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(54) **ATOMIZER AND ELECTRONIC CIGARETTE THEREOF**

(57) An atomizer and an electronic cigarette comprising same. The atomizer (100) comprises an upper cover assembly (20) and a fixed component; the upper cover assembly (20) comprises an upper cover (21), a movable component (24) capable of rotating relative to the upper cover (21), and a locking component (22) movably provided between the upper cover (21) and the movable component (24); the movable component (24) is partially accommodated in the upper cover (21); a through hole (2122) is provided on the upper cover (21); a groove (2421) is provided on the movable component (24); the fixed component is sleeved at outside of the upper cover (21); a clamping groove corresponding to the through hole (2122) is provided on the fixed component; when the movable component (24) is rotated until the groove (2421) is staggered with the locking component (22), the locking component (22) partially penetrates through the through hole (2122) and is locked with the clamping groove. By providing the groove (2421) corresponding to the locking component (22) on the movable component (24), when the movable component (24) is rotated relative to the upper cover (21), the movable component (24) can abut against the locking component (22), so that the locking component (22) is provided at outside of the upper cover assembly (20) in a protruding mode and clamped in the clamping groove. The present invention is easy to operate and prevents a child from easily open-

ing the atomizer to be in contact with an e-liquid.

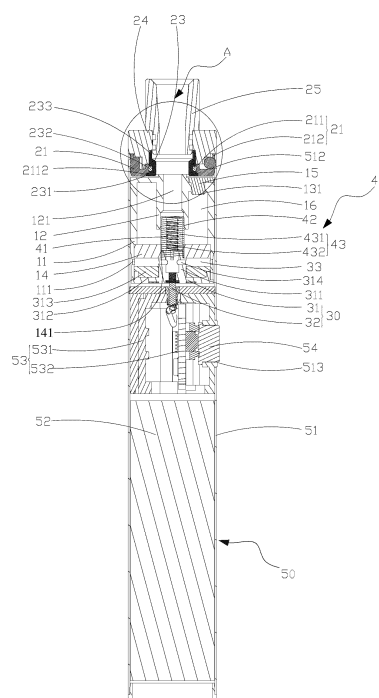


FIG. 5

Description**TECHNICAL FIELD**

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

BACKGROUND

- 10 **[0002]** E-cigarette is a common electronic product that users replace cigarettes. The electronic cigarette includes an atomizer and a battery assembly electrically connected to the atomizer. The atomizer is provided with a liquid storage chamber and an atomizing assembly. The atomizing assembly heats the liquid supplied by the liquid storage chamber under the electric driving of the battery assembly to form smoke for the user to inhale.

- 15 **[0003]** Considering the economic practicality of e-cigarettes, some e-cigarettes can often open the liquid storage chamber in the atomizer for repeated liquid filling operations. However, in order to prevent children from easily opening the liquid storage chamber of the atomizer to contact the e-liquid, some e-cigarettes have a child locking structure. The child locking structure of the electronic cigarette of the prior art often adopts a structure such as a push-pull structure, which has a relatively complicated structure, high cost, and inconvenient use.

SUMMARY

[0004] Based on the above, it is necessary to provide an atomizer and an electronic cigarette with a child locking structure with simple structure and convenient operation.

- 25 **[0005]** The technical solution adopted according to a first aspect of the present application to solve its technical problems is as follows:

- [0006]** An atomizer includes an upper cover assembly and a fixing member. The upper cover assembly includes an upper cover, a movable member rotatable relative to the upper cover, and a locking member movably provided between the upper cover and the movable member. The movable member is at least partially received in the upper cover. The upper cover is provided with a through hole. The movable member is provided with a recess. The fixing member is sleeved at the outside of the upper cover. The fixing member is provided with a locking groove corresponding to the through hole. When the movable member is rotated until the recess and the locking member are staggered from each other, the locking member partially passes through the through hole and is locked with the locking groove. When the movable member is rotated until the recess and the locking member are aligned with each other, the locking member is partially received in the recess and is separated from the locking groove.

- 35 **[0007]** Further, the upper cover includes an inner casing and an outer casing. The space between the inner casing and the outer casing forms a receiving groove. The through hole is provided in the outer casing. A containing groove corresponding to the through hole is recessed on the inner wall of the outer casing. The containing groove, the receiving groove and the through hole are in communication with each other. The locking member is received in the containing groove. The movable member is provided with an abutting ring. The abutting ring is received in the receiving groove. 40 The recess is provided in the abutting ring. The locking member is located on the outside of the abutting ring.

[0008] Further, an abutting block is provided on the side wall of the outer casing. The fixing member is provided with a clamping groove corresponding to the abutting block. The abutting block is engaged in the clamping groove.

- [0009]** Further, a limiting block is provided in the receiving groove. The inner wall of the abutting ring is recessed inwardly along the radial direction of the abutting ring to form an arc-shaped limiting groove. The limiting groove passes through the lower end surface of the abutting ring. The limiting block is located in the limiting groove. The limiting block can slide in the limiting groove.

- [0010]** Further, the inner wall of the inner casing is recessed to form an annular groove. The upper cover assembly further includes a latching member. The outer peripheral wall at the lower end of the latching member extends radially outward to form a snapping ring corresponding to the annular groove. The upper end of the latching member is connected to the movable member. The lower end of the latching member abuts against the annular groove of the upper cover through the snapping ring.

- [0011]** Further, the movable member further includes a movable member main body. The movable member main body is provided with a smoke outlet hole passing through the movable member main body. The abutting ring is formed around the smoke outlet hole by extending downward from the movable member main body along the axial direction of the movable member main body.

55 **[0012]** Further, the lower end surface of the movable member main body is protrudingly provided with a limiting ring. The inner wall of the outer casing is recessed to form an abutting surface. The abutting ring abuts against the abutting surface.

[0013] Further, the atomizer further includes a liquid storage tube. A liquid storage chamber is provided in the liquid storage tube. The liquid storage tube is provided with a liquid injection hole communicating with the liquid storage chamber. A liquid sealing member is detachably installed in the liquid injection hole. The upper cover is arranged to cover the liquid sealing member.

[0014] An electronic cigarette includes the atomizer described in any one of the foregoing.

[0015] Further, the electronic cigarette further includes a battery assembly. The battery assembly includes a battery sleeve, and the fixing member is the battery sleeve. The battery sleeve is sleeved at the outside of the upper cover. The locking groove is provided in the battery sleeve.

[0016] The beneficial effects of the first aspect of the present application are as follows:

[0017] The atomizer or the electronic cigarette provided by the present application has a locking member movably provided in the upper cover, the movable member is provided with a recess corresponding to the locking member. When rotating the movable member relative to the upper cover, the movable member can abut against the locking member, so that the locking member protrudes out from the upper cover assembly and is locked in the locking groove, thereby preventing children from easily opening the atomizer to contact the e-liquid and improving the safety of the atomizer. The structure is simple and the operation is convenient. Or, the movable member is rotated relative to the upper cover, so that the locking member is partially received in the recess and is separated from the locking groove, and the upper cover assembly is opened for liquid injection operation.

[0018] The second aspect of the present application provides an electronic cigarette. The electronic cigarette includes a battery assembly, a liquid storage assembly and an atomizing assembly. The battery assembly includes a battery sleeve with an open end. The battery assembly, the atomizing assembly and the liquid storage assembly are sequentially placed in the battery sleeve along the longitudinal axial direction of the battery sleeve. The atomizing assembly and the battery assembly and/or the liquid storage assembly and the atomizing assembly are in contact by abutting against each other. The open end of the battery sleeve is further provided with an upper cover assembly. When the upper cover assembly is removed from the battery sleeve, the liquid storage assembly can be separately poured out from the open end, or the atomizing assembly and the liquid storage assembly can be poured out from the open end.

[0019] Further, the upper cover assembly includes an upper cover, a movable member rotatable relative to the upper cover, and a locking member movably provided between the upper cover and the movable member. The movable member is at least partially received in the upper cover. The upper cover is provided with a through hole. The movable member is provided with a recess. The battery sleeve is sleeved at the outside of the upper cover. The battery sleeve is provided with a locking groove corresponding to the through hole. When the movable member is rotated until the recess and the locking member are staggered from each other, the locking member partially passes through the through hole and is locked with the locking groove. When the movable member is rotated until the recess and the locking member are aligned with each other, the locking member is partially received in the recess and is separated from the locking groove.

[0020] Further, the atomizing assembly includes an atomizing tube and a heating structure provided in the atomizing tube. The inner cavity of the atomizing tube forms an atomizing chamber. The heating structure includes a liquid guiding member and a heating member which are provided in the atomizing chamber and are in contact with each other. Two pins are provided on the heating member, one of the pins is electrically connected to one of the positive and negative electrodes of the battery assembly, the other pin is electrically connected to the other of the positive and negative electrodes of the battery assembly.

[0021] Further, the liquid storage assembly includes a liquid storage tube. A liquid storage chamber is provided in the liquid storage tube. The liquid storage tube is provided with a liquid injection hole communicating with the liquid storage chamber. A liquid sealing member is detachably installed in the liquid injection hole. The upper cover is arranged to cover the liquid sealing member.

[0022] Further, a venting member is provided in the liquid storage tube. A first sealing member is provided in the lower end of the liquid storage tube. A mounting groove is provided in the first sealing member. The upper end of the atomizing tube is inserted into the venting member. The lower end of the atomizing tube is inserted into the mounting groove.

[0023] Further, the electronic cigarette further includes a base provided at the lower end of the liquid storage tube. A mounting protrusion is protrudingly provided on one end surface of the base facing the liquid storage tube. The upper end of the mounting protrusion is inserted into the mounting groove, and the inner cavity of the mounting protrusion is in communication with the atomizing chamber. The side wall of the mounting protrusion is provided with a vent hole communicating with the inner cavity of the mounting protrusion.

[0024] Further, the upper end surface of the base is provided with a second sealing member located around the mounting protrusion. The gap between the second sealing member and the first sealing member constitutes an air inlet passage. The side wall at the bottom end of the liquid storage tube is provided with an air inlet hole communicating with the air inlet passage.

[0025] Further, the side wall of the upper cover is provided with an abutting block. The battery sleeve is provided with a clamping groove corresponding to the abutting block. The abutting block is engaged in the clamping groove.

[0026] Further, the locking member is a steel ball.

[0027] Further, the number of the recess, the through hole and the locking member are three respectively. The three recesses are evenly distributed on the movable member. The three through holes are evenly distributed on the upper cover.

[0028] The beneficial effects of the second aspect of the present application are as follows:

[0029] The battery assembly, the atomizing assembly and the liquid storage assembly are arranged in the battery sleeve in sequence along the longitudinal axial direction of the battery sleeve, the atomizing assembly and the battery assembly and/or the liquid storage assembly and the atomizing assembly are in contact by abutting against each other. After removing the upper cover assembly provided in the battery sleeve, the liquid storage assembly or the combination of the atomizing assembly and the liquid storage assembly can be taken out from the battery sleeve separately. The assembly structure is simple, and the disassembly and the maintenance are convenient.

BRIEF DESCRIPTION OF THE DRAWINGS

[0030] The following describes the present application further with reference to the drawings and embodiments.

FIG. 1 is a partially exploded view of the electronic cigarette of the present application;

FIG. 2 is a schematic structural view of the upper cover assembly of the electronic cigarette shown in FIG. 1 (the suction nozzle is not shown);

FIG. 3 is an exploded view of the upper cover assembly shown in FIG. 2;

FIG. 4 is an exploded view of the upper cover assembly shown in FIG. 2 from another perspective;

FIG. 5 is a cross-sectional view of the electronic cigarette shown in FIG. 1;

FIG. 6 is a partially enlarged view of portion A in the cross-sectional view of the electronic cigarette shown in FIG. 5;

FIG. 7 is a cooperative assembly diagram of the upper cover, the locking member and the movable member of the upper cover assembly shown in FIG. 2.

atomizer 100	liquid storage assembly 10	liquid storage tube 11
air inlet hole 111	venting member 12	liquid injection hole 131
first sealing member 14	mounting groove 141	liquid sealing member 15
liquid storage chamber 16	upper cover assembly 20	upper cover 21
inner casing 211	receiving groove 214	limiting block 2111
through hole 2122	containing groove 2121	abutting block 2124
annular groove 2112	locking member 22	abutting surface 2123
latching member 23	snapping ring 231	movable member 24
movable member main body 241	smoke outlet hole 2411	limiting ring 244
recess 2421	suction nozzle 25	limiting groove 2422
base assembly 30	base 31	mounting protrusion 311
accommodating groove 312	second sealing member 313	vent hole 314
connecting member 232	electrode column 32	air inlet passage 33
atomizing assembly 40	atomizing chamber 41	atomizing tube 42
heating structure 43	liquid guiding member 431	heating member 432
battery assembly 50	battery sleeve 51	battery cell 52
controller 53	button 54	locking groove 512
accommodating hole 513	control board bracket 531	control board 532
smoke outlet passage 121	abutting ring 242	clamping groove 514
opening end 511		

DETAILED DESCRIPTION OF PREFERRED EMBODIMENTS

[0031] The present application will now be described in detail with reference to the drawings. This figure is a simplified

schematic diagram, which only illustrates the basic structure of the present application in a schematic manner, so it only shows the structure related to the present application.

[0032] As shown in FIGs. 1 and 6, the present application provides an electronic cigarette, which includes an atomizer 100 and a battery assembly 50 electrically connected to the atomizer 100. The atomizer 100 includes a liquid storage assembly 10, an upper cover assembly 20 disposed at one end of the liquid storage assembly 10, a base assembly 30 disposed at the other end of the liquid storage assembly 10 relative to the upper cover assembly 20, and an atomizing assembly 40 that is operatively in fluid communication with the liquid storage assembly 10. In use, e-liquid in the liquid storage assembly 10 enters the atomizing assembly 40, the battery assembly 50 supplies power to the atomizing assembly 40, and the atomizing assembly 40 atomizes the e-liquid to generate smoke for the user to inhale.

[0033] The liquid storage assembly 10 includes a liquid storage tube 11 and a venting member 12 located in the liquid storage tube 11. The liquid storage tube 11 is substantially a hollow cylindrical structure with an opening at the bottom end thereof. The liquid storage tube 11 is provided with a liquid storage chamber 16. The venting member 12 is substantially a hollow tubular structure with both ends passing therethrough. Specifically, the venting member 12 is arranged coaxially with the liquid storage tube 11, and the upper end of the venting member 12 passes through the upper end surface of the liquid storage tube 11. The inner cavity of the venting member 12 forms a smoke outlet passage 121. In this embodiment, the liquid storage tube 11 and the venting member 12 are integrally formed to facilitate processing. It is understood that, in other embodiments not shown, the liquid storage tube 11 and the venting member 12 can also be separate components. In use, it only needs to connect the two, for example, the venting member 12 is in interference fit with the upper end of the liquid storage tube 11. A first sealing member 14 is provided in the lower end of the liquid storage tube 11. The first sealing member 14 is configured to seal the liquid storage chamber 16. A mounting groove 141 is provided in the first sealing member 14, the upper end of the atomizing assembly 40 passes through the mounting groove 141 and then is connected to the venting member 12, and the lower end of the atomizing assembly 40 is connected with the mounting groove 141. The liquid storage chamber 16 is formed by a space enclosed by the liquid storage tube 11, the venting member 12, the atomizing assembly 40 and the first sealing member 14. The upper end surface of the liquid storage tube 11 is provided with a liquid injection hole 131 communicating with the liquid storage chamber 16, and the e-liquid can be injected into the liquid storage chamber 16 through the liquid injection hole 131. In addition, a liquid sealing member 15 is detachably installed in the liquid injection hole 131. The liquid sealing member 15 is configured to seal the liquid injection hole 131 to prevent the e-liquid from leaking, and also provides the possibility of liquid injection. For example, a liquid injection needle may pierce the liquid sealing member 15 to replenish the e-liquid into the liquid storage chamber 16, or alternatively, the liquid sealing member 15 is pulled out, and the e-liquid replenishment or pouring operation is performed on the liquid storage chamber 16. The liquid sealing member 15 can be a silicone plug or a rubber plug, which is not limited here. In addition, the side wall of the liquid storage tube 11 is provided with an air inlet hole 111 communicating with the outside air. The outside air is guided to enter the air inlet end of the atomizing assembly 40 from the air inlet hole 111, and the smoke generated by atomizing the e-liquid through the atomizing assembly 40 is taken out of the atomizing assembly 40.

[0034] As shown in FIGs. 2 to 7, the upper cover assembly 20 includes an upper cover 21, a movable member 24 provided on the upper cover 21, and a locking member 22 provided between the upper cover 21 and the movable member 24.

[0035] Referring to FIGs. 3 and 4, the upper cover 21 includes an outer casing 212 and an inner casing 211 received in the outer casing 212. The space between the outer wall of the inner casing 211 and the inner wall of the outer casing 212 forms a receiving groove 214. The outer wall of the inner casing 211 is protrudingly formed with a limiting block 2111 along the radial direction of the inner casing 211. The bottom wall of the inner casing 211 is recessed upward to form an annular groove 2112. At least one containing groove 2121 communicating with the receiving groove 214 is recessed on the inner wall of the outer casing 212. At least one through hole 2122 corresponding to the containing groove 2121 is provided in the outer wall of the outer casing 212. In this embodiment, three containing grooves 2121 are recessed on the inner wall of the outer casing 212, the outer wall of the outer casing 212 is provided with three through holes 2122 corresponding to the three containing grooves 2121, respectively, and each through hole 2122 communicates with a corresponding containing groove 2121. The inner wall of the upper end of the outer casing 212 is recessed to form an abutting surface 2123. An abutting block 2124 is provided on the side wall of the outer casing 212.

[0036] The movable member 24 includes a movable member main body 241 and an abutting ring 242 provided on the movable member main body 241. The movable member main body 241 is provided with a smoke outlet hole 2411 passing through the upper and lower end surfaces of the movable member main body 241. The smoke outlet hole 2411 is in communication with the smoke outlet passage 121. The abutting ring 242 is formed around the smoke outlet hole 2411 by extending downward from the movable member main body 241 along the axial direction of the movable member main body 241. Three recesses 2421 are provided on the outer peripheral surface of the abutting ring 242. The width dimension of the recess 2421 is greater than or equal to the diameter dimension of the locking member 22, so that the locking member 22 can be at least partially received in the recess 2421. The recess 2421 is smoothly transitionally connected with the outer peripheral wall of the retaining ring 242. The inner wall of the abutting ring 242 is recessed

inwardly along the radial direction of the abutting ring 242 to form an arc-shaped limiting groove 2422. The limiting groove 2422 passes through the lower end surface of the abutting ring 242. The lower end surface of the movable member main body 241 is protrudingly provided with a limiting ring 244, and the limiting ring 244 abuts against the abutting surface 2123, thereby restricting the locking member 22 from moving in the axial direction of the upper cover 21.

[0037] When the upper cover 21 and the movable member 24 are connected, the abutting ring 242 is received in the receiving groove 214, the locking member 22 is located between the abutting ring 242 and the outer casing 212, and at the same time, the limiting block 2111 is located in the limiting groove 2422. When the movable member 24 rotates relative to the upper cover 21, the limiting block 2111 slides in the limiting groove 2422 along the limiting groove 2422. By providing the limiting groove 2422, the rotation angle of the movable member 24 relative to the upper cover 21 is limited.

[0038] When the movable member 24 is rotated such that the recess 2421 and the locking member 22 are staggered from each other, the locking member 22 abuts against the outer wall of the abutting ring 242, so that one end of the locking member 22 away from the abutting ring 242 partially passes through the through hole 2122 and extends to the outside of the upper cover 21. When the movable member 24 is rotated such that the recess 2421 and the locking member 22 are aligned with each other, the locking member 22 is partially received in the recess 2421, so that one end of the locking member 22 away from the abutting ring 242 is retracted into the containing groove 2121.

[0039] In this embodiment, three recesses 2421 are evenly distributed on the outer peripheral surface of the abutting ring 242, three containing grooves 2121 are evenly arranged on the inner wall of the upper cover 21, and three through hole 2122 are evenly distributed on the outer wall of the upper cover 21. It is understood that, in other embodiments not shown, the number of the recess 2421, the containing groove 2121 and the through hole 2122 are the same, and the number of the recess 2421, the containing groove 2121 and the through hole 2122 may also be one, two, four or more.

[0040] In this embodiment, the locking member 22 is a steel ball. It is understood that, in other embodiments not shown, the locking member 22 can also be a cylindrical structure or an arc-shaped spherical structure such as an ellipsoid. The upper cover assembly 20 further includes a latching member 23, the latching member 23 has a hollow cylindrical structure with both ends passing therethrough. The outer peripheral wall at the lower end of the latching member 23 extends radially outward to form a snapping ring 231 corresponding to the annular groove 2112. A connecting member 232 is sandwiched between the latching member 23 and the upper cover 21, and the connecting member 232 may be a rubber ring or a silicone ring. The upper end of the latching member 23 is inserted into the movable member 24, the lower end of the latching member 23 abuts against the annular groove 2112 of the upper cover 21 through the snapping ring 231. Therefore, when the movable member 24 rotates, the latching member 23 can rotate relative to the upper cover 21 under the driving of the movable member 24.

[0041] The upper cover assembly 20 further includes a suction nozzle 25. The suction nozzle 25 has a hollow cylindrical structure with both ends passing through. The lower end of the suction nozzle 25 is detachably mounted on the movable member 24. The inner cavity of the suction nozzle 25 is communicated with the annular groove 2112. In use, the user inhales the smoke through the suction nozzle 25. In this embodiment, the suction nozzle 25 is plugged into the movable member 24. It is understood that, in other embodiments not shown, the suction nozzle 25 can also be detachably connected with the movable member 24 through a detachable manner such as a snapping connection, a threaded connection, or a magnetic connection, so as to facilitate the user to replace or clean the suction nozzle. It is understood that, in other embodiments not shown, the suction nozzle 25 can also be omitted, and the user directly inhales the smoke through the through hole of the movable member 24.

[0042] As shown in FIG. 6, the base assembly 30 includes a base 31. An electrode column 32 is provided on the base 31, and the electrode column 32 is connected to one of the positive electrode and the negative electrode of the battery cell 52. The base 31 is inserted into the lower end of the liquid storage tube 11 and is located below the first sealing member 14. A mounting protrusion 311 is protrudingly provided on one end surface of the base 31 facing the liquid storage assembly 10. The inside of the mounting protrusion 311 is hollow. The mounting protrusion 311 is partially inserted into the mounting groove 141 and connected with the atomizing assembly 40. The upper end surface of the base 31 is recessed to form an accommodating groove 312 located around the mounting protrusion 311. A second sealing member 313 is installed in the accommodating groove 312. The outer wall of the second sealing member 313 abuts against the inner wall of the liquid storage tube 11 to enhance the tightness between the liquid storage assembly 10 and the base 31. The gap between the second sealing member 313 and the first sealing member 14 constitutes an air inlet passage 33. The air inlet passage 33 is in communication with the air inlet hole 111. The side wall of the mounting protrusion 311 is provided with a vent hole 314 communicating with the air inlet passage 33, and the vent hole 314 is in communication with the inner cavity of the mounting protrusion 311, so that the outside air enters the inner cavity of the mounting protrusion 311 through the air inlet hole 111, the air inlet passage 33 and the vent hole 314. The electrode column 32 is installed on the lower end surface of the base 31. The electrode column 32 is electrically connected to one of the positive electrode and the negative electrode of the battery assembly 50.

[0043] The atomizing assembly 40 includes an atomizing tube 42 and a heating structure 43 provided in the atomizing tube 42.

[0044] The atomizing tube 42 has substantially a hollow cylindrical structure with both ends passing through. The inner

cavity of the atomizing tube 42 forms an atomizing chamber 41. The atomizing tube 42 is provided with a liquid inlet hole communicating with the atomizing chamber 41, the liquid inlet hole is in communication with the liquid storage chamber 16, and the e-liquid in the liquid storage chamber 16 flows into the atomizing chamber 41 through the liquid inlet hole. The heating structure 43 is arranged in the atomizing chamber 41. The upper end of the atomizing tube 42 is inserted into the venting member 12, the lower end of the atomizing tube 42 is inserted into the mounting groove 141 and resists the mounting protrusion 311, and the atomizing chamber 41 is in communication with the inner cavity of the mounting protrusion 311, so that the outside air can enter the atomizing chamber 41 through the air inlet passage 33.

[0045] The heating structure 43 includes a liquid guiding member 431 and a heating member 432, which are in contact with each other. The liquid guiding member 431 is configured to absorbing the e-liquid flowing from the liquid storage chamber 16 into the atomizing chamber 41. The liquid guiding member 431 is made of, but is not limited to, porous ceramics, cotton cloth, fiber rope, foamed metal or foamed graphite. In this embodiment, the heating member 432 is wrapped by the liquid guiding member 431. Two pins are provided on the heating member 432, one of the pins passes through the mounting protrusion 311 and is electrically connected to one of the positive and negative electrodes of the battery assembly 50, and the other pin passes through the base 31 and is electrically connected to the other of the positive and negative electrodes of the battery assembly 50. Thus, the heating member 432 is electrically connected to the battery assembly 50, and the heating member 432 heats the e-liquid on the liquid guiding member 431 under the electric driving of the battery assembly 50 to generate smoke for the user to inhale. The heating member 432 can be, but is not limited to, a heating wire or a heating orifice plate. It is understood that, the contact manner in which the liquid guiding member 431 wraps the heating member 432 or the heating member 432 wraps the liquid guiding member 431 can both satisfy the purpose of the liquid guiding member 431 absorbing the e-liquid and the heating member 432 heating the e-liquid.

[0046] The battery assembly 50 includes a battery sleeve 51, a battery cell 52 and a controller 53 both arranged in the battery sleeve 51, and a button 54 partially protruding to the outside of the battery sleeve 51.

[0047] The battery sleeve 51 has a hollow cylindrical structure with an open end 511. The inner wall of the open end 511 of the battery sleeve 51 is recessed and formed with three locking grooves 512, and the three locking grooves 512 are evenly distributed on the inner wall of the battery sleeve 51. An accommodating hole 513 is provided in the side wall of the battery sleeve 51. The top of the battery sleeve 51 is partially recessed downward to form a clamping groove 514 corresponding to the abutting block 2124. The controller 53 includes a control board bracket 531 and a control board 532 arranged on the control board bracket 531. An insertion hole is provided in the top portion of the control board bracket 531. The battery cell 52 is installed at the bottom of the battery sleeve 51 through the open end 511. The controller 53 is arranged above the battery cell 52 and the control board 532 is electrically connected to the battery cell 52. The button 54 is disposed in the battery sleeve 51 and partially protrudes out of the battery sleeve 51 through the accommodating hole 513. By pressing the button 54, the control board 532, the battery cell 52 and the heating member 432 are electrically connected.

[0048] During installation, the snapping ring 231 is rotatably received in the annular groove 2112, so that the latching member 23 is rotatably installed on the upper cover 21. The locking member 22 is installed on the upper cover 21, and the movable member 24 is installed between the upper cover 21 and the latching member 23. Then, the latching member 23 is connected to the movable member 24. In this embodiment, the movable member 24 and the latching member 23 are connected by rivets. It is understood that, in other embodiments not shown, the movable member 24 and the latching member 23 can also be connected by threads or a clamping connection.

[0049] The base assembly 30, the atomizing assembly 40 and the liquid storage assembly 10 are sequentially placed in the battery sleeve 51 along the longitudinal axial direction of the battery sleeve 51, the base 31 abuts against the battery assembly 50, the electrode column 32 is inserted into the insertion hole and is electrically connected to the control board 532, the other pin of the heating member 432 passes through the base 31 and is electrically connected to the control board 532. Then, the upper cover assembly 20 is installed in the battery sleeve 51 through the open end 511, and the upper cover assembly 20 covers the liquid storage assembly 10. The abutting block 2124 of the upper cover 21 is engaged in the clamping groove 514 of the battery sleeve 51. In this embodiment, the number of the abutting block 2124 and the clamping groove 514 are respectively two, the two abutting blocks 2124 are arranged on opposite sides of the outer casing 212, and the two clamping grooves 514 are provided on opposite sides of the battery sleeve 51. The cooperation of the abutting block 2124 and the clamping groove 514 prevents the upper cover 21 from rotating with the movable member 24.

[0050] By rotating the movable member 24, the movable member 24 drives the latching member 23 to rotate relative to the upper cover 21 and the battery sleeve 51, the limiting block 2111 slides in the limiting groove 2422; when the limiting block 2111 abuts against one end of the limiting groove 2422, the recess 2421 of the abutting ring 242 is misaligned with the containing groove 2121 (or the locking member 22), the outer peripheral wall of the abutting ring 242 abuts against the locking member 22, so that one end of the locking member 22 away from the abutting ring 242 is protruded from the upper cover assembly 20 through the through hole 2122 and then is locked in the locking groove 512. Since the locking member 22 is locked in the locking groove 512, the upper cover assembly 20 and the battery

assembly 50 are tightly connected, thereby preventing children from easily opening the upper cover assembly 20 to contact the e-liquid.

[0051] When the remaining amount of the e-liquid in the liquid storage chamber 161 is insufficient requiring for liquid injection, the movable member 24 is rotated in a reverse direction until the limiting block 2111 resists the other end of the limiting groove 2422, the movable member 24 stops to be rotated, the recess 2421 is aligned with the locking member 22, so that the locking member 22 is partially received in the recess 2421 and is separated from the locking groove 512, so that the locking relationship between the locking member 22 and the locking groove 512 is released. At this time, by pulling the upper cover assembly 20 away from the battery assembly 50, the upper cover assembly 20 is separated from the liquid storage assembly 10, and then the liquid sealing member 15 is pulled out or the liquid sealing member 15 is pierced through using a liquid injection needle to inject liquid into the liquid storage chamber 16. At this time, the liquid storage assembly 10 can be poured out from the open end 511 separately; alternatively, the atomizing assembly 40 and the liquid storage assembly 10 can be poured out from the open end 511.

[0052] It is understood that, the atomizing assembly 40 and the battery assembly 50 are in contact by abutting against each other. Or, the liquid storage assembly 10 and the atomizing assembly 40 are in contact by abutting against each other.

[0053] The electronic cigarette further includes a fixing member, the fixing member is sleeved at the outside of the upper cover, the locking groove 512 is formed by recessing from the inner wall of the fixing member, the clamping groove 514 is provided on the fixing member, the upper cover assembly 20 is rotatably arranged on the fixing member by the locking member 22 being locked in the locking groove 512 of the fixing member. In this embodiment, the fixing member is the battery sleeve 51. It is understood that, in other embodiments not shown, the fixing member may also be the liquid storage tube 11, the liquid storage tube 11 extends upward to form a connecting pipe, the connecting pipe is sleeved at the outside of the upper cover 21, and the locking groove 512 is provided in the inner wall of the connecting pipe. A tight connection between the upper cover assembly 20 and the liquid storage assembly 10 is realized by the locking member 22 being locked in the locking groove 512 of the connecting pipe, thereby preventing children from easily opening the upper cover assembly 20 to contact the e-liquid.

[0054] In some embodiments, the atomizer 100 provided by the present application has a locking member 22 movably provided in the upper cover 21, the movable member 23 is provided with a recess 2421 corresponding to the locking member 22. When rotating the movable member 23 relative to the upper cover 21, the movable member 23 can abut against the locking member 22, so that the locking member 22 protrudes out from the upper cover assembly 20 and is locked in the locking groove 512, thereby preventing children from easily opening the atomizer 100 to contact the e-liquid and improving the safety of the atomizer 100. The structure is simple and the operation is convenient. Or, the movable member 23 is rotated relative to the upper cover 21, so that the locking member 22 is received in the recess 2421, the locking relationship between the locking member 22 and the locking groove 512 is released, and the upper cover assembly 20 is opened for liquid injection operation.

[0055] In some embodiments, the electronic cigarette provided by the present application has all the technical features of the above-mentioned atomizer 100, so it has the same technical effects as the above-mentioned atomizer 100.

[0056] In some embodiments, the electronic cigarette provided by the present application is assembled by arranging the battery assembly 50, the atomizing assembly 40 and the liquid storage assembly 10 in the battery sleeve 51 in sequence along the longitudinal axial direction of the battery sleeve 51, wherein the atomizing assembly 40 and the battery assembly 50 and/or the liquid storage assembly 10 and the atomizing assembly 40 are in contact by abutting against each other. After removing the upper cover assembly 20 provided in the battery sleeve 51, the liquid storage assembly 10 or the combination of the atomizing assembly 40 and the liquid storage assembly 10 can be taken out from the battery sleeve 51 separately. The assembly structure is simple, and the disassembly and the maintenance are convenient.

[0057] In some embodiments, the electronic cigarette provided by the present application has all the technical features of the above-mentioned atomizer 100, so it has the same technical effects as the above-mentioned atomizer 100.

[0058] Taking the above-mentioned ideal embodiments according to the present application as enlightenment, through the above description, the relevant staff can make various changes and modifications without departing from the concept of the present application. The technical scope of the present application is not limited to the content of the specification, and its technical scope must be determined according to the scope of the claims.

Claims

1. An atomizer comprising an upper cover assembly and a fixing member, wherein the upper cover assembly comprises an upper cover, a movable member rotatable relative to the upper cover, and a locking member movably provided between the upper cover and the movable member, the movable member is at least partially received in the upper cover, the upper cover is provided with a through hole, the movable member is provided with a recess, the fixing member is sleeved at the outside of the upper cover, the fixing member is provided with a locking groove corre-

sponding to the through hole; when the movable member is rotated until the recess and the locking member are staggered from each other, the locking member partially passes through the through hole and is locked with the locking groove; when the movable member is rotated until the recess and the locking member are aligned with each other, the locking member is partially received in the recess and is separated from the locking groove.

2. The atomizer according to claim 1, wherein the upper cover comprises an inner casing and an outer casing, the space between the inner casing and the outer casing forms a receiving groove, the through hole is provided in the outer casing, a containing groove corresponding to the through hole is recessed on the inner wall of the outer casing, wherein the containing groove, the receiving groove and the through hole are in communication with each other, the locking member is received in the containing groove, the movable member is provided with an abutting ring, the abutting ring is received in the receiving groove, the recess is provided in the abutting ring, the locking member is located on the outside of the abutting ring.
3. The atomizer according to claim 1, wherein an abutting block is provided on the side wall of the outer casing, the fixing member is provided with a clamping groove corresponding to the abutting block, the abutting block is engaged in the clamping groove.
4. The atomizer according to claim 2, wherein a limiting block is provided in the receiving groove, the inner wall of the abutting ring is recessed inwardly along the radial direction of the abutting ring to form an arc-shaped limiting groove, the limiting groove passes through the lower end surface of the abutting ring, the limiting block is located in the limiting groove, the limiting block can slide in the limiting groove.
5. The atomizer according to claim 2, wherein the inner wall of the inner casing is recessed to form an annular groove, the upper cover assembly further comprises a latching member, the outer peripheral wall at the lower end of the latching member extends radially outward to form a snapping ring corresponding to the annular groove, the upper end of the latching member is connected to the movable member, the lower end of the latching member abuts against the annular groove of the upper cover through the snapping ring.
6. The atomizer according to claim 2, wherein the movable member further comprises a movable member main body, the movable member main body is provided with a smoke outlet hole passing through the movable member main body, the abutting ring is formed around the smoke outlet hole by extending downward from the movable member main body along the axial direction of the movable member main body.
7. The atomizer according to claim 6, wherein the lower end surface of the movable member main body is protrudingly provided with a limiting ring, the inner wall of the outer casing is recessed to form an abutting surface, the abutting ring abuts against the abutting surface.
8. The atomizer according to claim 1, wherein the atomizer further comprises a liquid storage tube, a liquid storage chamber is provided in the liquid storage tube, the liquid storage tube is provided with a liquid injection hole communicating with the liquid storage chamber, a liquid sealing member is detachably installed in the liquid injection hole, the upper cover is arranged to cover the liquid sealing member.
9. An electronic cigarette comprising the atomizer according to any one of claims 1 to 8.
10. The electronic cigarette according to claim 9, wherein the electronic cigarette further comprises a battery assembly, the battery assembly comprises a battery sleeve, the fixing member is the battery sleeve, the battery sleeve is sleeved at the outside of the upper cover, the locking groove is provided in the battery sleeve.
11. An electronic cigarette comprising a battery assembly, a liquid storage assembly and an atomizing assembly, the battery assembly comprising a battery sleeve with an open end, wherein the battery assembly, the atomizing assembly and the liquid storage assembly are sequentially placed in the battery sleeve along the longitudinal axial direction of the battery sleeve, the atomizing assembly and the battery assembly and/or the liquid storage assembly and the atomizing assembly are in contact by abutting against each other, the open end of the battery sleeve is further provided with an upper cover assembly; when the upper cover assembly is removed from the battery sleeve, the liquid storage assembly can be separately poured out from the open end, or the atomizing assembly and the liquid storage assembly can be poured out from the open end.
12. The electronic cigarette according to claim 11, wherein the upper cover assembly comprises an upper cover, a

movable member rotatable relative to the upper cover, and a locking member movably provided between the upper cover and the movable member, the movable member is at least partially received in the upper cover, the upper cover is provided with a through hole, the movable member is provided with a recess, the battery sleeve is sleeved at the outside of the upper cover, the battery sleeve is provided with a locking groove corresponding to the through hole; when the movable member is rotated until the recess and the locking member are staggered from each other, the locking member partially passes through the through hole and is locked with the locking groove; when the movable member is rotated until the recess and the locking member are aligned with each other, the locking member is partially received in the recess and is separated from the locking groove.

13. The electronic cigarette according to claim **11**, wherein the atomizing assembly comprises an atomizing tube and a heating structure provided in the atomizing tube, the inner cavity of the atomizing tube forms an atomizing chamber, the heating structure comprises a liquid guiding member and a heating member which are provided in the atomizing chamber and are in contact with each other; two pins are provided on the heating member, one of the pins is electrically connected to one of the positive and negative electrodes of the battery assembly, the other pin is electrically connected to the other of the positive and negative electrodes of the battery assembly.

14. The electronic cigarette according to claim **12**, wherein the liquid storage assembly comprises a liquid storage tube, a liquid storage chamber is provided in the liquid storage tube, the liquid storage tube is provided with a liquid injection hole communicating with the liquid storage chamber, a liquid sealing member is detachably installed in the liquid injection hole, the upper cover is arranged to cover the liquid sealing member.

15. The electronic cigarette according to claim **14**, wherein a venting member is provided in the liquid storage tube, a first sealing member is provided in the lower end of the liquid storage tube, a mounting groove is provided in the first sealing member, the upper end of the atomizing tube is inserted into the venting member, the lower end of the atomizing tube is inserted into the mounting groove.

16. The electronic cigarette according to claim **15**, wherein the electronic cigarette further comprises a base provided at the lower end of the liquid storage tube, a mounting protrusion is protrudingly provided on one end surface of the base facing the liquid storage tube, the upper end of the mounting protrusion is inserted into the mounting groove, and the inner cavity of the mounting protrusion is in communication with the atomizing chamber, the side wall of the mounting protrusion is provided with a vent hole communicating with the inner cavity of the mounting protrusion.

17. The electronic cigarette according to claim **16**, wherein the upper end surface of the base is provided with a second sealing member located around the mounting protrusion, the gap between the second sealing member and the first sealing member constitutes an air inlet passage, the side wall at the bottom end of the liquid storage tube is provided with an air inlet hole communicating with the air inlet passage.

18. The electronic cigarette according to claim **12**, wherein the side wall of the upper cover is provided with an abutting block, the battery sleeve is provided with a clamping groove corresponding to the abutting block, the abutting block is engaged in the clamping groove.

19. The electronic cigarette according to claim **12**, wherein the locking member is a steel ball.

20. The electronic cigarette according to claim **12**, wherein the number of the recess, the through hole and the locking member are three respectively, the three recesses are evenly distributed on the movable member, the three through holes are evenly distributed on the upper cover.

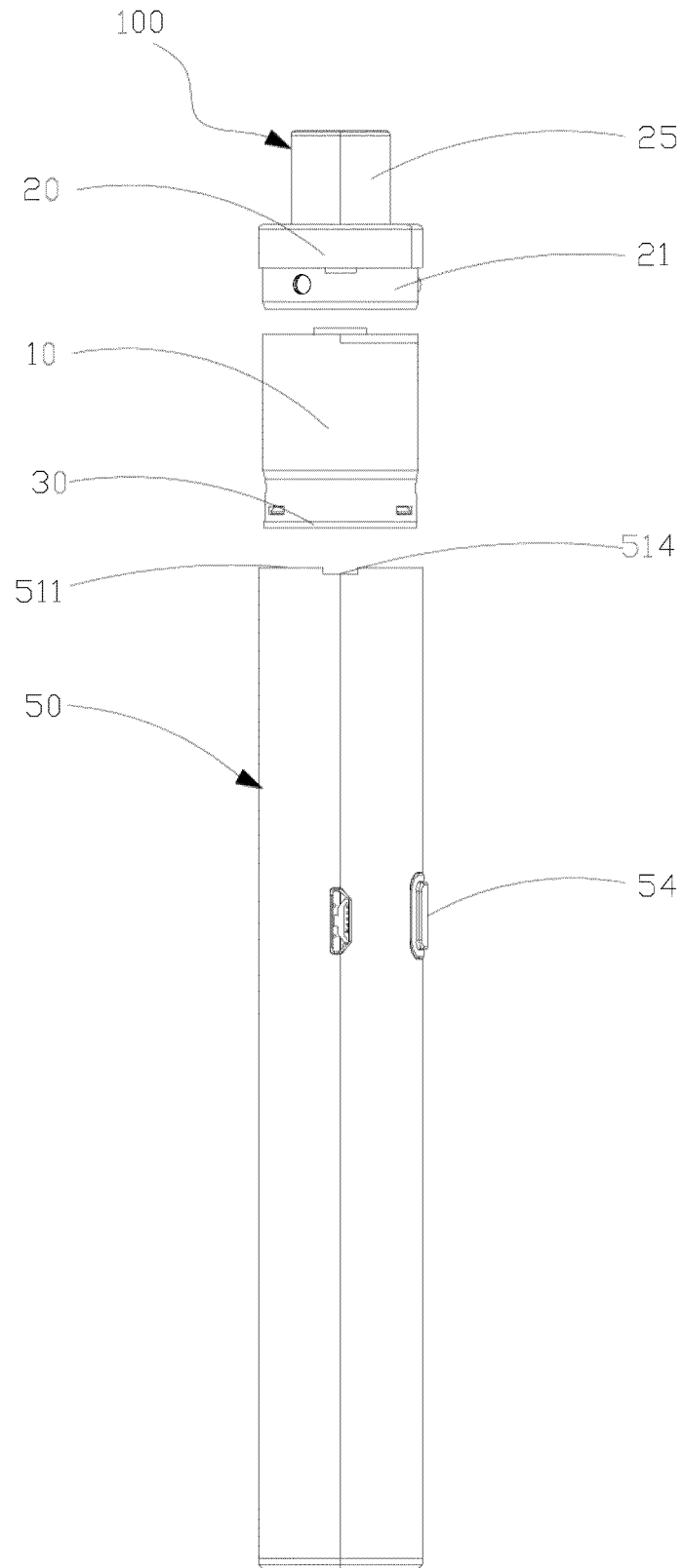


FIG. 1

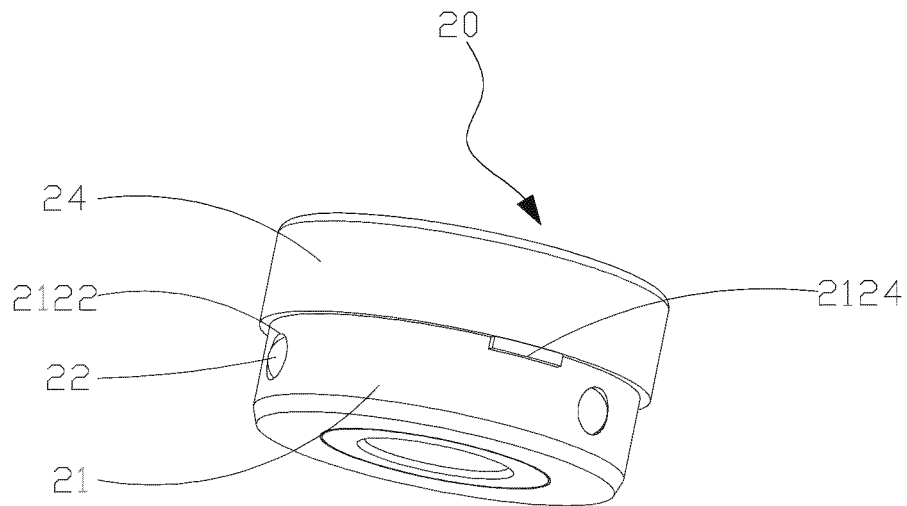


FIG. 2

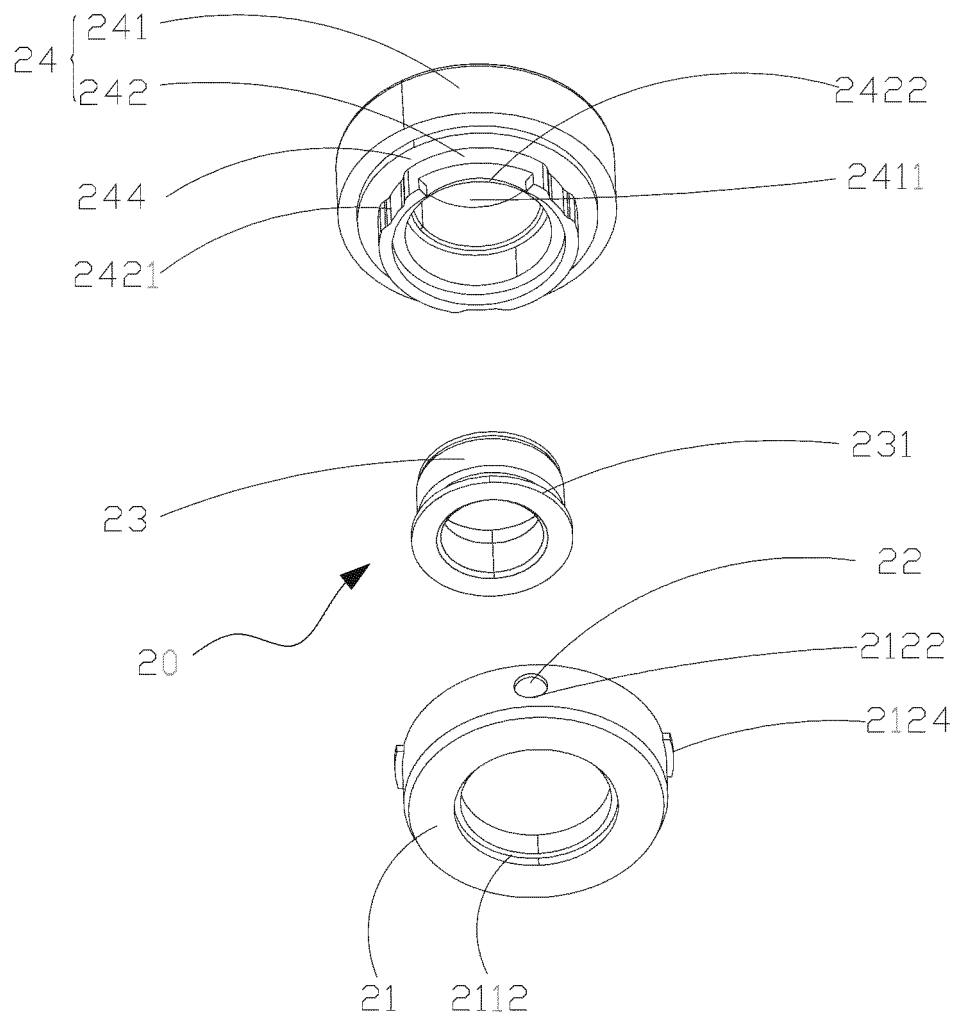


FIG. 3

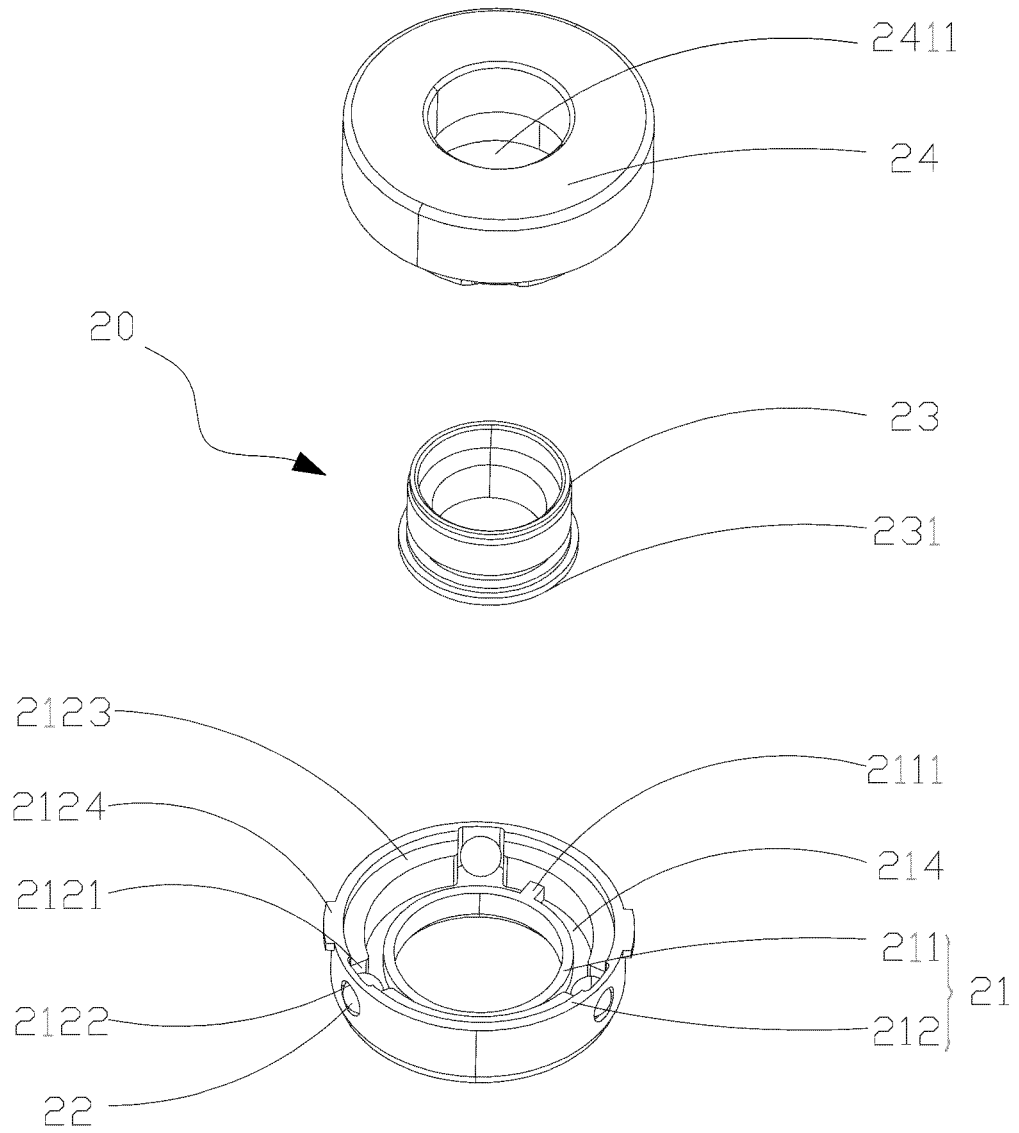


FIG. 4

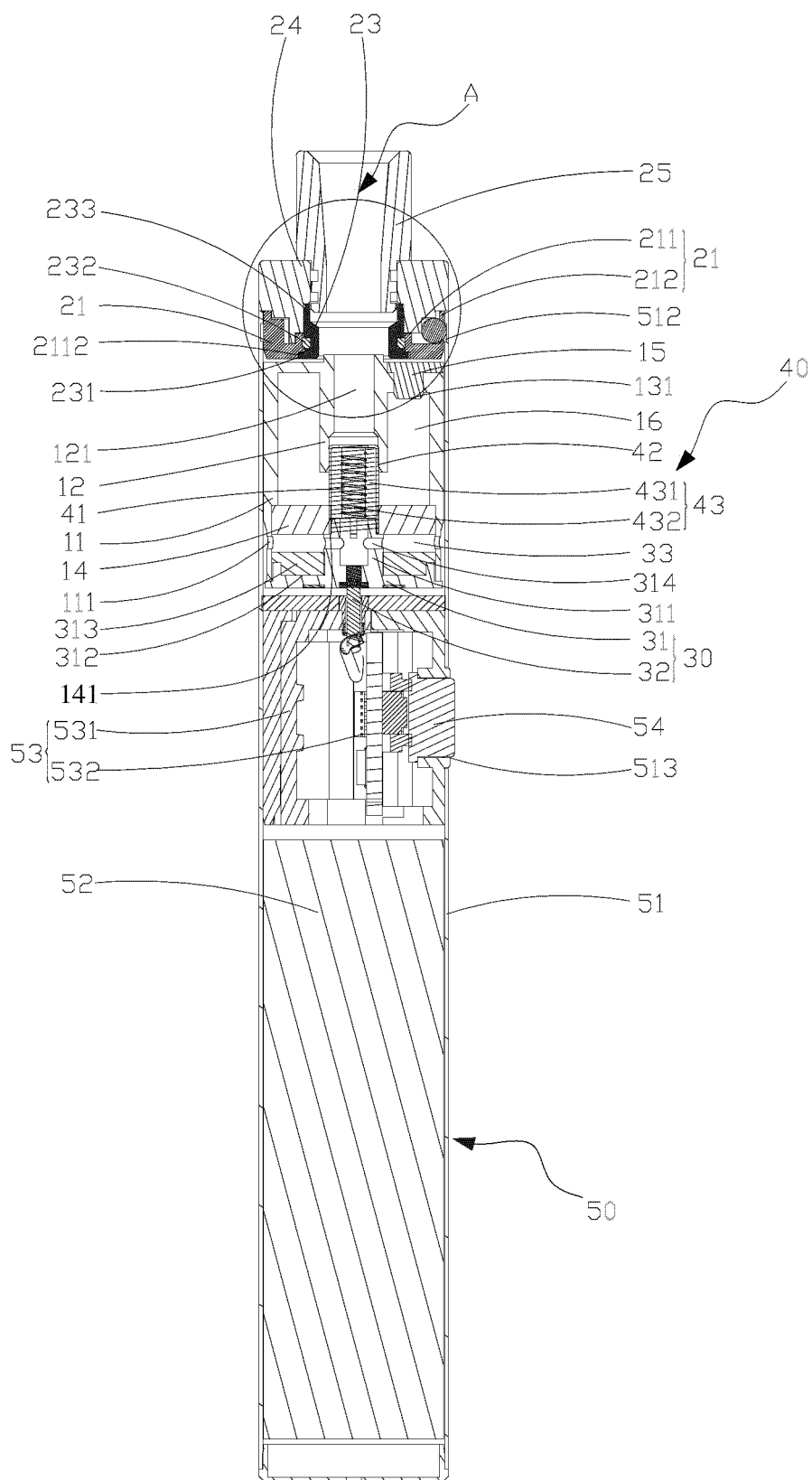


FIG. 5

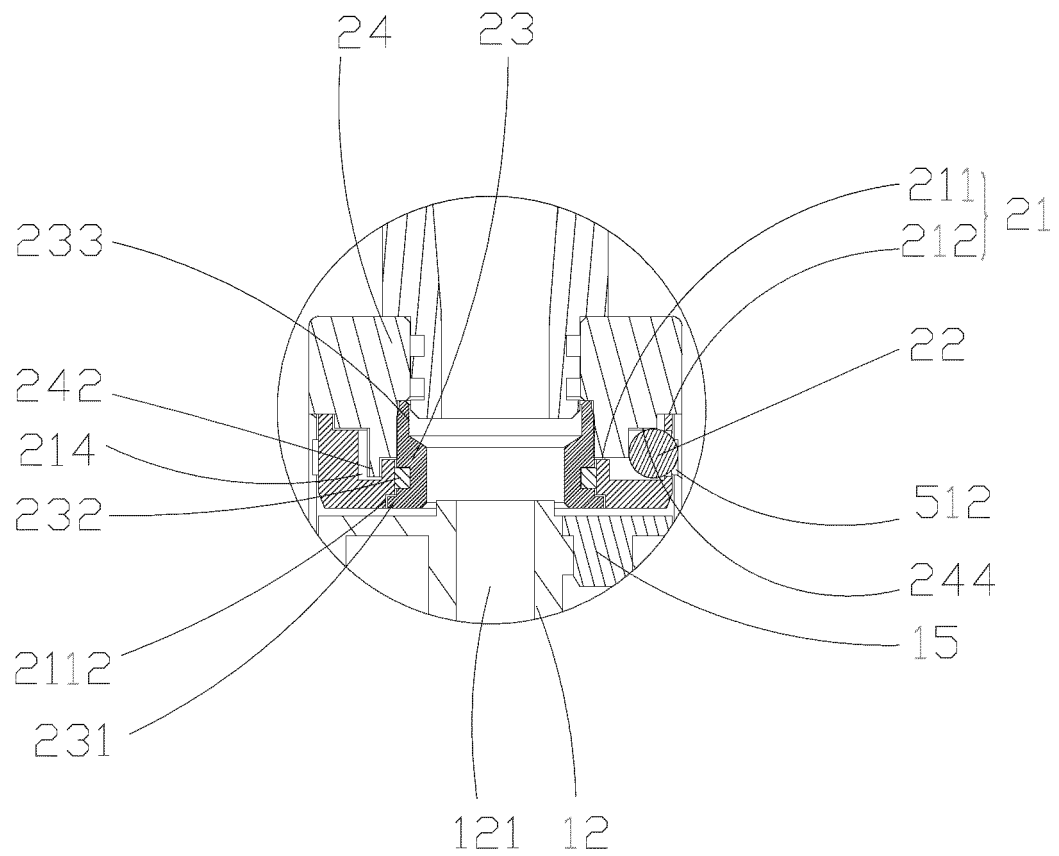


FIG. 6

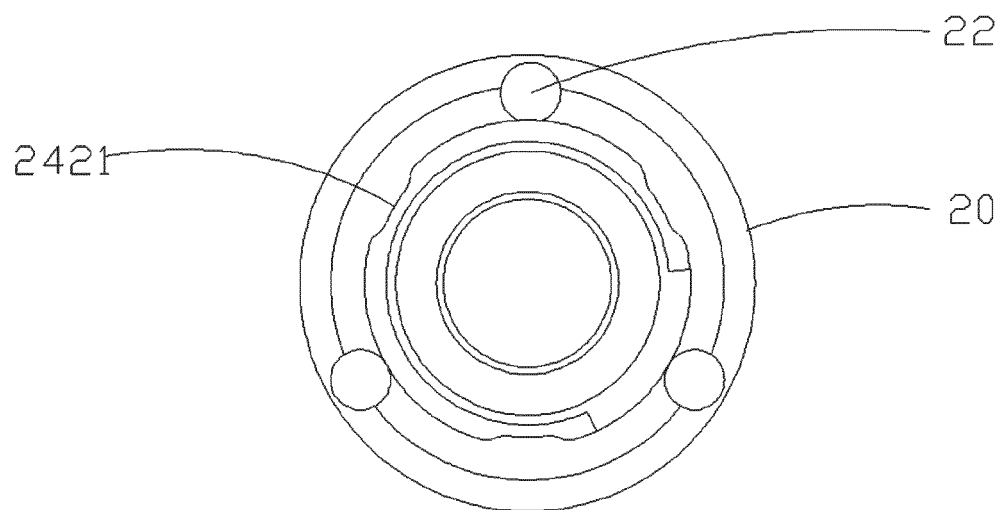


FIG. 7

INTERNATIONAL SEARCH REPORT

International application No.

PCT/CN2020/087142

A. CLASSIFICATION OF SUBJECT MATTER A24F 47/00(2020.01)i According to International Patent Classification (IPC) or to both national classification and IPC																					
B. FIELDS SEARCHED Minimum documentation searched (classification system followed by classification symbols) A24F 47/-; F16L 37/- Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched Electronic data base consulted during the international search (name of data base and, where practicable, search terms used) CNABS, CNTXT, VEN: 电子烟, 雾化, 锁止, 转, 珠, 球, 槽, 卡, electronic cigarette, smok+, atomiz+, rotat+, lock+, ball, groove, notch+,																					
C. DOCUMENTS CONSIDERED TO BE RELEVANT <table border="1"> <thead> <tr> <th>Category*</th> <th>Citation of document, with indication, where appropriate, of the relevant passages</th> <th>Relevant to claim No.</th> </tr> </thead> <tbody> <tr> <td>PX</td> <td>CN 210275881 U (CHANGZHOU PAITENG ELECTRONIC TECHNOLOGY SERVICE CO., LTD.) 10 April 2020 (2020-04-10) description, paragraphs 0046-0068, and figures 1-7</td> <td>1-20</td> </tr> <tr> <td>PX</td> <td>CN 210137816 U (CHANGZHOU PAITENG ELECTRONIC TECHNOLOGY SERVICE CO., LTD.) 13 March 2020 (2020-03-13) description, paragraphs 0005-0068, and figures 1-7</td> <td>1-20</td> </tr> <tr> <td>X</td> <td>CN 106418728 A (CHANGZHOU PAITENG ELECTRONIC TECHNOLOGY SERVICE CO., LTD.) 22 February 2017 (2017-02-22) description, paragraphs 0069-0099, and figures 1-5</td> <td>11,</td> </tr> <tr> <td>Y</td> <td>CN 106418728 A (CHANGZHOU PAITENG ELECTRONIC TECHNOLOGY SERVICE CO., LTD.) 22 February 2017 (2017-02-22) description, paragraphs 0069-0099, and figures 1-5</td> <td>12-20</td> </tr> <tr> <td>Y</td> <td>CN 207767544 U (CHANGZHOU PAITENG ELECTRONIC TECHNOLOGY SERVICE CO., LTD.) 28 August 2018 (2018-08-28) description, paragraphs 0038-0059, and figures 3-7</td> <td>1-10, 12-20</td> </tr> <tr> <td>Y</td> <td>CN 203168036 U (LIU, Qiuming) 04 September 2013 (2013-09-04) description, paragraphs 0031-0040, figures 2-3, 6</td> <td>1-10</td> </tr> </tbody> </table>	Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.	PX	CN 210275881 U (CHANGZHOU PAITENG ELECTRONIC TECHNOLOGY SERVICE CO., LTD.) 10 April 2020 (2020-04-10) description, paragraphs 0046-0068, and figures 1-7	1-20	PX	CN 210137816 U (CHANGZHOU PAITENG ELECTRONIC TECHNOLOGY SERVICE CO., LTD.) 13 March 2020 (2020-03-13) description, paragraphs 0005-0068, and figures 1-7	1-20	X	CN 106418728 A (CHANGZHOU PAITENG ELECTRONIC TECHNOLOGY SERVICE CO., LTD.) 22 February 2017 (2017-02-22) description, paragraphs 0069-0099, and figures 1-5	11,	Y	CN 106418728 A (CHANGZHOU PAITENG ELECTRONIC TECHNOLOGY SERVICE CO., LTD.) 22 February 2017 (2017-02-22) description, paragraphs 0069-0099, and figures 1-5	12-20	Y	CN 207767544 U (CHANGZHOU PAITENG ELECTRONIC TECHNOLOGY SERVICE CO., LTD.) 28 August 2018 (2018-08-28) description, paragraphs 0038-0059, and figures 3-7	1-10, 12-20	Y	CN 203168036 U (LIU, Qiuming) 04 September 2013 (2013-09-04) description, paragraphs 0031-0040, figures 2-3, 6	1-10
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<table border="1"> <tr> <td> * Special categories of cited documents: “A” document defining the general state of the art which is not considered to be of particular relevance “E” earlier application or patent but published on or after the international filing date “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) “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 </td> <td> “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 “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 “Y” document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art “&” document member of the same patent family </td> </tr> <tr> <td>Date of the actual completion of the international search 23 June 2020</td> <td>Date of mailing of the international search report 31 July 2020</td> </tr> <tr> <td>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</td> <td>Authorized officer</td> </tr> <tr> <td>Facsimile No. (86-10)62019451</td> <td>Telephone No.</td> </tr> </table>	* Special categories of cited documents: “A” document defining the general state of the art which is not considered to be of particular relevance “E” earlier application or patent but published on or after the international filing date “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) “O” document referring to an oral disclosure, use, exhibition or other means “P” document published prior to the international filing date but later than the priority date claimed	“T” later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention “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 “Y” document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art “&” document member of the same patent family	Date of the actual completion of the international search 23 June 2020	Date of mailing of the international search report 31 July 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.													
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Facsimile No. (86-10)62019451	Telephone No.																				

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INTERNATIONAL SEARCH REPORT

International application No.
PCT/CN2020/087142

C. DOCUMENTS CONSIDERED TO BE RELEVANT		
Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	CN 204070547 U (SHENZHEN IVPS TECHNOLOGY CO., LTD.) 07 January 2015 (2015-01-07) entire document	1-20
A	CN 104913144 A (A RAYMOND & CIE) 16 September 2015 (2015-09-16) entire document	1-20
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A	US 2019032832 A1 (STAUBLI SA ETS) 31 January 2019 (2019-01-31) entire document	1-20
A	US 10601175 B2 (CANARE ELECTRIC CO., LTD.) 24 March 2020 (2020-03-24) entire document	1-20

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INTERNATIONAL SEARCH REPORT
Information on patent family members

International application No.

PCT/CN2020/087142

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CN 106418728 A	22 February 2017	None	
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		JP WO2019186657 A1	30 April 2020

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