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(54) **HEATING ASSEMBLY, ATOMIZER AND ELECTRONIC CIGARETTE**

(57) A heating assembly for an atomizer includes a resistive heating element and an atomizing bracket. The resistive heating element is combined with the atomizing bracket. The resistive heating element includes a first connecting portion, a second connecting portion and a heating fence, wherein the first connecting portion and the second connecting portion are interconnected by the heating fence. The atomizing bracket includes an atomizing opening in communication with the heating fence. The present disclosure further provides an atomizer and an electronic cigarette.

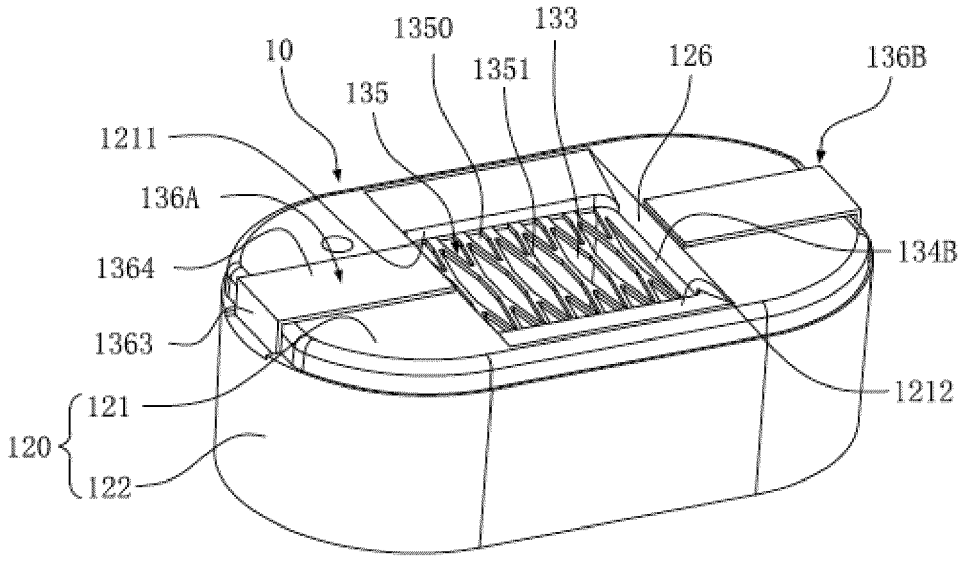

FIG. 12

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Description

CROSS REFERENCE TO RELATED APPLICATIONS

[0001] The present disclosure is based on and claims priority to U.S. Provisional Patent Application No. 63/304,624, filed on January 30, 2022, and further claims priority to Chinese Patent Application Nos. 202210296451.9 and 202220659265.2, both of which are filed on March 24, 2022, and claims priority to Chinese Patent Application Nos. 202221099745.4 and 202210499959.9, both of which are filed on May 09, 2022. The entire contents of the above-identified applications are incorporated herein by reference.

TECHNICAL FIELD

[0002] The present disclosure relates to the technical field of electronic atomization, and in particular, to a heating assembly, an atomizer, and an electronic cigarette with the atomizer.

BACKGROUND

[0003] Atomizer is the core part of electronic atomization products. The quality reliability of the atomizer determines the quality of the whole atomization product.

[0004] One of the existing atomizing structures is: the surface of ceramic porous material is printed and covered with heating slurry or the surface is embedded with metal resistive heating body. In both methods, porous ceramics are used as the oil conducting material to absorb smoke oil to the surface of the resistive heating body, which generates heat when the resistive heating body is energized, so as to atomize the smoke oil. The atomizing structures made by these methods have complex ceramic molding process, low yield and poor consistency of ceramics, so they have the disadvantages of high product cost, slightly poor oil conductivity of ceramics to easily produce burning smell, and slightly poor taste reduction.

[0005] Another existing atomizing structure is: the surface of a transverse cotton core is wrapped with a spiral resistive heating wire, the transverse cotton core absorbs the smoke oil to the surface of the resistive heating wire, and generates heat when the resistive heating wire is energized, so as to atomize the smoke oil. The transverse cotton core of the atomizing structure in this way is very easy to deform, resulting in difficult assembly, and the long oil guide distance is easy to produce burning smell.

[0006] A further existing atomizing structure is: the external surface of the resistive heating body of a vertical cotton core is wrapped with oil guide cotton, and the internal side of the resistive heating body is hollow. The oil guide cotton wrapped on the surface absorbs the smoke oil to the surface of the resistive heating body, and generates heat when the resistive heating body is energized, so as to atomize the smoke oil. The vertical cotton core of the atomizing structure in this way consists of many parts with complex assembly, resulting in high product cost.

[0007] From above, the existing atomizing structures fail to meet the requirements of the stability of product quality and automatic production.

SUMMARY

[0008] In view of the above, the object of the present disclosure is to provide a heating assembly and an atomizer with high quality stability and capable of automatic production and assembly, so as to at least partially solve the problems of poor consistency of product quality, difficult assembly and high cost.

[0009] An embodiment of the present disclosure provides a heating assembly for an atomizer. The heating assembly includes a resistive heating element and an atomizing bracket. The resistive heating element is combined with the atomizing bracket. The resistive heating element includes a first connecting portion, a second connecting portion and a heating fence, wherein the first connecting portion and the second connecting portion are interconnected by the heating fence. The atomizing bracket includes an atomizing opening in communication with the heating fence.

[0010] An embodiment of the present disclosure further provides an atomizer. The atomizer includes an atomizing bracket, a resistive heating element and an oil guiding member. The resistive heating element is combined with the atomizing bracket. The resistive heating element includes a first connecting portion, a second connecting portion and a heating fence, wherein the first connecting portion and the second connecting portion are interconnected by the heating fence. The atomizing bracket includes an atomizing opening in communication with the heating fence. The resistive heating element includes a first surface facing the oil guiding member and a second surface away from the oil guiding member. The oil guiding member includes a third surface facing the resistive heating element and a fourth surface away from the resistive heating element. The oil guiding member is disposed on the resistive heating element, and the third surface of the oil guiding member is in contact with the first surface of the resistive heating element.

[0011] An embodiment of the present disclosure further provides an electronic cigarette, wherein the electronic cigarette includes the above-mentioned atomizer.

[0012] In the heating assembly and atomizer provided by the embodiment of the present disclosure, the resistive heating element is combined with the atomizing bracket to form a heating assembly. Such a heating assembly can be assembled simply and can realize automatic assembly and production, to effectively improve the production efficiency and product stability, and effectively ensure the quality consistency of the atomizing structure. At the same time, the oil guiding member is in full and close contact with the resistive heating element of the heating assembly, thereby effectively improving

the atomization effect and avoiding the generation of burning smell to affect the taste of smoking during atomization.

BRIEF DESCRIPTION OF THE DRAWINGS

[0013]

FIG. 1 is a partially exploded view of an atomizer according to a first embodiment of the present disclosure.

FIG. 2 is a fully exploded view of the atomizer in FIG. 1.

FIG. 3 is a fully exploded view of the atomizer in FIG. 1 from a different viewing angle.

FIG. 4 is a top view of the atomizer in FIG. 1.

FIG. 5 is a cross-sectional view of the atomizer along line A-A in FIG. 4.

FIG. 6 is a cross-sectional view of the atomizer along line B-B in FIG. 4.

FIG. 7 is an exploded view of the heating assembly and the oil guiding member of the atomizer in FIG. 1.

FIG. 8 is a view showing the assembly of the heating assembly and the oil guiding member in FIG. 7.

FIG. 9 is another view of the heating assembly and the oil guiding member in FIG. 8.

FIG. 10 is a structural diagram when two ends of the resistive heating element have not been bent to form the conductive pins after the resistive heating element is embedded and combined with the atomizing bracket.

FIG. 11 is a cross-sectional view along line C-C after the assembly of the heating assembly and the oil guiding member in FIG. 8.

FIG. 12 is a structural diagram of a heating assembly for the atomizer according to another example of the present disclosure.

FIG. 13 is a structural diagram of another view angle of the heating assembly for the atomizer shown in FIG. 12.

FIG. 14 is a cross-sectional view of the heating assembly for the atomizer shown in FIG. 12 along a first direction.

FIG. 15 is a cross-sectional view of the heating assembly for the atomizer shown in FIG. 12 along a second direction.

FIG. 16 is a partially enlarged view of the heating assembly for the atomizer shown in FIG. 12.

FIG. 17 is a structural diagram of a resistive heating element of the heating assembly in an expanded state.

FIG. 18 is an exploded view of an atomizer according to a second embodiment of the present disclosure.

FIG. 19 is a top view of the atomizer in FIG. 18 after assembly.

FIG. 20 is a cross-sectional view of the atomizer along line D-D in FIG. 19.

FIG. 21 is a schematic diagram showing the airflow direction inside the atomizer in FIG. 20.

FIG. 22 is an assembly diagram of the resistive heating element, the atomizing bracket and the atomizing base of the atomizer in FIG. 18.

FIG. 23 is an exploded view of FIG. 22.

FIG. 24 is another view of FIG. 22 from a different viewing angle.

FIG. 25 is an exploded view of FIG. 24.

FIG. 26 is a schematic diagram of the resistive heating element of the atomizer in FIG. 18.

FIG. 27 is another view of FIG. 26 from a different viewing angle.

DETAILED DESCRIPTION OF PREFERRED EMBODIMENTS

[0014] The technical solutions in the embodiments of the present disclosure will be clearly and completely described below with reference to the accompanying drawings in the embodiments of the present disclosure. Obviously, the described embodiments are only part of the embodiments of the present disclosure, not all of the embodiments. Based on the embodiments of the present disclosure, all other embodiments obtained by ordinary technicians in the art without creative work belong to the protection scope of the present disclosure.

[0015] It should be noted that in this disclosure, relational terms such as "first" and "second" are only used to distinguish one entity or operation from another entity or operation, and do not necessarily require or imply any such actual relationship or order between these entities or operations.

First embodiment

[0016] Referring to FIGs. 1-6. a first embodiment of the present disclosure provides an atomizer 100, which includes an oil storage container 110, an atomizing bracket 120, a resistive heating element 130 and an oil guiding member 140, wherein the atomizing bracket 120, the resistive heating element 130 and the oil guiding member 140 are received in the oil storage container 110.

[0017] Referring to FIGs. 7-11, the resistive heating element 130 is combined with the atomizing bracket 120, and the oil guiding member 140 is disposed on the resistive heating element 130. The resistive heating element 130 has a sheet structure, and the resistive heating element 130 is made of a metal sheet. The resistive heating element 130 includes a first connecting portion 134A, a second connecting portion 134B, a heating fence 135, a first surface 131 facing the oil guiding member 140 and a second surface 132 away from the oil guiding member 140, wherein the first connecting portion 134A and the second connecting portion 134B are interconnected by the heating fence 135, the first surface 131 is the upper surface of the resistive heating element 130 and the second surface 132 is the lower surface of the resistive heating element 130. The atomizing bracket 120 includes an atomizing opening 126 in communication with the heating fence 135. The oil guiding member 140 includes a third surface 143 facing the resistive heating element 130 and a fourth surface 144 away from the resistive heating element 130, wherein the third surface 143 is the lower surface of the oil guiding member 140 and the fourth surface 144 is the upper surface of the oil guiding member 140. The third surface 143 of the oil guiding member 140 is in contact with the first surface 131 of the resistive heating element 130.

[0018] In this embodiment, the resistive heating element 130 is combined with the atomizing bracket 120, and then the oil guiding member 140 is directly in contact with the resistive heating element 130. In this way, the assembly is simple, and the automatic assembly and production can be realized, which can effectively improve the production efficiency and product stability, and effectively ensure the quality consistency of the atomizing structure. Further, the resistive heating element 130 is in full and close contact with the oil guiding member 140, which can effectively improve the atomization effect and avoid the influence of burning smell to affect the taste of smoking during atomization.

[0019] Referring to FIGs. 7-11, specifically, the first surface 131 and the second surface 132 of the resistive heating element 130 are flat surfaces, and the first surface 131 and the second surface 132 are parallel to each other. The oil guiding member 140 has a block structure, the third surface 143 and the fourth surface 144 of the oil guiding member 140 are flat surfaces, and the third surface 143 and the fourth surface 144 are parallel to each other. The oil guiding member 140 can cause the smoke oil to be evenly absorbed and transmitted to the resistive heating element 130, to improve the atomization effect. The oil guiding member 140 may be an oil guide cotton.

[0020] A plurality of through holes 133 are provided in the middle of the resistive heating element 130 to form the heating fence 135, so that the resistive heating element 130 forms the first connecting portion 134A, the second connecting portion 134B and the heating fence 135. The first connecting portion 134A, the second connecting portion 134B and the heating fence 135 are located in the same plane. The heating fence 135 is located in the middle of the resistive heating element 130, the first connecting portion 134A and the second connecting portion 134B are respectively located on two opposite sides of the heating fence 135 along a lengthwise direction of the resistive heating element 130, so that the heating fence 135 is located between the first connecting portion 134A and the second connecting portion 134B, and the first connecting portion 134A and the second connecting portion 134B are interconnected by the heating fence 135. The heating fence 135 forms a plurality of resistive heating wires 1351 between adjacent through holes 133, and thus the heating fence 135 is the heating part of the resistive heating element 130. The smoke generated by atomization can enter the airflow channel in the atomizer 100 through these through holes 133 and be taken away by the external air entering the atomizer 100 for the user to inhale.

[0021] The resistive heating element 130 further includes first and second conductive pins 136A, 136B connected with the first connecting portion 134A and the second connecting portion 134B respectively, wherein each conductive pin 136A/136B is electrically connected with a corresponding connecting portion 134A/134B. In this embodiment, each conductive pin 136A/136B is in the shape of an elongated plate, and each conductive pin 136A/136B is connected with a corresponding connecting portion 134A/134B through a bending portion 139. Each conductive pin 136A/136B and the corresponding connecting portion 134A/134B are separated from each other by the atomizing bracket 120. The two conductive pins 136A, 136B are each located at the lower surface of the atomizing bracket 120 and exposed outside the atomizing bracket 120. The two conductive pins 136A, 136B are each in contact with the lower surface of the atomizing bracket 120.

[0022] In this embodiment, the two conductive pins 136A, 136B extend respectively from two opposite ends of the resistive heating element 130 to the outside of the atomizing bracket 120, and are formed by bending downward and inward. Specifically, the two conductive pins 136A, 136B are formed by bending downward and inward from the two connecting portions 134A, 134B, respectively. Each conductive pin 136A/136B is exposed on the lower surface of the atomizing bracket 120, so that it is convenient to realize the electrical connection with the conductive electrode 175 (see FIG. 5) through the exposed conductive pin 136A/136B.

[0023] The resistive heating element 130 is made of metal, for example, the material of the resistive heating element 130 may be nickel chromium alloy, iron chromium aluminum, S316L stainless steel, or other alloy materials. The atomizing bracket 120 is made of a thermoplastic material with a high thermal decomposition temperature and that is able to tolerate rapid temperature changes. For example, the atomizing bracket 120 may be made of plastic, rubber or silicone. The resistive heating element 130 is combined with the atomizing bracket 120 through an insert molding process. Specifically, when forming the atomizing bracket 120, the resistive heating element 130 is placed in a cavity of a mold (not shown), and then molten plastic, rubber or silicone is injected into the cavity of the mold, so that the molten plastic, rubber or silicone is coated on the periphery of the resistive heating element 130, and after cooling, the atomizing bracket 120 is formed, so that the resistive heating element 130 is at least partially embedded in the atomizing bracket 120. The bottom surface and outer edges of the first connecting portion 134A and the second connecting portion 134B and the outer edge of the heating fence 135 are integrated with the atomizing bracket 120.

[0024] Referring to FIG. 10 and FIG. 11, after the resistive heating element 130 is embedded into the atomizing bracket 120 by insert molding process, two ends of the resistive heating element 130 extend horizontally out of the atomizing bracket 120 (see FIG. 10). Then, a tool (not shown) is used to bend two ends of the resistive heating element 130 downward and inward to form the two conductive pins 136A, 136B (see FIG. 11). The first conductive pin 136A and the second conductive pin 136B are respectively connected with the first connecting portion 134A and the second connecting portion 134B through the bending portions 139, and are located respectively under the first connecting portion 134A and the second connecting portion 134B. Further, the two conductive pins 136A, 136B are exposed to the outside of the atomizing bracket 120. Specifically, each conductive pin 136A/136B is in contact with the lower surface of the bottom plate 121 of the atomizing bracket 120.

[0025] In this embodiment, the resistive heating element 130 is combined with the atomizing bracket 120 to form a heating assembly 10.

[0026] Referring to FIGs. 7-11, the atomizing bracket 120 includes a bottom plate 121 and a side wall 122 extending upward from the periphery of the bottom plate 121. A receiving cavity 123 is formed in the atomizing bracket 120. The receiving cavity 123 is surrounded by the bottom plate 121 and the side wall 122 of the atomizing bracket 120, and the upper end of the receiving cavity 123 is formed with an opening 123A. The atomizing opening 126 is arranged in the middle of the bottom plate 121 and penetrates the upper and lower surfaces of the bottom plate 121. The atomizing opening 126 is in communication with the heating fence 135. The heating fence 135 is arranged at the position corresponding to the atomizing opening 126 so that the heating fence 135 is aligned with the atomizing opening 126. The atomizing opening 126 is in communication with the receiving cavity 123. The heating fence 135 is exposed and located above the atomizing opening 126, and the heating fence 135 spans the atomizing opening 126.

[0027] In this embodiment, the atomizing opening 126 has a size much smaller than the bottom plate 121, such that the heating fence 135 has a surface area exposed within the receiving cavity 123 larger than another surface area exposed within the atomizing opening 126, or the heating fence 135 has a surface area for contacting the oil guiding member 140 larger than another surface area facing towards the atomizing opening 126.

[0028] Referring to FIG. 9 and FIG. 11, the second surface 132 of the resistive heating element 130 is higher than the lower surface of the bottom plate 121 of the atomizing bracket 120, and a specific distance is formed between them, preferably 0.5mm-2.0mm.

[0029] The outline of the oil guiding member 140 matches the shape of the receiving cavity 123, and the oil guiding member 140 is placed in the receiving cavity 123 through the opening 123A at the upper end of the receiving cavity 123. The oil guiding member 140 is arranged in the receiving cavity 123 of the atomizing bracket 120 smoothly. The oil guiding member 140 is arranged independently of the atomizing bracket 120 and the resistive heating element 130. The oil guiding member 140 is removably received in the receiving cavity 123, that is, the oil guiding member 140 can be placed into or removed from the receiving cavity 123. The oil guiding member 140 has the ability to absorb smoke oil, but the atomizing bracket 120 does not have the ability to absorb smoke oil. The atomizing bracket 120 is used to combine the resistive heating element 130 and accommodate and support the oil guiding member 140. By limiting the oil guiding member 140 in the receiving cavity 123, the smoke oil absorbed into the receiving cavity 123 through the oil guiding member 140 can only be supplied downward to the resistive heating element 130 for atomization, which can effectively prevent the leakage of the smoke oil and the splashing during atomization.

[0030] Referring to FIG. 7 and FIG. 11, the bottom plate 121 of the atomizing bracket 120 includes a bearing surface 124 in contact with the third surface 143 of the oil guiding member 140. Specifically, the bearing surface 124 is the upper surface of the bottom plate 121. The first surface 131 of the resistive heating element 130 is located in the same plane with the upper surface of the bottom plate 121, that is, the upper surface of the heating fence 135 and the upper surface of each connecting portion 134A/134B are located in the same plane with the upper surface of the bottom plate 121. The first surface 131 of the resistive heating element 130 is exposed outside the bottom plate 121 of the atomizing bracket 120, that is, the upper surface of the heating fence 135 and the upper surface of each connecting portion 134A/134B are exposed outside the bottom plate 121 of the atomiz-

ing bracket 120. When the oil guiding member 140 is placed in the receiving cavity 123, the third surface 143 of the oil guiding member 140 is in contact with the first surface 131 of the resistive heating element 130 and the upper surface (i.e., the bearing surface 124) of the bottom plate 121, so that the oil guiding member 140 is arranged in the receiving cavity 123 smoothly. Specifically, the third surface 143 of the oil guiding member 140 is in contact with the upper surface of the heating fence 135 and the upper surface of each connecting portion 134A/134B of the resistive heating element 130 and the upper surface (i.e., the bearing surface 124) of the bottom plate 121.

[0031] Referring to FIG. 11, each conductive pin 136A, 136B is in contact with the lower surface of the bottom plate 121. Each connecting portion 134A/134B is located on the upper surface of the bottom plate 121, and each connecting portion 134A/134B is located above a corresponding conductive pin 136A/136B. Each connecting portion 134A/134B and the corresponding conductive pin 136A/136B are oppositely arranged on the upper and lower surfaces of the bottom plate 121. Each connecting portion 134A/134B and the corresponding conductive pin 136A/136B are separated from each other by the bottom plate 121 of the atomizing bracket 120, and each connecting portion 134A/134B and the corresponding conductive pin 136A/136B are connected through the bending portion 139. The connecting portions 134A, 134B, the heating fence 135, the conductive pins 136A, 136B and the bending portions 139 are an integral structure.

[0032] Referring to FIG. 8 and FIG. 11, the oil guiding member 140 is completely contained in the receiving cavity 123, and the fourth surface 144 of the oil guiding member 140 is lower than the upper surface of the side wall 122 of the atomizing bracket 120, so that a hollow cavity 123B is formed in the atomizing bracket 120 and the hollow cavity 123B is surrounded by the fourth surface 144 of the oil guiding member 140 and the side wall 122 of the atomizing bracket 120.

[0033] Referring to FIGs. 2, 3, 5 and 6, the atomizer 100 further includes an oil guiding bracket 150 received in the oil storage container 110. The oil guiding bracket 150 is arranged above the atomizing bracket 120. The lower end of the oil guiding bracket 150 is provided with an annular pressing wall 151, which extends into the hollow cavity 123B and abuts against the periphery of the fourth surface 144 of the oil guiding member 140. A downward pressure is applied to the oil guiding member 140 by the pressing wall 151, so that the oil guiding member 140 is sandwiched between the pressing wall 151 and the bottom plate 121 of the atomizing bracket 120 to prevent the oil guiding member 140 from loosening and displacement, and the oil guiding member 140 can better fit and contact with the resistive heating element 130, so as to improve the atomization effect.

[0034] The lower end of the oil guiding bracket 150 is further provided with two baffle plates 152, which are arranged oppositely to each other. The pressing wall 151 is located between the two baffle plates 152 with a gap 153 being formed between the pressing wall 151 and the two baffle plates 152, and the side wall 122 of the atomizing bracket 120 is inserted into the gap 153. By limiting the side wall 122 of the atomizing bracket 120 within the gap 153, the atomizing bracket 120 can be stably installed in the atomizer 100.

[0035] A sealing pad 181 is further provided in the gap 153, and the sealing pad 181 is sandwiched between the upper surface of the side wall 122 of the atomizing bracket 120 and the lower surface of the oil guiding bracket 150. The sealing pad 181 has a sheet structure, and the middle of the sealing pad 181 is provided with a through hole (not labelled) for the pressing wall 151 to pass through. The sealing pad 181 can prevent the smoke oil absorbed into the receiving cavity 123 from leaking from the upper surface of the side wall 122.

[0036] The upper end of the oil guiding bracket 150 is provided with two first liquid inlet holes 154 on both sides. The oil storage container 110 is provided with an oil storage chamber 111 for storing smoke oil. Each first liquid inlet hole 154 communicates the oil storage chamber 111 with the oil guiding member 140, so that the smoke oil in the oil storage chamber 111 can be transmitted to the oil guiding member 140 through the first liquid inlet holes 154.

[0037] The upper end of the oil guiding bracket 150 is provided with a first air outlet hole 155 in the middle. The first air outlet hole 155 is located between the two first liquid inlet holes 154. The oil storage container 110 is provided with a smoke outlet channel 112 which is isolated from the oil storage chamber 111. An air outlet channel 113 (see FIG. 6) is formed between the atomizing bracket 120 and the oil storage container 110. The first air outlet hole 155 communicates the air outlet channel 113 with the smoke outlet channel 112, so that the airflow in the atomizer 100 can flow to the smoke outlet channel 112 through the air outlet channel 113 and the first air outlet hole 155.

[0038] The atomizer 100 further includes a sealing cover 160 received in the oil storage container 110, and the sealing cover 160 is arranged above the oil guiding bracket 150. The sealing cover 160 is provided with a second air outlet hole 161 in the middle. The second air outlet hole 161 communicates the first air outlet hole 155 with the smoke outlet channel 112, so that the airflow in the atomizer 100 can flow to the smoke outlet channel 112 through the air outlet channel 113, the first air outlet hole 155 and the second air outlet hole 161 in sequence. The sealing cover 160 is provided with two second liquid inlet holes 162 on both sides corresponding to the two first liquid inlet holes 154. Each second liquid inlet hole 162 communicates the oil storage chamber 111 with a corresponding first liquid inlet hole 154, so that the smoke oil in the oil storage chamber 111 can be transmitted to the oil guiding member 140 through the second liquid inlet holes 162 and the first liquid inlet holes 154 in sequence.

[0039] The oil storage container 110 includes an outer

tube 114 and an inner tube 115 located in the outer tube 114. The lower end of the outer tube 114 is an open end, and the inner tube 115 is connected with the upper end of the outer tube 114. The oil storage chamber 111 is formed between the outer tube 114 and the inner tube 115. Specifically, the oil storage chamber 111 is an annular groove provided around the inner tube 115. The smoke outlet channel 112 is formed inside the inner tube 115, and the air outlet channel 113 is formed between the side wall 122 of the atomizing bracket 120 and the inner wall of the outer tube 114. In this embodiment, the inner tube 115 and the upper end of the outer tube 114 are integrated, that is, the inner tube 115 and the outer tube 114 are integrally formed.

[0040] The sealing cover 160 has a side wall 163, and the upper end of the oil guiding bracket 150 has a side wall 156. The side wall 163 of the sealing cover 160 is sandwiched between the side wall 156 at the upper end of the oil guiding bracket 150 and the inner wall of the outer tube 114. The lower end of the inner tube 115 is inserted into the second air outlet hole 161, so that the outer wall at the lower end of the inner tube 115 closely abuts against the sealing cover 160 to prevent the smoke oil in the oil storage chamber 111 from leaking.

[0041] The atomizer 100 further includes an atomizing base 170 arranged below the atomizing bracket 120 and installed at the open end of the outer tube 114. The atomizing base 170 includes a bottom plate 171 and a side wall 172 extending upward from the periphery of the bottom plate 171. The bottom plate 171 of the atomizing base 170 is provided with an air inlet hole 173. The external air enters the atomizer through the air inlet hole 173, then carries the smoke generated by atomization to flow sequentially through the air outlet channel 113, the first air outlet hole 155, the second air outlet hole 161 and the smoke outlet channel 112, and finally is discharged out for the user to inhale.

[0042] The atomizer 100 further includes a sealing ring 182 received in the oil storage container 110. The sealing ring 182 has an annular structure. The sealing ring 182 is sandwiched between the side wall 172 of the atomizing base 170 and the inner wall of the outer tube 114 to prevent the smoke oil from leaking out from the open end at the lower end of the outer tube 114.

[0043] The inner surface of the bottom plate 171 of the atomizing base 170 extends upward to provide with two positioning posts 174. The atomizer 100 further includes two conductive electrodes 175. The two conductive electrodes 175 are respectively inserted into the two positioning posts 174, the upper ends of the two conductive electrodes 175 are respectively in electrical contact with the two conductive pins 136A, 136B of the resistive heating element 130, and the lower ends of the two conductive electrodes 175 are exposed outside the oil storage container 110 to facilitate the electrical connection between the two conductive electrodes 175 and a power supply device (not shown).

[0044] The atomizer 100 further includes an oil absorbing member 183 received in the oil storage container 110. The oil absorbing member 183 has a block structure. The oil absorbing member 183 is arranged on the inner surface of the bottom plate 171 of the atomizing base 170 and is sleeved on the two positioning posts 174. The oil absorbing member 183 can absorb condensate or smoke oil generated during atomization to prevent the leakage of the condensate or smoke oil. The oil absorbing member 183 is an oil absorbing cotton or other material with oil absorbing function.

[0045] Referring to FIGs. 9-11, the middle of the bottom plate 121 of the atomizing bracket 120 is penetrated with the atomizing opening 126, the middle of the resistive heating element 130 is provided with a plurality of through holes 133 so as to form the heating fence 135, and the heating fence 135 is in communication with the atomizing opening 126. The smoke generated by atomization can enter the airflow channel in the atomizer 100 through the heating fence 135 and the atomizing opening 126, and is taken away by the external air entering the atomizer 100 for the user to inhale.

[0046] When the atomizer 100 works, the smoke oil stored in the oil storage chamber 111 of the oil storage container 110 is guided to the fourth surface 144 of the oil guiding member 140 through the second liquid inlet holes 162 of the sealing cover 160 and the first liquid inlet holes 154 of the oil guiding bracket 150, and then is absorbed by the oil guiding member 140 and transmitted to the third surface 143 which is in close contact with the resistive heating element 130, as shown by the liquid direction arrows in FIG. 5. The resistive heating element 130 generates heat when energized to atomize the smoke oil in contact with the first surface 131 of the resistive heating element 130 to form smoke, and the smoke formed by atomization enters the inner cavity of the atomizing base 170 through the heating fence 135 and the atomizing opening 126. The external air enters the inner cavity of the atomizing base 170 from the air inlet hole 173 of the atomizing base 170, then carries the smoke formed by atomization to flow sequentially through the air outlet channel 113, the first air outlet hole 155, the second air outlet hole 161 and the smoke outlet channel 112, and finally is discharged out for the user to inhale, as shown by the airflow direction arrows in FIG. 6.

[0047] In this embodiment, the resistive heating element is combined with the atomizing bracket made by plastic, rubber or silicone to become a heating assembly. Such a heating assembly can realize automatic forming and production through the mold, and after forming, there is no need to go through cumbersome post-processing treatment as required by ceramics, to effectively improve the production efficiency and the product stability, and effectively ensure the quality consistency of the atomizing structure.

[0048] In this embodiment, the inner cavity of the heating assembly is installed with an oil guiding member, and the oil guiding bracket is then installed. Under the downward pressure of the oil guiding bracket, the oil guiding

member is in close contact with the resistive heating element of the heating assembly, so as to form an atomizing structure with heating capacity and oil guiding channel, thereby effectively improving the atomization effect and avoiding the generation of burning smell to affect the taste of smoking during atomization.

[0049] Referring to FIGs. 12-17, another example of the heating assembly in the first embodiment is shown. The heating assembly 10 includes an atomizing bracket 120 and a resistive heating element 130 at least partially embedded in the atomizing bracket 120. The atomizing bracket 120 includes a bottom plate 121 and a side wall 122 extending upward from the periphery of the bottom plate 121. A receiving cavity 123 is formed between the bottom plate 121 and the side wall 122. An atomizing opening 126 is provided through the bottom plate 121. The heating fence 135 of the resistive heating element 130 spans the atomizing opening 126. The upper surface of the heating fence 135 and the upper surface of the bottom plate 121 are located in the same plane. The bottom plate 121 includes two inclined portions 1211, the two inclined portions 1211 are located at two opposite sides of the bottom plate 121 along a first direction (e.g., a width direction of the atomizing bracket 120), and the atomizing opening 126 is located between the two inclined portions 1211. The thickness of each inclined portion 1211 gradually decreases from the side wall 122 to the atomizing opening 126. In this embodiment, the resistive heating element 130 is, for example, a metal sheet made of nickel chromium alloy, iron chromium aluminum, S316L stainless steel, or other metals or metal alloy materials. The atomizing bracket 120 is made of a thermoplastic material with high thermal decomposition temperature and can withstand rapid temperature changes. For example, the atomizing bracket 120 is made of plastic, rubber, or silicone. The resistive heating element 130 can be combined with the atomizing bracket 120 through an insert injection molding process, such that the resistive heating element 130 is combined with the atomizing bracket 120.

[0050] In the heating assembly 10, the upper surface of the heating fence 135 of and the upper surface of the bottom plate 121 are located in the same plane. When the oil guiding member 140 is installed in the receiving cavity 123, the oil guiding member 140 can be in contact with the heating fence 135, effectively improving the atomization effect and avoiding the influence of burning smell to affect the taste of smoking during atomization. The thickness of the inclined portion 1211 gradually decreases from the side wall 122 to the atomizing opening 126. During injection molding of the inclined portion 1211, because the thickness of the inclined portion 1211 at the side close to the atomizing opening 126 is small, the injection molding material will not flow to the heating fence 135, so as not to pollute the heating fence 135. That is, the edge of the inclined portion 1211 located at the atomizing opening 126 will not form a rough edge of the injection molding material, which can effectively avoid secondary processing (for removing the rough edge) and is conducive to improving the production efficiency, reducing the production cost, and ensuring the high quality and stability of products.

[0051] Further, as shown in FIG. 14 and FIG. 17, the inclined portion 1211 forms an inclined surface 1212 at the bottom of the bottom plate 121. That is, the inclined portion 1211 has a flat surface at the top and an inclined surface 1212 at the bottom. The inclined surface 1212 is recessed from the lower surface of the bottom plate 121 and tilts upward from the side wall 122 to the atomizing opening 126, and the top flat surface of the inclined portion 1211 is a part of the upper surface of the bottom plate 121. The heating fence 135 includes two embedding parts 1352 which are arranged oppositely along the first direction (i.e., the width direction of the atomizing bracket 120). The two embedding parts 1352 are arranged corresponding to the two inclined portions 1211, respectively. The embedding part 1352 includes a plurality of embedding legs 1353 which are spaced apart from each other. The embedding legs 1353 are at least partially embedded in the atomizing bracket 120. A notch 1350 is formed between two adjacent embedding legs 1353, and the notch 1350 is at least partially located directly above the atomizing opening 126.

[0052] Further, as shown in FIG. 14, the embedding leg 1353 includes a suspending segment 1354, a fourth embedding segment 1355 and a fifth embedding segment 1356. The suspending segment 1354 is arranged corresponding to the atomizing opening 126, the lower surface of the fourth embedding segment 1355 is embedded in the inclined portion 1211, the upper surface of the fourth embedding segment 1355 is exposed in the receiving cavity 123, and the fifth embedding segment 1356 is embedded in the connection position between the inclined portion 1211 and the side wall 122.

[0053] Further, as shown in FIG. 14 and FIG. 17, a plurality of through holes 133 are provided in the middle of the heating fence 135, and a resistive heating wire 1351 is arranged between two adjacent through holes 133. The resistive heating wires 1351 are connected between the two embedding parts 1352, and the resistive heating wires 1351 are arranged corresponding to the atomizing opening 126. When the heating fence 135 is energized, both the resistive heating wires 1351 and the embedding parts 1352 generate heat, or only the resistive heating wires 1351 generate heat.

[0054] Optionally, the heating fence 135 includes a first section, two second sections and two third sections arranged along the first direction (i.e., the width direction of the atomizing bracket 120), wherein the first section is connected between the two second sections, and the two third sections are respectively connected with the two second sections. The first section corresponds to the atomizing opening 126, the lower surfaces of the two second sections are embedded in the inclined portions 1211, the upper surfaces of the two second sections are exposed in the receiving cavity 123, and the two third

sections are embedded in the connection position between the inclined portions 1211 and the side wall 122. In this case, the first section is provided with a plurality of through holes 133, between two adjacent through holes 133 is a resistive heating wire 1351, and the two ends of the first section near the two second sections are provided with a plurality of notches 1350. The notches 1350 are at least partially located above the atomizing opening 126.

[0055] Further, the minimum thickness of the inclined portion 1211 is 0.1 mm to 2 mm.

[0056] Further, as shown in FIG. 14, FIG. 15 and FIG. 17, the resistive heating element 130 further includes first and second connecting portions 134A, 134B which are arranged oppositely along a second direction (e.g., a length direction of the atomizing bracket 120), wherein the second direction is orthogonal to the first direction. The first and second connecting portions 134A, 134B can be energized to generate heat. The heating fence 135 is connected between the first and second connecting portions 134A, 134B. Each of the first and second connecting portions 134A, 134B includes an intermediate segment 1341 and two first embedding segments 1342 arranged along the first direction (i.e., the width direction of the atomizing bracket 120), and the intermediate segment 1341 is connected between the two first embedding segments 1342. The lower surface of the intermediate segment 1341 is embedded in the bottom plate 121, the upper surface of the intermediate segment 1341 is exposed in the receiving cavity 123, and the two first embedding segments 1342 are embedded in the connection position between the bottom plate 121 and the side wall 122.

[0057] Further, as shown in FIG. 14, FIG. 15 and FIG. 17, the resistive heating element 130 further includes first and second conductive pins 136A, 136B which are arranged oppositely along the second direction (i.e., the length direction of the atomizing bracket 120). The first and second conductive pins 136A, 136B are connected with the first and second connecting portions 134A, 134B, respectively, wherein the first connecting portion 134A is connected between the heating fence 135 and the first conductive pin 136A, and the second connecting portion 134B is connected between the heating fence 135 and the second conductive pin 136B. Each of the first and second conductive pins 136A, 136B includes a second embedding segment 1361, a third embedding segment 1362, a bending segment 1363 and an electrode segment 1364. The second embedding segment 1361 is connected to the intermediate segment 1341 of the first connecting portion 134A or the second connecting portion 134B. The third embedding segment 1362 is connected between the second embedding segment 1361 and the bending segment 1363. The bending segment 1363 is connected between the third embedding segment 1362 and the electrode segment 1364. The lower surface of the second embedding segment 1361 is embedded in the bottom plate 121, and the upper surface of the second embedding segment 1361 is exposed in the receiving cavity 123. The third embedding segment 1362 is embedded in the connection position between the bottom plate 121 and the side wall 122. The bending segment 1363 and the electrode segment 1364 are arranged outside the atomizing bracket 120, wherein the bending segment 1363 is arranged at the peripheral surface of the bottom plate 121, and the electrode segment 1364 is arranged at the lower surface of the bottom plate 121.

[0058] Further, the upper surfaces of the heating fence 135, the first and second connecting portions 134A, 134B, the first and second conductive pins 136A, 136B and the bottom plate 121 are located in the same plane. The first and second conductive pins 136A, 136B are bent downward and inward to form the two electrode segments 1364 which are in contact with the lower surface of the bottom plate 121.

[0059] In this embodiment, the resistive heating element 130 is combined with the atomizing bracket 120, and the oil guiding member 140 is received in the atomizing bracket 120 and is in direct contact with the resistive heating element 130, which is simple to assemble and can realize automatic assembly and production, to effectively improve the production efficiency and product stability, and effectively ensure the quality consistency of the atomizer. Moreover, the resistive heating element 130 is in direct and full contact with the oil guiding member 140, effectively improving the atomization effect, and avoiding the burning smell during atomization to affect the taste of smoking.

Second embodiment

[0060] Referring to FIGs. 18-21, a second embodiment of the present disclosure provides an atomizer 100, which includes an oil storage container 110, an atomizing bracket 120, a resistive heating element 130 and an oil guiding member 140, wherein the atomizing bracket 120, the resistive heating element 130 and the oil guiding member 140 are received in the oil storage container 110.

[0061] Referring to FIGs. 20-25, the resistive heating element 130 is combined with the atomizing bracket 120, and the oil guiding member 140 is disposed on the resistive heating element 130. The resistive heating element 130 has a sheet structure, and the resistive heating element 130 is made of a metal sheet. The resistive heating element 130 includes a first connecting portion 134A, a second connecting portion 134B, a heating fence 135, a first surface 131 facing the oil guiding member 140 and a second surface 132 away from the oil guiding member 140, wherein the first connecting portion 134A and the second connecting portion 134B are interconnected by the heating fence 135, the first surface 131 is the upper surface of the resistive heating element 130 and the second surface 132 is the lower surface of the resistive heating element 130. The atomizing bracket 120 includes an atomizing opening 126 in communication with the heating fence 135. The oil guiding member 140 includes a third

surface 143 facing the resistive heating element 130 and a fourth surface 144 away from the resistive heating element 130, wherein the third surface 143 is the lower surface of the oil guiding member 140 and the fourth surface 144 is the upper surface of the oil guiding member 140. The third surface 143 of the oil guiding member 140 is in contact with the first surface 131 of the resistive heating element 130.

[0062] In this embodiment, the resistive heating element 130 is combined with the atomizing bracket 120, and then the oil guiding member 140 is directly in contact with the resistive heating element 130. In this way, the assembly is simple, and the automatic assembly and production can be realized, which can effectively improve the production efficiency and product stability, and effectively ensure the quality consistency of the atomizing structure. Further, the resistive heating element 130 is in full and close contact with the oil guiding member 140, which can effectively improve the atomization effect and avoid the influence of burning smell to affect the taste of smoking during atomization.

[0063] Referring to FIG. 26 and FIG. 27, specifically, the first surface 131 and the second surface 132 of the resistive heating element 130 are flat surfaces, and the first surface 131 and the second surface 132 are parallel to each other.

[0064] Referring to FIG. 18 and FIG. 20, the oil guiding member 140 has a block structure, the third surface 143 and the fourth surface 144 are flat surfaces, and the third surface 143 and the fourth surface 144 are parallel to each other. The oil guiding member 140 can cause the smoke oil to be evenly absorbed and transmitted to the resistive heating element 130, so as to improve the atomization effect. The oil guiding member 140 may be an oil guide cotton.

[0065] Referring to FIGs. 20-21 and FIGs. 26-27, a plurality of through holes 133 are provided in the middle of the resistive heating element 130 to form the heating fence 135, so that the resistive heating element 130 forms the first connecting portion 134A, the second connecting portion 134B and the heating fence 135. The first connecting portion 134A, the second connecting portion 134B and the heating fence 135 are located in the same plane. The heating fence 135 is located in the middle of the resistive heating element 130, the first connecting portion 134A and the second connecting portion 134B are located on two opposite sides of the heating fence 135 along a lengthwise direction of the resistive heating element 130, so that the heating fence 135 is located between the first connecting portion 134A and the second connecting portion 134B, and the first connecting portion 134A and the second connecting portion 134B are interconnected by the heating fence 135. The heating fence 135 forms a plurality of resistive heating wires 1351 between adjacent through holes 133, and thus the heating fence 135 is the heating part of the resistive heating element 130. The smoke generated by atomization can enter the airflow channel in the atomizer 100 through these through holes 133 and be taken away by the external air entering the atomizer 100 for the user to inhale.

[0066] Referring to FIGs. 20-27, the atomizing bracket 120 includes a top plate 128 and a side wall 122 extending downward from the periphery of the top plate 128. The resistive heating element 130 further includes two conductive pins 136 electrically connected with the first connecting portion 134A and the second connecting portion 134B respectively. In this embodiment, each conductive pin 136 is in the shape of an elongated wire, each conductive pin 136 includes a horizontal part 1365 and a vertical part 1366, one end of the horizontal part 1365 is connected with a corresponding connecting portion 134A/134B, the vertical part 1366 is formed by bending and extending downward from the other end of the horizontal part 1365, and the vertical part 1366 extends downward to pass through the top plate 128. The upper surface of the atomizing bracket 120 is provided with an embedding slot 127, and the horizontal part 1365 is arranged in the embedding slot 127, so that the resistive heating element 130 is at least partially embedded in the top plate 128 of the atomizing bracket 120, so as to realize the combination of the resistive heating element 130 and the atomizing bracket 120. The vertical part 1366 being bent and extended downward facilitates the electrical connection with a power supply device (not shown). In this embodiment, the vertical part 1366 and the horizontal portion 1365 are perpendicular to each other and therefore form an included angle of 90 degrees.

[0067] The resistive heating element 130 is made of metal. For example, the material of the resistive heating element 130 may be nickel chromium alloy, iron chromium aluminum, S316L stainless steel and other alloy materials. The atomizing bracket 120 is made of a thermoplastic material with a high thermal decomposition temperature and that is able to tolerate rapid temperature changes. For example, the atomizing bracket 120 may be made of plastic, rubber or silicone. As another combining method, the resistive heating element 130 may also be combined with the atomizing bracket 120 by an insert molding process, so that the first connecting portion 134A, the second connecting portion 134B and the heating fence 135 are embedded in the atomizing bracket 120. Specifically, when forming the atomizing bracket 120, the resistive heating element 130 is placed in a cavity of a mold (not shown), and then molten plastic, rubber or silicone is injected into the cavity of the mold, so that the molten plastic, rubber or silicone is coated on the periphery of the resistive heating element 130, and after cooling, the atomizing bracket 120 is formed, so that the resistive heating element 130 is at least partially embedded in the atomizer bracket 120.

[0068] In this embodiment, the resistive heating element 130 is combined with the atomizing bracket 120 to form a heating assembly.

[0069] Referring to FIGs. 20-25, the atomizing bracket 120 includes a top plate 128 and a side wall 122 extending downward from the periphery of the top plate 128. The

resistive heating element 130 is embedded in the top plate 128 of the atomizing bracket 120. The first surface 131 of the resistive heating element 130 is located in the same plane with the upper surface of the top plate 128 of the atomizing bracket 120, and the third surface 143 of the oil guiding member 140 is also in contact with the upper surface of the top plate 128 of the atomizing bracket 120. The oil guiding member 140 is arranged independently of the atomizing bracket 120 and the resistive heating element 130. The oil guiding member 140 has the ability to absorb smoke oil, but the atomizing bracket 120 does not have the ability to absorb smoke oil. The atomizing bracket 120 is used to combine the resistive heating element 130 and support the oil guiding member 140.

[0070] The atomizing opening 126 is arranged on one side of the top plate 128 and penetrates the upper and lower surfaces of the top plate 128. The atomizing opening 126 is in communication with the heating fence 135. The heating fence 135 is arranged at the position corresponding to the atomizing opening 126 so that the heating fence 135 is aligned with the atomizing opening 126. The heating fence 135 is exposed and located above the atomizing opening 126, and the heating fence 135 spans the atomizing opening 126.

[0071] Referring to FIG. 20 and FIG. 21, the second surface 132 of the resistive heating element 130 is higher than the lower surface of the top plate 128 of the atomizing bracket 120, and a specific distance is formed between them, preferably 0.5mm-2.0mm.

[0072] Referring to FIGs. 20-25, the top plate 128 of the atomizing bracket 120 includes a bearing surface 124 in contact with the third surface 143 of the oil guiding member 140. Specifically, the bearing surface 124 is the upper surface of the top plate 128. The first surface 131 of the resistive heating element 130 is located in the same plane with the upper surface of the top plate 128. The third surface 143 of the oil guiding member 140 is in contact with the first surface 131 of the resistive heating element 130 and the upper surface (i.e., the bearing surface 124) of the top plate 128, so that the oil guiding member 140 is smoothly arranged on the upper surface of the top plate 128.

[0073] In other embodiments, the first surface 131 of the resistive heating element 130 may also be slightly higher than the upper surface of the top plate 128, so that the first surface 131 of the resistive heating element 130 can be slightly embedded into the oil guiding member 140 under the gravity of the oil storage member 116, so as to improve the contact area and liquid conduction effect between the resistive heating element 130 and the oil guiding member 140.

[0074] Referring to FIG. 18 and FIGs. 20-21, the oil storage container 110 is provided with an oil storage chamber 111, and an oil storage member 116 for storing smoke oil is provided in the oil storage chamber 111. The oil storage member 116 is a hollow cylinder. The shape of the oil storage member 116 matches the oil storage chamber 111, so that the oil storage member 116 can be fittingly received in the oil storage chamber 111, and the oil storage chamber 111 is fully occupied by oil storage member 116. The lower surface of the oil storage member 116 is in contact with the fourth surface 144 of the oil guiding member 140. Due to the gravity applied to the oil guiding member 140 by the oil storage member 116, the oil guiding member 140 is sandwiched between the oil storage member 116 and the top plate 128 of the atomizing bracket 120, so that the oil guiding member 140 is in close contact with the resistive heating element 130, so as to improve the atomization effect. The oil storage member 116 may be oil storage cotton or other material with oil storage function.

[0075] The top plate 128 of the atomizing bracket 120 is provided with a first air outlet hole 155 in the middle. The oil guiding member 140 is provided with a second air outlet hole 161 in the middle corresponding to the first air outlet hole 155. The oil storage container 110 is provided with a smoke outlet channel 112 which is isolated from the oil storage chamber 111. The second air outlet hole 161 communicates the first air outlet hole 155 with the smoke outlet channel 112, so that the airflow in the atomizer 100 can flow to the smoke outlet channel 112 through the first air outlet hole 155 and the second air outlet hole 161 in sequence.

[0076] The oil storage container 110 includes an outer tube 114 and an inner tube 115 located in the outer tube 114. The lower end of the outer tube 114 is an open end, and the inner tube 115 is connected with the upper end of the outer tube 114. The oil storage chamber 111 is formed between the outer tube 114 and the inner tube 115. Specifically, the oil storage chamber 111 is an annular groove provided around the inner tube 115. The smoke outlet channel 112 is formed inside the inner tube 115. In this embodiment, the inner tube 115 and the upper end of the outer tube 114 are integrated, that is, the inner tube 115 and the outer tube 114 are integrally formed. The oil storage member 116 is a hollow cylinder, the middle of the oil storage member 116 is penetrated with a through hole 117, and the oil storage member 116 is sleeved on the inner tube 115 through the through hole 117.

[0077] The atomizer 100 further includes an atomizing base 170 arranged below the atomizing bracket 120 and installed at the open end of the outer tube 114. The atomizing base 170 includes a bottom plate 171 and a side wall 172 extending upward from the periphery of the bottom plate 171. The side wall 122 of the atomizing bracket 120 is sandwiched between the side wall 172 of the atomizing base 170 and the inner wall of the outer tube 114. The lower end of the inner tube 115 is inserted into the second air outlet hole 161 and abuts against the upper surface of the top plate 128 of the atomizing bracket 120. Preferably, in this embodiment, the atomizing bracket 120 is made of rubber or silicone, such that the atomizing bracket 120 is soft and has a sealing function. Therefore, through the atomizing bracket 120, the smoke oil in the

oil storage chamber 111 can be prevented from leaking from the open end at the lower end of the outer tube 114, and there is no need to set the sealing cover 160 as described in the above first embodiment, so that the structure is simpler.

[0078] Referring to FIG. 18 and FIGs. 20-23, the inner surface of the bottom plate 171 of the atomizing base 170 extends upward to provide with two positioning posts 174. The vertical parts 1366 of the two conductive pins 136 respectively pass through the two positioning posts 174 and are exposed outside the oil storage container 110 to facilitate the electrical connection between the exposed conductive pins 136 and the power supply device (not shown).

[0079] In the atomizing base 170, an accommodating cavity 129 is provided. The accommodating cavity 129 is formed between the bottom plate 171 of the atomizing base 170 and the top plate 128 of the atomizing bracket 120. An oil absorbing member 183 is arranged in the accommodating cavity 129. Specifically, the oil absorbing member 183 is U-shaped, and the oil absorbing member 183 is provided with a cutout 184 corresponding to the position of the first air outlet hole 155. Therefore, the oil absorbing member 183 only occupies a portion of the inner cavity of the atomizing base 170. The oil absorbing member 183 can absorb condensate or smoke oil generated during atomization to prevent the leakage of the condensate or smoke oil. The oil absorbing member 183 is an oil absorbing cotton or other material having an oil absorbing function.

[0080] Referring to FIGs. 20-21 and FIGs. 23-25, the bottom plate 171 of the atomizing base 170 is provided with an air inlet hole 173. The external air enters the accommodating cavity 129 through the air inlet hole 173, then carries the smoke generated by atomization to flow sequentially through the first air outlet hole 155, the second air outlet hole 161 and the smoke outlet channel 112, and finally is discharged for the user to inhale.

[0081] Referring to FIGs. 20-21 and FIG. 23, the inner surface of the bottom plate 171 of the atomizing base 170 extends obliquely towards the side wall 172 of the atomizing base 170 to form a guiding tab 176. The guiding tab 176 is located directly under the atomizing opening 126, and the air inlet hole 173 is formed between the guiding tab 176 and the side wall 172 of the atomizing base 170. The condensate or smoke oil generated during atomization can be guided by the guiding tab 176 to the accommodating cavity 129 for collection and absorbed by the oil absorbing member 183 located in the accommodating cavity 129, so as to prevent the leakage of the condensate or smoke oil through the air inlet hole 173.

[0082] Referring to FIG. 18 and FIGs. 20-21, one side of the top plate 128 of the atomizing bracket 120 is penetrated with the atomizing opening 126, the middle of the resistive heating element 130 is provided with a plurality of through holes 133 so as to form the heating fence 135, and the heating fence 135 is in communication with the atomizing opening 126. The smoke generated by atomization can enter the airflow channel in the atomizer 100 through the heating fence 135 and the atomizing opening 126, and is taken away by the external air entering the atomizer 100 for the user to inhale.

[0083] When the atomizer 100 works, the smoke oil stored by the oil storage member 116 in the oil storage container 110 is guided to the oil guiding member 140. After being absorbed by the oil guiding member 140, the smoke oil is then transmitted to the third surface 143 which is in close contact with the resistive heating element 130. The resistive heating element 130 generates heat when energized to atomize the smoke oil in contact with the first surface 131 of the resistive heating element 130 to form smoke, and the smoke formed by atomization enters the accommodating cavity 129 of the atomizing base 170 through the heating fence 135 and the atomizing opening 126. The external air enters the atomizer from the air inlet hole 173 of the atomizing base 170, then carries the smoke formed by atomization to flow sequentially through the first air outlet hole 155, the second air outlet hole 161 and the smoke outlet channel 112, and finally is discharged out for the user to inhale, as shown by the airflow direction arrows in FIG. 21.

[0084] In this embodiment, the resistive heating element is combined with the upper surface of the atomizing bracket to form a heating assembly. Such a heating assembly is simple to assemble and can realize automatic assembly and production. The assembly process does not need to go through the complicated assembly process of wrapping oil guide cotton on external surface of resistive heating body as required by vertical cotton core, to effectively improve the production efficiency and product stability, and effectively ensure the quality consistency of the atomizing structure.

[0085] In this embodiment, the oil guiding member is sandwiched between the oil storage member and the heating assembly in the oil storage container. Under the gravity of the oil storage member, the oil guiding member is in close contact with the resistive heating element of the heating assembly, so as to form an atomizing structure with heating capacity and oil guiding channel, thereby effectively improving the atomization effect and avoiding the generation of burning smell to affect the taste of smoking during atomization.

[0086] The present disclosure further provides an electronic cigarette, including the above atomizer.

[0087] The electronic cigarette further includes a power supply device (not shown), and the power supply device is electrically connected with the atomizer. The power supply device contains a battery, and the power supply device provides the power required for the working of the atomizer.

[0088] The above are only the preferred embodiments of the present disclosure and are not intended to limit the present disclosure. Any modifications, equivalent replacements, improvements, etc. made within the spirit and principle of the present disclosure shall be included in the protection scope of the present disclosure.

Claims

1. A heating assembly for an atomizer, comprising a resistive heating element and an atomizing bracket, wherein the resistive heating element is combined with the atomizing bracket, the resistive heating element comprises a first connecting portion, a second connecting portion and a heating fence, wherein the first connecting portion and the second connecting portion are interconnected by the heating fence, the atomizing bracket comprises an atomizing opening in communication with the heating fence.

2. The heating assembly according to claim **1,** wherein the atomizing bracket comprises a bottom plate and a side wall extending upward from a periphery of the bottom plate, a receiving cavity is formed in the atomizing bracket, the bottom plate of the atomizing bracket is penetrated with the atomizing opening, the heating fence of the resistive heating element spans the atomizing opening.

3. The heating assembly according to claim **2,** wherein two ends of the resistive heating element extend out of the atomizing bracket and are respectively bent downward and inward to form two conductive pins, the two conductive pins are respectively connected with the first connecting portion and the second connecting portion and are respectively located under the first connecting portion and the second connecting portion, and the two conductive pins are exposed out of a lower surface of the bottom plate.

4. The heating assembly according to claim **2,** wherein the resistive heating element comprises a first surface and a second surface, the first surface is an upper surface of the resistive heating element, the second surface is a lower surface of the resistive heating element, the first surface and the second surface are flat surfaces, the first surface is located in the same plane with an upper surface of the bottom plate, the first surface of the resistive heating element and the upper surface of the bottom plate are used for contacting with an oil guiding member.

5. The heating assembly according to claim **2,** wherein the heating fence has a surface area exposed within the receiving cavity larger than another surface area exposed within the atomizing opening, or the heating fence has a surface area for contacting an oil guiding member larger than another surface area facing towards the atomizing opening.

6. The heating assembly according to claim **2,** wherein the bottom plate comprises two inclined portions, the atomizing opening is located between the two inclined portions, and a thickness of each inclined portion gradually decreases from the side wall to the atomizing opening.

7. The heating assembly according to claim **6,** wherein the inclined portion forms an inclined surface at the bottom of the bottom plate, the inclined surface is recessed from a lower surface of the bottom plate and tilts upward from the side wall to the atomizing opening; the heating fence comprises two embedding parts arranged oppositely, the two embedding parts are arranged corresponding to and connected to the two inclined portions, respectively.

8. The heating assembly according to claim **7,** wherein the embedding part comprises a first section, a third section and a second section interconnecting the first section and the third section, the first section has a lower surface exposed in the atomizing opening and a top surface exposed in the receiving cavity, the second section has a lower surface embedded within the inclined portion and a top surface exposed in the receiving cavity, and the third section has a lower surface embedded within the inclined portion and a top surface embedded between the inclined portion and the side wall.

9. The heating assembly according to claim **6,** wherein the two inclined portions are located at two opposite sides of the bottom plate along a first direction, the resistive heating element further comprises first and second connecting portions arranged oppositely along a second direction which is orthogonal to the first direction, and the resistive heating element further comprises first and second conductive pins arranged oppositely along the second direction and connected with the first and second connecting portions, respectively, wherein the first connecting portion is connected between the heating fence and the first conductive pin, and the second connecting portion is connected between the heating fence and the second conductive pin; wherein upper surfaces of the heating fence, the first and second connecting portions, the first and second conductive pins and the bottom plate are located in the same plane, and the first and second conductive pins are bent downward and inward to form two electrode segments which are in contact with a lower surface of the bottom plate.

10. The heating assembly according to claim **2,** wherein the heating fence comprises a plurality of embedding legs spaced apart from each other, the embedding legs are at least partially embedded in the atomizing bracket, a notch is formed between two adjacent embedding legs, and the notch is at least partially located directly above the atomizing opening.

11. The heating assembly according to claim **10,** wherein the embedding leg comprises a suspending seg-

ment, a fourth embedding segment and a fifth embedding segment, the suspending segment is arranged corresponding to the atomizing opening, the fourth embedding segment is connected between the suspending segment and the fifth embedding segment, a lower surface of the fourth embedding segment is embedded in the bottom plate, an upper surface of the fourth embedding segment is exposed in the receiving cavity, the fifth embedding segment is embedded in a connection position between the bottom plate and the side wall.

12. The heating assembly according to claim **10,** wherein a plurality of through holes is provided in a middle of the heating fence, a resistive heating wire is arranged between two adjacent through holes, the resistive heating wires are connected to the embedding legs respectively, and the resistive heating wires are arranged corresponding to the atomizing opening.

13. The heating assembly according to claim **2,** wherein the resistive heating element further comprises first and second connecting portions arranged oppositely, the heating fence is connected between the first and second connecting portions, each of the first and second connecting portions comprises an intermediate segment and two first embedding segments, the intermediate segment is connected between the two first embedding segments; a lower surface of the intermediate segment is embedded in the bottom plate, an upper surface of the intermediate segment is exposed in the receiving cavity, and the two first embedding segments are embedded in a connection position between the bottom plate and the side wall.

14. The heating assembly according to claim **13,** wherein the resistive heating element further comprises first and second conductive pins arranged oppositely, the first and second conductive pins are respectively connected with the first and second connecting portions, each of the first and second conductive pins comprises a second embedding segment, a third embedding segment, a bending segment and an electrode segment, the second embedding segment is connected to the intermediate segment of the first connecting portion or the second connecting portion, the third embedding segment is connected between the second embedding segment and the bending segment, the bending segment is connected between the third embedding segment and the electrode segment; a lower surface of the second embedding segment is embedded in the bottom plate, an upper surface of the second embedding segment is exposed in the receiving cavity, the third embedding segment is embedded in a connection position between the bottom plate and the side wall; the bending segment and the electrode segment are arranged outside the atomizing bracket, wherein the bending segment is arranged at a peripheral surface of the bottom plate, and the electrode segment is arranged at a lower surface of the bottom plate.

15. The heating assembly according to claim **1,** wherein the resistive heating element is made of metal, the atomizing bracket is made of a thermoplastic material, the resistive heating element is combined with the atomizing bracket through an insert molding process, the resistive heating element is at least partially embedded in the atomizing bracket, the heating fence is exposed and located above the atomizing opening, wherein the first connecting portion, the second connecting portion and the heating fence are located in the same plane.

16. An atomizer comprising an atomizing bracket, a resistive heating element and an oil guiding member, wherein the resistive heating element is combined with the atomizing bracket, the resistive heating element comprises a first connecting portion, a second connecting portion and a heating fence, the first connecting portion and the second connecting portion are interconnected by the heating fence, the atomizing bracket comprises an atomizing opening in communication with the heating fence, the resistive heating element comprises a first surface facing the oil guiding member and a second surface away from the oil guiding member, the oil guiding member comprises a third surface facing the resistive heating element and a fourth surface away from the resistive heating element, the oil guiding member is disposed on the resistive heating element, the third surface of the oil guiding member is in contact with the first surface of the resistive heating element.

17. The atomizer according to claim **16,** wherein the oil guiding member is an oil guide cotton, and the third surface of the oil guiding member and the first surface of the resistive heating element are flat surfaces.

18. The atomizer according to claim **16,** wherein the resistive heating element further comprises two conductive pins connected with the first connecting portion and the second connecting portion respectively, wherein each conductive pin is electrically connected with a corresponding connecting portion, and each conductive pin is connected with the corresponding connecting portion through a bending portion; each conductive pin and the corresponding connecting portion are separated from each other by the atomizing bracket, the two conductive pins are each located at a lower surface of the atomizing bracket and exposed outside the atomizing bracket, and the two conductive pins are each in contact with the lower surface of the atomizing bracket.

19. The atomizer according to claim **16,** wherein the atomizing bracket comprises a bottom plate and a side wall extending upward from a periphery of the bottom plate, a receiving cavity is formed in the atomizing bracket, the oil guiding member is arranged in the receiving cavity, and the bottom plate of the atomizing bracket is penetrated with the atomizing opening, the oil guiding member is completely contained in the receiving cavity, and the fourth surface of the oil guiding member is lower than an upper surface of the side wall of the atomizing bracket, a hollow cavity is formed in the atomizing bracket and the hollow cavity is surrounded by the fourth surface of the oil guiding member and the side wall of the atomizing bracket in the atomizing bracket.

20. The atomizer according to claim **19,** wherein the atomizer further includes an oil guiding bracket, the oil guiding bracket is arranged above the atomizing bracket, a lower end of the oil guiding bracket is provided with an annular pressing wall, and the pressing wall extends into the hollow cavity and abuts against a periphery of the fourth surface of the oil guiding member.

21. The atomizer according to claim **20,** wherein the lower end of the oil guiding bracket is further provided with two baffle plates arranged oppositely to each other, the pressing wall is located between the two baffle plates, a gap is formed between the pressing wall and the two baffle plates, and the side wall of the atomizing bracket is inserted into the gap.

22. The atomizer according to claim **20,** wherein an upper end of the oil guiding bracket is provided with two first liquid inlet holes on both sides, the atomizer further comprises an oil storage container, the oil storage container is provided with an oil storage chamber for storing smoke oil, and each first liquid inlet hole communicates the oil storage chamber with the oil guiding member.

23. The atomizer according to claim **22,** wherein the upper end of the oil guiding bracket is provided with a first air outlet hole in the middle, and the oil storage container is provided with a smoke outlet channel isolated from the oil storage chamber, an air outlet channel is formed between the atomizing bracket and the oil storage container, and the first air outlet hole communicates the air outlet channel with the smoke outlet channel.

24. The atomizer according to claim **23,** wherein the atomizer further comprises a sealing cover, the sealing cover is arranged above the oil guiding bracket, the sealing cover is provided with a second air outlet hole in the middle, the second air outlet hole communicates the first air outlet hole with the smoke outlet channel, the sealing cover is provided with two second liquid inlet holes on both sides corresponding to the two first liquid inlet holes, and each second liquid inlet hole communicates the oil storage chamber with a corresponding first liquid inlet hole.

25. The atomizer according to claim **24,** wherein the oil storage container comprises an outer tube and an inner tube located in the outer tube, a lower end of the outer tube is an open end, and the inner tube is connected with an upper end of the outer tube, the oil storage chamber is formed between the outer tube and the inner tube, the smoke outlet channel is formed inside the inner tube, and the air outlet channel is formed between the side wall of the atomizing bracket and an inner wall of the outer tube.

26. The atomizer according to claim **25,** wherein the sealing cover has a side wall, the upper end of the oil guiding bracket has a side wall, the side wall of the sealing cover is sandwiched between the side wall of the oil guiding bracket and the inner wall of the outer tube, a lower end of the inner tube is inserted into the second air outlet hole, the outer wall at the lower end of the inner tube is closely abuts against the sealing cover.

27. The atomizer according to claim **25,** wherein the atomizer further comprises an atomizing base, the atomizing base is arranged below the atomizing bracket, the atomizing base is installed at the open end of the outer tube, the atomizing base comprises a bottom plate and a side wall extending upward from a periphery of the bottom plate, the bottom plate of the atomizing base is provided with an air inlet hole, wherein the external air enters the atomizer from the air inlet hole, carries the smoke generated by atomization, and is discharged out through the air outlet channel, the first air outlet hole, the second air outlet hole and the smoke outlet channel.

28. The atomizer according to claim **27,** wherein an inner surface of the bottom plate of the atomizing base extends upward to provide with two positioning posts, the atomizer further comprises two conductive electrodes, two conductive pins are respectively bent from the first connecting portion and the second connecting portion to be exposed from a lower surface of the bottom plate, the two conductive electrodes are respectively inserted into the two positioning posts and upper ends of the two conductive electrodes are respectively in electrical contact with two conductive pins of the resistive heating element, the atomizer further comprises an oil absorbing member arranged on the inner surface of the bottom plate of the atomizing base and sleeved on the two positioning posts.

29. The atomizer according to claim **16,** wherein the resistive heating element is at least partially embedded in the atomizing bracket, the atomizing bracket comprises a bottom plate and a side wall extending upward from the periphery of the bottom plate, a receiving cavity is formed between the bottom plate and the side wall, the atomizing opening is provided through the bottom plate, the heating fence of the resistive heating element spans the atomizing opening, an upper surface of the heating fence and an upper surface of the bottom plate are located in the same plane; the bottom plate comprises two inclined portions, the atomizing opening is located between the two inclined portions, and a thickness of each inclined portion gradually decreases from the side wall to the atomizing opening, the heating fence comprises two embedding parts arranged oppositely, the two embedding parts are arranged corresponding to the two inclined portions, respectively; the embedding part comprises a plurality of embedding legs spaced apart from each other, the embedding legs are at least partially embedded in the inclined portions, a notch is formed between two adjacent embedding legs, and the notch is at least partially located directly above the atomizing opening.

30. An electronic cigarette comprising an atomizer according to any one of claims **16** to **29.**

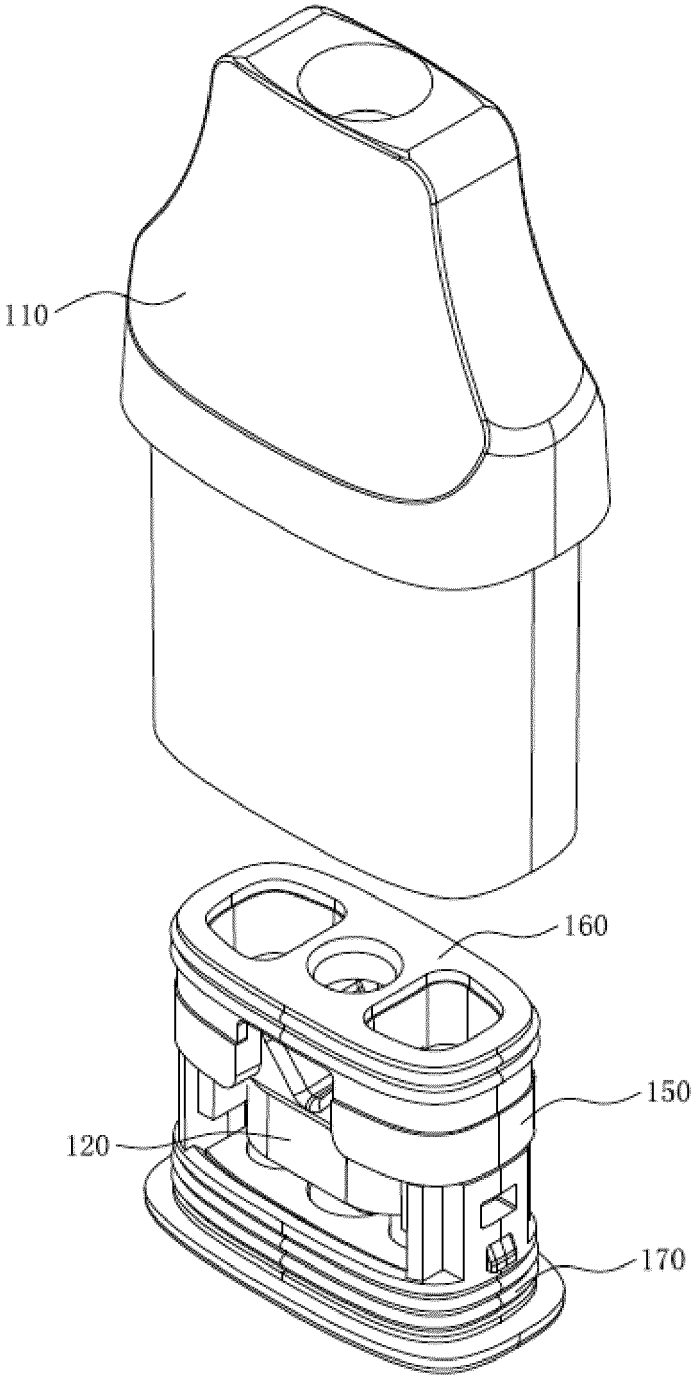

FIG. 1

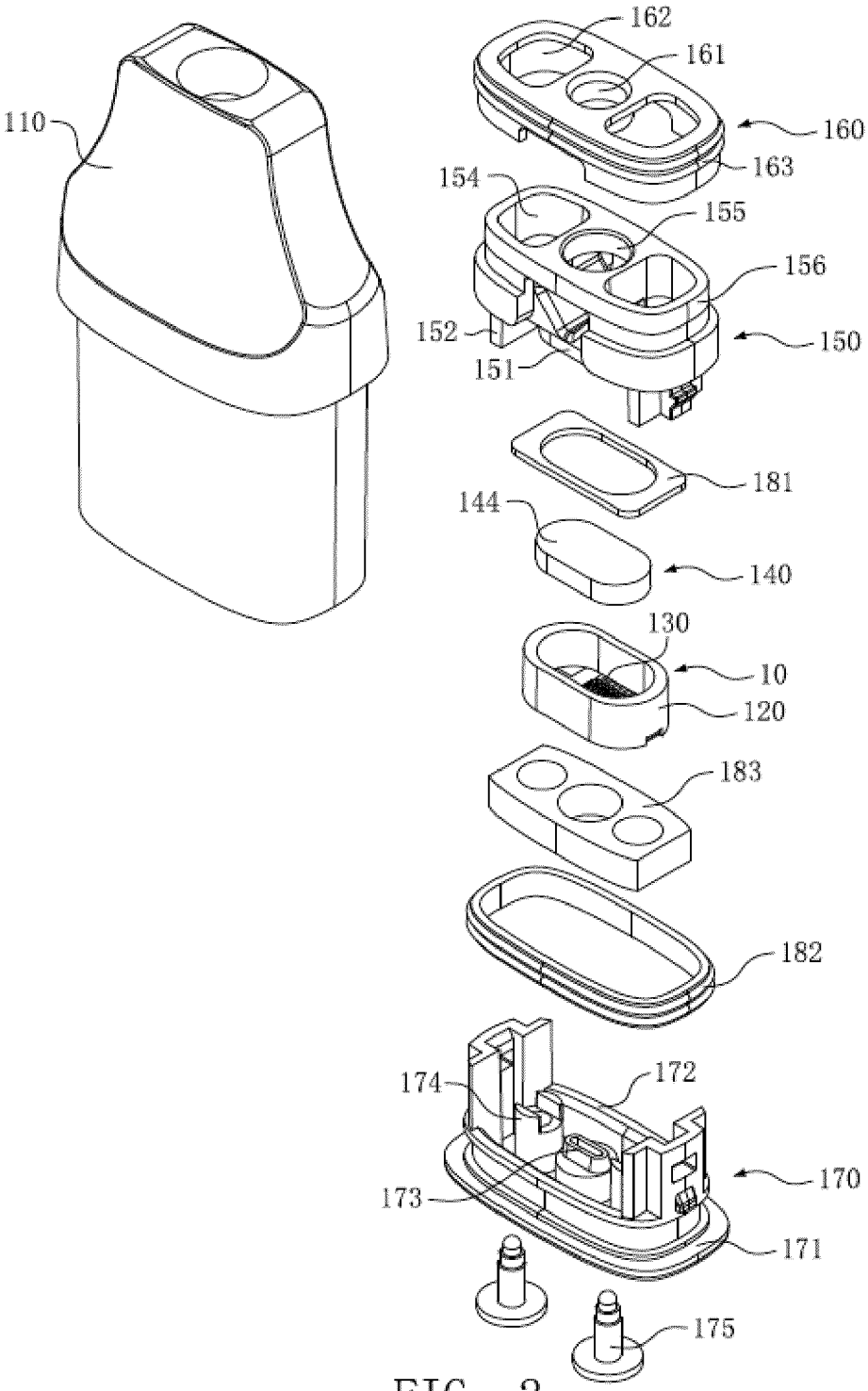
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FIG. 2

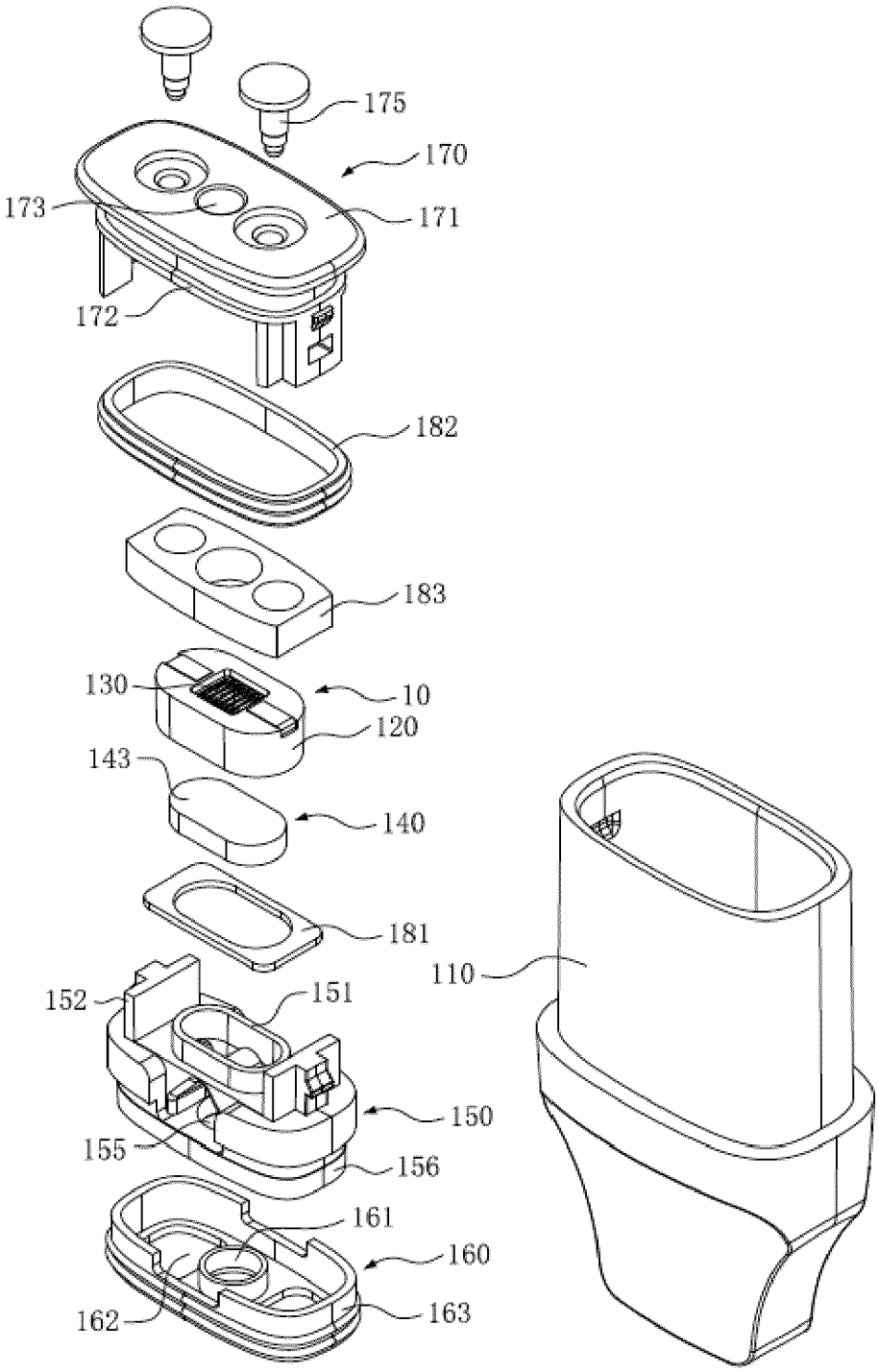
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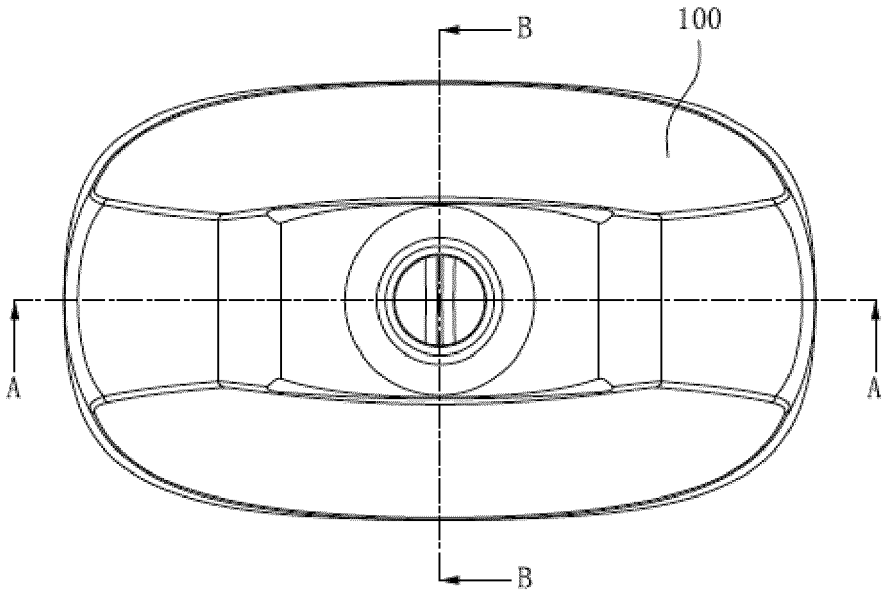
FIG. 3



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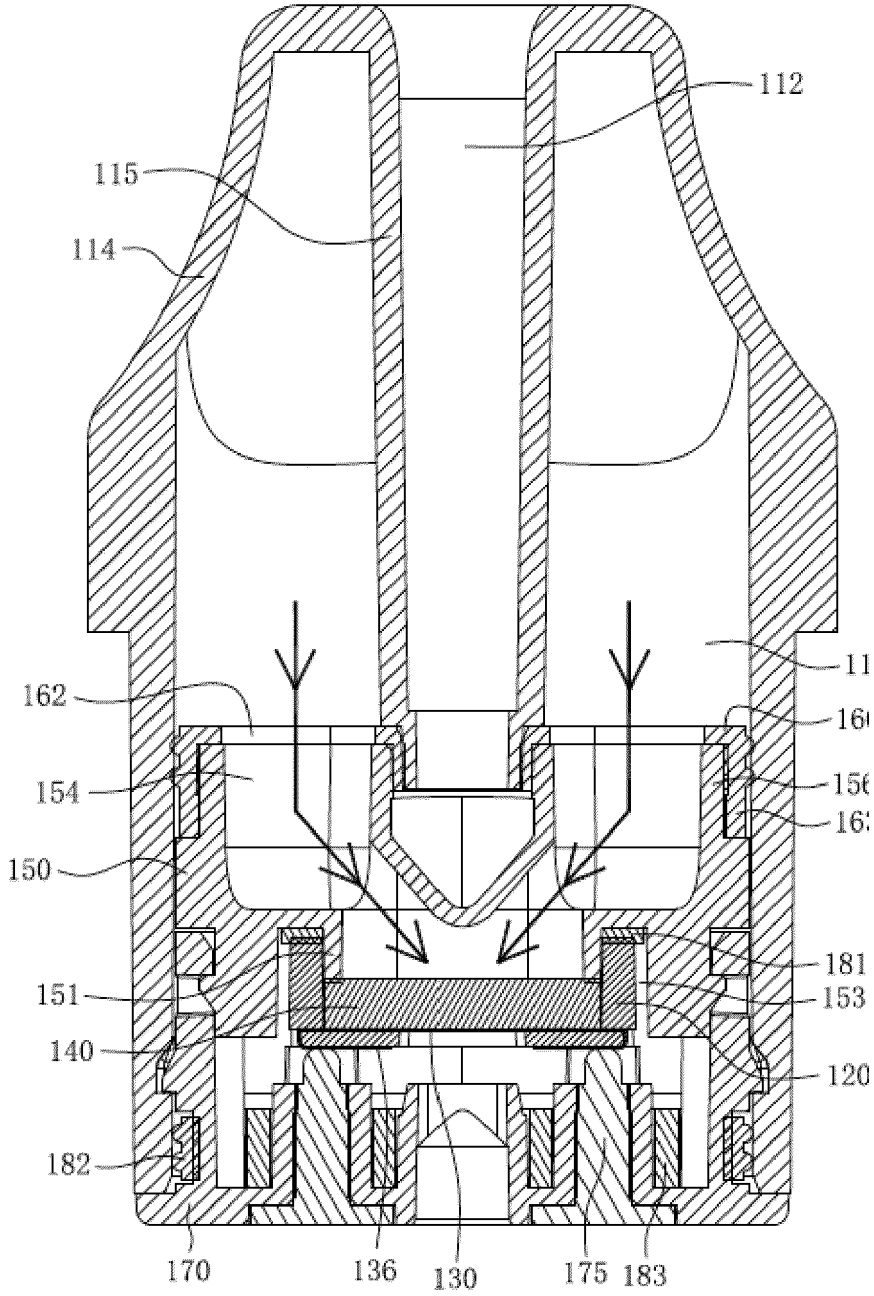
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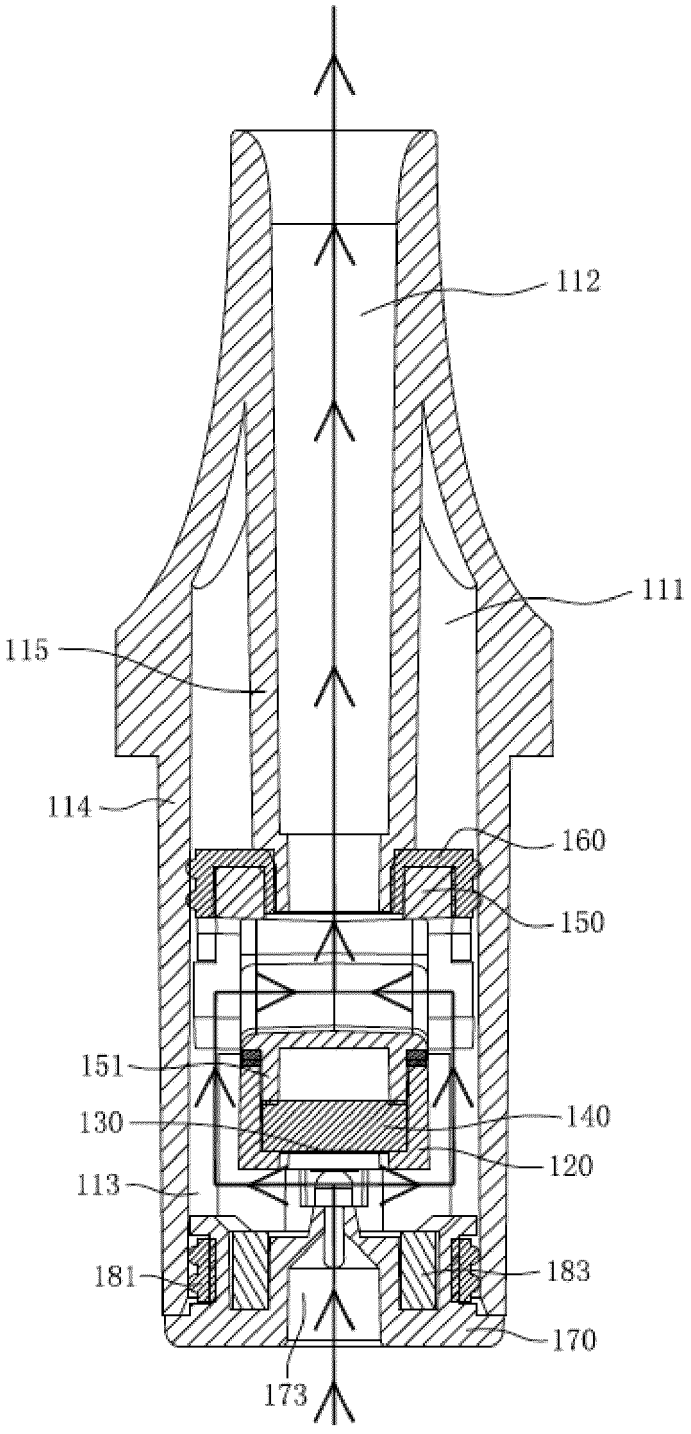
FIG. 5



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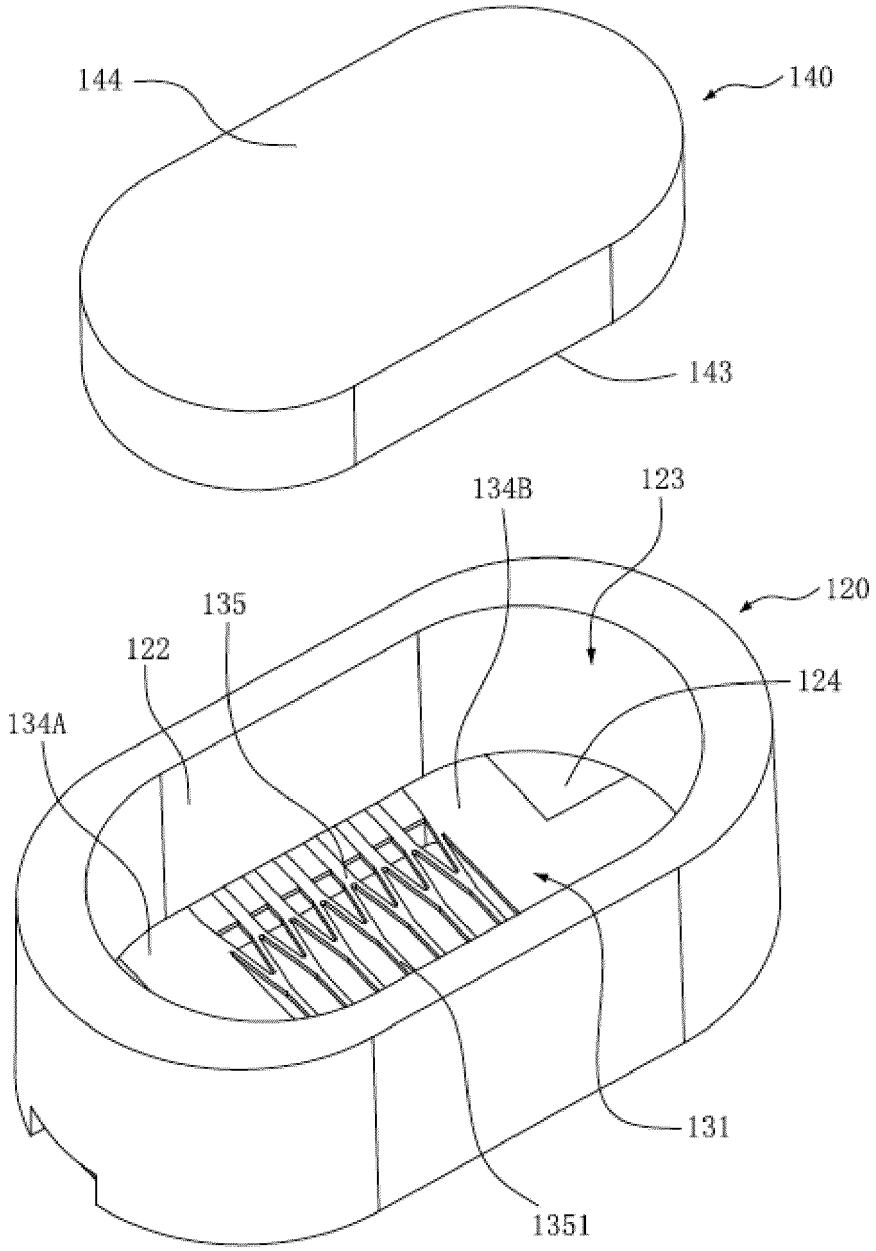

FIG. 7

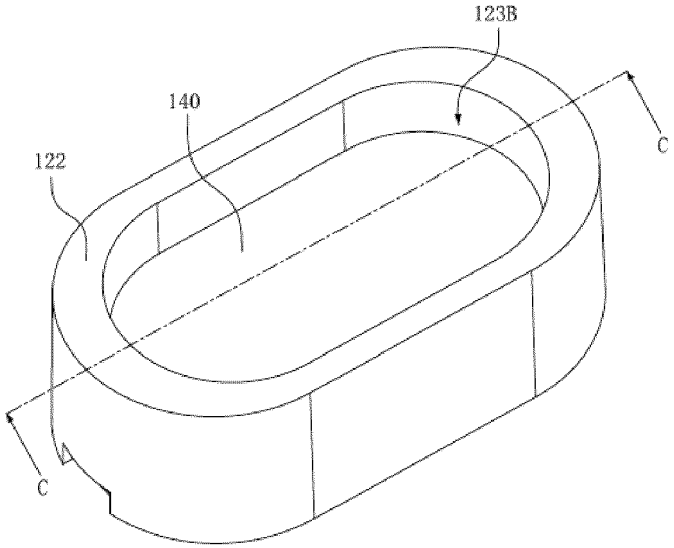

FIG. 8

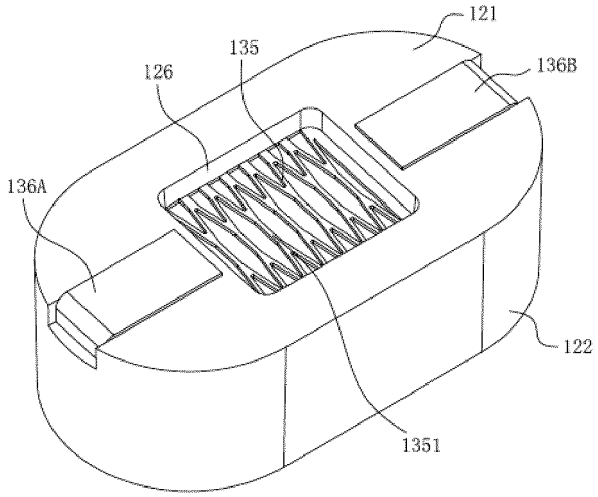

FIG. 9

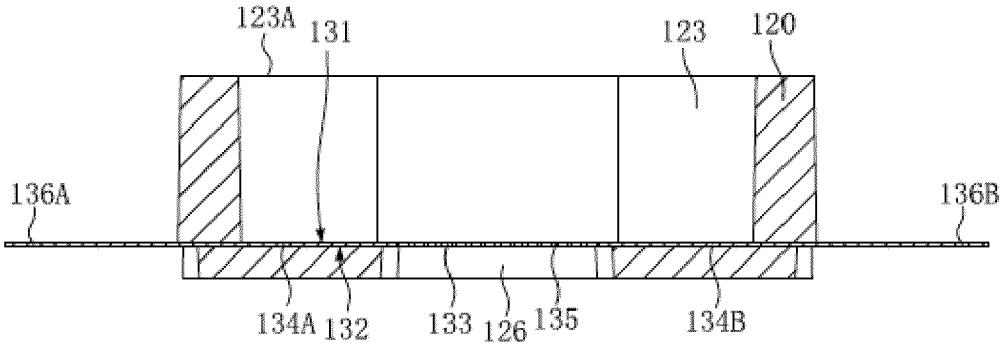
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FIG. 10

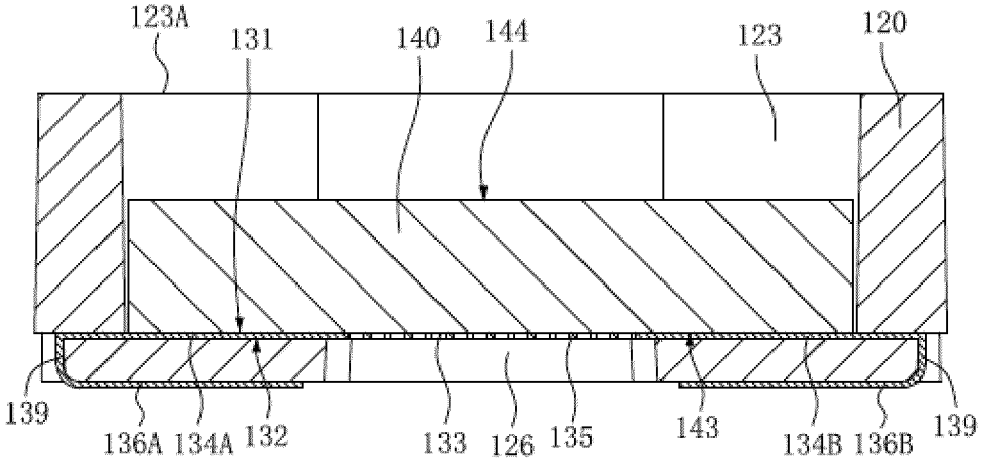
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FIG. 11

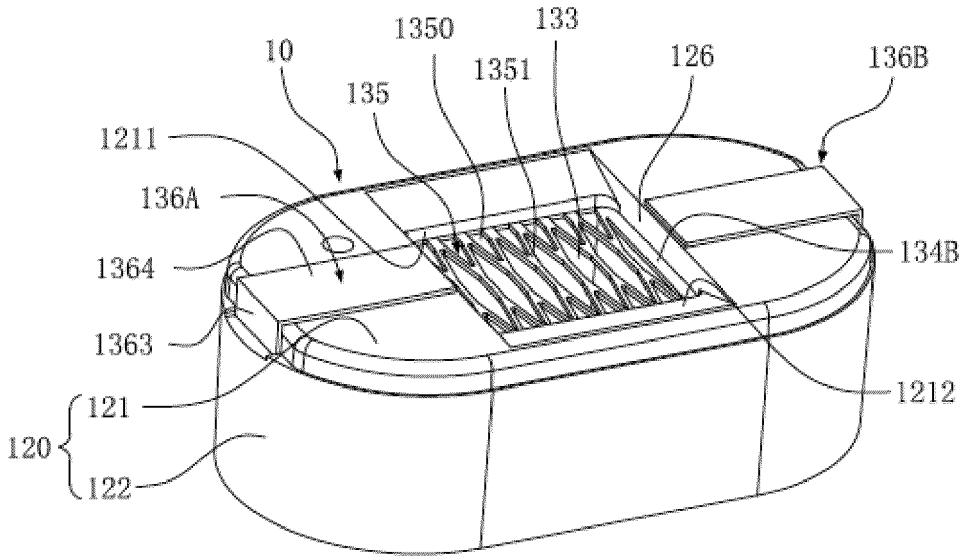
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FIG. 12

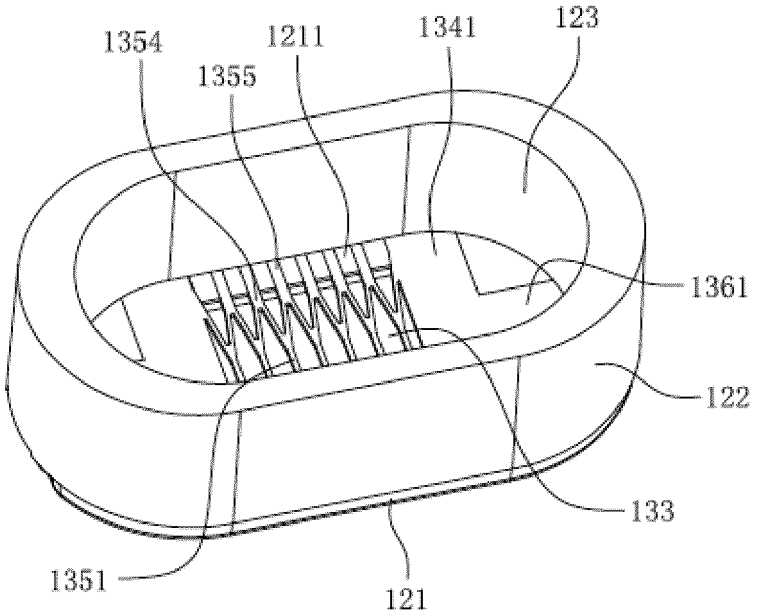
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FIG. 13

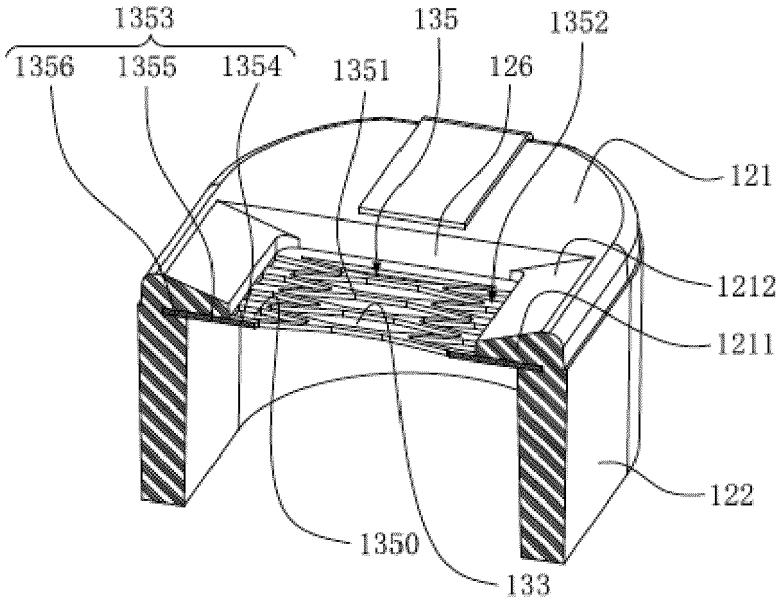
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FIG. 14

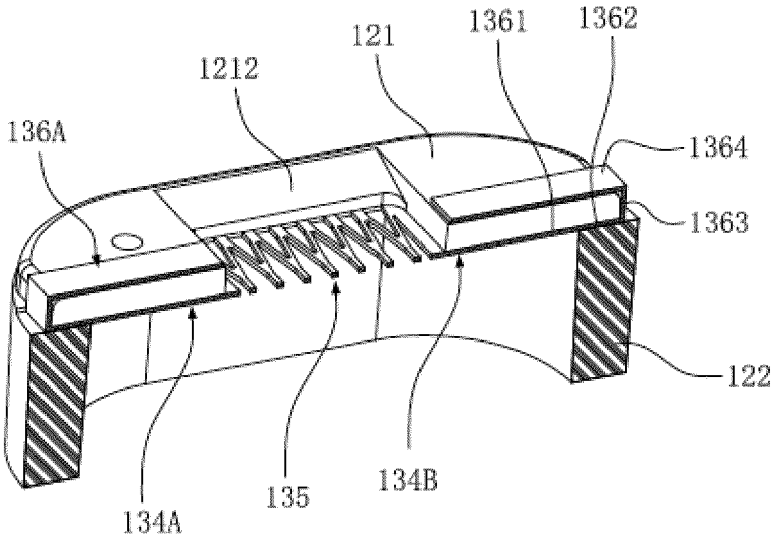
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FIG. 15

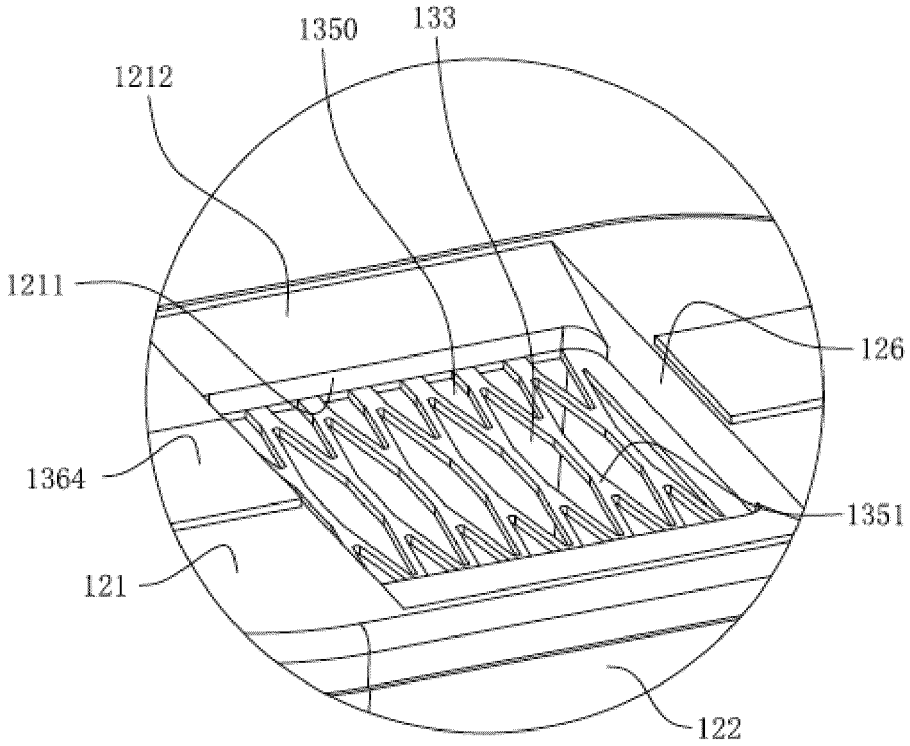

FIG. 16

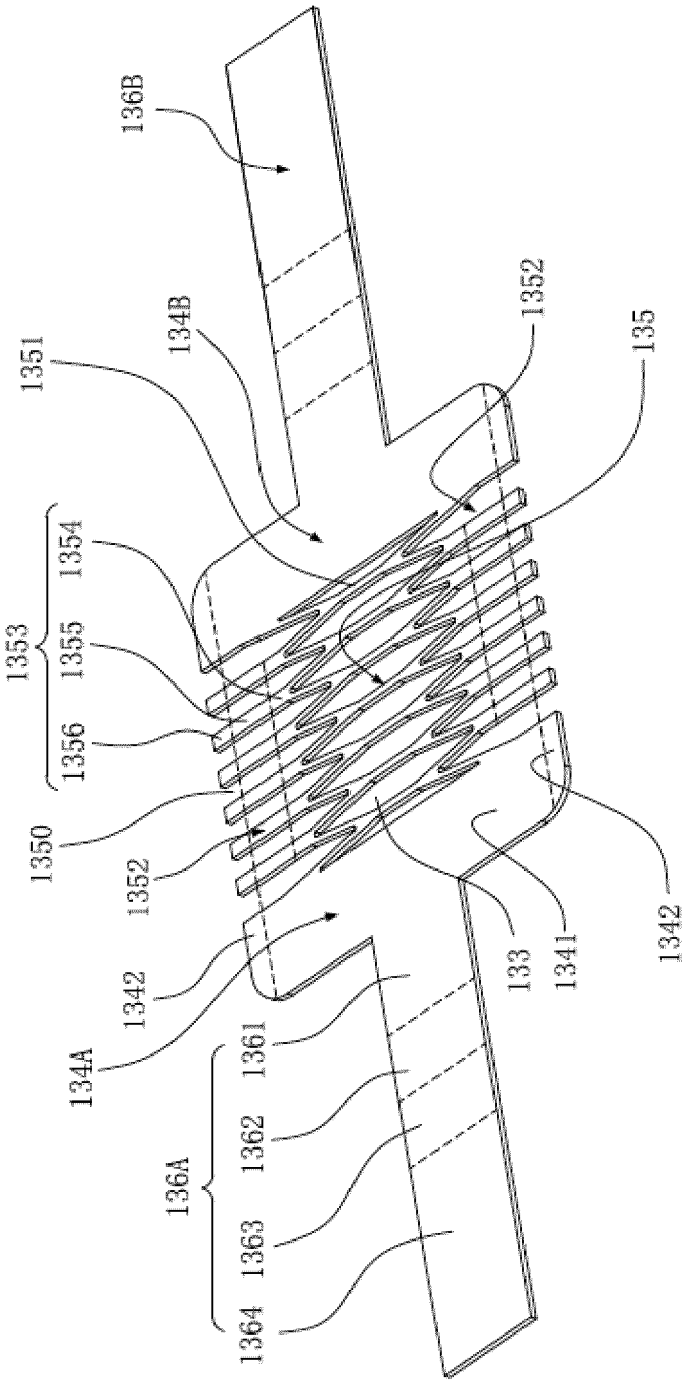
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FIG. 17

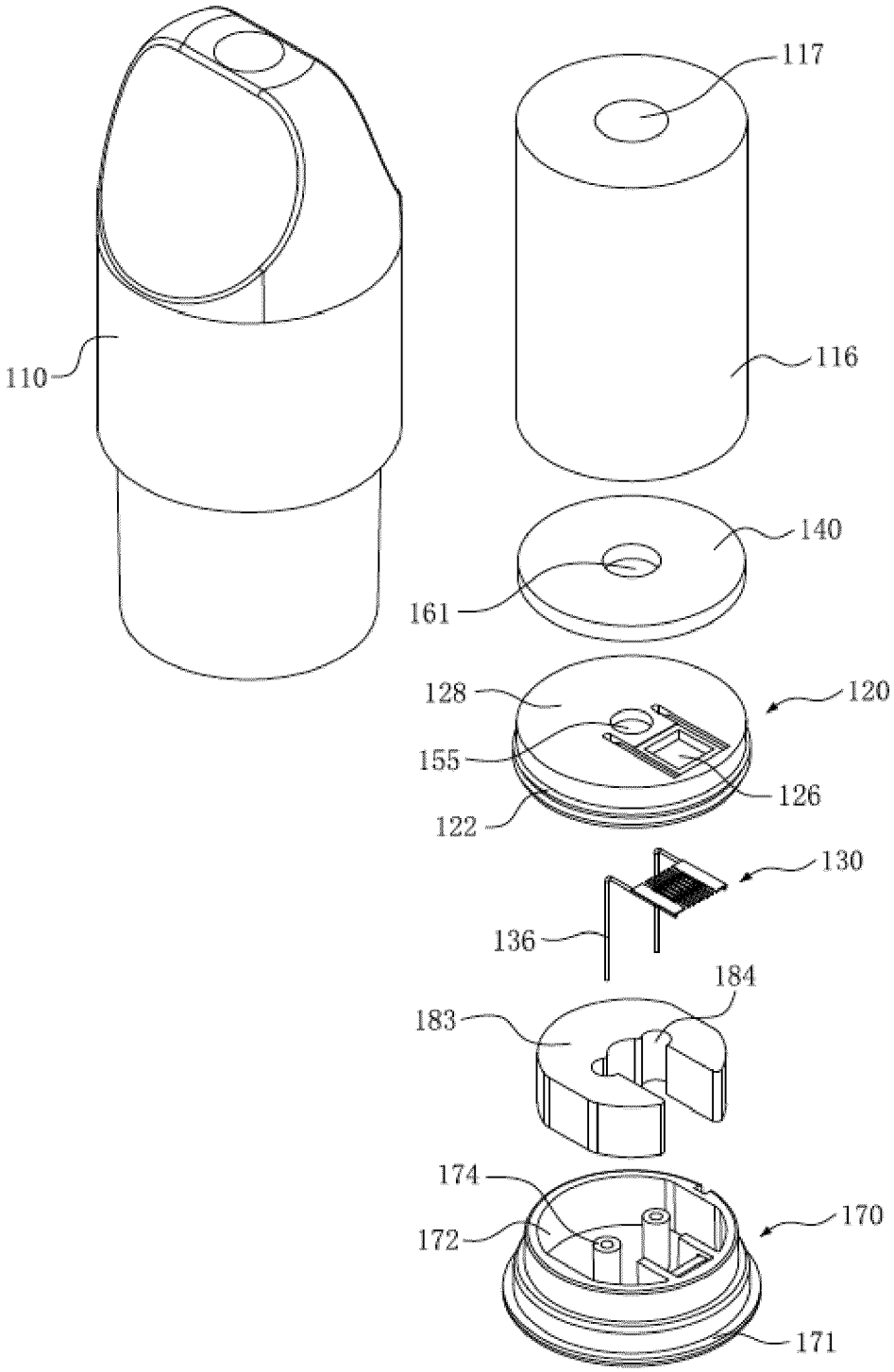
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FIG. 18

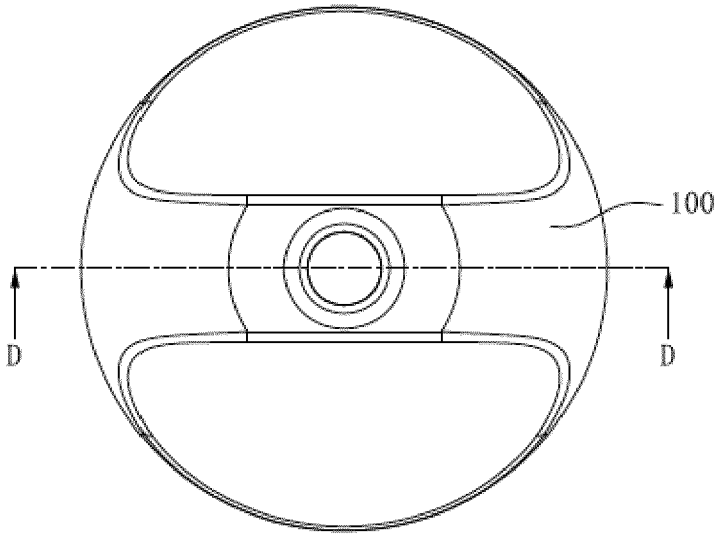

FIG. 19

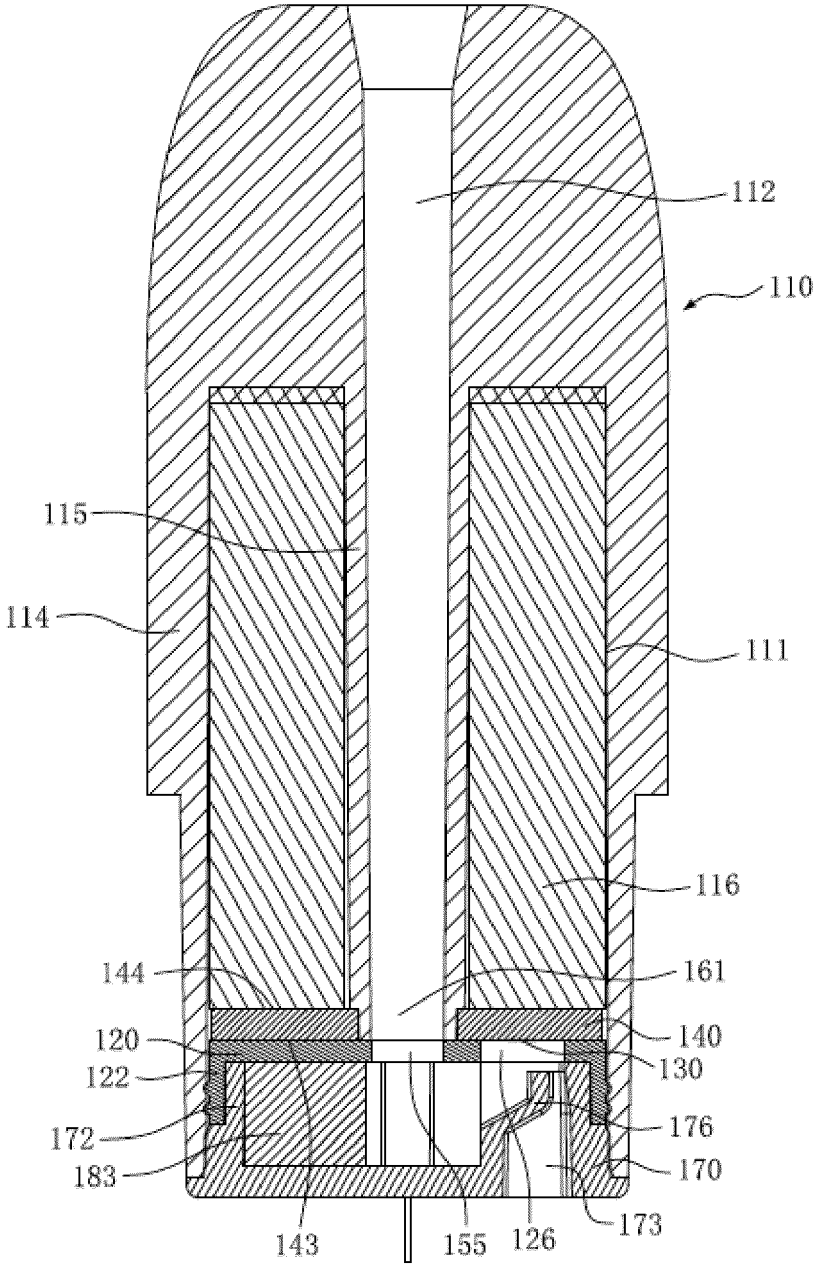
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FIG. 20

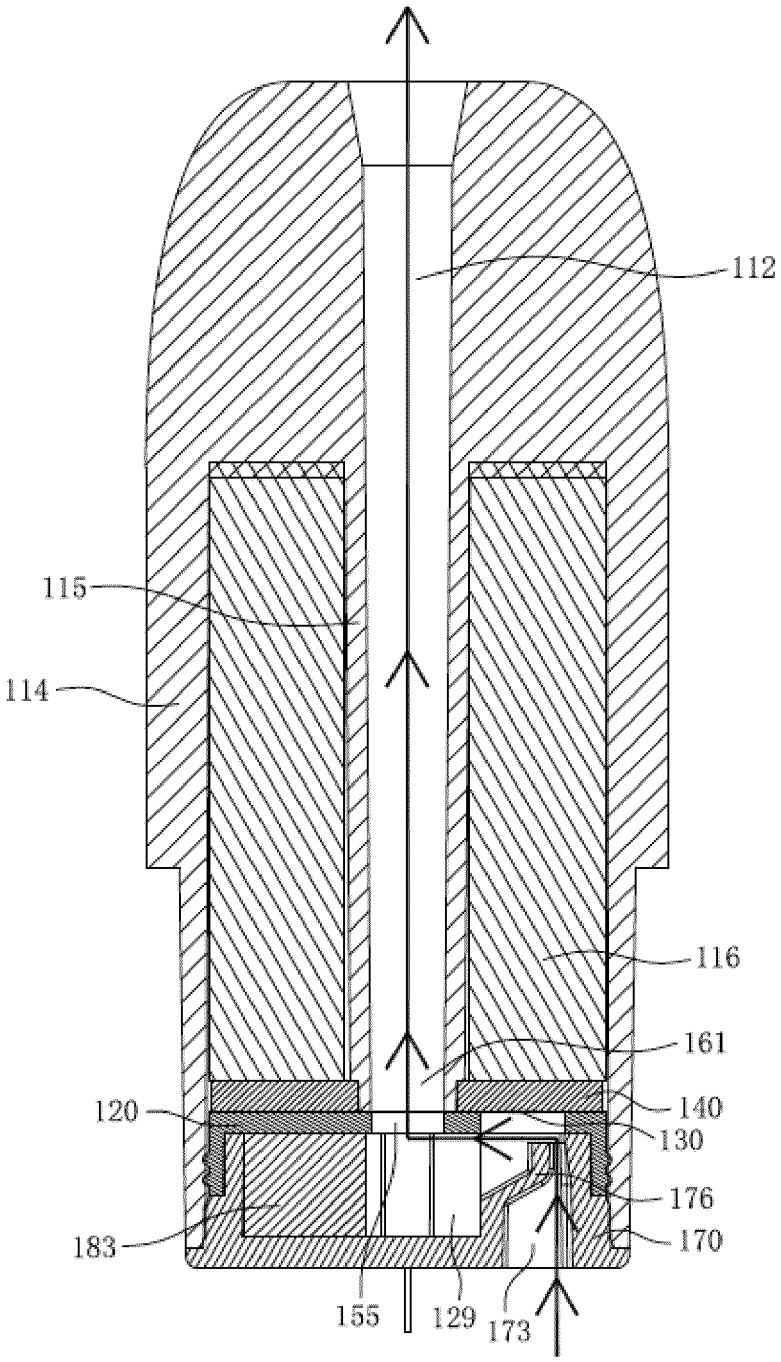

FIG. 21

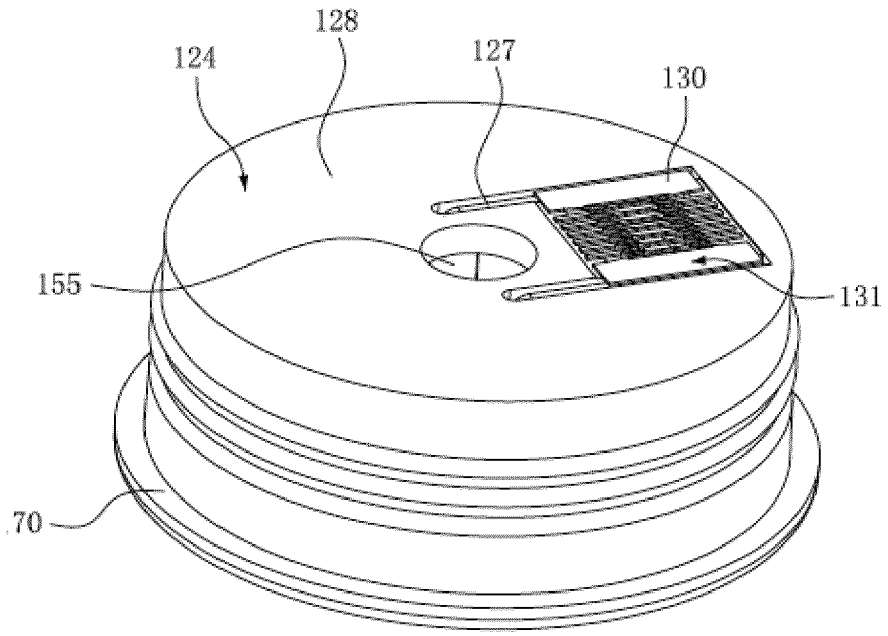

FIG. 22

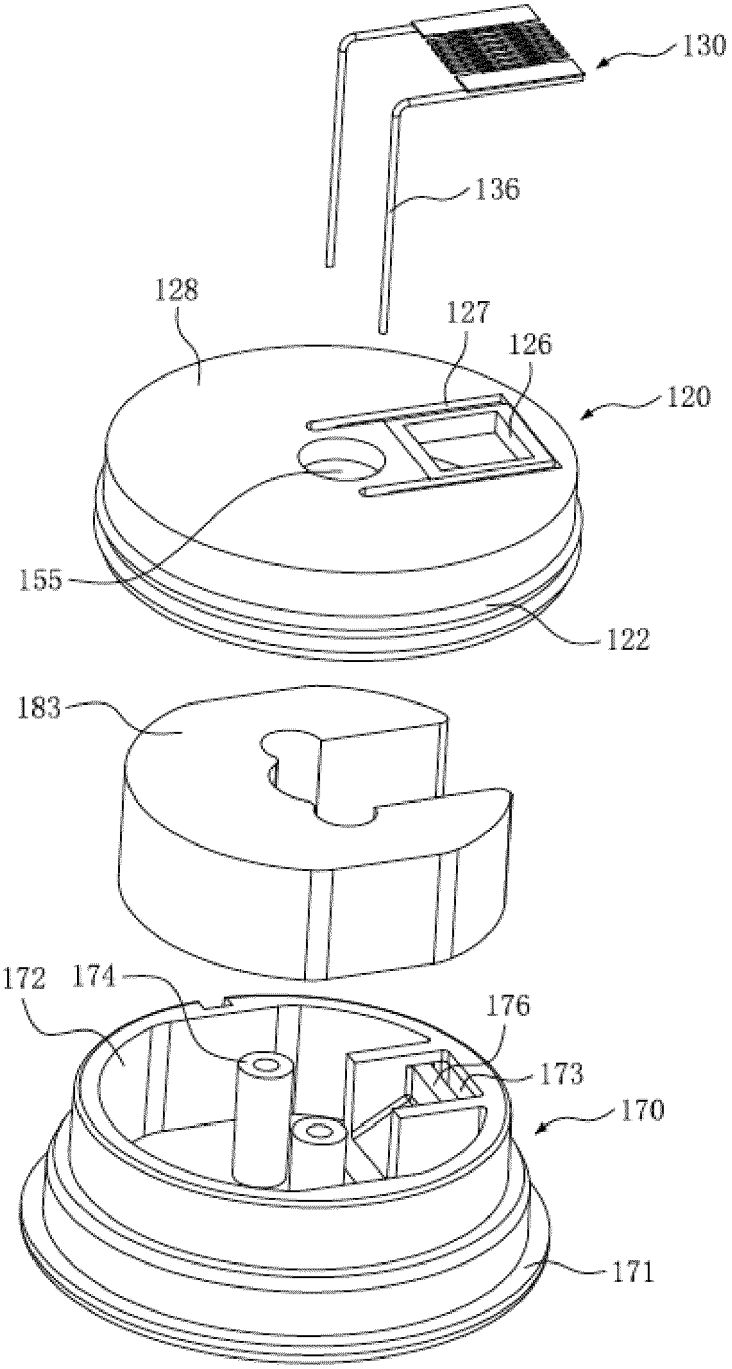

FIG. 23

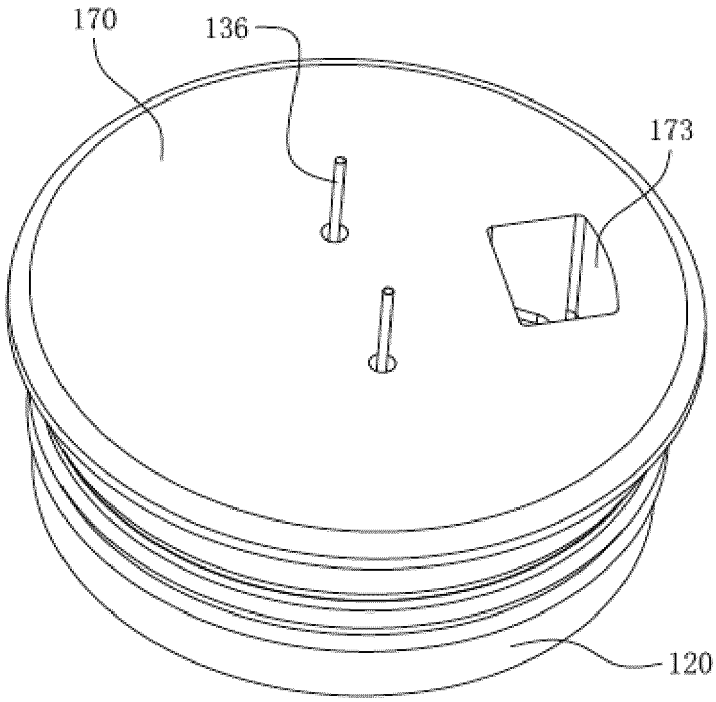

FIG. 24

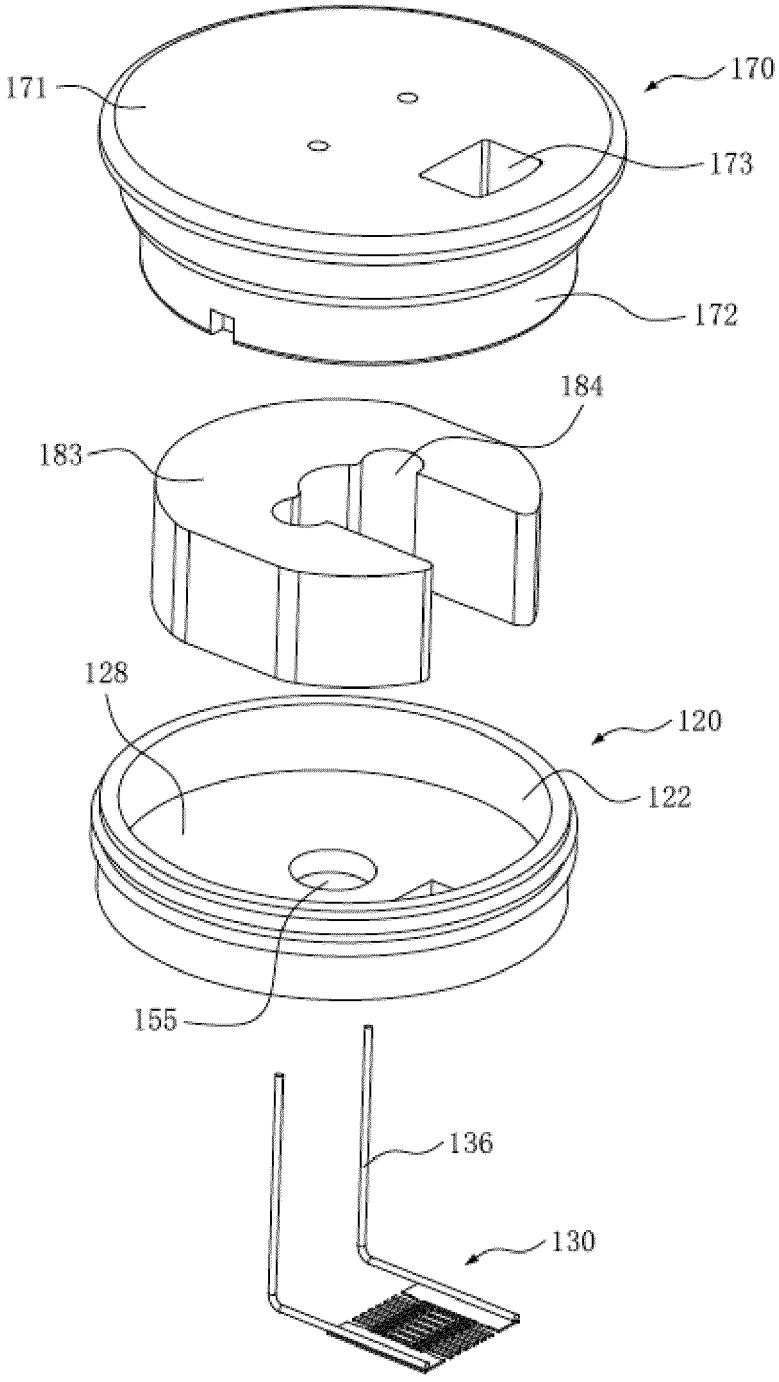

FIG. 25

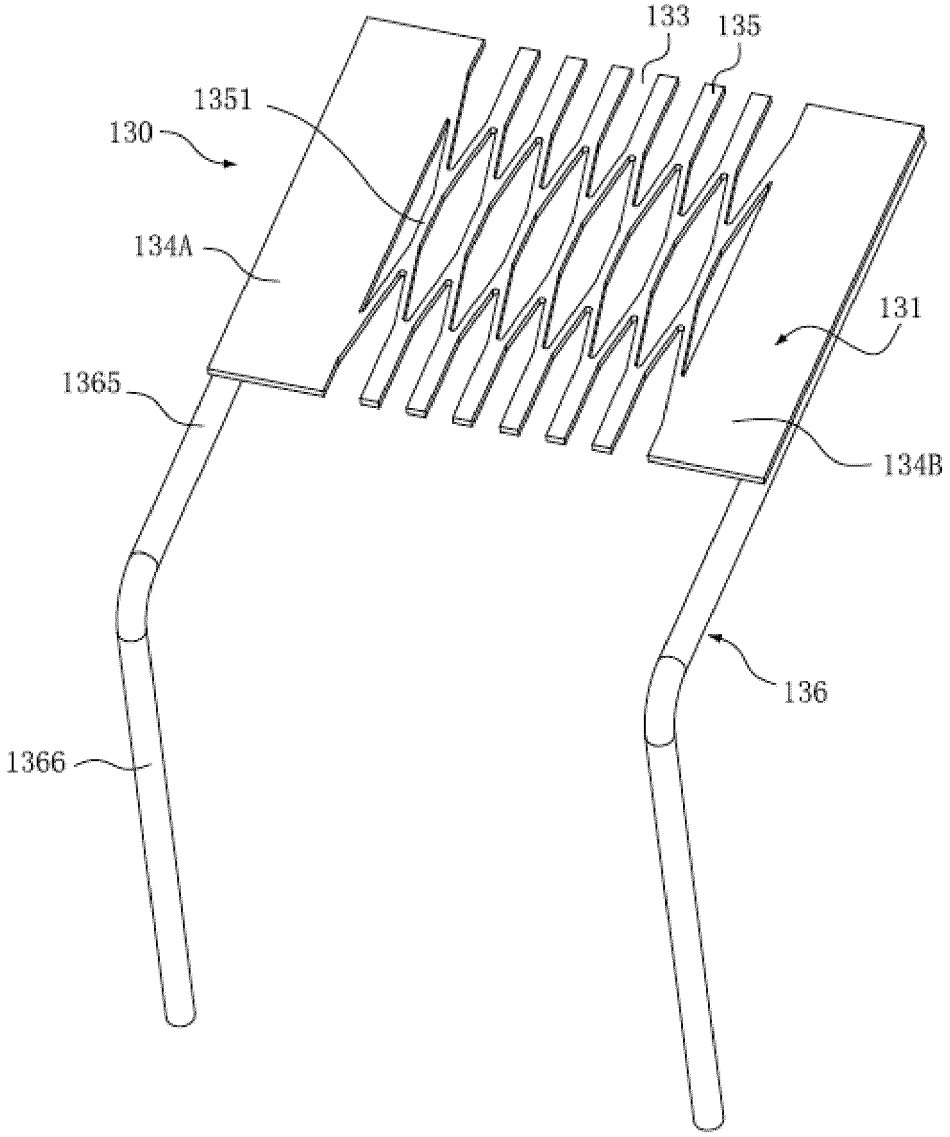

FIG. 26

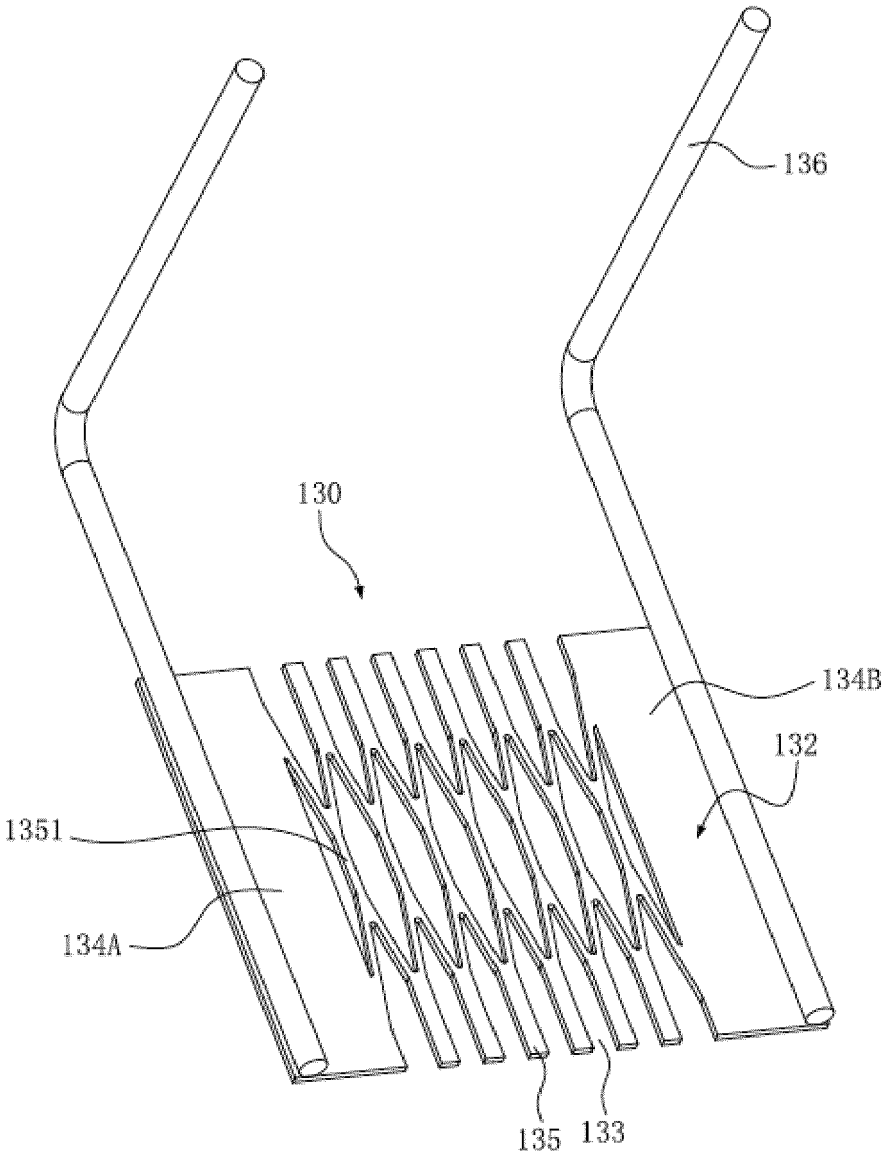

FIG. 27

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EUROPEAN SEARCH REPORT

Application Number
EP 22 20 2999

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X	EP 3 487 323 B1 (PHILIP MORRIS PRODUCTS SA [CH]) 30 September 2020 (2020-09-30) * paragraph [0055]; figure 1C *	1-30	
X	EP 3 487 324 B1 (PHILIP MORRIS PRODUCTS SA [CH]) 18 November 2020 (2020-11-18) * paragraph [0073] - paragraph [0075]; figures 1A-1C *	1-30	
X	CN 113 576 046 A (SHENZHEN HQD TECH CO LTD) 2 November 2021 (2021-11-02) * the whole document *	1-30	
A	EP 3 892 136 A1 (O NET AUTOMATION TECH SHENZHEN LIMITED [CN]) 13 October 2021 (2021-10-13) * paragraph [0054] - paragraph [0055]; figures 6,9 *	1-30	TECHNICAL FIELDS SEARCHED (IPC) H05B A24F

The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
Munich	31 May 2023	Gea Haupt, Martin

CATEGORY OF CITED DOCUMENTS

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