



(11) **EP 4 397 197 A1**

(12) **EUROPEAN PATENT APPLICATION**
published in accordance with Art. 153(4) EPC

(43) Date of publication:
10.07.2024 Bulletin 2024/28

(21) Application number: **22863081.0**

(22) Date of filing: **11.08.2022**

(51) International Patent Classification (IPC):
A24F 40/40 ^(2020.01) **A24F 40/46** ^(2020.01)
A24F 40/50 ^(2020.01) **A24F 47/00** ^(2020.01)
A24F 40/57 ^(2020.01)

(86) International application number:
PCT/CN2022/111914

(87) International publication number:
WO 2023/029941 (09.03.2023 Gazette 2023/10)

(84) Designated Contracting States:
AL AT BE BG CH CY CZ DE DK EE ES FI FR GB GR HR HU IE IS IT LI LT LU LV MC MK MT NL NO PL PT RO RS SE SI SK SM TR
Designated Extension States:
BA ME
Designated Validation States:
KH MA MD TN

(30) Priority: **31.08.2021 CN 202111012948**

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(54) **HEATING ASSEMBLY, ELECTRONIC ATOMIZATION DEVICE, AND CONTROL METHOD FOR HEATING ASSEMBLY**

(57) The present application provides a heating assembly, an electronic atomization device, and a control method for a heating assembly. The heating assembly comprises a heating element and a control unit. The control unit detects a first resistance value of the heating element at a current time point in a heating stage, and determines, according to a preset temperature-time curve of the heating element in the heating stage, a target resistance value corresponding to a target temperature at the current time point; in response to the first resistance value being greater than the target resistance value, the control unit turns off, in a first time period, a pathway

between a battery assembly connected to the heating assembly and the heating element, so that the heating element stops being heated in the first time period; and in response to the first resistance value not being greater than the target resistance value, the control unit turns on, in a second time period, the pathway between the battery assembly and the heating element, so that the heating element is driven for heating in the second time period. By controlling a heating time, the temperature of the heating element is maintained at the target temperature, thereby ensuring an atomization effect.

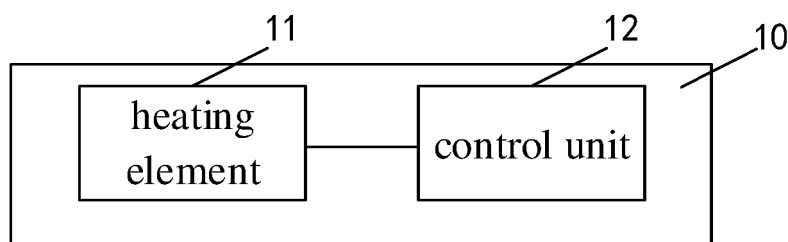


FIG. 1

Description

CROSS REFERENCE TO RELATED APPLICATIONS

[0001] The present disclosure claims priority to Chinese Patent Application 202111012948.5, filed August 31, 2021, the entire content of which is incorporated herein by reference.

TECHNICAL FIELD

[0002] The present disclosure relates to the field of electronic aerosol forming devices, in particular to a heating assembly, an electronic aerosol forming device, and a control method for heating assembly.

BACKGROUND

[0003] The electronic aerosol forming device is used to heat a substrate configured to generate aerosol. The electronic aerosol forming device may be used in different fields, for example, the electronic aerosol forming device may bake a solid substrate of plant leaves with a specific aroma by a heating not burning mode, in this way, the solid substrate of leaves may be baked to form aerosols. Furthermore, ingredients such as flavors and fragrances may be added to the plant leaves, and may be baked and mixed in the aerosols, to make the aerosols to have the desired aroma.

[0004] The related electronic aerosol forming device usually includes a battery assembly and a heating assembly. The heating assembly is used for receiving the substrate configured to generate aerosol and the heating element. The battery assembly controls the power supply of the heating element, in this way, the heating element may heat the substrate configured to generate aerosol.

[0005] However, in the process of heating for generating aerosol of the related electronic aerosol forming device, if the temperature of the heating element is too high, the generated aerosol may have a burning smell; if the temperature of the heating element is too low, the substrate configured to generate aerosol may not be heated sufficiently, thereby resulting in poor aerosol forming effect.

SUMMARY

[0006] The present disclosure provides a heating assembly, an electronic aerosol forming device, and a control method for heating assembly, which may effectively control the temperature of the heating element and ensure the aerosol forming effect.

[0007] To solve the aforesaid technical problem, some embodiments of the present disclosure provide a heating assembly. The heating assembly includes: a heating element; a control unit, configured to detect a first resistance value of the heating element at the current time point in the heating phase, and determine a target resist-

ance value corresponding to a target temperature at the current time point. The control unit is configured to turn off the path between a battery assembly connected to the heating assembly and the heating element in a first time period in response to the first resistance value being greater than the target resistance value, and the heating element is controlled to stop work in the first time period. The control unit is configured to turn on the path between the battery assembly and the heating element in a second time period in response to the first resistance value being not greater than the target resistance value, and the heating element is driven to work and generate heat in the second time period.

[0008] In some embodiments, the duration of the first time period is equal to or unequal to the duration of the second time period.

[0009] In some embodiments, the heating phase includes a plurality of heating periods and a plurality of stop periods, each of the heating periods includes at least one first time period, each of the stop periods includes at least one second time period, the duration of each of the at least one first time period is equal to the duration of another of the at least one first time period, and the duration of each of the at least one second time period is equal to the duration of another of the at least one second time period.

[0010] In some embodiments, the numbers of the at least one first time period in any two of the heating periods are equal or unequal to each other, and the numbers of the at least one second time period in any two of the stop periods are equal or unequal to each other.

[0011] In some embodiments, the heating assembly including: a switch unit, arranged on the path between the heating element and the battery assembly. The control unit is connected to the switch unit, the control unit is configured to control the switch unit to be turned off in the first time period and turn off the path between the battery assembly and the heating element, or configured to control the switch unit to be turned on in the second time period and turn on the path between the battery assembly and the heating element.

[0012] In some embodiments, the heating element includes a heating unit and a temperature-measuring unit, the heating unit is connected to the battery assembly through the switch unit, the temperature-measuring unit is in parallel connection with the heating unit and is connected to the control unit, and the control unit is configured to detect the first resistance value of the heating element through the temperature-measuring unit. The heating assembly includes a sampling unit, the sampling unit is in series connection with the temperature-measuring unit, the sampling unit is connected to the control unit, the control unit is configured to detect the current flowing through the sampling unit and the temperature-measuring unit through the sampling unit, and determine the resistance value of the temperature-measuring unit, and the resistance value of the temperature-measuring unit represents the first resistance value of the heating

element.

[0013] In some embodiments, the target temperature of the heating element at the current time point is determined based on a preset temperature-time curve of the heating element in the heating phase, and the target resistance value corresponding to the target temperature is determined based on a preset temperature-resistance relationship table.

[0014] To solve the aforesaid technical problem, some embodiments of the present disclosure provide a control method for a heating assembly. The method includes: detecting a first resistance value of a heating element at the current time point in the heating phase, and determining a target resistance value corresponding to a target temperature at the current time point; stopping heating the heating element in a first time period in response to the first resistance value being greater than the target resistance value; and heating the heating element in a second time period in response to the first resistance value being not greater than the target resistance value.

[0015] In some embodiments, the duration of the first time period is equal to or unequal to the duration of the second time period.

[0016] In some embodiments, the heating phase includes a plurality of heating periods and a plurality of stop periods, each of the heating periods includes at least one first time period, each of the stop periods includes at least one second time period, the duration of each of the at least one first time period is equal to the duration of another of the at least one first time period, the duration of each of the at least one second time period is equal to the duration of another of the at least one second time period, the numbers of the at least one first time period in any two of the heating periods are equal or unequal to each other, and the numbers of the at least one second time period in any two of the stop periods are equal or unequal to each other.

[0017] To solve the aforesaid technical problem, some embodiments of the present disclosure provide an electronic aerosol forming device. The electronic aerosol forming device includes: a battery assembly; and a heating assembly. The battery assembly is configured to power the heating assembly, and the heating assembly is the aforesaid heating assembly.

[0018] The beneficial effects of the present disclosure are as follows. Differ from the related technology, some embodiments of the present disclosure provide a heating assembly. The heating assembly includes: a heating element; a control unit, configured to detect a first resistance value of the heating element at the current time point in the heating phase, and determine a target resistance value corresponding to a target temperature at the current time point. The control unit is configured to turn off the path between a battery assembly connected to the heating assembly and the heating element in a first time period in response to the first resistance value being greater than the target resistance value, and the heating element is controlled to stop work in the first time period.

The control unit is configured to turn on the path between the battery assembly and the heating element in a second time period in response to the first resistance value being not greater than the target resistance value, and the heating element is driven to work and generate heat in the second time period. By controlling the heating duration, the temperature of the heating element may be effectively controlled, and the aerosol forming effect may be ensured.

BRIEF DESCRIPTION OF THE DRAWINGS

[0019] To describe the technical solutions in embodiments of the present disclosure or the related art more clearly, the following briefly describes the accompanying drawings required for describing the embodiments or the related art. Apparently, the accompanying drawings in the following description show only some embodiments of the present disclosure, and a person of ordinary skill in the art may still derive other accompanying drawings from the accompanying drawings without creative efforts.

FIG. 1 is a schematic functional module diagram of a heating assembly provided by some embodiments of the present disclosure.

FIG. 2 is a timing diagram of a switch unit provided by some embodiments of the present disclosure.

FIG. 3 is a schematic circuit diagram of a heating assembly provided by some embodiments of the present disclosure.

FIG. 4 is a logic diagram of a control method of a control unit provided by some embodiments of the present disclosure.

FIG. 5 is a schematic flow chart of a control method for a heating assembly provided by some embodiments of the present disclosure.

FIG. 6 is a schematic structural diagram of an electronic aerosol forming device provided by some embodiments of the present disclosure.

DETAILED DESCRIPTIONS

[0020] The technical solutions in the embodiments of the present disclosure are clearly and completely described below with reference to the accompanying drawings in the embodiments of the present disclosure. Apparently, the described embodiments are merely some rather than all of the embodiments of the present disclosure. All other embodiments obtained by a person of ordinary skill in the art based on the embodiments of the present disclosure without creative efforts shall fall within the protection scope of the present disclosure.

[0021] As shown in FIG. 1, FIG. 1 is a schematic functional module diagram of a heating assembly provided by some embodiments of the present disclosure. The heating assembly 10 includes a heating element 11 and a control unit 12. The control unit 12 is configured to control the heating element 11 to work, so as to heat the

substrate configured to generate aerosol.

[0022] The control unit 12 is configured to detect a first resistance value R_x of the heating element 11 at the current time point in the heating phase and determine a target resistance value R_t corresponding to a target temperature at the current time point. The heating duration for the heating element 11 may be controlled based on the relationship between the first resistance value R_x and the target resistance value R_t . It may be understood that, in practical applications, the greater the resistance, the higher the temperature. Therefore, when the first resistance value R_x is greater than the target resistance value R_t , it may be determined that the temperature corresponding to the first resistance value R_x is greater than the temperature corresponding to the target resistance value R_t .

[0023] In some embodiments, in combination with FIG. 2, the path between the battery assembly 20 and the heating element 11 is turned on or turned off by using a PWM signal in a T_0 time period, to heat the heating element 11. For example, the first resistance value R_x corresponding to a time period T_1 may be detected in the time period T_1 . When the first resistance value R_x is not greater than (that is, less than or equal to) the target resistance value R_t , that is, when the current temperature is less than the target temperature, the control unit 12 is configured to turn on the path between the battery assembly 20 and the heating element 11 in a second time period T_2 . The heating element 11 is driven to work and generate heat in the second time period T_2 , thereby increasing the temperature of the heating element 11. In some embodiments, the duration of T_2 is greater than the duration of T_0 .

[0024] The first resistance value R_x corresponding to a time period T_3 is detected in the time period T_3 . When the first resistance value R_x is greater than the target resistance value R_t , the temperature is too high at this time. The control unit 12 is configured to turn off the path between the battery assembly 20 connected to the heating assembly 10 and the heating element 11 in a first time period T_4 , and the heating element 11 is controlled to stop work in the first time period T_4 , thereby decreasing the temperature of the heating element 11. In some embodiments, the duration of T_4 is greater than the duration of T_1 .

[0025] The temperature corresponding to the first resistance value R_x is the current temperature. The temperature corresponding to the target resistance value R_t is the current target temperature. That is, when the current temperature is greater than the current target temperature, the current temperature of the heating element 11 is needed to be decreased. At this time, the electrical connection between the battery assembly 20 and the heating element 11 is needed to be turned off in the first time period T_4 , in this way, the heating element 11 is controlled to stop work, and the temperature of the heating element 11 is gradually decreased to the target temperature. When the current temperature is not greater

than the current target temperature, the current temperature of the heating element 11 is needed to be increased in the second time period T_2 . At this time, the electrical connection between the battery assembly 20 and the heating element 11 is needed to be turned on, in this way, the heating element 11 is driven to work and generate heat and the temperature of the heating element 11 is gradually increased to the target temperature. The electric connection between the heating element 11 and the battery assembly 20 is controlled by the control unit 12, in this way, the temperature of the heating element 11 may be effectively controlled, and the aerosol forming effect may be ensured.

[0026] In some embodiments, a temperature-resistance relationship table and a temperature-time curve may be prestored in advance. When the first resistance value R_x corresponding to the current time point is detected, the current temperature corresponding to the first resistance value R_x may be determined based on the temperature-resistance relationship table. Furthermore, the target temperature corresponding to the current time point may be obtained based on the temperature-time curve and the current time point. The target resistance value R_t corresponding to the target temperature may be determined from the temperature-resistance relationship table based on the target temperature.

[0027] When the control unit 12 detects that the first resistance value R_x of the heating element 11 at the current time point is greater than the target resistance value R_t at the current time point, the temperature of the heating element 11 is needed to be decreased in the first time period T_4 . When the control unit 12 detects that the first resistance value R_x of the heating element 11 at the current time point is not greater than the target resistance value R_t at the current time point, the temperature of the heating element 11 is needed to be increased in the second time period T_2 . By controlling the duration of the first time period T_4 and the duration of the second time period T_2 , it may be ensured that the heating element 11 is substantially within the fluctuation range of the target temperature, and is infinitely close to the target temperature, and the aerosol forming effect of the heating element 11 may be ensured. The duration of the first time period T_4 and the duration of the second time period T_2 may be equal or unequal to each other, as long as the temperature of the heating element 11 is kept close to the target temperature.

[0028] In some embodiments, as shown in FIG. 2, the heating phase includes a plurality of heating periods and a plurality of stop periods. Each of the heating periods includes at least one first time period T_4 , and each of the stop periods includes at least one second time period T_2 . In some embodiments, the duration of each of the at least one first time period T_4 is equal to the duration of another of the at least one first time period T_4 , the duration of each of the at least one second time period T_2 is equal to the duration of another of the at least one second time period T_2 , and the duration of the first time period T_4 is

equal to the duration of the second time period T2.

[0029] In some embodiments, as shown in FIG. 3, which is a timing diagram of a switch unit provided by some embodiments of the present disclosure, the heating phase includes a plurality of heating periods and a plurality of stop periods. Each of the heating periods includes at least one first time period T4, and each of the stop periods includes at least one second time period T2. In some embodiments, the duration of each of the at least one first time period T4 is equal to the duration of another of the at least one first time period T4, the duration of each of the at least one second time period T2 is equal to the duration of another of the at least one second time period T2, and the duration of the first time period T4 is unequal to the duration of the second time period T2.

[0030] In some embodiments, the number of the at least one first time period in any two of the heating periods may be equal or unequal to each other. The number of the at least one second time period in any two of the stop periods may be equal or unequal to each other. When the first resistance value Rx is greater than the target resistance value Rt, the heating element 11 is in the heating period. When the control unit 12 detects that the first resistance value Rx of the heating element 11 is greater than the target resistance value Rt for several consecutive times, the heating period includes a plurality of first time periods T4. When the first resistance value Rx is not greater than the target resistance value Rt, the heating element 11 is in the stop period. When the control unit 12 detects that the first resistance value Rx of the heating element 11 is not greater than the target resistance value Rt for several consecutive times, the stop period includes a plurality of second time periods T2. Each of the heating periods includes at least one first time period T4, and each of the stop periods includes at least one second time period T2. The number of the at least one first time period T4 included in each of the heating periods and the number of the at least one second time period T2 included in each of the stop periods may be determined based on the ratio of the first resistance value Rx and the target resistance value Rt of the heating element 11 at the current time point. That is, the numbers of the at least one first time period in any two of the heating periods may be equal or unequal to each other, and the numbers of the at least one second time period in any two of the stop periods may be equal or unequal to each other.

[0031] In some embodiments, as shown in FIG. 3, which is a schematic circuit diagram of a heating assembly provided by some embodiments of the present disclosure, the heating assembly 10 includes a switch unit 121. The switch unit 121 is arranged on the path between the heating element 11 and the battery assembly 20. The control unit 12 is connected to the switch unit 121 and is configured to control the switch unit 121 to be turned on or turned off, in this way, the path between the battery assembly 20 and the heating element 11 may be turned off in the first time period T4, or the path between the

battery assembly 20 and the heating element 11 may be turned on in the second time period T2. Therefore, by controlling the switch unit 121 to be turned on or turned off through the control element, it may be ensured that the temperature of the heating element 11 is close to the target temperature in the heating phase, and the aerosol forming effect may be ensured.

[0032] In some embodiments, the heating element 11 includes a heating unit R1 and a temperature-measuring unit R2. The heating unit R1 is connected to the battery assembly 20 through the switch unit 121. When the switch unit 121 is in a turn-on state, the battery assembly 20 powers the heating unit R1, and the heating unit R1 works to heat the substrate configured to generate aerosol. The temperature-measuring unit R2 is in parallel connection with the heating unit R1 and is connected to the control unit 12, and the control unit 12 may be configured to detect the first resistance value Rx of the heating unit R1 through the temperature-measuring unit R2.

[0033] In some embodiments, the heating assembly 10 includes a sampling unit R3. The sampling unit R3 is in series connection with the temperature-measuring unit R2, and the sampling unit R3 is connected to the control unit 12. The control unit 12 may be configured to detect the current flowing through the sampling unit R3 and the temperature-measuring unit R2 through the sampling unit R3, and then determine a resistance value of the temperature-measuring unit R2. Herein, the resistance value of the temperature-measuring unit R2 represents the first resistance value Rx of the heating element 11. It may be understood that, the current actual resistance value of the temperature-measuring unit R2 is the current actual resistance value of the heating element 11. In some embodiments, the control unit 12 may detect a current I3 flowing through the sampling unit R3, the resistance of the sampling unit R3 is already known, and the voltage V1 of the sampling unit R3 may be calculated. Based on the voltage division principle of a series circuit, the voltage V2 of the temperature-measuring unit R2 may be obtained by subtracting the voltage V1 of the sampling unit R3 from the voltage of the battery assembly 20, and then the resistance value of the temperature-measuring unit R2 at the current time point may be obtained by using the resistance calculation formula:

$$R2 = \frac{V2}{I3} = \frac{V2}{\frac{V1}{R3}} = \frac{V2 * R3}{V1}$$

[0034] The resistance value of the temperature-measuring unit R2 represents the first resistance value Rx of the heating element 11, in this way, the first resistance value Rx of the heating element 11 at the current time point may be obtained. The control unit 12 is configured to drive the battery assembly 20 to power the heating element 11 in the first time period T4, or stop powering the heating element 11 by the battery assembly 20 in the

second time period T2, by comparing the first resistance value Rx of the temperature-measuring element at the current time point and the target resistance value Rt corresponding to the target temperature at the current time point.

[0035] As shown in FIG. 4, FIG. 4 is a logic diagram of a control method of a control unit provided by some embodiments of the present disclosure. The control unit 12 is configured to detect the first resistance value Rx of the heating element 11 at the current time point in the heating phase and determine the target resistance value Rt corresponding to the target temperature at the current time point. When detecting that the first resistance value Rx is greater than the target resistance value Rt, the control unit 12 is configured to control the switch element 121 to be turned off and stop powering the heating element 11 by the battery assembly 20. When detecting that the first resistance value Rx is not greater than the target resistance value Rt, the control unit 12 is configured to control the switch element 121 to be turned on and drive the battery assembly 20 to power the heating element 11. In some embodiments, when detecting that the first resistance value Rx is greater than the target resistance value Rt, the control unit 12 is configured to control the switch element 121 to be turned off in the first time period T4, and stop powering the heating element 11 by the battery assembly 20. The first time period T4 has a duration of 0.1ms. When detecting that the first resistance value Rx is not greater than the target resistance value Rt, the control unit 12 is configured to control the switch element 121 to be turned on in the second time period T2, and drive the battery assembly 20 to power the heating element 11. The second time period T2 has a duration of 0.1ms (millisecond). It may be understood that, for illustrative purposes only, the duration of the first time period T4 and the duration of the second time period T2 are 0.1ms, and the actual value may be selected based on specific situations.

[0036] In some embodiments, the control unit 12 includes a Proportion Integration Differentiation controller (PID controller), which outputs a PWM signal for the switch unit 121 by comparing the first resistance value Rx at the current time point with the target resistance value Rt at the current time point. When the first resistance value Rx is greater than the target resistance value Rt, the switch unit 121 is configured to turn off the path between the battery assembly 20 and the heating element 11. When the first resistance value Rx is not greater than the target resistance value Rt, the switch unit 121 is configured to turn on the path between the battery assembly 20 and the heating element 11.

[0037] In the heating assembly 10 provided by some embodiments of the present disclosure, the control unit 12 is configured to detect the actual resistance value Rx of the heating element 11 at the current time point in the heating phase, compare the actual resistance value Rx of the heating element 11 at the current time point with the target resistance value Rt corresponding to the

prestored target temperatures at the current time point, and control the switch unit 121 to be turned off or turned on through the PWM signal, thereby adjusting the duration of the battery assembly 20 powering the heating element 11, in this way, the actual temperature of the heating element 11 may be controlled to be close to the preset target temperature, and the aerosol forming effect of the heating assembly 10 may be ensured.

[0038] As shown in FIG. 5, FIG. 5 is a schematic flow chart of a control method for a heating assembly provided by some embodiments of the present disclosure. The control method includes the following operations.

[0039] Operation S 11, the method includes detecting a first resistance value of a heating element at the current time point in the heating phase, and determining a target resistance value corresponding to a target temperature at the current time point.

[0040] The control unit is configured to detect the first resistance value Rx of the heating element at the current time point in the heating phase, and determine the target resistance value Rt corresponding to the target temperature at the current time point. The heating duration for the heating element is controlled based on the relationship between the first resistance value Rx and the target resistance value Rt. It may be understood that, in practical applications, the resistance corresponds to the temperature. The greater the resistance, the higher the corresponding temperature. When the first resistance value Rx is greater than the target resistance value Rt, that is, it may be determined that the temperature corresponding to the first resistance value Rx is greater than the temperature corresponding to the target resistance value Rt. The lower the resistance, the lower the corresponding temperature. When the first resistance value Rx is less than the target resistance value Rt, it may be determined that the temperature corresponding to the first resistance value Rx is less than the temperature corresponding to the target resistance value Rt.

[0041] Operation S12, the method includes stopping heating the heating element in a first time period in response to the first resistance value being greater than the target resistance value.

[0042] When it is detected that the first resistance value Rx of the heating element at the current time point is greater than the target resistance value Rt at the current time point, it is determined that the temperature of the heating element is high, and the heating element is controlled to stop work in the first time period.

[0043] The temperature corresponding to the first resistance value Rx is the current temperature of the heating element. The temperature corresponding to the target resistance value Rt is the target temperature of the heating element. That is, when the current temperature is greater than the target temperature, the temperature of the heating element is needed to be decreased. At this time, the heating element is controlled to stop work in the first time period, in this way, the temperature of the heating element is gradually decreased to the target temper-

ature.

[0044] Operation S13, the method includes heating the heating element in a second time period in response to the first resistance value being not greater than the target resistance value.

[0045] When it is detected that the first resistance value R_x of the heating element at the current time point is not greater than the target resistance value R_t at the current time point, it is determined that the temperature of the heating element is low, and the heating element is needed to work and generate heat in the second time period.

[0046] The temperature corresponding to the first resistance value R_x is the current temperature of the heating element 11. The temperature corresponding to the target resistance value R_t is the target temperature of the heating element. That is, when the current temperature is not greater than the target temperature, the temperature of the heating element 11 is needed to be increased. At this time, the heating element works and generates heat in the second time period, in this way, the temperature of the heating element may be gradually increased to the target temperature.

[0047] In the control method for the heating assembly provided by some embodiments of the present disclosure, the control unit is configured to detect the actual resistance value R_x of the heating element at the current time point in the heating phase, compare the actual resistance value R_x of the heating element at the current time point with the target resistance value R_t corresponding to the prestored target temperature at the current time point, and control the switch unit to be turned on or turned off through a PWM signal, thereby adjusting the duration of the battery assembly heating the heating element, in this way, the actual temperature of the heating element 11 may be controlled to be close to the preset target temperature, and the aerosol forming effect of the heating assembly 10 may be ensured. The control method is simple in logic and is suitable for low-cost platforms.

[0048] As shown in FIG. 6, FIG. 6 is a schematic structural diagram of an electronic aerosol forming device provided by some embodiments of the present disclosure. The electronic aerosol forming device includes a heating assembly 10 and a battery assembly 20. The heating assembly 10 may be inserted into the solid substrate configured to generate aerosol or surround the solid substrate configured to generate aerosol. The battery assembly 20 is electrically connected to the heating assembly 10 to power the heating assembly 10, in this way, the heating assembly 10 may heat the substrate configured to generate aerosol.

[0049] The foregoing descriptions are merely embodiments of the present disclosure, and the patent scope of the present disclosure is not limited thereto. All equivalent structure or process changes made according to the content of this specification and accompanying drawings in the present disclosure or by directly or indirectly applying the present disclosure in other related technical fields shall fall within the protection scope of the present

disclosure

Claims

1. A heating assembly, comprising:

a heating element;
a control unit, configured to detect a first resistance value of the heating element at the current time point in a heating phase, and determine a target resistance value corresponding to a target temperature at the current time point;
wherein the control unit is configured to turn off the path between a battery assembly connected to the heating assembly and the heating element in a first time period in response to the first resistance value being greater than the target resistance value, and the heating element is controlled to stop work in the first time period; and
wherein the control unit is configured to turn on the path between the battery assembly and the heating element in a second time period in response to the first resistance value being not greater than the target resistance value, and the heating element is driven to work and generate heat in the second time period.

2. The heating assembly according to claim 1, wherein the duration of the first time period is equal to or unequal to the duration of the second time period.

3. The heating assembly according to claim 1, wherein the heating phase comprises a plurality of heating periods and a plurality of stop periods, each of the heating periods comprises at least one first time period, each of the stop periods comprises at least one second time period, the duration of each of the at least one first time period is equal to the duration of another of the at least one first time period, and the duration of each of the at least one second time period is equal to the duration of another of the at least one second time period.

4. The heating assembly according to claim 3, wherein the numbers of the at least one first time period in any two of the heating periods are equal or unequal to each other, and the numbers of the at least one second time period in any two of the stop periods are equal or unequal to each other.

5. The heating assembly according to claim 1, comprising:

a switch unit, arranged on the path between the heating element and the battery assembly;
wherein the control unit is connected to the switch unit, the control unit is configured to con-

- trol the switch unit to be turned off in the first time period and turn off the path between the battery assembly and the heating element, or configured to control the switch unit to be turned on in the second time period and turn on the path between the battery assembly and the heating element.
6. The heating assembly according to claim 5, wherein the heating element comprises a heating unit and a temperature-measuring unit, the heating unit is connected to the battery assembly through the switch unit, the temperature-measuring unit is in parallel connection with the heating unit and is connected to the control unit, and the control unit is configured to detect the first resistance value of the heating element through the temperature-measuring unit; and wherein the heating assembly comprises a sampling unit, the sampling unit is in series connection with the temperature-measuring unit, the sampling unit is connected to the control unit, the control unit is configured to detect the current flowing through the sampling unit and the temperature-measuring unit through the sampling unit, and determine the resistance value of the temperature-measuring unit, and the resistance value of the temperature-measuring unit represents the first resistance value of the heating element.
7. The heating assembly according to claim 1, wherein the target temperature of the heating element at the current time point is determined based on a preset temperature-time curve of the heating element in the heating phase, and the target resistance value corresponding to the target temperature is determined based on a preset temperature-resistance relationship table.
8. An electronic aerosol forming device, comprises:
 a battery assembly; and
 a heating assembly, wherein the battery assembly is configured to power the heating assembly, and the heating assembly is the heating assembly according to any one of claims 1-7.
9. A control method for a heating assembly, comprises:
 detecting a first resistance value of a heating element at the current time point in a heating phase, and determining a target resistance value corresponding to a target temperature at the current time point;
 stopping heating the heating element in a first time period in response to the first resistance value being greater than the target resistance value; and
 heating the heating element in a second time
- period in response to the first resistance value being not greater than the target resistance value.
10. The control method according to claim 9, wherein the duration of the first time period is equal to or unequal to the duration of the second time period.
11. The control method according to claim 9, wherein the heating phase comprises a plurality of heating periods and a plurality of stop periods, each of the heating periods comprises at least one first time period, each of the stop periods comprises at least one second time period, the duration of each of the at least one first time period is equal to the duration of another of the at least one first time period, the duration of each of the at least one second time period is equal to the duration of another of the at least one second time period, the numbers of the at least one first time period in any two of the heating periods are equal or unequal to each other, and the numbers of the at least one second time period in any two of the stop periods are equal or unequal to each other.

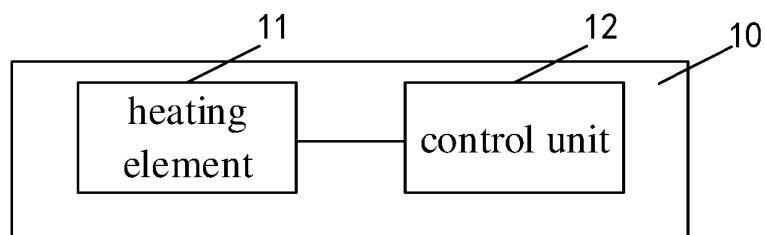


FIG. 1

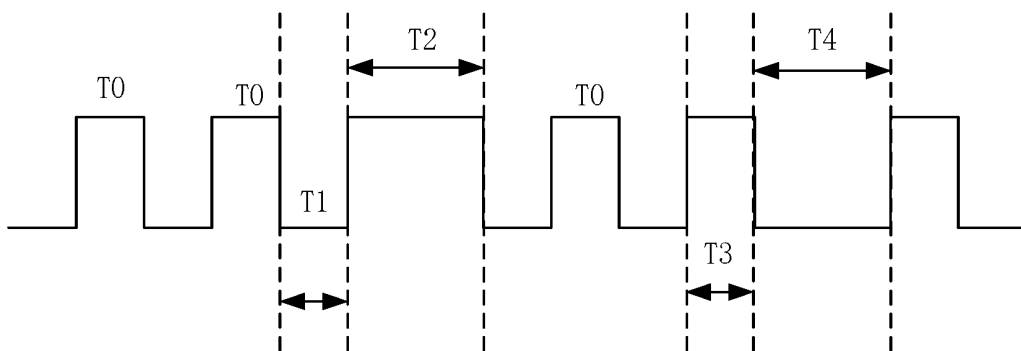


FIG. 2

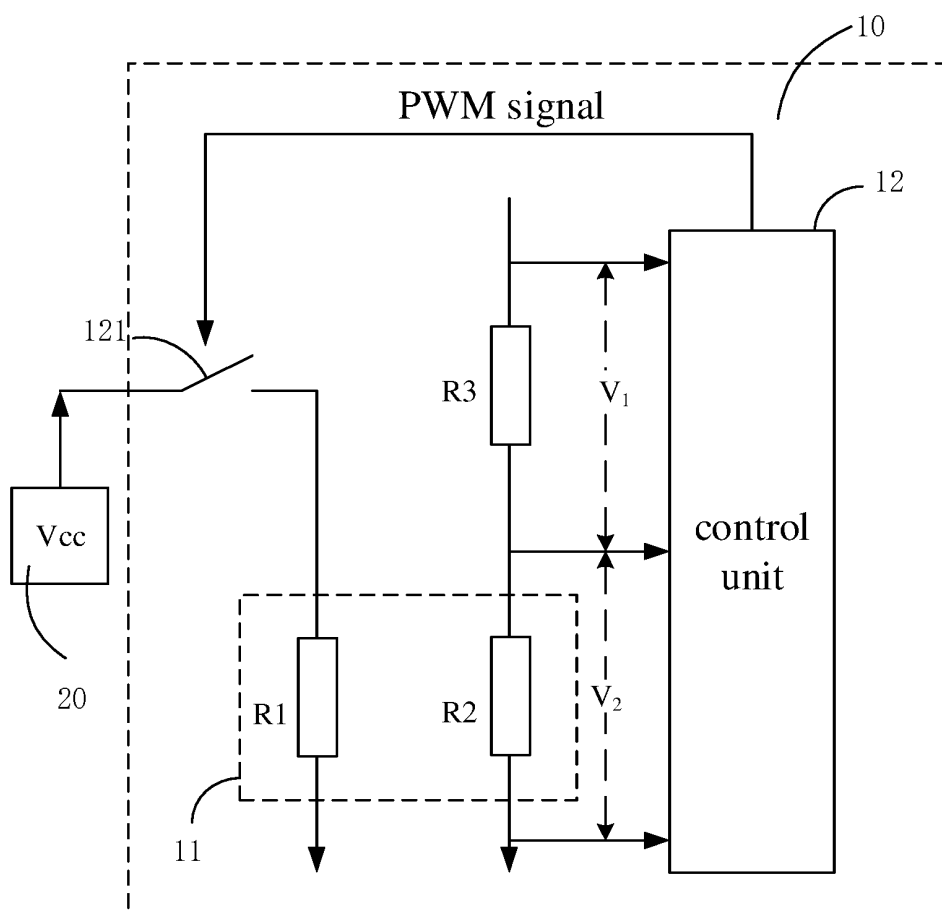


FIG. 3

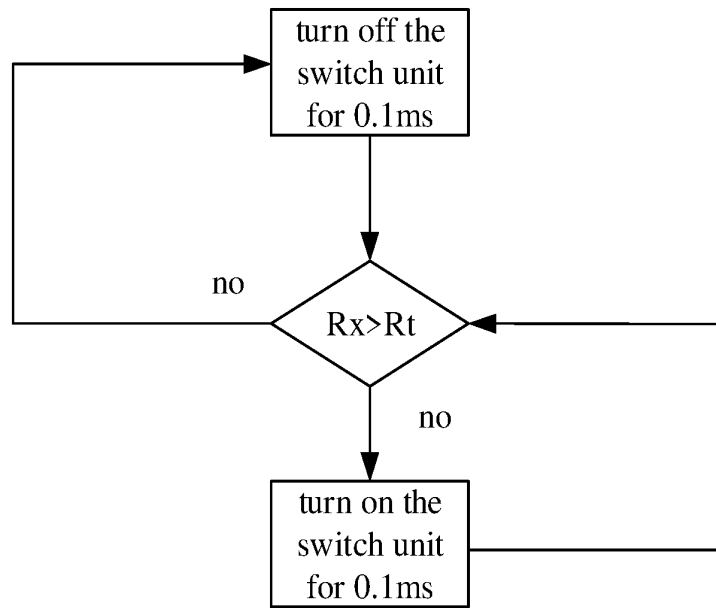


FIG. 4

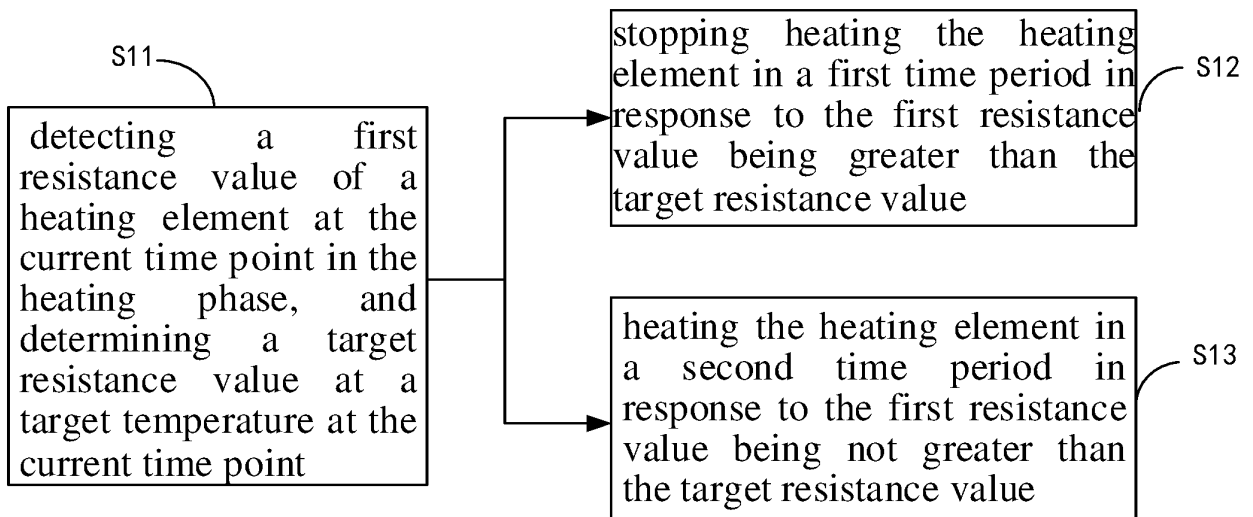


FIG. 5

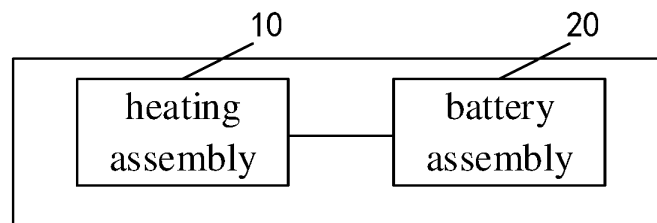


FIG. 6

INTERNATIONAL SEARCH REPORT

International application No.

PCT/CN2022/111914

A. CLASSIFICATION OF SUBJECT MATTER

A24F 40/40(2020.01)i; A24F 40/46(2020.01)i; A24F 40/50(2020.01)i; A24F 47/00(2020.01)i; A24F 40/57(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)

CNTXT: VEN; WPABSC: ENTXT; USTXT; EPTXT; JPTXT; CNKI: 电子烟, 加热, 电阻, 阻值, 停止, 暂停, 电源, 电压, 时间段, 开关, 恒温, 保持, 目标温度, 测温, heating assembly, electronic atomizing device, electronic cigarette, time period, temperature, resistance

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
PX	CN 113907422 A (SHENZHEN MAISHI TECHNOLOGY CO., LTD.) 11 January 2022 (2022-01-11) claims 1-11, and description, paragraphs [0005]-[0057], and figures 1-6	1-11
X	CN 108366439 A (ZHANG YIYUE) 03 August 2018 (2018-08-03) description, paragraphs [0059]-[0145], and figures 1-7	1-11
A	CN 110558617 A (SHENZHEN SMOORE TECHNOLOGY LIMITED) 13 December 2019 (2019-12-13) entire document	1-11
A	CN 109730360 A (SHENZHEN SMOORE TECHNOLOGY LIMITED) 10 May 2019 (2019-05-10) entire document	1-11
A	CN 104571190 A (JOYETECH (CHANGZHOU) ELECTRONIC TECHNOLOGY CO., LTD.) 29 April 2015 (2015-04-29) entire document	1-11

☐ 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
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"E" earlier application or patent but published on or after the international filing date	"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
"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)	"&" document member of the same patent family
"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	

Date of the actual completion of the international search

12 October 2022

Date of mailing of the international search report

20 October 2022

Name and mailing address of the ISA/CN

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100088, China

Authorized officer

Facsimile No. (86-10)62019451

Telephone No.

INTERNATIONAL SEARCH REPORT
Information on patent family members

International application No.

PCT/CN2022/111914

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CN 113907422 A	11 January 2022	None	
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		EP 3249488 A1	29 November 2017
		JP 2018505696 A	01 March 2018
		CN 104571190 B	10 May 2017
		IN 201717029557 A	24 November 2017
		EP 3249488 A4	06 March 2019
		JP 6483283 B2	13 March 2019
		US 10321718 B2	18 June 2019
		JP 6667690 B2	18 March 2020
		EP 3249488 B1	06 October 2021

Form PCT/ISA/210 (patent family annex) (January 2015)

REFERENCES CITED IN THE DESCRIPTION

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