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(54) **ATOMISER AND ELECTRONIC ATOMISING APPARATUS**

(57) Provided in the present application are a vaporizer and an electronic vaporization device. The vaporizer includes: at least one inhalation opening; a liquid storage cavity, which is configured to store a liquid substrate; a vaporization assembly, which heats the liquid substrate to generate an aerosol; a holder, which at least partially accommodates or holds the vaporization assembly; and a vapor output pipe, which provides an airflow path for outputting the aerosol to the at least one inhalation opening. The vapor output pipe is provided with an air inlet end, which is connected to the holder in a fit manner. A protruding structure is provided on the holder, and the protruding structure is close to the air inlet end of the vapor output pipe, so as to guide a condensate which is generated in the vapor output pipe out of the vapor output pipe through the air inlet end. In the above vaporizer, an aerosol condensate in a vapor output pipe is guided out of the vapor output pipe via a protruding structure on a holder, thereby reducing or eliminating the inhalation of the condensate.

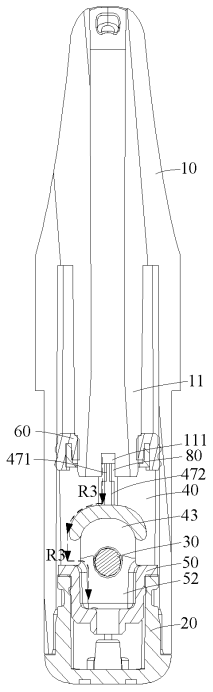

FIG. 9

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Description

CROSS-REFERENCE TO RELATED APPLICATIONS

[0001] The present application claims the priority of the earlier application with the application number 202110076302.7, submitted to the China National Intellectual Property Administration on January 20, 2021 and entitled "VAPORIZER AND ELECTRONIC VAPORIZATION DEVICE", which earlier application is incorporated herein by reference in its entirety.

TECHNICAL FIELD

[0002] Embodiments of the present application relate to the technical field of electronic vaporization devices, and in particular, to a vaporizer and an electronic vaporization device.

BACKGROUND

[0003] Tobacco products (e.g. cigarettes and cigars) burn tobacco during use to generate tobacco smoke. Attempts are made to replace these tobacco-burning products by making products that release compounds without burning.

[0004] An example of this type of product is a heating device that releases compounds by heating rather than burning materials. For example, the materials may be tobacco or other non-tobacco products. These non-tobacco products may include or not include nicotine. As another example, there are aerosol-providing articles, for example, a so-called e-cigarette device. These devices usually contain a liquid, and the liquid is heated to vaporize, so as to generate an inhalable vapor or aerosol. The liquid may contain nicotine, and/or aromatics, and/or aerosol-generation substances (e.g. glycerin). With regard to a known device such as a vaporizer, during the process from outputting to inhalation of the aerosol that is generated through heating and vaporizing, a condensate is formed on an inner wall of an output channel, and is inhaled along with an outputted airflow.

SUMMARY

[0005] The embodiments of the present application provide a vaporizer, which is configured to vaporize a liquid substrate to generate an aerosol, and includes an outer housing provided with at least one inhalation opening. The outer housing is internally provided with:

a liquid storage cavity, which is configured to store a liquid substrate;

a vaporization assembly, which is in fluid communication with the liquid storage cavity so as to draw the liquid substrate and heat the liquid substrate to generate an aerosol;

a holder, which is constructed to at least partially accommodate or hold the vaporization assembly; and

a vapor output pipe, which provides an airflow path for outputting the aerosol to the at least one inhalation opening, the vapor output pipe is provided with an air inlet end, which is connected to the holder in a fit manner.

[0006] A protruding structure is provided on the holder, and the protruding structure is close to the air inlet end of the vapor output pipe, so as to guide a condensate which is generated in the vapor output pipe out of the vapor output pipe through the air inlet end.

[0007] In the above vaporizer, an aerosol condensate in the vapor output pipe is guided out of the vapor output pipe via the protruding structure on the holder, thereby reducing or eliminating the inhalation of the condensate.

[0008] In a preferred implementation, there is no contact but a gap kept between the protruding structure and the vapor output pipe, such that the gap delimits and forms a capillary channel.

[0009] In the preferred implementation, a first notch located at the air inlet end is provided in the vapor output pipe, and the protruding structure at least partially extends into the first notch.

[0010] In the preferred implementation, the protruding structure is constructed to extend in a longitudinal direction of the outer housing, and have a first portion and a second portion, which are opposite each other in an extension direction. The first portion at least partially extends into the first notch, and the capillary channel is delimited between the first portion and the first notch. The second portion is located outside the first notch.

[0011] In the preferred implementation, the second portion has a width greater than that of the first portion; and/or

the second portion has an extension length greater than the length of the first portion.

[0012] In the preferred implementation, a flow guide groove is further provided in the protruding structure and configured to guide an aerosol condensate, which is adsorbed by the capillary channel, in a direction away from the vapor output pipe.

[0013] In the preferred implementation, the holder further includes a blocking portion, which extends in a longitudinal direction perpendicular to the outer housing, and the flow guide groove extends onto the blocking portion, so as to guide the aerosol condensate toward the blocking portion.

[0014] In the preferred implementation, at least a part of a surface of the blocking portion that is close to the vapor output pipe is constructed to be a curved arc.

[0015] In the preferred implementation, the vaporization assembly includes:

a liquid guide element, which extends in the longitudinal direction perpendicular to the outer housing, and is in fluid communication with the liquid storage

cavity to draw a liquid substrate; and
a heating element, which at least partially surrounds the liquid guide element, and is configured to heat at least a part of the liquid substrate in the liquid guide element to generate an aerosol.

[0016] A projection of the blocking portion in the longitudinal direction of the outer housing covers the heating element.

[0017] In the preferred implementation, the holder at least partially delimits a vaporization cavity, which surrounds at least a part of the vaporization assembly.

[0018] The protruding structure is at least partially located within the vaporization cavity to guide the aerosol condensate in the vapor output pipe toward the vaporization cavity.

[0019] In the preferred implementation, the air inlet end of the vapor output pipe has a width direction perpendicular to the longitudinal direction of the outer housing, and a thickness direction perpendicular to the width direction, and the size of the vapor output pipe in the width direction is greater than the size thereof in the thickness direction.

[0020] The first notch is located on at least one side of the vapor output pipe in the thickness direction.

[0021] In the preferred implementation, the vapor output pipe is constructed to have a cross section that is substantially elliptical.

[0022] In the preferred implementation, the air inlet end of the vapor output pipe is further provided with a second notch, which is located on at least one side of the vapor output pipe in the width direction.

[0023] In the preferred implementation, the width of the first notch is greater than the width of the second notch.

[0024] Another embodiment of the present application further provides an electronic vaporization device, including a vaporizer, which vaporizes a liquid substrate to generate an aerosol, and a power supply mechanism, which supplies power to the vaporization device. The vaporizer includes the described vaporizer.

BRIEF DESCRIPTION OF THE DRAWINGS

[0025] One or more embodiments are exemplarily described with reference to the corresponding figures in the accompanying drawings, and the exemplary descriptions are not to be construed as limiting the embodiments. Elements in the accompanying drawings that have same reference signs are represented as similar elements, and unless otherwise particularly stated, the figures in the accompanying drawings are not drawn to scale.

FIG. 1 is a schematic diagram of an electronic vaporization device provided in an embodiment of the present application.
FIG. 2 is a schematic structural diagram of an embodiment of a vaporizer in FIG. 1 from a perspective.
FIG. 3 is a schematic exploded diagram of the vaporizer in FIG. 2 from a perspective.
FIG. 4 is a schematic exploded diagram of the vaporizer in FIG. 2 from another perspective.
FIG. 5 is a schematic cross-sectional diagram of the vaporizer in FIG. 2 in a width direction.
FIG. 6 is a schematic diagram of a vaporization assembly in FIG. 4 that is mounted in an upper holder and a lower holder.
FIG. 7 is a schematic cross-sectional diagram of an outer housing in FIG. 3 from a perspective.
FIG. 8 is a schematic cross-sectional diagram of the upper holder in FIG. 3 from a perspective.
FIG. 9 is a schematic cross-sectional diagram of the vaporizer in FIG. 2 in a thickness direction.
FIG. 10 is a schematic structural diagram of an upper holder provided in another embodiment from a perspective; and
FIG. 11 is a schematic diagram of an air inlet end of a vapor output pipe in a main housing in another embodiment.

DETAILED DESCRIPTION

[0026] For ease of understanding of the present application, the present application is described in further details below with reference to the accompanying drawings and specific implementations.

[0027] The present application provides an electronic vaporization device. Referring to FIG. 1, the electronic vaporization device includes a vaporizer 100, which stores a liquid substrate and vaporizes same to generate an aerosol; and a power supply mechanism 200, which supplies power to the vaporizer 100.

[0028] In an optional implementation, for example, as shown in FIG. 1, the power supply mechanism 200 includes a receiving cavity 270, which is provided at an end in a length direction and configured to receive and accommodate at least a part of the vaporizer 100; and a first electrical contact 230, which is at least partially exposed on a surface of the receiving cavity 270, and configured to be electrically connected to the vaporizer 100 to supply power to the vaporizer 100 when at least a part of the vaporizer 100 is received and accommodated in the power supply mechanism 200.

[0029] According to the preferred implementation shown in FIG. 1, an end part of the vaporizer 100 opposite to the power supply mechanism 200 in the length direction is provided with a second electrical contact 21, such that when at least a part of the vaporizer 100 is received in the receiving cavity 270, the second electrical contact 21 is in contact with and abuts against the first electrical contact 230 so as to form an electrically conductive connection.

[0030] A sealing member 260 is arranged in the power supply mechanism 200, and at least a part of an internal space of the power supply mechanism 200 is separated by the sealing member 260 to form the receiving cavity 270. In the preferred implementation shown in FIG. 1, the sealing member 260 is constructed to extend in a

cross section direction of the power supply mechanism 200, and is made of a flexible material, so as to prevent the liquid substrate, which seeps from the vaporizer 100 to the receiving cavity 270, from flowing to components such as a controller 220 and a sensor 250 in the power supply mechanism 200.

[0031] In the preferred implementation shown in FIG. 1, the power supply mechanism 200 further includes a battery cell 210, which is close to another end in the length direction relative to the receiving cavity 270, and is configured to supply power; and the controller 220, which is arranged between the battery cell 210 and an accommodating cavity, the controller 220 operably guiding a current between the battery cell 210 and the first electrical contact 230.

[0032] When in use, the power supply mechanism 200 includes the sensor 250, which is configured to sense a vaping airflow generated when vaping is performed via a vaping nozzle cap 20 of the vaporizer 100, such that the controller 220 controls the battery cell 210 to output a current to the vaporizer 100 according to a detection signal of the sensor 250.

[0033] Furthermore, in the preferred implementation shown in FIG. 1, a charging interface 240 is provided at another end of the power supply mechanism 200 that faces away from the receiving cavity 270, and is configured to charge the battery cell 210 after being connected to an external charging device.

[0034] FIG. 2 shows a specific schematic structural diagram of the vaporizer 100 in an embodiment of the present application. In the embodiment, the vaporizer 100 as a whole is of an elongate flat shape, and has a proximal end 110 and a distal end 120, which are opposite each other in the length direction. When in use, the proximal end 110 serves as an end used by a user to vape by the mouth, and the distal end 120 is an end that is received in the power supply mechanism 200. An external construction includes:

a main housing 10, which is of a hollow cylindrical shape, with an end part close to the distal end 120 being an opening; and

an end cover 20, which is disposed at the distal end 120 of the vaporizer 100, and closes the opening of the main housing 10, such that the main housing and the end cover together form a completed housing of the vaporizer 100.

[0035] Furthermore, as shown in FIG. 2, the second electrical contact 21 of the vaporizer 100 penetrates the interior of the vaporizer from the distal end 120, and is at least partially exposed on a surface of the end cover 20, such that the second electrical contact easily forms an electrically conductive connection with the power supply mechanism 200 when in use. Moreover, an air inlet 22 is further provided at the distal end 120 of the vaporizer 100, and is configured in such a way that external air enters the vaporizer 100 when the user vapes.

[0036] Moreover, in another optional implementation, the vaporizer 100 is further provided with a magnetic attraction element (not shown in the figures), which penetrates the interior of the vaporizer from the distal end 120, and when in use, the magnetic attraction element magnetically attracts the power supply mechanism 200, such that the vaporizer 100 is stably held in the power supply mechanism 200.

[0037] Furthermore, FIG. 3 to FIG. 5 show a schematic diagram of an internal structure of the vaporizer 100 in FIG. 2, and a schematic exploded diagram of some components thereof. As shown in FIG. 3 and FIG. 5, the vaporizer 100 further includes:

a vapor output pipe 11, which extends in an axial direction of the main housing 10, with an upper end thereof being in airflow communication with an inhalation opening A at an upper end of the main housing 10 to output an aerosol generated in the vaporizer 100 to the inhalation opening A for inhalation;

a liquid storage cavity 12, which is formed by a space between the vapor output pipe 11 and an inner wall of the main housing 10, and is configured to store a liquid substrate; and

a vaporization assembly 30, which is configured to draw the liquid substrate from the liquid storage cavity 12 by capillary infiltration, and heat and vaporize the drawn liquid substrate to generate an aerosol for inhalation. Specifically, the vaporization assembly 30 includes a liquid guide element 31 and a heating element 32, which at least partially surrounds the liquid guide element 31. As shown in FIG. 3 and FIG. 4, the liquid guide element 31 is constructed to extend in a width direction of the main housing 10, two ends thereof being exposed or being in fluid communication with the liquid storage cavity 12. The liquid substrate in the liquid storage cavity 12 is absorbed by the two ends of the liquid guide element 31 and then transferred inward along an arrow R1 as shown in FIG. 4. The heating element 32 surrounds or is wound on at least a part of the liquid guide element 31, and is configured to heat at least a part of the liquid substrate in the liquid guide element 31 to generate an aerosol for inhalation.

[0038] In an optional implementation, the liquid guide element 31 may be made of or include a porous ceramics body, fiber wool, a fiber rope, a porous material, etc. The heating element 32 may be made of a resistive metal material, for example, iron, nickel, chromium or an alloy of them, etc.

[0039] Further referring to FIG. 3 to FIG. 5, the rigid upper holder 40 and the flexible lower holder 50 are assembled in the main housing 10 to fix the vaporization assembly 30. Specifically referring to FIG. 3 and FIG. 4, a clamping arm 44 extending out is arranged on the upper holder 40, and the vaporization assembly 30 abuts against or is clamped on the lower holder 50 by the clamp-

ing arm 44. Moreover, a first concave cavity 43 facing the lower holder 50 is provided in the upper holder 40, and a second concave cavity 52 facing the upper holder 40 is provided in the lower holder 50, such that, after assembly, the first concave cavity 43 and the second concave cavity 52 together form a vaporization cavity, which encircles or surrounds the vaporization assembly 30 and accommodates an aerosol that is released and generated.

[0040] In a preferred implementation shown in FIG. 4, a carrying groove 51 that is opposite an end part of the liquid guide element 31 is further provided in the lower holder 50, and is configured to carry a liquid substrate that seeps from the end part of the liquid guide element 31.

[0041] To facilitate the sealing of a gap between the upper holder 40 and the liquid storage cavity 12, the vaporizer 100 further includes a sealing element 60, which is at least partially located between the upper holder 40 and the liquid storage cavity 12, so as to seal the liquid storage cavity 12. The liquid guide element 31 and the heating element 32, after being mounted, are both mainly accommodated within the vaporization cavity to release a generated aerosol to the vaporization cavity, and the aerosol is outputted to the vapor output pipe 11 through a first insertion hole 61 in the sealing element 60.

[0042] Furthermore, a bottom wall of the second concave cavity 52 of the lower holder 50 is further provided with a hole 53, which is opposite the air inlet 22 in the end cover 20, and external air entering from the air inlet hole 22 enters the vaporization cavity through the hole 53.

[0043] With regard to a design of an outputted airflow of an aerosol, the upper holder 40 is provided with a second insertion hole 41. The end part of the vapor output pipe 11 penetrates the first insertion hole 61 in the sealing element 60 and is then further inserted into the second insertion hole 41. Two sides of the upper holder 40 in the thickness direction are provided with output channels 45, such that the aerosol within the vaporization cavity is outputted to the vapor output pipe 11 along an arrow R2 shown in FIG. 3 and FIG. 6.

[0044] To cooperate with the vaporization assembly 30 for liquid guide, the sealing element 60 is provided with a first liquid guide hole 62 for the liquid substrate to flow toward the upper holder 40. The upper holder 40 is further provided with a second liquid guide hole 42. When in use, the liquid substrate in the liquid storage cavity 12 sequentially passes through the first liquid guide hole 62 and the second liquid guide hole 42, and is transferred to the vaporization assembly 30 and is absorbed and vaporized.

[0045] Furthermore, in a preferred implementation shown in FIG. 8 and FIG. 9, a transversely extending blocking portion 46 is arranged in the upper holder 40, and the blocking portion delimits the first concave cavity 43. A projection of the blocking portion 46 in the longitudinal direction of the vaporizer 100 covers the heating element 32, such that, when in use, the blocking portion can block large droplets formed by an e-liquid blast during a heating process of the heating element 32; moreover, the blocking portion can also block a condensate and the like within the vaporization cavity, preventing same from directly flowing toward the vapor output pipe 11.

[0046] Further referring to the preferred embodiment shown in FIG. 6 to FIG. 9, a lower end part of the vapor output pipe 11 that is inserted into the upper holder 40 is provided with at least one notch 111, and the upper holder 40 is provided with a ridge 47, which fits the notch 111. Specifically, in FIG. 8, the ridge 47 extends in the longitudinal direction of the vaporizer 100, and has two portions having different widths, i.e. a first portion 471 that is close to the vapor output pipe 11, and a second portion 472 that is relatively away from the vapor output pipe 11. The first portion 471 has a smaller width than the second portion 472, and the first portion 471 is thinner than the second portion 472 in terms of form. In the implementation shown in FIG. 9, the first portion 471 has a width of approximately 0.3 mm to 0.8 mm, and the second portion 472 has a width of approximately 0.8 mm to 1.5 mm. The notch 111 has a width of approximately 1.2 mm.

[0047] The form after assembly is as shown in FIG. 9. The first portion 471 at least partially extends into the notch 111 at the lower end of the vapor output pipe 11, and the second portion 472 is located outside the notch 111. Moreover, after assembly, two side surfaces of the first portion 471 are not in contact with two side surfaces of the notch 111, and according to FIG. 9, there is spacing kept between the two side surfaces of the first portion 471 and the two side surfaces of the notch 111. Furthermore, the spacing is controlled smaller than 2 mm, so as to form the capillary channel 80 that longitudinally extends. Therefore, during use, when an aerosol condensate formed on an inner wall of the vapor output pipe 11 falls or flows downward to a lower end under gravity, the condensate at the lower end of the vapor output pipe 11 is guided downward into the holder 40 by a capillary adsorbing and guiding acting force of the capillary channel 80, so as to avoid the condensate from accumulating at the inner wall or the lower end of the vapor output pipe 11, thereby alleviating or eliminating the problem of inhaling the condensate.

[0048] Further referring to the preferred implementation shown in FIG. 8, a lower end of the ridge 47 is connected to the blocking portion 46, such that the condensate that is drawn and guided by the capillary channel 80 drips onto the blocking portion 46. In the preferred implementation shown in FIG. 8 and FIG. 9, the blocking portion 46 is arc-shaped, and thus the condensate that subsequently flows and falls onto the blocking portion 46 is guided downward from an upper surface of the arc, so as to flow and fall into the vaporization cavity, as indicated by an arrow R3 shown in FIG. 9.

[0049] In the preferred implementation shown in FIG. 8, the extension length of the second portion 472 is greater than that of the first portion 471. In the implementation, the length of the second portion 472 is approximately 3

mm, and the length of the first portion 471 is approximately 2 mm.

[0050] Furthermore, in another optional implementation, the ridge 47 further includes a flow guide groove 473, which is delimited by the second portion 472 and a wall of the upper holder 40. In FIG. 8, there is the flow guide groove 473 at a portion where the second portion 472 is combined with the upper holder 40, and the flow guide groove 473 further facilitates quickly guiding the condensate, which is transferred by the capillary channel 80, onto the blocking portion 46, avoiding the condensate from being adsorbed and held in the capillary channel 80 between the first portion 471 and the vapor output pipe 11.

[0051] In another variant implementation, the vaporization assembly 30 may also be a currently common vaporization assembly that is made of porous ceramics. The porous ceramics may be the porous ceramics body that has a transversely penetrating liquid channel as provided by the applicant in the patent No. 201920645593.5, or common cup-shaped ceramics that is provided with a groove in an upper surface thereof. When being assembled, the liquid substrate is also accommodated, held and transferred to the porous ceramics by the upper holder 50.

[0052] In another optional or variant implementation, the ridge 47 may change into another shape or position. For example, FIG. 10 shows a schematic structural diagram of another upper holder 50a that is provided with a ridge 47a. The size of the ridge 47a in FIG. 10 is larger than that of the ridge 47 in FIG. 8. In terms of shape, the ridge 47a is also provided with a first portion 471a and a second portion 472a, moreover, a longitudinally extending flow guide groove 473a is formed at a portion where the second portion 472a is joined to a wall 400a of the upper holder 40a, transferring the condensate downward more quickly.

[0053] The first portion 471a is closer to the center than the first portion 471, and is also not in contact with the wall 400a of the upper holder 40a, such that an accommodating space 4711a is formed between the first portion 471a and the wall. After assembly, the notch 111 at the lower end of the vapor output pipe 11 extends into the accommodating space 4711a, such that the space of the capillary channel 80 between the ridge 47a and the vapor output pipe 11 can be further enlarged, which is conducive to the receiving and accommodating of more aerosol condensate. Similarly, after assembly, a part of the first portion 471a still extends into the notch 111 of the vapor output pipe 11, and certain spacing is kept, forming the capillary channel that adsorbs and transfers the condensate at the lower end of the vapor output pipe 11.

[0054] FIG. 11 shows a schematic diagram of a vapor output pipe 11a that is manufactured in a main housing 10a in another embodiment. In the implementation shown in FIG. 11, the cross-sectional shape of the vapor output pipe 11a is a flat shape, and preferably an elliptical shape. Moreover, the elliptical shape takes the width direction of the main housing 10a as a long axis B1 and the thickness direction of the main housing 10a as a short axis B2, such that the condensate in the vapor output pipe 11a tends more to accumulate at an end part of the long axis B1 that has a larger curvature. Therefore, the end part of the vapor output pipe 11a is provided with a second notch 112a close to at least one side of the main housing 10a in the width direction. By using the second notch 112a, the end part of the long axis B 1 that has the larger curvature forms a hollowed space, and thus the condensate is prevented from accumulating here and turns to more accumulate to a position close to the first notch 111a, and is then guided into the vaporization cavity more easily under the cooperation of the ridge 47. Certainly, to further fit the elliptical or flat vapor output pipe 11a, the first insertion hole 61 and the second insertion hole 41 above are also of a flat or elliptical shape for fitting. Similarly, in conjunction with the above implementations, the position of the ridge 47 needs to be adjusted to fit the first notch 111a to form the capillary channel, so as to guide the aerosol condensate.

[0055] In a preferred implementation shown in FIG. 11, the first notch 111a has a width greater than that of the second notch 112a. In the implementation, the width of the first notch 111a is approximately 2.4 mm, and the width of the second notch 112a is approximately 1 mm.

[0056] To be sure, the description of the present application and the accompanying drawings thereof illustrate preferred embodiments of the present application, but are not limited to the embodiments described in this description; furthermore, a person of ordinary skill in the art may make improvements or modifications according to the foregoing description, and all the improvements and modifications shall fall within the scope of protection of the appended claims of the present application.

Claims

1. A vaporizer, configured to vaporize a liquid substrate to generate an aerosol, and comprising an outer housing, which is provided with at least one inhalation opening, **characterized in that**, the outer housing being internally provided with:

   a liquid storage cavity, which is configured to store a liquid substrate;
   a vaporization assembly, which is in fluid communication with the liquid storage cavity so as to draw the liquid substrate and heat the liquid substrate to generate an aerosol;
   a holder, which is constructed to at least partially accommodate or hold the vaporization assembly; and
   a vapor output pipe, which provides an airflow path for outputting the aerosol to the at least one inhalation opening, the vapor output pipe being provided with an air inlet end, which is connected

to the holder in a fit manner,
a protruding structure being provided on the holder, and the protruding structure being close to the air inlet end of the vapor output pipe, so as to guide a condensate which is generated in the vapor output pipe out of the vapor output pipe through the air inlet end.

2. The vaporizer according to claim 1, wherein there is no contact but a gap kept between the protruding structure and the vapor output pipe, such that the gap delimits and forms a capillary channel.

3. The vaporizer according to claim 1 or 2, wherein a first notch located at the air inlet end is provided in the vapor output pipe; and the protruding structure at least partially extends into the first notch.

4. The vaporizer according to claim 3, wherein the protruding structure is constructed to extend in a longitudinal direction of the outer housing, and have a first portion and a second portion, which are opposite each other in an extension direction; the first portion at least partially extends into the first notch, and the capillary channel is delimited between the first portion and the first notch; and the second portion is located outside the first notch.

5. The vaporizer according to claim 4, wherein the second portion has a width greater than that of the first portion; and/or
the second portion has an extension length greater than the length of the first portion.

6. The vaporizer according to claim 1 or 2, wherein a flow guide groove is further provided in the protruding structure and configured to guide an aerosol condensate, which is adsorbed by the capillary channel, in a direction away from the vapor output pipe.

7. The vaporizer according to claim 6, wherein the holder further comprises a blocking portion, which extends in a longitudinal direction perpendicular to the outer housing, and the flow guide groove extends onto the blocking portion, so as to guide the aerosol condensate toward the blocking portion.

8. The vaporizer according to claim 7, wherein at least a part of a surface of the blocking portion that is close to the vapor output pipe is constructed to be a curved arc.

9. The vaporizer according to claim 7, wherein the vaporization assembly comprises:

a liquid guide element, which extends in the longitudinal direction perpendicular to the outer housing, and is in fluid communication with the liquid storage cavity to draw a liquid substrate; and
a heating element, which at least partially surrounds the liquid guide element, and is configured to heat at least a part of the liquid substrate in the liquid guide element to generate an aerosol,
wherein a projection of the blocking portion in the longitudinal direction of the outer housing covers the heating element.

10. The vaporizer according to claim 1 or 2, wherein the holder at least partially delimits a vaporization cavity, which surrounds at least a part of the vaporization assembly; and
the protruding structure is at least partially located within the vaporization cavity to guide the aerosol condensate in the vapor output pipe toward the vaporization cavity.

11. The vaporizer according to claim 3, wherein the air inlet end of the vapor output pipe has a width direction perpendicular to the longitudinal direction of the outer housing, and a thickness direction perpendicular to the width direction, and the size of the vapor output pipe in the width direction is greater than the size thereof in the thickness direction; and
the first notch is located on at least one side of the vapor output pipe in the thickness direction.

12. The vaporizer according to claim 11, wherein the vapor output pipe is constructed to have a cross section that is substantially elliptical.

13. The vaporizer according to claim 11, wherein the air inlet end of the vapor output pipe is further provided with a second notch, which is located on at least one side of the vapor output pipe in the width direction.

14. The vaporizer according to claim 13, wherein the width of the first notch is greater than the width of the second notch.

15. An electronic vaporization device, comprising a vaporizer, which vaporizes a liquid substrate to generate an aerosol, and a power supply mechanism, which supplies power to the vaporization device, **characterized in that**, the vaporizer comprising the vaporizer according to any one of claims 1 to 14.

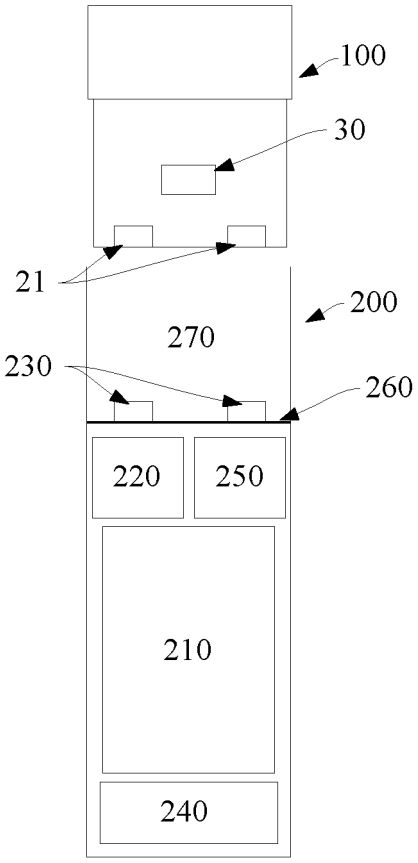


FIG. 1

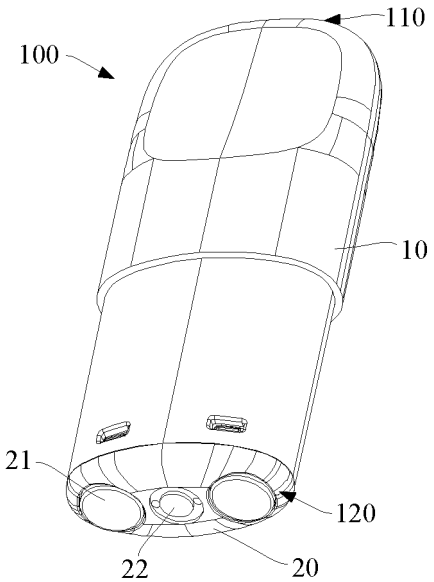


FIG. 2

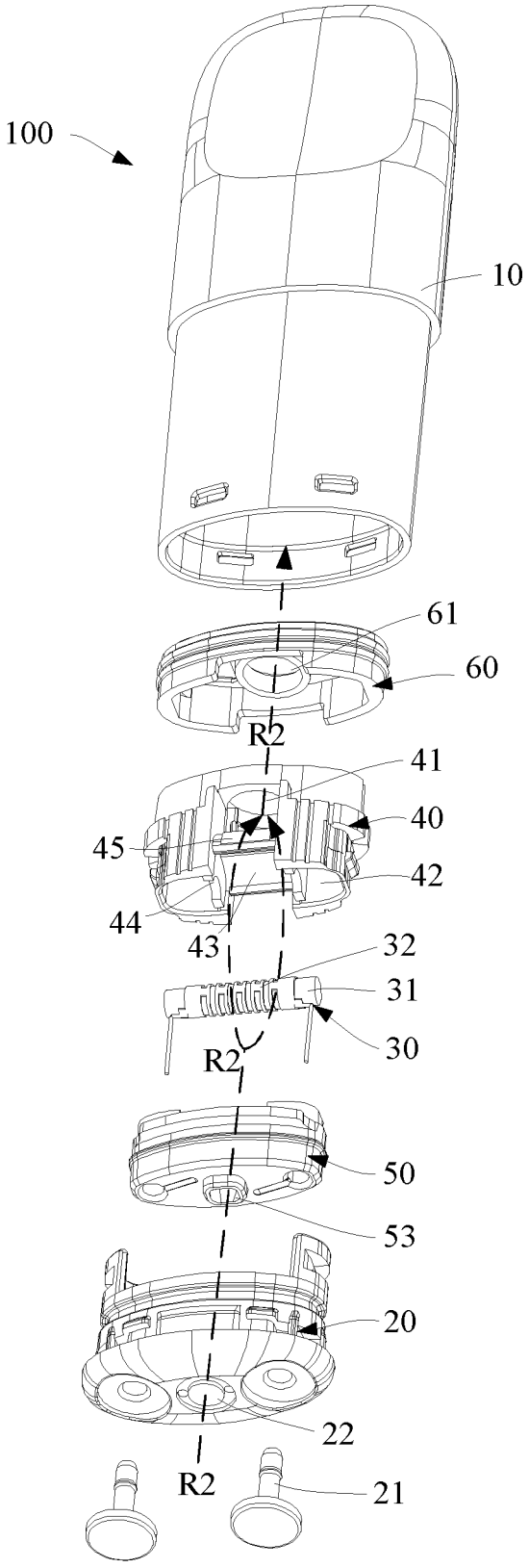


FIG. 3

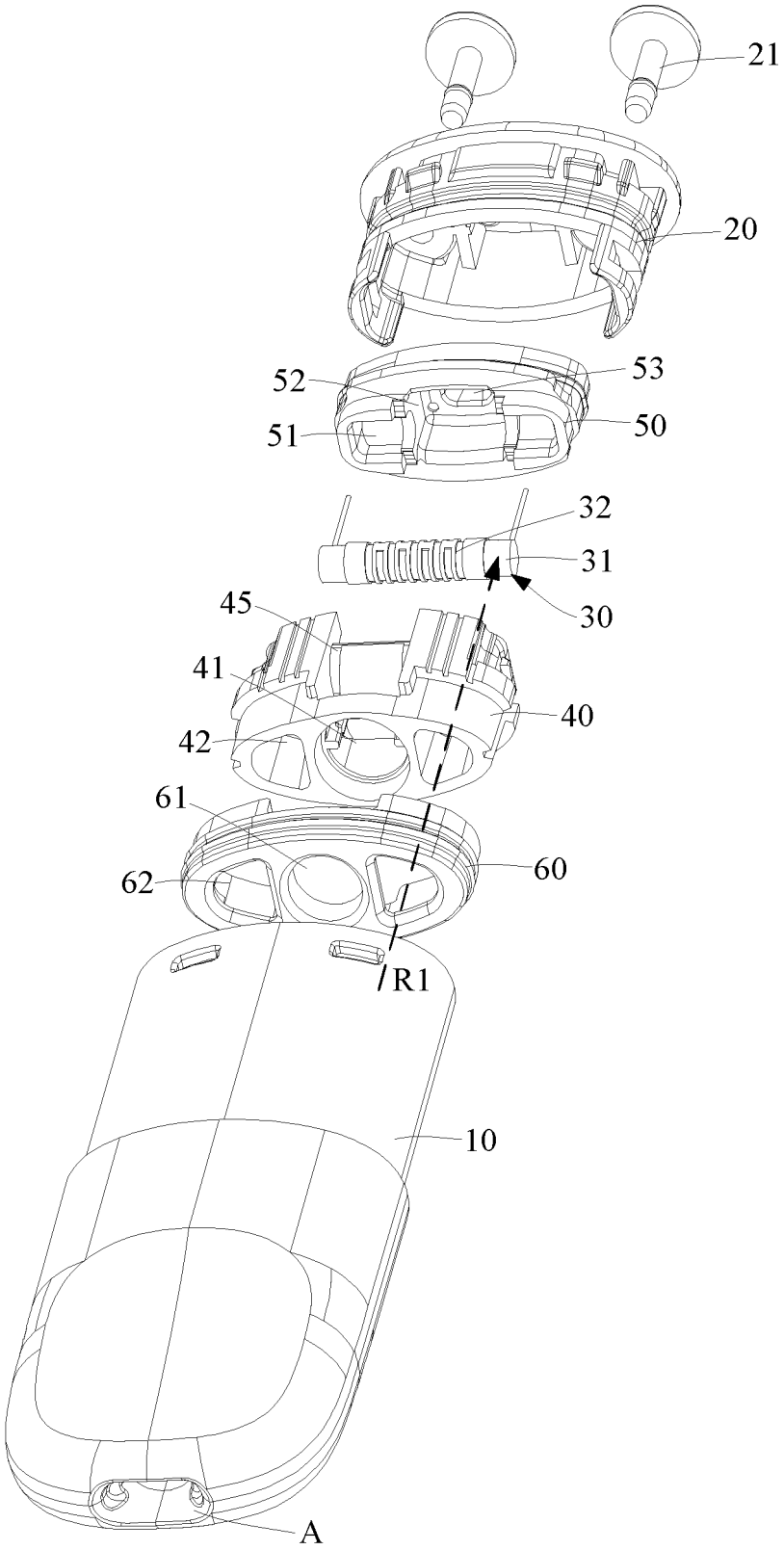
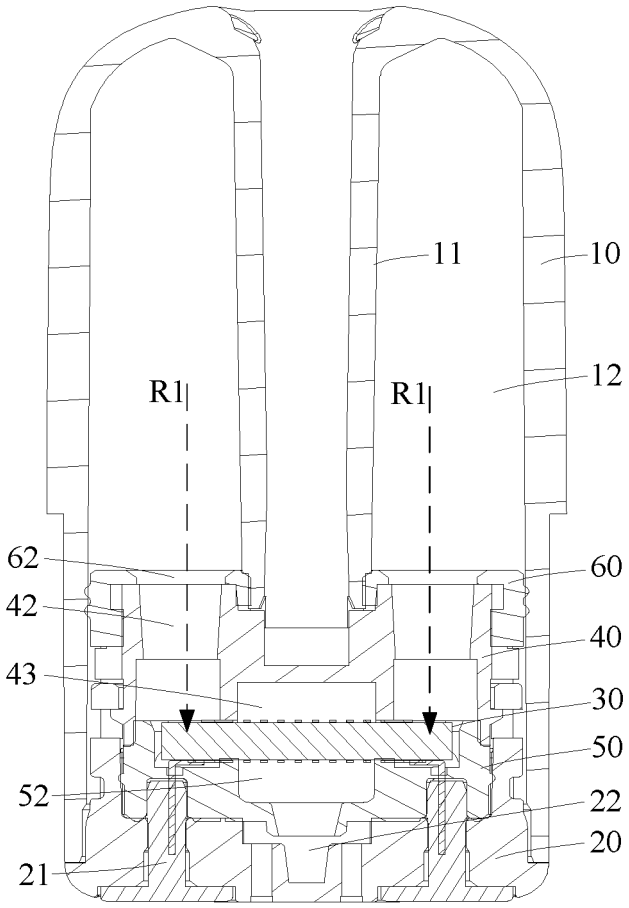


FIG. 4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R1
R1
12
62
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42
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43
30
50
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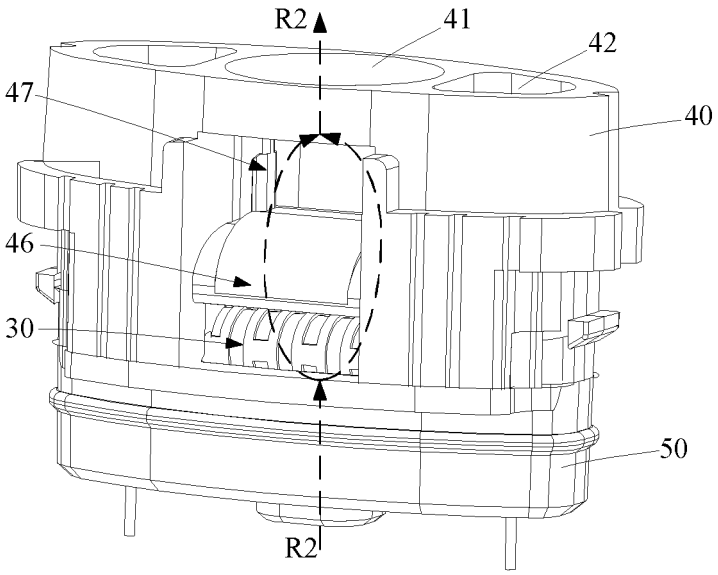
22
20
21

FIG. 5


R2
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46
30
50
R2

FIG. 6

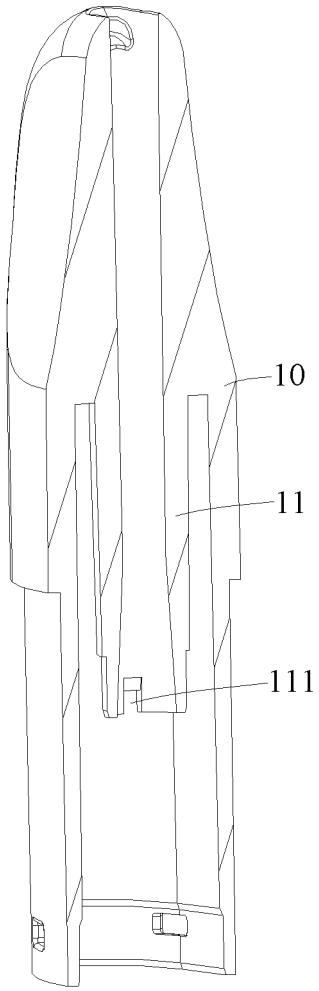


FIG. 7

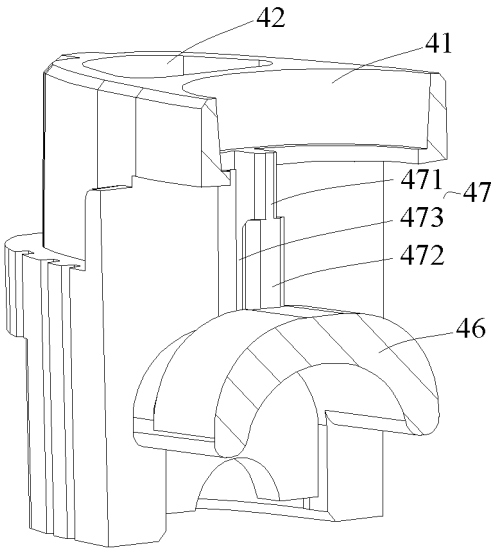
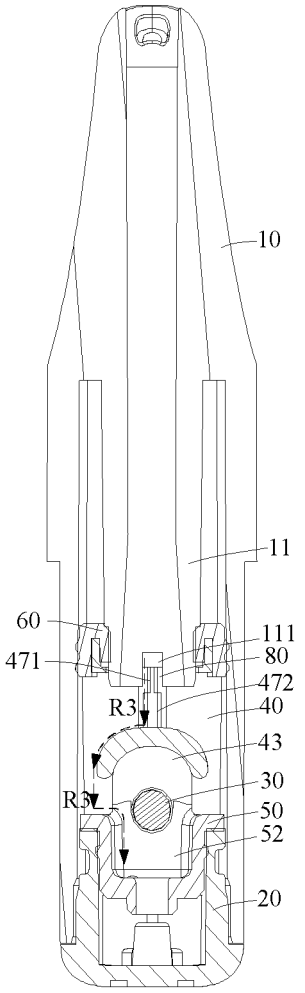


FIG. 8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472
R3
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43
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R3
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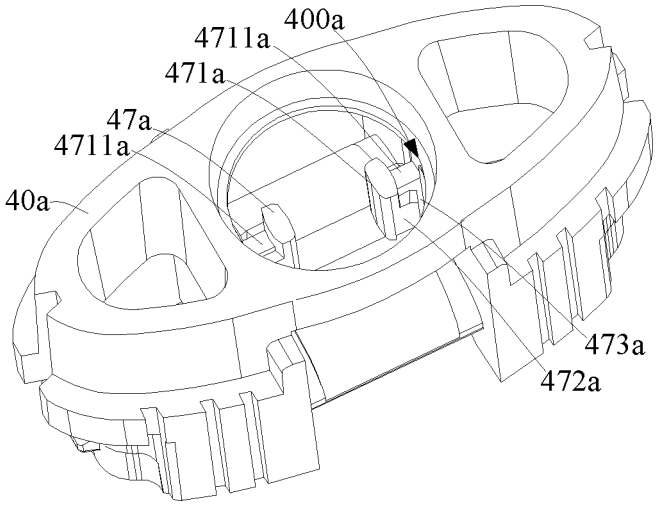
52
20

FIG. 9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4711a
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473a
472a

FIG. 10

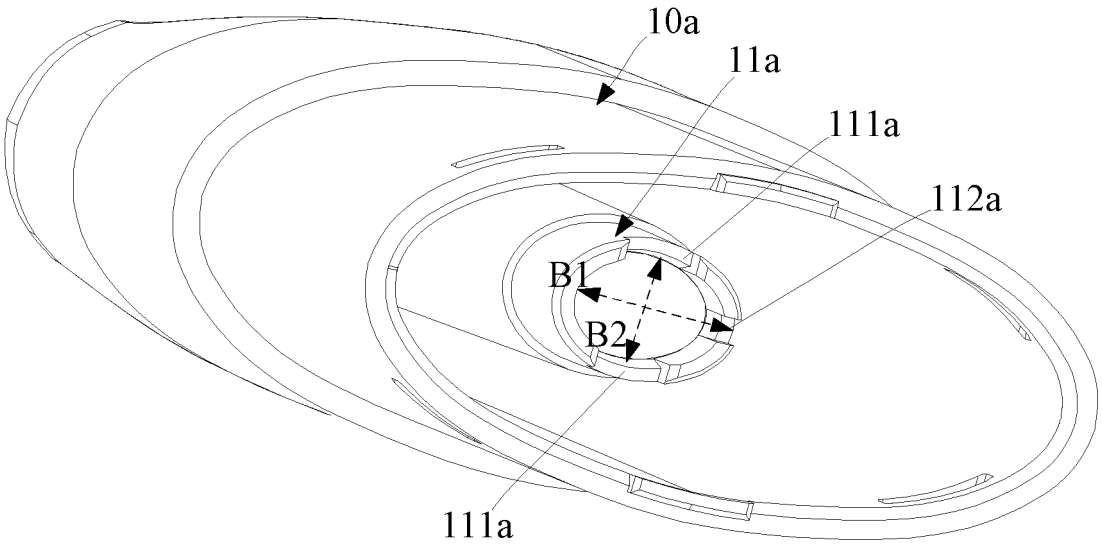

FIG. 11

INTERNATIONAL SEARCH REPORT

International application No.
PCT/CN2022/072793

A. CLASSIFICATION OF SUBJECT MATTER

A24F 40/10(2020.01)i; A24F 40/40(2020.01)i; A24F 47/00(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; A24F47

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)

CNABS; VEN; CNTXT; ENTXTC; WPABSC: 电子烟, 雾化, 气溶胶, 凸起, 突起, 遮挡, 挡片, 冷凝, 液体, 液滴; electronic cigarette, atomiser, aerosol, heave, swell, convex, shelter, cover, condens+, liquid, fluid drop

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
PX	CN 215347034 U (SHENZHEN FIRST UNION TECHNOLOGY CO., LTD.) 31 December 2021 (2021-12-31) description, paragraphs 44-77, and figures 1-11	1-15
X	WO 2020259692 A1 (SHENZHEN FIRST UNION TECH. CO.) 30 December 2020 (2020-12-30) description, pages 7-11, and figures 11-20	1-3, 6-15
X	CN 206119187 U (CHANGZHOU PAITENG ELECTRONIC TECHNOLOGY SERVICE CO., LTD.) 26 April 2017 (2017-04-26) description paragraphs 43-45, figure 2	1-3, 6-15
A	CN 110638102 A (SHENZHEN SMOORE TECHNOLOGY LIMITED) 03 January 2020 (2020-01-03) entire document	1-15
A	CN 110236233 A (YANG, Shuang) 17 September 2019 (2019-09-17) entire document	1-15
A	CN 212088061 U (SHENZHEN RELX TECH. CO., LTD.) 08 December 2020 (2020-12-08) entire document	1-15

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

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"&" document member of the same patent family

Date of the actual completion of the international search	Date of mailing of the international search report
08 March 2022	**28 March 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

International application No.
PCT/CN2022/072793

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	CN 211932550 U (CHINA TOBACCO YUNNAN INDUSTRIAL L.L.C.) 17 November 2020 (2020-11-17) entire document	1-15
A	CN 211746937 U (CHANGZHOU PAITENG ELECTRONIC TECHNOLOGY SERVICE CO., LTD.) 27 October 2020 (2020-10-27) entire document	1-15
A	CN 210869884 U (CHANGZHOU PAITENG ELECTRONIC TECHNOLOGY SERVICE CO., LTD.) 30 June 2020 (2020-06-30) entire document	1-15
A	CN 210299478 U (SHENZHEN WOODY VAPES TECHNOLOGY CO., LTD.) 14 April 2020 (2020-04-14) entire document	1-15
A	US 2013333700 A1 (BUCHBERGER HELMUT et al.) 19 December 2013 (2013-12-19) entire document	1-15

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INTERNATIONAL SEARCH REPORT
Information on patent family members

International application No.
PCT/CN2022/072793

Patent document cited in search report	Publication date (day/month/year)	Patent family member(s)	Publication date (day/month/year)
CN 215347034 U	31 December 2021	None	
WO 2020259692 A1	30 December 2020	CN 210611013 U	26 May 2020
CN 206119187 U	26 April 2017	US 2018116289 A1	03 May 2018
		US 10334886 B2	02 July 2019
CN 110638102 A	03 January 2020	CN 211091889 U	28 July 2020
CN 110236233 A	17 September 2019	None	
CN 212088061 U	08 December 2020	CN 110574970 A	17 December 2019
CN 211932550 U	17 November 2020	CN 111109685 A	08 May 2020
CN 211746937 U	27 October 2020	WO 2021159915 A1	19 August 2021
CN 210869884 U	30 June 2020	None	
CN 210299478 U	14 April 2020	None	
US 2013333700 A1	19 December 2013	AU 2012214085 A1	16 August 2012
		AU 2012214085 A8	29 August 2013
		AU 2012214085 B2	09 July 2015
		PL 2672847 T3	30 October 2015
		JP 2014511175 A	15 May 2014
		JP 5681819 B2	11 March 2015
		HK 1250206 A1	07 December 2018
		CN 103491815 A	01 January 2014
		CN 103491815 B	20 January 2016
		US 2021204602 A1	08 July 2021
		US 2018280653 A1	04 October 2018
		US 10918820 B2	16 February 2021
		HU E026804 T2	28 July 2016
		US 2014238396 A1	28 August 2014
		US 10010695 B2	03 July 2018
		US 8752545 B2	17 June 2014
		WO 2012106739 A1	16 August 2012
		ES 2543312 T3	18 August 2015
		CA 2824970 A1	16 August 2012
		CA 2824970 C	03 May 2016
		EP 2672847 A1	18 December 2013
		EP 2672847 B1	22 April 2015
		AT 510837 A4	15 July 2012
		AT 510837 B1	15 July 2012
		TW 201317014 A	01 May 2013

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REFERENCES CITED IN THE DESCRIPTION

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Patent documents cited in the description

- CN 202110076302 **[0001]**
- WO 201920645593 A **[0051]**