(19) Europäisches Patentamt
European Patent Office
Office européen des brevets

(11) EP 4 353 093 A1

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

(43) Date of publication:
17.04.2024 Bulletin 2024/16

(21) Application number: **21951283.7**

(22) Date of filing: **29.07.2021**

(51) International Patent Classification (IPC):
A24F 40/00 *(2020.01)*

(52) Cooperative Patent Classification (CPC):
A24F 40/00

(86) International application number:
PCT/CN2021/109220

(87) International publication number:
WO 2023/004675 (02.02.2023 Gazette 2023/05)

(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

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(54) AEROSOL GENERATING DEVICE

(57) The present disclosure relates to an aerosol-generating device, including: a shell including a resonant cavity; a microwave assembly arranged on the shell and configured to feed a microwave into the resonant cavity; a mounting portion arranged on the shell, at least a portion of the mounting portion being located in the resonant cavity, and the mounting portion comprising an atomization cavity configured to accommodate an aerosol-forming substrate; and a pressure sensor arranged on the shell and located outside the resonant cavity, and configured for collecting the air pressure value in the atomization cavity. The present disclosure detects whether the aerosol-generating device is in a suction state and controls the operation of the microwave assembly according to the suction state, so that the microwave assembly can be controlled to stop running timely when the user stops suction, thereby avoiding the waste of the electrical energy and the aerosol-forming substrate.

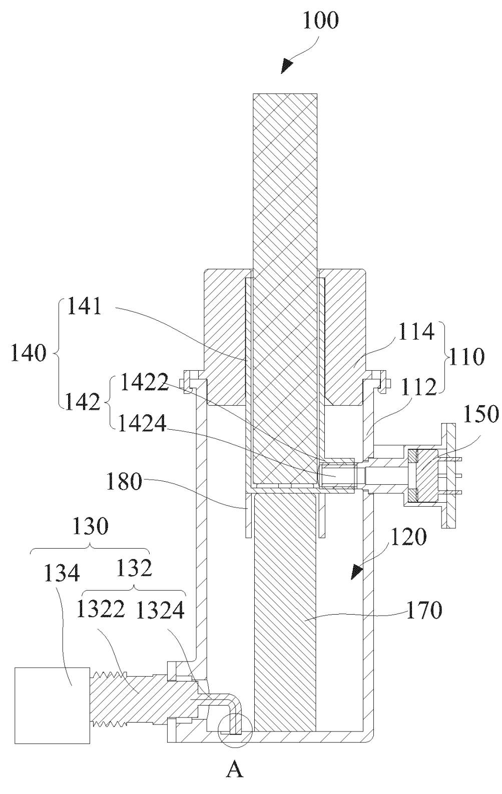

FIG. 1

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Description

FIELD

[0001] The present disclosure relates to the field of electronic atomization, and more specifically, to an aerosol-generating device.

BACKGROUND

[0002] A heat-not-burn (HNB) device is an electronic device that heats an aerosol-forming substrate (a processed plant leaf product) in a heat-not-burn manner. The heat-not-burn device can heat the aerosol-forming substrate to a high temperature at which the aerosol-forming substrate can generate an aerosol but does not burn, so that the aerosol-forming substrate can generate the aerosol required by a user on the premise of not burning.

[0003] Currently, the HNB device in the market mainly adopt a resistance heating mode, which uses a central heating sheet or a central heating needle or the like to insert into the aerosol-forming substrate for heating. This device needs a long preheating waiting time before use, and cannot be smoked and stopped freely. The carbonization of the aerosol-forming substrate is uneven, resulting in insufficient baking and a low utilization rate of the aerosol-forming substrate. Secondly, the heating sheet of the HNB device is prone to generating dirt in the aerosol-forming substrate extractor and the heating sheet base, making it difficult to clean. Besides, the local aerosol-forming substrate in contact with the heating sheet is too high in temperature, leading to a partial cracking to produce harmful substances to the human body. Therefore, the microwave heating technology gradually replaces the resistance heating mode to become a new heating mode. The microwave heating technology has the characteristics of high efficiency, timeliness, selectivity, and no delay in heating, and only has a heating effect on substances having specific dielectric properties. The advantages of using the microwave heating for atomization are as follows: a, the microwave heating is radiation heating and non-heat conduction, and instant smoking and stopping can be achieved; b, no heating sheet exists, so that the problems of sheet breaking and heating sheet cleaning do not exist; c, the aerosol-forming substrate is high in utilization rate, high in taste consistency, and closer to a cigarette in taste.

[0004] However, in the existing HNB device using the microwave heating, the microwave assembly cannot be controlled to stop running in time when the user stops smoking, resulting in waste of electrical energy and the aerosol-forming substrate.

SUMMARY

[0005] The present disclosure aims to solve one of the technical problems existing in the prior art or related technologies.

[0006] Therefore, an aerosol-generating device is provided in the present disclosure.

[0007] In view of this, an aerosol-generating device is provided in the present disclosure, including: a shell including a resonant cavity; a microwave assembly arranged on the shell and configured to feed a microwave into the resonant cavity; a mounting portion arranged on the shell, at least a portion of the mounting portion being located in the resonant cavity, and the mounting portion comprising an atomization cavity configured to accommodate an aerosol-forming substrate; and a pressure sensor arranged on the shell and located outside the resonant cavity, and the acquisition end of the pressure sensor being in communication with the atomization cavity for collecting the air pressure value in the atomization cavity.

[0008] The aerosol-generating device provided in the present disclosure includes a shell, a microwave assembly, a mounting portion, and a pressure sensor. A resonant cavity is provided in the shell, the microwave output end of the microwave assembly is connected to the resonant cavity, and the microwave generated by the microwave assembly is fed into the resonant cavity. The mounting portion is arranged in the shell, and an atomization cavity is provided in the mounting portion and configured to accommodate the aerosol-forming substrate. The microwave assembly feeds the microwave into the resonant cavity and then the microwave is transmitted to the mounting portion through the resonant cavity, thereby perform microwave heating to the aerosol-forming substrate in the atomization cavity.

[0009] The mounting portion isolates the resonant cavity from the atomization cavity, so that liquid waste or solid waste generated after the aerosol-forming substrate in the atomization cavity is atomized can be prevented from entering the resonant cavity, thereby avoiding the occurrence of a failure of the aerosol-generating device caused by the waste entering the resonant cavity.

[0010] The aerosol-generating device further includes a pressure sensor, and the acquisition end of the pressure sensor is in communication with the atomization cavity. The pressure sensor can collect the air pressure value in the atomization cavity. The pressure sensor is arranged on the shell and located outside the resonant cavity, so that the pressure sensor will not be affected by the microwave conducted in the resonant cavity. The change of the air pressure value in the atomization cavity is collected through the pressure sensor, and whether the aerosol-generating device is in a suction state can be detected according to the change of the air pressure value in the atomization cavity. The operation of the microwave assembly is controlled according to the suction state of the aerosol-generating device.

[0011] In some embodiments, when the aerosol-generating device is detected to be in the suction state, the microwave assembly is controlled to run, so as to perform microwave heating atomization to the aerosol-forming substrate in the atomization cavity. When the aerosol-generating device is not in the suction state, the microwave assembly is controlled to stop running to stop the heating atomization to the aerosol-forming substrate in the atomization cavity.

[0012] In some other embodiments, when the aerosol-generating device is in a startup state, and a preheating control command is received, controlling the microwave assembly to operate at first power until the temperature value in the atomization cavity enters a set temperature range, and maintaining the temperature value within the set temperature range, so that the effect of preheating the aerosol-forming substrate in the atomization cavity is achieved. Detecting whether the aerosol-generating device is in the suction state, and adjusting the first power according to the suction state of the aerosol-generating device. Specifically, when it is detected that the aerosol-generating device is in the suction state, controlling the microwave assembly to operate at a second power, so that the temperature in the atomization cavity is rapidly increased, and the aerosol-forming substrate is rapidly heated and atomized to generate an aerosol, where the second power is greater than the first power. When it is detected that the aerosol-generating device is not in the suction state, controlling the microwave assembly to maintain the operation at the first power to continue to preheat the aerosol-forming substrate.

[0013] The present disclosure collects the pressure value in the atomization cavity through the pressure sensor to detect whether the aerosol-generating device is in the suction state, and controls the operation of the microwave assembly according to the suction state, so that the microwave assembly can be controlled to stop running timely when the user stops suction, thereby avoiding the waste of the electrical energy and the aerosol-forming substrate. The aerosol-forming substrate is preheated when the aerosol-generating device is not in the suction state, and is rapidly heated to the atomization temperature when in the suction state, thereby reducing the energy consumption and improving the atomization efficiency of the aerosol-forming substrate, and further improving the atomization degree of the aerosol-forming substrate, thereby improving the user experience.

[0014] Further, the aerosol-generating device in the above technical solution provided in the present disclosure may have the following additional technical features:

[0015] In one possible design, the mounting portion includes: a seat, the atomization cavity being arranged in the seat; and a conductive member, one end of the conductive member being connected to the seat, and the other end of the conductive member being connected to the acquisition end of the pressure sensor.

[0016] In this design, the mounting portion includes the seat and the conductive member. The seat is disposed in the shell, and is enclosed with the atomization cavity to form the resonant cavity. The conductive member penetrates through the shell, one end of the conductive member is connected to the seat, the conductive member is in communication with the atomization cavity, and the other end of the conductive member extends to the outside of the shell to be connected to the pressure sensor. The atomization cavity is communicated with the pressure sensor outside the shell through the conductive member, so that the pressure sensor can directly collect the pressure value in the atomization cavity.

[0017] In one possible design, the conductive member includes: a first pipe member integrally formed with the seat; and a second pipe member disposed on the shell. A first end of the second pipe member penetrates through the shell to be connected to the first pipe member, a second end of the second pipe member is connected to the pressure sensor, and the acquisition end of the pressure sensor is located in the second pipe member.

[0018] In this design, the conductive member includes the first pipe member and the second pipe member. The first pipe member is communicated with the seat. The second pipe member is disposed on the side wall of the shell, and the second pipe member penetrates through the shell to be connected to the first pipe member. The end of the second pipe member located outside the shell is connected to the pressure sensor. The conductive member is configured to be formed by connecting the first pipe member and the second pipe member, so that the assembly process of the aerosol-generating device can be simplified, and the separate disassembly and cleaning of the mounting portion can be facilitated.

[0019] The first pipe member is integrated with the seat, thereby further reducing the assembly steps. The second pipe member is disposed on the shell through a fixing member, which may be a fastener such as a screw or a rivet.

[0020] The steps for assembling the conductive member and mounting portion include: inserting the seat integrally formed with the first pipe member into the shell; threading the second pipe member through the side wall of the shell, connecting the second pipe member to the first pipe member in an inserted manner, so that the first pipe member and the second pipe member being in communication with the atomization cavity in the seat, and ensuring the sealing performance of the connection between the first pipe member and the second pipe member; fixing the second pipe member to the side wall of the shell through the fastener, to finish the assembly process of the conductive member and the mounting portion. The first pipe member and the second pipe member are respectively arranged in and outside the shell, and then the first pipe member and the second pipe member are connected to each other, so that the assembly steps of the conductive member are simplified while ensuring the sealing performance of the conductive member.

[0021] In one possible design, the mounting portion further includes an opening located at one end of the seat, in communication with the atomization cavity, and configured to allow the aerosol-forming substrate to enter the atomization cavity.

[0022] In this design, the mounting portion further includes the opening provided at one end of the seat, and the opening faces the outside of the shell. The opening is communicated with the atomization cavity and configured for allowing the aerosol-forming substrate into the atomization cavity through the opening.

[0023] It can be understood that the aerosol-forming substrate is provided with a suction portion, which extends out of the atomization cavity through the opening, and the user can suck the aerosol-forming substrate through the suction portion.

[0024] In one possible design, the aerosol-generating device further includes: a first through hole arranged on the shell, and the resonant cavity being communicated with the outside through the first through hole. The mounting portion further includes: a second through hole arranged on the seat, and the atomization cavity being communicated with the resonant cavity through the second through hole.

[0025] In this design, the aerosol-generating device includes the first through hole and the second through hole. The first through hole is arranged on the shell to communicate the resonant cavity with the outside of the shell, and the second through hole is arranged on the seat to communicate the resonant cavity with the atomization cavity. When the user performs suction through the suction portion of the aerosol-forming substrate, the gas outside the shell sequentially flows through the first through hole, the resonant cavity, the second through hole, the atomization cavity, and the aerosol-forming substrate, the precipitate generated by heating the aerosol-forming substrate is mixed with the gas to form the aerosol, which is discharged from the suction portion, to form a gas flow channel, so that the air outside the shell can be continuously supplemented into the atomization cavity during the suction process of the aerosol-forming substrate, allowing the aerosol-forming substrate to be fully atomized, and avoiding excessive suction resistance of the aerosol-forming substrate caused by small airflow, thereby improving the user experience.

[0026] In one arranged design, the mounting portion may further include: at least two protruding portions arranged on the inner wall of the atomization cavity and protruding from the inner wall of the atomization cavity. A gap is provided between two adjacent protruding portions of the at least two protruding portions, and the at least two protruding portions are configured to fix the aerosol-forming substrate.

[0027] In this design, the mounting portion further includes the at least two protruding portions arranged on the inner wall of the atomization cavity. The at least two protruding portions can play a role in fixing the aerosol-forming substrate. The aerosol-forming substrate is inserted into the atomization cavity through the opening, and the at least two protruding portions abut against the outer wall of the aerosol-forming substrate to fix it, thereby preventing the aerosol-forming substrate from sliding out of the atomization cavity.

[0028] Two adjacent protruding portions of the at least two protruding portions are spaced apart, and the gap between the two adjacent protruding portions and the gap between the aerosol-forming substrate and the side wall of the atomization cavity form an airflow channel.

[0029] When the user performs suction through the suction portion of the aerosol-forming substrate, the gas outside the shell flows sequentially through the gap between the two adjacent protruding portions, the gap between the aerosol-forming substrate and the side wall of the atomization cavity, and the aerosol-forming substrate, the precipitate generated by heating the aerosol-forming substrate is mixed with the gas to form the aerosol, and the aerosol is discharged from the suction portion. During the suction process of the aerosol-forming substrate, the air outside the shell can be continuously supplemented into the atomization cavity, so that the aerosol-forming substrate can be fully atomized. Further, the excessive suction resistance of the aerosol-forming substrate caused by small airflow can be avoided, thereby improving the user experience.

[0030] In one possible design, the at least two protruding portions are located on the inner wall of the atomization cavity close to the opening, and the at least two protruding portions are uniformly distributed in the circumferential direction of the atomization cavity.

[0031] In this design, the at least two protruding portions are uniformly arranged in the circumferential direction of the atomization cavity. The uniformly distributed protruding portions can effectively fix the aerosol-forming substrate and prevent the aerosol-forming substrate from falling off from the atomization cavity during the suction process. The aerosol-forming substrate will generate some waste during the suction process, and the at least two protruding portions are arranged at the end close to the opening, so that the user can conveniently clean the waste attached to the protruding portions, thereby preventing the waste from blocking the gap between the protruding portions, and improving the running stability of the aerosol-generating device.

[0032] In one possible design, the mounting portion further includes: a groove arranged on the inner wall of the atomization cavity and extending in the centerline direction of the atomization cavity.

[0033] In this design, the mounting portion further includes the groove provided on the inner wall of the atomization cavity. After the aerosol-forming substrate is inserted into the atomization cavity through the opening, the aerosol-forming substrate is in contact with the inner wall of the atomization cavity, the friction force between the inner wall of the atomization cavity and the aerosol-forming substrate can prevent the aerosol-forming substrate from falling off from the atomization cavity.

[0034] When the user sucks through the suction portion of the aerosol-forming substrate, the gas outside the shell sequentially flows through the groove and the aerosol-forming substrate, the precipitate generated by heating the aerosol-forming substrate is mixed with the gas to form the aerosol, and the aerosol is discharged from the suction portion. During the suction process of the aerosol-forming substrate, the air outside the shell can be continuously supplemented into the atomization cavity, so that the aerosol-forming substrate can be fully atomized. Further, the excessive suction resistance of the aerosol-forming substrate caused by small airflow can be avoided, thereby improving the user experience.

[0035] In one possible design, the number of the grooves is at least two, and the at least two grooves are uniformly distributed in the circumferential direction of the atomization cavity.

[0036] In this design, a plurality of grooves are uniformly distributed on the inner wall of the atomization cavity, so that the external air can be uniformly contacted with the aerosol-forming substrate, and the precipitate of the aerosol-forming substrate can be fully mixed with the air to form the aerosol, thereby improving the atomization effect of the aerosol-forming substrate.

[0037] It can be understood that the suction resistance of the aerosol-generating device can be adjusted by reasonable setting of the number and the inner diameter of the grooves.

[0038] In one possible design, the mounting portion may further include: a separator arranged in the atomization cavity and dividing the atomization cavity into a first cavity and a second cavity. The first cavity is in communication with the second cavity, and the first cavity is configured to accommodate the aerosol-forming substrate.

[0039] In this design, the mounting portion further includes the separator disposed in the atomization cavity. The separator divides the atomization cavity into the first cavity and the second cavity that are mutually communicated. The first cavity is configured to accommodate the aerosol-forming substrate, and the second cavity is in communication with the external air of the atomization cavity.

[0040] When the user sucks through the suction portion of the aerosol-forming substrate, the gas outside the shell sequentially flows through the second cavity, the first cavity, and the aerosol-forming substrate, that is, the air enters the first cavity through the second cavity to be in contact with the aerosol-forming substrate, the precipitate generated by heating the aerosol-forming substrate is mixed with the gas to form the aerosol, and the aerosol is discharged from the suction portion. During the suction process of the aerosol-forming substrate, the air outside the shell can be continuously supplemented into the atomization cavity, so that the aerosol-forming substrate can be fully atomized. Further, the excessive suction resistance of the aerosol-forming substrate caused by small airflow can be avoided, thereby improving the user experience.

[0041] In one possible design, the first cavity and the second cavity are coaxial and annularly distributed, and the second cavity is located on the outer side of the first cavity.

[0042] In this design, the second cavity is annular shaped and located outside the first cavity, so that the air can uniformly enter the first cavity from the outside after flowing through the second cavity, so that the external air can be uniformly contacted with the aerosol-forming substrate, and the precipitate of the aerosol-forming substrate can be fully mixed with the air to form the aerosol, thereby improving the atomization effect of the aerosol-forming substrate.

[0043] In one possible design, the mounting portion may further include a third through hole arranged on the separator and located at the end of the separator connected to the bottom wall of the atomization cavity.

[0044] In this design, the mounting portion further includes the third through hole. The third through hole is arranged at the separator, and the first cavity is in communication with the second cavity through the third through hole.

[0045] In one possible design, the mounting portion further includes a supporting portion arranged on the bottom wall of the atomization cavity and protruding from the bottom wall of the atomization cavity.

[0046] In this design, the mounting portion further includes the supporting portion arranged on the bottom wall of the atomization cavity. The supporting portion is configured to support the aerosol-forming substrate, so that a gap is formed between the aerosol-forming substrate and the bottom wall of the atomization cavity, so that the air entering the atomization cavity from the outside can be in contact with the bottom end of the aerosol-forming substrate, the mixing effect between the air and the precipitate generated by heating the aerosol-forming substrate is further improved, and the precipitate of the aerosol-forming substrate can be fully mixed with the air to form the aerosol, thereby improving the atomization effect of the aerosol-forming substrate.

[0047] In one possible design, the shell includes: a body; and an end cover detachably connected to the body. The mounting portion penetrates through the end cover, and the end cover and the body enclose the resonant cavity.

[0048] In this design, the shell includes the body and the end cover. The mounting portion is arranged on the end cover, and the end cover is detachably connected to the body, so that the user can conveniently clean the mounting portion separately by disassembling the end cover, thereby avoiding a water ingress fault caused by cleaning the entire aerosol-generating device.

[0049] In one possible design, the aerosol-generating device further includes: a resonant column arranged in the resonant cavity. A first end of the resonant column is connected to the bottom wall of the cavity wall of the resonant cavity, and a second end of the resonant column is disposed corresponding to the mounting portion.

[0050] In this design, the resonant column is configured for resonant conduction of the microwave. The first end of the resonant column is connected to the bottom wall of the resonant cavity, and the second end of the resonant column is corresponding to the mounting portion. The microwave fed into the resonant cavity by the microwave assembly is conducted along the first end to the second end of the resonant column, thereby performing microwave heating on the aerosol-forming substrate in the atomization cavity of the mounting portion.

[0051] The atomization cavity and the resonant cavity are isolated from each other through the mounting portion, so that liquid waste or solid waste generated after the aerosol-forming substrate in the atomization cavity is atomized can be prevented from entering the resonant cavity, thereby avoiding the occurrence of a failure of the microwave assembly caused by the waste entering the resonant cavity.

[0052] In some embodiments, the inner wall of the resonant cavity and the resonant column are made of a conductive material, which may be selected as a metal material, such as gold, copper, or silver.

[0053] In some embodiments, the inner wall of the resonant cavity and the outer wall of the resonant column are provided with a conductive coating. The conductive coating may be selected as a metal coating, such as a gold coating, a copper coating, or a silver coating.

[0054] In these embodiments, the metal with a high stability and a good conductivity is selected to provide the resonant cavity and resonant column, so that the effect of preventing a microwave leakage is achieved, and the inner wall of the resonant cavity and the resonant column can be prevented from rusting.

[0055] In some embodiments, the portion of the mounting portion located in the resonant cavity is made of a low dielectric loss material, such as a PTFE material (polytetrafluoroethylene material), a glass material, or a ceramic material, so that the microwave can be conducted into the atomization cavity in the mounting portion to perform microwave heating on the aerosol-forming substrate in the atomization cavity to generate aerosol.

[0056] In some embodiments, the mounting portion is detachably connected to the shell.

[0057] In these embodiments, the atomization cavity configured for accommodating the aerosol-forming substrate is arranged in the mounting portion, so that the atomization cavity can be separately disassembled and cleaned by disassembling the mounting portion, thereby improving the user experience.

[0058] In one possible design, the resonant column is spaced apart from the mounting portion.

[0059] In this design, a gap is provided between the resonant column and the mounting portion, so that the resonant column can be prevented from being extruded during the process of assembling the mounting portion into the shell, and the requirements for the production and assembly precision of the resonant column and the mounting portion can be reduced.

[0060] In one possible design, the aerosol-generating device further includes: a fixing portion arranged at the mounting portion and located in the resonant cavity. The fixing portion includes a limiting cavity, and at least a portion of the resonant column is located in the limiting cavity.

[0061] In this design, the aerosol-generating device further includes the fixing portion arranged on the mounting portion, and the limiting cavity is provided in the fixing portion. At least a portion of the resonant column is located in the limiting cavity, and the fixing portion fixes the resonant column through the limiting cavity, thereby providing a certain anti-vibration effect on the resonant column and preventing the resonant column from falling off due to vibration.

[0062] In some embodiments, the fixing portion and the mounting portion are integrally formed.

[0063] In these embodiments, the fixing portion and the mounting portion, which are integrally formed together, have a high bonding strength, thereby improving the stabilizing effect of the fixing portion on the resonant column.

[0064] In one possible design, the axis of the atomization cavity is coaxial with the axis of the resonant column.

[0065] In this design, the atomization cavity is coaxial with the resonant column, so that the microwave transmitted to the atomization cavity through the resonant column can be transmitted to the central position of the atomization cavity, the uniformity of microwave heating the aerosol-forming substrate in the atomization cavity is improved, the uneven heating of the aerosol-forming substrate caused by the concentration of the microwave in the atomization cavity is avoided, and the atomization effect of the aerosol-forming substrate is further improved.

[0066] In one possible design, the microwave assembly includes: a microwave introducing portion arranged on the side wall of the shell and in communication with the resonant cavity; and a microwave emission source connected to the microwave introducing portion. The microwave output from the microwave emission source is fed into the resonant cavity through the microwave introducing portion, and conducted in the direction from the first end of the resonant column to the second end of the resonant column.

[0067] In this design, the microwave assembly includes the microwave emission source and the microwave introducing portion. The microwave emission source is configured to generate a microwave, and the microwave introducing portion arranged on the side wall of the shell is configured to transmit the microwave generated by the microwave emission source to the resonant cavity. After the microwave is fed into the resonant cavity through the microwave introducing portion, the microwave can be conducted in the direction from the first end of the resonant column to the second end of the resonant column, so that the microwave can directly act on the aerosol-forming substrate in the atomization cavity, thereby improving the atomization effect of the aerosol-forming substrate.

[0068] In one possible design, the microwave introducing portion includes: a first introducing member arranged on the side wall of the shell and connected to the microwave emission source; and a second introducing member, a first end of the second introducing member being connected to the first introducing member, the second introducing member being located in the resonant cavity, and a second end of the second introducing member facing the bottom wall of the resonant cavity.

[0069] In this design, the microwave introducing portion includes the first introducing member and the second introducing member. The first introducing member penetrates through the side wall of the shell, and the first end of the first introducing member is connected to the microwave emission source, so that the microwave generated by the microwave emission source enters the microwave introducing portion through the first end of the first introducing member. The second end of the first introducing member is connected to the first end of the second introducing member, and the second end of the second introducing member faces the bottom wall of the resonant cavity. After being conducted through the first introducing member and the second introducing member, the microwave is transmitted from the bottom wall of the resonant cavity to the atomization cavity to perform microwave heating atomization on the aerosol-forming substrate in the atomization cavity.

[0070] Wherein, the first introducing member is coaxial with the microwave output end of the microwave emission source. The second introducing member has a horizontal introducing portion and a vertical introducing portion, the axis of the horizontal introducing portion is parallel to the bottom wall of the resonant cavity, and the axis of the vertical introducing portion is perpendicular to the bottom wall of the resonant cavity. The horizontal introducing portion is connected to the vertical introducing portion through a bending portion, and the horizontal introducing portion is coaxial with the first introducing member. By arranging the microwave introducing portion in the above manner, the microwave generated by the microwave emission source can all enter the resonant cavity and be conducted in the resonant cavity through the resonant column.

[0071] In one possible design, the aerosol-generating device further includes a recessed portion arranged on the bottom wall of the resonant cavity, and the second end of the second introducing member is located in the recessed portion.

[0072] In this design, the aerosol-generating device further includes the recessed portion, which is arranged on the bottom wall of the resonant cavity and disposed corresponding to the second end of the second introducing member. The second end of the second introducing member extends into the recessed portion, so that the microwave entering the resonant cavity can be conducted in the direction from the second end to the first end of the resonant column, thereby reducing the energy loss during the microwave conduction.

[0073] In one possible design, the microwave introducing portion includes: a third introducing member arranged on the side wall of the shell. A first end of the third introducing member is connected to the microwave emission source, and a second end of the third introducing member faces the resonant column.

[0074] In this design, the microwave introducing portion further includes the third introducing member, which is coaxially arranged with the microwave output end of the microwave emission source. The first end of the third introducing member is connected to the microwave emission source, and the second end of the third introducing member faces the resonant column. By coaxially arranging the third introducing member with the microwave output end of the microwave emission source, and connecting the third introducing member to the resonant column, the microwave is directly transmitted to the resonant column, so that the microwave output from the microwave emission source all enters the resonant cavity.

BRIEF DESCRIPTION OF THE DRAWINGS

[0075] The above and/or additional aspects and advantages of the present disclosure will become apparent and easy to be understood from the following description of embodiments in conjunction with the accompanying drawings. In the accompanying drawings:

FIG. 1 is a first schematic structural diagram of an aerosol-generating device in an embodiment of the present disclosure;

FIG. 2 is a partial enlarged view of the aerosol-generating device shown in FIG. 1 at the location A;

FIG. 3 is a second schematic structural diagram of the aerosol-generating device in the embodiment of the present disclosure;

FIG. 4 is a first schematic structural diagram of a mounting portion of the aerosol-generating device in an embodiment of the present disclosure;

FIG. 5 is a second schematic structural diagram of the mounting portion of the aerosol-generating device in the embodiment of the present disclosure;

FIG. 6 is a first schematic structural diagram of the mounting portion of the aerosol-generating device in another embodiment of the present disclosure;

FIG. 7 is a second schematic structural diagram of the mounting portion of the aerosol-generating device in the another embodiment of the present disclosure;

FIG. 8 is a first schematic structural diagram of the mounting portion of the aerosol-generating device in yet another embodiment of the present disclosure;

FIG. 9 is a second schematic structural diagram of the mounting portion of the aerosol-generating device in the yet another embodiment of the present disclosure; and

FIG. 10 is a third schematic structural diagram of the aerosol-generating device in the embodiment of the present disclosure.

[0076] Wherein, the correspondence between the reference numerals and the component names in FIG. 1 to FIG. 10 is:
100 aerosol-generating device, 110 shell, 112 body, 114 end cover, 120 resonant cavity, 130 microwave assembly, 132 microwave introducing portion, 1322 first introducing member, 1324 second introducing member, 1326 third introducing member, 134 microwave emission source, 140 mounting portion, 141 seat, 142 conductive member, 1422 first pipe member, 1424 second pipe member, 143 atomization cavity, 1432 first cavity, 1434 second cavity, 144 second through hole, 145 protruding portion, 146 groove, 147 separator, 150 pressure sensor, 160 first through hole, 170 resonant column, 180 fixing portion, 190 recessed portion.

DETAILED DESCRIPTION

[0077] To have a clearer understanding of the above-mentioned objectives, features, and advantages of the present disclosure, the present disclosure will be further described in detail below with reference to the accompanying drawings and specific embodiments. It should be noted that, in the case of no conflict, the embodiments of the present disclosure and the features in the embodiments may be combined with each other.

[0078] Many specific details are elaborated in the following description to facilitate a thorough understanding of the present disclosure. However, the present disclosure may also be implemented in other manners different from those described herein. Therefore, the scope of protection of the present disclosure is not limited by the specific embodiments disclosed below.

[0079] An aerosol-generating device in some embodiments of the present disclosure will be described below with reference to FIG. 1 to FIG. 10.

[0080] As shown in FIG. 1 and FIG. 3, an aerosol-generating device 100 in an embodiment of the present disclosure includes a shell 110, a microwave assembly 130, a mounting portion 140, and a pressure sensor 150.

[0081] The shell 110 includes a resonant cavity 120.

[0082] The microwave assembly 130 is arranged on the shell 110, and is configured to feed a microwave into the resonant cavity 120.

[0083] The mounting portion 140 is arranged on the shell 110, and at least a portion of the mounting portion 140 is located in the resonant cavity 120. The mounting portion 140 includes an atomization cavity 143, which is configured to accommodate an aerosol-forming substrate.

[0084] The pressure sensor 150 is arranged on the shell 110 and located outside the resonant cavity 120. The acquisition end of the pressure sensor 150 is in communication with the atomization cavity 143 for acquiring an air pressure value in the atomization cavity 143.

[0085] The aerosol-generating device 100 provided in the embodiment includes the shell 110, the microwave assembly 130, the mounting portion 140, and the pressure sensor 150. The resonant cavity 120 is provided in the shell 110, and the microwave output end of the microwave assembly 130 is connected to the resonant cavity 120. The microwave generated by the microwave assembly 130 is fed into the resonant cavity 120. The mounting portion 140 is disposed in the shell 110, and the atomization cavity 143 is provided in the mounting portion 140. The atomization cavity 143 is configured to accommodate the aerosol-forming substrate. The microwave assembly 130 feeds the microwave into the resonant cavity 120, and then the microwave is transmitted to the mounting portion 140 through the resonant cavity 120, so as to perform microwave heating to the aerosol-forming substrate in the atomization cavity 143.

[0086] The mounting portion 140 isolates the resonant cavity 120 from the atomization cavity 143, so that liquid waste or solid waste generated after the aerosol-forming substrate in the atomization cavity 143 is atomized can be prevented from entering the resonant cavity 120, thereby avoiding the occurrence of a failure of the aerosol-generating device 100 caused by the waste entering the resonant cavity 120.

[0087] The aerosol-generating device 100 further includes the pressure sensor 150, and the acquisition end of the pressure sensor 150 is in communication with the atomization cavity 143. The pressure sensor 150 can collect the air pressure value in the atomization cavity 143. The pressure sensor 150 is arranged on the shell 110 and located outside the resonant cavity 120, so that the pressure sensor 150 will not be affected by the microwave conducted in the resonant cavity 120. The change of the air pressure value in the atomization cavity 143 is collected through the pressure sensor 150, and whether the aerosol-generating device 100 is in a suction state can be detected according to the change of the air pressure value in the atomization cavity 143. The operation of the microwave assembly 130 is controlled according to the suction state of the aerosol-generating device 100.

[0088] In some embodiments, if the aerosol-generating device 100 is detected to be in the suction state, the microwave assembly 130 is controlled to run, so as to perform microwave heating atomization to the aerosol-forming substrate in the atomization cavity 143. When the aerosol-generating device 100 is not in the suction state, the microwave assembly 130 is controlled to stop running to stop heating and atomizing the aerosol-forming substrate in the atomization cavity 143.

[0089] In some other embodiments, when the aerosol-generating device 100 is in a startup state, and a preheating control command is received, controlling the microwave assembly 130 to operate at first power until the temperature value in the atomization cavity 143 enters a set temperature range, and maintaining the temperature value within the set temperature range, so that the effect of preheating the aerosol-forming substrate in the atomization cavity 143 is achieved. Detecting whether the aerosol-generating device 100 is in the suction state, and adjusting the first power according to the suction state of the aerosol-generating device 100. Specifically, when it is detected that the aerosol-generating device 100 is in the suction state, controlling the microwave assembly 130 to operate at a second power, so that the temperature in the atomization cavity 143 is rapidly increased, the aerosol-forming substrate is rapidly heated and atomized to generate an aerosol, where the second power is greater than the first power. When it is detected that the aerosol-generating device 100 is not in the suction state, controlling the microwave assembly 130 to maintain the operation at the first power to continue to preheat the aerosol-forming substrate.

[0090] The present disclosure collects the pressure value in the atomization cavity 143 through the pressure sensor 150 to detect whether the aerosol-generating device 100 is in the suction state, and controls the operation of the microwave assembly 130 according to the suction state, so that the microwave assembly 130 can be controlled to stop running timely after the user stops suction, thereby avoiding the waste of the electrical energy and the aerosol-forming substrate. The aerosol-forming substrate is preheated when the aerosol-generating device 100 is not in the suction state, and is rapidly heated to the atomization temperature when in the suction state, thereby reducing the energy consumption and improving the atomization efficiency of the aerosol-forming substrate, and further improving the atomization degree of the aerosol-forming substrate, thereby improving the user experience.

[0091] In addition, the aerosol-generating device 100 in the above technical solution provided in the present disclosure may further have the following additional technical features:

[0092] In any of the above embodiments, as shown in FIG. 1 and FIG. 3, the mounting portion 140 includes a seat 141, a conductive member 142, and an atomization cavity 143.

[0093] The atomization cavity 143 is arranged in the seat 141;

[0094] One end of the conductive member 142 is connected to the seat 141 and is in communication with the atomization cavity 143. Another end of the conductive member 142 is connected to the acquisition end of the pressure sensor 150.

[0095] In this embodiment, the mounting portion 140 includes the seat 141 and the conductive member 142. The seat 141 is disposed in the shell 110, and is enclosed with the atomization cavity 143 to form the resonant cavity 120. The conductive member 142 passes through the shell 110, one end of the conductive member 142 is connected to the seat 141, and the conductive member 142 is in communication with the atomization cavity 143. The other end of the conductive member 142 extends to the outside of the shell 110 and is connected to the pressure sensor 150. The atomization cavity 143 is communicated with the pressure sensor 150 outside the shell 110 through the conductive member 142, so that the pressure sensor 150 can directly collect the pressure value in the atomization cavity 143.

[0096] As shown in FIG. 1, in any of the above embodiments, the conductive member 142 includes: a first pipe member 1422 and a second pipe member 1424.

[0097] The first pipe member 1422 is integrally formed with the seat 141.

[0098] The second pipe member 1424 is disposed on the shell 110, and a first end of the second pipe member 1424 penetrates through the shell 110 and is connected to the first pipe member 1422, a second end of the second pipe member 1424 is connected to the pressure sensor 150, and the acquisition end of the pressure sensor 150 is located in the second pipe member 1424.

[0099] In this embodiment, the conductive member 142 includes the first pipe member 1422 and the second pipe member 1424. The first pipe member 1422 is communicated with the seat 141. The second pipe member 1424 is disposed on the side wall of the shell 110, and the second pipe member 1424 penetrates through the shell 110 to be connected to the first pipe member 1422. The end of the second pipe member 1424 located outside the shell 110 is connected to the pressure sensor 150. The conductive member 142 is configured to be formed by connecting the first pipe member 1422 and the second pipe member 1424, so that the assembly process of the aerosol-generating device 100 can be simplified, and the separate disassembly and cleaning of the mounting portion 140 can be facilitated.

[0100] The first pipe member 1422 is integrally formed with the seat 141, thereby further reducing the assembly steps. The second pipe member 1424 is disposed on the shell 110 through a fixing member, which may be a fastener such as a screw or a rivet.

[0101] The steps of assembling the conductive member 142 and the mounting portion 140 include: inserting the seat 141 integrally formed with the first pipe member 1422 into the shell 110. Threading the second pipe member 1424 through the side wall of the shell 110, the second pipe member 1424 being connected to the first pipe member 1422 in an inserted manner, so that the first pipe member 1422 and the second pipe member 1424 are in communication with the atomization cavity 143 in the seat 141, and ensuring the sealing performance of the connection between the first pipe member 1422 and the second pipe member 1424. Fixing the second pipe member 1424 to the side wall of the shell 110 through the fastener, so that the assembly process of the conductive member 142 and the mounting portion 140 is completed. The first pipe member 1422 and the second pipe member 1424 are respectively arranged in and outside the shell 110, and then the first pipe member 1422 and the second pipe member 1424 are connected to each other, so that the assembly steps of the conductive member 142 are simplified while ensuring the sealing performance of the conductive member 142.

[0102] In any of the above embodiments, the mounting portion 140 further includes an opening. The opening is arranged at one end of the seat 141, in communication with the atomization cavity 143, and configured to allow the aerosol-forming substrate to enter the atomization cavity 143.

[0103] In this embodiment, the mounting portion 140 further includes the opening provided at one end of the seat 141, and the opening faces the outside of the shell 110. The opening is communicated with the atomization cavity 143 and configured for placing the aerosol-forming substrate into the atomization cavity 143 through the opening.

[0104] It can be understood that the aerosol-forming substrate is provided with a suction portion, which extends out of the atomization cavity 143 through the opening, and the user can suck the aerosol-forming substrate through the suction portion.

[0105] As shown in FIG. 3, in any of the above embodiments, the aerosol-generating device 100 further includes a first through hole 160.

[0106] The first through hole 160 is provided on the shell 110, and the resonant cavity 120 is communicated with the outside through the first through hole 160.

[0107] The mounting portion 140 further includes a second through hole 144, which is arranged on the seat 141. The atomization cavity 143 is communicated with the resonant cavity 120 through the second through hole 144.

[0108] In this embodiment, the aerosol-generating device 100 includes the first through hole 160 and the second through hole 144. The first through hole 160 is arranged on the shell 110 to communicate the resonant cavity 120 with the outside of the shell 110, and the second through hole 144 is arranged on the seat 141 to communicate the resonant cavity 120 with the atomization cavity 143. When the user performs suction through the suction portion of the aerosol-forming substrate, the gas outside the shell 110 sequentially flows through the first through hole 160, the resonant cavity 120, the second through hole 144, the atomization cavity 143, and the aerosol-forming substrate, the precipitate generated by heating the aerosol-forming substrate is mixed with the gas to form the aerosol, which is discharged from the suction portion, to form a gas flow channel, so that the air outside the shell 110 can be continuously supplemented into the atomization cavity 143 during the suction process of the aerosol-forming substrate, allowing the aerosol-forming substrate to be fully atomized, and avoiding excessive suction resistance of the aerosol-forming substrate caused by small airflow, thereby improving the user experience.

[0109] As shown in FIG. 4 and FIG. 5, in any of the above embodiments, the mounting portion 140 further includes at least two protruding portions 145.

[0110] The at least two protruding portions 145 are arranged on the inner wall of the atomization cavity 143, and protrude from the inner wall of the atomization cavity 143. A gap is provided between two adjacent protruding portions 145 of the at least two protruding portions 145, and the at least two protruding portions 145 are configured to fix the aerosol-forming substrate.

[0111] In this embodiment, the mounting portion 140 further includes the at least two protruding portions 145 provided on the inner wall of the atomization cavity 143. The at least two protruding portions 145 can play a role in fixing the aerosol-forming substrate. The aerosol-forming substrate is inserted into the atomization cavity 143 through the opening, and the at least two protruding portions 145 abut against the outer wall of the aerosol-forming substrate to fix it, thereby preventing the aerosol-forming substrate from sliding out of the atomization cavity 143.

[0112] Two adjacent protruding portions 145 of the at least two protruding portions 145 are spaced apart, and the gap between the two adjacent protruding portions 145 and the gap between the aerosol-forming substrate and the side wall of the atomization cavity 143 form an airflow channel.

[0113] When the user performs suction through the suction portion of the aerosol-forming substrate, the gas outside the shell 110 flows sequentially through the gap between the two adjacent protruding portions 145, the gap between the aerosol-forming substrate and the side wall of the atomization cavity 143, and the aerosol-forming substrate, the precipitate generated by heating the aerosol-forming substrate is mixed with the gas to form an aerosol, and the aerosol is discharged from the suction portion. During the suction process of the aerosol-forming substrate, the air outside the shell 110 can be continuously supplemented into the atomization cavity 143, so that the aerosol-forming substrate can be fully atomized. Further, the excessive suction resistance of the aerosol-forming substrate caused by small airflow can be avoided, thereby improving the user experience.

[0114] In any of the above embodiments, the at least two protruding portions 145 are located on the inner wall of the atomization cavity 143 close to the opening, and the at least two protruding portions 145 are uniformly distributed in the circumferential direction of the atomization cavity 143.

[0115] In this embodiment, the at least two protruding portions 145 are uniformly arranged in the circumferential direction of the atomization cavity 143. The uniformly distributed protruding portions 145 can effectively fix the aerosol-forming substrate and prevent the aerosol-forming substrate from falling off from the atomization cavity 143 during the suction process. The aerosol-forming substrate will generate some waste during the suction process, and the at least two protruding portions 145 are arranged at the end close to the opening, so that the user can conveniently clean the waste attached to the protruding portions 145, thereby preventing the waste from blocking the gap between the protruding portions 145, and improving the running stability of the aerosol-generating device 100.

[0116] As shown in FIG. 6 and FIG. 7, the mounting portion 140 in any of the above embodiments further includes a groove 146.

[0117] The groove 146 is arranged on the inner wall of the atomization cavity 143, and extends in the centerline direction of the atomization cavity 143.

[0118] In this embodiment, the mounting portion 140 further includes the groove 146 provided on the inner wall of the atomization cavity 143. After the aerosol-forming substrate is inserted into the atomization cavity 143 through the opening, the aerosol-forming substrate is in contact with the inner wall of the atomization cavity 143, the friction force between the inner wall of the atomization cavity 143 and the aerosol-forming substrate can prevent the aerosol-forming substrate from falling off from the atomization cavity 143.

[0119] When the user sucks through the suction portion of the aerosol-forming substrate, the gas outside the shell 110 sequentially flows through the groove 146 and the aerosol-forming substrate, the precipitate generated by heating the aerosol-forming substrate is mixed with the gas to form the aerosol, and the aerosol is discharged from the suction portion. During the suction process of the aerosol-forming substrate, the air outside the shell 110 can be continuously supplemented into the atomization cavity 143, so that the aerosol-forming substrate can be fully atomized. Further, the excessive suction resistance of the aerosol-forming substrate caused by small airflow can be avoided, thereby improving the user experience.

[0120] In any of the above embodiments, the number of the grooves 146 is at least two, and the at least two grooves 146 are uniformly distributed along the circumferential direction of the atomization cavity 143.

[0121] In this embodiment, a plurality of grooves 146 are uniformly distributed on the inner wall of the atomization cavity 143, so that the external air can be uniformly contacted with the aerosol-forming substrate, and the precipitate of the aerosol-forming substrate can be fully mixed with the air to form the aerosol, thereby improving the atomization effect of the aerosol-forming substrate.

[0122] It can be understood that the suction resistance of the aerosol-generating device 100 can be adjusted by reasonable setting of the number and the inner diameter of the grooves 146.

[0123] As shown in FIG. 8 and FIG. 9, the mounting portion 140 in any of the above embodiments further includes a separator 147.

[0124] The separator 147 is arranged in the atomization cavity 143, and divides the atomization cavity 143 into a first cavity 1432 and a second cavity 1434. The first cavity 1432 is in communication with the second cavity 1434, and the first cavity 1432 is configured to accommodate the aerosol-forming substrate.

[0125] In this embodiment, the mounting portion 140 further includes the separator 147 disposed in the atomization cavity 143. The separator 147 divides the atomization cavity 143 into the first cavity 1432 and the second cavity 1434 that are mutually communicated. The first cavity 1432 is configured to accommodate the aerosol-forming substrate, and the second cavity 1434 is in communication with the external air of the atomization cavity 143.

[0126] When the user sucks through the suction portion of the aerosol-forming substrate, the gas outside the shell 110 sequentially flows through the second cavity 1434, the first cavity 1432, and the aerosol-forming substrate, that is, the air enters the first cavity 1432 through the second cavity 1434 to be in contact with the aerosol-forming substrate, the precipitate generated by heating the aerosol-forming substrate is mixed with the gas to form the aerosol, and the aerosol is discharged from the suction portion. During the suction process of the aerosol-forming substrate, the air outside the shell 110 can be continuously supplemented into the atomization cavity 143, so that the aerosol-forming substrate can be fully atomized. Further, the excessive suction resistance of the aerosol-forming substrate caused by small airflow can be avoided, thereby improving the user experience.

[0127] In any of the above embodiments, the first cavity 1432 and the second cavity 1434 are coaxially and annularly distributed, and the second cavity 1434 is located on the outer side of the first cavity 1432.

[0128] In this embodiment, the second cavity 1434 is annular shaped and located outside the first cavity 1432, so that the air can uniformly enter the first cavity 1432 from the outside after flowing through the second cavity 1434, so that the external air can be uniformly contacted with the aerosol-forming substrate, and the precipitate of the aerosol-forming substrate can be fully mixed with the air to form the aerosol, thereby improving the atomization effect of the aerosol-forming substrate.

[0129] In any of the above embodiments, the mounting portion 140 further includes a third through hole.

[0130] The third through hole is arranged on the separator 147, and the third through hole is located at the end of the separator 147 that is connected to the bottom wall of the atomization cavity 143.

[0131] In this embodiment, the mounting portion 140 further includes the third through hole. The third through hole is arranged at the separator 147, and the first cavity 1432 is in communication with the second cavity 1434 through the third through hole.

[0132] In any of the above embodiments, the mounting portion 140 further includes a supporting portion.

[0133] The supporting portion is arranged on the bottom wall of the atomization cavity 143, and protrudes from the bottom wall of the atomization cavity 143.

[0134] In this embodiment, the mounting portion 140 further includes the supporting portion arranged on the bottom wall of the atomization cavity 143. The supporting portion is configured to support the aerosol-forming substrate, so that a gap is formed between the aerosol-forming substrate and the bottom wall of the atomization cavity 143, so that the air entering the atomization cavity 143 from the outside can be in contact with the bottom end of the aerosol-forming substrate, the mixing effect between the air and the precipitate generated by heating the aerosol-forming substrate is further improved, and the precipitate of the aerosol-forming substrate can be fully mixed with the air to form the aerosol, thereby improving the atomization effect of the aerosol-forming substrate.

[0135] In any of the above embodiments, the shell 110 includes a body 112 and an end cover 114.

[0136] The end cover 114 is detachably connected to the body 112, the mounting portion 140 passes through the end cover 114, and the end cover 114 and the body 112 enclose the resonant cavity 120.

[0137] In this embodiment, the shell 110 includes the body 112 and the end cover 114. The mounting portion 140 is arranged on the end cover 114, and the end cover 114 is detachably connected to the body 112, so that the user can conveniently clean the mounting portion 140 separately by disassembling the end cover 114, thereby avoiding a water ingress fault caused by cleaning the entire aerosol-generating device 100.

[0138] In any of the above embodiments, the aerosol-generating device 100 further includes a resonant column 170.

[0139] The resonant column 170 is arranged in the resonant cavity 120, a first end of the resonant column 170 is connected to the bottom wall of the cavity wall of the resonant cavity 120, and a second end of the resonant column 170 is disposed corresponding to the mounting portion 140.

[0140] In this embodiment, the resonant column 170 is configured for resonant conduction of the microwave. The first end of the resonant column 170 is connected to the bottom wall of the resonant cavity 120, and the second end of the resonant column 170 is corresponding to the mounting portion 140. The microwave fed into the resonant cavity 120 by the microwave assembly 130 is conducted along the first end to the second end of the resonant column 170, thereby performing microwave heating on the aerosol-forming substrate in the atomization cavity 143 of the mounting portion 140.

[0141] The atomization cavity 143 and the resonant cavity 120 are isolated from each other by the mounting portion 140, so that liquid waste or solid waste generated after the aerosol-forming substrate in the atomization cavity 143 is atomized can be prevented from entering the resonant cavity 120, thereby avoiding the occurrence of a failure of the microwave assembly 130 caused by the waste entering the resonant cavity 120.

[0142] In some embodiments, the inner wall of the resonant cavity 120 and the resonant column 170 are made of a conductive material, which may be selected as a metal material, such as gold, copper, or silver.

[0143] In some embodiments, the inner wall of the resonant cavity 120 and the outer wall of the resonant column 170 are provided with a conductive coating. The conductive coating may be selected as a metal coating, such as a gold coating, a copper coating, or a silver coating.

[0144] In these embodiments, the metal with a high stability and a good conductivity is selected to provide the resonant cavity 120 and resonant column 170, so that the effect of preventing a microwave leakage is achieved, and the inner wall of the resonant cavity 120 and the resonant column 170 can be prevented from rusting.

[0145] In some embodiments, the portion of the mounting portion 140 located in the resonant cavity 120 is made of a low dielectric loss material, such as a PTFE material (polytetrafluoroethylene material), a glass material, or a ceramic material, so that the microwave can be conducted into the atomization cavity 143 in the mounting portion 140 to perform microwave heating on the aerosol-forming substrate in the atomization cavity 143 to generate the aerosol.

[0146] In some embodiments, the mounting portion 140 is detachably connected to the shell 110.

[0147] In these embodiments, the atomization cavity 143 configured for accommodating the aerosol-forming substrate is arranged in the mounting portion 140, so that the atomization cavity 143 can be separately disassembled and cleaned by disassembling the mounting portion 140, thereby improving the user experience.

[0148] As shown in FIG. 1 and FIG. 2, in any of the above embodiments, the resonant column 170 is spaced apart from the mounting portion 140.

[0149] In this embodiment, a gap is provided between the resonant column 170 and the mounting portion 140, so that the resonant column 170 can be prevented from being extruded during the process of assembling the mounting portion 140 into the shell 110, and the requirements for the production and assembly precision of the resonant column 170 and the mounting portion 140 can be reduced.

[0150] As shown in FIG. 1, in any of the above embodiments, the aerosol-generating device 100 further includes a fixing portion 180 arranged at the mounting portion 140 and located in the resonant cavity 120. The fixing portion 180 includes a limiting cavity, and at least a portion of the resonant column 170 is located in the limiting cavity.

[0151] In this embodiment, the aerosol-generating device 100 further includes the fixing portion 180 arranged on the mounting portion 140, and the limiting cavity is provided in the fixing portion 180. At least a portion of the resonant column 170 is located in the limiting cavity, and the fixing portion 180 fixes the resonant column 170 through the limiting cavity, thereby providing a certain anti-vibration effect on the resonant column 170 and preventing the resonant column 170 from falling off due to vibration.

[0152] In some embodiments, the fixing portion 180 is integrally formed with the mounting portion 140.

[0153] In these embodiments, the fixing portion 180 and the mounting portion 140, which are integrally formed together, have a high bonding strength, thereby improving the stabilizing effect of the fixing portion 180 on the resonant column 170.

[0154] As shown in FIG. 1 and FIG. 2, in any of the above embodiments, the axis of the atomization cavity 143 is coaxial with the axis of the resonant column 170.

[0155] In this embodiment, the atomization cavity 143 is coaxial with the resonant column 170, so that the microwave transmitted to the atomization cavity 143 through the resonant column 170 can be transmitted to the central position of the atomization cavity 143, the uniformity of microwave heating the aerosol-forming substrate in the atomization cavity 143 is improved, the uneven heating of the aerosol-forming substrate caused by the concentration of the microwave in the atomization cavity 143 is avoided, and the atomization effect of the aerosol-forming substrate is further improved.

[0156] As shown in FIG. 1 and FIG. 2, in any of the above embodiments, the microwave assembly 130 includes a microwave introducing portion 132.

[0157] The microwave introducing portion 132 is arranged on the side wall of the shell 110, and is in communication with the resonant cavity 120. A microwave emission source 134 is connected to the microwave introducing portion 132, the microwave output from the microwave emission source 134 is fed into the resonant cavity 120 through the microwave introducing portion 132, and conducted in the direction from the first end of the resonant column 170 to the second end of the resonant column 170.

[0158] In this embodiment, the microwave assembly 130 includes the microwave emission source 134 and the microwave introducing portion 132. The microwave emission source 134 is configured to generate a microwave, and the microwave introducing portion 132 arranged on the side wall of the shell 110 is configured to transmit the microwave generated by the microwave emission source 134 to the resonant cavity 120. After the microwave is fed into the resonant cavity 120 through the microwave introducing portion 132, the microwave can be conducted in the direction from the first end of the resonant column 170 to the second end of the resonant column 170, so that the microwave can directly act on the aerosol-forming substrate in the atomization cavity 143, thereby improving the atomization effect of the aerosol-forming substrate.

[0159] As shown in FIG. 1, in any of the above embodiments, the microwave introducing portion 132 includes a first introducing member 1322 and a second introducing member 1324.

[0160] The first introducing member 1322 is arranged on the side wall of the shell 110, and is connected to the microwave emission source 134.

[0161] A first end of the second introducing member 1324 is connected to the first introducing member 1322, the second introducing member 1324 is located in the resonant cavity 120, and a second end of the second introducing member 1324 faces the bottom wall of the resonant cavity 120.

[0162] In this embodiment, the microwave introducing portion 132 includes the first introducing member 1322 and the second introducing member 1324. The first introducing member 1322 passes through the side wall of the shell 110, and the first end of the first introducing member 1322 is connected to the microwave emission source 134, so that the microwave generated by the microwave emission source 134 enters the microwave introducing portion 132 through the first end of the first introducing member 1322. The second end of the first introducing member 1322 is connected to the first end of the second introducing member 1324, and the second end of the second introducing member 1324 faces the bottom wall of the resonant cavity 120. After being conducted through the first introducing member 1322 and the second introducing member 1324, the microwave is transmitted from the bottom wall of the resonant cavity 120 to the atomization cavity 143 to microwave heating and atomizing the aerosol-forming substrate in the atomization cavity 143.

[0163] The first introducing member is coaxial with the microwave output end of the microwave emission source 134. The second introducing member has a horizontal introducing portion and a vertical introducing portion, the axis of the horizontal introducing portion is parallel to the bottom wall of the resonant cavity 120, and the axis of the vertical introducing portion is perpendicular to the bottom wall of the resonant cavity 120. The horizontal introducing portion is connected to the vertical introducing portion through a bending portion, and the horizontal introducing portion is coaxial with the first introducing member. By arranging the microwave introducing portion 132 in the above manner, the microwave generated by the microwave emission source 134 can all enter the resonant cavity 120 and be conducted in the resonant cavity 120 through the resonant column 170.

[0164] As shown in FIG. 2, in any of the above embodiments, the aerosol-generating device 100 further includes a recessed portion 190.

[0165] The recessed portion 190 is arranged on the bottom wall of the resonant cavity 120, and the second end of the second introducing member is located in the recessed portion 190.

[0166] In this embodiment, the aerosol-generating device 100 further includes the recessed portion 190, which is arranged on the bottom wall of the resonant cavity 120 and is disposed corresponding to the second end of the second introducing member. The second end of the second introducing member extends into the recessed portion 190, so that the microwave entering the resonant cavity 120 can be conducted in the direction from the second end to the first end of the resonant column 170, thereby reducing the energy loss during the microwave conduction.

[0167] As shown in FIG. 10, in any of the above embodiments, the microwave introducing portion 132 includes a third introducing member 1326.

[0168] The third introducing member 1326 is arranged on the side wall of the shell 110, a first end of the third introducing member 1326 is connected to the microwave emission source 134, and a second end of the third introducing member 1326 faces the resonant column 170.

[0169] In this embodiment, the microwave introducing portion 132 further includes the third introducing member 1326, which is coaxially arranged with the microwave output end of the microwave emission source 134. The first end of the third introducing member 1326 is connected to the microwave emission source 134, and the second end of the third introducing member 1326 faces the resonant column 170. By coaxially arranging the third introducing member 1326 with the microwave output end of the microwave emission source 134, and connecting the third introducing member 1326 to the resonant column 170, the microwave is directly transmitted to the resonant column 170, so that the microwave output from the microwave emission source 134 all enters the resonant cavity 120.

[0170] It should be noted that, unless otherwise explicitly specified and defined, in the claims, the specification, and the accompanying drawings of the present disclosure, the term "a plurality of refers to two or more. The orientation or positional relationships indicated by terms " upper", " lower", etc. are orientation or position relationships shown based on the accompanying drawings, and are merely used for more conveniently describing the present disclosure and simplifying the description, rather than indicating or implying that the device or component referred to should have a particular orientation or be constructed and operated in a particular orientation, and therefore, should not be understood as a limitation to the present disclosure. The terms "connection", "mounted", "fixation", etc. should be understood in a broad sense. For example, the "connection" may be a fixed connection between multiple objects, a detachable connection between multiple objects, or an integral connection; or may be a direct connection between multiple objects, or an indirect connection between multiple objects through an intermediate medium. For ordinary technical personnel in this field, the specific meanings of the above terms in the present disclosure can be understood based on specific circumstances of the above data.

[0171] In the claims, the specification, and the accompanying drawings of the present disclosure, the terms "one embodiment", "some embodiments", "specific embodiments", etc. mean that the specific features, structures, materials, or characteristics described in conjunction with the embodiments or examples are included in at least one embodiment or example of the present disclosure. In the claims, the specification, and the accompanying drawings of the present disclosure, the illustrative expressions of the above terms may not necessarily refer to the same embodiment or example. Moreover, the particular features, structures, materials, or characteristics described may be combined in an appropriate manner in any one or more embodiments or examples.

[0172] The above are only preferred embodiments of the present disclosure and are not intended to limit the present disclosure. For a person of ordinary skill in the art, the present disclosure may have various modifications and variations. Any modifications, equivalent replacements, improvements, etc. made within the spirit and principles of the present disclosure shall fall within the protection scope of the present disclosure.

Claims

1. An aerosol-generating device, comprising:

   a shell (110) comprising a resonant cavity (120);
   a microwave assembly (130) arranged on the shell (110) and configured to feed a microwave into the resonant cavity (120);
   a mounting portion (140) arranged on the shell (110), at least a portion of the mounting portion (140) being located in the resonant cavity (120), and the mounting portion (140) comprising an atomization cavity (143) configured to accommodate an aerosol-forming substrate; and
   a pressure sensor (150) arranged on the shell (110) and located outside the resonant cavity (120), and the acquisition end of the pressure sensor being in communication with the atomization cavity (143) for collecting the air pressure value in the atomization cavity (143).

2. The aerosol-generating device of claim 1, wherein the mounting portion (140) comprises:

   a seat (141), the atomization cavity (143) being arranged on the seat (141); and
   a conductive member (142),
   wherein one end of the conductive member (142) is connected to the seat (141), and the other end of the conductive member (142) is connected to the acquisition end of the pressure sensor.

3. The aerosol-generating device of claim 2, wherein the mounting portion (140) further comprises:
   an opening arranged at one end of the seat (141), in communication with the atomization cavity (143), and configured to allow the aerosol-forming substrate to enter the atomization cavity (143).

4. The aerosol-generating device of claim 3, wherein the mounting portion (140) further comprises:

   at least two protruding portions (145) arranged on the inner wall of the atomization cavity (143)

and protruding from the inner wall of the atomization cavity (143),
wherein a gap is provided between two adjacent protruding portions (145) of the at least two protruding portions (145), and the at least two protruding portions (145) are configured to fix the aerosol-forming substrate.

5. The aerosol-generating device of claim 4, wherein, the at least two protruding portions (145) are located on the inner wall of the atomization cavity (143) close to the opening, and uniformly distributed in the circumferential direction of the atomization cavity (143).

6. The aerosol-generating device of claim 3, wherein the mounting portion (140) further comprises:
at least one groove (146) arranged on the inner wall of the atomization cavity (143) and extending in the centerline direction of the atomization cavity (143).

7. The aerosol-generating device of claim 6, wherein, the at least one groove (146) comprises at least two grooves (146) uniformly distributed in the circumferential direction of the atomization cavity (143).

8. The aerosol-generating device of claim 3, wherein the mounting portion (140) further comprises:

a separator (147) arranged in the atomization cavity (143) and dividing the atomization cavity (143) into a first cavity (1432) and a second cavity (1434),
wherein the first cavity (1432) is in communication with the second cavity (1434), and configured to accommodate the aerosol-forming substrate.

9. The aerosol-generating device of any one of claims 2 to 8, wherein the mounting portion (140) further comprises:
a supporting portion arranged on the bottom wall of the atomization cavity (143) and protruding from the bottom wall of the atomization cavity (143).

10. The aerosol-generating device of any one of claims 1 to 8, further comprising:

a resonant column (170) arranged in the resonant cavity (120),
wherein a first end of the resonant column (170) is connected to the bottom wall of the resonant cavity (120), and a second end of the resonant column (170) is correspondingly arranged with the mounting portion (140), and
wherein the axis of the atomization cavity (143) is coaxial with the axis of the resonant column (170).

11. The aerosol-generating device of claim 10, wherein, the resonant column (170) is spaced apart from the mounting portion (140).

12. The aerosol-generating device of claim 10, wherein the microwave assembly (130) comprises:

a microwave introducing portion (132) arranged on the side wall of the shell (110) and in communication with the resonant cavity (120); and
a microwave emission source (134) connected to the microwave introducing portion (132),
wherein the microwave output from the microwave emission source (134) is fed into the resonant cavity (120) through the microwave introducing portion (132), and conducted along the direction from the first end of the resonant column (170) to the second end of the resonant column (170).

13. The aerosol-generating device of claim 12, wherein the microwave introducing portion (132) comprises:

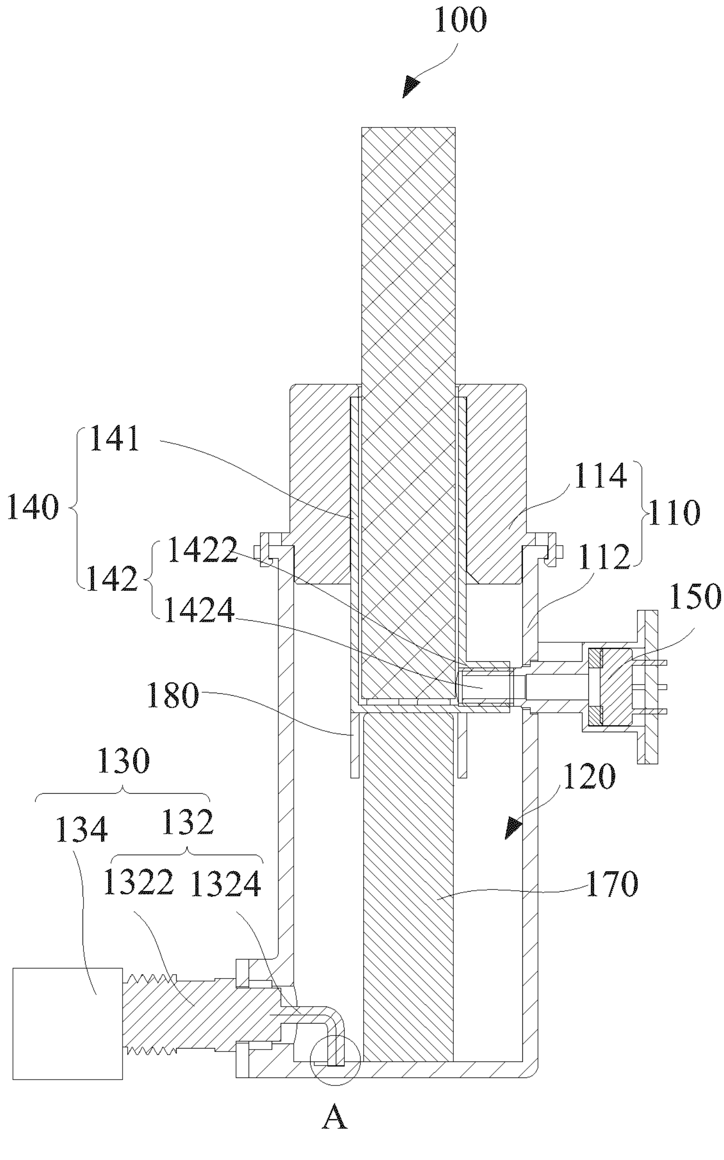
a first introducing member (1322) arranged on the side wall of the shell (110) and connected to the microwave emission source (134); and
a second introducing member (1324),
wherein a first end of the second introducing member (1324) is connected to the first introducing member (1322), the second introducing member (1324) is located in the resonant cavity (120), and a second end of the second introducing member (1324) faces the bottom wall of the resonant cavity (120).

14. The aerosol-generating device of claim 13, further comprising:

a recessed portion (190) arranged on the bottom wall of the resonant cavity (120),
wherein the second end of the second introducing member (1324) is located in the recessed portion (190).

15. The aerosol-generating device of claim 12, wherein the microwave introducing portion (132) comprises:

a third introducing member (1326) arranged on the side wall of the shell (110),
wherein a first end of the third introducing member (1326) is connected to the microwave emission source (134), and a second end of the third introducing member (1326) faces the resonant column (170).


100
141
140
142
1422
1424
114
110
112
150
180
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134
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1322
1324
120
170
A

FIG. 1

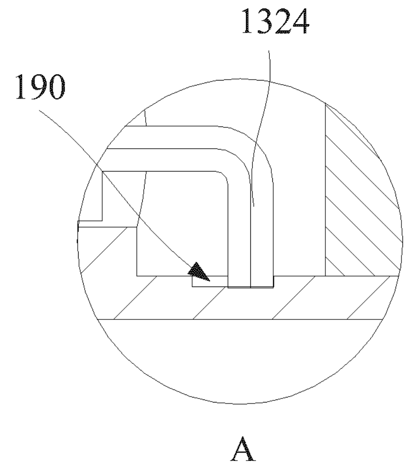

FIG. 2

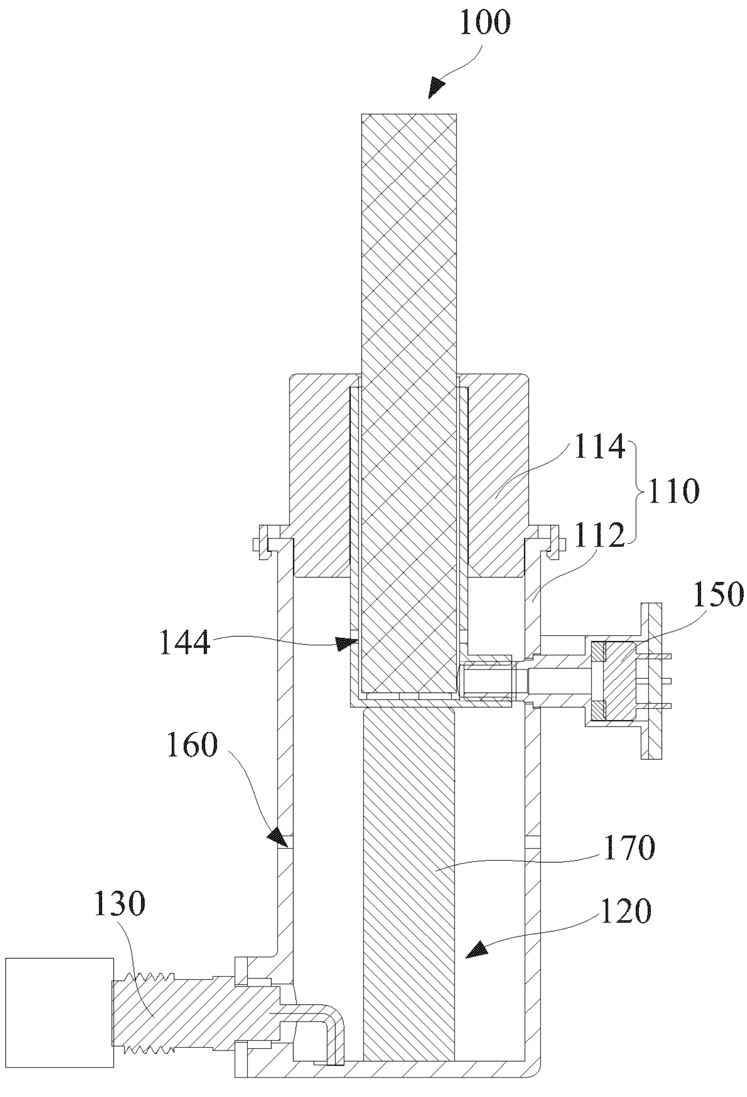

FIG. 3

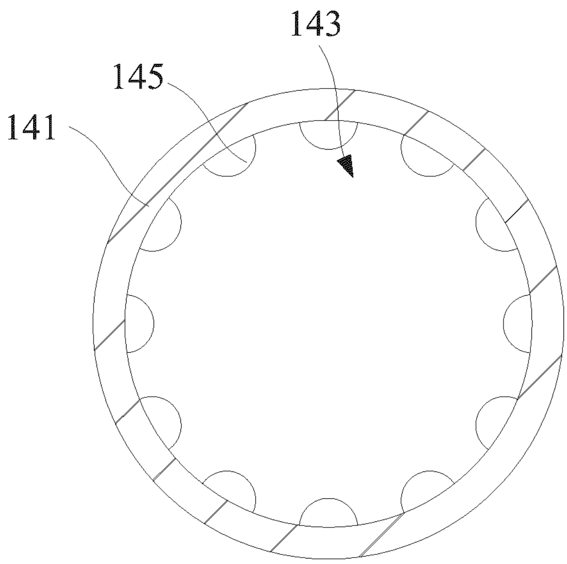

FIG. 4

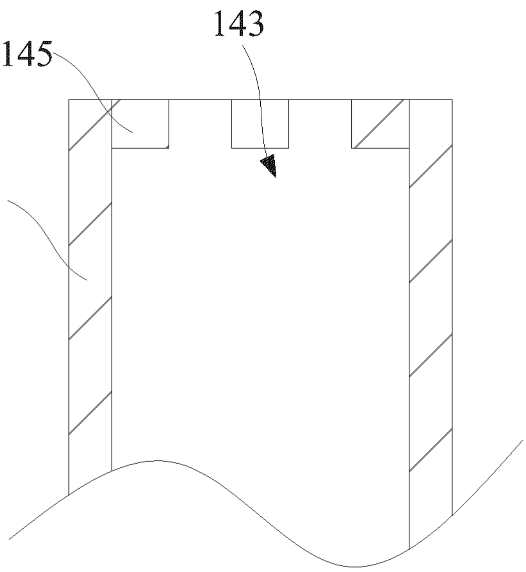

FIG. 5

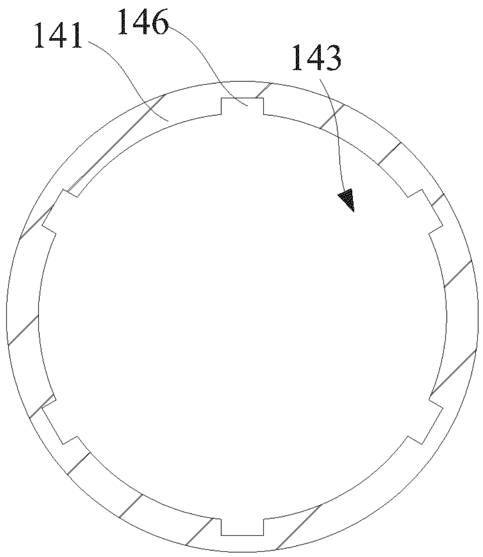

FIG. 6

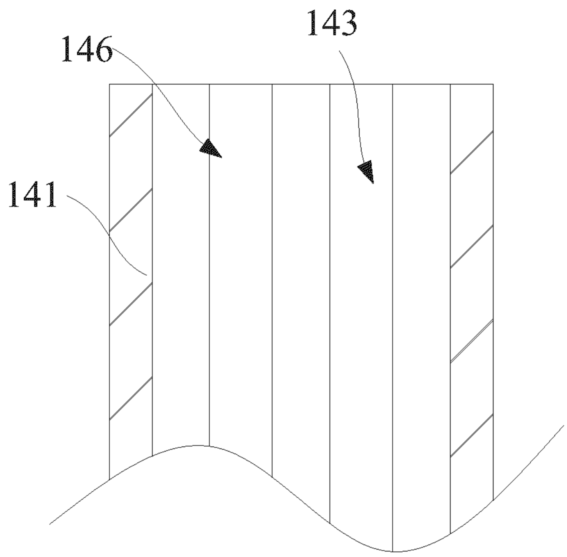

FIG. 7

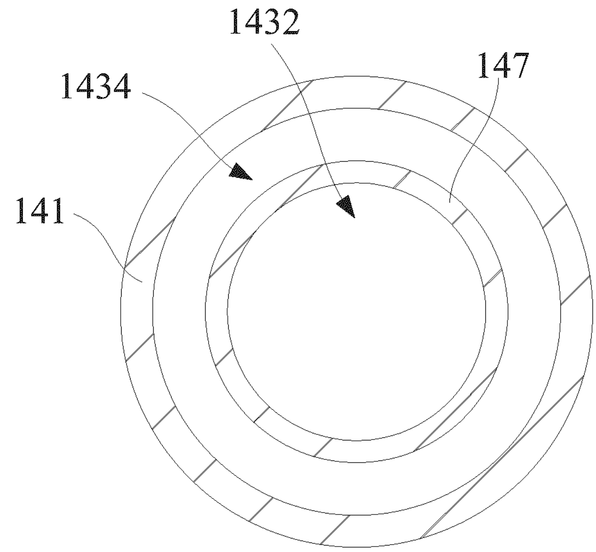

FIG. 8

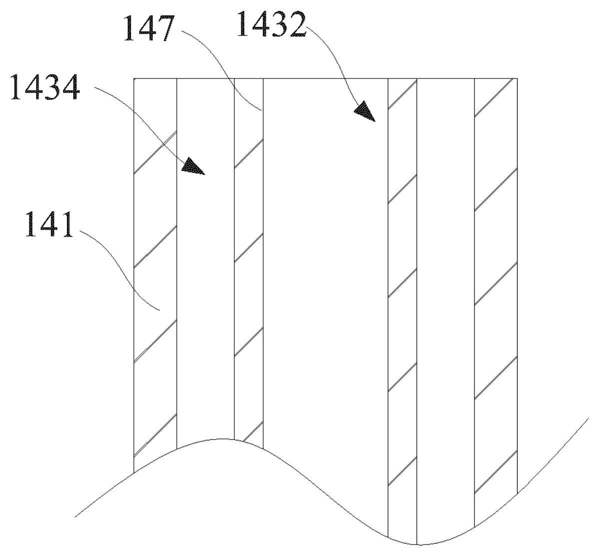

FIG. 9

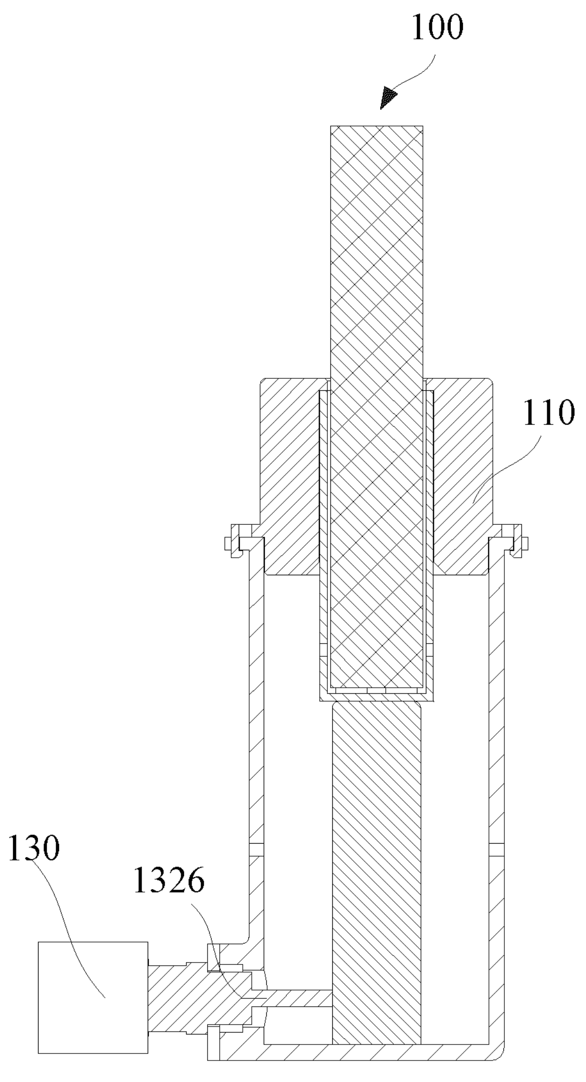

FIG. 10

INTERNATIONAL SEARCH REPORT

International application No.
PCT/CN2021/109220

A. CLASSIFICATION OF SUBJECT MATTER

A24F 40/00(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)

A24F40

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, ENTXTC, ENTXT, VEN: 微波, 谐振腔, 雾化, 谐振柱 microwave, resonant Cavity, atomization, resonant Column

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
Y	CN 108552614 A (CHINA TOBACCO YUNNAN INDUSTRIAL CO., LTD.) 21 September 2018 (2018-09-21) description, paragraphs 7-15, and figures 1-4	1-22
Y	CN 112438433 A (GREEN LIGHT LABORATORY (SHENZHEN) TECHNOLOGY CO., LTD.) 05 March 2021 (2021-03-05) description, paragraph 4, and figures 2-8	1-22
Y	CN 108552613 A (CHINA TOBACCO YUNNAN INDUSTRIAL CO., LTD.) 21 September 2018 (2018-09-21) description, paragraphs 7-15, and figures 1-4	1-22
A	WO 2021013477 A1 (PHILIP MORRIS PRODUCTS SA) 28 January 2021 (2021-01-28) entire document	1-22
A	WO 2021090022 A1 (NICOVENTURES TRADING LTD.) 14 May 2021 (2021-05-14) entire document	1-22

☐ Further documents are listed in the continuation of Box C. ☑ See patent family annex.

* Special categories of cited documents:
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- "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
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- "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

Date of the actual completion of the international search	Date of mailing of the international search report
27 April 2022	**07 May 2022**
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
Information on patent family members

International application No.
PCT/CN2021/109220

Patent document cited in search report	Publication date (day/month/year)	Patent family member(s)	Publication date (day/month/year)
CN 108552614 A	21 September 2018	None	
CN 112438433 A	05 March 2021	None	
CN 108552613 A	21 September 2018	WO 2020015223 A1	23 January 2020
WO 2021013477 A1	28 January 2021	IL 289384 D0	01 February 2022
WO 2021090022 A1	14 May 2021	GB 201916163 D0	18 December 2019

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