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(54) **ELECTRONIC CIGARETTE ATOMIZATION DEVICE AND ELECTRONIC CIGARETTE**

(57) Provided are an electronic cigarette vaporization apparatus (100) and an electronic cigarette. The electronic cigarette vaporization apparatus includes: a housing (10), an e-liquid storage tank (13) and a vaporization assembly (20) being arranged in the housing (10), and an airflow channel (11) in communication with external air being provided on the housing (10); and the vaporization assembly (20) including a porous body and a heating body, the porous body including a liquid absorbing surface and a vaporization surface that are oppositely arranged, the heating body being arranged on the vaporization surface, at least one vent channel (21) being pro-

vided on the porous body, an end of the vent channel (21) being in communication with the e-liquid storage tank (13), and an other end of the vent channel (21) being in communication with the external air; and a first seal member, the first seal member (30) being sleeved on the vaporization assembly (20), and the first seal member (30) including at least one seal portion (31) corresponding to the vent channel (21); and the seal portion (31) opening and closing the vent channel (21) to allow the external air to enter the e-liquid storage tank (13) and prevent liquid in the e-liquid storage tank (13) from flowing out.

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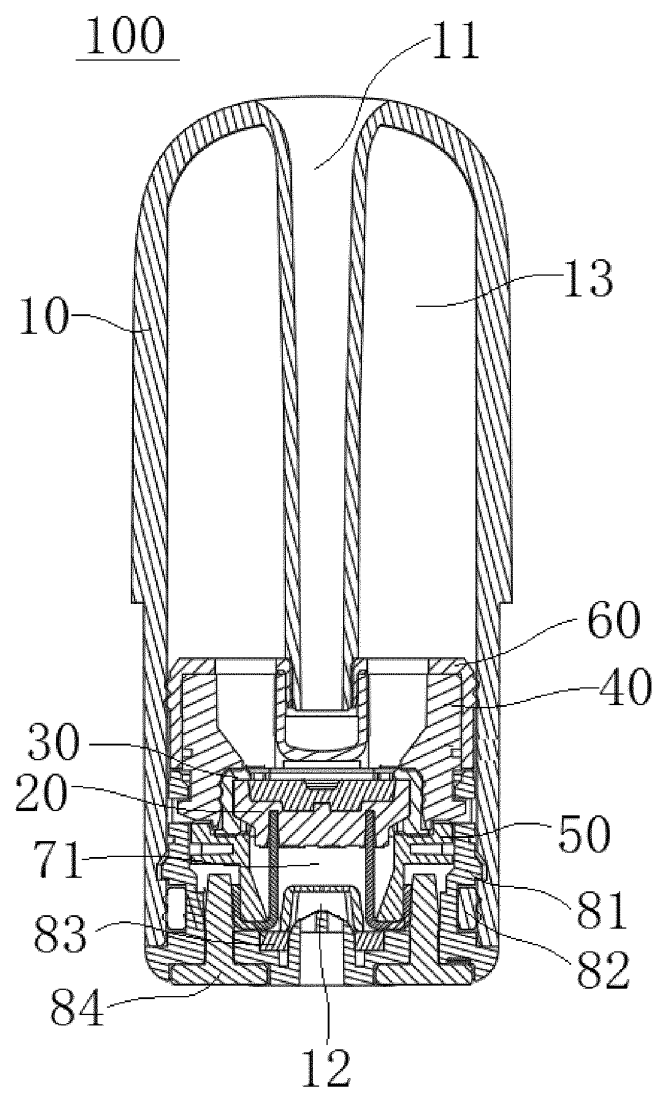


FIG. 1

Description

CROSS-REFERENCE TO RELATED APPLICATIONS

[0001] This application claims priority to Chinese Patent Application No. 202121151375.X, filed on May 26, 2021 and entitled "ELECTRONIC CIGARETTE VAPORIZATION APPARATUS AND ELECTRONIC CIGARETTE", which is incorporated herein by reference in its entirety.

FIELD

[0002] The present disclosure relates to the technical field of electronic cigarettes, and more specifically, to an electronic cigarette vaporization apparatus and an electronic cigarette having the electronic cigarette vaporization apparatus.

BACKGROUND

[0003] As a healthy and convenient consumer product, electronic cigarettes have been favored by consumers in recent years, and use of the electronic cigarettes has become increasingly popular. An electronic cigarette product uses a manner of vaporizing e-liquid, to provide a user with vapor that can be inhaled. For the convenience of carrying and using the electronic cigarette by the user, the electronic cigarette product has a compact and small shape design. The design manner leads to a very compact internal structure of the electronic cigarette product.

[0004] Due to limited space, the internal structure of the electronic cigarette product is prone to some functional defects. For example, an existing electronic cigarette product has problems of e-liquid leakage and poor liquid supply. In a process of performing vaporization processing on the e-liquid, the e-liquid needs to be able to flow to an area in which a vaporization device is located. Leakage of the e-liquid or insufficient flow of the e-liquid to the vaporization device greatly reduces user experience. It is necessary to improve a structure of the electronic cigarette product.

SUMMARY

[0005] An objective of the present disclosure is to provide a new technical solution for an electronic cigarette vaporization apparatus and an electronic cigarette, which may at least resolve problems of e-liquid leakage and poor liquid supply in an electronic cigarette product in the related art.

[0006] According to a first aspect of the present disclosure, an electronic cigarette vaporization apparatus is provided, including: a housing, an e-liquid storage tank and a vaporization assembly being arranged in the housing, and an airflow channel in communication with external air being provided on the housing; and the vaporiza-

tion assembly including a porous body and a heating body, the porous body including a liquid absorbing surface and a vaporization surface that are oppositely arranged, the heating body being arranged on the vaporization surface, at least one vent channel being provided on the porous body, an end of the vent channel being in communication with the e-liquid storage tank, and an other end of the vent channel being in communication with the external air; and a first seal member, the first seal member being sleeved on the vaporization assembly, and the first seal member including at least one seal portion corresponding to the vent channel; and the seal portion opening and closing the vent channel to allow the external air to enter the e-liquid storage tank and prevent liquid in the e-liquid storage tank from flowing out.

[0007] According to an embodiment of the present disclosure, the vent channel passes through along an extending direction from the liquid absorbing surface to the vaporization surface.

[0008] According to an embodiment of the present disclosure, the seal portion is switchable between a first state and a second state, and in the first state, the seal portion closes the vent channel, to prevent the liquid in the e-liquid storage tank from flowing out; and in the second state, the seal portion opens the vent channel, to allow the external air to enter the e-liquid storage tank.

[0009] According to an embodiment of the present disclosure, a first cover body and a second cover body are further arranged in the housing, the first cover body and the second cover body define an accommodating cavity, the vaporization assembly is arranged in the accommodating cavity, an avoidance groove and a liquid flowing hole are provided in the first cover body, and the avoidance groove is in communication with the liquid flowing hole.

[0010] According to an embodiment of the present disclosure, in the second state, the seal portion is deformed toward the e-liquid storage tank to open the vent channel, to allow the external air to enter the e-liquid storage tank; and in the first state, the seal portion is deformed toward the vaporization assembly to close the vent channel.

[0011] According to an embodiment of the present disclosure, the electronic cigarette vaporization apparatus further includes: a second seal member, where the second seal member is arranged in the housing, and an outer edge of the second seal member abuts against an inner wall of the housing to enclose and form the e-liquid storage tank.

[0012] According to an embodiment of the present disclosure, when an air pressure in the e-liquid storage tank is greater than or equal to an external atmospheric pressure, the seal portion is in the first state; and when the air pressure in the e-liquid storage tank is less than the external atmospheric pressure, the seal portion is in the second state.

[0013] According to an embodiment of the present disclosure, an upper edge of the first seal member abuts against the vaporization assembly, and the seal portion

is located on an inner wall of the upper edge of the first seal member.

[0014] According to an embodiment of the present disclosure, a quantity of vent channels is more than one, the vent channels are spaced along the heating body, and a quantity of seal portions and a quantity of avoidance grooves respectively correspond to the quantity of the vent channels.

[0015] According to an embodiment of the present disclosure, when the seal portions are in the first state, each seal portion covers a vent channel corresponding to the seal portion.

[0016] According to an embodiment of the present disclosure, the first seal member is an elastic material member.

[0017] According to an embodiment of the present disclosure, the seal portion is made of a silica gel sheet.

[0018] According to an embodiment of the present disclosure, the vent channel is a groove provided on an outer surface of the porous body, and the groove passes through the porous body along the extending direction from the liquid absorbing surface to the vaporization surface.

[0019] According to an embodiment of the present disclosure, the first seal member is sleeved on the vaporization assembly, and the groove matches an inner wall of the first seal member to form the vent channel.

[0020] According to an embodiment of the present disclosure, the vent channel is a through hole running through the porous body along the extending direction from the liquid absorbing surface to the vaporization surface.

[0021] According to an embodiment of the present disclosure, the quantity of vent channels is more than one, and the vent channels are spaced on an outer side wall of the porous body.

[0022] According to an embodiment of the present disclosure, the quantity of vent channels is more than one, and the vent channels are spaced on an inner edge of an outer periphery of the porous body.

[0023] According to an embodiment of the present disclosure, a quantity of seal portions and arrangement positions of the seal portions are in a one-to-one correspondence with the quantity of vent channels and arrangement positions of the vent channels.

[0024] According to an embodiment of the present disclosure, using the extending direction from the liquid absorbing surface to the vaporization surface as a preset direction, a cross section of the first seal member perpendicular to the preset direction is an elongated structure, and multiple seal portions are located on two ends of the elongated structure.

[0025] According to an embodiment of the present disclosure, the quantity of seal portions is four, and the four seal portions are symmetrically distributed in pairs on two ends of the elongated structure.

[0026] According to an embodiment of the present disclosure, the first cover body is in interference fit with the

first seal member, and the first seal member is in interference fit with the vaporization assembly.

[0027] According to an embodiment of the present disclosure, a vaporization cavity is formed between the vaporization surface of the porous body and the second cover body, and a vent hole in communication with the airflow channel is provided on the second cover body.

[0028] According to an embodiment of the present disclosure, the electronic cigarette vaporization apparatus further includes: a lower cover, where the lower cover is arranged on a lower end of the second cover body and matches the housing, an air inlet hole is provided on the lower cover, and the air inlet hole is in communication with the vent hole.

[0029] According to a second aspect of the present disclosure, an electronic cigarette is provided, including the electronic cigarette vaporization apparatus described in any one of the foregoing embodiments.

[0030] According to an embodiment of the present disclosure, by providing a vent channel on the vaporization assembly, one seal portion corresponding to the vent channel is provided on the first seal member, and the vent channel is opened and closed through the seal portion, so that the external air enters the e-liquid storage tank. In this way, air pressure balance in the electronic cigarette vaporization apparatus is implemented, and smooth liquid supply of the electronic cigarette vaporization apparatus is ensured, to enable the electronic cigarette vaporization apparatus to implement complete vaporization, and improve user experience. In addition, the electronic cigarette vaporization apparatus may further prevent the liquid in the e-liquid storage tank from flowing out, causing e-liquid leakage.

[0031] Other features of the present disclosure and advantages thereof become apparent through the following detailed description of exemplary embodiments of the present disclosure with reference to the accompanying drawings.

BRIEF DESCRIPTION OF THE DRAWINGS

[0032] The accompanying drawings, which are incorporated in and constitute a part of this specification, illustrate embodiments of the present disclosure and together with the description serve to explain principles of the present disclosure.

FIG. 1 is a cross-sectional view of an electronic cigarette vaporization apparatus of the present disclosure;

FIG. 2 is an exploded view the structure in FIG. 1; FIG. 3 is a schematic diagram of a structure of a first seal member of an electronic cigarette vaporization apparatus of the present disclosure;

FIG. 4 is another schematic diagram of a structure of a first seal member of an electronic cigarette vaporization apparatus of the present disclosure;

FIG. 5 is a schematic diagram of a structure of a first

cover plate of an electronic cigarette vaporization apparatus of the present disclosure;
 FIG. 6 is another schematic diagram of a structure of a first cover plate of an electronic cigarette vaporization apparatus of the present disclosure;
 FIG. 7 is a schematic diagram of a structure of a vaporization assembly of an electronic cigarette vaporization apparatus of the present disclosure;
 FIG. 8 is another schematic diagram of a structure of a vaporization assembly of an electronic cigarette vaporization apparatus of the present disclosure;
 FIG. 9 is a schematic diagram of a structure of a second cover body of an electronic cigarette vaporization apparatus of the present disclosure;
 FIG. 10 is a back view of a lower cover of an electronic cigarette vaporization apparatus of the present disclosure; and
 FIG. 11 is a front view of a lower cover of an electronic cigarette vaporization apparatus of the present disclosure.

Reference numerals:

[0033]

Electronic cigarette vaporization apparatus 100;
 housing 10; airflow channel 11; air inlet hole 12; e-liquid storage tank 13;
 vaporization assembly 20; vent channel 21;
 first seal member 30; seal portion 31; first through hole 32;
 first cover body 40; avoidance groove 41; liquid flowing hole 42;
 second cover body 50; vent hole 51;
 second seal member 60;
 vaporization cavity 71;
 lower cover 81; mounting hole 811; lower cover seal member 82; and liquid absorbing body 83.

DETAILED DESCRIPTION

[0034] Various exemplary embodiments of the present disclosure are described in detail with reference to the accompanying drawings. It should be noted that relative arrangements of components and steps, numerical expressions, and numerical values that are set forth in these embodiments do not limit a scope of the present disclosure unless specifically stated otherwise.

[0035] The following description of at least one exemplary embodiment is merely illustrative in nature and in no way intended as any limitation of the present disclosure and application or use of the present disclosure.

[0036] A technique, a method, and a device that are known to a person of ordinary skill in the related art may not be discussed in detail, but in proper circumstances, the technique, method, and device should be considered as a part of the specification.

[0037] In all examples shown and discussed herein,

any specific value should be construed as exemplary only, and not as a limitation. Therefore, other examples of the exemplary embodiment may have different values.

[0038] It should be noted that similar numerals and letters represent similar items in the figures below. Therefore, once an item is defined in one figure, further discussion does not need to be performed on the item in subsequent figures.

[0039] An electronic cigarette vaporization apparatus 100 according to an embodiment of the present disclosure is described in detail below with reference to the accompanying drawings.

[0040] Referring to FIG. 1 to FIG. 8, an electronic cigarette vaporization apparatus 100 according to an embodiment of the present disclosure includes a housing 10, a vaporization assembly 20, and a first seal member 30. An e-liquid storage tank 13 and the vaporization assembly 20 are arranged in the housing 10. The housing 10 is made of an elastic translucent material or an elastic transparent material. The e-liquid storage tank 13 is configured to store e-liquid in a liquid form, and the vaporization assembly 20 is mainly configured to vaporize liquid such as e-liquid to generate aerosol (vapor). An airflow channel 11 in communication with external air is provided on the housing 10. Air in the environment and the vapor generated by heating and vaporizing by the vaporization assembly 20 is introduced and exported through the airflow channel 11.

[0041] The vaporization assembly 20 mainly includes a porous body and a heating body, and the porous body uses a porous ceramic structure. The porous body has a liquid absorbing surface and a vaporization surface that are oppositely arranged, and the heating body is arranged on the vaporization surface of the porous body. The e-liquid is conducted to the vaporization surface through the liquid absorbing surface, is vaporized under the action of the heating body to form the vapor, and is exported from the vaporization surface. At least one vent channel 21 is provided on the porous body, an end of the vent channel 21 is in communication with the e-liquid storage tank 13, and an other end of the vent channel 21 is in communication with the external air.

[0042] The first seal member 30 is sleeved on the vaporization assembly 20, a first through hole 32 is provided on the first seal member 30, and the first through hole 32 is used for the first seal member 30 to conduct air and e-liquid. The first seal member 30 seals the vaporization assembly 20, to prevent the e-liquid in the e-liquid storage tank from flowing into the vaporization cavity from places other than the liquid absorbing surface. The first seal member 30 includes at least one seal portion 31 corresponding to the vent channel 21. The seal portion 31 opens and closes the vent channel 21 to allow the external air to enter the e-liquid storage tank 13 and prevent liquid in the e-liquid storage tank 13 from flowing out.

[0043] When a user inhales, a sensor in the electronic cigarette is triggered, which sends a signal to drive the vaporization assembly 20 to start heating. The liquid in

the porous body is heated and vaporized on the vaporization surface, and the vaporized vapor enters the airflow channel 11 of the housing 10 through the vaporization cavity and is inhaled by the user. When the e-liquid in the e-liquid storage tank decreases gradually, air pressure in the e-liquid storage tank 13 drops, forming a negative pressure. The air pressure in the vaporization cavity 71 is relatively high, and the air pushes away the seal portion 31 and then flows into the e-liquid storage tank 13, to implement air pressure balance. In this way, it is ensured that sufficient e-liquid is absorbed on the porous body to maintain a vaporization effect.

[0044] In the present disclosure, in an operating process of the electronic cigarette vaporization apparatus 100, the e-liquid enters the porous body from the liquid absorbing surface of the porous body, is heated by the heating body on the vaporization surface of the porous body, and is vaporized to form vapor and is then exported. Because the e-liquid is continuously consumed by vaporization, the e-liquid storage tank 13 is in a state of negative pressure in this case, and the external air needs to be replenished to the liquid absorbing surface to restore balance of the internal and external pressure difference. In this case, the seal portion 31 in the first seal member 30 is pushed away and deformed by an air flow, and the seal portion 31 opens the vent channel 21. The air enters the e-liquid storage tank 13 through the vent channel 21, which implements a good vent effect and avoids problems of poor e-liquid supply and core burnt.

[0045] Therefore, in the electronic cigarette vaporization apparatus 100 of the present disclosure, by providing a vent channel 21 on the vaporization assembly 20, one seal portion 31 corresponding to the vent channel 21 is provided on the first seal member 30, and the vent channel 21 is opened and closed through the seal portion 31, so that the external air enters the e-liquid storage tank 13. In this way, air pressure balance in the electronic cigarette vaporization apparatus 100 is implemented, and smooth liquid supply of the electronic cigarette vaporization apparatus 100 is ensured, to enable the electronic cigarette vaporization apparatus 100 to implement complete vaporization, and improve user experience. In addition, the electronic cigarette vaporization apparatus 100 may further prevent the liquid in the e-liquid storage tank 13 from flowing out, preventing e-liquid leakage.

[0046] According to an embodiment of the present disclosure, referring to FIG. 1, FIG. 7, and FIG. 8, the vent channel 21 passes through along an extending direction from the liquid absorbing surface to the vaporization surface. When the e-liquid storage tank 13 is in a negative pressure state, the seal portion 31 opens the vent channel 21, and the air enters the e-liquid storage tank through the vent channel 21, so that the internal air pressure and the external air pressure are balanced and the e-liquid supply is smoother.

[0047] In the present disclosure, the seal portion 31 is switchable between a first state and a second state. The seal portion 31 is in the first state. In this case, the seal

portion 31 closes the vent channel 21, to prevent the liquid in the e-liquid storage tank 13 from flowing out. When the seal portion 31 is in the second state, the seal portion 31 opens the vent channel 21, to allow the external air to enter the e-liquid storage tank 13 through the vent channel 21, the internal and external pressure difference of the e-liquid storage tank 13 is balanced, and the e-liquid supply is smoother.

[0048] Optionally, the seal portion 31 is in the second state. The seal portion 31 is deformed toward the e-liquid storage tank 13 to open the vent channel 21, to allow the external air to enter the e-liquid storage tank 13. The seal portion 31 is in the first state. The seal portion 31 is deformed toward the vaporization assembly 20 to close the vent channel 21.

[0049] According to an embodiment of the present disclosure, as shown in FIG. 1, FIG. 5, FIG. 6, and FIG. 9, a first cover body 40 and a second cover body 50 are further arranged in the housing 10, the first cover body 40 and the second cover body 50 define an accommodating cavity, the vaporization assembly 20 is arranged in the accommodating cavity, an avoidance groove 41 and a liquid flowing hole 42 are provided in the first cover body 40, the avoidance groove 41 is in communication with the liquid flowing hole 42, and the avoidance groove 41 is in communication with the airflow channel 11. The liquid absorbing surface is in communication with the e-liquid storage tank 13 through the liquid flowing hole 42; and the vent channel 21 is in communication with the external air through the avoidance groove 41 in communication with the liquid flowing hole 42.

[0050] In some specific embodiments of the present disclosure, referring to FIG. 1 and FIG. 2, the electronic cigarette vaporization apparatus 100 further includes a second seal member 60. The second seal member 60 is mounted in the housing 10. In addition, an outer edge of the second seal member 60 abuts against an inner wall of the housing 10, so that the second seal member 60 and the housing 10 are enclosed to form the e-liquid storage tank 13.

[0051] According to an embodiment of the present disclosure, when an air pressure in the e-liquid storage tank 13 is greater than or equal to an external atmospheric pressure, the seal portion 31 is in the first state. In this case, the seal portion 31 closes the vent channel 21, to prevent the liquid in the e-liquid storage tank 13 from flowing out. When the air pressure in the e-liquid storage tank 13 is less than the external atmospheric pressure, the seal portion 31 is in the second state. The seal portion 31 opens the vent channel 21, to allow the external air to enter the e-liquid storage tank 13 through the vent channel 21, the internal and external pressure difference of the e-liquid storage tank 13 is balanced, and the e-liquid supply is smoother.

[0052] In the present disclosure, referring to FIG. 2, FIG. 3, and FIG. 4, an upper edge of the first seal member 30 abuts against the vaporization assembly 20, and the seal portion 31 is located on an inner wall of the upper

edge of the first seal member 30. The seal portion 31 is in the first state. The seal portion 31 covers the vent channel 21, to close the vent channel 21, and prevent the liquid in the e-liquid storage tank 13 from flowing out. The seal portion 31 is in the second state. The seal portion 31 is deformed toward the e-liquid storage tank 13 to open the vent channel 21, to allow the external air to enter the e-liquid storage tank 13 through the vent channel 21.

[0053] According to an embodiment of the present disclosure, referring to FIG. 7 and FIG. 8, a quantity of vent channels 21 is more than one, the vent channels 21 are spaced along the heating body, and a quantity of seal portions 31 and a quantity of avoidance grooves 41 respectively correspond to the quantity of the vent channels 21.

[0054] When the seal portions 31 are in the first state, each seal portion 31 respectively covers a vent channel 21 corresponding to the seal portion 31. The first seal member 30 uses an elastic material member. For example, the first seal member 30 and the seal portion 31 are made of a material with a specific elastic deformation capacity such as soft rubber, to ensure that the seal portion 31 is deformed when the seal portion 31 is switched between the first state and the second state, to open or close the vent channel 21. According to an embodiment of the present disclosure, the first seal member 30 is made of silica gel material, and the seal portion 31 is made of a silica gel sheet.

[0055] According to an embodiment of the present disclosure, referring to FIG. 7 and FIG. 8, the vent channel 21 is a groove provided on an outer surface of the porous body, and the groove passes through the porous body along the extending direction from the liquid absorbing surface to the vaporization surface. The first seal member 30 is sleeved on the vaporization assembly 20, and the groove matches an inner wall of the first seal member 30 to form the vent channel 21.

[0056] In the present disclosure, the quantity of vent channels 21 is more than one, and the vent channels 21 are spaced on an outer side wall of the porous body. The quantity of seal portions 31 and arrangement positions of the seal portions 31 are in a one-to-one correspondence with the vent channels 21. It should be noted that a shape of the groove is not particularly limited. In different embodiments, a cross-sectional shape of the groove may be further a triangle, a rectangle, or an irregular shape with an opening on a side surface. Due to the opening on the side surface of the groove, when the porous body is assembled, the opening on the side surface of the groove is closed by the first seal member 30, to form the vent channel.

[0057] In an embodiment, the vent channel 21 is a through hole running through the porous body along the extending direction from the liquid absorbing surface to the vaporization surface. Optionally, the quantity of vent channels 21 is more than one, and the vent channels 21 are spaced on an inner edge of an outer periphery of the

porous body. A cross section of the through hole may be in a shape of a circle. It should be noted that a shape of the through hole is not particularly limited. In different embodiments, a cross-sectional shape of the through hole may be further in a shape of an oval, a triangle, a rectangle, or an irregular shape. In addition, the quantity of seal portions 31 and arrangement positions of the seal portions 31 are in a one-to-one correspondence with the vent channels 21.

[0058] In some specific embodiments of the present disclosure, as shown in FIG. 3 and FIG. 4, using the extending direction from the liquid absorbing surface to the vaporization surface as a preset direction, a cross section of the first seal member 30 perpendicular to the preset direction is an elongated structure, and multiple seal portions 31 are located on two ends of the elongated structure. The quantity of seal portions 31 is four, and the four seal portions 31 are symmetrically distributed in pairs on two ends of the elongated structure. Certainly, a person skilled in the art can understand that a specific quantity of seal portions 31 and a specific size and thickness of each seal portion 31 can be specifically limited according to actual needs.

[0059] In an embodiment of the present disclosure, as shown in FIG. 3 and FIG. 4, an upper edge of the first seal member 30 abuts against the vaporization assembly 20, and the seal portion 31 is located on an inner wall of the upper edge of the first seal member.

[0060] In the present disclosure, as shown in FIG. 1 and FIG. 2, the first cover body 40 is in interference fit with the first seal member 30, and the first seal member 30 is in interference fit with the vaporization assembly 20. The first seal member 30 is in interference fit with the vaporization assembly 20.

[0061] According to an embodiment of the present disclosure, a vaporization cavity 71 is formed between the vaporization surface of the porous body and the second cover body 50, and vapor generated after vaporization is introduced into the vaporization cavity 71 and is finally exported through the airflow channel 11. Multiple vent holes 51 in communication with the airflow channel 11 are provided on the second cover body 50. Air enters into the vaporization cavity 71 through the vent hole 51. The multiple vent holes 51 cause the air to flow in evenly, and maintain the vapor in the vaporization cavity 71 and the air evenly mixed. The evenly arranged multiple vent holes 51 also increase air resistance when the air flows in. The user can feel sufficient air resistance when inhaling through the airflow channel 11, which improves an experience effect of inhaling vapor.

[0062] In some specific embodiments of the present disclosure, the electronic cigarette vaporization apparatus 100 further includes: a lower cover 81. The lower cover 81 is arranged on a lower end of the second cover body 50 and matches the housing 10, an air inlet hole 12 is provided on the lower cover 81, and the air inlet hole 12 is in communication with the vent hole 51. When the user inhales air, the external air passes through the air

inlet hole 12, then passes through the vent hole 51, and then enters the vaporization cavity 71.

[0063] In an optional embodiment, an end of the vent channel 21 is in communication with the e-liquid storage tank 13, an other end of the vent channel 21 is in communication with the vaporization cavity 71, and the vent channel 21 is in communication with the external air through the vaporization cavity 71. When the air pressure of the e-liquid storage tank 13 decreases due to reduction of the e-liquid, because the vaporization cavity 71 is in communication with the air inlet hole 12, the air pressure of the vaporization cavity 71 is consistent with the outside world, which is higher than the air pressure of the e-liquid storage tank 13. Therefore, the seal portion 31 is pushed away by the air on a side of the vaporization cavity 71, and the air enters the e-liquid storage tank 13, to implement air pressure balance.

[0064] As shown in FIG. 1, FIG. 10, and FIG. 11, the electronic cigarette vaporization apparatus 100 further includes a lower cover seal member. The lower cover seal member 82 is arranged around an outer periphery of the lower cover 81, and an outer edge of the lower cover seal member 82 abuts against an inner wall of the housing 10. The second seal member 60, the vaporization assembly 20, and the lower cover seal member 82 are configured to provide necessary airtightness inside the electronic cigarette vaporization apparatus 100, to avoid unnecessary conduction between the e-liquid storage tank 13 and connection gaps of components, thereby effectively avoiding occurrence of e-liquid leakage. The lower cover seal member 82 is made of a soft material. A sealing rib is arranged on the lower cover seal member 82 and the lower cover seal member 82 is interference fit with the lower cover 81 and the housing 10, to implement isolation from the outside world.

[0065] In an embodiment, referring to FIG. 1 and FIG. 2, the electronic cigarette vaporization apparatus 100 further includes a liquid absorbing body 83. The liquid absorbing body 83 is arranged around an outer periphery of the air inlet hole 12, and the liquid absorbing body 83 is configured to absorb condensed liquid flowing out of the air inlet hole 12.

[0066] In an embodiment, referring to FIG. 1 and FIG. 2, the electronic cigarette vaporization apparatus 100 further includes a conductive nail. The conductive nail is electrically connected to the heating body through a mounting hole 811 in the lower cover 81 for access of a power supply.

[0067] Certainly, in the present disclosure, other structures of the electronic cigarette vaporization apparatus 100 may be understandable and may be implemented, and are not described in detail in the present disclosure.

[0068] In summary, in the electronic cigarette vaporization apparatus 100 of the present disclosure, by providing a vent channel 21 on the vaporization assembly 20, one seal portion 31 corresponding to the vent channel 21 is provided on the first seal member 30, and the vent channel 21 is opened and closed through the seal portion

31, so that the external air may enter the e-liquid storage tank 13. In this way, air pressure balance in the electronic cigarette vaporization apparatus 100 is implemented, and smooth liquid supply of the electronic cigarette vaporization apparatus 100 is ensured, to enable the electronic cigarette vaporization apparatus 100 to implement complete vaporization, and improve user experience. In addition, the electronic cigarette vaporization apparatus may further prevent the liquid in the e-liquid storage tank 13 from flowing out, causing e-liquid leakage.

[0069] According to the present disclosure, an electronic cigarette is further provided, which includes the electronic cigarette vaporization apparatus 100 described in the foregoing embodiments. Because the electronic cigarette vaporization apparatus 100 according to the present disclosure has the foregoing technical effects, the electronic cigarette according to the embodiments of the present disclosure should also have a corresponding technical effect. In other words, the electronic cigarette of the present disclosure may effectively resolve problems of poor liquid supply and e-liquid leakage in the housing 10.

[0070] In the present disclosure, referring to FIG. 1 and FIG. 2, a principle of the electronic cigarette is that the liquid in the e-liquid storage tank 13 is introduced into the liquid absorbing surface of the vaporization assembly 20. When a user inhales, a sensor in the electronic cigarette is triggered, which sends a signal to drive the vaporization assembly 20 to start heating. The liquid is heated and vaporized on the vaporization surface, and the air flows in through the air inlet hole 12, to take away the vapor and air in the vaporization cavity 71. The vapor and air enter the airflow channel 11 through the first cover body 40 and a channel on the second seal member 60, and finally enter the mouth of the user. When the e-liquid in the e-liquid storage tank decreases, air pressure in the e-liquid storage tank 13 drops, forming a negative pressure. The air pressure on a side in the vaporization cavity 71 is relatively high, and the air pushes away the seal portion 31 and then flows into the e-liquid storage tank 13, to implement air pressure balance. Further, sufficient e-liquid may be absorbed on the porous body to maintain an effect of generating vapor.

[0071] Due to addition of a through hole or a groove (vent channel 21) on the porous body of the vaporization assembly 20, in an operating process of the electronic cigarette, the e-liquid passes through an e-liquid channel from the liquid absorbing surface to the vaporization surface, and the air is replenished to the e-liquid storage tank 13 through the added vent channel 21, thereby implementing a good vent effect. A phenomenon of e-liquid leakage and poor e-liquid flowing has been avoided.

[0072] In the present disclosure, other structures of the electronic cigarette vaporization apparatus 100 may be understandable and may be implemented, and are not described in detail in the present disclosure.

[0073] Although some specific embodiments of the present disclosure have been described in detail through

examples, a person skilled in the art should understand that the foregoing examples are for description only, and not intended to limit the scope of the present disclosure. It should be understood by a person skilled in the art that modifications may be made to the foregoing embodiments without departing from the scope and spirit of the present disclosure. The scope of the present disclosure is limited by the appended claims.

Claims

1. An electronic cigarette vaporization apparatus, comprising:

a housing, an e-liquid storage tank and a vaporization assembly being arranged in the housing, and an airflow channel in communication with external air being provided on the housing; and the vaporization assembly comprising a porous body and a heating body, the porous body comprising a liquid absorbing surface and a vaporization surface that are oppositely arranged, the heating body being arranged on the vaporization surface, at least one vent channel being provided on the porous body, an end of the vent channel being in communication with the e-liquid storage tank, and an other end of the vent channel being in communication with the external air; and

a first seal member, the first seal member being sleeved on the vaporization assembly, the first seal member comprising at least one seal portion corresponding to the vent channel, and the seal portion opening and closing the vent channel to allow the external air to enter the e-liquid storage tank and prevent liquid in the e-liquid storage tank from flowing out.

2. The electronic cigarette vaporization apparatus according to claim 1, wherein the vent channel passes through along an extending direction from the liquid absorbing surface to the vaporization surface.

3. The electronic cigarette vaporization apparatus according to claim 1 or 2, wherein

the seal portion is switchable between a first state and a second state, and in the first state, the seal portion closes the vent channel, to prevent the liquid in the e-liquid storage tank from flowing out; and

in the second state, the seal portion opens the vent channel, to allow the external air to enter the e-liquid storage tank.

4. The electronic cigarette vaporization apparatus according to any one of claims 1 to 3, wherein a first

cover body and a second cover body are further arranged in the housing, the first cover body and the second cover body define an accommodating cavity, the vaporization assembly is arranged in the accommodating cavity, an avoidance groove and a liquid flowing hole are provided in the first cover body, and the avoidance groove is in communication with the liquid flowing hole.

5. The electronic cigarette vaporization apparatus according to claim 3, wherein in the second state, the seal portion is deformed toward the e-liquid storage tank to open the vent channel, to allow the external air to enter the e-liquid storage tank; and in the first state, the seal portion is deformed toward the vaporization assembly to close the vent channel.

6. The electronic cigarette vaporization apparatus according to any one of claims 1 to 5, further comprising: a second seal member, wherein the second seal member is arranged in the housing, and an outer edge of the second seal member abuts against an inner wall of the housing to enclose and form the e-liquid storage tank.

7. The electronic cigarette vaporization apparatus according to claim 3, wherein when an air pressure in the e-liquid storage tank is greater than or equal to an external atmospheric pressure, the seal portion is in the first state; and when the air pressure in the e-liquid storage tank is less than the external atmospheric pressure, the seal portion is in the second state.

8. The electronic cigarette vaporization apparatus according to any one of claims 1 to 7, wherein an upper edge of the first seal member abuts against the vaporization assembly, and the seal portion is located on an inner wall of the upper edge of the first seal member.

9. The electronic cigarette vaporization apparatus according to claim 4, wherein a quantity of vent channels is more than one, the plurality of vent channels are spaced along the heating body, and a quantity of seal portions and a quantity of avoidance grooves respectively correspond to the quantity of the vent channels.

10. The electronic cigarette vaporization apparatus according to claim 9, wherein when the seal portions are in the first state, each seal portion covers a vent channel corresponding to the seal portion.

11. The electronic cigarette vaporization apparatus according to any one of claims 1 to 10, wherein the first seal member is an elastic material member.

12. The electronic cigarette vaporization apparatus according to any one of claims 1 to 11, wherein the seal portion is made of a silica gel sheet.
13. The electronic cigarette vaporization apparatus according to any one of claims 1 to 12, wherein the vent channel is a groove provided on an outer surface of the porous body, and the groove passes through the porous body along the extending direction from the liquid absorbing surface to the vaporization surface. 5
14. The electronic cigarette vaporization apparatus according to claim 13, wherein the first seal member is sleeved on the vaporization assembly, and the groove matches an inner wall of the first seal member to form the vent channel. 10
15. The electronic cigarette vaporization apparatus according to any one of claims 1 to 13, wherein the vent channel is a through hole running through the porous body along the extending direction from the liquid absorbing surface to the vaporization surface. 15
16. The electronic cigarette vaporization apparatus according to claim 14, wherein the quantity of vent channels is more than one, and the plurality of vent channels are spaced on an outer side wall of the porous body. 20
17. The electronic cigarette vaporization apparatus according to claim 14, wherein the quantity of vent channels is more than one, and the plurality of vent channels are spaced on an inner edge of an outer periphery of the porous body. 25
18. The electronic cigarette vaporization apparatus according to any one of claims 1 to 17, wherein a quantity of seal portions and arrangement positions of the seal portions are in a one-to-one correspondence with the quantity of vent channels and arrangement positions of the vent channels. 30
19. The electronic cigarette vaporization apparatus according to claim 18, wherein using the extending direction from the liquid absorbing surface to the vaporization surface as a preset direction, a cross section of the first seal member perpendicular to the preset direction is an elongated structure, and multiple seal portions are located on two ends of the elongated structure. 35
20. The electronic cigarette vaporization apparatus according to claim 19, wherein the quantity of seal portions is four, and the four seal portions are symmetrically distributed in pairs on two ends of the elongated structure. 40
21. The electronic cigarette vaporization apparatus according to claim 4, wherein the first cover body is in interference fit with the first seal member, and the first seal member is in interference fit with the vaporization assembly. 45
22. The electronic cigarette vaporization apparatus according to claim 4, wherein a vaporization cavity is formed between the vaporization surface of the porous body and the second cover body, and a vent hole in communication with the airflow channel is provided on the second cover body. 50
23. The electronic cigarette vaporization apparatus according to claim 22, further comprising: a lower cover, wherein the lower cover is arranged on a lower end of the second cover body and matches the housing, an air inlet hole is provided on the lower cover, and the air inlet hole is in communication with the vent hole. 55
24. An electronic cigarette, comprising the electronic cigarette vaporization apparatus according to any one of claims 1 to 23.

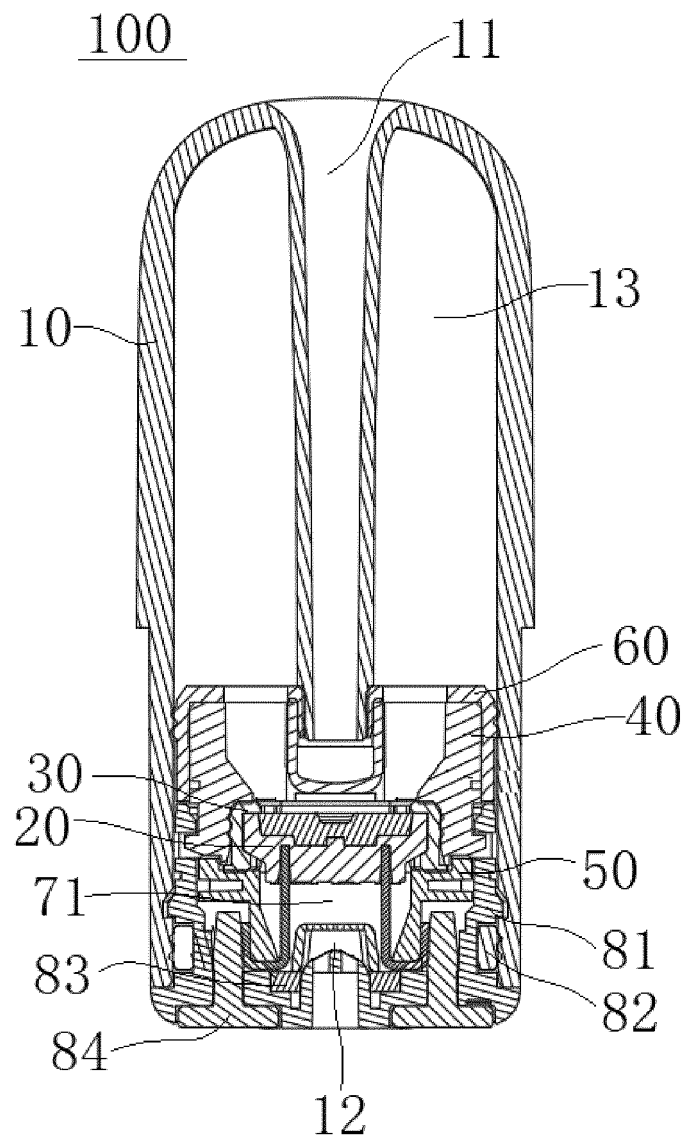


FIG. 1

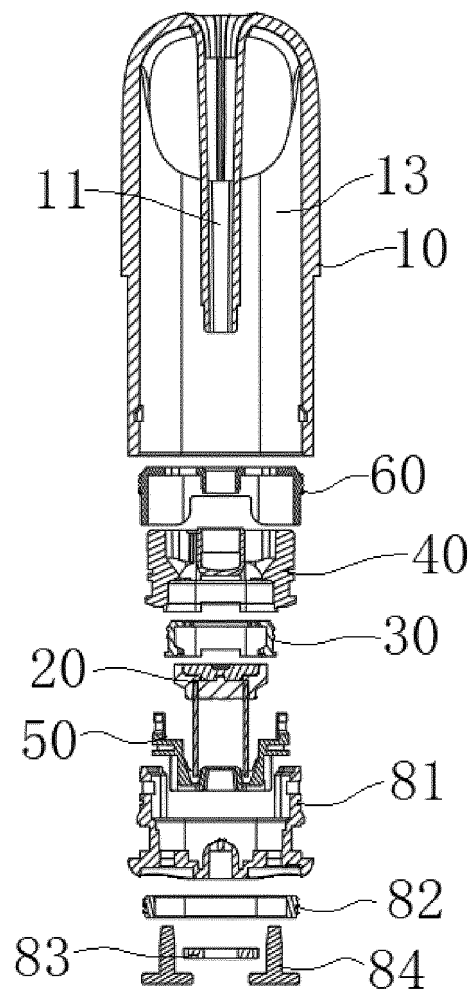


FIG. 2

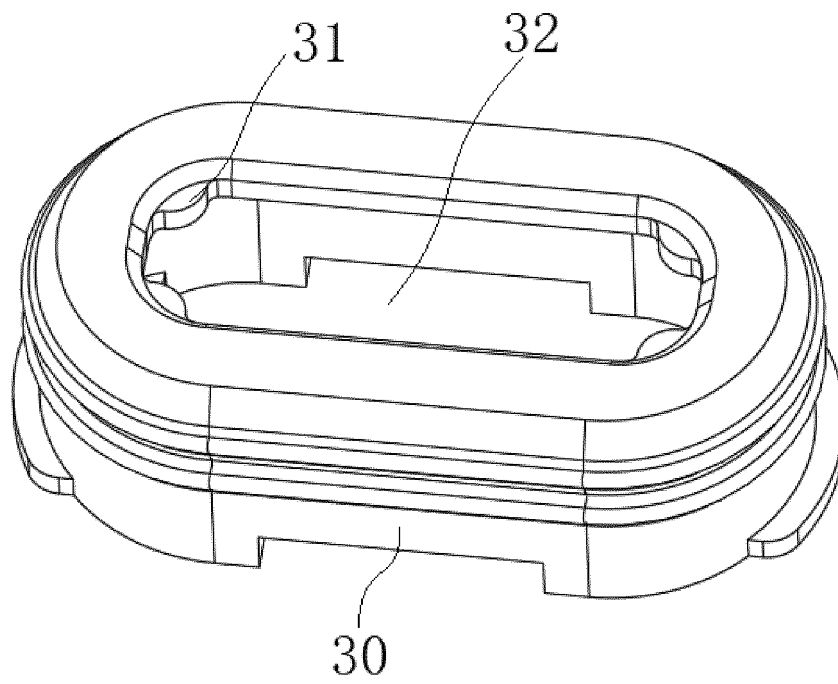


FIG. 3

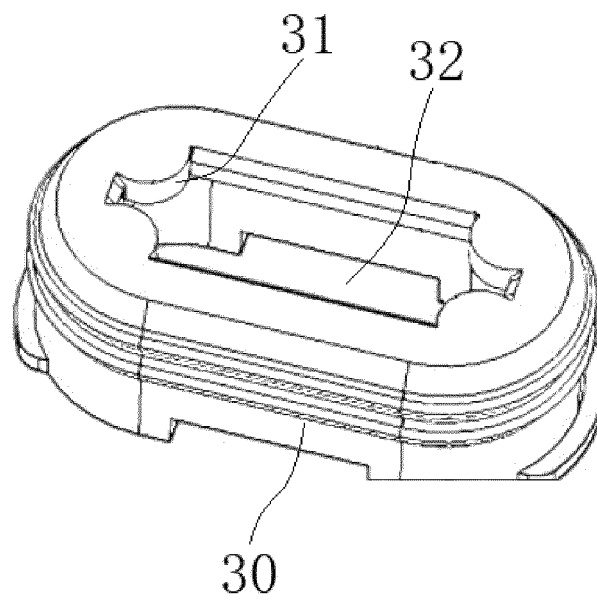


FIG. 4

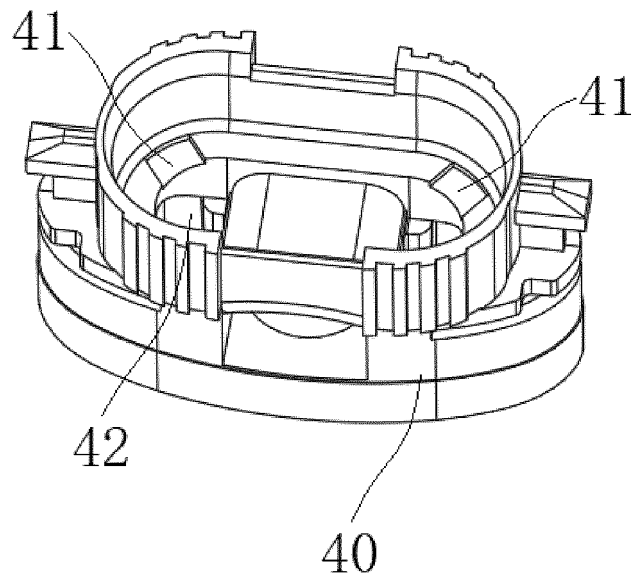


FIG. 5

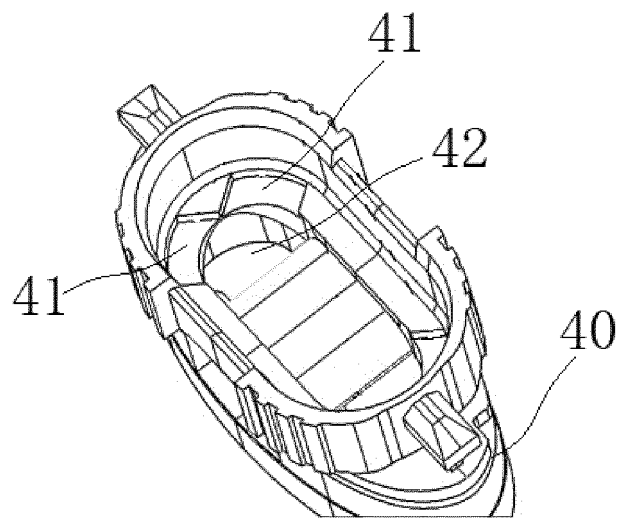


FIG. 6

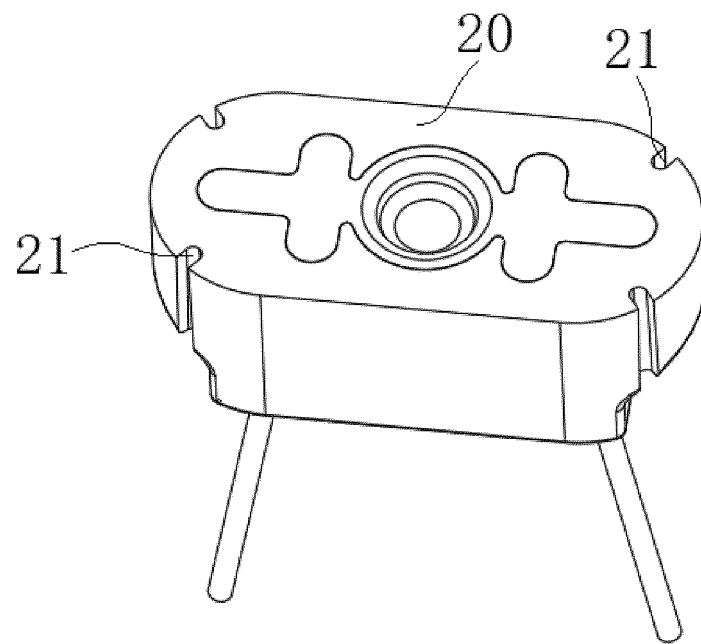


FIG. 7

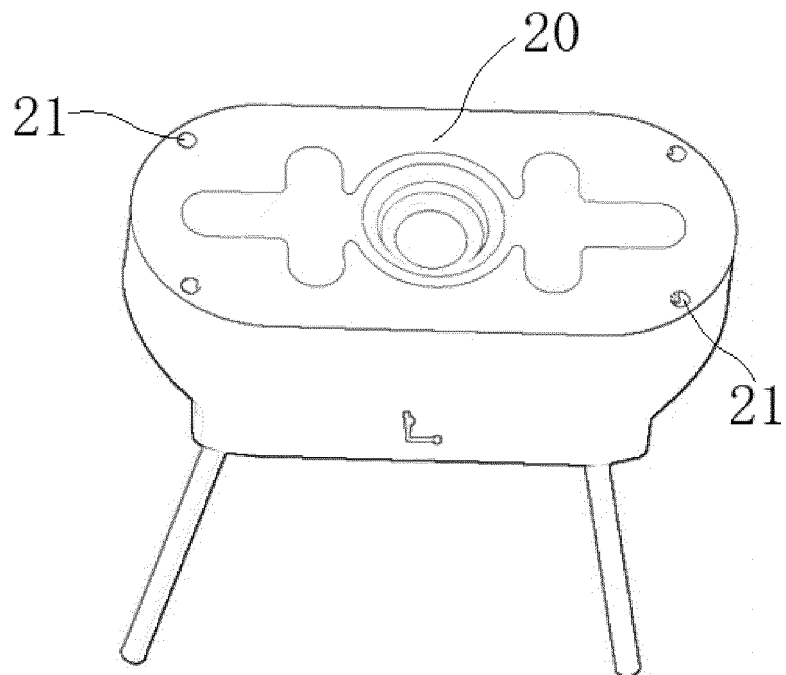


FIG. 8

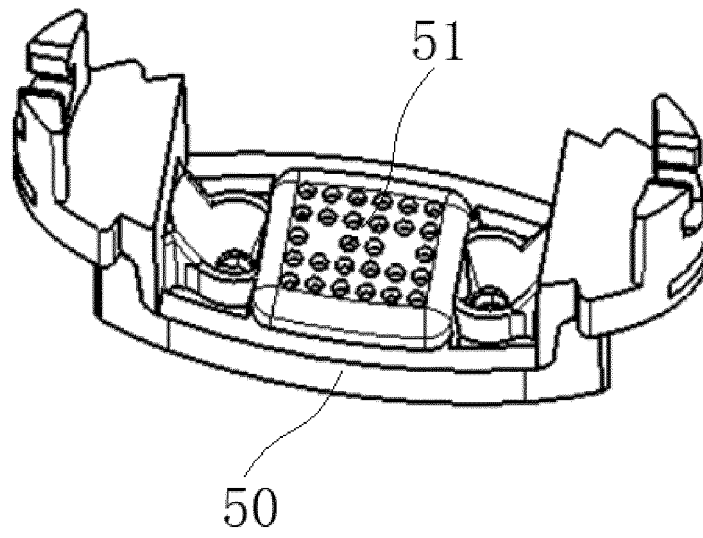


FIG. 9

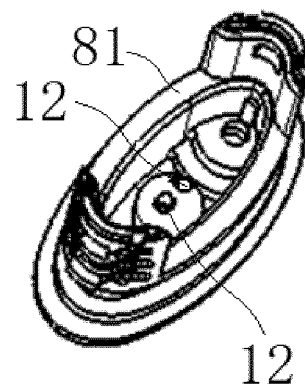


FIG. 10

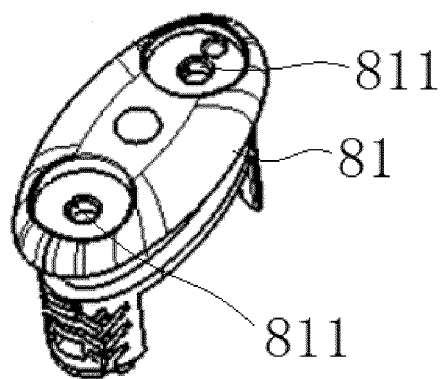


FIG. 11

INTERNATIONAL SEARCH REPORT

International application No.

PCT/CN2021/122902

A. CLASSIFICATION OF SUBJECT MATTER

A24F 40/48(2020.01)i; A24F 40/46(2020.01)i; A24F 40/42(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)

CNTXT, VEN: 平衡, 气压, 密封, balance, pressure, seal

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	CN 112471608 A (SHENZHEN SMOORE TECHNOLOGY LIMITED) 12 March 2021 (2021-03-12) description, pages 3-6, and figures 1-7	1-24
X	CN 111631437 A (SHENZHEN SMOORE TECHNOLOGY LIMITED) 08 September 2020 (2020-09-08) description, pages 3-6, and figures 1-12	1-24
X	CN 212345299 U (SHENZHEN SMOORE TECHNOLOGY LIMITED) 15 January 2021 (2021-01-15) description, pages 3-6, and figures 1-12	1-24
X	CN 111772236 A (SHENZHEN SMOORE TECHNOLOGY LIMITED) 16 October 2020 (2020-10-16) description, pages 3-6, and figures 1-11	1-24
X	CN 212937910 U (SHENZHEN SMOORE TECHNOLOGY LIMITED) 13 April 2021 (2021-04-13) description, pages 3-6, and figures 1-11	1-24
X	CN 111657548 A (SHENZHEN SMOORE TECHNOLOGY LIMITED) 15 September 2020 (2020-09-15) description, pages 4-8, and figures 1-14	1-24

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

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Date of the actual completion of the international search

12 January 2022

Date of mailing of the international search report

29 January 2022

Name and mailing address of the ISA/CN

China National Intellectual Property Administration (ISA/
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Authorized officer

Facsimile No. (86-10)62019451

Telephone No.

INTERNATIONAL SEARCH REPORT

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PCT/CN2021/122902

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C. DOCUMENTS CONSIDERED TO BE RELEVANT

10

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	CN 212911660 U (SHENZHEN SMOORE TECHNOLOGY LIMITED) 09 April 2021 (2021-04-09) description, pages 4-8, and figures 1-14	1-24
A	EP 3753595 A1 (NERUDIA LTD.) 23 December 2020 (2020-12-23) entire document	1-24

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INTERNATIONAL SEARCH REPORT
Information on patent family members

International application No.

PCT/CN2021/122902

Patent document cited in search report	Publication date (day/month/year)	Patent family member(s)	Publication date (day/month/year)
CN 112471608 A	12 March 2021	None	
CN 111631437 A	08 September 2020	None	
CN 212345299 U	15 January 2021	None	
CN 111772236 A	16 October 2020	None	
CN 212937910 U	13 April 2021	None	
CN 111657548 A	15 September 2020	None	
CN 212911660 U	09 April 2021	None	
EP 3753595 A1	23 December 2020	WO 2020254669 A1	24 December 2020

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

REFERENCES CITED IN THE DESCRIPTION

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