

Emulation Aerosol Sucker

TECHNICAL FIELD

- 5 This utility model relates to an electronic suction apparatus, in particular, an emulation aerosol sucker that doesn't contain tar but nicotine.

BACKGROUND ART

- 10 Today when "smoking is harmful to your health" has become a common sense, there are one billion people smoking cigarettes, and this figure is still rising. On Mar. 1, 2003, the World Health Organization (WHO) issued the first international smoking ban-Framework Convention on **Tobacco** Control. According to WHO's data, smoking causes 4,900,000 deaths each year. Smoking causes serious respiratory system
15 diseases and cancers, though it is a hard job to persuade the smokers to completely quit smoking.

- Nicotine is the effective ingredient of cigarette, which produces a lot of tar mist as the cigarette burns. The tar mist accesses the pulmonary alveolus and is quickly absorbed
20 into the blood. Nicotine thus acts on the receptor of the central nervous system, bringing the euphoria like stimulant drugs to the smokers, who feel light in the head and on wings as well.

- Nicotine is a micromolecular alkaloid, which is basically harmless to human bodies with a small dosage. Plus, its half life period is extremely short in blood. Tar is the
25 major harmful substance in tobacco. Tobacco tar comprises of several thousands of ingredients, dozens of which are carcinogenic substances. It has now been proved that second hand smoking is even more harmful to those who don't smoke.

- 30 To seek the cigarette substitutes that don't contain harmful tar but nicotine, many inventors have used the relatively pure nicotine to create such products as "Cigarette Patch", "Nicotine Gargle", "Aerosol Packed in the High Pressure Tank with Propellant", "Nicotine Chewing Gum", and "Nicotine Beverage". These products are not as harmful as tar, but are absorbed very slowly. As a result, its peak concentration
35 can't be effectively established in blood, and the smokers can't be satisfied to the full. In addition, the smokers are deprived of the "smoking" habit. Therefore, the substituting products are not real cigarette substitutes or products helping to quit smoking.

- 40 **CONTENTS OF THE UTILITY MODEL**

The purpose of this utility model is to provide an emulation aerosol sucker that substitutes for cigarettes and helps the smokers to quit smoking.

The technical solution of this utility model is the further innovation of the utility model called "Aerosol Electronic Cigarette" for which the inventor filed with the State Intellectual Property Office of the People's Republic of China on Apr. 14, 2000, with the application number of 20040031182.0, and the international application number of PCT/CN2005/000337.

The purpose of this utility model is fulfilled with the following solution: this utility model 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, and an internal thread electrode is located in one end of the atomizer assembly; the battery assembly and the atomizer assembly are connected through the thread electrodes, and the cigarette bottle assembly is inserted into the other end of the atomizer assembly, thus forming one cigarette type or cigar type body.

Therein, the battery assembly includes indicators, a lithium battery, a MOSFET electric circuit board, a sensor, a silicon rubber corrugated membrane, a first thread electrode, a first negative pressure cavity, and a first shell. On one end of the first shell is the external thread electrode, while on the other end is the indicators. On one side of the first shell is an indicator cap, in which there is a fine hole. On the other side of the first shell, the lithium battery and the MOSFET electric circuit board are connected successively. The sensor is located on MOSFET electric circuit board. Between the first thread electrode and the sensor is the silicon rubber corrugated membrane, on which there is the first negative pressure cavity. The sensor is connected with the silicon rubber corrugated membrane through the reed switch fixed thereon. MCU is provided between the MOSFET electric circuit board and the sensor. On the surface of the first shell, a screen is provided. The MCU scans the sensor in the power-saving mode of pulse, and according to the signal parameters of the sensor, restricts the atomizing capacity with the integral function of frequency to single operation time. Also, the MCU accomplishes the following controls: the pulse width modulation and over discharging protection for the constant power output of the electric current; automatic cleaning function for thousands of times per operation; step lighting/dying down control of the indicators; display of the operation times and battery capacity; and automatic recovery after sensor malfunction shutdown, etc. The sensor may be switch sensor made of elastic alloy slice, Hall element of linear output, semiconductor force-sensitive chip, semiconductor matrix thermoelectric bridge chip, or capacitance and inductance sensor. The indicators are two red LEDs. The silicon rubber corrugated membrane may be made of fluorinated rubber, butyronitrile rubber, or elastic alloy film. The external thread electrode is a gold-coated stainless steel or brass part with a hole drilled in the center. The lithium battery may be either a rechargeable polymer lithium battery or a rechargeable lithium ion battery. The atomizer assembly includes the internal thread electrode, an air-liquid separator, an atomizer and the second shell. One end of the second shell is inserted into the cigarette bottle assembly for connection, while the other end of the second shell has the internal thread electrode, in which there is the second negative pressure cavity.

The air-liquid separator and the atomizer are connected with the internal thread electrode successively. On the second shell, there is an air intake channel. The internal thread electrode is a gold-coated stainless steel or brass part with a hole drilled in the center. The air-liquid separator is made of stainless steel or plastic with a hole drilled.

5 The atomizer may be a capillary impregnation atomizer or a spray atomizer, inside which there is a heating body. The spray atomizer has a spray hole on it. The spray hole is made through molding and drilling foamed ceramics, micro-porous ceramics, foamed metal, stainless steel fiber felt, or chemical fiber. The heating body is made of

10 a micro-porous ceramics holder on which electric heating materials, such as nickel-chromium alloy wire, iron-chromium alloy wire, or platinum wire, are wound. Alternatively, heating body may be a porous component made of electrically conductive ceramics or PTC ceramics, with a sintered electrode. The surface of the heating body is sintered into high-temperature glaze to fix the zeolite grains, which

15 are made of natural zeolite, artificial non-organic micro-porous ceramics or aluminum oxide grains. The cigarette bottle assembly includes a cigarette liquid bottle, fiber and a suction nozzle. The fiber containing cigarette liquid is located on one end of the cigarette liquid bottle, and this end is inserted into the second shell and lies against the atomizer. The suction nozzle is located on the other end of the cigarette liquid bottle.

20 Between the fiber and interior wall of the cigarette liquid bottle is an air suction channel. The cigarette liquid bottle and the suction nozzle are made of non-toxic plastic. The fiber is made of polypropylene fiber or nylon fiber. The cigarette liquid in the fiber for atomization contains 0.1-3.5% of nicotine, 0.05-5% of tobacco flavor, 0.1-3% of organic acid, 0.1-0.5% of stabilizer, and propanediol for the remaining. The said sucker and its connecting structure may be taken as a drug delivery device of

25 pulmonary suction with routine medicines loaded.

This invention will bring the following benefits and active effects: For this utility model, smoking doesn't bring any cigarette tar, considerably reducing the carcinogenic risks. At the same time, the smokers can still enjoy the feel and excitement of smoking, and there is no fire hazard since there is no need for igniting.

30 In addition, the apparatus and its connecting structure of this utility model may be loaded with conventional drugs for delivery to the lung.

DESCRIPTION OF DRAWINGS

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FIG. 1 is the diagram of visual appearance of the cigarette type of this utility model.

FIG. 2A is the diagram of one structure of the battery assembly of this utility model.

40 FIG. 2B is the diagram of another structure of the battery assembly of this utility model.

FIG. 3 is the diagram of the atomizer assembly of this utility model.

FIG. 4 is the diagram of the cigarette bottle assembly of this utility model.

FIG. 5A is the diagram of one internal structure of this utility model.

5 FIG. 5B is the diagram of another internal structure of this utility model.

FIG. 6 is the diagram of the structure of the charger of this utility model.

FIG. 7 is the electric circuit diagram of MCU and MOSFET of this utility model.

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FIG. 8 is the diagram of the structure of the capillary impregnation atomizer of this utility model.

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

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FIG. 10 is the diagram of the structure of the spray atomizer of this utility model.

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

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FIG. 12 is the diagram of the structure of the cigar type contour of this utility model.

SPECIFIC MODE FOR CARRYING OUT THE UTILITY MODEL

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

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Example 1

As shown in FIG. 1, the visual appearance of this utility model is similar to a cigarette inserted into the cigarette holder. The emulation aerosol sucker includes a battery assembly, an atomizer assembly and a cigarette bottle assembly. An external thread electrode 209 is located in one end of the battery assembly, and an internal thread electrode 302 is located in one end of the atomizer assembly. The battery assembly and atomizer assembly are connected through the thread electrodes into an emulation cigarette. The cigarette bottle assembly is inserted into the other end of atomizer assembly, to form one cigarette type emulation aerosol sucker.

As shown in FIG. 2A, the battery assembly includes indicators 202, a lithium battery 203, a MOSFET electric circuit board 205, a sensor 207, a silicone rubber corrugated membrane 208, a first thread electrode 209, a first negative pressure cavity 210, and a first shell 211. On one end of the first shell 211 is the external thread electrode 209, while on the other end are the indicators 202. On one side of the shell 211, an indicator cap 201 is provided, in which there is a fine hole 501. On the other side of the shell 211, the lithium battery 203 and the MOSFET (Metallic Oxide Semiconductor Field Effect Tube) electric circuit board 205 are connected

5 successively. The sensor 207 is located on the MOSFET electric circuit board 205. Between the first thread electrode 209 and the sensor 207 is the silicon rubber corrugated membrane 208, on which there is the first negative pressure cavity 210. The sensor 207 is connected with the silicon rubber corrugated membrane 208 through the reed switch 212 fixed thereon.

10 Therein, the sensor 207 may be switch sensor made of elastic alloy slice, Hall element of linear output, semiconductor force-sensitive chip, semiconductor matrix thermoelectric bridge chip, or capacitance and inductance sensor. The indicators 202 are two red LEDs. The lithium battery 203 may be either a rechargeable polymer lithium battery or a rechargeable lithium ion battery. The external thread electrode 209 is a gold-coated stainless steel or brass part with a hole drilled in the center. The silicon rubber corrugated membrane 208 may alternatively be made of fluorinated rubber, butyronitrile rubber, or elastic alloy film.

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

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

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

35 As shown in FIG. 5A, the standby state of this utility model has the fully charged battery assembly shown in FIG. 2A fastened onto the atomizer assembly shown in FIG. 3, which is then inserted into the cigarette bottle assembly shown in FIG. 4. When the user slightly sucks the suction nozzle 403 with mouth, the negative pressure is formed on the silicon rubber corrugated membrane 208 through the air suction channel 503 and the first and second negative pressure cavities 210, 301. The silicon rubber corrugated membrane 208, under the action of suction pressure difference, deforms to drive the reed switch 212 and the sensor 207, thereby starting the MOSFET electric circuit board 205. At this moment, the indicators 202 are lit

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