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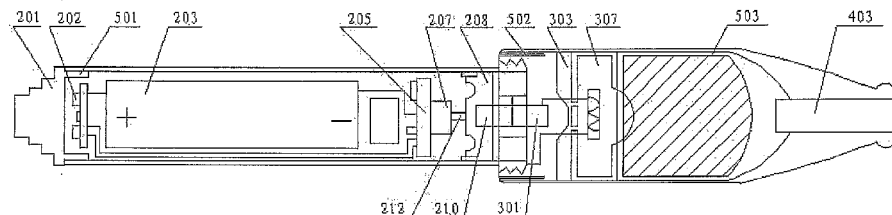
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(54) Title of Invention: EMULATION AEROSOL SUCKER



(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 the battery assembly. An internal thread electrode is located in one end of the 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.

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## Emulation Aerosol Sucker

### Technical Field

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

### Background Art

Nowadays, it is common knowledge that “smoking is harmful to health.” At this time there are still one billion smokers all over the world, however, and this number increases every year. The World Health Organization (WHO) passed its first international anti-smoking agreement, the *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 may cause serious diseases of the 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 large volume of tar droplets produced from nicotinamide during cigarette burning is quickly absorbed after entering the alveoli. After nicotinamide is absorbed into the blood, it acts upon receptors of the central nervous system to bring “euphoria” to people, similar to that of a stimulant. For example, the smoker feels dizzy or gets high.

A small dose of nicotinamide, which is a small-molecule alkaloid, is basically harmless to the human body and its half-life in blood is extremely short. The primary harmful substance of tobacco is tar. Tar in tobacco consists of thousands of ingredients, among which dozens are carcinogens. It has been proven that passive smoking poses greater harm to non-smokers.

In search of 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 drinks” are made of relatively 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 need of “enjoyment” of nicotinamide, but also deprive smokers of the developed “inhaling” or “sucking” habit. Therefore, these similar products cannot be truly used as products to quit smoking or cigarette substitutes.

### Summary of the Invention

The present invention is intended to provide an emulation aerosol sucker which has the effects of substituting for cigarettes to quit smoking. For the present application, the aerosol may be considered as a kind of liquid particles suspended in the air.

The technical solution in the present invention is a further innovation of the patented utility model titled “Atomizing Electronic Cigarette” (number of application submitted by the inventor to the State Intellectual Property Office of the People’s Republic of China on April 14, 2000: 200420031182.0; International Application Number: PCT/CN2005/000337).

The objective of the present invention is realized through the following technical solution: The present invention includes a battery assembly, an atomizer assembly and a cigarette bottle assembly. One end of the battery assembly is connected to one end of the atomizer assembly, and the cigarette bottle assembly is inserted into the other end of said atomizer assembly to jointly form one cigarette-type or cigar-type integral body.

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Wherein: An external thread electrode is set at one end of the battery assembly; an internal thread electrode is set at one end of the atomizer assembly, and the battery assembly and the atomizer assembly are connected through the screwthread electrode. The battery assembly includes an indicator lamp, a battery, a MOSFET circuit board, a sensor, a silicon rubber corrugated diaphragm, a first screwthread electrode, a first negative pressure cavity, and a first casing, the external thread electrode being set at one end of the first casing, the indicator lamp being installed at the other end, one side of the indicator lamp being covered with an indicator lamp shade, and a micropore being opened on the indicator lamp shade, the other side of the indicator lamp being connected to the 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 screwthread 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 several thousand operations, gradual brightening and gradual extinguishing of the indicator lamp, display of number of operations and battery capacity, and automatic recovery of sensor out-of-operation caused by a misoperation; said sensor may be a switch sensor made of elastic alloy sheets, a linear-output Hall device, a semiconductor force-sensitive chip, a semiconductor matrix thermoelectric bridge chip, or a capacitive or inductive sensor; said indicator lamp consists of two red light-emitting diodes (LEDs); said silicon rubber corrugated diaphragm may also be made of fluororubber, nitrile butadiene rubber, or elastic alloy films; and said external thread electrode is made of a stainless steel or brass piece which is gold-plated and at the center of which a hole is opened. Said battery is a lithium battery; said lithium battery is a rechargeable polymer lithium battery or rechargeable lithium ion battery; said atomizer assembly includes an internal thread 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 internal thread electrode being set at the other end, a second negative pressure cavity being set on the internal thread electrode, and the gas-liquid separator and the atomizer being connected to the internal thread electrode in turn; an air inlet hole is opened on the second casing; said internal thread electrode is made of a stainless steel or brass piece which is gold-plated and at the center of which a hole is opened. Said gas-liquid separator is made of holed stainless steel or plastic; said atomizer may be a capillary infiltration atomizer or a spray atomizer and a heating element is set in the atomizer; a spray hole is opened on the spray atomizer; 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, Fe-Cr-Al alloy wire or platinum filament wound on a microporous ceramic frame, or may 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 natural zeolite, artificial inorganic microporous ceramic, or aluminum oxide grains. Said cigarette bottle assembly includes 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 contacting against the atomizer, the suction nozzle being located at the other end of the cigarette liquid bottle, and an air intake hole being reserved 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, 0.1% to 0.5% stabilizer, and the remaining percentage of propanediol; said sucker and its connection structures may be loaded with conventional medications to serve as a pulmonary inhalational medication delivery apparatus.

Advantages and positive effects of the present invention: The present invention 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 invention may be loaded with conventional medications to serve as a pulmonary inhalational medication delivery apparatus.

**Brief Description of the Drawings**

Figure 1 shows the appearance of the cigarette-type emulation aerosol sucker of the present invention;

Figure 2A shows a structure of the battery assembly of the present invention;

Figure 2B shows another structure of the battery assembly of the present invention;

5 Figure 3 shows a schematic diagram for the atomizer assembly of the present invention;

Figure 4 shows a schematic diagram for the cigarette bottle assembly of the present invention;

Figure 5A shows a schematic diagram for an internal structure of the present invention;

Figure 5B shows a schematic diagram for another internal structure of the present invention;

Figure 6 shows the structure of the charger of the present invention;

10 Figure 7 shows the circuits of the MCU and MOSFET;

Figure 8 shows the structure of the capillary infiltration atomizer of the present invention;

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 invention;

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

15 Figure 12 shows the structure of the cigar-type emulation aerosol sucker of the present invention.

**Specific Embodiments**

The following further describes the present invention in detail, in combination with the drawings.

**Embodiment 1**

20 As shown in Figure 1, the present invention, the appearance of which is similar to a cigarette inserted in a cigarette holder, includes a battery assembly, an atomizer assembly and a cigarette bottle assembly; an external thread electrode (209) is set at one end of the battery assembly, an internal thread electrode (302) is set at one end of the atomizer assembly, and the battery assembly and the atomizer assembly are connected through the screwthread electrode to form a simulated cigarette body; the cigarette bottle assembly is inserted into the other end of the atomizer assembly to jointly form a cigarette-type emulation aerosol sucker.

25 As shown in Figure 2A, the battery assembly includes an indicator lamp (202), a lithium battery (203), a MOSFET circuit board (205), a sensor (207), a silicon rubber corrugated diaphragm (208), a first screwthread electrode (209), a first negative pressure cavity (210), and a first casing (211); the external thread electrode (209) is set at one end of the first casing (211); the indicator lamp (202) is installed at the other end; one side of the indicator lamp is covered with an indicator lamp shade (201) and a micropore (501) is opened on the indicator lamp shade (201); the other side of the indicator lamp 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 screwthread 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.

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Wherein: the sensor (207) may be a switch sensor made of elastic alloy sheets, a linear-output Hall device, a semiconductor force-sensitive chip, a semiconductor matrix thermoelectric bridge chip, or a capacitive or inductive sensor. The indicator lamp (202) consists of two red LEDs. The lithium battery (203) may be a rechargeable polymer lithium battery or rechargeable lithium ion battery. The external thread electrode (209) is made of a stainless steel or brass piece which is gold-plated and at the center of which a hole is opened. The silicon rubber corrugated diaphragm (208) may also be made of fluororubber, nitrile butadiene rubber, or elastic alloy films.

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As shown in Figure 3, the atomizer assembly includes an internal thread 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 internal thread electrode (302) is set at the other end; a second negative pressure cavity (301) is set on the internal thread electrode; the gas-liquid separator (303) and the atomizer (307) are connected to the internal thread electrode (302) in turn; and an air inlet hole (502) is opened on the second casing (306). Wherein: the gas-liquid separator (303) is made of holed stainless steel or plastic, and the internal thread electrode (302) is made of a stainless steel or brass piece which is gold-plated and at the center of which a hole is opened.

The atomizer (307) may 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 includes 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 contacts 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 standby state of the present invention, 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 lamp (202) is gradually brightened, and the lithium battery (203) supplies power to the heating element (305) in the atomizer (307) through the MOSFET circuit board (205) and the internal and external thread 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 lamp is gradually extinguished. When the number of operations reaches the preset value, the atomizer (307) delays 5 seconds to 20 seconds 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) may 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) may be made of a thermoelectric material such as nichrome wire, Fe-Cr-Al alloy wire, or platinum filament wound on a microporous ceramic frame, or may 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 adsorb the cigarette liquid. In the battery assembly, a micropore (501) is opened on the indicator lamp shade (201) to balance the pressure difference between the two sides of the silicon rubber corrugated diaphragm (208).

The cigarette liquid used for atomization contains 0.1% to 3.5% nicotinamide, 0.05% to 5% tobacco flavor, 0.1% to 3% organic acid, 0.1% to 0.5% stabilizer, and the remaining percentage of propanediol.

The first and second casings (211 and 306) of the present invention are made of stainless steel tubes or copper alloy tubes and are externally decorated with the color of the baking varnish to emulate real cigarettes.

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

The screwthread electrode (601) shown in Figure 6 and matching the external thread electrode (209) on the battery assembly may be used as an interface to recharge the lithium battery (203) of the present invention.

#### Embodiment 2

As shown in Figure 2B, Embodiment 2 differs 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 times smoked.

As shown in Figure 5B, in the standby state of the present invention, 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 lamp (202) is gradually brightened, and the lithium battery (203) supplies power to the heating element (305) in the atomizer (307) through the MOSFET circuit board (205) and the internal and external thread 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 (207). In addition, the MCU (206) controls the pulse width modulation of constant power output of the power supply, overdischarge protection, automatic cleaning function after several thousand operations, gradual brightening and gradual extinguishing of the indicator lamp, 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 invention may also be loaded with conventional medications to serve as a pulmonary inhalational medication delivery apparatus.

In addition, only one specific embodiment and one application embodiment of the present invention are described above, but these embodiments do not limit the scope of protection of the present invention. All equivalent variations or modifications made without departing from the design spirit of the present invention shall be deemed within the scope of protection of the present invention.

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**CLAIMS**

1. An emulation aerosol sucker, characterized in that it includes a battery assembly, an atomizer assembly, and a cigarette bottle assembly, said cigarette bottle assembly including a cigarette liquid bottle, said atomizer assembly including an atomizer, and the cigarette bottle assembly being inserted into one 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: an external thread electrode is set at one end of said battery assembly, an internal thread electrode is set at one end of the atomizer assembly, and the battery assembly and the atomizer assembly are connected together through the screwthread electrode.

3. The emulation aerosol sucker according to claim 1, characterized in that: said battery assembly includes a battery, a MOSFET circuit board, a sensor, a first screwthread electrode, a first negative pressure cavity, and a first casing, an external thread electrode being set at one end of the first casing, the other end being connected to the battery and the MOSFET circuit board in turn, and a sensor being set on the MOSFET circuit board.

4. The emulation aerosol sucker according to claim 3, characterized in that: said battery assembly further includes a silicon rubber corrugated diaphragm, the silicon rubber corrugated diaphragm being installed between the first screwthread 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.

5. The emulation aerosol sucker according to claim 3, characterized in that: said battery assembly further includes an indicator lamp, the indicator lamp being installed at the other end of the first casing, one side of the indicator lamp being covered with an indicator lamp shade and a micropore being opened on the indicator lamp shade; 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.

6. The emulation aerosol sucker according to claim 5, characterized in that: said MCU 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; at the same time, the MCU controls pulse width modulation of current constant power output, overdischarge protection, automatic cleaning function after several thousand operations, gradual brightening and gradual extinguishing of the indicator lamp, display of number of operations and battery capacity, and automatic recovery of sensor out-of-operation caused by a misoperation; said indicator lamp consists of two red light-emitting diodes.

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

8. The emulation aerosol sucker according to claim 4, characterized in that said silicon rubber corrugated diaphragm is made of fluororubber, nitrile butadiene rubber, or elastic alloy films.

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9. The emulation aerosol sucker according to claim 3, characterized in that said external thread electrode is made of a stainless steel or brass piece which is gold-plated and at the center of which a hole is opened; said battery is a lithium battery; said lithium battery is a rechargeable polymer lithium battery or rechargeable lithium ion battery.

5 10. The emulation aerosol sucker according to claim 1, characterized in that said atomizer assembly includes an internal thread electrode, an atomizer, and a second casing, the cigarette bottle assembly being inserted into one end of the second casing, the internal thread electrode being set at the other end, a second negative pressure cavity being set on the internal thread electrode.

10 11. The emulation aerosol sucker according to claim 3, characterized in that said atomizer assembly includes an internal thread electrode, an atomizer, and a second casing, the cigarette bottle assembly being inserted into one end of the second casing, the internal thread electrode being set at the other end, a second negative pressure cavity being set on the internal thread electrode.

15 12. The emulation aerosol sucker according to claim 6, characterized in that said atomizer assembly includes an internal thread electrode, an atomizer, and a second casing, the cigarette bottle assembly being inserted into one end of the second casing, the internal thread electrode being set at the other end, a second negative pressure cavity being set on the internal thread electrode.

20 13. The emulation aerosol sucker according to claim 7, characterized in that said atomizer assembly includes an internal thread electrode, an atomizer, and a second casing, the cigarette bottle assembly being inserted into one end of the second casing, the internal thread electrode being set at the other end, a second negative pressure cavity being set on the internal thread electrode.

14. The emulation aerosol sucker according to claim 10, 11, 12, or 13, characterized in that said atomizer assembly includes a gas-liquid separator, the gas-liquid separator and the atomizer being connected to the internal thread electrode in turn; an air inlet hole is opened on the second casing.

25 15. The emulation aerosol sucker according to claim 14, characterized in that said internal thread electrode is made of a stainless steel or brass piece which is gold-plated and at the center of which a hole is opened; said gas-liquid separator is made of holed stainless steel or plastic.

16. The emulation aerosol sucker according to claim 10, 11, 12, or 13, characterized in that said atomizer is a capillary infiltration atomizer or spray atomizer, a heating element being set in the atomizer; a spray hole is opened on the spray atomizer.

30 17. The emulation aerosol sucker according to claim 15, characterized in that said atomizer is a capillary infiltration atomizer or spray atomizer, a heating element being set in the atomizer; a spray hole is opened on the spray atomizer.

35 18. The emulation aerosol sucker according to claim 16, characterized in that 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.



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19. The emulation aerosol sucker according to claim 16, characterized in that said heating element is made of a thermoelectric material such as nichrome wire, Fe-Cr-Al alloy wire or platinum filament wound on a microporous ceramic frame, or may 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 natural zeolite, artificial inorganic microporous ceramic, or aluminum oxide grains.

20. The emulation aerosol sucker according to claim 3, characterized in that said cigarette bottle assembly includes 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 contacting against the atomizer, the suction nozzle being located at the other end of the cigarette liquid bottle, and an air intake hole being reserved between fibers and the inner wall of the cigarette liquid bottle.

21. The emulation aerosol sucker according to claim 10, 11, 12, or 13, characterized in that said cigarette bottle assembly includes 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 contacting against the atomizer, the suction nozzle being located at the other end of the cigarette liquid bottle, and an air intake hole being reserved between fibers and the inner wall of the cigarette liquid bottle.

22. The emulation aerosol sucker according to claim 21, characterized in that: said cigarette liquid bottle and suction nozzle are made of nontoxic plastic; said fibers are polypropylene fibers or nylon fibers.

23. The emulation aerosol sucker according to claim 22, characterized in that: 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, 0.1% to 0.5% stabilizer, and the remaining percentage of propanediol.

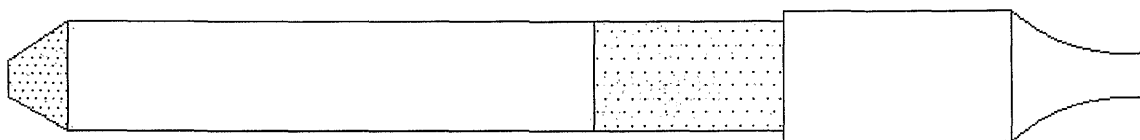


Figure 1

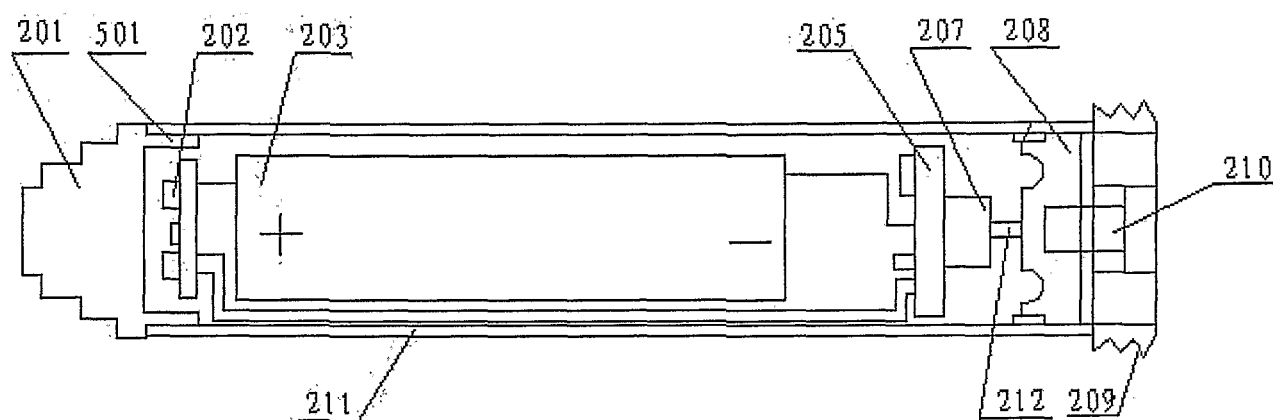


Figure 2A

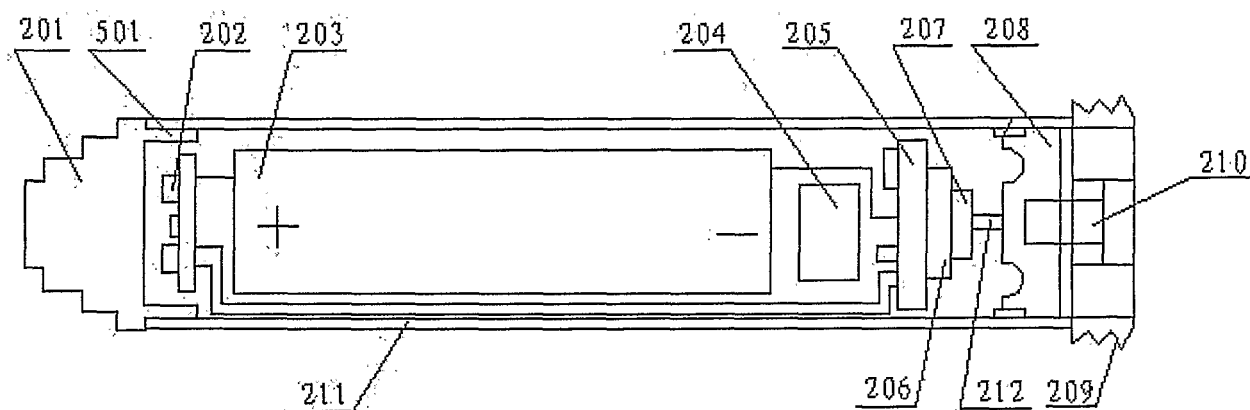


Figure 2B

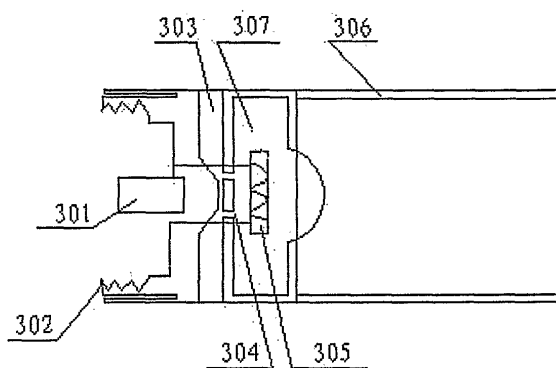


Figure 3

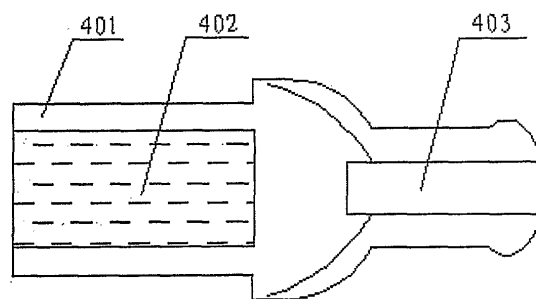


Figure 4

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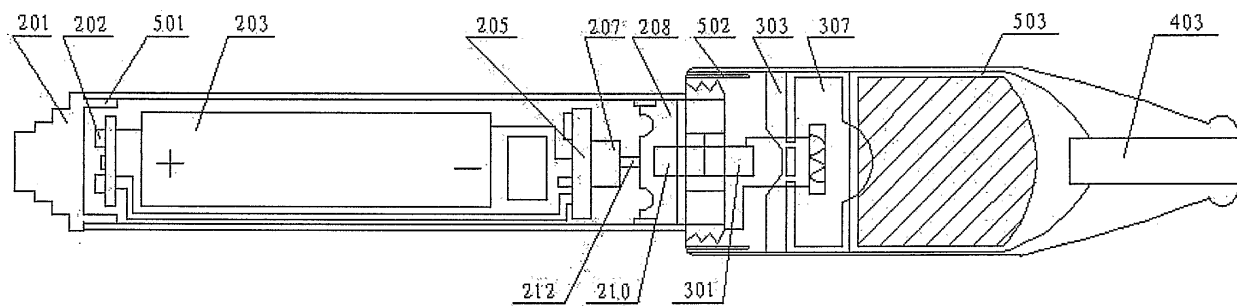


Figure 5A

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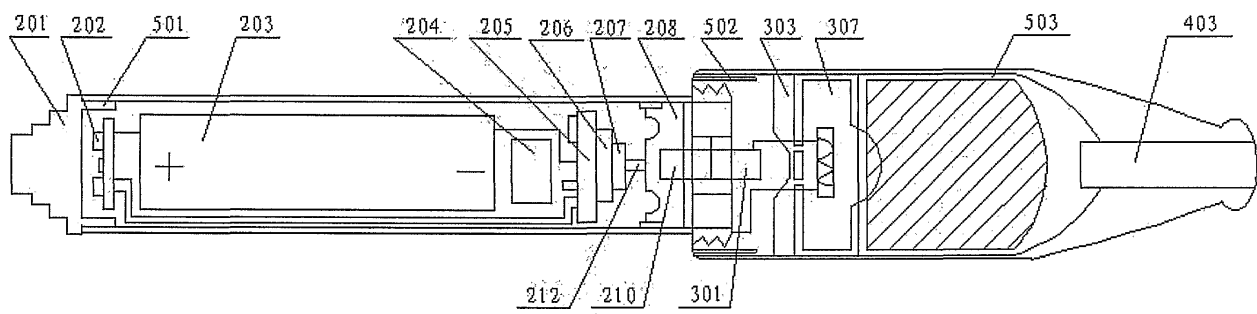


Figure 5B

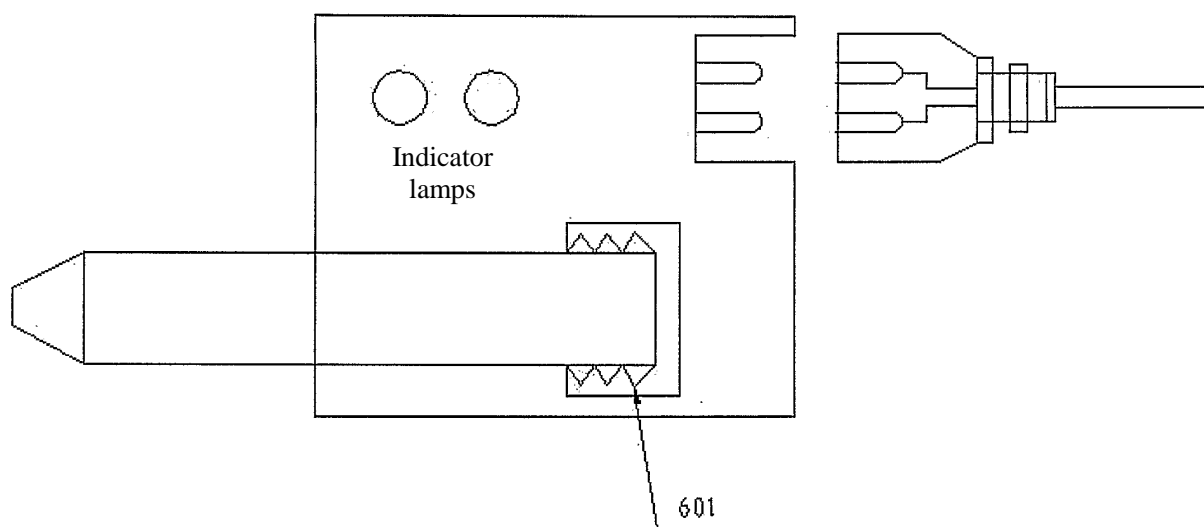


Figure 6



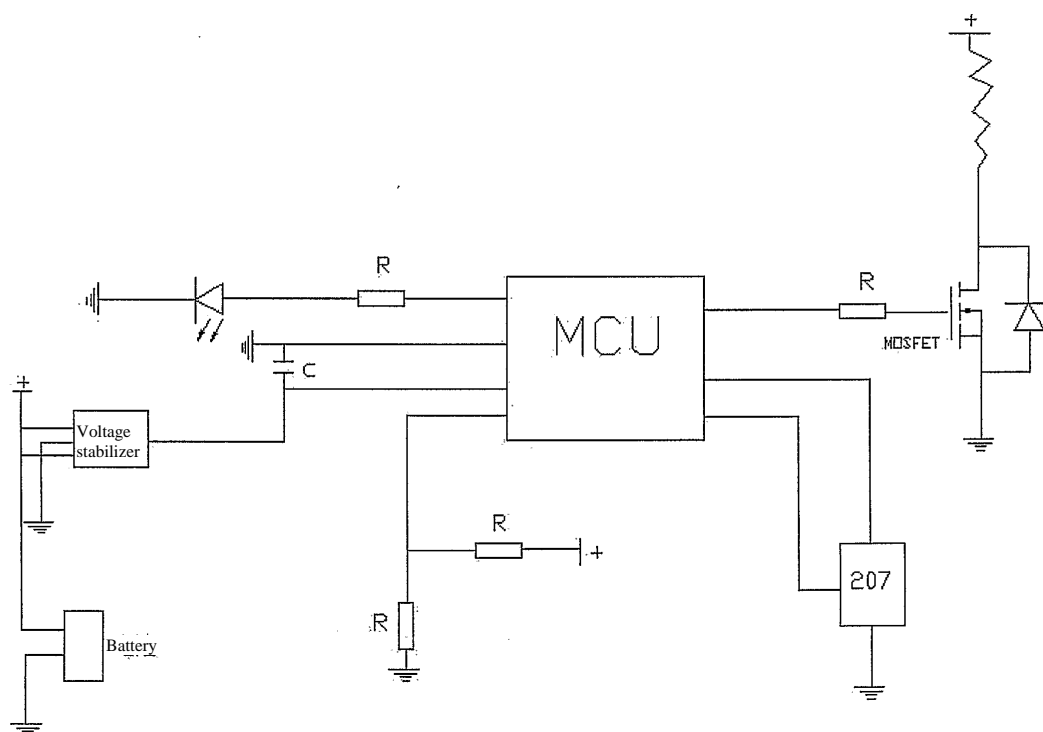


Figure 7

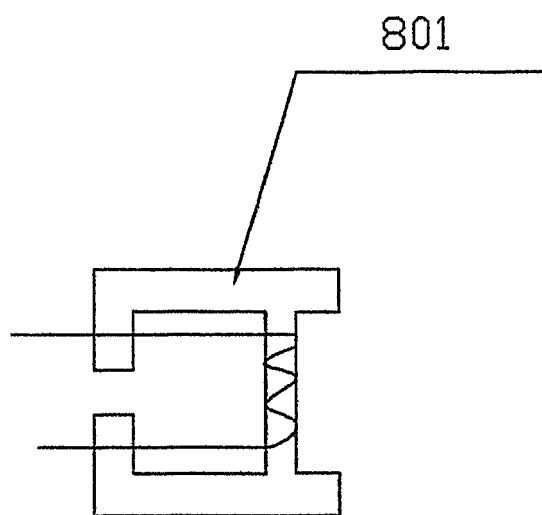


Figure 8

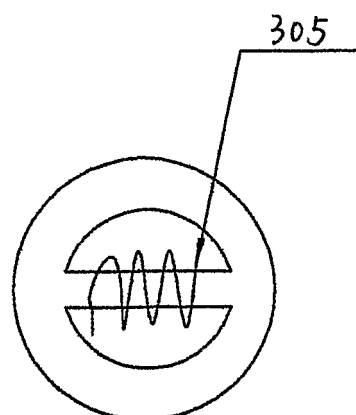


Figure 9

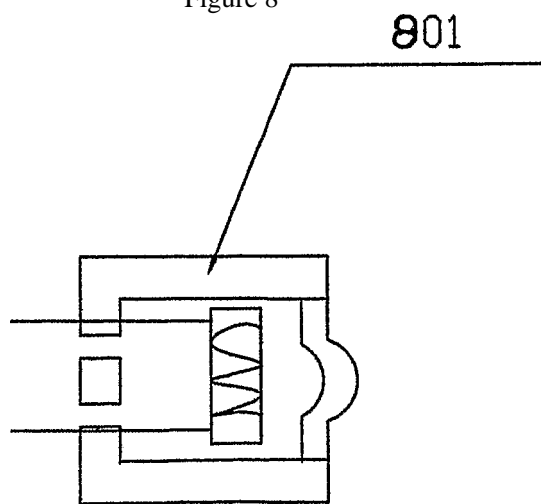


Figure 10

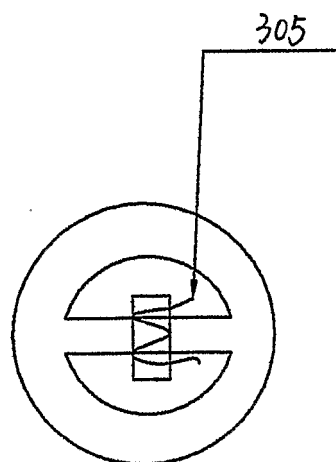


Figure 11

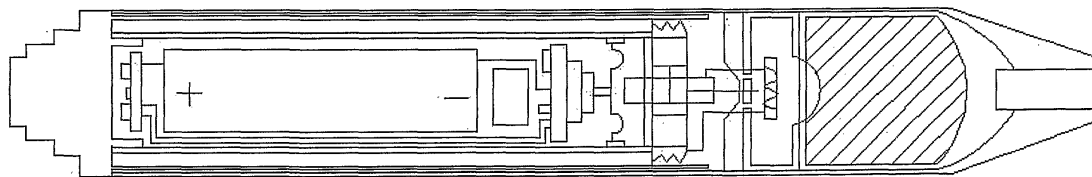


Figure 12

# 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.

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Date of the actual completion of the international search  
20 Jul. 2007(20.07.2007)

Date of mailing of the international search report  
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**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

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## INTERNATIONAL SEARCH REPORT

International application No.

PCT/CN2007/001576

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**A24D1/18(2006.01) i**

**A24F47/00(2006.01) i**

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Wendy Poon

Sworn to before me this  
August 12, 2016



Signature, Notary Public



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(19) 世界知识产权组织  
国际局



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PCT

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(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)。

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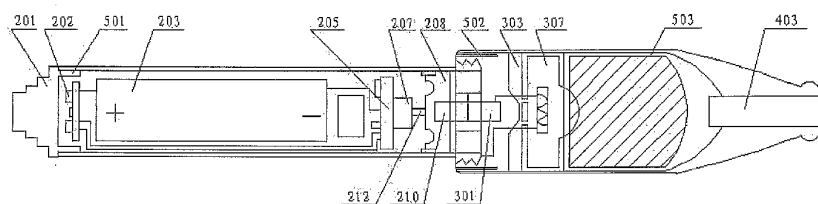
(74) 代理人: 沈阳科苑专利商标代理有限公司 (SHENYANG PATENT & TRADEMARK AGENCY ACADEMIA SINICA); 中国辽宁省沈阳市和平区三好街24号, Liaoning 110004 (CN)。

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— 包括国际检索报告。

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(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

- 5 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

- 10 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。

- 15 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然的感觉。

- 20 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。

- 25 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。

- 30 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。

- 35 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

5 可用氟橡胶、丁腈橡胶或弹性合金膜制成；所述外螺纹电极

10 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

15 第二壳体上开有进气孔道；所述内螺纹电极

20 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

25 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。

35 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

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；

5 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；

10 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；

15 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

20 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 25 205、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 30 207 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 还可用于氟橡胶、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。

- 5 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。

- 10 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。

- 15 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。

- 25 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。

- 30 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、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。

5 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。

## 10 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。

15 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  
20 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  
25 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、  
30 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。

## 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

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是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。

5        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。

20        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是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

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。

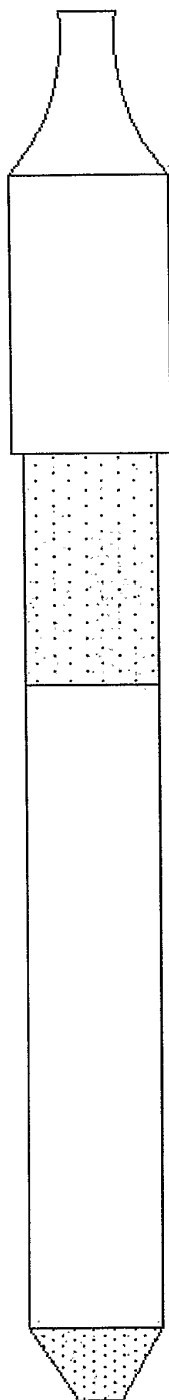
20、根据权利要求 3 所述的仿真气溶胶吸入器，其特征在于所述烟瓶组件包括烟液瓶、纤维及吸嘴，带有烟液的纤维容置在烟液瓶的一端，该端插接在第二壳体内、抵接在雾化器上，吸嘴位于烟液瓶的另一端，在纤维与烟液瓶的内壁间留有吸气孔道

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。





1

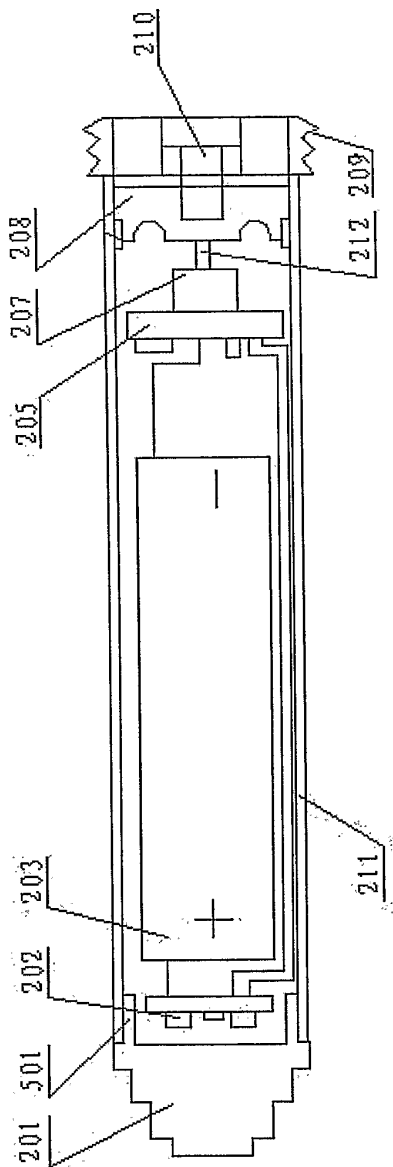


图 2A

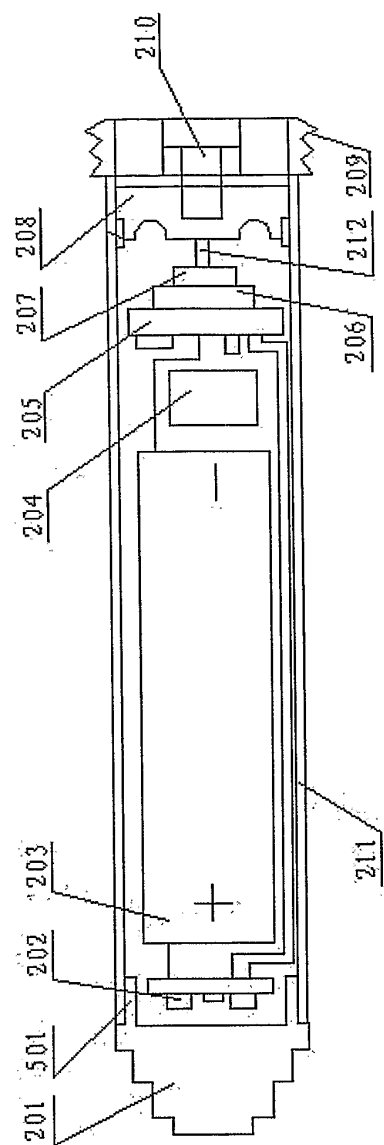


图 2B

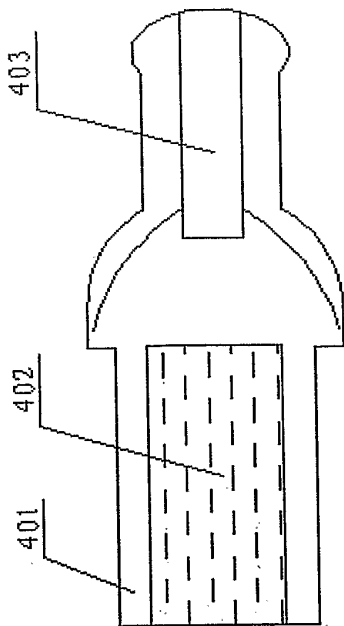


图 4

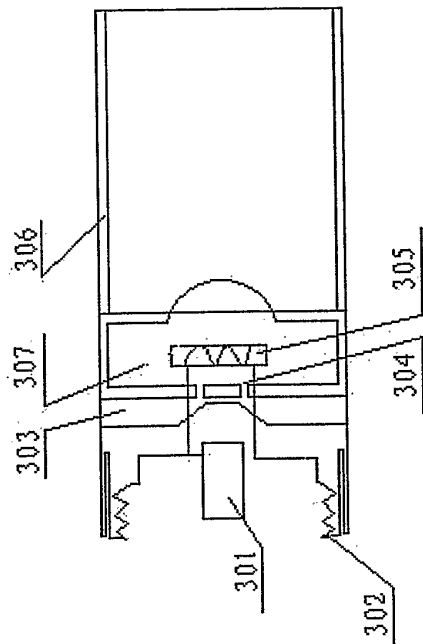


图 3

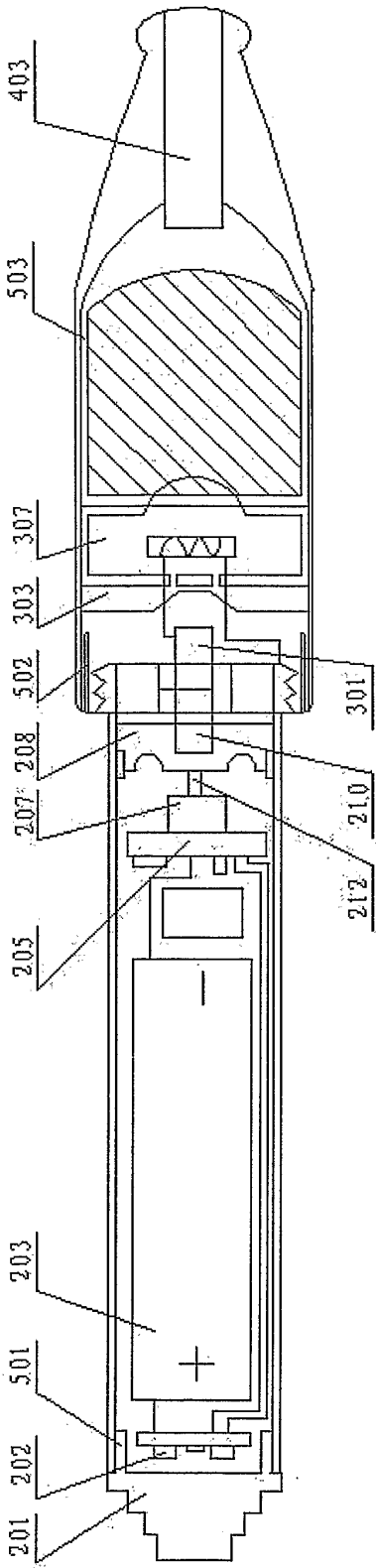


图 5A

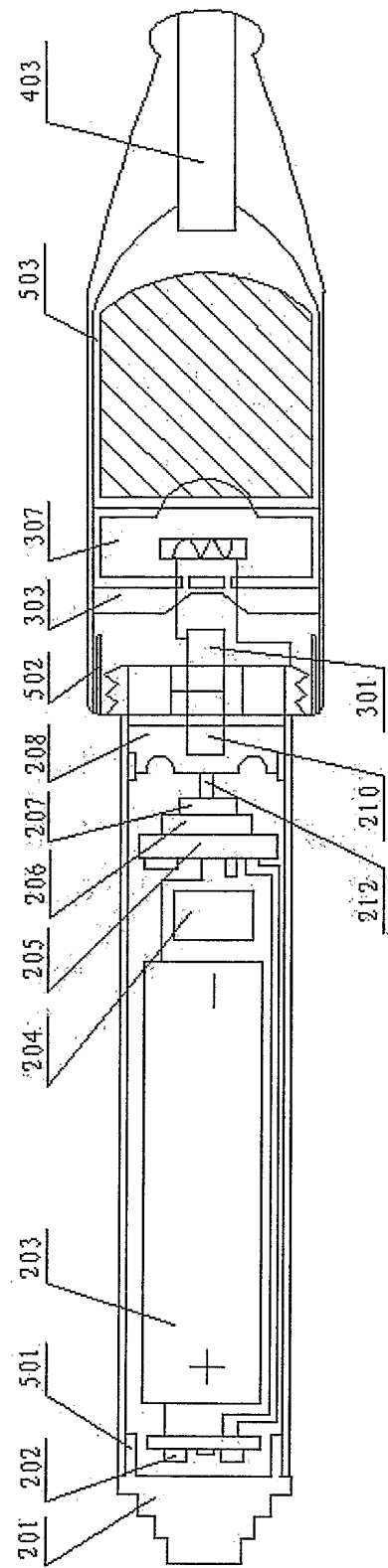


图 5B

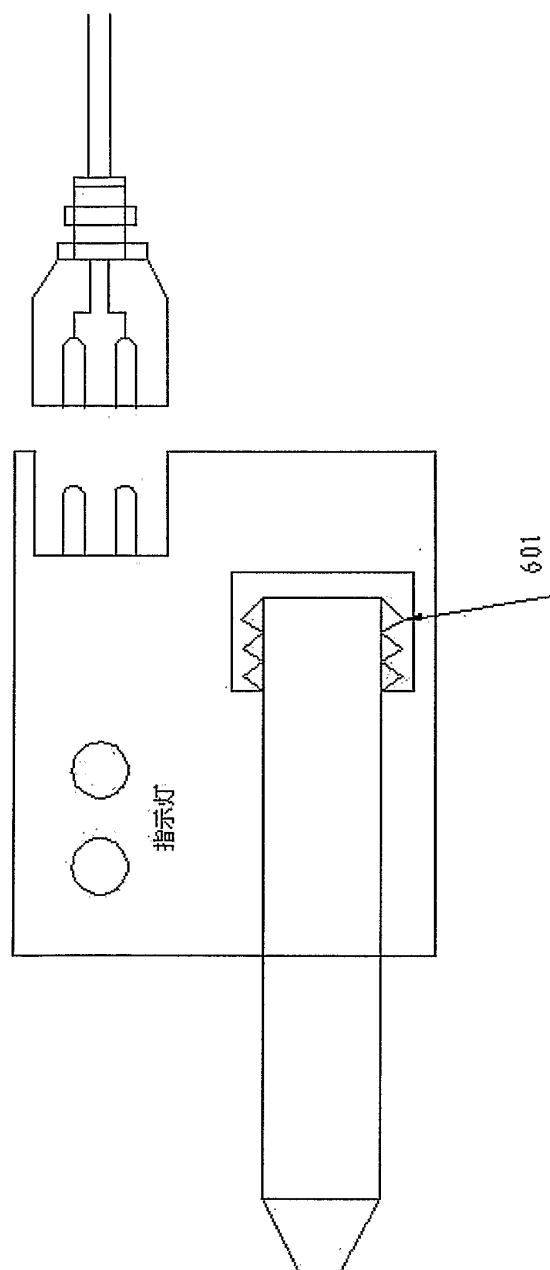


图 6

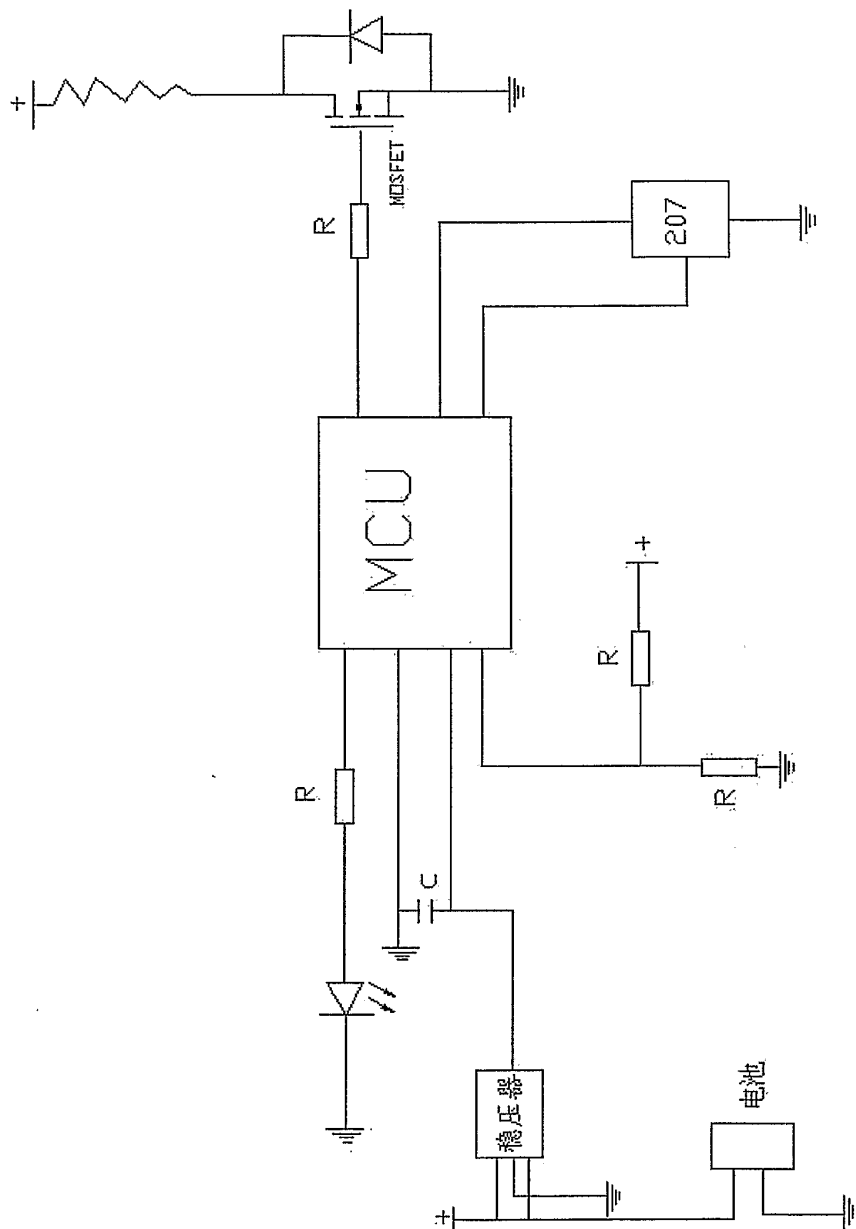


图 7



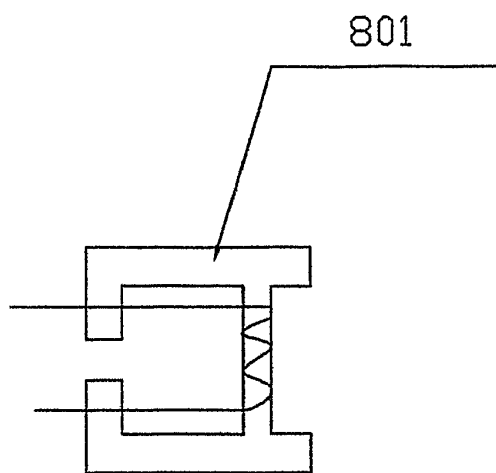


图 8

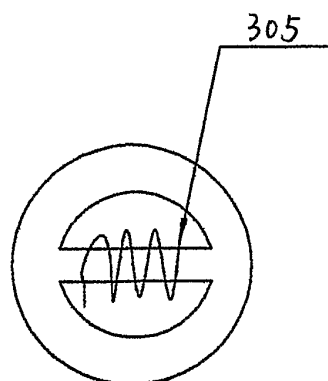


图 9

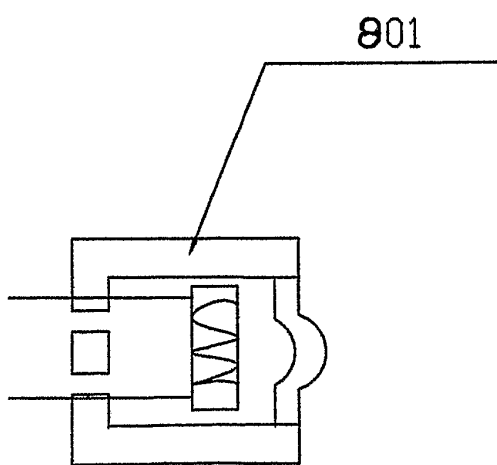


图 10

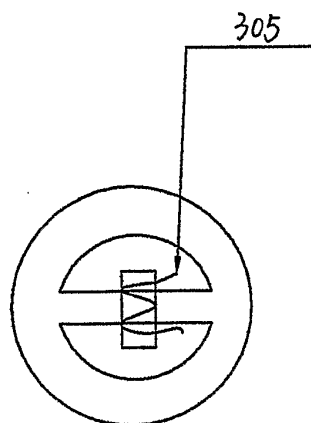


图 11

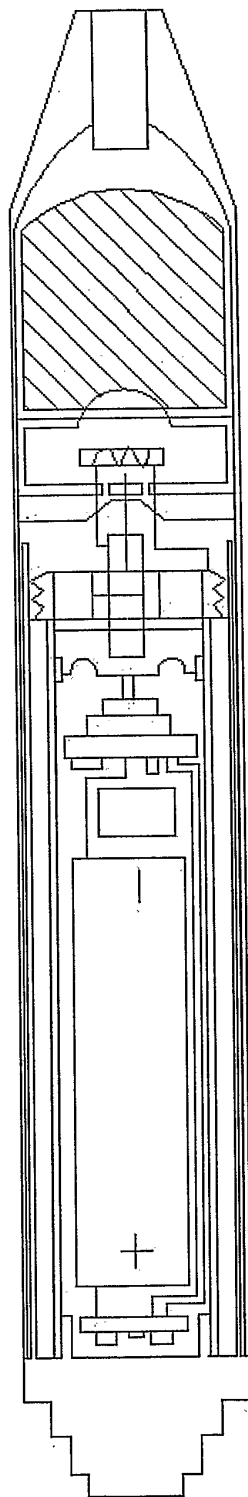


图 12

# 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:	"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
"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	"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
"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)	"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
"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	"&"document member of the same patent family

Date of the actual completion of the international search  
20 Jul. 2007(20.07.2007)

Date of mailing of the international search report  
**16 Aug. 2007 (16.08.2007)**

Name and mailing address of the ISA/CN  
The State Intellectual Property Office, the P.R.China  
6 Xitucheng Rd., Jimen Bridge, Haidian District, Beijing, China  
100088  
Facsimile No. 86-10-62019451

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**ZHAO,Xiaoyu**  
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**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
		CA2518174A	11 Nov. 2004
CN1541577A	03 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**

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) 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) 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) 说明书第2页第15—18行; 图1	1
X	CN1541577A(韩力)03.11月2004(03.11.2004) 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(07.08.1990) 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

20.7月2007(20.07.2007)

国际检索报告邮寄日期

16.8月2007(16.08.2007)

中华人民共和国国家知识产权局(ISA/CN)

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受权官员

赵晓宇

电话号码: (86-10) 62085853

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

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**