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(54) **ATOMIZER AND ELECTRONIC ATOMIZING DEVICE**

(57) This application provides a vaporizer and an electronic vaporization device. The vaporizer includes: a housing, having a liquid storage cavity formed therein; a vaporization assembly, having a vaporization surface and configured to vaporize a liquid substrate to generate an aerosol; a support, including a holding space configured to hold the vaporization assembly; a flexible seal element, having an interference fit region, and configured to provide a seal between the housing and the vaporization assembly through an interference fit of a partial region to prevent the liquid substrate from flowing out from the liquid storage cavity through a region other than the vaporization surface; and an air channel, configured to provide an airflow path for air to enter the liquid storage cavity, where the airflow path avoids the interference fit region, and the air channel includes a first part extending from an outer surface of the support to an inner surface of the holding space, and a second part extending between the seal element and a surface of the support. Through the vaporizer, air is supplemented to the liquid storage cavity through the air channel including an interference fit part that avoids the seal element, to relieve or balance a negative pressure of the liquid storage cavity.

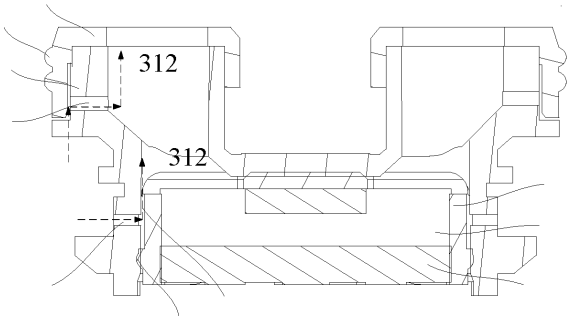

FIG. 9

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Description

CROSS-REFERENCE TO RELATED APPLICATIONS

[0001] This application claims priority to Chinese Patent Application No. 202120513630.4, filed with the China National Intellectual Property Administration on March 11, 2021 and entitled "VAPORIZER AND ELECTRONIC VAPORIZATION DEVICE", which is incorporated herein by reference in its entirety.

TECHNICAL FIELD

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

BACKGROUND

[0003] There are aerosol-providing products, for example, e-cigarette devices. The devices generally include e-liquid. The e-liquid is heated to be vaporized, so as to generate an inhalable vapor or aerosol. The e-liquid may include nicotine and/or a fragrance composite and/or an aerosol-generation article (for example, glycerol). In addition to the fragrance composite in the e-liquid,
an existing e-cigarette device generally includes a porous ceramic body that has a large amount of micropores provided inside and is configured to absorb and conduct the e-liquid, and a heating element is arranged on a surface of the porous ceramic body and configured to heat and vaporize the absorbed e-liquid. The micropores in the porous body are used as channels for the e-liquid to infiltrate and flow to a vaporization surface, and also used as air exchange channels for air to enter a liquid storage cavity from the outside to serve as a supplement to maintain balance of the air pressure in the liquid storage cavity after the e-liquid in the liquid storage cavity is consumed, so that bubbles are generated in the porous ceramic body when the e-liquid is heated, vaporized, and consumed, and then the bubbles emerge from a liquid absorbing surface and then enter the liquid storage cavity.

[0004] For the existing e-cigarette device, as the e-liquid in the liquid storage cavity is consumed, the liquid storage cavity is gradually in a negative pressure state, preventing fluid transfer to a certain extent, so that the e-liquid is less conveyed to the vaporization surface through the micropore channels of the porous ceramic body for vaporization. Particularly, when the existing e-cigarette device is in a continuous inhaling and use state, the air outside the liquid storage cavity is difficult to pass through the micropore channels of the porous ceramic body to enter the liquid storage cavity in a short time, to slow down the speed of conveying the e-liquid to the vaporization surface, and insufficient e-liquid supplied to the heating element will cause the temperature of the heating element to be excessively high, resulting in decomposition and volatilization of the e-liquid components to generate harmful substances such as formaldehyde.

SUMMARY

[0005] An embodiment of this application provides a vaporizer, configured to vaporize a liquid substrate to generate an aerosol, and including:

a housing, where a liquid storage cavity configured to store a liquid substrate is formed in the housing;
a vaporization assembly, having a vaporization surface and configured to vaporize at least part of the liquid substrate to generate an aerosol;
a support, including a holding space in fluid communication with the liquid storage cavity, where the vaporization assembly is at least partially accommodated in the holding space;
a flexible seal element, having an interference fit region, where the seal element is configured to provide a seal between the housing and the vaporization assembly through the interference fit region, or to provide a seal between the support and the vaporization assembly; and
an air channel, configured to provide an airflow path for air to enter the liquid storage cavity, where the airflow path avoids the interference fit region, and the air channel includes a first part extending from an outer surface of the support to an inner surface of the support, and a second part extending between the seal element and a surface of the support.

[0006] Through the vaporizer, the air channel supplements air to the liquid storage cavity from a position avoiding the interference fit region of the seal element, to relieve or balance a negative pressure of the liquid storage cavity, and a size of the air channel can be prevented from becoming uncontrollable due to squeezing and deformation of the interference fit region of the seal element.

[0007] In a preferred implementation, a convex rib at least partially surrounding the seal element is arranged on the seal element, and the interference fit region is defined by the convex rib.

[0008] In a preferred implementation, the seal element includes a first seal element arranged between the support and the vaporization assembly; and a first avoidance groove adjacent to the first part is arranged on the first seal element, and the second part is defined between the first avoidance groove and an inner surface of the holding space.
two convex edges are arranged on the first seal element, and the first avoidance groove is formed by a gap between the at least two convex edges.

[0009] In a preferred implementation, a protruding height of the convex rib is greater than or equal to a protruding height of the at least two convex edges.

[0010] In a preferred embodiment, the second part is

constructed to extend in a longitudinal direction of the vaporizer.

[0011] In a preferred implementation, the first part and the second part are substantially perpendicular to each other.

[0012] In a preferred implementation, the vaporization assembly includes a liquid channel running through the vaporization assembly in a length direction, and is in fluid communication with the liquid storage cavity through the liquid channel to absorb the liquid substrate.

[0013] In a preferred implementation, the first seal element includes a side wall opposite to the liquid channel in the length direction, and the first avoidance groove is located on an outer surface of the side wall.

[0014] Another embodiment of this application further provides a vaporizer, configured to vaporize a liquid substrate to generate an aerosol, and including:

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

a vaporization assembly, configured to receive the liquid substrate of the liquid storage cavity and vaporize the liquid substrate to generate an aerosol;

a support, configured to at least partially hold the vaporization assembly, and having a liquid guide hole for the liquid substrate in the liquid storage cavity to flow to the vaporization assembly;

a flexible second seal element, having an interference fit region, where the second seal element is configured to provide a seal between the housing and the support through the interference fit region; and

an air channel, configured to provide an airflow path for air to enter the liquid storage cavity, where the airflow path avoids the interference fit region, and the air channel includes a third part extending between the second seal element and a surface of the support, and a fourth part extending from an outer surface of the support to the liquid guide hole.

[0015] An embodiment of this application further provides an electronic vaporization device, including a vaporizer configured to vaporize a liquid substrate to generate an aerosol, and a power supply mechanism configured to supply power to the vaporizer. The vaporizer includes the vaporizer described above.

[0016] In this application, by using the interference fit region which allows the air channel to avoid the flexible seal element, an air flow area of the air channel may be effectively prevented from a change as a result of a squeezing action from an interference fit while ensuring a sealing performance. As a result, efficiency of air entering the liquid storage cavity is difficult to meet design requirements, ensuring consistency of the air channel, and improving stability of product performances.

BRIEF DESCRIPTION OF THE DRAWINGS

[0017] One or more embodiments are exemplarily described with reference to the corresponding figures in the accompanying drawings, and the descriptions are not to be construed as limiting the embodiments. Elements in the accompanying drawings that have same reference numerals 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 structural diagram of an electronic vaporization device according to an embodiment of this application.

FIG. 2 is a schematic structural diagram of an embodiment of a vaporizer in FIG. 1.

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 view in a longitudinal direction of the vaporizer in FIG. 2.

FIG. 6 is a schematic structural diagram of a support in FIG. 5 from another perspective.

FIG. 7 is a schematic structural diagram of a flexible seal sleeve in FIG. 5 from another perspective.

FIG. 8 is a schematic structural diagram of a seal element in FIG. 5 from another perspective.

FIG. 9 is a schematic diagram of an air channel formed by the support with the flexible seal sleeve and the seal element in FIG. 5.

FIG. 10 is a schematic structural diagram of a porous body in FIG. 9 from another perspective.

FIG. 11 is a schematic structural diagram of a support according to another embodiment.

DETAILED DESCRIPTION

[0018] For ease of understanding of this application, this application is described below in more detail with reference to the accompanying drawings and specific implementations.

[0019] An embodiment of this application provides an electronic vaporization device. Referring to FIG. 1, the electronic vaporization device includes: a vaporizer 100, configured to store a liquid substrate and vaporize the liquid substrate to generate an aerosol; and a power supply mechanism 200, configured to supply power to the vaporizer 100.

[0020] In an optional implementation, as shown in FIG. 1, the power supply mechanism 200 includes a receiving cavity 270, arranged at an end in a length direction and configured to receive and accommodate at least part of the vaporizer 100; and first electrical contacts 230, 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 part of the vaporizer 100 is received and accom-

modated in the power supply mechanism 200.

[0021] According to a preferred implementation shown in FIG. 1, a second electrical contact 21 is arranged on an end portion of the vaporizer 100 opposite to the power supply mechanism 200 in the length direction, so that when the at least 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 to form an electrical connection.

[0022] A seal member 260 is arranged in the power supply mechanism 200, and at least part of an internal space of the power supply mechanism 200 is separated by the seal member 260 to form the receiving cavity 270. In the preferred implementation shown in FIG. 1, the seal member 260 is configured to extend along a cross section direction of the power supply mechanism 200, and is preferably prepared by a flexible material such as silica gel, so as to prevent the liquid substrate seeping from the vaporizer 100 to the receiving cavity 270 from flowing to a controller 220, a sensor 250, and other components inside the power supply mechanism 200.

[0023] In the preferred implementation shown in FIG. 1, the power supply mechanism 200 further includes a core 210, located at another end facing away from the receiving cavity 270 along the length direction, and configured to supply power; and the controller 220, arranged between the core 210 and an accommodating cavity, and operably guiding a current between the core 210 and the first electrical contacts 230.

[0024] During use, the power supply mechanism 200 includes a sensor 250, configured to sense an inhalation flow generated by using a suction nozzle cover 20 of the vaporizer 100 during inhalation, so that the controller 220 controls the core 210 to output a current to the vaporizer 100 according to a detection signal of the sensor 250.

[0025] Further, in the preferred implementation shown in FIG. 1, a charging interface 240 is arranged on another end of the power supply mechanism 200 facing away from the receiving cavity 270, and is configured to supply power to the core 210.

[0026] Embodiments in FIG. 2 to FIG. 5 are schematic structural diagrams of an embodiment of the vaporizer 100 in FIG. 1, which includes:

a main housing 10, where the main housing 10 is generally in a flat cylindrical shape according to FIG. 2 and FIG. 3; and the main housing 10 has a proximal end 110 and a distal end 120 opposite to each other in a length direction. According to requirements for common use, the proximal end 110 is configured as an end for a user to inhale the aerosol, and a suction nozzle A for the user to inhale is arranged at the proximal end 110; and the distal end 120 is used as an end combined with the power supply mechanism 200, and the distal end 120 of the main housing 10 is an opening on which a detachable end cap 20 is installed. The opening structure is configured to install necessary functional components inside the main housing 10.

[0027] Further, in a specific implementation shown in FIG. 2 to FIG. 4, the second electrical contact 21 penetrates into the vaporizer 100 from a surface of the end cap 20, so that at least part of the second electrical contact is exposed outside the vaporizer 100, and then may contact the first electrical contact 230 to conduct electricity. In addition, the end cap 20 is further provided with a first air inlet 23, configured to supply external air into the vaporizer 100 during inhalation.

[0028] Further referring to FIG. 3 to FIG. 5, the main housing 10 is internally provided with a liquid storage cavity 12 for storing the liquid substrate, and a vaporization assembly for absorbing the liquid substrate from the liquid storage cavity 12, and heating and vaporizing the liquid substrate. The vaporization assembly generally includes a capillary liquid guide element for absorbing the liquid substrate, and a heating element combined with the liquid guide element. The heating element heats at least part of the liquid substrate in the liquid guide element to generate the aerosol during power on. In an optional implementation, the liquid guide element includes flexible fibers such as cotton fibers, non-woven fabrics, and glass fiber ropes, or includes porous materials with a microporous structure, such as porous ceramics. The heating element can be combined onto the liquid guide element or wound on the liquid guide element through printing, deposition, sintering, physical assembly, or the like.

[0029] Further, in a preferred implementation shown in FIG. 3 to FIG. 5, the vaporization assembly includes: a porous body 30, configured to absorb and transfer the liquid substrate; and a heating element 40 configured to heat and vaporize the liquid substrate absorbed by the porous body 30. Specifically:

in the schematic structural cross-sectional view shown in FIG. 5, the main housing 10 is internally provided with a vapor-gas transmission pipe 11 arranged along an axial direction; and the main housing 10 is further internally provided with a liquid storage cavity 12 configured to store the liquid substrate. In the implementation, at least part of the vapor-gas transmission pipe 11 extends in the liquid storage cavity 12, and the liquid storage cavity 12 is formed by the space between an outer wall of the vapor-gas transmission pipe 11 and an inner wall of the main housing 10. A first end of the vapor-gas transmission pipe 11 opposite to the proximal end 110 is in communication with the suction nozzle A, and a second end opposite to the distal end 120 is in airflow connection with a vaporization chamber 340 formed by defining between a vaporization surface 310 of the porous body 30 and the end cap 20, so as to transmit the aerosol generated by the vaporized liquid substrate in the heating element 40 and released to the vaporization chamber 340 to the suction nozzle A for inhalation.

[0030] Referring to the structure of the porous body 30 shown in FIG. 3, FIG. 4, and FIG. 5, the shape of the porous body 30 is configured to be, but not limited to, generally a blocky structure in the embodiment. According to a preferred design of this embodiment, the porous body includes the vaporization surface 310 which is

arched in shape and faces the end cap 20 along the axial direction of the main housing 10. In use, a side of the porous body 30 facing away from the vaporization surface 310 is in fluid communication with the liquid storage cavity 12, so as to absorb the liquid substrate, then the microporous structure inside the porous body 30 transmits the liquid substrate to the vaporization surface 310 to be heated and vaporized to form the aerosol, and the formed aerosol is released or escaping from the vaporization surface 310.

[0031] Certainly, the heating element 40 is formed on the vaporization surface 310; and after assembly, the second electrical contact 21 abuts against the heating element 40, so as to supply power to the heating element 40.

[0032] Further, referring to FIG. 3 to FIG. 5, in order to assist in the installation and fixation of the porous body 30 and the sealing of the liquid storage cavity 12, the main housing 10 is further provided with a flexible seal sleeve 50, a support 60, and a flexible seal element 70, which not only seals an opening of the liquid storage cavity 12, but also fixes and holds the porous body 30 inside.

[0033] For the specific structure and shape, the flexible seal sleeve 50 is generally in a hollow cylinder shape. The inner hollow is configured to accommodate the porous body 30, and is sleeved outside the porous body 30 in a close-fitting manner.

[0034] The rigid support 60 holds the porous body 30 sleeved with the flexible seal sleeve 50. In some embodiments, the support may generally have an annular shape with an open lower end. A holding space 64 is configured to accommodate and hold the flexible seal sleeve 50 and the porous body 30. On one hand, the flexible seal sleeve 50 can seal a gap between the porous body 30 and the support 60 to prevent the liquid substrate from seeping out of the gap between them; and on the other hand, the flexible seal sleeve 50 is located between the porous body 30 and the support 60, which is advantageous for the porous body 30 to be stably accommodated in the support 60 to avoid from loosening.

[0035] The flexible seal element 70 is arranged between the liquid storage cavity 12 and the support 60, and the shape of the flexible seal element is adapted to the cross section of the inner contour of the main housing 10, so as to seal the liquid storage cavity 12 and prevent the liquid substrate from leaking out of the liquid storage cavity 12. Further, to prevent shrinkage and deformation of a flexible silicone base 53 made of a flexible material from affecting sealing tightness, the support 60 is accommodated in the flexible seal element 70 to support the flexible silicone base.

[0036] After mounting, to ensure smooth conveying of the liquid substrate and output of the aerosol, a first liquid guide hole 71 for the liquid substrate to flow through is provided on the flexible seal element 70, a second liquid guide hole 61 is correspondingly provided on the support 60, and a third liquid guide hole 51 is provided on the flexible seal sleeve 50. In use, the liquid substrate in the liquid storage cavity 12 flows to the porous body 30 held in the flexible seal sleeve 50 via the first liquid guide hole 71, the second liquid guide hole 61, and the liquid guide hole 51 successively as shown by arrow R1 in FIG. 4 and FIG. 5, then the liquid substrate is absorbed and transferred to the vaporization surface 310 for vaporization, and the generated aerosol is released into the vaporization chamber 340 defined between the vaporization surface 310 and the end cap 20.

[0037] On an aerosol output path during the inhalation process, referring to FIG. 3 to FIG. 6, the flexible seal element 70 is provided with a first insertion hole 72 for a lower end of the vapor-gas transmission pipe 11 to plug in, the support 60 is correspondingly provided with a second insertion hole 62, and an opposite side of the support 60 to the main housing 10 is provided with an aerosol output channel 63 through which the vaporization surface 310 is in airflow communication with the second insertion hole 62. A complete inhalation airflow path after installation is shown by arrow R2 in FIG. 3. The external air enters the vaporization chamber 340 via the first air inlet 23 on the end cap 20, then carries the generated aerosol to flow from the aerosol output channel 63 to the second insertion hole 62, and then outputs to the vapor-gas transmission pipe 11 via the first insertion hole 72.

[0038] Further, referring to FIG. 6, the support 60 is provided with a first air hole 65 and a second air hole 66 extending through the support 60 in a width direction, both of which are part of the path for the external air to enter the liquid storage cavity 12, thereby relieving or balancing the negative pressure of the liquid storage cavity 12.

[0039] The first air hole 65 is located on a wall defining the holding space 64. In the implementation, the outside air enters the holding space 64 from the first air hole 65 along a first path part R311 shown in FIG. 6, and then enters the liquid storage cavity 12.

[0040] The second air hole 66 is located on the wall surrounded or covered by the flexible seal element 70. In the implementation, the outside air enters from the second air hole 66 to the second liquid guide hole 61 along a fourth path part R322 shown in FIG. 6, and then enters the liquid storage cavity 12.

[0041] To facilitate a smooth entry of air from the first air hole 65 into the liquid storage cavity 12, reference may be made in FIG. 7.

[0042] A first avoidance groove 52 defined by a distance between the two longitudinally extending convex edges 521 is arranged on a position of a side wall of the flexible seal sleeve 50 relative to an air outlet port of the first air hole 65. On the one hand, the first avoidance groove 52 is configured to prevent the side wall of the flexible seal sleeve 50 from covering or abutting the air outlet port of the first air hole 65. On the other hand, the first avoidance groove also provides air from the outlet port of the first air hole 65 to enter a second path part R312 of the liquid storage cavity 12, and a first path part R311 provided by the first air hole 65 forms a complete

first air channel for supplementing air into the liquid storage cavity 12, as shown in FIG. 9.

[0043] As can be further seen from the figure, the second path part R312 extends in the longitudinal direction of the vaporizer 100, and extending directions of the second path part R312 and the first path part R311 are substantially perpendicular to each other.

[0044] Meanwhile, according to FIG. 7 and FIG. 9, a first convex rib 53 is further arranged on a surface of the flexible seal sleeve 50. After assembly, the porous body 30 and the support 60 clamp the first convex rib 53 from both inside and outside respectively, so that the first convex rib 53 forms a portion of interference assembly to form an effective seal between the holding space 64 of the support 60 and the porous body 30.

[0045] In a more preferred implementation, the first avoidance groove 52 is required to avoid the first convex rib 53, thereby preventing the first avoidance groove 52 from being in the interference region after assembly, which causes an area of a channel of the second path part R312 to be contracted and the like to affect the entry of air. Further, in a more preferred implementation, a protruding height of the first convex rib 53 is greater than or equal to a protruding height of the convex edge 521, so as to avoid the convex edge 521 being squeezed by an inner wall of the holding space 64 of the support 60 and causing the first avoidance groove 52 to shrink and deform after assembly.

[0046] Similarly, as shown in FIG. 8 and FIG. 9, a second avoidance groove 73 is arranged on an inner wall of an air inlet port of the flexible seal element 70 relative to the second air hole 66. On the one hand, the second avoidance groove is configured to prevent an inner wall of the flexible seal element 70 from covering or abutting the air inlet port of the second air hole 66. On the one hand, the second avoidance groove further provides a third path part 321 where air can smoothly enter an air inlet end of the second air hole 66, and forms a complete second air channel for supplementing air into the liquid storage cavity 12 with the fourth path part R322 provided by the second air hole 66, as shown by arrow R32 in FIG. 9.

[0047] Similarly, the outer surface of the flexible seal element 70 also has a second convex rib 74 surrounding the flexible seal element 70, which is configured to closely clamp the second convex rib 74 from inner and outer sides by an inner wall of the main housing 10 and the support 60 after assembly, and form the interference fit region to effectively seal the liquid storage cavity 12. Certainly, the third path part 321 defined by the second avoidance groove 73 is required to avoid the interference region formed by the second convex rib 74.

[0048] In a preferred implementation, air inlet ports of the first air hole 65 and/or the second air hole 66 is in air flow communication with the vaporization chamber 340 through a gap between the support 60 and the main housing 10. In use, the air in the vaporization chamber 340 enters the liquid storage cavity 12 through the first air hole 65 and/or the second air hole 66. In another variable implementation, the air inlet ports of the first air hole 65 and/or the second air hole 66 may be in direct communication with the external atmosphere.

[0049] Further, in a more preferred implementation, as shown in FIG. 9 and FIG. 10 and combined with FIG. 6, the porous body 30 is arched in shape and has a first side wall 31 and a second side wall 32 opposite to each other in a thickness direction, and a base part 34 extending between the first side wall 31 and the second side wall 32; and a lower surface of the base part 34 is configured as a vaporization surface 310. In addition, the first side wall 31 and the second side wall 32 extend along a length direction of the porous body 30. Accordingly, a liquid channel 33 extending along the length direction of the porous body 30 is defined among the first side wall 31 and the second side wall 32, and the liquid substrate flowing through the first liquid guide hole 71, the second liquid guide hole 61, and the liquid guide hole 51 is received and absorbed through the liquid channel 33.

[0050] Further, as shown in FIG. 9, the first air hole 65 is constructed to extend in a width direction of the vaporizer 100 and is opposite to the liquid channel 33 of the porous body 30 in the width direction. Meanwhile, the first avoidance groove 52 on the side wall of the flexible seal sleeve 50 is located on an outer surface of the side wall corresponding to the liquid channel 33 along the longitudinal direction of the porous body 30.

[0051] In another variant implementation, the first avoidance groove 52 and/or the second avoidance groove 73 may alternatively be formed on the support 60. For example, FIG. 11 shows a schematic diagram of a support 60a according to another embodiment. The surface of the support 60a surrounded by the flexible seal element 70 has the second avoidance groove 67a extending longitudinally. On the one hand, the third path part 321 shown in FIG. 11 is provided, and on the other hand, the air inlet port of the second air hole 66a is not tightly attached or sealed by the seal element 70, so that air can smoothly enter the second air hole 66a.

[0052] Similarly, the first avoidance groove 52 may alternatively be formed on an inner surface of the holding space 64 of the support 60, thereby forming the second path part R312 of the first air channel between the inner surface of the holding space and an outer surface of the flexible seal sleeve 50.

[0053] It should be noted that, the specification and the accompanying drawings of this application provide preferred embodiments of this application, but is not limited to the embodiments described in this specification. Further, a person of ordinary skill in the art may make improvements or modifications according to the foregoing descriptions, and all the improvements and modifications shall fall within the protection scope of the appended claims of this application.

Claims

1. A vaporizer, configured to vaporize a liquid substrate to generate an aerosol, and comprising:

   a housing, wherein a liquid storage cavity configured to store a liquid substrate is formed in the housing;
   a vaporization assembly, having a vaporization surface and configured to vaporize at least part of the liquid substrate to generate an aerosol;
   a support, comprising a holding space in fluid communication with the liquid storage cavity, wherein the vaporization assembly is at least partially accommodated in the holding space;
   a flexible seal element, having an interference fit region, wherein the seal element is configured to provide a seal between the housing and the vaporization assembly through the interference fit region, or to provide a seal between the support and the vaporization assembly; and
   an air channel, configured to provide an airflow path for air to enter the liquid storage cavity, wherein the airflow path avoids the interference fit region, and the air channel comprises a first part extending from an outer surface of the support to an inner surface of the support, and a second part extending between the seal element and a surface of the support.

2. The vaporizer according to claim 1, wherein a convex rib at least partially surrounding the seal element is arranged on the seal element, and the interference fit region is defined by the convex rib.

3. The vaporizer according to claim 2, wherein the seal element comprises a first seal element arranged between the support and the vaporization assembly, a first avoidance groove adjacent to the first part is arranged on the first seal element, and the second part is defined between the first avoidance groove and an inner surface of the holding space.

4. The vaporizer according to claim 3, wherein two convex edges are arranged on the first seal element, and the first avoidance groove is formed by a gap between the at least two convex edges.

5. The vaporizer according to claim 4, wherein a protruding height of the convex rib is greater than or equal to a protruding height of the at least two convex edges.

6. The vaporizer according to any of claims 1 to 5, wherein the second part is constructed to extend in a longitudinal direction of the vaporizer.

7. The vaporizer according to any of claims 1 to 5, wherein the first part and the second part are substantially perpendicular to each other.

8. The vaporizer according to claim 7, wherein the vaporization assembly comprises a liquid channel running through the vaporization assembly in a length direction, and is in fluid communication with the liquid storage cavity through the liquid channel to absorb the liquid substrate.

9. The vaporizer according to claim 8, wherein the first seal element comprises a side wall opposite to the liquid channel in the length direction, and the first avoidance groove is located on an outer surface of the side wall.

10. A vaporizer, configured to vaporize a liquid substrate to generate an aerosol, and comprising:

    a liquid storage cavity, configured to store a liquid substrate;
    a vaporization assembly, configured to receive the liquid substrate of the liquid storage cavity and vaporize the liquid substrate to generate an aerosol;
    a support, configured to at least partially hold the vaporization assembly, and having a liquid guide hole for the liquid substrate in the liquid storage cavity to flow to the vaporization assembly;
    a flexible second seal element, having an interference fit region, wherein the second seal element is configured to provide a seal between the housing and the support through the interference fit region; and
    an air channel, configured to provide an airflow path for air to enter the liquid storage cavity, wherein the airflow path avoids the interference fit region, and the air channel comprises a third part extending between the second seal element and a surface of the support, and a fourth part extending from an outer surface of the support to the liquid guide hole.

11. An electronic vaporization device, comprising a vaporizer configured to vaporize a liquid substrate to generate an aerosol, and a power supply mechanism configured to supply power to the vaporizer, wherein the vaporizer comprises the vaporizer according to any of claims 1 to 10.

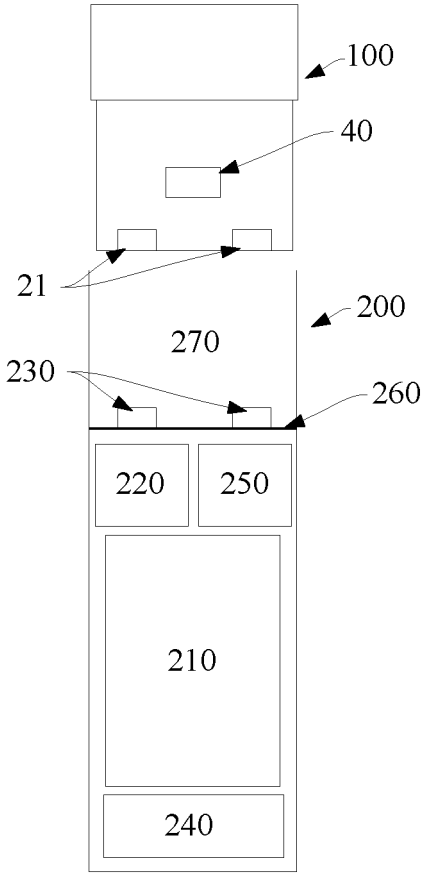

FIG. 1

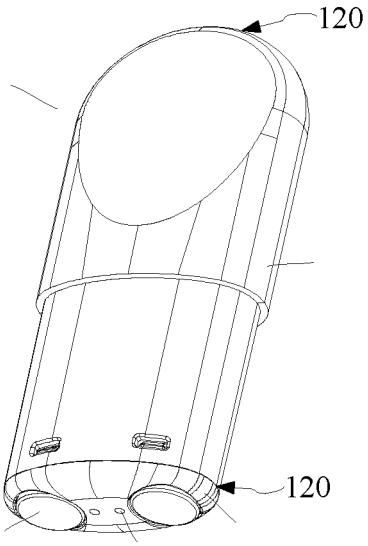

FIG. 2

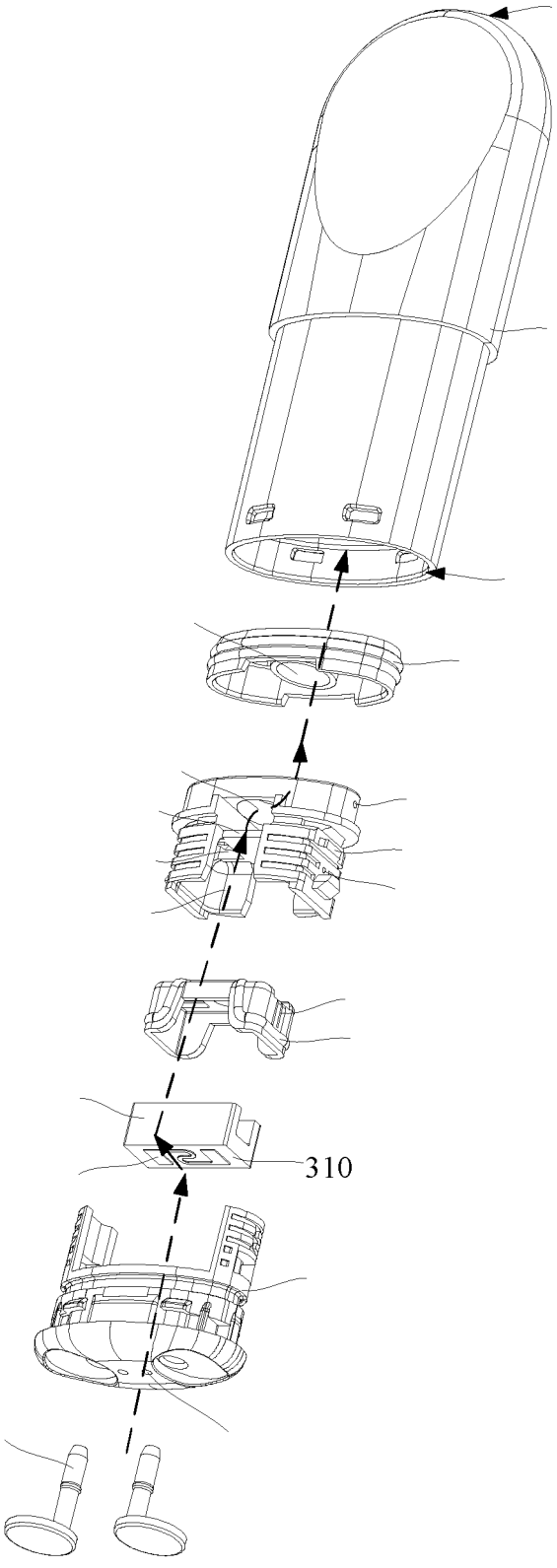

FIG. 3

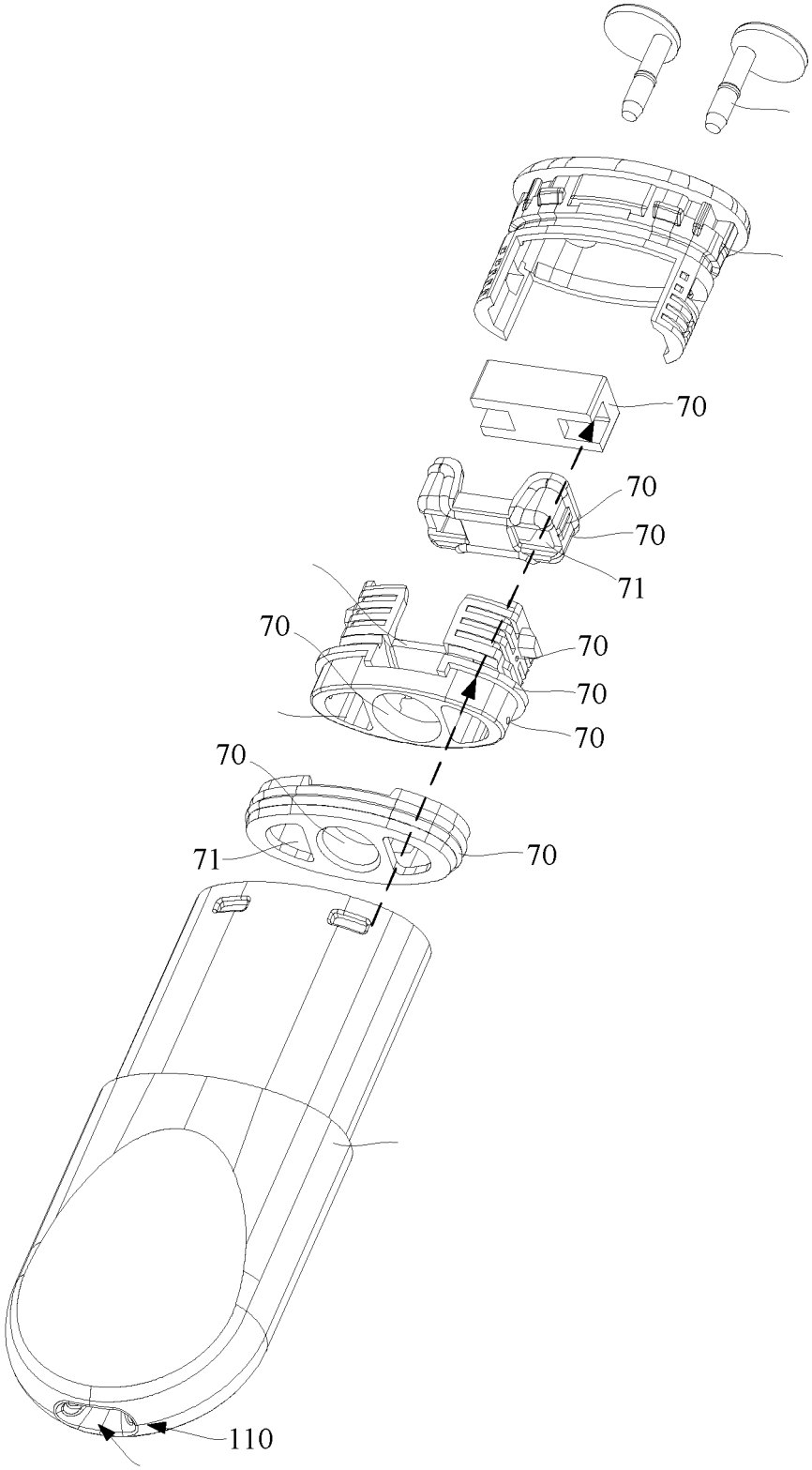

FIG. 4

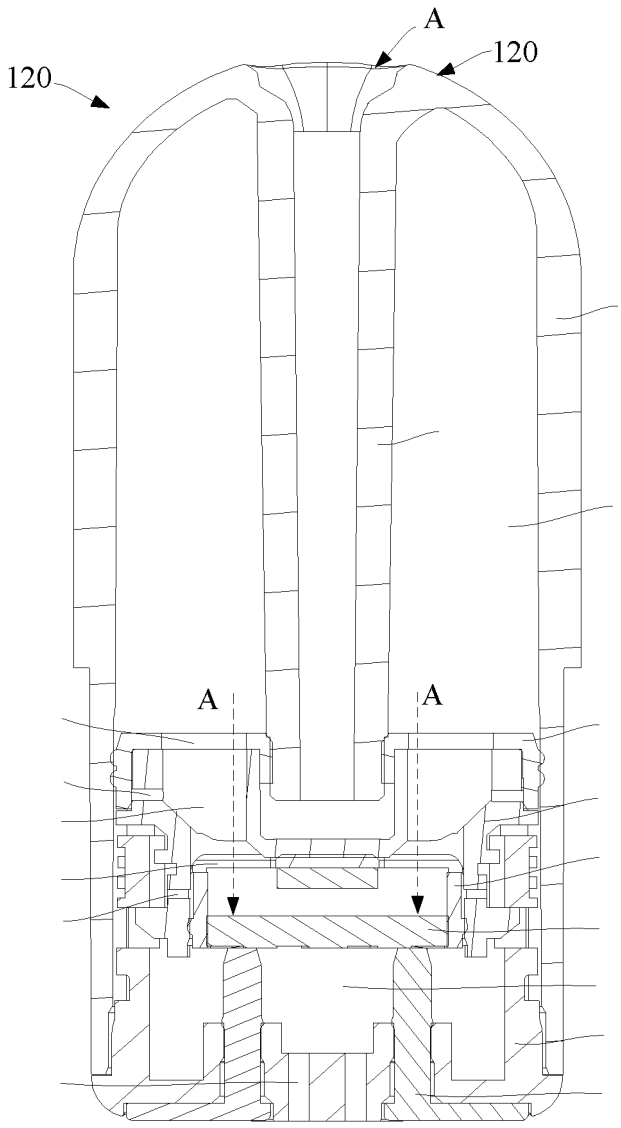

FIG. 5

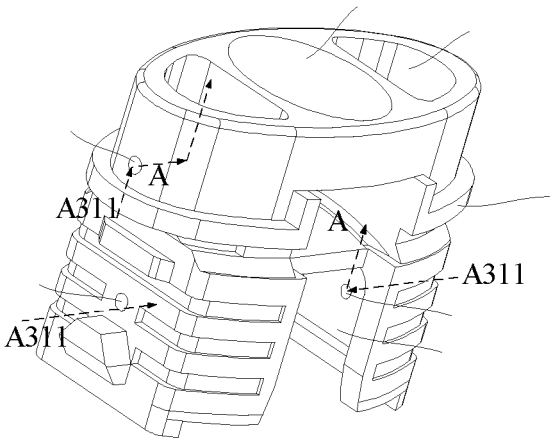

FIG. 6

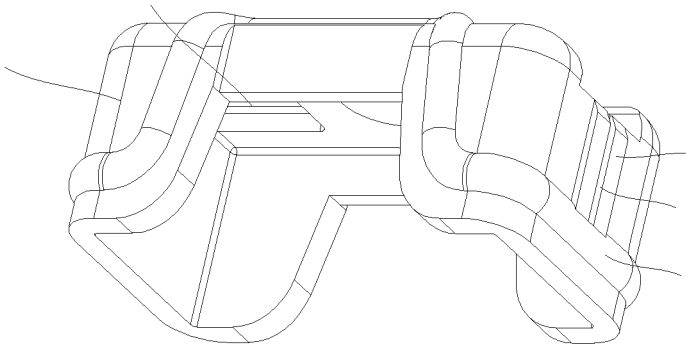

FIG. 7

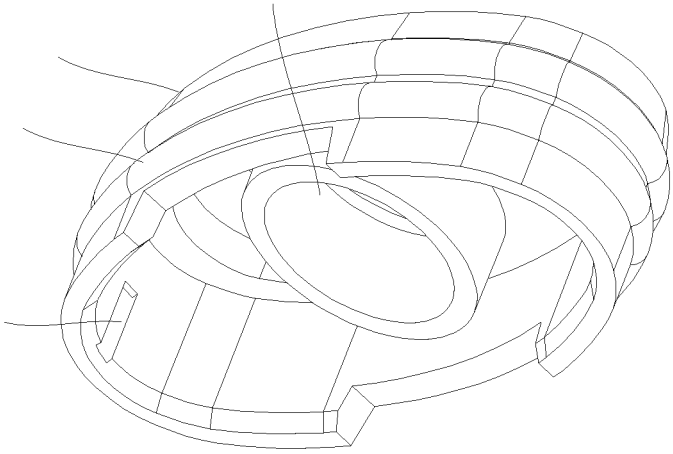

FIG. 8

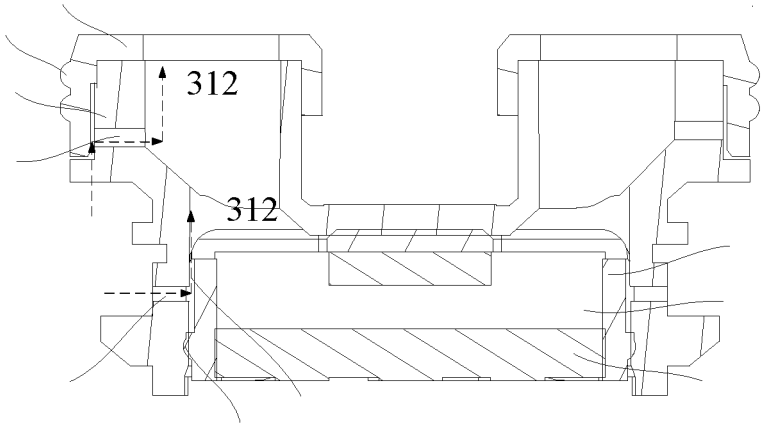

FIG. 9

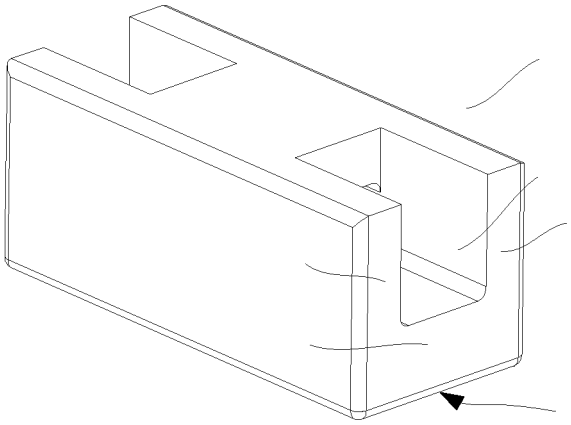

FIG. 10

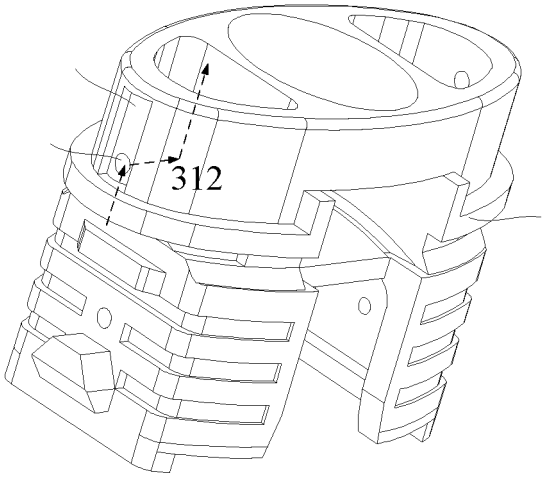

FIG. 11

INTERNATIONAL SEARCH REPORT

International application No.
PCT/CN2022/080439

A. CLASSIFICATION OF SUBJECT MATTER

A24F 40/10(2020.01)i; A24F 40/40(2020.01)i

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

A24F

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)

CNABS; CNTXT; CNKI; VEN; USTXT; EPTXT; WOTXT: 深圳市合元科技有限公司, 麦克韦尔, 派腾, 负压, 气液, 气压, 压强, 平衡, 干烧, 进气, 补充气体, 补气, 阻液, 阻流, 气体, 气流, 通道, 进气口, 电子烟, 雾化, 气溶胶, 储液, 烟液, 烟油, liquid, negativ+, cigaret+, smok+, oil?, gas, air, inlet+, pressure, atomiz+, dry burn+

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
PX	CN 215347020 U (SHENZHEN FIRST UNION TECHNOLOGY CO., LTD.) 31 December 2021 (2021-12-31) claims 1-11	1-11
Y	CN 212590252 U (SHENZHEN FIRST UNION TECHNOLOGY CO., LTD.) 26 February 2021 (2021-02-26) abstract, description, paragraphs [0006]-[0176], and figures 1-20	1-11
Y	CN 110893016 A (SHENZHEN SMOORE TECHNOLOGY LIMITED) 20 March 2020 (2020-03-20) abstract, description, paragraphs [0004]-[0054], and figures 1-13	1-11
A	CN 112353002 A (DONGGUAN ALPHA ELECTRONIC TECHNOLOGY CO., LTD.) 12 February 2021 (2021-02-12) entire document	1-11
A	CN 107713023 A (SHENZHEN INNOKIN ELECTRONIC TECHNOLOGY CO., LTD.) 23 February 2018 (2018-02-23) entire document	1-11

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* Special categories of cited documents:
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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
09 May 2022	**19 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

International application No.
PCT/CN2022/080439

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	CN 210611015 U (SHENZHEN SMOORE TECHNOLOGY LIMITED) 26 May 2020 (2020-05-26) entire document	1-11

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INTERNATIONAL SEARCH REPORT
Information on patent family members

International application No.
PCT/CN2022/080439

Patent document cited in search report	Publication date (day/month/year)	Patent family member(s)	Publication date (day/month/year)
CN 215347020 U	31 December 2021	None	
CN 212590252 U	26 February 2021	CN 113796579 A	17 December 2021
		CN 215347025 U	31 December 2021
		WO 2021254395 A1	23 December 2021
CN 110893016 A	20 March 2020	CN 211910558 U	13 November 2020
CN 112353002 A	12 February 2021	CN 214903777 U	30 November 2021
		CN 214802289 U	23 November 2021
CN 107713023 A	23 February 2018	CN 207665984 U	31 July 2018
CN 210611015 U	26 May 2020	WO 2020252647 A1	24 December 2020
		CN 110250582 A	20 September 2019
		WO 2020252810 A1	24 December 2020
		US 2022007731 A1	13 January 2022
		CN 210611014 U	26 May 2020
		CN 214179148 U	14 September 2021
		CN 215381432 U	04 January 2022

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REFERENCES CITED IN THE DESCRIPTION

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Patent documents cited in the description

- CN 202120513630 **[0001]**