EXHIBIT 15

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[12] Utility Model Patent Specification

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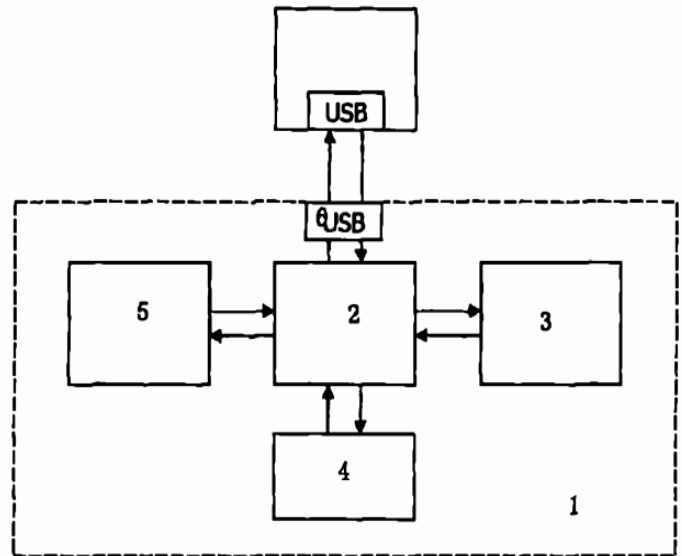1 Page of Claims, 3 Pages of Specification, and 2 Pages of Attached Drawings

(54) **Title of Utility Model**
　An Electronic Atomizer

(57) **Abstract**

　A kind of electronic atomizer relates to a battery-driven heating device, which comprises a shell and a battery arranged in the shell, wherein a processing chip, a heating device and a sensing device are arranged in the shell, and the processing chip is electrically connected with the battery, the heating device and the sensing device respectively; the processing chip is internally provided with an airflow sensing switch circuit, a heating drive circuit, a charging mode detection circuit, a battery charging and protection circuit and a light-emitting diode drive circuit, the output pin of the heating drive circuit is connected with the heating device, the output pin of the light-emitting diode drive circuit is connected with light-emitting diode, the input pin of the airflow sensing switch circuit is connected with the sensing device, and the charging mode detection circuit and the battery charging and protection circuit are connected with the battery at one end, and with the power input at the other end. The present utility model can sense the user's smoking motion by airflow sensing mode, which can greatly improve the service life of the switch device, increase sensitivity, eliminate wrong triggering and reduce assembly cost.

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CN 201482667 U   **Claims**   1 / 1

1. An electronic atomizer comprising a shell (1) and a battery (5) arranged in the shell, wherein a processing chip (2), a heating device (3) and a sensing device (4) are arranged inside the shell (1), the processing chip (1) is electrically connected with the battery (5), the heating device (3) and the sensing device (4) respectively; the processing chip (2) is internally provided with an airflow sensing switch circuit (21), a heating drive circuit (22), a charging mode detection circuit (23), a battery charging and protection circuit (24) and a light-emitting diode drive circuit (25); the output pin of the heating drive circuit (22) is connected with the heating device (3), the output pin of the light-emitting diode drive circuit (25) is connected with light-emitting diode D1, the input pin of the airflow sensing switch circuit (21) is connected with the sensing device (4), and the charging mode detection circuit (23) and the battery charging and protection circuit (24) are connected with the battery (5) at one end, and with the power input at the other end.

2. The electronic atomizer according to claim 1, wherein an electronic serial interface (6) is arranged in the shell (1), an opening for the electronic serial interface is arranged on the shell (1), and the electronic serial interface (6) is electrically connected with the processing chip (2).

3. The electronic atomizer according to claim 1, wherein a battery compartment is arranged in the shell (1), and a battery is installed in the battery compartment.

4. The electronic atomizer according to claim 1, wherein the heating device (3) is a heating wire.

5. The electronic atomizer according to claim 1, wherein the sensing device (4) is a capacitive airflow sensing.

6. The electronic atomizer according to claim 2, wherein the electronic serial interface (6) is a USB interface.

7. The electronic atomizer according to claim 1, wherein: the pin 1 of the processing chip (2) is set as an input pin of an air-flow sensing switch circuit, pin 2 is set as a grounding pin, the pin 3 is set as an output pin of the light-emitting diode drive circuit, the pin 4 is set as an output pin of the heating drive circuit and an input pin of the charging mode detection circuit and the battery charging and protection circuit, and the pin 5 is set as a power input pin.

8. The electronic atomizer according to claim 1, wherein the heating drive circuit (22) outputs the voltage to the heating device (3) in the form of pulse width modulation.

An Electrical Connector

Technical Field

[0001]   The present utility model relates to a battery-driven heating device.

Background Art

[0002]   In the market, electronic atomizers are powered by lithium batteries or other power sources and use a heating wire to generate heat to atomize the liquid, which is then inhaled by people. In medical applications, the atomized liquid is medicinal liquid. In the application of electronic cigarettes, the atomized liquid simulates the traditional tobacco effect or other flavors. At present, electronic cigarettes use various switching devices such as mechanical switch and Hall sensing switch to sense the smoking motion of users, so as to decide to switch on or off the heating device. These switching devices all have a mechanical part or magnetic sensing part, causing the products to have a short life, be easy to produce error triggering, or be lack sensitivity.

Summary of the Invention

[0003]   The purpose of the present utility model is to provide an electronic atomizer that controls the switch by airflow sensing.

[0004]   The purpose of the present utility model can be achieved by designing an electronic atomizer comprising a shell and a battery arranged in the shell, wherein a processing chip, a heating device and a sensing device are arranged inside the shell, the processing chip is electrically connected with the battery, the heating device and the sensing device respectively; the processing chip is internally provided with an airflow sensing switch circuit, a heating drive circuit, a charging mode detection circuit, a battery charging and protection circuit and a light-emitting diode drive circuit; the output pin of the heating drive circuit is connected with the heating device, the output pin of the light-emitting diode drive circuit is connected with light-emitting diode, the input pin of the airflow sensing switch circuit is connected with the sensing device, and the charging mode detection circuit and the battery charging and protection circuit are connected with the battery at one end, and with the power input at the other end.

[0005]   The present utility model senses the smoking motion of the user in an innovative airflow sensing way, which can greatly prolong the service life of the switch device, increase sensitivity, eliminate wrong triggering and reduce assembly cost.

Description of the Attached Drawings

[0006]   Fig. 1 is a structural schematic diagram of a preferred embodiment of the present utility model.

[0007]   Fig. 2 is a functional module diagram of the preferred embodiment of the present utility model.

[0008]   Fig. 3 is a circuit schematic diagram of the preferred embodiment of the present utility model in heating mode.

[0009]   Fig. 4 is a circuit schematic diagram of the preferred embodiment of the present utility model in charging mode.

Specific Embodiment

[0010]   The present utility model will be further described concerning the following embodiment.

[0011]   As shown in Figs. 1 and 2, an electronic atomizer comprising a shell 1 and a battery 5 arranged in the shell, wherein a processing chip 2, a heating device 3 and a sensing device 4 are arranged inside the shell 1, the processing chip 1 is electrically connected with the battery 5, the heating device 3 and the sensing device 4 respectively; the processing chip 2 is internally provided with an airflow sensing switch circuit 21, a heating drive circuit 22, a charging mode detection circuit 23, a battery charging and protection circuit 24 and a light-emitting diode drive circuit 25; the output pin of the heating drive circuit 22 is connected with the heating device 3, the output pin of the light-emitting diode drive circuit 25 is connected with the light-emitting diode D1, the input pin of the airflow sensing switch circuit 21 is connected with the sensing device 4, the charging mode detection circuit 23 and the battery charging and protection circuit 24 are connected with the battery 5 at one end, and with the power input at the other end, and an opening for the heating device is provided on the shell.

[0012]   As shown in Fig. 1, an electronic serial interface 6 is arranged in shell 1, an opening for the electronic serial interface is arranged on shell 1, and the electronic serial interface 6 is electrically connected with the processing chip 2. The electronic serial interface 6 in this embodiment is a USB interface.

[0013]   As shown in Fig. 2, pin 1 of the processing chip 2 is set as an input pin of an air-flow sensing switch circuit, pin 2 is set as a grounding pin, the pin 3 is set as an output pin of the light-emitting diode drive circuit, the pin 4 is set as an output pin of the heating drive circuit and an input pin of the charging mode detection circuit and the battery charging and protection circuit, and the pin 5 is set as a power input pin.

[0014]   A battery compartment is arranged in shell 1, and a battery is installed in the battery compartment. The battery in this embodiment is a lithium battery.

[0015]   The heating drives circuit 22 is used to drive the heating device 3, and the heating drives circuit 22 outputs the voltage to the heating device 3 in the form of pulse width modulation. The heating device 3 burns cigarettes and atomized liquid by generating heat. The heating device 3 can be a heating wire, a heating resistor, or other materials that generate heat by using electric energy. In this embodiment, the heating device 3 is a heating wire.

[0016]   The sensing device 4 is a capacitive airflow sensor. The airflow sensing switch circuit 21 is used to sense the user's smoking motion and provides airflow sensing function by detecting a capacitance value of an external capacitive airflow sensor C1. Airflow will be generated when the users smoke, and when the airflow passes through the capacitive airflow sensor C1, the capacitance value of capacitive airflow sensor C1 will change, thus triggering the airflow sensing switch circuit 21.

[0017]   As shown in Fig. 3, the processing chip is U1, the battery pack is BT1, the sensing device is C1, the heating device is L1, and the light-emitting diode is D1. The capacitor C2 is connected with pin 5 (BAT) of the processing chip U1 at one end, and the capacitor C2 is grounded at the other end. Airflow is generated when the user smokes, and the airflow triggers the airflow sensing switch circuit 21 through the capacitive airflow sensing device C1. Then, the heating drive circuit 22 outputs voltage to the heating device L1 in the form of pulse width modulation, and the high temperature and heat generated by the heating device L1 are enough to atomize the liquid imitating a cigarette for the user to inhale. When heating, the light-emitting diode drive circuit 25 simultaneously outputs current to the light-emitting diode D1 to show that the heating device L1 is heating. When the user stops smoking, processing chip 2 will immediately stop driving the heating device L1 and the light-emitting diode D1.

[0018]   If the user smokes continuously for more than five seconds, the processing chip 2 will stop outputting voltage to the heating device L1 and flash the light-emitting diode D1 several times, indicating that the heating time is too long.

[0019]   When the voltage of the lithium battery is lower than 3.2V, after the user smokes and the airflow sensing switch circuit 21 is triggered, the processing chip 2 will not output voltage to the heating device L1, and will flash the light-emitting diode D1 several times to indicate that the battery voltage is too low. This can protect battery 5 from over-discharge.

[0020]   The charging mode detection circuit 23 can detect whether the present utility model is in battery charging mode or normal heating mode so that it can normally charge or atomize the liquid. When the voltage of the fourth pin (OUT) of the processing chip 2 is higher than the voltage of the fifth pin (BAT), the processing chip 2 is in the charging mode, and receives power from USB via the fourth pin (OUT) for charging the battery. When the voltage of the fifth pin (BAT) is higher than or equal to the voltage of the fourth pin (OUT), processing chip 2 is in a normal heating state and can drive the heating wire to heat according to the instruction of the airflow sensing switch circuit 21.

[0021]   The battery charging and protection circuit 24 provides the charging and protection functions to the lithium battery 5, and can fully charge the lithium battery 5 by limiting the voltage with a constant current. In addition, circuit 24 can be connected to other electronic products through the USB interface 6, and can directly use the USB power supply for charging. In the normal working state, circuit 24 can detect the voltage of the lithium battery 5 to protect battery 5 from over-discharge. Lithium batteries can be of different capacities, shapes and packages. In this way, the lithium battery can be directly used for power supply without adding a lithium battery protection chip and charging chip.

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