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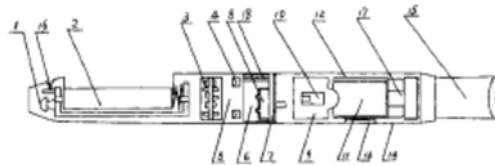
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Claims 2 Pages Specification 5 Pages Attached  
Figures 5 Pages

[54] Title of Utility Model Atomizer Electronic Cigarette

[57] Abstract

The present utility model relates to an atomizer electronic cigarette containing no tar and only nicotine, comprising an enclosure and a mouthpiece; an air inlet is set on the outer wall of the enclosure; an electronic circuit board, a normal pressure cavity, a sensor, a vapor-liquid separator, an atomizer, and a liquid-supplying bottle are set successively in the enclosure; wherein the electronic circuit board is composed of an electronic switch circuit and a high-frequency generator; a sensor airflow channel is opened on one side of the sensor; a negative pressure cavity is set in the sensor; the atomizer is in contact with the liquid-supplying bottle; an atomization cavity is set inside of the atomizer; a retaining ring to lock the liquid-supplying bottle is set between one side of the liquid-supplying bottle and the enclosure, and an aerosol passage is opened on the other side of the liquid-supplying bottle; the air inlet, normal pressure cavity, vapor-liquid separator, atomizer, aerosol passage, gas vent, and mouthpiece are connected successively. There is no tar in the present utility model, which greatly reduces the risk of cancer; users can still have the feeling and excitement of smoking; there is no need of ignition, and there is no fire hazard.



1. An atomizer electronic cigarette, comprising an enclosure and a mouthpiece, characterized in that: an air inlet (4) is set on the outer wall of said enclosure (14); an electronic circuit board (3), a normal pressure cavity (5), a sensor (6), a vapor-liquid separator (7), an atomizer (9), and a liquid-supplying bottle (11) are set successively in the enclosure (14); wherein the electronic circuit board (3) is composed of an electronic switch circuit and a high-frequency generator; a sensor airflow channel (18) is opened on one side of the sensor (6); a negative pressure cavity (8) is set in the sensor (6); the atomizer (9) is in contact with the liquid-supplying bottle (11); an atomization cavity (10) is set inside of the atomizer (9); a retaining ring (13) to lock the liquid-supplying bottle (11) is set between one side of the liquid-supplying bottle (11) and the enclosure (14), and an aerosol passage (12) is opened on the other side of the liquid-supplying bottle (11); the air inlet (4), normal pressure cavity (5), vapor-liquid separator (7), atomizer (9), aerosol passage (12), gas vent (17), and mouthpiece (15) are connected successively; the front end of the enclosure (14) further comprises a light emitting diode (1) and a battery (2), which jointly constitute a mouthpiece-shaped, cigar-shaped, or pipe-shaped body.

2. An atomizer electronic cigarette as described in Claim 1, characterized in that the atomizer (9) is placed in the rear of the enclosure (14); the liquid-supplying bottle (11) is set between the vapor-liquid separator (7) and the atomizer (9); a spring (33) to press the liquid-supplying bottle (11) tightly on the atomizer (9) is set on one end of the liquid-supplying bottle (11).

3. An atomizer electronic cigarette as described in Claim 1 or Claim 2, characterized in that a display (32) is set on the inner wall of the enclosure (14).

4. An atomizer electronic cigarette as described in Claim 1 or Claim 2, characterized in that a micro switch (16) for manual cleaning is set inside of the enclosure (14) and is in parallel connection with the sensor (6).

5. An atomizer electronic cigarette as described in Claim 1 or Claim 2, characterized in that a ripple film (22) is set between said sensor (6) and the negative pressure cavity (8) therein; a first magnet (20), a second magnet (21), and a reed switch (19) set in between are also set in the sensor (6); the second magnet (21) is fixated on the ripple film (22).

6. An atomizer electronic cigarette as described in Claim 1 or Claim 2, characterized in that a silicone check valve (31) is set inside of said sensor (6); a third magnet (34) is set in the valve; the reed switch (19) is set outside of the valve on the side close to the magnet.

7. An atomizer electronic cigarette as described in Claim 1 or Claim 2, characterized in that a through hole is opened on said vapor-liquid separator (7).

8. An atomizer electronic cigarette as described in Claim 7, characterized in that the silicone check valve (31) is sleeved over the through hole on the vapor-liquid separator (7).

9. An atomizer electronic cigarette as described in Claim 1 or Claim 2, characterized in that an overflow hole (29) is opened on an atomization cavity wall (25) of said atomization cavity (10); a heating element (26) is set in the atomization cavity (10); a long stream ejection hole (24) is opened on one side of the heating element (26); a porous body (27) is wrapped around the atomization cavity wall (25); a first piezoelectric element (23) is set on one side of the atomizer (9), and a bulge (36) is set on the other side.

10. An atomizer electronic cigarette as described in Claim 1 or Claim 2, characterized in that a second piezoelectric element (35) is set in said atomizer (9).

11. An atomizer electronic cigarette as described in Claim 9, characterized in that the porous body (27) in said atomizer (9) may be made of nickel foam, stainless steel fiber felt, high molecular polymeric foam, and ceramic foam; the heating element (26) may be made of platinum wires, nichrome, or iron-chromium-aluminum alloy wires containing rare earth elements, and it may also be made into a sheet; the atomization cavity wall (25) may be made of alumina or ceramic.

12. An atomizer electronic cigarette as described in Claim 7, characterized in that said vapor-liquid separator (7) may be made of plastic or silicone rubber.

13. An atomizer electronic cigarette as described in Claim 1 or Claim 2, characterized in that a liquid storing porous body (28) is installed inside of said liquid-supplying bottle (11), which may be filled by polypropylene fiber, polyester fiber, nylon fiber, or foamed plastic; it may also be a multilayer pillar injection molded from polyvinyl chloride, polypropylene, or polycarbonate.

14. An atomizer electronic cigarette as described in Claim 5, characterized in that the reed switch (19), first magnet (20), second magnet (21), and ripple film (22) may be replaced by a semiconductor strain gauge with a sealing film, which is installed at the location of the sensor ripple film.

## An Atomizer Electronic Cigarette

### Technical Field

The present utility model relates to an atomizer electronic cigarette, in particular an atomizer electronic cigarette containing no tar and only nicotine.

### Background Art

As “smoking is harmful to health” has become common knowledge, there are still one billion smokers around the world, and the number is still increasing every year. On March 1, 2003, the World Health Organization (WHO) passed the first international smoking ban agreement, the “Framework Convention on Tobacco Control”. According to the numbers provided by WHO, smoking causes the death of 4.9 million people every year. Although smoking may result in serious respiratory diseases and cancers, it is extremely difficult for smokers to completely quit smoking.

The effective ingredient of cigarettes is nicotine. During smoking, nicotine, along with a large amount of tar droplets generated from the cigarette ignition, enters alveoli and is quickly absorbed. Once absorbed into the bloodstream, nicotine acts on the receptors of the central nervous system, causing “euphoria” similar to stimulants, for example, the dizziness or the feeling of self-satisfaction experienced by smokers.

Nicotine is a small-molecule alkaloid and is basically harmless to human with small dosage. Moreover, its half-life is extremely short in the bloodstream. The harmful substance in tobacco is mainly tar. Tobacco tar is composed of thousands of ingredients, and dozens of them are carcinogens. It has been proven that passive smoking is more harmful to non-smokers.

To seek tobacco substitutes containing only nicotine but not the harmful tar, a lot of inventions are products made of purer nicotine, such as, “nicotine patches”, “nicotine mouthwash”, “high-pressure aerosols packaged with propellants”, “nicotine gum”, and “nicotine beverages”. Although these products do not have the hazards of tar, the nicotine absorption is slow, and the effective peak concentration cannot be established in the bloodstream; it cannot meet the demand of the feeling of “excitement” from nicotine, and at the same it deprives the habits of “smoking” and “sucking” developed by smokers; thus, similar products cannot become actual products to quit smoking or cigarette substitutes.

### Summary of the Utility Model

To overcome the aforementioned shortcomings, the objective of the present utility model is to provide an atomizer electronic cigarette with the effects of quitting smoking and substituting cigarettes.

The objective of the present utility is realized by the following technical solution:

The present utility model comprises an enclosure and a mouthpiece; an air inlet is set on the outer wall of the enclosure; an electronic circuit board, a normal pressure cavity, a sensor, a vapor-liquid separator, an atomizer, and a liquid-supplying bottle are set successively in the enclosure; wherein the electronic circuit board is composed of an electronic switch circuit and a high-frequency generator; a sensor airflow channel is opened on one side of the sensor; a negative pressure cavity is set in the sensor; the atomizer is in contact with the liquid-supplying bottle; an atomization cavity is set inside of the atomizer; a retaining ring to lock the liquid-supplying bottle is set between one side of the liquid-supplying bottle and the enclosure, and an aerosol passage is opened on the other side of the liquid-supplying bottle; the air inlet, normal pressure cavity, vapor-liquid separator, atomizer, aerosol passage, gas vent, and mouthpiece are connected successively; the front end of the enclosure further comprises a light emitting diode and a battery, which jointly constitute a mouthpiece-shaped, cigar-shaped, or pipe-shaped body.

Wherein, a display is set on the inner wall of the enclosure. A micro switch for manual cleaning is set inside of the enclosure and is in parallel connection with the sensor. A ripple film is set between the sensor and the negative pressure cavity therein. A first magnet, a second magnet, and a reed switch set in between are also set in the sensor; the second magnet is fixated on the ripple film. A silicone check valve is set inside of the sensor; a third magnet is set in the valve; the reed switch is set outside of the valve on the side close to the magnet. A through hole is opened on the vapor-liquid separator; the silicone check valve is sleeved over the through hole on the vapor-liquid separator. An overflow hole is opened on a atomization cavity wall of the atomization cavity; a heating element is set in the atomization cavity; a long stream ejection hole is opened on one side of the heating element; a porous body is wrapped around the atomization cavity wall; a first piezoelectric element is set on one side of the atomizer, and a bulge is set on the other side. A second piezoelectric element is set in the atomizer. The porous body in the atomizer may be made of nickel foam, stainless steel fiber felt, high molecular polymeric foam, and ceramic foam. The heating element may be made of platinum wires, nichrome, or iron-chromium-aluminum alloy wires containing rare earth elements, and it may also be made into a sheet. The atomization cavity wall may be made of alumina or ceramic. The vapor-liquid separator may be made of plastic or silicone rubber. A liquid storing porous body is installed inside of the liquid-supplying bottle, which may be filled by polypropylene fiber, polyester fiber, nylon fiber, or foamed plastic. It may also be a multilayer pillar injection molded from polyvinyl chloride, polypropylene, or polycarbonate. The reed switch, first magnet, second magnet, and ripple film may be replaced by a semiconductor strain gauge with a sealing film, which is installed at the location of the sensor ripple film.

The present utility model has also disclosed an atomizer electronic cigarette with another structure; the atomizer is placed in the rear of the enclosure; the liquid-supplying bottle is set between the vapor-liquid separator and the atomizer; a spring to press the liquid-supplying bottle tightly on the atomizer is set on one end of the liquid-supplying bottle.

The advantages of the present utility model are: there is no tar, which greatly reduces the risk of cancer; users can still have the feeling and excitement of smoking; there is no need of ignition, and there is no fire hazard.

The device and connection structure of the present utility model may be installed in the routine medical devices for pulmonary drug delivery once the solution storage device is slightly modified.

#### **Description of Attached Figures**

Figure 1 is a schematic of the overall structure of the present utility model;

Figure 2 is a schematic of another overall structure of the present utility model;

Figure 3 is a schematic of the overall structure of the present utility model with a display;

Figure 4 is a structure diagram of the sensor of the present utility model;

Figure 5 is a structure diagram of the sensor with a silicone check valve of the present utility model;

Figure 6 is a structure diagram of an atomizer of the present utility model;

Figure 7 is a structure diagram of the ceramic piece in the atomizer of the present utility model;

Figure 8 is a structure diagram of another atomizer of the present utility model;

Figure 9 is a structure diagram of a vapor-liquid separator of the present utility model;

Figure 10 is a structure diagram of another vapor-liquid separator of the present utility model;

Figure 11 is a structure diagram of the connection between the liquid-supplying bottle and the mouthpiece of the present utility model;

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