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(71) Applicant: **Shenzhen Merit Technology Co., Ltd.**
Shenzhen, Guangdong 518105 (CN)

(72) Inventor: **DOU, Hengheng**
Shenzhen, Guangdong 518105 (CN)

(74) Representative: **Westphal, Mussgnug & Partner,**
Patentanwälte mbB
Werinherstraße 79
81541 München (DE)

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(54) **CONTROL DEVICE, STORAGE MEDIUM, COMPUTER PROGRAM PRODUCT, AND AEROSOL GENERATING DEVICE AND CONTROL METHOD THEREFOR**

(57) A control device, a storage medium, a computer program product, and an aerosol generating device and a control method therefor. The aerosol generating device comprises a heat generating element (13), the heat generating element is a heat generating element (13) with a magnetic temperature characteristic. The aerosol generating device comprises an RLC circuit (12), the RLC circuit (12) comprising an inductance coil, and at least a

part of the inductance coil being located in a magnetic field of the heat generating element; and a control module used for controlling the RLC circuit to generate alternating current on the inductance coil to perform induction heating on the heat generating element, and determining the temperature of the heating element by detecting the specific parameters of the RLC circuit.

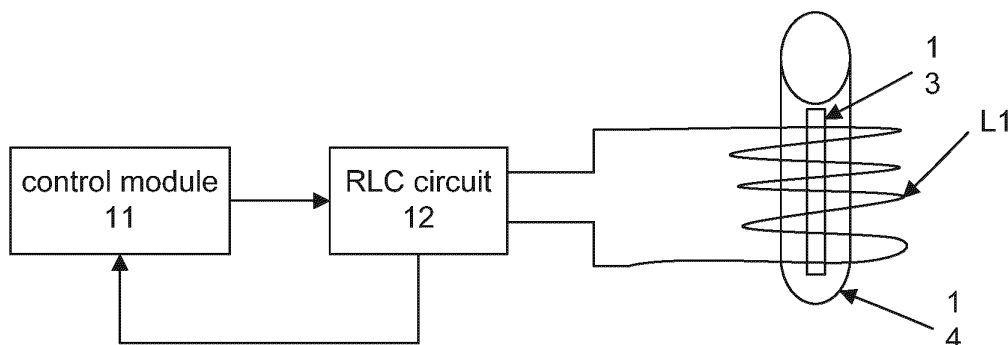


FIG1

Description

Technical Field

[0001] The invention relates to the field of atomizing equipment, in particular to a control device, a storage medium, a computer program product, an aerosol generating device and a control method therefor.

Description of Related Art

[0002] Aerosol generating device is a kind of device which can atomize aerosol generating substrate in atomizer. It has the advantages of safety, convenience, health, environmental protection and the like, so it is more and more concerned and favored by people.

[0003] In the existing aerosol generating device, a temperature sensor is usually used to detect the temperature of the aerosol generating substrate. However, due to the need to reserve space for the temperature sensor in the structure, there is a problem of limited structural design. Moreover, because the electrical separation from the heating element cannot be realized, there is also a problem of difficult cleaning caused by electrical connection.

BRIEF SUMMARY OF THE INVENTION

Technical issues

[0004] The technical problem to be solved by the invention is that the structure design of the aerosol generating device in the prior art is limited and the cleaning is difficult.

SOLUTIONS TO PROBLEMS

Technical solutions

[0005] The technical proposal adopted by the invention for solving the technical problem is that an aerosol generating device is constructed, which comprises a heating element, wherein the heating element is a heating element with magnetic temperature characteristics, and the aerosol generating device comprises:

[0006] An RLC circuit, comprising an induction coil, and at least a part of the induction coil is located within a magnetic field of the heating element;

[0007] A control module, which is configured for controlling the RLC circuit to generate alternating current on the induction coil to perform induction heating on the heating element, and determining the temperature of the heating element by detecting at least one specific parameter of the RLC circuit.

[0008] Preferably, the control module is also configured for determining whether a puff action occurs according to the temperature of the heating element.

[0009] Preferably, the control module is also configured for detecting the specific parameter of the RLC circuit

in a timed wake-up manner in a standby state, and realizing the insertion detection of the aerosol generating substrate according to the detected specific parameter of the RLC circuit; and also configured for detecting the specific parameter of the RLC circuit in working state, and realizing there move of the aerosol generating substrate according to the detected specific parameter of the RLC circuit.

[0010] Preferably, the control module is configured for controlling the RLC circuit to generate alternating current on the induction coil in a first time period to perform induction heating on the heating element; determining the temperature of the heating element by detecting a specific parameter of the RLC circuit in a second time period.

[0011] Preferably, the RLC circuit further comprises a first capacitor, a second capacitor, a first transistor and a second transistor, wherein, the second terminal of the first transistor is connected with the first terminal of the second transistor, the first terminal of the first transistor is connected with the output terminal of a battery, the second terminal of the second transistor is grounded, the control terminal of the first transistor is connected with the first output terminal of the control module, the control terminal of the second transistor is connected with the second output terminal of the control module, the first capacitor and the second capacitor are connected in series between the output terminal of the battery and ground, the first terminal of the induction coil is connected with the connection point of the first transistor and the second transistor, and the second terminal of the induction coil is connected with the connection point of the first capacitor and the second capacitor.

[0012] Preferably, the control module comprises:

A voltage detecting unit, which is configured for detecting the voltage of the second capacitor;

A first main control unit, which is configured for determining the temperature of the heating element according to the voltage of the second capacitor.

[0013] Preferably, the voltage detecting unit comprises a first diode and a third capacitor, wherein, the positive electrode of the first diode is connected with the connection point of the second capacitor and the first capacitor, the negative electrode of the first diode is connected with an input terminal of the first main control unit, and the third capacitor is connected between the negative electrode of the first diode and ground.

[0014] Preferably, the control module comprises:

A current detecting unit, which is configured for detecting the current of the induction coil;

A second main control unit, which is configured for determining the temperature of the heating element according to the current of the induction coil.

[0015] Preferably, the current detecting unit comprises a current transformer, a resistor, a second diode and a

fourth capacitor, wherein, one terminal of the primary winding of the current transformer is connected with the second terminal of the induction coil, the other terminal of the primary winding of the current transformer is connected with the connection point of the first capacitor and the second capacitor, one terminal of the secondary winding of the current transformer is respectively connected with the first terminal of the resistor and the anode of the second diode, the other terminal of the secondary winding of the current transformer and the second terminal of the resistor are respectively grounded, and the fourth capacitor is connected between the negative electrode of the second diode and ground.

[0016] The invention also constructs a control method of an aerosol generating device, which comprises the following steps:

Controlling an RLC circuit to generate alternating current on an induction coil to perform induction heating on a heating element, wherein, the RLC circuit comprises an induction coil, and at least a part of the induction coil is located in a magnetic field of the heating element;

Determining the temperature of the heating element by detecting at least one specific parameter of the RLC circuit.

[0017] Preferably, it also comprises:

Determining whether a puff action occurs according to the temperature of the heating element.

[0018] Preferably, it also comprises:

In a standby state, detecting the specific parameter of the RLC circuit in a timed wake-up manner, and determining the insertion and removal state of the aerosol generating substrate; And/or,

In working state, detecting the specific parameter of the RLC circuit, and realizing the remove of the aerosol generating substrate according to the detected specific parameter of the RLC circuit.

[0019] The invention also constructs a control device, which comprises a memorizer and a processor, wherein the memorizer stores a computer program, and when the processor executes the computer program, the steps of the control method of an aerosol generating device are realized.

[0020] The invention also constructs a storage medium, which stores computer instructions that, when run on a processor, the processor executes a control method of an aerosol generating device as described above.

[0021] The invention also constructs a computer program, when the computer program is run on a computer; the computer executes the control method of an aerosol generating device as described above.

BENEFICIAL EFFECTS OF INVENTION

Beneficial effect

[0022] According to the technical proposal of the invention, when a control module controls a RLC circuit to generate alternating current on an induction coil, a heating element conducts induction heating. At the same time, when the temperature of the heating element changes, because of its magnetic temperature characteristic, it will affect the apparent resistance and inductance of the induction coil, and then cause the specific parameter of the RLC circuit to change. Therefore, the temperature change of the heating element can be determined according to the specific parameter of the RLC circuit. This detection method solves the problem of limited structural design of aerosol generating device because it does not need to set any temperature sensor, and also solves the problem of difficult cleaning caused by electrical connection because the induction coil does not need to be electrically connected with the heating element.

BRIEF DESCRIPTION OF THE SEVERAL VIEWS OF THE DRAWINGS

Illustrated drawings

[0023] The invention will be further explained below with reference to the accompanying drawings and embodiments in which:

Fig. 1 is a logic structure diagram of an embodiment of an aerosol generating device according to the present invention;

Fig. 2 is a circuit diagram of a second embodiment of an aerosol generating device according to the present invention;

Fig. 3 is a graph of heating element temperature and capacitor voltage as a function of time in one embodiment of the present invention;

Fig. 4 is a graph of heating element temperature and capacitor voltage as a function of time in one embodiment of the present invention;

Fig. 5 is a circuit diagram of a third embodiment of an aerosol generating device of the present invention;

Fig. 6 is a flowchart of an embodiment of the control method of an aerosol generating device of the present invention.

DETAILED DESCRIPTION OF THE INVENTION

Embodiments of the invention

[0024] A clear and complete description of the technical aspects of the embodiments of the invention will be given below in conjunction with the accompanying draw-

ings in which the embodiments of the invention are described, and it will be apparent that the described embodiments are only part of the embodiments of the invention, not all of them. Based on the embodiments in the present invention, all other embodiments obtained by those of ordinary skill in the art without making creative efforts are within the scope of protection of the present invention.

[0025] Fig. 1 is a logic structure diagram of an embodiment of an aerosol generating device of the present invention, which comprises a control module 11, an RLC circuit 12 and a heating element 13, wherein the heating element 13 can be embedded in an aerosol generating substrate 14, and the heating element 13 is a heating element having magnetic temperature characteristics, i.e. a metal or alloy having a specific Curie temperature point, and its magnetic induction value decreases with an increase in temperature below a specific Curie temperature point (e.g. 420 ° C), and is almost linear. The material of the heating element 30 can be selected, for example, an Fe-Ni-Cr alloy. The RLC circuit 12 includes an induction coil (with internal resistance) L1, and at least a part of the induction coil L1 is located within a magnetic field of the heating element 13. The control module 11 is configured for controlling the RLC circuit 12 to generate alternating current on the induction coil L1 to perform induction heating on the heating element 13, and for determining the temperature of the heating element 13 by detecting at least one specific parameter of the RLC circuit 12, such as the voltage of the capacitor in the RLC circuit 12 and the current of the induction coil.

[0026] In this embodiment, when an alternating current is passed through the induction coil L1, the heating element 13 performs induction heating to atomize and heat the aerosol generating substrate 14. When the temperature of the heating element 13 is changed, the apparent resistance and the inductance of the induction coil L1 are affected because the heating element 13 has obvious magnetic temperature characteristics at a specific temperature (between 150 and 420 ° C). As for the RLC circuit in operation, changes in inductance and apparent resistance value cause changes in specific parameter of the RLC circuit 12, for example, the voltage of the capacitor in the RLC circuit 12 and the current of the induction coil. Therefore, the temperature change of the heating element 13 can be determined according to the changes in specific parameter of the RLC circuit 12. This detection method solves the problem of limited structural design of the aerosol generating device because no temperature sensor is required, and also solves the problem of cleaning difficulty caused by electrical connection because the induction coil L1 does not need to be electrically connected with the heating element 13.

[0027] Further, in an alternative embodiment, the control module 11 is also configured to determine whether or not a puff action has occurred based on the temperature of the heating element 13. In this embodiment, when there is a puff air flow in the aerosol generating substrate,

the heating element has obvious temperature change, so the detection of puff action can be realized through the determined temperature change, and then the number of puff actions can be measured.

[0028] Further, in an alternative embodiment, the control module 11 is further configured to detect at least one specific parameter of the RLC circuit 12 in a timed wake-up manner in a standby state, and to realize insertion detection of the aerosol generating substrate according to the detected specific parameter of the RLC circuit. In working state, at least one specific parameter of the RLC circuit 12 is detected, and remove of the aerosol generating substrate is realized according to the detected specific parameter of the RLC circuit. In this embodiment, in the aerosol generating device, the magnetic induction value of the heating element 30 is different in different cases where the aerosol generating substrate is inserted and the aerosol generating substrate is not inserted, so the insertion and remove of the aerosol generating substrate can be performed by detecting a specific parameter of the RLC circuit 12.

[0029] Further, in an alternative embodiment, the control module 11 is configured for controlling the RLC circuit 12 to generate an alternating current on the induction coil L1 to perform induction heating on the heating element 13 in a first time period of time; and determining the temperature of the heating element 13 in a second time period by detecting a specific parameter of the RLC circuit 12.

[0030] Fig. 2 is a circuit diagram of a second embodiment of an aerosol generating device of the present invention, the aerosol generating device of the embodiment comprising a control module, an RLC circuit, and a heating element (not shown), wherein:

The heating element is a heating element with magnetic temperature characteristics, and the RLC circuit comprises an induction coil L1, a first capacitor C1, a second capacitor C2, a first transistor Q1 and a second transistor Q2. At least a part of the induction coil L1 is located within a magnetic field of the heating element 13. The first transistor Q1 and the second transistor Q2 are both MOS tubes, the source of the first transistor Q1 is connected to the drain of the second transistor Q2, the drain of the first transistor Q1 is connected to the output terminal (BAT) of a battery, the source of the second transistor Q2 is grounded, the first capacitor C1 and the second capacitor C2 are connected in series between the output terminal (BAT) of the battery and ground, the first terminal of the induction coil L1 is connected to the connection point of the first transistor Q1 and the second transistor Q2, and the second terminal of the induction coil L1 is connected to the connection point of the first capacitor C1 and the second capacitor C2.

[0031] The control module comprises a voltage detecting unit and a first main control unit U1, wherein, the voltage detecting unit is configured for detecting the voltage of the second capacitor C2, and specifically comprises a first diode D1, a third capacitor C3 and a resistor

R1, wherein the positive electrode of the first diode D1 is connected with the connection point of the second capacitor C2 and the first capacitor C1, and the third capacitor C3 and the resistor R1 are connected between the negative electrode of the first diode D1 and ground. The input terminal of the first main control unit U1 is connected to the negative electrode of the first diode D1, the first output terminal of the first main control unit U1 is connected to the gate of the first transistor Q1, the second output terminal of the first main control unit U1 is connected to the gate of the second transistor Q2, and the first main control unit U1 is configured for determining the temperature of the heating element according to the voltage of the second capacitor C2.

[0032] In this embodiment, when the heating element needs to be heated, the first main control unit U1 controls the first transistor Q1 and the second transistor Q2 to conduct alternately through the first output terminal and the second output terminal of the first main control unit U1, so that alternating current is generated on the induction coil L1, and the heating element starts to induce heating. The heating power is related to the conduction frequency of the two transistors and the control time. When it is necessary to measure the temperature of the heating element, the first main control unit U1 controls the first transistor Q1 and the second transistor Q2 to conduct alternately through its first output terminal and its second output terminal, and the RLC circuit starts to work. Because the temperature change of the heating element will affect the apparent resistance and inductance of the induction coil L1, and then affect the voltage on the second capacitor C2, the first control unit U1 detects the change of the peak voltage at both terminals of the second capacitor C2 through the first diode D1, and can effectively feedback the change of the temperature of the heating element, as shown in Fig. 3.

[0033] With respect to this embodiment, it should also be noted that the heating and temperature measurement of the heating element can be carried out in the same time period or can be carried out in two separate time periods. Moreover, if it is carried out in the same time period, the two output terminals of the first main control unit can output control signals with specific frequencies in this time period. If it is carried out in different time periods, in a first time period, the two output terminals of the first main control unit can output a control signal with a specific frequency, and in a second time period, another control signal with a specific frequency can be output. In addition, the frequency of the outputted control signal may vary in the same time period.

[0034] In one embodiment, in order to avoid the influence of battery charge, after detecting the peak voltage at both terminals of the second capacitor C2, the first control unit also calculates the ratio between the peak voltage and the output voltage of the battery (i.e., the power supply voltage of the RLC circuit), and feeds back the change of the temperature of the heating element according to the change of the ratio, so as to avoid the

inaccurate temperature detection caused by the low battery charge.

[0035] In a specific embodiment, the first main control unit U1 also determines whether a puff action occurs according to the detected temperature change of the heating element. Specifically, in combination with Figure 4, when there is a puff air flow in the aerosol generating substrate, the heating element will have obvious temperature change. After detecting the voltage at both terminals of the second capacitor, the first main control unit U1 detects whether the puff action V occurs by judging whether the ratio of the voltage to the output voltage of the battery has obvious jump, and then measures the number of puff actions.

[0036] In a specific embodiment, the first main control unit U1 detects voltages at both terminals of the second capacitor C2 in a standby state through a timing wake-up manner, then compares the detected voltages with a first preset value, and realizes insertion detection of an aerosol generating substrate according to the difference between the two; In working state, the voltage at both terminals of the second capacitor C2 is detected, and then the detected voltage is compared with a second preset value, and the remove of the aerosol generating substrate is realized according to the difference between the two values. In addition, it is preferable that the frequency of the control signal output by the first main control unit U1 is lower than the resonant frequency of the RLC circuit at the time of insertion and remove.

[0037] Fig. 5 is a circuit diagram of a third embodiment of an aerosol generating device of the present invention, which includes a control module, an RLC circuit, and a heating element (not shown), and the following is only different from the embodiment shown in Fig. 2:

[0038] The control module comprises a current detecting unit and a second main control unit U2, wherein, the current detecting unit is configured for detecting the current of the induction coil L1, and specifically comprises a current transformer IL1, a resistor R2, a second diode D2, a fourth capacitor C4 and a resistor R3, wherein one terminal of the primary winding of the current transformer IL1 is connected with the second terminal of the induction coil L1, the other terminal of the primary winding of the current transformer IL1 is connected with the connection point of the first capacitor C1 and the second capacitor C2, one terminal of the secondary winding of the current transformer IL1 is connected with the first terminal of the resistor R2 and the anode of the second diode D2 respectively, the other terminal of the secondary winding of the current transformer IL1 and the second terminal of the resistor are respectively grounded, and the fourth capacitor C4 and the resistor R3 are respectively connected between the negative electrode of the second diode D2 and the ground. The input terminal of the second main control unit U2 is connected to the negative electrode of the second diode D2, the first output terminal of the second main control unit U2 is connected to the gate of the first transistor Q1, the second output terminal of

the second main control unit U2 is connected to the gate of the second transistor Q2, and the second main control unit U2 is configured for determining the temperature of the heating element according to the current of the induction coil L 1.

[0039] In this embodiment, the heating control process of the second main control unit U2 is the same as that of the embodiment shown in Fig. 2 and will not be described here. When temperature measurement of the heating element is needed, the second main control unit U2 controls the first transistor Q1 and the second transistor Q2 to conduct alternately through its first output terminal and the second output terminal, and the RLC circuit starts to work. Since the temperature change of the heating element will affect the apparent resistance value and inductance of the induction coil L1, and then affect the current on the induction coil L1, the current transformer IL1 detects the current on the induction coil L1, converts it into voltage through the resistor R2, and then sends it to the input terminal of the second control unit U2 through the second diode D2, so that the second control unit U2 can effectively feedback the temperature change of the heating element according to the change of the input signal of the input terminal.

[0040] Fig. 6 is a flowchart of an embodiment of a control method for an aerosol generating device of the present invention. The control method of this embodiment comprises:

Step S10. controlling the RLC circuit to generate alternating current on the induction coil to perform induction heating on the heating element, wherein, combining with Fig. 1, the RLC circuit comprises an induction coil, and at least a part of the induction coil is located in the magnetic field of the heating element;

Step S20. determining the temperature of the heating element by detecting at least one specific parameter of the RLC circuit, such as the current of the induction coil in the RLC circuit, and the voltage of the capacitor in the RLC circuit.

[0041] Further, the control method of the invention further comprises:

Determining whether a puff action occurs according to the temperature of the heating element.

[0042] Further, the control method of the invention further comprises:

In a standby state, detecting at least one specific parameter of the RLC circuit in a timed wake-up manner, and determining the insertion and removal state of the aerosol generating substrate; and/or,
In working state, detecting at least one specific parameter of the RLC circuit, and realizing remove of the aerosol generating substrate according to the detected specific parameter.

[0043] The invention also constructs a control device, which comprises a memorizer and a processor, wherein the memorizer stores a computer program, and when the processor executes the computer program, the steps of the control method of an aerosol generating device are realized.

[0044] The invention also constructs a storage medium storing computer instructions, when run on a processor; the processor executes a control method of an aerosol generating device as described above.

[0045] The invention also constructs a computer program, when the computer program is run on a computer; the computer executes the control method of an aerosol generating device as described above.

[0046] The foregoing is merely a preferred embodiment of the invention and is not intended to limit the invention which may be subject to various modifications and variations to those skilled in the art. Any modifications, equivalents, modifications, etc. made within the spirit and principles of the present invention shall be included within the scope of the claims of the present invention.

Claims

1. An aerosol generating device comprises a heating element with magnetic temperature characteristics, wherein the aerosol generating device comprises:

a RLC circuit, comprising an induction coil, and at least a part of induction coil is located within the magnetic field of the heating element;
a control module, configured for controlling the RLC circuit to generate alternating current on the induction coil to perform induction heating on the heating element, and determining the temperature of the heating element by detecting at least one specific parameter of the RLC circuit.

2. The aerosol generating device according to claim 1, wherein,
the control module is configured for determining whether a puff action occurs according to the temperature of the heating element.

3. The aerosol generating device according to claim 1, wherein,
the control module is configured for detecting the specific parameter of the RLC circuit in a timed wake-up manner in a standby state, and detecting the insertion of a aerosol generating substrate according to the detected specific parameter of the RLC circuit; and configured for detecting the specific parameter of the RLC circuit in working state, and detecting the remove of the aerosol generating substrate according to the detected specific parameter of the RLC

circuit.

4. The aerosol generating device according to claim 1, wherein,
the control module is configured for controlling the RLC circuit to generate alternating current on the induction coil in a first time period to perform induction heating on the heating element; determining the temperature of the heating element by detecting the specific parameter of the RLC circuit in a second time period.
5. The aerosol generating device according to any one of claims 1-4, wherein the RLC circuit further comprises a first capacitor, a second capacitor, a first transistor and a second transistor, wherein, the second terminal of the first transistor is connected with the first terminal of the second transistor, the first terminal of the first transistor is connected with the output terminal of a battery, the second terminal of the second transistor is grounded, the control terminal of the first transistor is connected with the first output terminal of the control module, the control terminal of the second transistor is connected with the second output terminal of the control module, the first capacitor and the second capacitor are connected in series between the output terminal of the battery and ground, the first terminal of the induction coil is connected with the connection point of the first transistor and the second transistor, and the second terminal of the induction coil is connected with the connection point of the first capacitor and the second capacitor.
6. The aerosol generating device according to claim 5, wherein the control module comprises:

a voltage detecting unit, configured for detecting the voltage of the second capacitor;
a first main control unit configured for determining the temperature of the heating element according to the voltage of the second capacitor.
7. The aerosol generating device according to claim 6, wherein, the voltage detecting unit comprises a first diode and a third capacitor, wherein the positive electrode of the first diode is connected to a connection point between the second capacitor and the first capacitor, the negative electrode of the first diode is connected to an input terminal of the first main control unit, and the third capacitor is connected between the negative electrode of the first diode and ground.
8. The aerosol generating device according to claim 5, wherein the control module comprises:

a current detecting unit, configured for detecting the current of the induction coil;

a second main control unit, configured for determining the temperature of the heating element according to the current of the induction coil.

9. The aerosol generating device according to claim 8, wherein the current detecting unit comprises a current transformer, a resistor, a second diode and a fourth capacitor, wherein one terminal of the primary winding of the current transformer is connected to the second terminal of the induction coil, the other terminal of the primary winding of the current transformer is connected to a connection point between the first capacitor and the second capacitor, one terminal of the secondary winding of the current transformer is connected to the first terminal of the resistor and the anode of the second diode respectively, the other terminal of the secondary winding of the current transformer and the second terminal of the resistor are grounded respectively, and the fourth capacitor is connected between the negative electrode of the second diode and ground.
10. A control method of an aerosol generating device, which comprises:

controlling an RLC circuit to generate alternating current on an induction coil to perform induction heating on a heating element, wherein, the RLC circuit comprises an induction coil, and at least a part of the induction coil is located in the magnetic field of the heating element,
determining the temperature of the heating element by detecting at least one specific parameter of the RLC circuit.
11. The control method of an aerosol generating device according to claim 10, further comprising:
determining whether a puff action occurs according to the temperature of the heating element.
12. The control method of an aerosol generating device according to claim 10, further comprising:

in a standby state, detecting the specific parameter of the RLC circuit in a timed wake-up manner, and determining the insertion and removal state of the aerosol generating substrate;
and/or,
in working state, detecting the specific parameter of the RLC circuit, and realizing the remove of the aerosol generating substrate according to the detected specific parameter of the RLC circuit.
13. A control device comprising a memorizer and a processor, the memorizer having a computer program stored therein, wherein, the processor performs the steps of the control method of an aerosol generating

device according to any one of claims 10 to 12 when executing the computer program.

14. A storage medium, wherein, the storage medium stores computer instructions that, when run on a processor, the processor executes the control method of an aerosol generating device according to any one of claims 10 to 12. 5
15. A computer program, wherein, when the computer program is run on a computer, the computer performs the control method of an aerosol generating device according to any one of claims 10 to 12. 10

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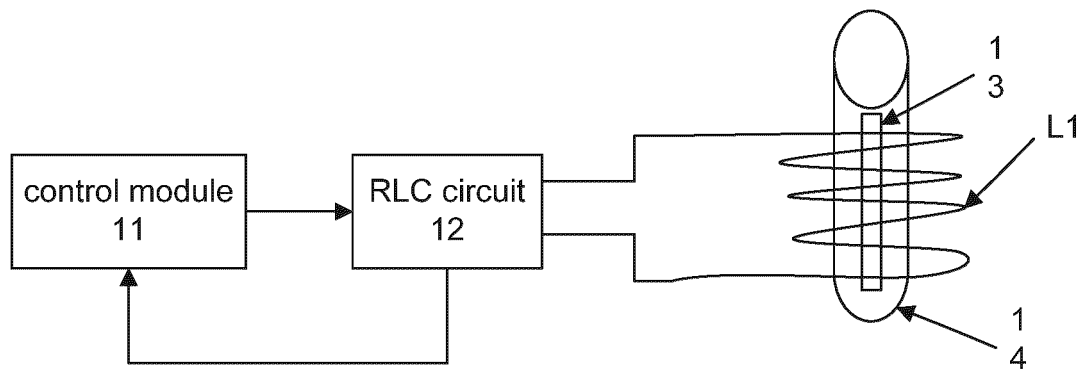


FIG1

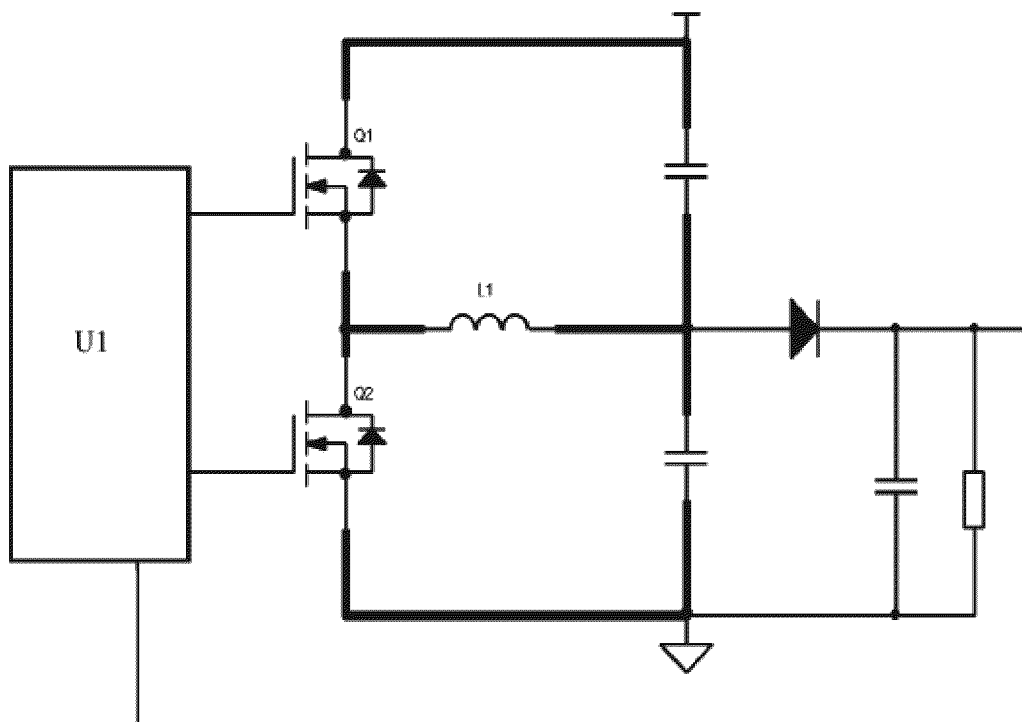


FIG2

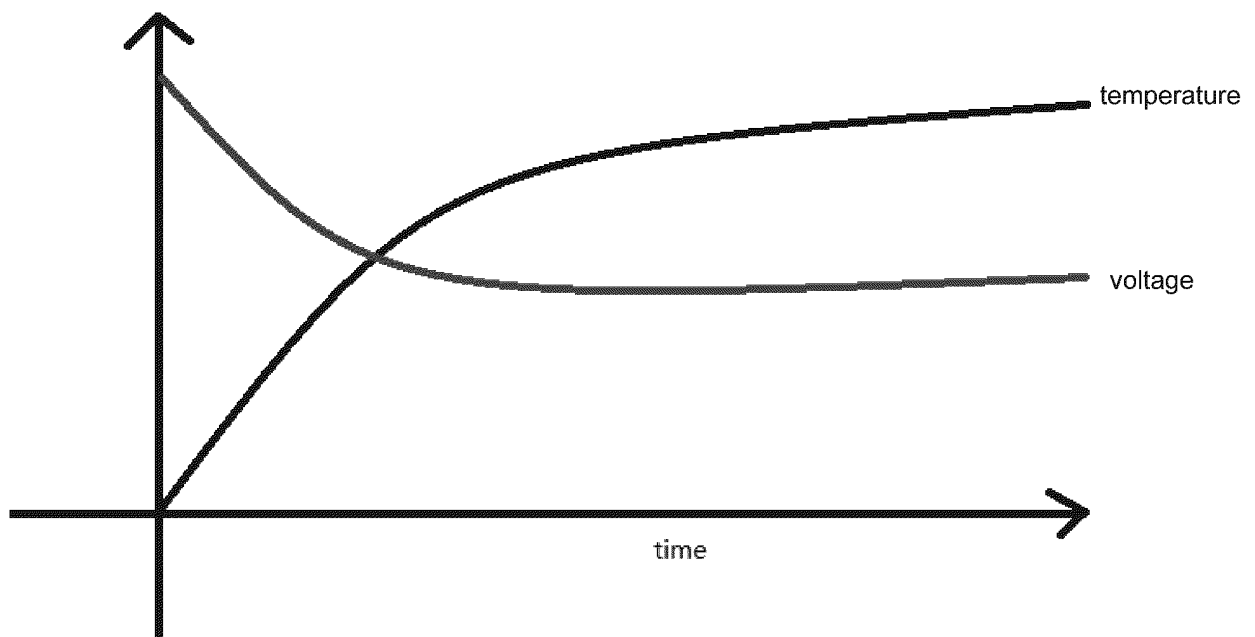


FIG3

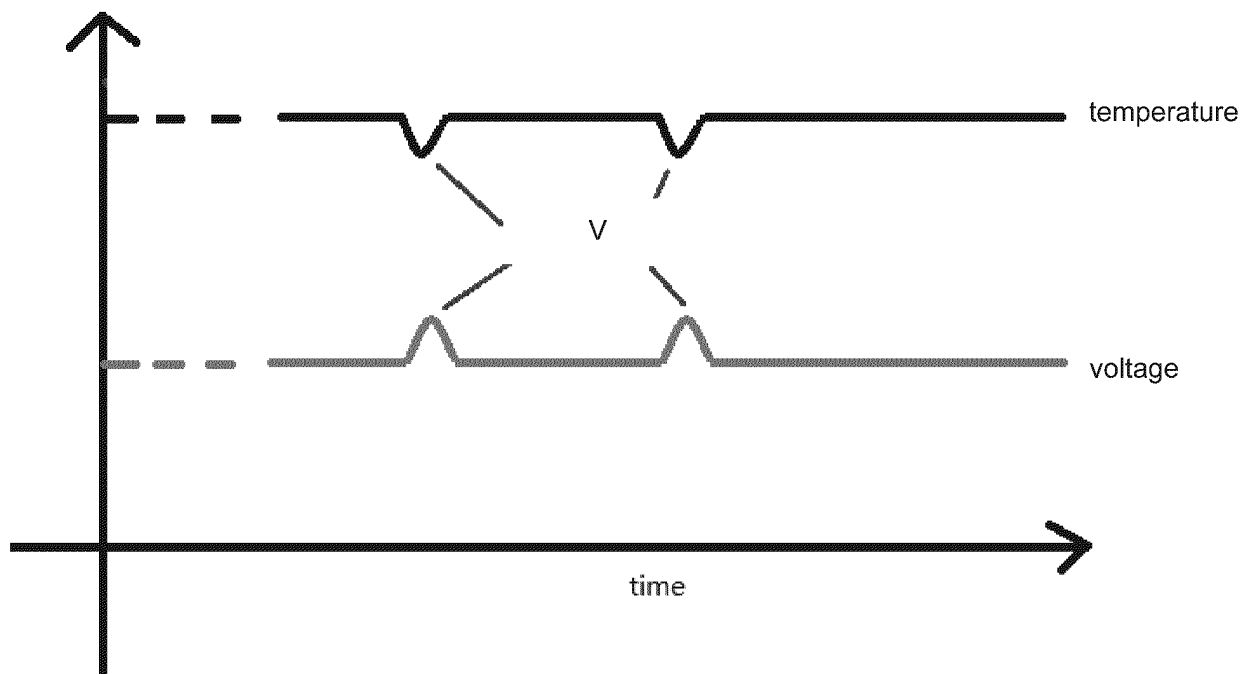


FIG4

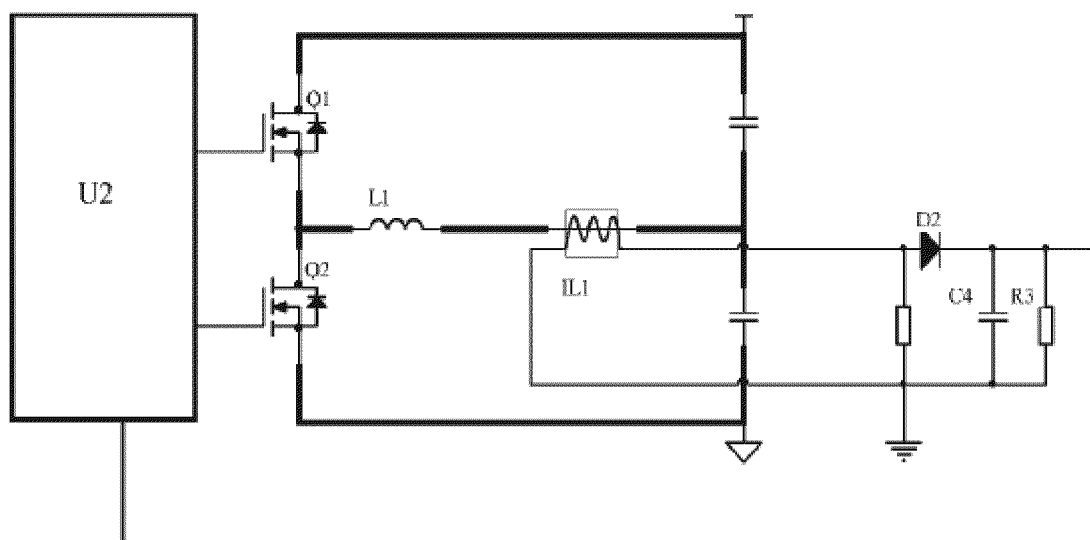


FIG5

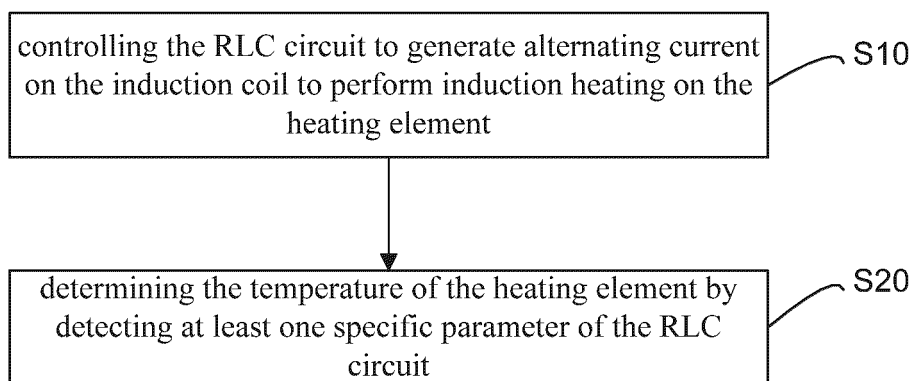


FIG6

INTERNATIONAL SEARCH REPORT

International application No.

PCT/CN2022/112218

A. CLASSIFICATION OF SUBJECT MATTER A24F 40/46(2020.01)i 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) 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) CNPAT, EPODOC, WPI, CNKI: 深圳麦时科技有限公司, 气溶胶, 电子烟, 发热体, 磁温, 磁导率, 增大, 变化, 加热, RLC, LC, 线圈, 电容, 电压, 温度传感器, aerosol generating, temperature, heat+, induction coil, magnetic permeability, electrical parameter																		
C. DOCUMENTS CONSIDERED TO BE RELEVANT																		
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☒ Further documents are listed in the continuation of Box C. ☒ See patent family annex.																		
<table border="0"> <tr> <td style="vertical-align: top;"> * Special categories of cited documents: “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 “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) “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 </td> <td style="vertical-align: top;"> “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 “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 “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 “&” document member of the same patent family </td> </tr> </table>	* Special categories of cited documents: “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 “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) “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	“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 “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 “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 “&” document member of the same patent family																
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<table border="1"> <tr> <td> Name and mailing address of the ISA/CN China National Intellectual Property Administration (ISA/CN) No. 6, Xitucheng Road, Jimenqiao, Haidian District, Beijing 100088, China Facsimile No. (86-10)62019451 </td> <td> Authorized officer Telephone No. </td> </tr> </table>	Name and mailing address of the ISA/CN China National Intellectual Property Administration (ISA/CN) No. 6, Xitucheng Road, Jimenqiao, Haidian District, Beijing 100088, China Facsimile No. (86-10)62019451	Authorized officer Telephone No.																
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INTERNATIONAL SEARCH REPORT

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C. DOCUMENTS CONSIDERED TO BE RELEVANT		
Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	WO 2004077000 A1 (WALTER HUBERT, E.) 10 September 2004 (2004-09-10) entire document	1-15
A	WO 2017085242 A1 (PHILIP MORRIS PRODUCTS S.A.) 26 May 2017 (2017-05-26) entire document	1-15

INTERNATIONAL SEARCH REPORT
Information on patent family members

International application No.

PCT/CN2022/112218

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CN	113925223	A	14 January 2022	None			
CN	112702929	A	23 April 2021	KR	20210044877	A	23 April 2021
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