称： 仿真气溶胶吸入器

申 请 人： 韩力

发明人或设计人： 韩力

中华人民共和国
国家知识产权局局长

2007 年 7 月 4 日

权 利 要 求 书

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，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，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。

2. 按权利要求 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 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。

3. 按权利要求 2 所述的仿真气溶胶吸入器，其特征在于：在 MOSFET 电路板（205）与传感器（207）之间加设有 MCU（206）；第一壳体（211）表面加设有显示屏（204）。

4. 按权利要求 3 所述的仿真气溶胶吸入器，其特征在于：所述 MCU（206）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（206）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。

5. 按权利要求 2 或 3 所述的仿真气溶胶吸入器，其特征在于：所述传感器（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。

6. 按权利要求 2 或 3 所述的仿真气溶胶吸入器，其特征在于：所述指示灯（202）为两只红色的发光二极管。

7. 按权利要求 2 或 3 所述的仿真气溶胶吸入器，其特征在于：所述硅橡胶波纹隔膜（208）还可采用氟橡胶、丁腈橡胶或弹性合金膜制成。

8. 按权利要求 2 或 3 所述的仿真气溶胶吸入器，其特征在于：所述外螺纹电极（209）为不锈钢或黄铜件镀金开中孔制成。

9. 按权利要求 2 或 3 所述的仿真气溶胶吸入器，其特征在于：所述锂电池（203）可为可充电的聚合物锂电池或可充电的锂离子电池。

10. 按权利要求 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（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）。

11. 按权利要求 10 所述的仿真气溶胶吸入器，其特征在于：所述内螺纹电极（302）为不锈钢或黄铜件镀金开中孔制成。

12. 按权利要求 10 所述的仿真气溶胶吸入器，其特征在于：所述气液分离器（303）是用不锈钢或塑料开孔制成。

13. 按权利要求 10 所述的仿真气溶胶吸入器，其特征在于：所述雾化器（307）可为毛细浸润式雾化器或喷射式雾化器，雾化器（307）内设有加热体（305）；喷射式雾化器上开有喷射孔（304）。

14. 按权利要求 13 所述的仿真气溶胶吸入器，其特征在于：所述喷射孔（304）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。

15. 按权利要求 13 所述的仿真气溶胶吸入器，其特征在于：所述加热体（305）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（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。

16. 按权利要求 1 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（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）。

17. 按权利要求 16 所述的仿真气溶胶吸入器，其特征在于：所述烟液瓶（401）、吸嘴（403）是用无毒塑料制成。

18. 按权利要求 16 所述的仿真气溶胶吸入器，其特征在于：所述纤维（402）是用聚丙烯纤维或尼龙纤维制成。

19. 按权利要求 16 所述的仿真气溶胶吸入器，其特征在于：所述纤维（402）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。

20. 按权利要求 1 所述的仿真气溶胶吸入器，其特征在于：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。

说明书

仿真气溶胶吸入器

技术领域

本实用新型涉及电子吸入装置，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。

实用新型内容

本实用新型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。

本实用新型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“雾化电子烟”专利的创新型。

本实用新型的目的在于通过以下技术方案来实现的：

本实用新型包括电池组件、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。

其中：电池组件包括指示灯、锂电池、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，另一侧依次连接锂电池及 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采用氟橡胶、丁腈橡胶或弹性合金膜制成；所述外螺纹电极可为不锈钢或黄铜件镀金开中孔制成；所述锂电池可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；所述内螺纹电极可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。

本实用新型的优点与积极效果为：

本实用新型吸烟无焦油，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。本实用新型的装置和连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 为本实用新型香烟型的外观示意图；
- 图 2A 为本实用新型电池组件的一种结构示意图；
- 图 2B 为本实用新型电池组件的另一种结构示意图；
- 图 3 为本实用新型雾化器组件的示意图；
- 图 4 为本实用新型烟瓶组件的示意图；
- 图 5A 为本实用新型的一种内部结构示意图；
- 图 5B 为本实用新型的另一种内部结构示意图；
- 图 6 为本实用新型充电器的结构示意图；
- 图 7 为本实用新型 MCU 及 MOSFET 的电路原理图；
- 图 8 为本实用新型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 为本实用新型喷射式雾化器的结构示意图；
- 图 11 为图 10 的左视图；
- 图 12 为本实用新型雪茄式外形的结构示意图。

具体实施方式

下面结合附图对本实用新型作进一步详述。

实施例 1

如图 1 所示，本实用新型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。

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, 本实用新型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、芳纶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 用、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。

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。

本实用新型的第一、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，本实用新型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。

本实用新型的锂电池 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 不同这处在于：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，本实用新型的待工作状态是将图 2B 所示的、充满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。

说明书附图

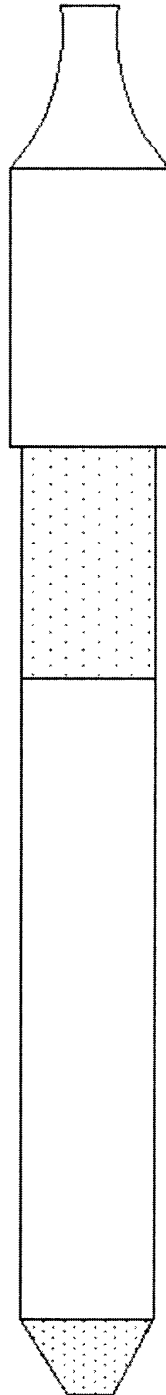


图 1

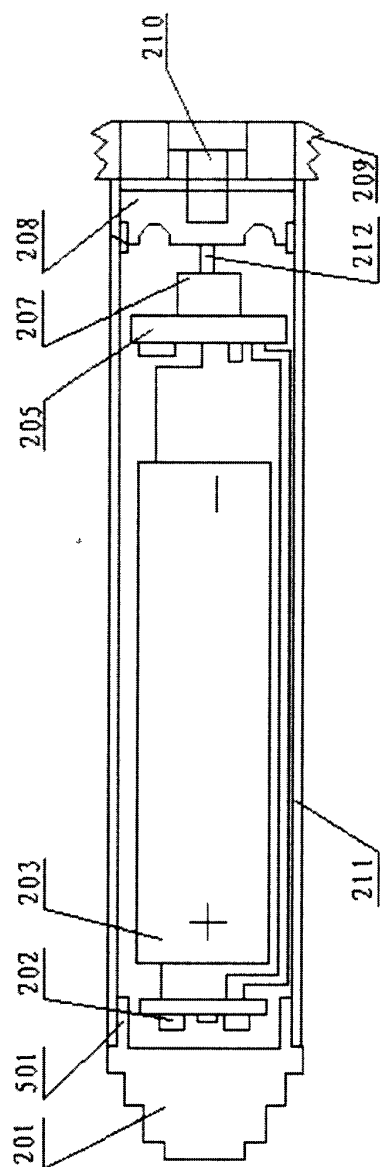


图 2A

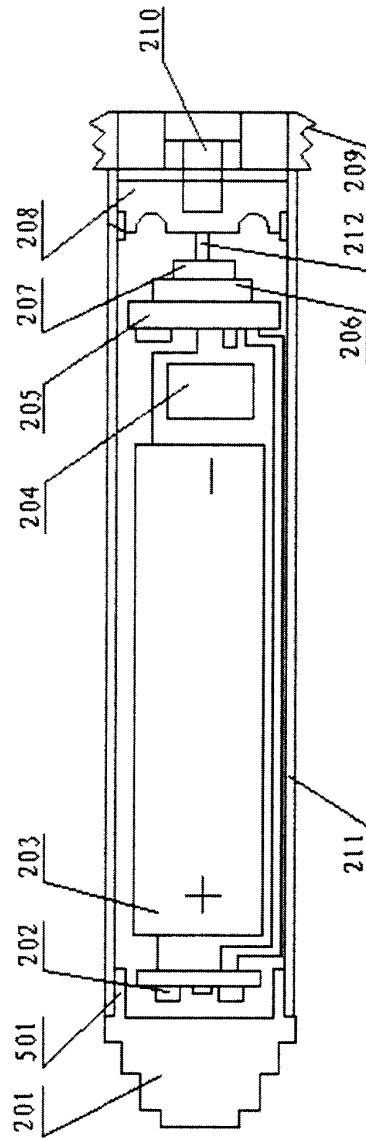


图 2B

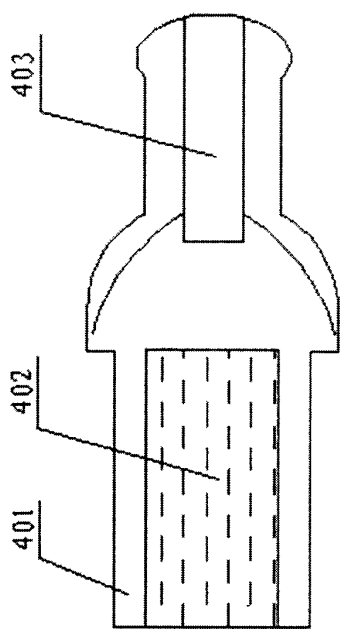


图 4

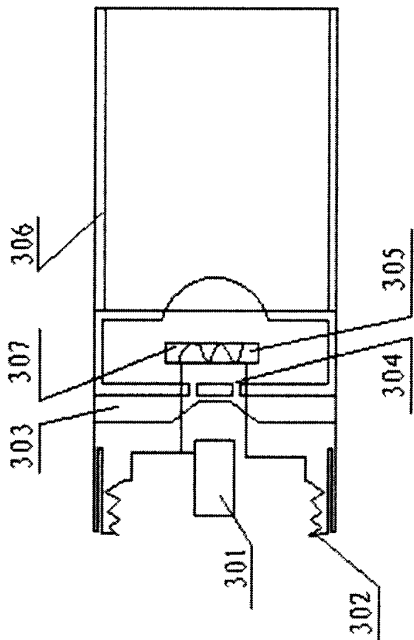


图 3

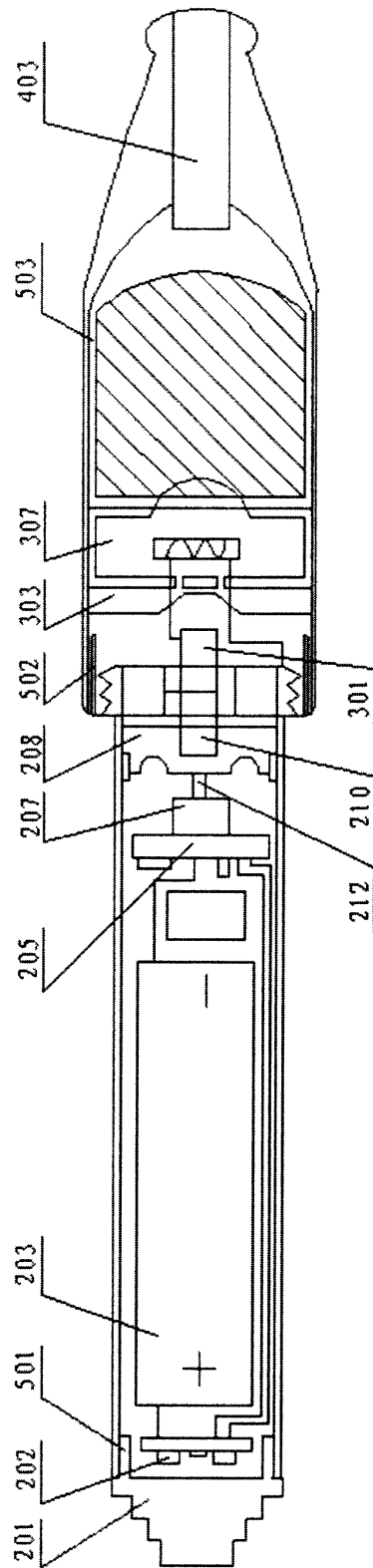


图 5A

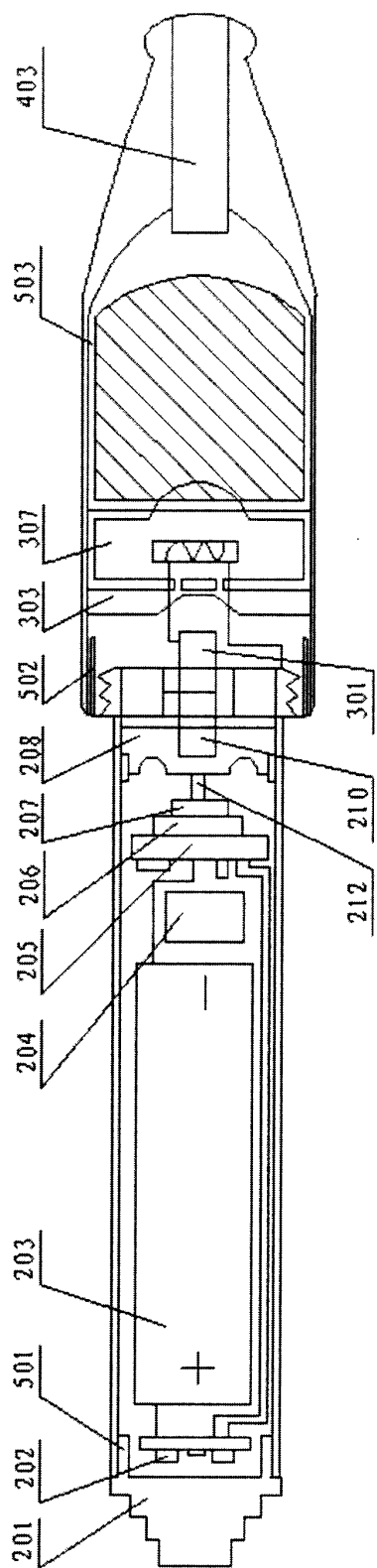


图 5B

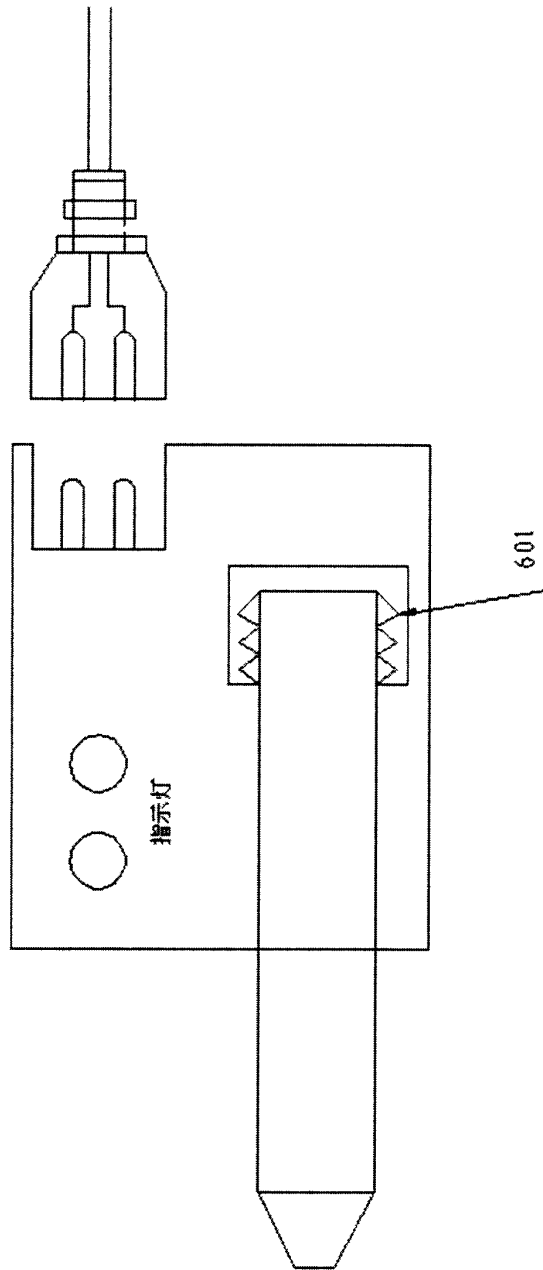


图 6

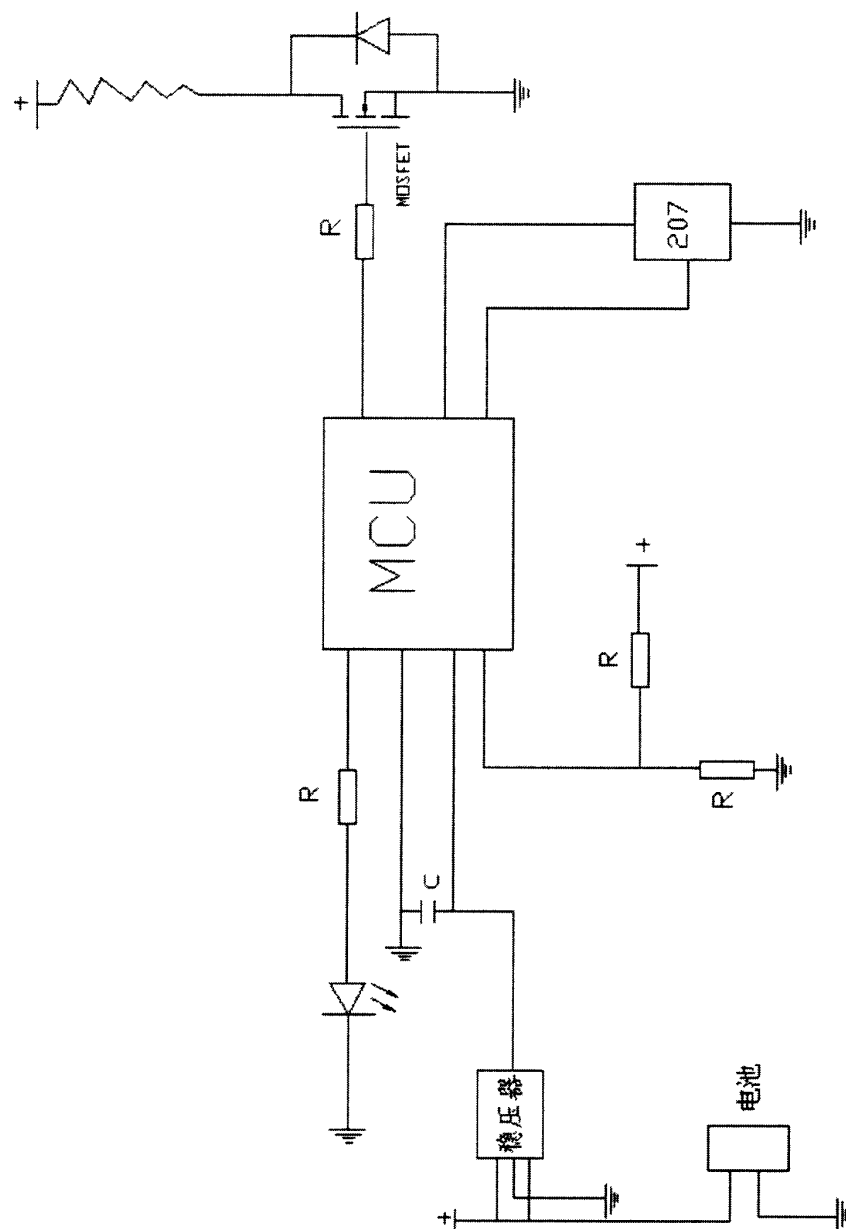


图 7

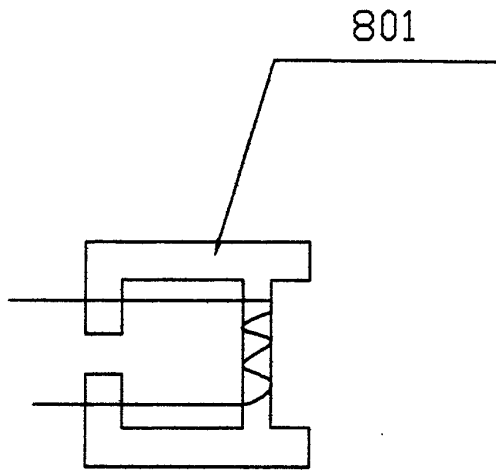


图 8

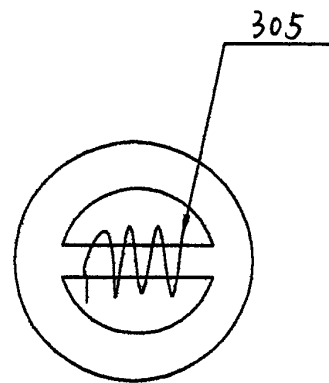


图 9

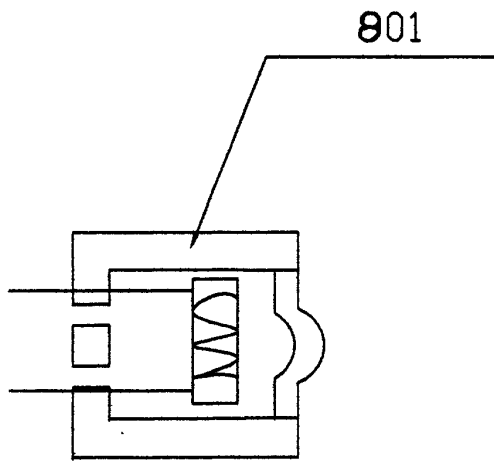


图 10

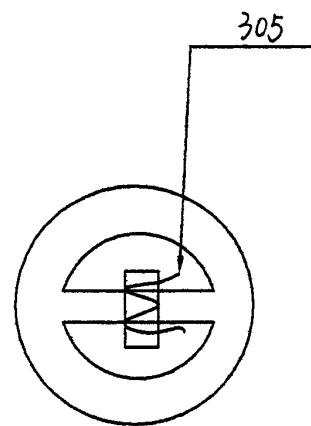


图 11

23

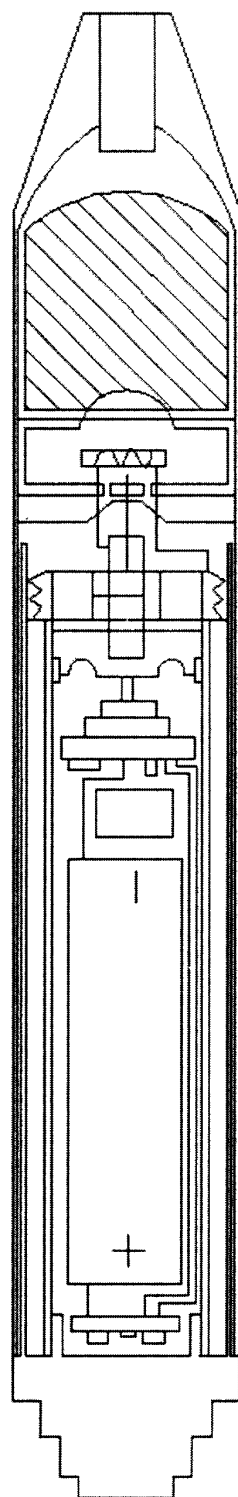


图 12