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(54) **ATOMIZER AND ELECTRONIC CIGARETTE**

(57) An atomizer (100), the atomizer (100) comprising a liquid storage assembly (10) and an atomization assembly (20); the liquid storage assembly (10) is internally provided with a liquid storage cavity (11), the liquid storage assembly (10) is provided with a mounting hole (121), the mounting hole (121) is in communication with the liquid storage cavity (11); the atomization assembly (20) is internally provided with an atomization cavity (21), a liquid inlet hole (222) in communication with the atomization cavity (21) is formed on the atomization assembly (20), the atomization assembly (20) is slidably provided in the mounting hole (121) along the axial direction of the mounting hole (121); when the atomization assembly (20) slides to a first state, the wall of the mounting hole (121) shields the liquid inlet hole (222) so that the liquid inlet hole (222) is staggered from the liquid storage cavity (11), and when the atomization assembly (20) slides to a second state, the liquid inlet hole (222) is in communication with the liquid storage cavity (11) and the atomization cavity. The atomizer (100) facilitates storage of e-liquid. Also provided is an electronic cigarette using the atomizer (100).

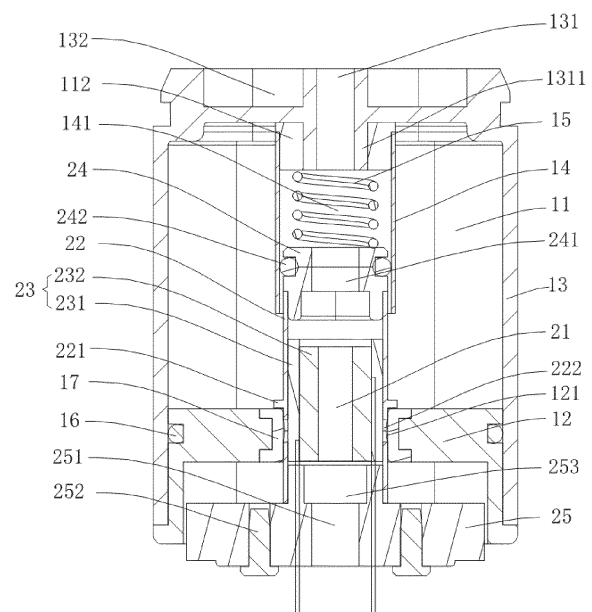


FIG. 2

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Description**TECHNICAL FIELD**

5 **[0001]** The disclosure relates to the technical field of simulated smoking, and more particularly, relates to an atomizer and an electronic cigarette using the atomizer.

BACKGROUND

10 **[0002]** At present, the electronic cigarette has become a relatively mature smoking substitute in the market, which supplies power to the heating structure in the atomizer through the battery device, so that the heating structure is electrically driven to heat the e-liquid to generate smoke for the user to inhale.

15 **[0003]** In the traditional atomizer, since the liquid storage cavity and the atomizing cavity are communicated with each other, when the electronic cigarette is not used for a long time, the e-liquid in the liquid storage cavity may enter the atomizing cavity and be absorbed by the liquid absorbing member. Since the atomizing cavity is communicated to the outside, the e-liquid absorbed by the liquid absorbing member is easy to volatilize to the outside, so that the liquid absorbing member may repeatedly absorb the e-liquid in the liquid storage cavity. When the user uses the electronic cigarette again, since part of the e-liquid in the liquid storage cavity has been absorbed by the liquid absorbing member, the amount of the e-liquid in the liquid storage cavity is reduced, making it difficult to store the e-liquid in the liquid storage cavity. Further, since the atomizing cavity is also communicated with the air inlet passage, when the amount of the e-liquid absorbed by the liquid absorbing member is saturated, the e-liquid in the liquid storage cavity may leak to the outside through the air inlet passage. Moreover, because the e-liquid is in contact with the air for a long time, it may cause the e-liquid to deteriorate and affect the user experience.

SUMMARY

25 **[0004]** Based on the above, in order to solve at least one of the above problems, it is necessary to provide an atomizer that is convenient for storing the e-liquid and an electronic cigarette using the atomizer.

30 **[0005]** An atomizer includes a liquid storage assembly and an atomizing assembly, wherein a liquid storage cavity is provided in the liquid storage assembly, the liquid storage assembly is provided with a mounting hole, the mounting hole is in communication with the liquid storage cavity, an atomizing cavity is provided in the atomizing assembly, the atomizing assembly is provided with a liquid inlet hole communicating with the atomizing cavity, the atomizing assembly is slidably disposed in the mounting hole along an axial direction of the mounting hole;

35 **[0006]** when the atomizing assembly slides to a first state, an inner wall of the mounting hole shields the liquid inlet hole such that the liquid inlet hole and the liquid storage cavity are staggered ;

[0007] when the atomizing assembly slides to a second state, the liquid inlet hole communicates the liquid storage cavity and the atomizing cavity.

40 **[0008]** Further, the atomizing assembly includes an atomizing housing, the atomizing housing is slidably disposed in the mounting hole along the axial direction of the mounting hole, the atomizing cavity is provided in the atomizing housing, and the liquid inlet hole is provided on the atomizing housing.

[0009] Further, a side wall of the atomizing housing protrudes outward along a radial direction of the atomizing housing to form a limiting protrusion.

[0010] Further, the liquid storage assembly further includes a liquid storage member, and the liquid storage cavity is an inner cavity of the liquid storage member.

45 **[0011]** Further, a first latching groove and a second latching groove are provided on the liquid storage member and spaced apart from each other, the atomizing assembly further includes a seat installed on the atomizing housing, a protrusion capable of engaging with the first latching groove or the second latching groove is provided on the seat.

[0012] Further, the first latching groove and the second latching groove are sequentially arranged along an axial direction of the liquid storage member.

50 **[0013]** Further, the liquid storage assembly further includes an elastic member, and the elastic member is disposed between the atomizing assembly and the liquid storage assembly.

[0014] Further, the liquid storage member is provided with a smoke outlet hole communicating with the outside, the liquid storage assembly includes a venting member disposed in the liquid storage member, an inner cavity of the venting member is in communication with the smoke outlet hole.

55 **[0015]** Further, the atomizing housing is slidably disposed in the venting member.

[0016] An electronic cigarette includes a battery device and an atomizer as described above, wherein the atomizer is electrically connected to the battery device.

[0017] In the atomizer of the present disclosure and the electronic cigarette using the atomizer, when the user does

not use the electronic cigarette, the inner wall of the mounting hole shields the liquid inlet hole, so that the liquid inlet hole and the liquid storage cavity are staggered, which is convenient for storage the e-liquid, When the user uses the electronic cigarette, the liquid inlet hole communicates the liquid storage cavity and the atomizing cavity.

BRIEF DESCRIPTION OF THE DRAWINGS

[0018]

FIG. 1 is a schematic structural diagram of an atomizer of an electronic cigarette according to a first embodiment of the present disclosure in one state;

FIG. 2 is a cross-sectional view of the atomizer shown in FIG. 1;

FIG. 3 is a schematic structural diagram of the atomizer shown in FIG. 1 in another state;

FIG. 4 is a cross-sectional view of the atomizer shown in FIG. 3;

FIG. 5 is a schematic diagram showing the engaging relationship of the atomizer shown in FIG. 1;

FIG. 6 is a partially exploded view of the atomizer shown in FIG. 1;

FIG. 7 is a cross-sectional view of a liquid storage assembly of the electronic cigarette shown in FIG. 1;

FIG. 8 is a cross-sectional view of an atomizing assembly of the electronic cigarette shown in FIG. 1;

FIG. 9 is a schematic structural diagram of an atomizer of an electronic cigarette according to a second embodiment of the present disclosure in one state;

FIG. 10 is a cross-sectional view of the atomizer shown in FIG. 9;

FIG. 11 is a schematic structural view of the atomizer shown in FIG. 9 in another state;

FIG. 12 is a cross-sectional view of the atomizer shown in FIG. 11;

FIG. 13 is a partially exploded view of the atomizer shown in FIG. 9;

FIG. 14 is an exploded view of the atomizer shown in FIG. 13;

FIG. 15 is a partially exploded view of the atomizer shown in FIG. 9 from another viewing angle;

FIG. 16 is an exploded view of the atomizer shown in FIG. 15; and

FIG. 17 is a schematic structural view of a seat in the atomizer shown in FIG. 9.

atomizer 100, 200	liquid storage assembly 10, 30
liquid sealing member 12, 32	liquid storage member 13, 33
connecting portion 131, 453	mounting hole 121, 321
heating structure 23, 44	upper cover 24
liquid inlet hole 222, 431	liquid absorbing member 231, 441
air inlet hole 251, 336	electrode contact member 252, 4512
elastic member 15	sealing ring 242
second scaling member 17	groove 132
first sensing air passage 334	first through hole 322
abutting portion 452	first communication hole 4511
protrusion 4531	first latching groove 337
supporting member 46	suction nozzle 50
guiding hole 3392	
atomizing assembly 20, 40	liquid storage cavity 11, 31
venting member 14, 42	smoke outlet hole 131, 331
atomizing cavity 21, 41	atomizing housing 22, 43
seat 25, 45	limiting protrusion 221
heating member 232, 442	air outlet hole 241, 3393
air intake passage 253, 335	air outlet passage 141, 454
connecting ring 112	first sealing member 16

(continued)

liquid injection hole 332	liquid plug 333
second through hole 323	seat body 451
air inlet groove 4521	flange 4522
second latching groove 338	connecting member 339
smoke outlet opening 51	guiding groove 3391

DETAILED DESCRIPTION OF PREFERRED EMBODIMENTS

[0019] In order to facilitate the understanding of the present disclosure, the present disclosure will be described in details with reference to the accompanying drawings. Preferred embodiments of the present disclosure are given in the accompanying drawings. However, the present disclosure can be realized in many different forms and is not limited to the embodiments described herein. On the contrary, the purpose of providing these embodiments is to make a more thorough and comprehensive understanding of the disclosed contents of the present disclosure.

[0020] It should be noted that when an element is referred to as being "fixed to" another element, it may be directly fixed to the other element or intervening elements may also be present. When an element is referred to as being "connected to" another element, it can be directly connected to the other element or intervening elements may also be present.

[0021] Unless defined otherwise, all technical and scientific terms used herein have the same meaning as commonly understood by one of ordinary skill in the art to which this disclosure belongs. The terms used herein in the description of the present disclosure are only for the purpose of describing specific embodiments, and are not intended to limit the present disclosure. The term "and / or" as used herein includes any and all combinations of one or more of the associated listed items.

First embodiment

[0022] Please refer to FIGs. 1 to 4, the first embodiment of the present disclosure provides an electronic cigarette (not shown). The electronic cigarette includes an atomizer 100 and a battery device (not shown). The atomizer 100 is configured to electrically connect with the battery device. The atomizer 100 heats the e-liquid under the electric driving of the battery device, so that the e-liquid is atomized into smoke.

[0023] The atomizer 100 includes a liquid storage assembly 10 and an atomizing assembly 20 installed in the liquid storage assembly 10. The liquid storage assembly 10 includes a liquid storage cavity 11 and a liquid sealing member 12 disposed in the liquid storage cavity 11. The atomizing assembly 20 is disposed in the liquid storage cavity 11. The atomizing assembly 20 is provided with an atomizing cavity 21. The atomizing assembly 20 can move axially relative to the liquid sealing member 12, so that the atomizing cavity 21 is in fluid communication with the liquid storage cavity 11 or is isolated from the liquid storage cavity 11.

[0024] The liquid storage assembly 10 includes a liquid storage member 13, a venting member 14 disposed in the liquid storage member 13, and a liquid sealing member 12 received in the liquid storage member 13. The inner cavity of the liquid storage member 13 is formed as a liquid storage cavity 11 for storing e-liquid, and a smoke outlet hole 131 is provided on the liquid storage member 13. The inner cavity of the venting member 14 is in communication with the smoke outlet hole 131. The atomizing assembly 20 heats the e-liquid in the liquid storage cavity 11 under the electric driving of the battery device, and the e-liquid is heated to generate smoke. The smoke flows out sequentially through the inner cavity of the venting member 14 and the smoke outlet hole 131, and the user can inhale the smoke generated by atomization from the smoke outlet hole 131.

[0025] The liquid storage member 13 is generally a hollow cylindrical structure with an open lower end. The smoke outlet hole 131 is provided at the upper end of the liquid storage member 13. In this embodiment, the liquid storage assembly 10 adopts a pre-packaged manner, and the e-liquid is injected into the liquid storage cavity 11 in advance. After the e-liquid is consumed, the atomizer 100 is discarded as a whole, and the atomizer 100 cannot be refilled with e-liquid.

[0026] The venting member 14 and the liquid storage member 13 are two independent components, and the two are detachably connected by means of snap connection or plug connection. In one embodiment, the lower end surface of the liquid storage member 13 protrudes downward along the axial direction of the liquid storage member 13 to form a connecting portion 1311 around the smoke outlet hole 131. The venting member 14 is sleeved on the connecting portion 1311. The connecting portion 1311 is a hollow structure, and the inner cavity of the connecting portion 1311 is in communication with the inner cavity of the venting member 14 and the smoke outlet hole 131.

[0027] In one embodiment, the side wall of the liquid sealing member 12 abuts against the inner wall of the liquid storage cavity 11 to seal the open end of the liquid storage member 13. The upper end surface of the liquid sealing member 12 constitutes a part of the inner wall of the liquid storage cavity 11. The liquid sealing member 12 is provided with a mounting hole 121 for installing the atomizing assembly 20. The mounting hole 121 is in communication with the liquid storage cavity 11. Through the tight fit between the liquid sealing member 12 and the inner wall of the liquid storage cavity 11, the liquid sealing member 12 can be more firmly connected to the inner wall of the liquid storage cavity 11, so that the liquid sealing member 12 is fixedly installed in the liquid storage member 13. Further, through the tight fit between the liquid sealing member 12 and the inner wall of the liquid storage cavity 11, the gap between the side wall of the liquid sealing member 12 and the inner wall of the liquid storage cavity 11 can also be sealed, thereby preventing the e-liquid in the liquid storage cavity 11 from leaking to the outside through the gap between the liquid sealing member 12 and the liquid storage cavity 11. It is understood that, in another embodiment not shown, the liquid sealing member 12 and the liquid storage member 13 may also be integrally formed.

[0028] Please refer to FIG. 2, FIG. 5, FIG. 6, FIG. 7 and FIG. 8, the atomizing assembly 20 includes an atomizing housing 22 disposed in the mounting hole 121, a heating structure 23 disposed in the atomizing housing 22, an upper cover 24 installed at one end of the atomizing housing 22, and a seat 25 installed at the other end of the atomizing housing 22 relative to the upper cover 24.

[0029] The atomizing housing 22 has generally a hollow cylindrical structure with both ends being opened. In this embodiment, the atomizing housing 22 is slidably disposed in the mounting hole 121 along the axial direction of the mounting hole 121. The side wall of the atomizing housing 22 abuts against the inner wall of the mounting hole 121. The upper end of the atomizing housing 22 is movably connected with the venting member 14, so that the inner cavity of the atomizing housing 22 is in communication with the smoke outlet hole 131. In this specific embodiment, the upper end of the atomizing housing 22 extends into the venting member 14. The cavity enclosed by the side wall of the atomizing housing 22, the side wall of the venting member 14, the upper end surface of the liquid sealing member 12 and the inner wall of the liquid storage member 13 is the liquid storage cavity 11. The side wall of the atomizing housing 22 protrudes outward along the radial direction of the atomizing housing 22 to form a limiting protrusion 221. The limiting protrusion 221 abuts against the upper end surface of the liquid sealing member 12. At least one liquid inlet hole 222 capable of communicating with the liquid storage cavity 11 is provided on the outer peripheral surface of the atomizing housing 22. In this embodiment, there are multiple (e.g., three or more) liquid inlet holes 222, and the liquid inlet holes 222 are evenly arranged along the circumferential direction of the atomizing housing 22, so that the e-liquid in the liquid storage cavity 11 can evenly flow into the atomizing housing 22. The liquid inlet hole 222 is arranged close to the lower end of the atomizing housing 22. In this way, when the amount of the e-liquid in the liquid storage cavity 11 is small, the e-liquid located at the bottom of the liquid storage cavity 11 can also flow into the atomizing housing 22 through the liquid inlet hole 222.

[0030] The heating structure 23 is disposed in the atomizing housing 22. When the atomizer 100 shakes, the side wall of the heating structure 23 can resist the inner surface of the atomizing housing 22, so that the atomizing housing 22 can limit the radial displacement of the heating structure 23. The heating structure 23 includes a liquid absorbing member 231 disposed in the atomizing housing 22 and a heating member 232 contacting with the liquid absorbing member 231. In this embodiment, the liquid absorbing member 231 is wrapped around the heating member 232, and the liquid absorbing member 231 is interposed between the atomizing housing 22 and the heating member 232. The outer peripheral surface of the liquid absorbing member 231 is attached to the inner peripheral surface of the atomizing housing 22, so that the e-liquid in the liquid storage cavity 11 can be smoothly absorbed by the liquid absorbing member 231 through the liquid inlet hole 222. The heating member 232 heats and atomizes the e-liquid absorbed by the liquid absorbing member 231. The space of the heating member 232 for heating and atomizing the e-liquid is the atomizing cavity 21. In this embodiment, the heating member 232 is generally a hollow structure extending along the axial direction of the atomizing assembly 20. The inner cavity of the heating member 232 constitutes the atomizing cavity 21. The smoke formed by heating the e-liquid by the heating member 232 is mainly located in the atomizing cavity 21.

[0031] The liquid absorbing member 231 is made of a material that is easy to absorb liquid, such as cotton, cotton cloth or porous ceramics. The liquid absorbing member 231 can gradually absorb the e-liquid flowing onto the liquid absorbing member 231 through the liquid inlet hole 222. In this embodiment, the liquid absorbing member 231 is cotton cloth.

[0032] The shape of the heating member 232 may be a heating net, a heating sheet, a heating wire, etc. The heating net and the heating sheet can heat evenly, which can prevent local overheating. In this embodiment, the heating member 232 is a cylindrical spiral heating wire. The heating member 232 may be made of a material such as stainless steel, nickel-chromium alloy, or ceramics.

[0033] The upper cover 24 is disposed at the upper end of the atomizing housing 22. The upper cover 24 is provided with an air outlet hole 241 communicating with the atomizing cavity 21 and the inner cavity of the venting member 14.

[0034] The seat 25 is disposed at the lower end of the atomizing housing 22. The seat 25 is provided with an air inlet hole 251 communicating the atomizing cavity 21 and the outside. Two electrode contact members 252 are provided on

the seat 25 and spaced apart from each other, and the two electrode contact members 252 are respectively connected to two ends of the heating member 232. The two electrode contact members 252 are both electrical conductors. Specifically, the two electrode contact members 252 are made of a conductive material such as iron, cobalt, or nickel. One of the electrode contact members 252 is used as a positive contact, and the other electrode contact member 252 is used as a negative contact. When the atomizer 100 is installed in place, the atomizer 100 and the battery device are electrically connected.

[0035] In this embodiment, the upper cover 24, the atomizing housing 22 and the seat 25 are independent components. The upper cover 24 and the atomizing housing 22, or the atomizing housing 22 and the seat 25 are detachably connected by snapping connection or plugging connection. It is understood that, in another embodiment not shown, the upper cover 24, the atomizing housing 22 and the seat 25 may also be integrally formed.

[0036] Please refer to FIGs. 2 and 4, in this embodiment, the channel communicating the air inlet hole 251 and the atomizing cavity 21 is an air intake passage 253. The channel communicating the atomizing cavity 21 and the inner cavity of the venting member 14 is an air outlet passage 141. The smoke formed by heating the e-liquid by the heating member 232 is located in the atomizing cavity 21. The outside air enters the atomizing cavity 21 through the air inlet hole 251 and the air intake passage 253 to mix with the atomized smoke, and then, the smoke mixed with the air flows out from the smoke outlet hole 131 after passing through the air outlet passage 141.

[0037] The battery device is detachably connected to the atomizer 100, and the detachable connection includes, but is not limited to, snapping connection, plugging connection, magnetic attraction connection, and so on. After the battery device and the atomizer 100 are assembled in place, the positive electrode and the negative electrode of the battery device are electrically connected to the two electrode contact members 252, respectively, so that the atomizer 100 can heat the e-liquid under the electric driving of the battery device and make the e-liquid be atomized into smoke for the user to inhale.

[0038] In this embodiment, the atomizer 100 has a first state and a second state. Specifically, the first state is a state in which the atomizer 100 is not assembled with the battery device, and the second state is a state in which the atomizer 100 and the battery device are electrically connected after the atomizer 100 and the battery device are assembled in place.

[0039] In the first state of the atomizer 100, the lower end surface of the limiting protrusion 221 abuts against the upper end surface of the liquid sealing member 12. The liquid inlet hole 222 is shielded by the liquid sealing member 12. The liquid sealing member 12 prevents the e-liquid in the liquid storage cavity 11 from entering the atomizing cavity 21 through the liquid inlet hole 222.

[0040] In the process of assembling the atomizer 100 and the battery device, the atomizer 100 is gradually switched from the first state to the second state. Specifically, the battery device exerts a bottom-to-up driving force on the seat 25, the seat 25 moves upward relative to the liquid sealing member 12 in the axial direction of the liquid sealing member 12, so that the atomizing housing 22 is driven to move upward relative to the liquid sealing member 12 in the axial direction of the liquid sealing member 12, and the liquid inlet hole 222 communicates the liquid storage cavity 11 and the atomizing cavity 21. When the atomizer 100 is switched to the second state, the liquid inlet hole 222 communicates the liquid storage cavity 11 and the atomizing cavity 21, and the e-liquid in the liquid storage cavity 11 enters the atomizing cavity 21 through the liquid inlet hole 222.

[0041] When the battery device and the atomizer 100 are separated, the driving force exerted by the battery device on the seat 25 disappears. Due to the gravity of the atomizer assembly 20 or by pulling the seat 25 downwards, the seat 25 moves downward relative to the liquid sealing member 12 in the axial direction of the liquid sealing member 12. When the lower end surface of the limiting protrusion 221 abuts against the upper end surface of the liquid sealing member 12, the liquid inlet hole 222 is shielded by the liquid sealing member 12. That is, the inner wall of the mounting hole 121 shields the liquid inlet hole 222, so that the liquid inlet hole 222 is staggered from the liquid storage cavity 11, and the atomizer 100 is switched from the second state to the first state.

[0042] Please refer to FIG. 2 and FIG. 4, optionally, in order to facilitate the atomizer 100 to switch from the second state to the first state, the liquid storage assembly 10 further includes an elastic member 15. Specifically, the elastic member 15 is a spring. The elastic member 15 is disposed between the atomizing assembly 20 and the liquid storage assembly 10. Specifically, one end of the elastic member 15 abuts against the lower end surface of the connecting portion 1311, and the other end of the elastic member 15 abuts against the upper end surface of the upper cover 24. During the process of assembling the atomizer 100 and the battery device, the battery device exerts a bottom-to-up driving force on the atomizing assembly 20. When the driving force is greater than the elastic force provided by the elastic member 15 on the atomizing assembly 20, the elastic member 14 is compressed, and the atomizing assembly 20 moves upward relative to the liquid sealing member 12 in the axial direction of the liquid sealing member 12. As a result, the atomizer 100 is gradually switched from the first state to the second state, such that the liquid inlet hole 222 communicates the liquid storage cavity 11 and the atomizing cavity 21. When the battery device and the atomizer 100 are separated, the driving force exerted by the battery device on the seat 25 disappears, and the elastic force provided by the elastic member 15 on the atomizing assembly 20 can cause the atomizing assembly 20 to move downward relative to the liquid sealing member 12 along the axial direction of the liquid sealing member 12. When the lower end

surface of the limiting protrusion 221 abuts against the upper end surface of the liquid sealing member 12, the liquid inlet hole 222 is shielded by the liquid sealing member 12, and the atomizer 100 is switched from the second state to the first state. It is understood that, in another embodiment not shown, the elastic member 15 may also be a rigid and elastic element such as a thin steel sheet disposed in the inner cavity of the venting member 14, and the number of the elastic members 15 is not limited. Alternatively, the elastic member 15 may also be a cylinder made of a soft material with elasticity such as silicone or rubber.

[0043] Optionally, in order to improve the air tightness between the upper cover 24 and the connecting portion 1311, a sealing ring 242 is sandwiched between the inner wall of the venting member 14 and the side wall of the upper cover 24 to prevent air leakage. It is understood that, the sealing ring 242 is made of a material with good sealing property, such as silicone or rubber.

[0044] Optionally, in order to increase the contact area of the upper end surface of the elastic member 15 and facilitate the installation of the elastic member 15, a connecting ring 112 is sandwiched between the connecting portion 1311 and the venting member 14, and the upper end of the elastic member 15 abuts on the connecting ring 112. Specifically, the connecting ring 112 is sleeved on the connecting portion 1311, the venting member 14 is sleeved on the connecting ring 112, and the inner cavity of the venting member 14 is in communication with the smoke outlet hole 131. It is understood that, the connecting ring 112 may be made of a material with good sealing property, such as silicone or rubber, to further improve the air tightness between the upper cover 24 and the connecting portion 1311.

[0045] Optionally, in order to improve the tightness between the side wall of the liquid sealing member 12 and the inner wall of the liquid storage member 13, or between the inner wall of the mounting hole 121 and the atomizing housing 22 so as to prevent the e-liquid in the liquid storage cavity 11 from leaking to the outside, in this embodiment, a first sealing member 16 is provided between the side wall of the liquid sealing member 12 and the inner wall of the liquid storage member 13, and a second sealing member 17 is provided between the inner wall of the mounting hole 121 and the atomizing housing 22. Both the first sealing member 16 and the second sealing member 17 may be made of a material with good sealing property, such as silicone or rubber.

[0046] Optionally, in order to facilitate the suction operation and improve the use experience for the user, the liquid storage member 13 is provided with a groove 132 around the periphery of the smoke outlet hole 131. The user can fit his lips to the wall of the groove 132, and inhales the smoke through the protruding wall of the smoke outlet hole 131. It is understood that, in another embodiment not shown, the atomizer 100 further includes a suction nozzle (not shown), the suction nozzle is detachably connected to the upper end of the liquid storage member 13 by snapping connection or plugging connection, etc. The suction nozzle is provided with a smoke outlet opening (not shown) that communicates with the outside and the smoke outlet hole 131, and the user can inhale the smoke through the suction nozzle.

[0047] In the atomizer 100 of the present disclosure and the electronic cigarette using the atomizer 100, when the user does not use the electronic cigarette, the inner wall of the mounting hole 121 shields the liquid inlet hole 222, so that the liquid inlet hole 222 and the liquid storage cavity 11 are staggered, which is convenient for storing the e-liquid. When the user uses the electronic cigarette, the liquid inlet hole 222 communicates the liquid storage cavity 11 and the atomizing cavity 21.

Second embodiment

[0048] Please refer to FIGs. 9-17, the second embodiment of the present disclosure provides an electronic cigarette (not shown). The electronic cigarette includes an atomizer 200 and a battery device (not shown). The atomizer 200 is configured to electrically connect with the battery device. The atomizer 200 heats the e-liquid under the electric driving of the battery device, so that the e-liquid is atomized into smoke.

[0049] Referring to FIGs. 9-12, the atomizer 200 includes a liquid storage assembly 30, an atomizing assembly 40 installed in the liquid storage assembly 30, and a suction nozzle 50 installed on the liquid storage assembly 30. The liquid storage assembly 30 includes a liquid storage member 33 provided with a liquid storage cavity 31 and a liquid sealing member 32 disposed in the liquid storage cavity 31. The atomizing assembly 40 is disposed in the liquid storage cavity 31. The atomizing assembly 40 is provided with an atomizing cavity 41. The atomizing assembly 40 can move relative to the liquid sealing member 32 along the axial direction of the liquid sealing member 32, so that the atomizing cavity 41 is in fluid communication with the liquid storage cavity 31 or is isolated from the liquid storage cavity 31.

[0050] One end of the liquid storage cavity 31 in the liquid storage member 33 is open, and the liquid sealing member 32 is provided at the open end of the liquid storage cavity 31.

[0051] The liquid storage member 33 is generally a hollow cylindrical structure with an open lower end. The internal space of the liquid storage member 33 forms the liquid storage cavity 31 for storing e-liquid. The liquid storage member 33 is made of a transparent or translucent material, so that the user can observe the remaining amount of the e-liquid in the liquid storage cavity 31 through the liquid storage member 33. In this embodiment, the liquid storage member 33 is made of transparent glass. In order to facilitate the user's operation of injecting e-liquid into the liquid storage cavity 31, a liquid injection hole 332 communicating with the liquid storage cavity 31 is provided on the side wall of the liquid

storage member 33, and a liquid plug 333 is provided in the liquid injecting hole 332. The liquid plug 333 is made of a material with good sealing property, such as rubber and silicone. After the user fills the liquid storage cavity 31 with e-liquid through the liquid injection hole 332, the liquid plug 333 is installed in the liquid injection hole 332. The liquid plug 333 can seal the liquid injection hole 332 to prevent the e-liquid in the liquid storage cavity 31 from leaking from the liquid injection hole 332. It is understood that, in another embodiment not shown, the liquid injection hole 332 and the liquid plug 333 are not provided on the liquid storage member 33. Instead, the e-liquid is pre-injected into the liquid storage member 33 in a pre-packaged manner, and after the e-liquid is consumed, the atomizer 200 is discarded as a whole, and the atomizer 200 is a non-refillable atomizer 200, or the liquid storage member 33 is discarded individually, and the liquid storage member 33 cannot be refilled with e-liquid.

[0052] Please refer to FIG. 10, FIG. 12, FIG. 14 and FIG. 16, a first sensing air passage 334 isolating from the liquid storage cavity 31 is provided in the liquid storage member 33. Specifically, one side of the inner wall of the liquid storage cavity 31 is provided with the first sensing air passage 334 along the axial direction of the liquid storage member 33. The lower end of the first sensing air passage 334 penetrates the lower end surface of the liquid storage member 33, and the upper end of the first sensing air passage 334 penetrates the upper end surface of the liquid storage member 33.

[0053] In this embodiment, the atomizer 200 is provided with a smoke outlet hole 331 and an air inlet hole 336. Specifically, the upper end surface of the liquid storage member 33 is provided with the smoke outlet hole 331, the side wall of the liquid storage member 33 is provided with the air inlet hole 336, and the inner cavity of the air inlet hole 336 is isolated from the liquid storage cavity 31.

[0054] The side wall of the liquid sealing member 32 abuts against the inner wall of the liquid storage cavity 31 to seal the open end of the liquid storage member 33. The upper end surface of the liquid sealing member 32 constitutes a part of the inner wall of the liquid storage cavity 31. The liquid sealing member 32 is provided with a mounting hole 321 for installing the atomizing assembly 40. The mounting hole 321 is in communication with the liquid storage cavity 31. Through the tight fit between the liquid sealing member 32 and the inner wall of the liquid storage cavity 31, the liquid sealing member 32 can be more firmly connected to the inner wall of the liquid storage cavity 31, so that the liquid sealing member 32 is fixedly installed in the liquid storage member 33. Further, through the tight fit between the liquid sealing member 32 and the inner wall of the liquid storage cavity 31, the gap between the side wall of the liquid sealing member 32 and the inner wall of the liquid storage cavity 31 can also be sealed, thereby preventing the e-liquid in the liquid storage cavity 31 from leaking to the outside through the gap between the liquid sealing member 32 and the inner wall of the liquid storage cavity 31. In this embodiment, the liquid sealing member 32 is further provided with a first through hole 322 and a second through hole 323, which are spaced from each other. The first through hole 322 is in communication with the first sensing air passage 334, and the second through hole 323 is in communication with the air inlet hole 336.

[0055] Please refer to FIG. 10, FIG. 12 and FIG. 13 to FIG. 16, the atomizing assembly 40 includes a venting member 42 disposed in the smoke outlet hole 331, an atomizing housing 43 disposed in the mounting hole 321 and connected to the lower end of the venting member 42, a heating structure 44 disposed in the atomizing housing 43, and a seat 45 installed at the other end of the atomizing housing 43 relative to the venting member 42.

[0056] The venting member 42 has generally a tubular structure with both ends being opened. The venting member 42 is slidably disposed in the smoke outlet hole 331, and the inner cavity of the venting member 42 is in communication with the smoke outlet hole 331.

[0057] The atomizing housing 43 has generally a hollow cylindrical structure with both ends being opened. In this embodiment, the atomizing housing 43 is slidably disposed in the mounting hole 321 along the axial direction of the mounting hole 321. The side wall of the atomizing housing 43 abuts against the inner wall of the mounting hole 321. The atomizing housing 43 and the venting member 42 are integrally formed. The inner cavity of the atomizing housing 43 is in communication with the inner cavity of the venting member 42, so that the inner cavity of the atomizing housing 43 is in communication with the smoke outlet hole 331. The cavity enclosed by the side wall of the atomizing housing 43, the side wall of the venting member 42, the upper end surface of the liquid sealing member 32 and the inner wall of the liquid storage member 33 is the liquid storage cavity 31. At least one liquid inlet hole 431 capable of communicating with the liquid storage cavity 31 is provided on the outer peripheral surface of the atomizing housing 43. In this embodiment, there are multiple liquid inlet holes 431 (e.g., three or more), and the liquid inlet holes 431 are evenly arranged along the circumferential direction of the atomizing housing 43, so that the e-liquid in the liquid storage cavity 31 can evenly flow into the atomizing housing 43. The liquid inlet hole 431 is arranged close to the lower end of the atomizing housing 43. In this way, when the amount of the e-liquid in the liquid storage cavity 31 is small, the e-liquid located at the bottom of the liquid storage cavity 31 can also flow into the atomizing housing 43 through the liquid inlet hole 431.

[0058] In one embodiment, the atomizing housing 43 and the venting member 42 are integrally formed. It is understood that, in another embodiment not shown, the atomizing housing 43 and the venting member 43 are two separate components, and the atomizing housing 43 and the venting member 43 can be connected by plugging, bonding, welding, threaded connection, or the like.

[0059] The heating structure 44 is disposed in the atomizing housing 43. When the atomizer 200 shakes, the side wall of the heating structure 44 can resist the inner surface of the atomizing housing 43, so that the atomizing housing 43

can limit the displacement of the heating structure 44 along the radial direction of the atomizing housing 43. The heating structure 44 includes a liquid absorbing member 441 disposed in the atomizing housing 43 and a heating member 442 contacting with the liquid absorbing member 441. In this embodiment, the liquid absorbing member 441 is wrapped around the heating member 442, and the liquid absorbing member 441 is interposed between the atomizing housing 43 and the heating member 442. The outer peripheral surface of the liquid absorbing member 441 is attached to the inner peripheral surface of the atomizing housing 43, so that the e-liquid in the liquid storage cavity 31 can be smoothly absorbed by the liquid absorbing member 441 through the liquid inlet hole 431, and the heating member 442 heats and atomizes the e-liquid absorbed by the liquid absorbing member 441. The space of the heating member 442 for heating and atomizing the e-liquid is the atomizing cavity 41. In this embodiment, the space enclosed by the inner peripheral surface of the heating member 442 constitutes the atomizing cavity 41. The smoke formed by heating the e-liquid by the heating member 442 is mainly located in the atomizing cavity 41.

[0060] The liquid absorbing member 441 is made of a porous material that is easy to absorb liquid, such as cotton, cotton cloth or porous ceramics. The liquid absorbing member 441 can gradually absorb the e-liquid flowing onto the liquid absorbing member 441 through the liquid inlet hole 431. In this embodiment, the liquid absorbing member 441 is a cotton cloth with at least one through hole. The arrangement of the through holes can increase the absorption capacity of the cotton cloth for the e-liquid.

[0061] The shape of the heating member 442 may be any shape such as a heating net, a heating sheet, etc. Both the heating net and the heating sheet can heat evenly, which can prevent local overheating. The heating member 442 may be made of a material with resistance, such as stainless steel, nickel-chromium alloy, and ceramics. In this embodiment, the heating member 442 is a cylindrical spiral heating wire.

[0062] Please refer to FIG. 10, FIG. 12 and FIG. 17, the seat 45 can move relative to the liquid storage member 33 along the axial direction of the liquid storage member 33. The seat 45 includes a seat body 451 disposed below the atomizing housing 43, an abutting portion 452 protruding from the seat body 451 for connecting with the atomizing housing 43, and connecting portions 453 arranged on two opposite sides of the abutting portion 452 for connecting with the liquid storage member 33.

[0063] The seat body 451 is provided with a first communication hole 4511 communicating the first through hole 322 with the outside. Two electrode contact members 4512 are provided on the seat body 451 and spaced apart from each other, and the two electrode contact members 4512 are respectively connected to two ends of the heating member 442. The two electrode contact members 4512 are both electrical conductors. Specifically, the two electrode contact members 4512 are both made of a conductive material such as iron, cobalt, nickel, etc. One of the electrode contact members 4512 is used as a positive contact, and the other electrode contact member 4512 is used as a negative contact. When the atomizer 200 is installed in place, the atomizer 200 and the battery device are electrically connected.

[0064] The abutting portion 452 has generally a hollow cylindrical structure with an open upper end. An air inlet groove 4521 is provided on the abutting portion 452. The interior of the abutting portion 452 protrudes upward along the axial direction of the seat body 451 to form a flange 4522. The flange 4522 is used to resist the lower end surface of the atomizing housing 43. When the inner wall of the abutting portion 452 is connected to the side wall of the atomizing housing 43, the lower end surface of the atomizing housing 43 abuts against the upper end surface of the flange 4522. The air inlet groove 4521 is in communication with the second through hole 323 and the atomizing cavity 41, so that the atomizing cavity 41 is in communication with the air inlet hole 336.

[0065] In this embodiment, a first latching groove 337 and a second latching groove 338 are provided on the side wall of the liquid storage member 33 sequentially along the axial direction of the liquid storage member 33. The connecting portion 453 is provided with a protrusion 4531 capable of engaging with the first latching groove 337 or the second latching groove 338. The protrusion 4531 is made of a soft material such as silicone or rubber. When installing the seat 45, the protrusion 4531 is engaged in the second latching groove 338 or the first latching groove 337 to keep the seat 45 fixed relative to the liquid storage member 33. Further, when the protrusion 4531 is engaged in the second latching groove 338 or the first latching groove 337, the protrusion 4531 is visible from the outside, so as to remind the user that the seat 45 has been installed in place. It is understood that, the number of the first latching groove 337 and the second latching groove 338 is not limited here, and it can be set according to the requirements of assembly between the seat 45 and the liquid storage member 33. The number of the protrusion 4531 is at least one, as long as the seat 45 can slide axially with respect to the liquid storage member 33, and the at least one protrusion 4531 is engaged in the second latching groove 338 or the first latching groove 337.

[0066] The suction nozzle 50 is detachably connected to the upper end of the liquid storage member 33 by means of snap connection or plug connection. The suction nozzle 50 is provided with a smoke outlet opening 51 communicating with the outside. In this embodiment, both the smoke outlet hole 331 and the first sensing air passage 334 are in communication with the smoke outlet opening 51, so that the user can inhale the smoke through the smoke outlet opening 51.

[0067] In this embodiment, the channel communicating the air inlet hole 336 and the atomizing cavity 41 is an air intake passage 335. It is understood that, the air intake passage 335 is a passage by communicating the air inlet hole

336, the second through hole 323, the air inlet groove 4521 and the atomizing cavity 41 in sequence. The channel communicating the atomizing cavity 41 and the smoke outlet hole 331 is an air outlet passage 454. It is understood that, the air outlet passage 454 is a passage by communicating the atomizing cavity 41, the inner cavity of the atomizing housing 43, the inner cavity of the venting member 42, the smoke outlet hole 331 and the smoke outlet opening 51 in sequence. The smoke formed by heating the e-liquid by the heating member 442 is located in the atomizing cavity 41. The outside air enters the atomizing cavity 41 through the air inlet hole 336 and the air intake passage 335 in sequence to mix with the atomized smoke, and then, the smoke mixed with the air flows out from the smoke outlet opening 51 after passing through the air outlet passage 454.

[0068] The battery device is detachably connected to the atomizer 200, and the detachable connection includes, but is not limited to, snapping connection, plugging connection, and so on. After the battery device and the atomizer 200 are assembled in place, the positive electrode and the negative electrode of the battery device are electrically connected to the two electrode contact members 4512, respectively, so that the atomizer 200 can heat the e-liquid under the electric driving of the battery device and atomize the e-liquid into smoke for the user to inhale.

[0069] Please refer to FIG. 10 and FIG. 12, in this embodiment, the atomizer 200 has a first state and a second state. Specifically, the first state is a state in which the atomizer 200 is not assembled with the battery device, and the second state is a state in which the atomizer 200 and the battery device are electrically connected after the atomizer 200 and the battery device are assembled in place.

[0070] In the first state of the atomizer 200, the protrusion 4531 is engaged in the second latching groove 338, the seat 45 is kept fixed relative to the liquid storage member 33, and the liquid inlet hole 431 is shielded by the liquid sealing member 32. That is, the inner wall of the mounting hole 321 shields the liquid inlet hole 431, so that the liquid inlet hole 431 is staggered from the liquid storage cavity 31, and the liquid sealing member 32 prevents the e-liquid in the liquid storage cavity 31 from entering the atomizing cavity 41 through the liquid inlet hole 431.

[0071] In the process of assembling the atomizer 200 and the battery device, the battery device exerts a bottom-to-up driving force on the seat 45. When the driving force is greater than the engaging force between the inner wall of the second latching groove 338 and the side wall of the protrusion 4531, the protrusion 4531 disengages from the second latching groove 338, thereby causing the seat 45 to move axially upward relative to the liquid storage member 33. Since the lower end surface of the atomizing housing 43 abuts against the upper end surface of the flange 4522, the seat 45 drives the atomizing housing 43 to move axially upward relative to the liquid sealing member 32 when the seat 45 moves upwards, so that the liquid inlet hole 431 communicates the liquid storage cavity 31 and the atomizing cavity 41, and the atomizer 200 is gradually switched from the first state to the second state. When the protrusion 4531 is engaged in the first latching groove 337 and the atomizer 200 is switched to the second state, the liquid inlet hole 431 communicates the liquid storage cavity 31 and the atomizing cavity 41, and the e-liquid in the liquid storage cavity 31 enters the atomizing cavity 41 through the liquid inlet hole 431.

[0072] When the battery device and the atomizer 200 are separated, the driving force exerted by the battery device on the seat 45 disappears, and the user can pull the seat 45 downwards. When the pulling force is greater than the engaging force between the inner wall of the first latching groove 337 and the side wall of the protrusion 4531, the protrusion 4531 disengages from the first latching groove 337, thereby causing the seat 45 to move axially downward relative to the liquid storage member 33. Since the atomizing housing 43 is connected to the inner wall of the abutting portion 452, the seat 45 drives the atomizing housing 43 to move axially downward relative to the liquid sealing member 32 when the seat 45 moves downwards. When the protrusion 4531 is engaged in the second latching groove 338, the liquid inlet hole 431 is shielded by the liquid sealing member 32, and the atomizer 200 is switched from the second state to the first state.

[0073] It is understood that, in another embodiment not shown, the position of the first latching groove 337 and the second latching groove 338 and the position of the protrusion 4531 can be interchanged. That is, the protrusion 4531 is provided on the side wall of the liquid storage member 33, both the first latching groove 337 and the second latching groove 338 are provided on the connecting portion 453, and the first latching groove 337 and the second latching groove 338 are sequentially arranged along the axial direction of the liquid storage member 33, so long as the protrusion 453 can engage with the first latching groove 337 or the second latching groove 338, and the seat 45 can move axially relative to the liquid storage member 33.

[0074] Optionally, in order to support the liquid absorbing member 122, prevent the liquid absorbing member 441 from deforming, increase the strength of the liquid absorbing member 122 and further improve the stability of the liquid absorbing member 441 during use, the atomizing assembly 40 further includes a supporting member 46 disposed below the liquid absorbing member 122. The supporting member 46 has generally a hollow tubular structure with both ends being opened, the upper end surface of the supporting member 46 abuts against the lower end surface of the liquid absorbing member 122, and the lower end surface of the supporting member 46 abuts against the upper end surface of the flange 452.

[0075] Please refer to FIG. 10 and FIG. 16, optionally, in order to improve the air tightness between the suction nozzle 50 and the venting member 42, a connecting member 339 is sandwiched between the venting member 42 and the inner

wall of the smoke outlet hole 331 to prevent air leakage. Specifically, the connecting member 339 is recessed with a guiding groove 3391, the bottom wall of the guiding groove 3391 is provided with a guiding hole 3392 and an air outlet hole 3393 which are spaced from each other. The guiding hole 3392 is in communication with the first sensing air passage 334 and the smoke outlet opening 51. The air outlet hole 3393 is in communication with the atomizing cavity 41 and the smoke outlet opening 51. It is understood that, the connecting member 339 is made of a material with good sealing property, such as silicone or rubber.

[0076] The battery device includes a battery casing (not shown) and a power source (not shown) received in the battery casing. The space enclosed by the battery casing and the power source forms a second sensing air passage (not shown).

[0077] The upper end surface of the battery casing is provided with a second communication hole (not shown) communicating with the second sensing air passage, and the second communication hole corresponds to the first communication hole 4511. When the atomizer 200 is connected to the battery device, the first communication hole 4511 is in communication with the second communication hole, so that the first sensing air passage 334 is in communication with the second sensing air passage.

[0078] The electronic cigarette of the present disclosure further includes a control board (not shown) and a sensor (not shown) disposed in the second sensing air passage. The control board is electrically connected with the sensor and the battery device. In this embodiment, the sensor is a differential pressure sensor. When the user sucks, a negative pressure is formed in the first sensing air passage 334 and the second sensing air passage, the sensor generates a differential pressure signal after sensing the pressure change and transmits the differential pressure signal to the control board; after the control board receives the differential pressure signal, it controls the battery device to supply power to the atomizer 200. At this time, the e-liquid is atomized to generate smoke; meanwhile, the outside air enters the atomizing cavity 41 through the air inlet hole 336 and the air intake passage 335 in sequence and mixes with the smoke to form a mixed vapor. Under the action of suction, the mixed vapor finally enters the mouth of the user through the smoke outlet opening 51 after passing through the air outlet passage 454.

[0079] In the atomizer 200 of the present disclosure and the electronic cigarette using the atomizer 200, when the user does not use the electronic cigarette, the inner wall of the mounting hole 321 shields the liquid inlet hole 431, so that the liquid inlet hole 431 is staggered from the liquid storage cavity 31, which is convenient for storing e-liquid. When the user uses the electronic cigarette, the liquid inlet hole 431 communicates the liquid storage cavity 31 and the atomizing cavity 41.

[0080] The above-mentioned embodiments merely represent several implementations of the present application, and the descriptions thereof are specific and detailed, but they shall not be understood as a limitation on the scope of the present application. It should be noted that, for those of ordinary skill in the art, variations and improvements may still be made without departing from the concept of the present application, and all of which shall fall into the protection scope of the present application. Therefore, the protection scope of the present application shall be subject to the appended claims.

Claims

1. An atomizer comprising a liquid storage assembly and an atomizing assembly, wherein a liquid storage cavity is provided in the liquid storage assembly, the liquid storage assembly is provided with a mounting hole, the mounting hole is in communication with the liquid storage cavity, an atomizing cavity is provided in the atomizing assembly, the atomizing assembly is provided with a liquid inlet hole communicating with the atomizing cavity, the atomizing assembly is slidably disposed in the mounting hole along an axial direction of the mounting hole;

when the atomizing assembly slides to a first state, an inner wall of the mounting hole shields the liquid inlet hole such that the liquid inlet hole and the liquid storage cavity are staggered ;
when the atomizing assembly slides to a second state, the liquid inlet hole communicates the liquid storage cavity and the atomizing cavity.

2. The atomizer according to claim 1, wherein the atomizing assembly comprises an atomizing housing, the atomizing housing is slidably disposed in the mounting hole along the axial direction of the mounting hole, the atomizing cavity is provided in the atomizing housing, and the liquid inlet hole is provided on the atomizing housing.

3. The atomizer according to claim 2, wherein a side wall of the atomizing housing protrudes outward along a radial direction of the atomizing housing to form a limiting protrusion.

4. The atomizer according to claim 2, wherein the liquid storage assembly further comprises a liquid storage member, and the liquid storage cavity is an inner cavity of the liquid storage member.

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5. The atomizer according to claim 4, wherein a first latching groove and a second latching groove are provided on the liquid storage member and spaced apart from each other, the atomizing assembly further comprises a seat installed on the atomizing housing, a protrusion capable of engaging with the first latching groove or the second latching groove is provided on the seat.
 6. The atomizer according to claim 5, wherein the first latching groove and the second latching groove are sequentially arranged along an axial direction of the liquid storage member.
 7. The atomizer according to claim 1, wherein the liquid storage assembly further comprises an elastic member, and the elastic member is disposed between the atomizing assembly and the liquid storage assembly.
 8. The atomizer according to claim 4, wherein the liquid storage member is provided with a smoke outlet hole communicating with the outside, the liquid storage assembly comprises a venting member disposed in the liquid storage member, an inner cavity of the venting member is in communication with the smoke outlet hole.
 9. The atomizer according to claim 8, wherein the atomizing housing is slidably disposed in the venting member.
 10. An electronic cigarette comprising a battery device and an atomizer according to any one of claims 1 to 9, wherein the atomizer is electrically connected to the battery device.

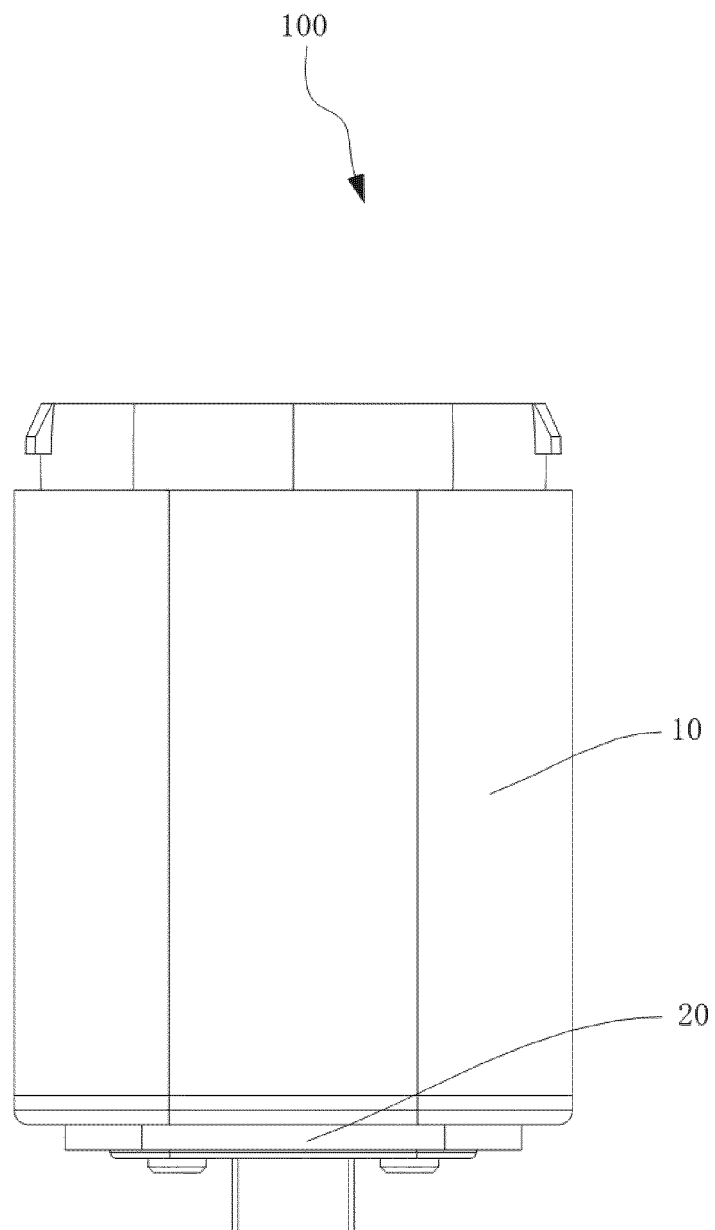


FIG. 1

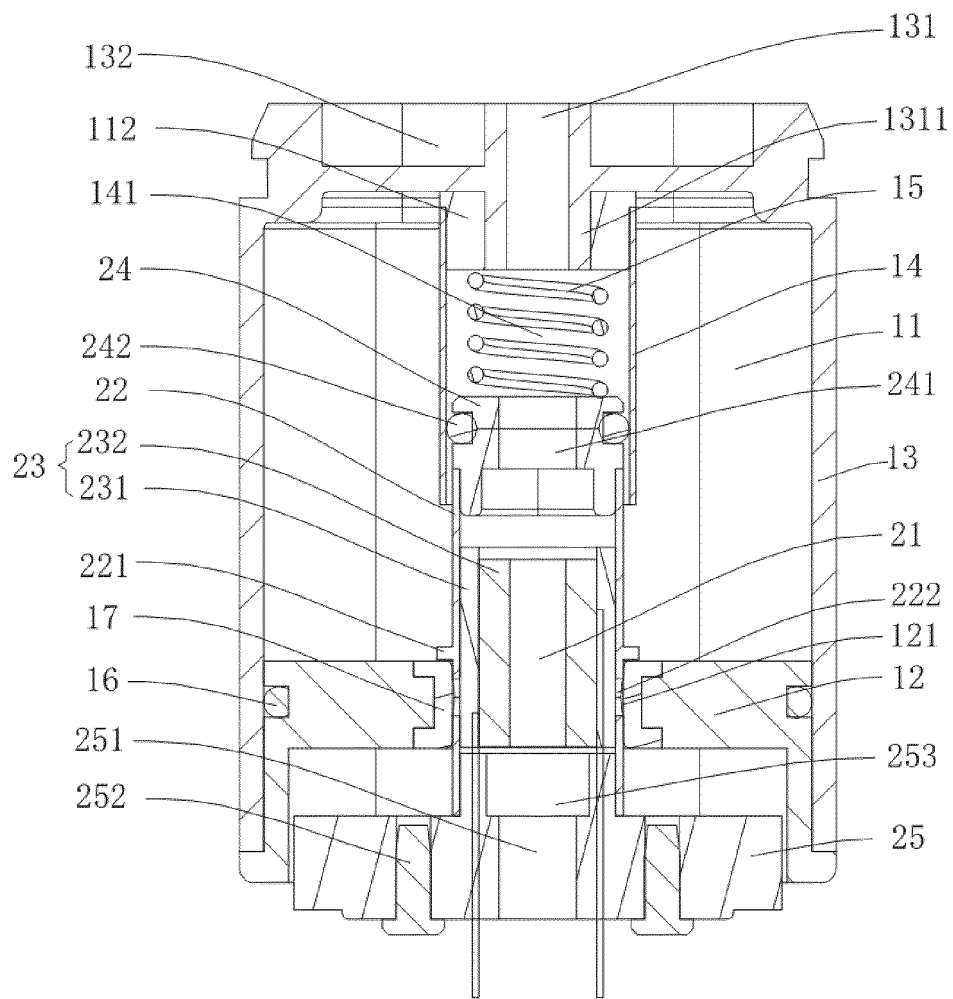


FIG. 2

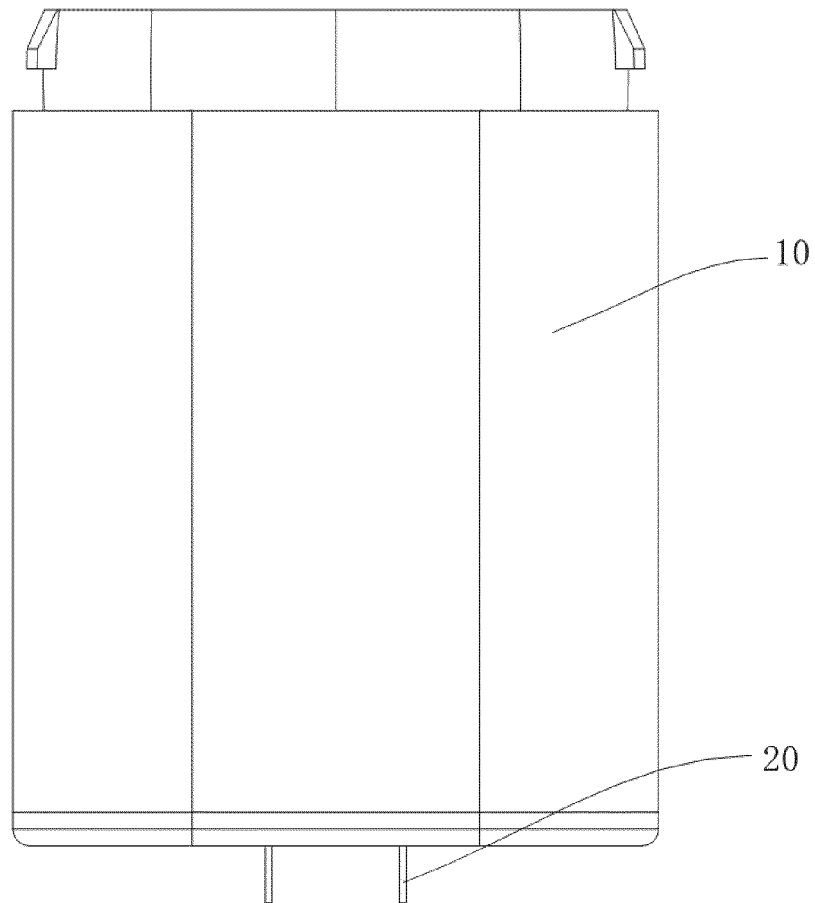


FIG. 3

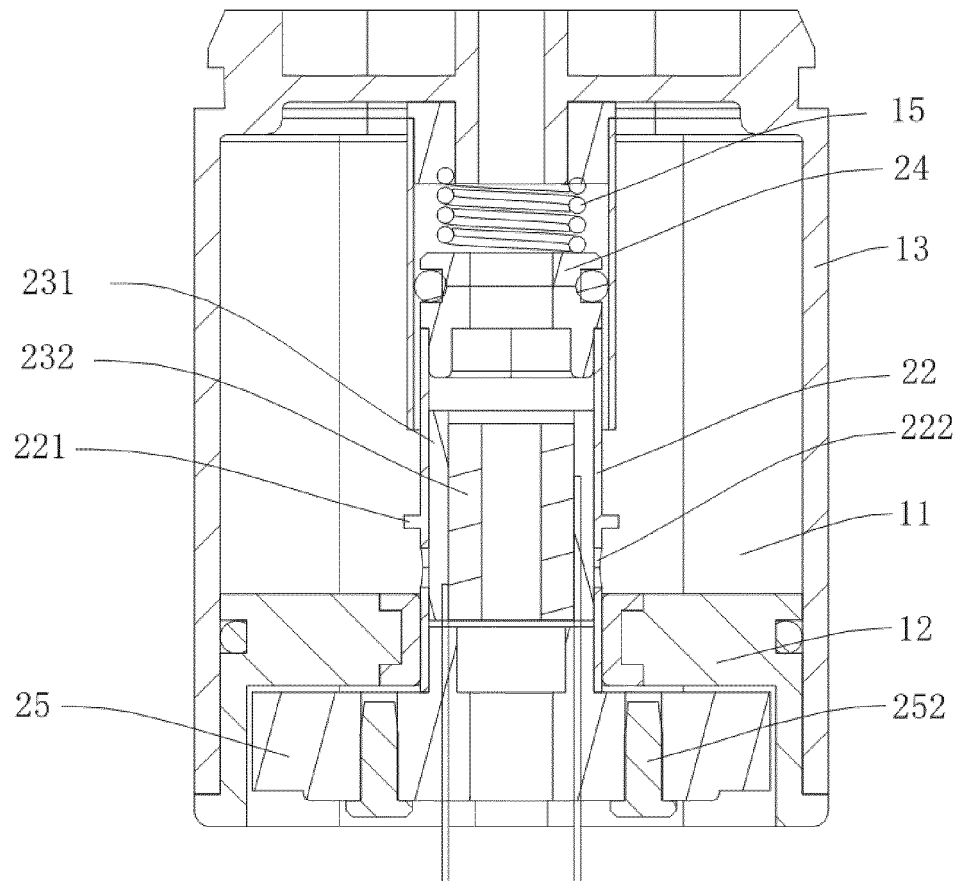


FIG. 4

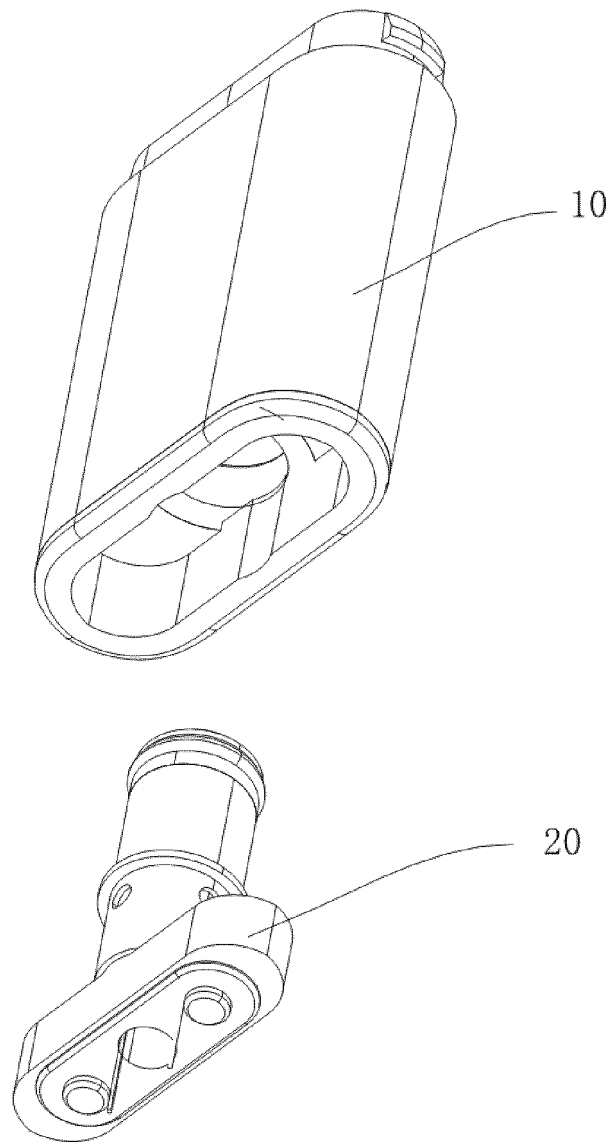


FIG. 5

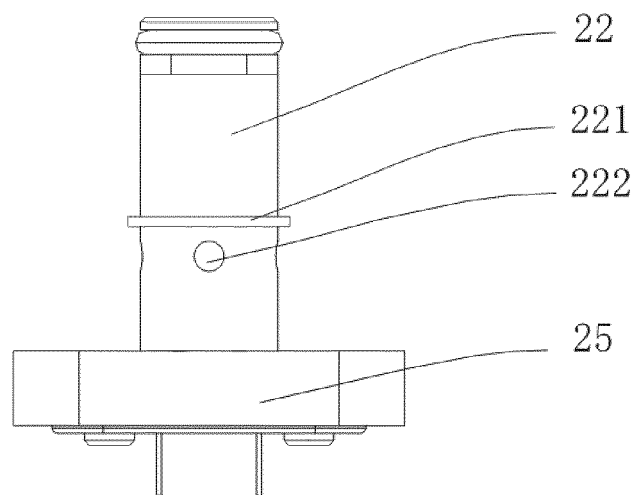
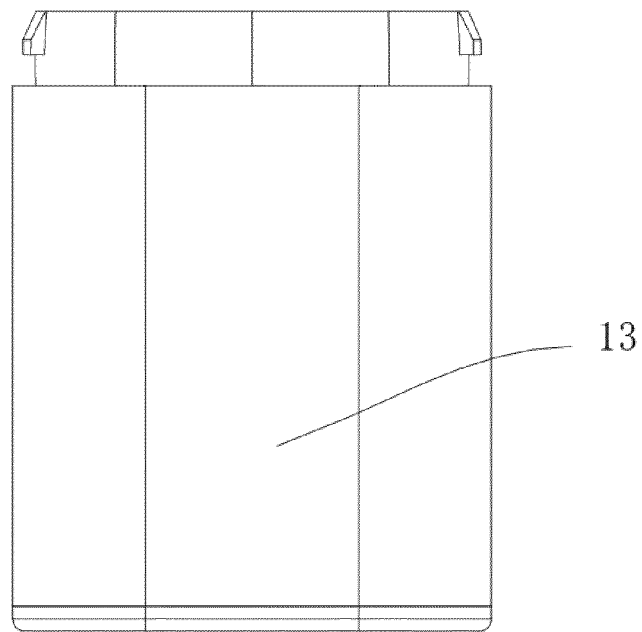


FIG. 6

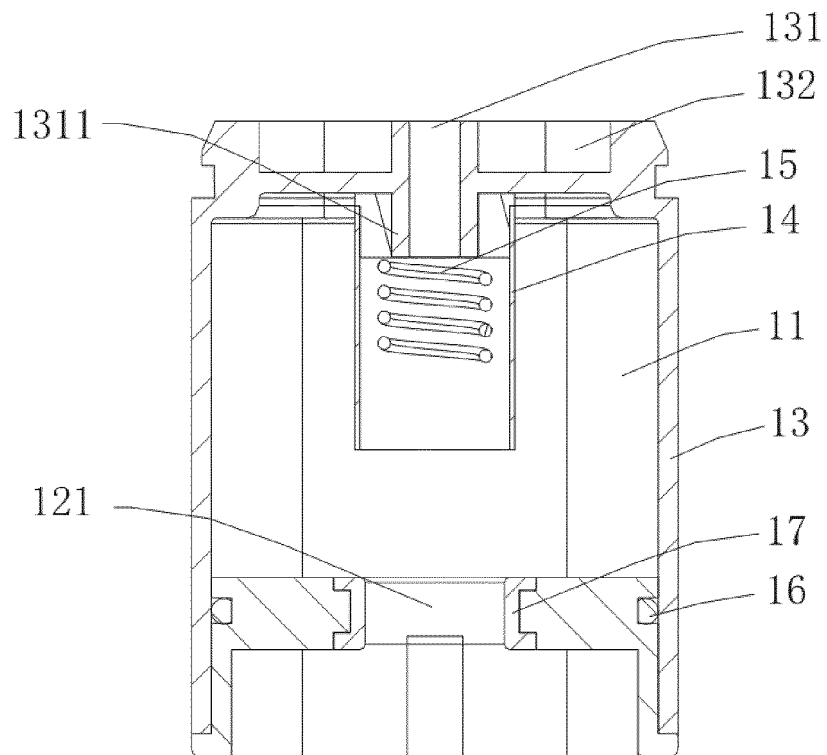


FIG. 7

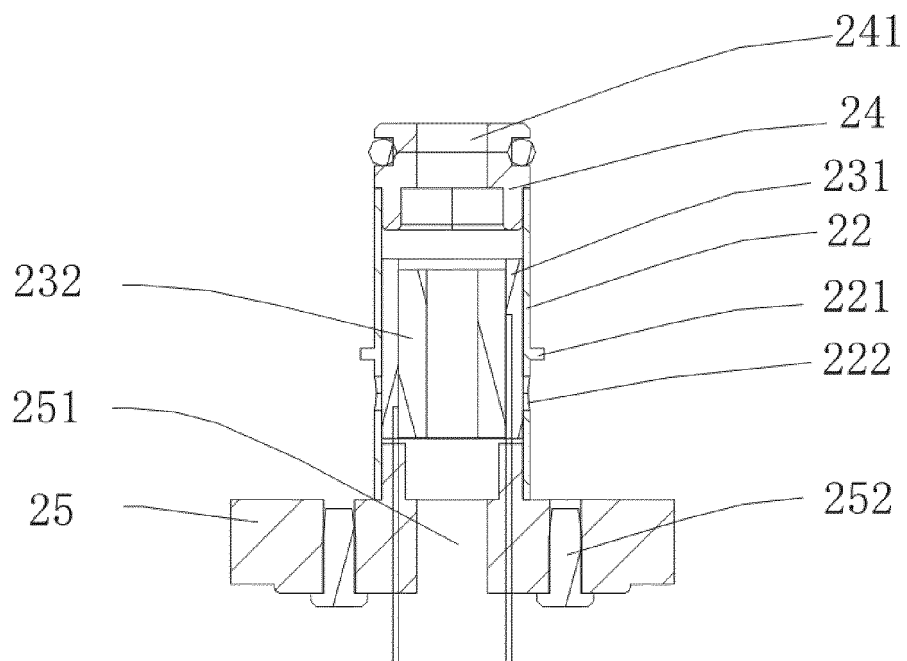


FIG. 8

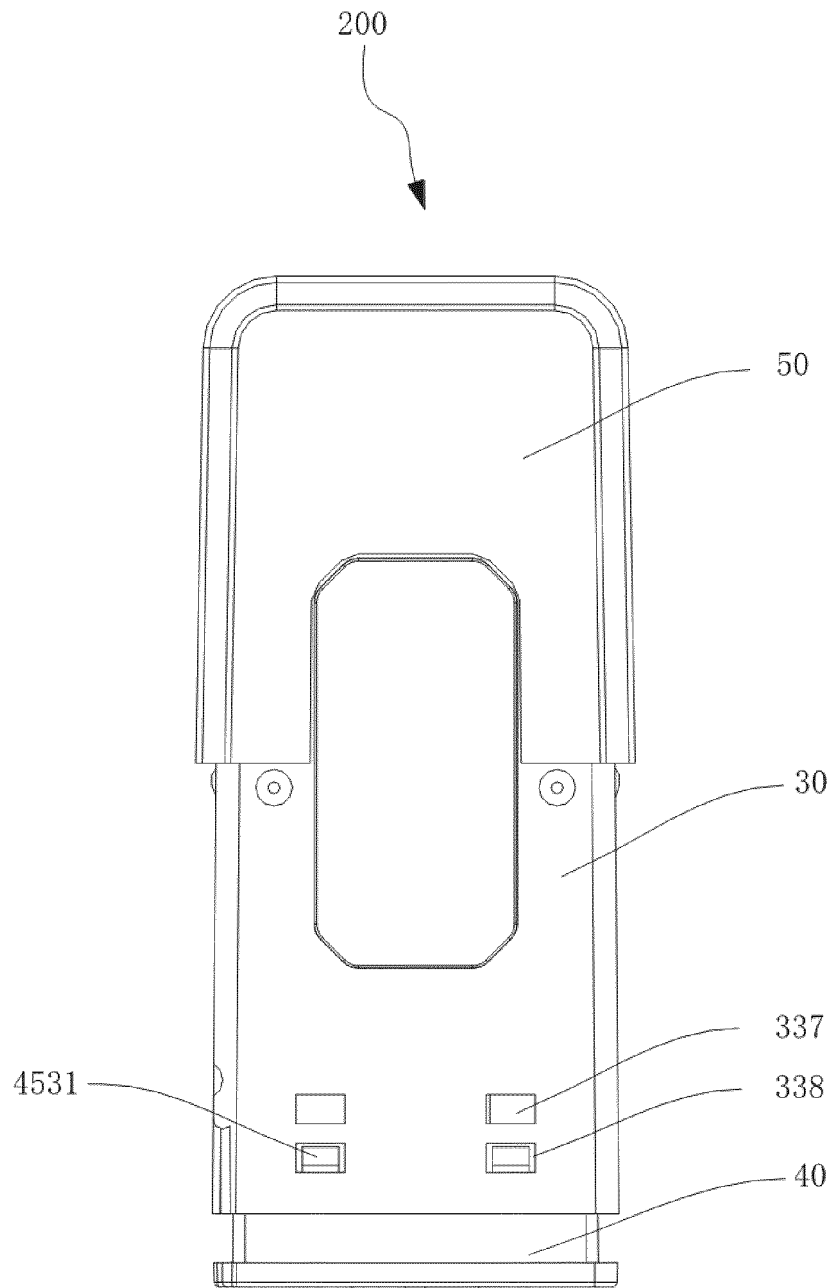


FIG. 9

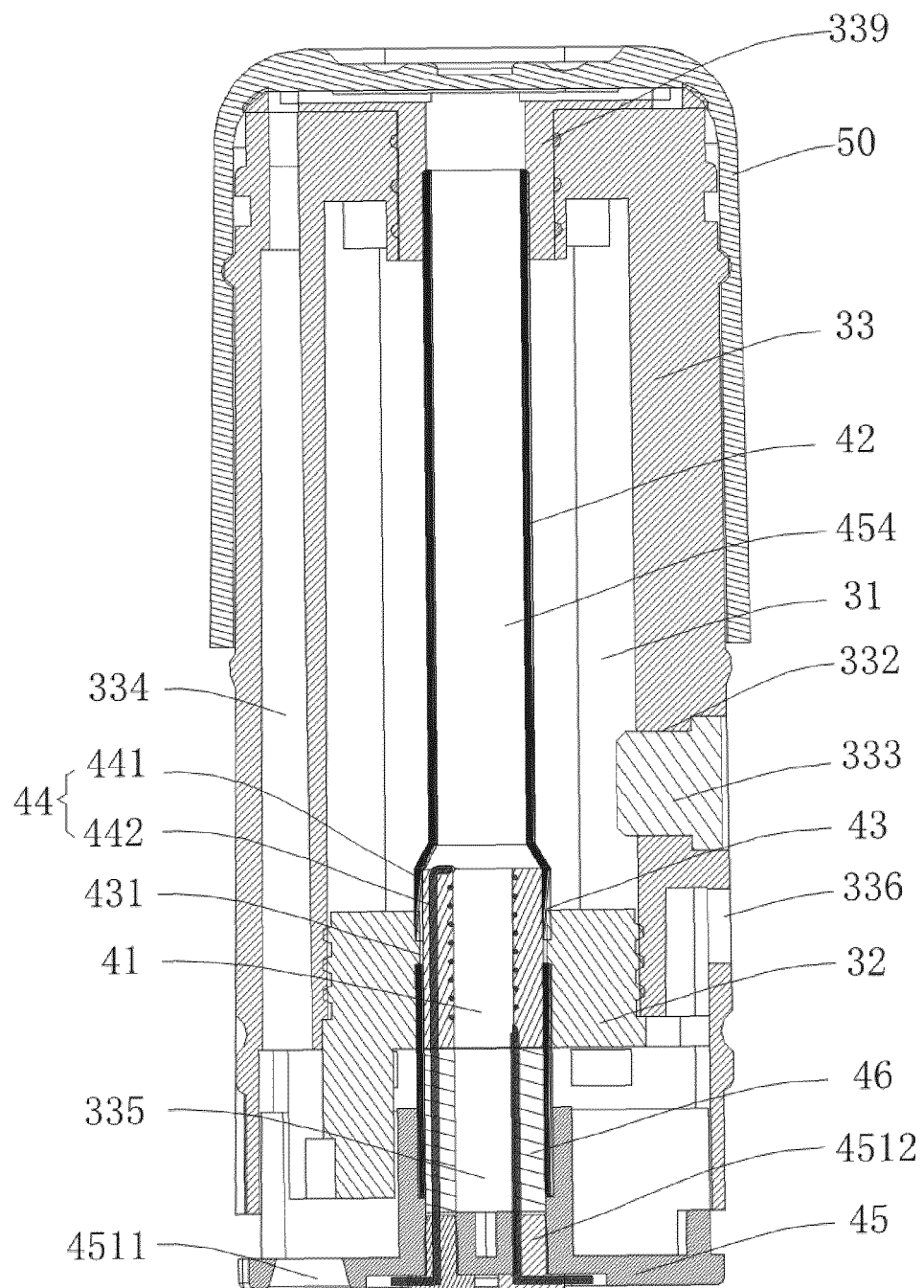


FIG. 10

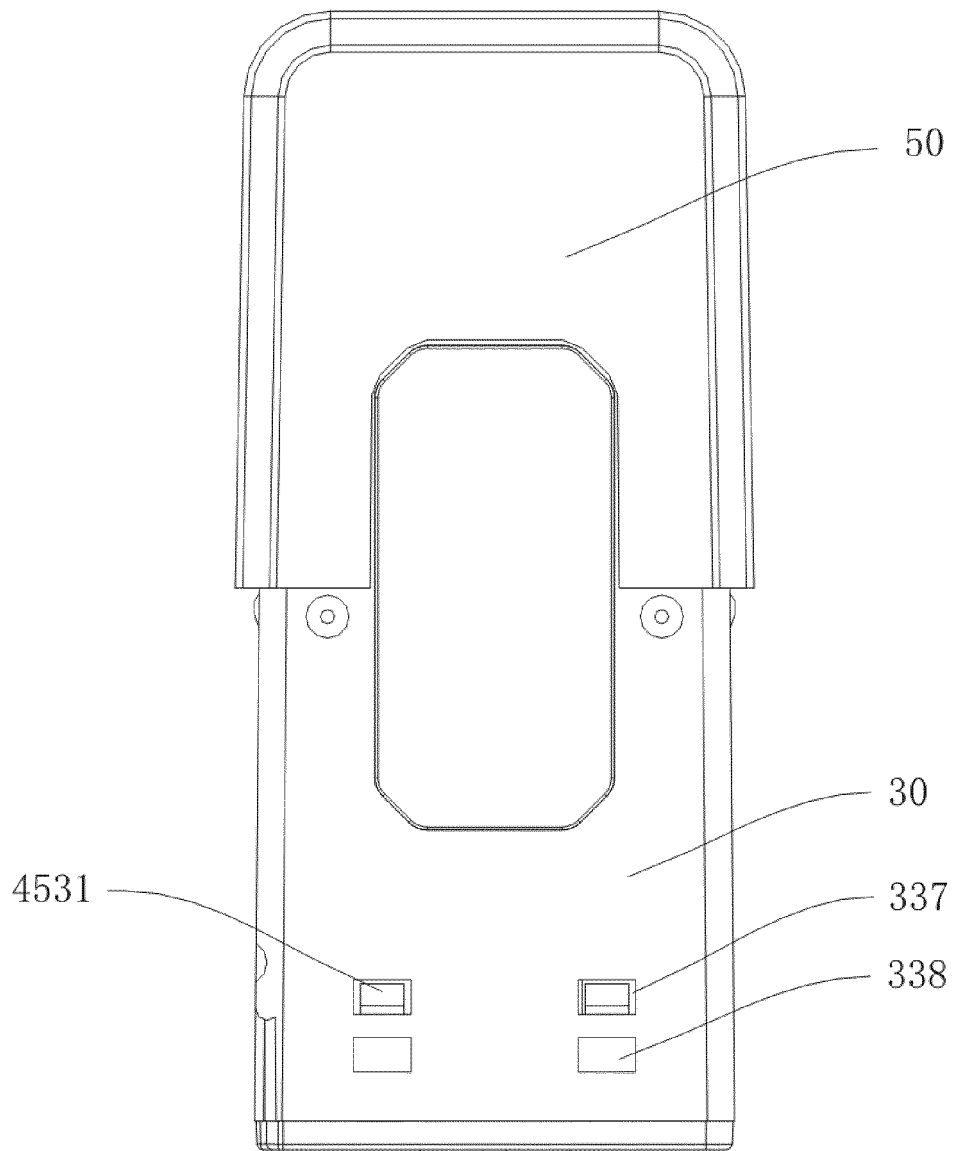


FIG. 11

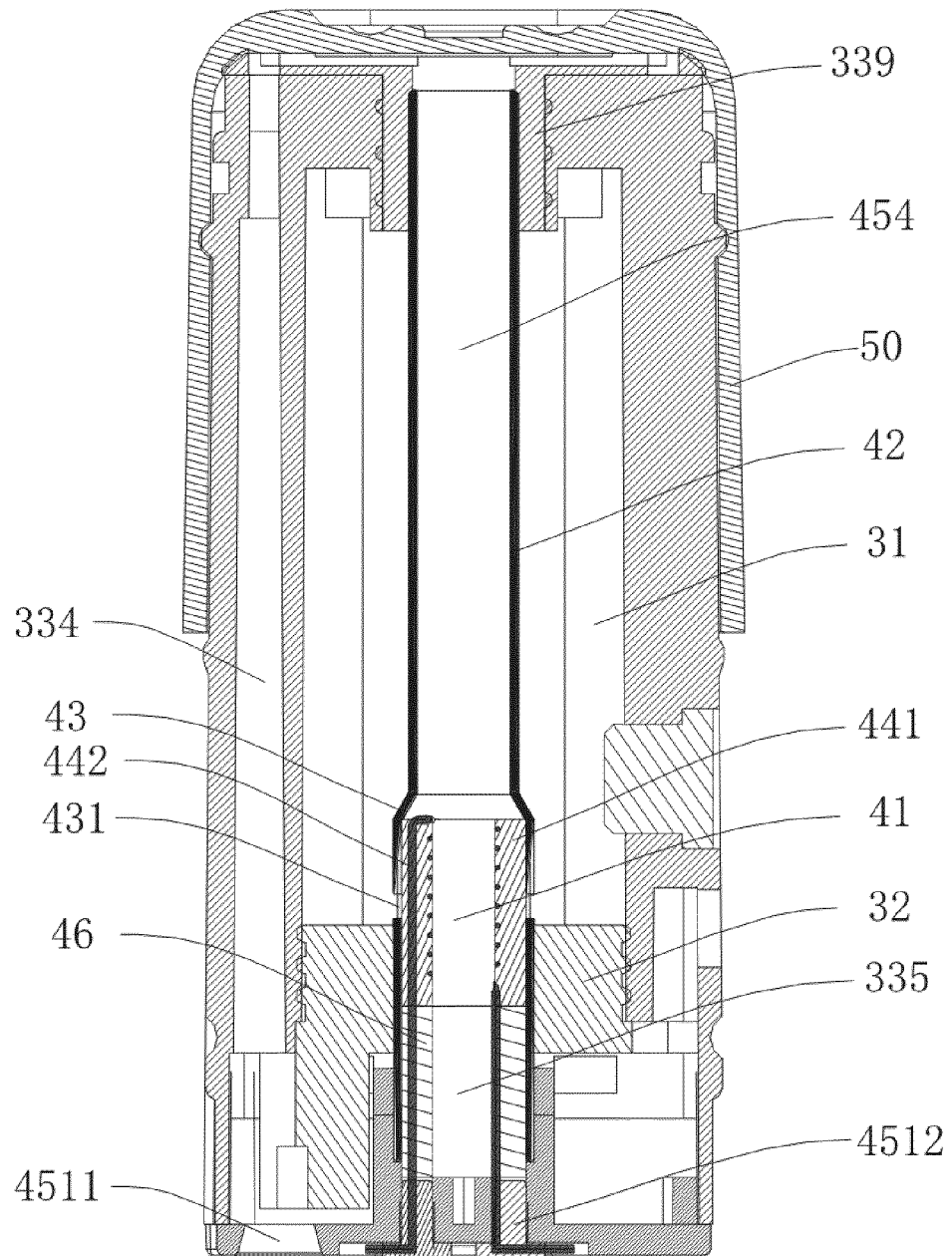


FIG. 12

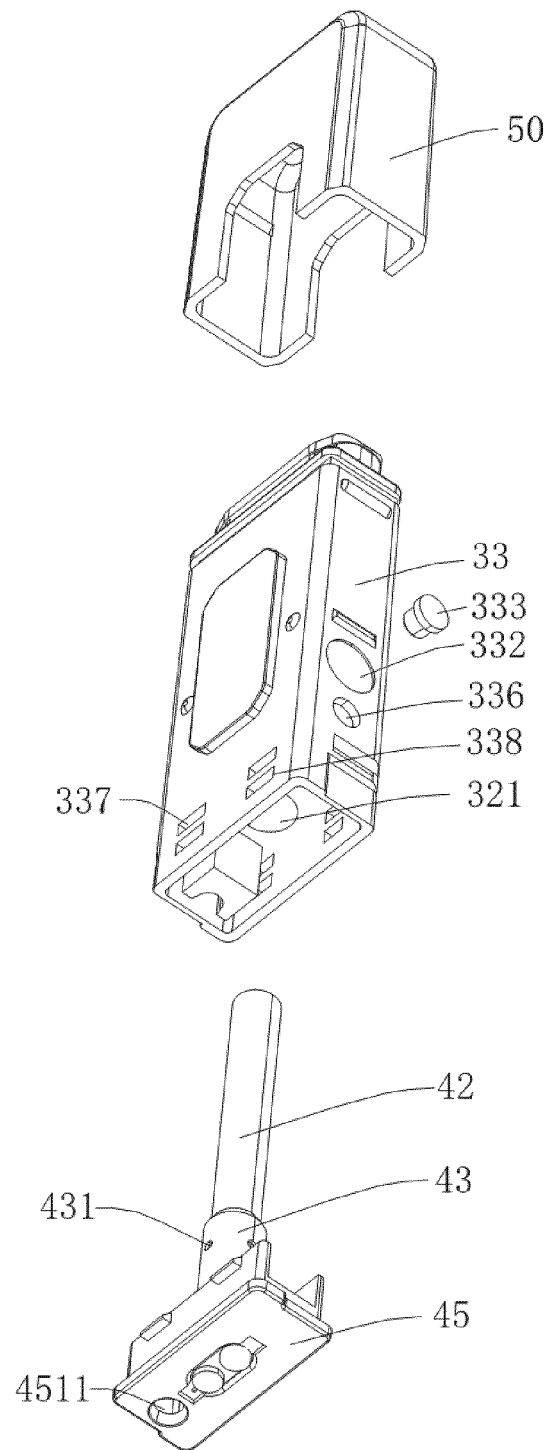


FIG. 13

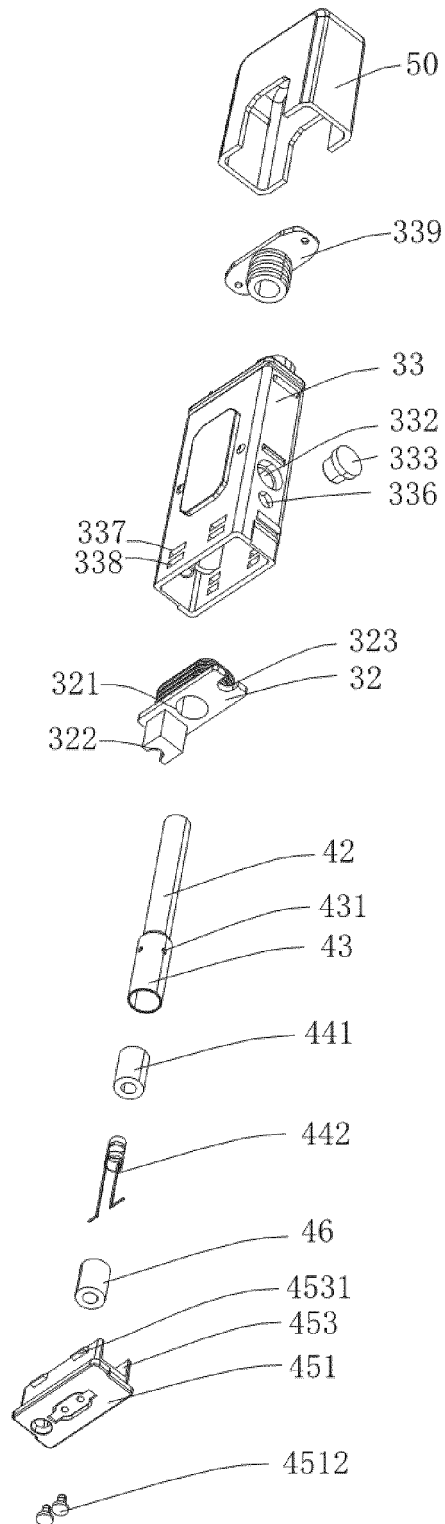


FIG. 14

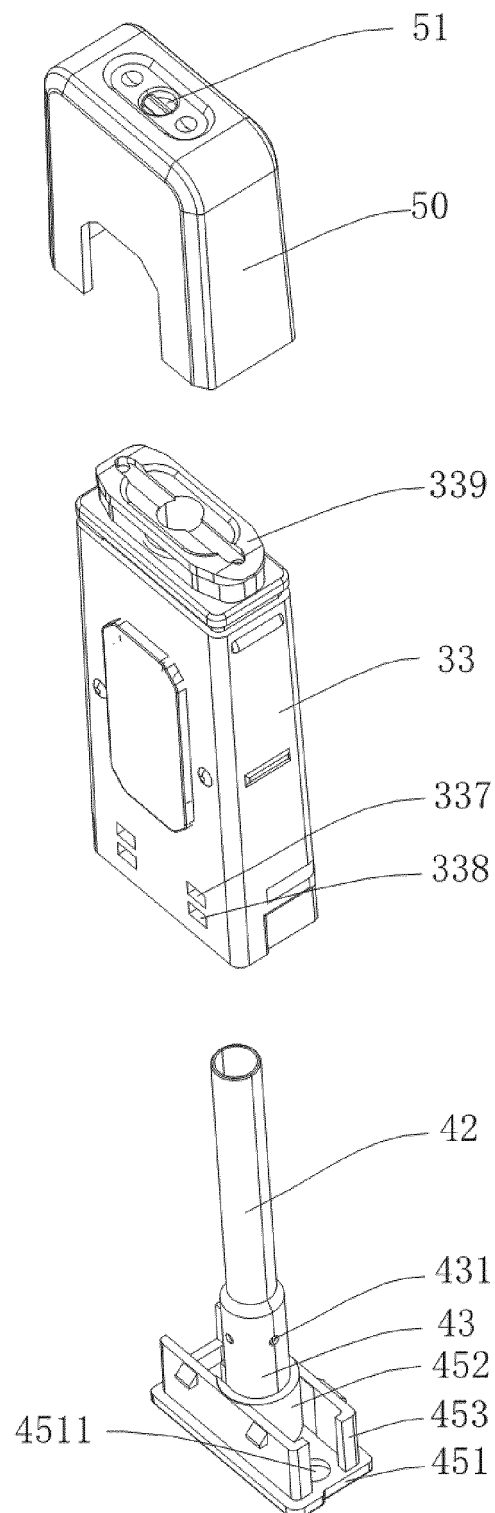


FIG. 15

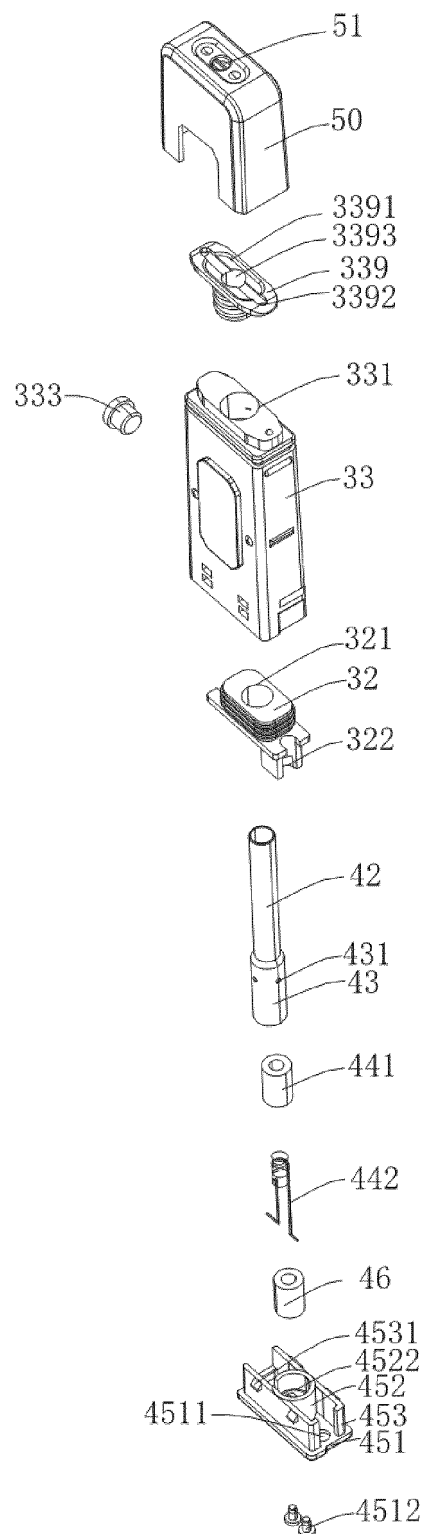


FIG. 16

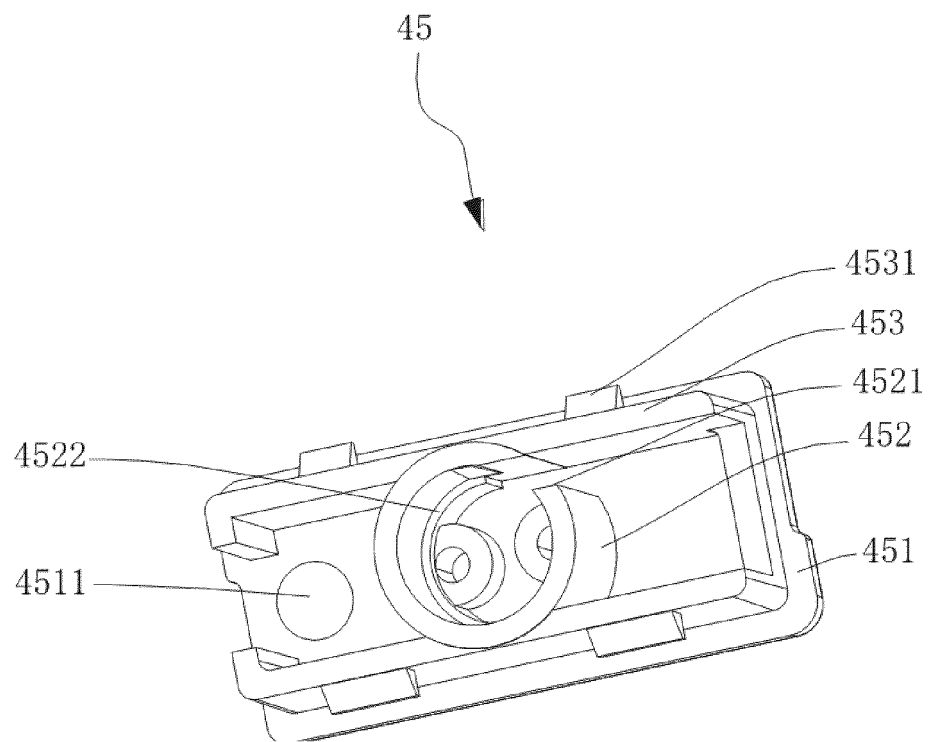


FIG. 17

INTERNATIONAL SEARCH REPORT

International application No.

PCT/CN2020/089734

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)

CNPAT, CNTXT, CNKI, WPI, EPODOC: 邱伟华 OR 刘新平, 常州市派腾电子技术服务有限公司, 雾化, 储液, 进液孔 OR 进液口, 错开 OR 遮蔽 OR 封闭 OR 堵塞 OR 封 OR 闭 OR 堵 OR 塞, 打开 OR 连通, 轴向; electric 5d (smok+ OR cigarette), atomiz+, inlet OR hole, open OR close

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
PX	CN 210158009 U (CHANGZHOU PAITENG ELECTRONIC TECHNOLOGY SERVICE CO., LTD.) 20 March 2020 (2020-03-20) description, paragraphs [0050]-[0102], and figures 1-11	1-10
X	CN 205848694 U (SHENZHEN MICROVAPOR TECHNOLOGY CO., LTD.) 04 January 2017 (2017-01-04) description, paragraphs [0037]-[0062], and figures 1-9	1-10
X	CN 206687166 U (SHENZHEN INNOKIN TECHNOLOGY CO., LTD.) 01 December 2017 (2017-12-01) description, paragraphs [0028]-[0037], and figures 1-3	1-10
X	CN 108208936 A (CHANGZHOU PAITENG ELECTRONIC TECHNOLOGY SERVICE CO., LTD.) 29 June 2018 (2018-06-29) description, paragraphs [0055]-[0101], and figures 1-9	1-10
A	CN 104824847 A (SHENZHEN SMOORE TECHNOLOGY LIMITED) 12 August 2015 (2015-08-12) entire document	1-10

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

* Special categories of cited documents:	"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention
"A" document defining the general state of the art which is not considered to be of particular relevance	"X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone
"E" earlier application or patent but published on or after the international filing date	"Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art
"L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)	"&" document member of the same patent family
"O" document referring to an oral disclosure, use, exhibition or other means	
"P" document published prior to the international filing date but later than the priority date claimed	

Date of the actual completion of the international search 15 July 2020	Date of mailing of the international search report 12 August 2020
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	Authorized officer
Facsimile No. (86-10)62019451	Telephone No.

Form PCT/ISA/210 (second sheet) (January 2015)

INTERNATIONAL SEARCH REPORT

International application No.
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C. DOCUMENTS CONSIDERED TO BE RELEVANT		
Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	US 2016316820 A1 (KIMREE HI-TECH INC.) 03 November 2016 (2016-11-03) entire document	1-10
A	US 2017119055 A1 (KIMREE HI-TECH INC.) 04 May 2017 (2017-05-04) entire document	1-10

INTERNATIONAL SEARCH REPORT
Information on patent family members

International application No.
PCT/CN2020/089734

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Patent document cited in search report			Publication date (day/month/year)	Patent family member(s)			Publication date (day/month/year)
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CN	205848694	U	04 January 2017	None			
CN	206687166	U	01 December 2017	None			
CN	108208936	A	29 June 2018	CN	207011680	U	16 February 2018
				CN	206687160	U	01 December 2017
				CN	108208935	A	29 June 2018
CN	104824847	A	12 August 2015	CN	104824847	B	10 July 2018
US	2016316820	A1	03 November 2016	WO	2015096107	A1	02 July 2015
				US	9839240	B2	12 December 2017
US	2017119055	A1	04 May 2017	WO	2015149313	A1	08 October 2015