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(54) **ELECTRONIC CIGARETTE**

(57) An electronic cigarette includes a mouthpiece (10) having a mouthpiece connection socket. The mouthpiece connects to the housing (40) at the mouthpiece connection socket. The housing forms a first cavity (41). The vaporizer assembly has a vapor body housing (22) that fits into the housing. The vapor body housing houses an atomizer (21), and the vapor body housing is formed as a tube. A gasket assembly includes a first gasket (23a) and a second gasket (23b). The vapor body housing receives the gasket assembly. An electrical control assembly (30) is mounted in the first cavity. The vaporizer assembly is mounted between the mouthpiece and electrical control assembly. The electrical control assembly supplies a working voltage to the vaporizer assembly. The vaporizer assembly produces a vapor that can flow to the mouthpiece component.

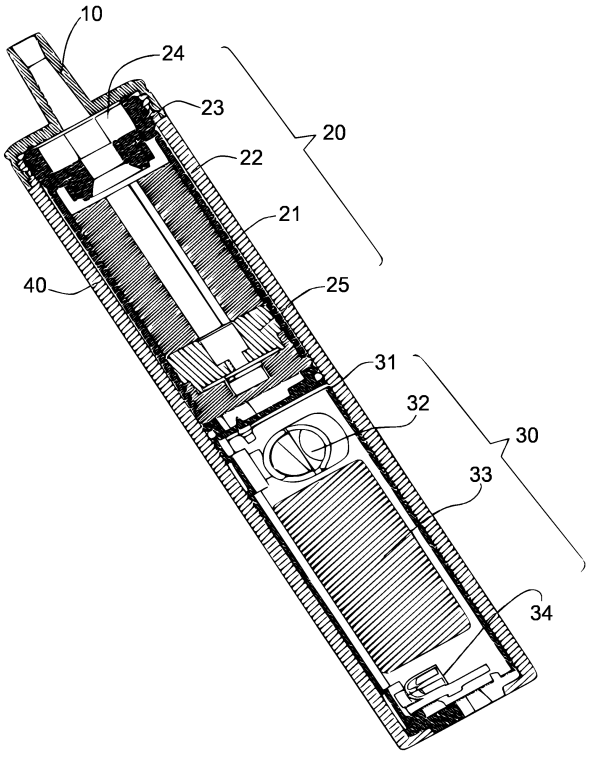

Fig. 1

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Description

FIELD OF THE INVENTION

[0001] The present invention is in the field of electronic cigarettes.

DISCUSSION OF RELATED ART

[0002] A variety of different electronic cigarettes vaporize liquid such as oil for user inhalation. Electronic cigarettes have replaced traditional cigarettes and have decreased tar intake for many users. Thus, E-cigarettes are electronic products that imitate cigarettes. They have the same appearance, vapor, taste, and feel as cigarettes. At present, they have become a relatively mature smoking alternative in the market.

[0003] Electronic cigarettes use batteries to supply power to the heating wire in the atomizing head, so that the heating wire heats the e-liquid under the electric drive to generate vapor for the user to obtain a smoking experience. However, most of the existing electronic cigarettes adopt an integrated structure which are discarded after use as they are not easily recycled or repaired. This creates a lot of litter and waste.

SUMMARY OF INVENTION

[0004] The device discloses an electronic cigarette comprised of a mouthpiece assembly, a cigarette body assembly, an electric control assembly, and a housing made of bio-polyester degradable material. A first cavity is formed on the housing and the vapor body assembly. It is electrically connected with the electric control component and is sequentially installed in the first cavity. The mouthpiece component is detachably connected to the housing and is located at the end of the vapor body component away from the electric control component. When the electric control component supplies the working voltage to the vapor body component, the vapor body component can atomize the vapor liquid inside, so that the atomized vapor can flow into the mouthpiece component with the air flow for smoking.

[0005] The device provides an electronic cigarette which can be degraded by microorganisms in nature after use by adopting a housing made of bio-polyester degradable material without polluting the environment. At the same time, the cigarette holder assembly can be replaced without the need of the entire electronic cigarette to prolong the service life of the electronic cigarette and solve the problem of high cost for users.

[0006] The device provides an electronic cigarette which comprises a mouthpiece assembly, a cigarette body assembly, an electric control assembly, and a housing made of biodegradable polyester material. A first cavity is formed on the housing and the vapor body assembly, which is electrically connected with the electric control assembly and installed in the first cavity. In turn, the mouthpiece assembly is detachably connected to the housing and is located at the end of the cigarette body assembly away from the electric control assembly. When the electric control component supplies the working voltage to the vapor body component, the vapor body component can atomize the vapor liquid inside, so that the atomized vapor can flow into the mouthpiece component with the air flow for smoking.

[0007] In the electronic cigarette according to an embodiment of the present invention, the mouthpiece assembly is provided with a first assembly, and the housing is provided with a second assembly. The mouthpiece assembly is connected by the first assembly and the second assembly. The fittings can be detachably mounted on the housing. In the electronic cigarette according to an embodiment of the present invention, one of the first assembly parts and the second assembly parts are magnetic adsorption parts. The other of the first assembly parts and the second assembly parts are metal or magnetic mounts. One of the first assembly parts and the second assembly parts can be buckle parts. The other of the first assembly parts and the second assembly parts are slot parts, and the slot part and the second assembly part can be buckle parts snapped into place.

[0008] One of the first assembly parts and the second assembly parts can be the outer wall of the mouthpiece assembly. The other of the first assembly parts and the second assembly parts are the inner wall of the housing, and the outer wall and the internal wall can be interference fit.

[0009] In the electronic cigarette according to an embodiment of the present invention, the first assembly part includes a rotating table provided on the inner side wall of the mouthpiece assembly, and the second assembly part includes a rotating table provided on the outer side wall of the housing. A rotary slot engaging a rotary table from one side of the rotary slot can be rotatably engaged in the rotary slot.

[0010] In the electronic cigarette according to an embodiment of the present device, a locking protrusion is provided on the side of the rotating platform facing the rotating slot. The rotating slot includes a guiding part and a locking part communicating with the guiding part. The bottom end of the guide part is provided with a recessed structure, and the position of the recessed structure corresponds to the position of the locking protrusion.

[0011] In the electronic cigarette according to an embodiment of the present invention, the vapor body assembly includes a vapor body housing, an atomizer, an oil absorbing body, a sealing seat, and an open second cavity formed in the vapor body housing. The atomizer is installed in the second cavity and the sealing seat is sealed at the open end of the second cavity. The oil absorbing body is arranged between the sealing seat and the mouthpiece assembly.

[0012] In the electronic cigarette according to an embodiment of the present device, the sealing seat includes a second sealing seat, a first sealing seat, and have an

accommodating groove. The first sealing seat and the second sealing seat are respectively sealed on the second sealing seat. In the two opposite open ends of the cavity, the oil absorber is accommodated in the accommodating groove.

[0013] In the electronic cigarette according to an embodiment of the present invention, the electronic control component includes an electric control housing, a battery, and a microphone. A third cavity is formed in the electronic control housing, the battery, and the microphone. The vapor body assembly is electrically connected and accommodated in the third cavity.

[0014] In the electronic cigarette according to an embodiment of the present invention, the electronic control housing is provided with a first through hole and a second through hole. The housing is provided with a limiting hole communicating with the first cavity. The position of the first through hole corresponds to the position of the limiting hole. The vapor body assembly communicates with the second through hole, and the microphone is arranged between the first through hole and the second through hole in the airflow channel formed between the through holes.

[0015] In the electronic cigarette according to one embodiment of the present device, the electronic control assembly can include a charging interface formed on a peripheral side of the electronic control housing. The battery is electrically connected to the charging interface.

[0016] The technical solutions provided by the embodiments of the present application may include the following components: a mouthpiece assembly, a cigarette body assembly, an electric control assembly, and a housing. A first cavity is formed on the housing and the cigarette body assembly. The electronic control components are installed in the first cavity, and the mouthpiece assembly is detachably connected to the housing, so that the mouthpiece assembly can be replaced without discarding the entire electronic cigarette to prolong the service life of the electronic cigarette and solve the problem of high user cost. The housing is made of biodegradable polyester materials, so it can be degraded by microorganisms in nature after use to form CO_2 and H_2O which does not pollute the environment or bring any negative impact to the environment after use.

[0017] It is the object of the present invention is to provide an electronic cigarette that is easily recycled so that disposable electronic vaporizers create less pollution and trash for the environment keeping dangerous metals in rechargeable batteries away from landfills.

[0018] This object is achieved by the subject matter of the independent claim.

[0019] Preferred embodiments of the invention mirror the subject matter of the dependent claims.

BRIEF DESCRIPTION OF THE DRAWINGS

[0020]

Figure 1 is a schematic structural diagram of an electronic cigarette provided by an embodiment of the present application.

Figure 2 is a schematic structural diagram of the electronic cigarette in Fig. 1 at another angle.

Figure 3 is a schematic cross-sectional view of the electronic cigarette in Fig. 2 at one angle.

Figure 4 is a schematic cross-sectional view of the electronic cigarette in Fig. 2 at another angle.

Figure 5 is an exploded schematic view of the electronic cigarette in Fig. 2.

Figure 6 is a schematic structural view of the housing in Fig. 5.

Figure 7 is a structural schematic diagram of the housing in Fig. 5 at another angle.

Figure 8 is a schematic structural view of the mouthpiece assembly in Fig. 5.

Figure 9 is a schematic cross-sectional view of the vapor body assembly in Fig. 5.

Figure 10 is an exploded schematic diagram of the vapor body assembly in Fig. 5.

Figure 11 is an exploded schematic view of the electric control assembly in Fig. 5.

Figure 12 is an exploded view of the electronic vaporizer in cigarette mode.

Figure 13 is a bottom perspective view of the electronic vaporizer in cigarette mode.

Figure 14 is a top perspective view of the electronic vaporizer in cigarette mode.

Figure 15 is a top, side and bottom view of the electronic vaporizer in cigarette mode.

DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENTS

[0021] The connection structure of the electronic cigarette is completely redesigned from the prior art to make it modular and thus recyclable or repairable without tools. As shown in Figures 1 to 11, the present application provides an electronic cigarette comprising a mouthpiece 10, a vaporizer assembly 20, an electrical control assembly 30, and a housing 40 made of biodegradable polyester materials. The housing 40 is generally formed as a tube with a cylindrical shaped first cavity 41. The vapor-

izer assembly 20 is electrically connected with the electric control assembly 30 and installed in the first cavity 41. The mouthpiece 10 is detachably connected to the housing 40 and is located away from the vaporizer assembly 20 and from the electric control. At one end of the electrical control assembly 30 the electrical control assembly 30 supplies the working voltage to the vaporizer assembly 20, so that the vaporizer assembly 20 atomizes vapor liquid inside of the vaporizer assembly 20. The atomized vapor can flow into the mouthpiece with the airflow for user inhalation. The housing 40 can be formed from an extruded aluminum tube or a formed plastic tube.

[0022] Exemplarily, the vaporizer assembly 20 heats the vapor liquid to generate vapor. After the vapor enters the mouthpiece 10 through the air outlet on the mouthpiece 10, the mouthpiece 10 can filter the vapor. The filtered vapor is sucked from the mouthpiece 10 and exhausted through the mouth for suction by the user. Among them, the mouthpiece 10 can filter the large particles and impurities in the vapor and reduce the harm of the vapor to the human body. When the mouthpiece 10 reaches the service life, it can be directly replaced with a new mouthpiece 10. Compared with the prior art, electronic cigarettes can be discarded directly. In this embodiment, the service life of the electronic cigarette is extended by replacing the mouthpiece 10.

[0023] Since the housing 40 is made of bio-polyester degradable materials, the bio-polyester degradable materials include, but are not limited to, polylactic acid (PLA), polybutylene adipate/terephthalate (PBAT), polyethylene glycol acid (PGA), poly (lactic-co-glycolic acid) (PLGA), polycaprolactone (PCL), polytrimethylene carbonate (PTMC), polyesteramide, and polybutylene succinate (PBS). Polyester materials, such as polyhydroxypentylbutyrate (PHBV), polyacetylglutamic acid or polyorthoester (POE) and GN600F-Z (PBAT+PLA) can be completely degraded by microorganisms in nature after use to form CO_2 and H_2O which do not pollute the environment and have a broad market prospect.

[0024] After the above technical solution is adopted, since the mouthpiece 10 is detachably connected to the housing 40, when the mouthpiece 10 reaches the end of its service life or needs to be replaced, the mouthpiece 10 can be disassembled from the housing 40 to replace it with a new mouthpiece 10. Other parts of the cigarette can be modularly replaced and reused without discarding the entire electronic cigarette.

[0025] In an optional embodiment, the mouthpiece 10 is provided with a first fitting and the housing 40 is provided with a second fitting, so that the mouthpiece 10 can be detachable through the cooperation of the first fitting and the second fitting installed on the housing 40.

[0026] Exemplarily, an insertion slot is formed on the mouthpiece 10. An insertion portion is formed on one end of the housing 40, and the insertion portion is connected to the insertion slot. The first assembly part may be the inner side wall of the insertion slot, and the second assembly part may be the outer side wall of the insertion part. The inner side wall of the mouthpiece 10 and the outer side wall of the housing 40 are interference fit or glued together. The first assembly part may be a buckle on the mouthpiece 10, and the second assembly part may be a slot of the housing 40. The mouthpiece 10 is detachably mounted on the housing 40 through the connection between the buckle and the slot or the first assembly. The accessory can be set on the first adsorption part on the mouthpiece 10, and the second assembly part can be the second adsorption part of the housing 40. The mouthpiece 10 is installed on the housing 40 through the cooperation of the first adsorption part and the second adsorption part.

[0027] After adopting the above technical solution, the mouthpiece 10 is detachably mounted on the housing 40 through the cooperation of the first fitting and the second fitting which not only facilitates the removal of the mouthpiece 10 from the housing 40, but also improves the speed of disassembly.

[0028] In an optional embodiment, one of the first assembly parts and the second assembly parts may be a magnetic adsorption part, and the other of the first assembly parts and the second assembly parts may be a metal adsorption part or a magnetic adsorption part. Exemplarily, the first assembly and the second assembly can be permanent magnets or electromagnets. The permanent magnets can be AlNiCo permanent magnet alloys or FeCrCo permanent magnet alloys. The electromagnets can be selected according to structural needs that power on and off to control the working state of the locking device. A variety of different types of magnets can be used having different raw materials and configurations.

[0029] When the mouthpiece 10 is plugged into the socket part of the housing 40, the opposite magnetic poles of the first assembly part and the second assembly part are opposite, so that the mouthpiece 10 can be firmly fixed on the socket part of the housing 40 under the attraction force of the opposite magnetic poles superior. In this embodiment, the first assembly is provided with at least one magnet on the mouthpiece 10, and the inner wall of the insertion slot is provided with at least one magnet installation slot. Each magnet is correspondingly installed on the magnet installation slot and the second installation. The accessory is a magnetic iron sheet arranged on the housing 40, and the magnetic iron sheet is installed on the outward side of the housing 40, so that the magnetic iron sheet can be adsorbed on at least one magnet.

[0030] In addition, the first assembly and the second assembly can be magnetically connected at the same time wherein the magnetic poles of the first assembly are opposite to the opposite magnetic poles of the second assembly, and the opposite magnetic poles here refer to the magnetic poles of the first assembly and the second assembly. The opposite magnetic poles of the fittings constitute opposite magnetic poles, so that the mouthpiece 10 can be fitted on the socket part of the housing

40 under the attraction of the first fitting and the second fitting, and then locked and fixed.

[0031] It should be noted that the first assembly part can also be a bar magnet, a circular magnet, or a magnet of other shapes. The second assembly part can be other metal parts that can be attracted by the magnet. The first assembly part is for other metal parts that can be attracted by magnets and the second assembly part is a magnet which is not limited in this application.

[0032] In an optional embodiment, one of the first assembly parts and the second assembly parts may be a buckle part, and the other of the first assembly parts and the second assembly parts may be a slot part. The mouthpiece 10 can be detachably installed on the housing 40 by snapping with the buckle part.

[0033] Exemplarily, the first assembly part is a buckle part provided on the inner wall of the mouthpiece 10, and the second assembly part is a slot part provided on the housing 40. The position of the buckle part corresponds to the position of the slot part, so that the mouthpiece 10 can be locked together through the connection of the buckle portion and the groove portion.

[0034] In addition, the buckle part can also be arranged on the housing 40, and the catch groove part can also be arranged on the cigarette holder assembly 10. The position of the catch groove part corresponds to the position of the buckle part, so that the mouthpiece 10 can be connected by the buckle part and the mouthpiece 10. The fit of the slot part is tightly fixed on the socket part of the housing 40.

[0035] In an optional embodiment, one of the first fitting and the second fitting are the outer side wall of the mouthpiece assembly. The other of the first fitting and the second fitting are the inner side wall of the housing and the outer side wall and the inner side. The walls are interference fit to tightly fix the mouthpiece 10 on the housing 40.

[0036] In an optional embodiment, the first assembly part includes a rotating table 11 provided on the inner side wall of the mouthpiece 10, and the second assembly part includes a rotating slot 42 provided on the outer side wall of the housing 40, so that the rotating table 11 can enter from one side of the rotating slot 42 and be rotatably engaged in the rotating slot 42 to complete the connection between the mouthpiece 10 and the housing 40.

[0037] The rotating slot 42 includes a guide part 421 and an engaging part 422 communicated with the guide part 421. The engaging part 422 is arranged around the peripheral side of the housing 40 and the extension direction of the guide part 421 is parallel to the axis of the housing 40. The mouthpiece 10 enters the rotating slot 42 through the rotating table 11 along the free end of the guide part 421, and then the rotating table 11 is clamped to the clamping part 422 by rotating to complete the assembly of the mouthpiece 10 and the housing 40. The structure is simple and easy to operate.

[0038] In an optional embodiment, the side of the rotating table 11 facing the rotation groove 42 is provided with a locking protrusion 111, and the bottom end of the guide part 421 is provided with a recessed structure 423 corresponding to the position, so that when the locking protrusion 111 is at the end of the guide part 421 the end of the locking protrusion 111 away from the locking protrusion 111 can be flushed with the end surface of the rotation groove 42 away from the recessed structure 423 or lower than the rotating slot 42. The groove 42 faces away from the end surface of the recessed structure 423 so that the rotating table 11 can enter the clamping portion 422 smoothly, and the clamping protrusion 111 can act as a clamping limit to prevent the mouthpiece 10 from being separated from the housing 40.

[0039] It should be noted that the rotation groove 42 is provided with a limiter on the side away from the guide portion 421. The distance between the limiter and the rotation groove 42 on the side away from the guide portion 421 is adapted to the width of the rotation table 11, so that the rotating table 11 rotates from the side where the engaging part 422 is located at the guiding part 421 to the other side where the engaging part 422 is away from the guiding part 421. The bottom slides out from the engaging part 422 to improve the stability of the connection between the rotating table 11 and the rotating slot 42.

[0040] When the mouthpiece 10 is connected to the housing 40 through the cooperation between the rotating table 11 and the rotating slot 42, the mouthpiece 10 and the housing 40 adopt a gap fit, and then the rotating table 11 can be fixed in the rotating slot 42 through a limiting platform. Alternatively, the locking protrusion 111 and the rotation groove 42 can be fixed through an interference fit which is not limited in this application.

[0041] In an optional embodiment, a friction structure is provided on the outer peripheral side of the mouthpiece 10 for increasing the frictional force of the mouthpiece 10 to facilitate separation or assembly of the mouthpiece 10 and the housing 40.

[0042] In an optional embodiment, the vaporizer assembly 20 includes a vapor body housing 22, an atomizer 21, an oil absorbing body 24, and a gasket assembly 23. An open second cavity is formed in the vapor body housing 22. The atomizer 21 is installed in the second cavity 211 and the gasket assembly 23 is sealed on the open end of the second cavity 211. The oil absorbing body 24 is arranged between the gasket assembly 23 and the mouthpiece 10 for absorbing the mouthpiece assembly. The condensate trap between the mouthpiece 10 and the vaporizer assembly 20 prevents the user from aspirating the condensate and thus improves the user experience. The oil-absorbing body 24 is oil-absorbing cotton made of cotton or synthetic cotton fibers.

[0043] In an optional embodiment, the gasket assembly 23 includes a second gasket 23b, a first gasket 23a, and an accommodating groove 231. The first gasket assembly 23a and the second gasket assembly 23b are respectively sealed in the second cavity 211. In the two opposite open ends, the oil absorbing body 24 is accommodated in the accommodating groove 231. The opening direction of the accommodating groove 231 faces the

mouthpiece 10, and the oil absorbing body 24 can be replaced when the mouthpiece 10 is replaced.

[0044] The vapor body housing 22 has a first open end 222 and a second open end 223 opposite to each other. The first gasket assembly 23a is installed in the first open end 222, and the second gasket assembly 23b is connected to the second open end. In the second open end 223, atomizer 21 is arranged between the first gasket assembly 23a and the second gasket assembly 23b. Preferably, both the first gasket assembly 23a and the second gasket assembly 23b are made of silica gel 341 material.

[0045] In an optional embodiment, the atomizer 21 includes a heating core and an oil storage cotton. The heating core is built in the oil storage cotton and the oil storage cotton is built in the vapor body housing 22. The second gasket assembly 23b is arranged on the heating core. The bottom end of the core is sealed with the vapor body housing 22 which is used to prevent the vapor liquid in the oil storage cotton from flowing into the electrical control assembly 30 and to support the heating core. In an optional embodiment, the vaporizer assembly 20 includes a vapor body cover 25. The vapor body cover 25 is covered on the second open end 223, and the second gasket assembly 23 b is located inside the vapor body cover 25. In an optional embodiment, the vaporizer assembly 20 includes bottom oil-absorbing cotton 26. The bottom oil-absorbing cotton 26 is arranged between the vapor body cover 25 and the second gasket assembly 23b for absorbing vapor liquid. In an optional embodiment, the electric control assembly 30 includes an electric control housing 31, a battery 33, and a microphone 32. A third cavity is formed in the electric control housing 31, the battery 33, the microphone 32, and the cigarette. The body assembly 20 is electrically connected and accommodated in the third cavity, so that the microphone 32 can control the battery 33 to provide an operating voltage to the atomizer 21.

[0046] When the user inhales through the mouthpiece 10, the microphone 32 controls the battery 33 to provide an operating voltage to the atomizer 21 under the action of the aspirated airflow, so that the atomizer 21 can absorb the vapor on the oil storage cotton or matrix. After the atomized vapor enters the mouthpiece 10 through the air outlet on the mouthpiece 10, the mouthpiece 10 can filter the vapor, and the filtered vapor is discharged from the suction port of the mouthpiece 10 where the user aspirates.

[0047] In an optional embodiment, the electrical control housing 31 includes a first housing 31a and a second housing 31b. The first housing 31a and the second housing 31b are buckled together to form the third cavity. The first housing 31a is formed with a recessed groove that constitutes the third cavity and a microphone bracket is arranged in the concave groove. The microphone 32 is installed on the microphone bracket and the battery 33 is accommodated in the concave groove. The body 31b covers the opening of the concave groove to seal the concave groove.

[0048] In an optional embodiment, the electrical control housing 31 is provided with a first through hole 311 and a second through hole 312 wherein the housing 40 is provided with a limiting hole 43 communicating with the first cavity 41. The position of a through hole 311 corresponds to the position of the limiting hole, the vaporizer assembly communicates with the second through hole 312, and the microphone 32 is arranged in the airflow channel formed between the first through hole 311 and the second through hole 312 middle.

[0049] In an optional embodiment, the electrical control assembly 30 includes a charging interface 34. The charging interface 34 is formed on the peripheral side of the electric control housing 31, and the battery 33 is electrically connected to the charging interface 34, so that the charging interface 34 can charge the battery 33.

[0050] In an optional embodiment, the electrical control assembly 30 includes a pin contacts 35. The vaporizer assembly 20 is provided with a socket hole and the pin contacts 35 is mated with the socket hole to form the connection between the vaporizer assembly 20 and the electric control assembly 30. After the electronic control assembly 30 is disassembled from the electronic cigarette, the user can charge the battery through the pin contacts 35.

[0051] It should be noted that when the electrical control assembly 30 charges the battery through the pin contacts 35, the charging interface 34 may not need to be provided, so as to reduce the components of the electric control assembly 30, thereby saving the manufacturing cost of the electric control assembly 30. The sealing performance of the third cavity in the electronic control housing 31 can be improved so that the air flow can only flow between the first through hole 311 and the second through hole 312 further ensuring the normal operation of the microphone 32. The cigarette housing 22 and the electric control housing 31 can also be made of biodegradable polyester materials which is not limited in this application.

[0052] After adopting the above technical solution, since the housing 40 is provided with the first cavity 41, the vaporizer assembly 20 and the electric control assembly 30 can be detachably accommodated in the first cavity 41 while the mouthpiece 10 can be detachably installed in the first cavity. The open end of the body 41 not only facilitates the replacement of the mouthpiece 10, but also fills the vaporizer assembly 20 with oil. For example, the mouthpiece 10 is removed from the housing 40, and then the top of the electronic cigarette is filled with oil. In addition, since the electric control assembly 30 and the vaporizer assembly 20 are electrically connected through the pin contacts 35, the electric control assembly 30 can be replaced. The battery inside the electric control assembly 30 can also be replaced. The battery can be charged through the charging interface 34. Therefore, electronic cigarette can be modularly swapped and thus repaired repeatedly for improved environmental

conversation of resources without any tools.

[0053] As seen in Fig. 1, the housing 40 is a tubular member that terminates at a mouthpiece 10. The mouthpiece 10 covers the housing 40 at the mouthpiece end of the housing 40. The air pathway 60 is formed on the mouthpiece 10 and passes through the mouthpiece air outlet 61.

[0054] As seen in Fig. 2, the housing 40 has an intake end with an electrical control assembly 30. The electrical control assembly has a housing air inlet 62 located at a first through hole 311. The first through hole 311 is circular and larger than the housing air inlet 62.

[0055] As seen in Fig. 3, the cross section of the present invention shows an electric control assembly 30 mounted before the vaporizer assembly 20, which in turn is mounted before the mouthpiece 10. The electrical control assembly 30 has an electric control housing 31 that retains a microphone 32 that senses a vibration such as air flow or tapping on the housing 40. The battery 33 receives power from a charging interface 34 and powers the vaporizer assembly 20. The battery 33 and the charging interface 34 are also mounted in the electrical control housing 31. The charging interface 34 can be a USB socket or other electrical socket.

[0056] The housing air inlet 62 receives outside air and passes it along the battery cooling air channel 63. The heat from the battery 33 transfers to the airflow. The airflow then passes across the microphone 32 and leads to the electrical control housing 31. The airflow then passes into the vaporizer assembly 20 through the vaporizer assembly air channel 64.

[0057] The vaporizer assembly 20 has a vapor body housing 22 that retains an atomizer 21. The atomizer heats liquid and vaporizes liquid to produce a stream of vapor. The atomizer 21 receives a vapor body cover 25 toward the air inlet end and a gasket assembly 23 toward the mouthpiece end. The vapor body cover 25 and the gasket assembly 23 cooperate to retain liquid in the vapor body housing 22. The vapor body housing 22 is concentric with the housing 40 and slides into the housing 40 by maintaining a smaller diameter than the housing 40. The gasket assembly 23 receives and oil absorbing body 24. The vaporizer assembly air channel 64 passes through the oral absorbing body 24 and out through the mouthpiece 10, finally exiting at the mouthpiece air outlet 61.

[0058] As seen in Fig. 4, a mouthpiece 10 has a widening portion and a narrowing portion when taken from a side cross section. The mouthpiece 10 fits over the housing 40 by a threaded attachment. The internal threads of the mouthpiece 10 engage with the external threads of the housing 40. The oil absorbing body 24 is formed as a toroidal disk and is clamped between the first gasket 23a and the second gasket 23b. The vapor body cover 25 secures to the gasket assembly 23. The first gasket has a depression that receives the oil absorbing body 24. The vapor body housing 22 has a smaller diameter than the housing 40 and fits within the housing 40.

[0059] After the mouthpiece 10 is removed from the housing 40, the vapor body cover 25 slides out along with the atomizer 21 and vapor body housing 22. Additionally, the electrical control housing 31 also slides out from the housing 40. The first through hole 311 is sized as a finger size opening that can receive a finger, a pen, pencil or other rod-shaped implement for ejecting the battery 33, the charging interface 34, the microphone 32, and all of the rest of the internal components. The vapor body cover 25 forms of partition between the vapor body housing 22 and the electrical control housing 31. The electrical control housing 31 opens and allows removal of the individual components including the charging interface 34 and the microphone 32. The vapor body housing 22 similarly allows each action of the atomizer 21 after the vapor body cover 25 is removed. Accordingly, each one of the individual parts of the electronic vaporizer can be broken down and sorted so that they can now be recycled or refurbished.

[0060] As seen in Fig. 5, the mouthpiece 10 further includes a mouthpiece grip 12 that facilitates connection to the housing 40. The external thread of the housing 40 can be formed as a rotating slot 42. The vaporizer assembly 20 slides out of the housing 40, and detaches from the electrical control assembly 30 at pin controls 35. The pin controls 35 transfer actual power from the electrical control assembly 32 the vaporizer assembly 20. The charging interface 34 similarly detaches from the electrical control assembly 30.

[0061] As seen in Figs. 6-7, the mouthpiece 10 being removed shows the housing 40 with the rotating groove 42. The rotating groove 42 includes a guide portion 421 which receives the mouthpiece. The guide portion 421 is an indentation in the shape of a groove 423 for receiving the rotating table 11 of the mouthpiece 10. The rotating table 11 rotates into the engaging portion 422 which is a narrowing of the groove 423. The first cavity 41 as the rotating groove 42 formed on it. The first cavity 41 receives the components. After the mouthpiece 10 is removed, the internal parts if they are stuck, are biased against the limiting opening 43. Since the limiting opening 43 prevents the components from exiting through the bottom of the electronic vaporizer, but the first cavity 41 is open at the top, a user can use a tool to push the internal components out from the bottom limiting opening 43.

[0062] As seen in Fig. 8, the mouthpiece 10 has a rotating table 11 which protrudes inwardly from the mouthpiece connection socket 15. The mouthpiece connection socket 15 is formed at the mouthpiece connection socket sidewall 18. The mouthpiece grip 12 has a mouthpiece grip indent 17 which allows a user to pinch the mouthpiece connection socket sidewall 18. The locking protrusion 111 is formed as a detent which is loosened when a user pinches the mouthpiece grip 12. The mouthpiece grip 12 is formed on opposite sides of the mouthpiece connection socket sidewall 18. The rotating table 11 having the locking protrusion 111 is located between the pair of mouthpiece grips 12 at 90° from each mouthpiece grip

12.

[0063] The mouthpiece 10 further includes a mouthpiece outlet 13 having a mouthpiece air flow channel 16 passing through it. The mouthpiece connection socket 15 has a mouthpiece connection shoulder 14 that adopts the mouthpiece connection socket 15 to the mouthpiece outlet 13. The rotating table 11 and the locking protrusion 111 formed on the rotating table 11 can also be formed in pairs at 180° from each other. When the rotating table 11 is formed in pairs, the mouthpiece grip 12 can also be formed in pairs and 90° from the rotating table 11 so that pinching the pair of mouthpiece grip 12 loosens the locking protrusion 111 from the rotating groove 42. The rotating table 11 slides into the engaging portion 422. When the engaging portion 422 is formed as a gentle constricting shape, it retains the rotating table 11 during normal use.

[0064] As seen in Fig. 9, the vaporizer assembly 20 can be removed from the housing 40. Vaporizer assembly 20 has a vapor body housing 22 that retains the atomizer 21. The second gasket 23b inserts into the vapor body housing 22 and retains the oil reservoir matrix 52 of the atomizer 21. The oil absorbent cotton piece 26 is inserted into a shallow well of the vapor body cover 25. The vapor body cover 25 retains the second gasket 23b against the vapor body housing 22. During normal use, the second gasket 23b has a second gasket airflow passage 65, and the oil reservoir matrix 52 has an oil reservoir matrix air passage 66.

[0065] Gasket assembly 23 includes a first gasket 23a as well as a second gasket 23b. The oil absorbing body 24 has an oil absorbing body air passage 68. The first gasket has a first gasket indent 28 that engages the vapor body housing 22. The first gasket additionally includes a first gasket inlet taper 29 which is a wider portion of the first gasket airflow passage 67. The first gasket airflow passage 67 extends from the wide portion to a narrow portion. The vapor body housing 22 also includes a second cavity 221 which catches oil in an annular trap when the electronic vaporizer is inverted, and then releases oil back into the oil reservoir matrix 52 when the electronic vaporizer is again right side up. The first gasket has a first gasket sponge socket 27. The first gasket sponge socket 27 is configured to receive the oil absorbing body 24. The first gasket 23 also has an external seal that seals the first gasket 23 eight to the housing 40. Thus, the first gasket 23 a secures the inside surface of the housing 42 to the inside surface of the vapor body housing 22. Gasket assembly 23 is preferably made of silicone for heat resistance and seal properties. The well absorbing body air passage 68 preferably has the same diameter as the first gasket airflow passage 67 and the oil reservoir matrix air passage 66 and the second gasket airflow passage 65.

[0066] As seen in Fig. 10, the vaporizer assembly 20 has a vaporizer by housing 22 with a first open end 222 and a second open and 223. The first open end 222 receives the first gasket 23 and the first gasket sponge socket 27 can be formed as an accommodating groove 231 which receives the oil absorbing body 24.

[0067] The atomizer 21 is formed of an oil reservoir housing 58. The second gasket 23 fits into the second open end 223, just as the first gasket 23 fits into the first open end 222. The vapor body cover 25 retains the oil absorbing cotton 26 against the second gasket 23b. The first gasket 23a has a first gasket airflow passage 67.

[0068] The electrical control assembly 30 can also be broken down for recycling. The battery 33 fits into battery compartment 35. The battery compartment 35 is formed between a first housing 31a and a second housing 31b. The electrical control housing 31 thus includes a first housing 31a and a second housing 31b. The first housing 31 a has a total of four rectangularly oriented compartment latches 37 each formed at a latch indent 38. The first through hole 311 passes air along the battery and through the electrical control housing 31. The compartment latch 37 latches to the second housing 31b. During recycling, a user can open the electrical control assembly 30 to recover the battery 33. The pin contacts 35 include a first pin contact 351 and a second pin contact 352. These pin contacts can be pulled out and recycled if necessary. The microphone 32 is also preferably removable without tools such as being snap fit without permanent solder. Air flows from a first through hole 311 across the battery 33 and exiting through a second through hole 312. The first through hole and the second through hole are formed on the electrical control assembly 30.

[0069] As seen in Fig. 12, the present invention can be made as a cigarette vaporizer with a removable cigarette insert not shown when a cigarette holder 53 is substituted for the mouthpiece. When completely disassembled, the electronic cigarette has multiple parts that can be recycled. A cigarette holder plug 54 detaches from the cigarette holder 53. The cigarette holder 53 similarly detaches from the oil absorbing body 24 and the first gasket 23a. The oil reservoir housing 58 separates from the oil reservoir matrix 52 and the heater core 51. The heater core 51 can be formed with an electrical resistance heater for heating oil in an oil reservoir matrix 52 or a cigarette insert. The second gasket 23b separates from the oil absorbing cotton 26. The vapor body housing 22 similarly separates from the oil reservoir housing 58.

[0070] Pin contacts 35 can be removed from the microphone retainer 57. Even the first electrical housing seal 58 can be separated from the microphone retainer 57. The battery 33 user can either pop out or slide out from a tubular first housing 31a and second housing 31b. The second electrical housing seal 59 can also be removed from the charging interface end cap 88 which is normally sealed to the electrical housing. The bottom interface sponge 55 releases from the charging interface 34 and the charging interface 34 can be removed from the charging interface end cap 88. The charging interface cover 56 is removed before use of the product, and the charging interface cover 56 can also be recycled or reused as a dust cover.

[0071] Figs. 13-15 show external views of the electronic cigarette.

[0072] As seen in the previous Figs. 1-15, the external view shows the housing 40 which has a thicker sidewall than the vapor body housing 22 sidewall. The housing 40 provides the structural support for the internal parts. Thus, a vast majority of the structural support in terms of both volume and mass is in the housing 40 and is biodegradable. The housing 40 is formed as an external sleeve that receives a pair of internal sleeves. The first internal sleeve is the vapor body housing 22 and the second internal sleeve is the electrical control housing 31. A third pin contact can extend from the electrical control assembly 34 connection to the vaporizer assembly 20. The third pin contact can be a ground, and the first pin and second pin can be a positive and negative contact. The three pin contacts preferably insert into the electrical control assembly 34 such that the electrical control assembly 34 has three pin receiving openings for bridging the electrical connections.

[0073] Because of the modular sleeve structure architecture of the electronic vaporizer, during use, the user can recharge the battery through the USB connection and replace or recycle the inner battery without tools. The vapor body housing can also be removed for cleaning, recycling, or replacement. Finally, the housing 40 is easy to recycle as its sleeve structure allows it to be quickly removable and separated from other components.

REFERENCE NUMBER LIST

[0074]

10	mouthpiece
11	rotating table
111	locking protrusion
12	mouthpiece grip
13	mouthpiece outlet
14	mouthpiece connection shoulder
15	mouthpiece connection socket
16	mouthpiece airflow channel
17	mouthpiece grip indent
18	mouthpiece connection socket sidewall
20	vaporizer assembly
21	atomizer
22	vapor body housing
221	second cavity
222	first open end
223	second open end
224	second cavity
23	gasket assembly
23a	first gasket
23b	second gasket
231	accommodating groove
24	oil absorbing body
25	vapor body cover
26	oil-absorbing cotton
27	first gasket sponge socket
28	first gasket indent
29	first gasket inlet taper
30	electrical control assembly
31	electrical control housing
31a	first housing
31b	second housing
311	first through hole
312	second through hole
32	microphone
33	battery
34	charging interface
341	silica gel
35	pin contacts
351	first pin contact
352	second pin contact
36	battery compartment
37	compartment latch
38	latch indent
40	housing
41	first cavity
42	rotating groove
421	guide portion
422	engaging portion
423	recessed structure
43	limiting opening
51	heater core
52	oil reservoir matrix
53	cigarette holder
54	cigarette holder plug
55	bottom interface sponge
56	charging device cover
57	microphone retainer
58	oil reservoir housing
59	second electrical housing seal
60	air pathway
61	mouthpiece air outlet
88	charging interface endcap

Claims

1. An electronic cigarette comprising:

a. a mouthpiece (10), wherein the mouthpiece (10) has a mouthpiece connection socket (15);

b. a housing (40), wherein the mouthpiece (10) connects to the housing (40) at the mouthpiece connection socket (15), wherein the housing (40) has a first cavity (41);

c. a vaporizer assembly (20), wherein the vaporizer assembly (20) has a vapor body housing (22) that slides into the housing (40), wherein the vapor body housing (22) houses an atomizer (21), wherein the vapor body housing (22) is formed as a tube;

d. a gasket assembly (23), wherein the gasket assembly (23) includes a first gasket (23a) and a second gasket (23b), wherein the vapor body

housing (22) receives the gasket assembly (23); and

e. an electrical control assembly (30), wherein the electrical control assembly (30) is mounted in the first cavity (41), wherein the vaporizer assembly (20) is mounted between the mouthpiece (10) and electrical control assembly (30), wherein the electrical control assembly (30) supplies a working voltage to the vaporizer assembly (20), wherein the vaporizer assembly (20) produces a vapor that can flow to the mouthpiece (10) component, according to the electrical control assembly (30) slides into the housing (40).

2. The electronic cigarette of claim 1, wherein the housing (40) is made of a biodegradable polyester material.

3. The electronic cigarette of claim 1 or 2, wherein at least one of the parts, namely the mouthpiece (10), vaporizer assembly (20), gasket assembly (23), or electrical control assembly (30) are magnetically connected to the housing (40).

4. The electronic cigarette of one of the preceding claims, wherein at least one of the parts, namely the mouthpiece (10), vaporizer assembly (20), gasket assembly (23), or electrical control assembly (30) are snap fit to the housing (40).

5. The electronic cigarette of one of the preceding claims, wherein at least one of the parts, namely the mouthpiece (10), vaporizer assembly (20), gasket assembly (23), or electrical control assembly (30) are connected together by interference fit.

6. The electronic cigarette of one of the preceding claims, wherein the mouthpiece (10) assembly has a mouthpiece connection socket (15) that fits over the housing (40), wherein the mouthpiece connection socket (15) further includes a rotating table (11) that protrudes from the mouthpiece connection socket (15), wherein the mouthpiece connection socket (15) is formed at a mouthpiece connection socket sidewall (18), wherein the housing (40) has a rotating slot that receives the rotating table (11).

7. The electronic cigarette of claim 6, wherein the rotating groove (42) further includes a guide portion (421) that receives the rotating table (11) during an insertion motion, then an engaging portion (422) formed as a groove that receives the rotating table (11) during a rotation motion, wherein the engaging portion (422) locks the rotating table (11) in place during use.

8. The electronic cigarette of claim 6 or 7, wherein the mouthpiece (10) has a pair of grips, wherein a user can squeeze the pair of groups for loosening the rotating table (11) from the rotating slot.

9. The electronic cigarette of one of the preceding claims, wherein the vaporizer assembly (20) further comprises an oil absorbing body (24), wherein the first gasket (23a) further includes a first gasket sponge socket (27), wherein the first gasket sponge socket (27) is configured to receive the oil absorbing body (24).

10. The electronic cigarette of one of the preceding claims, wherein the first gasket (23a) fits into the vapor body housing (22), and the second gasket (23b) fits into the vapor body housing (22), wherein the first gasket (23a) also forms a seal between the first gasket (23a) and the housing (40), wherein the first gasket (23a) has a first gasket (23a) airflow passage through the first gasket (23a), wherein the second gasket (23b) has a second gasket (23b) airflow passage through the second gasket (23b), and wherein the oil reservoir matrix (52) has an oil reservoir matrix (52) air passage through the oil reservoir matrix (52).

11. The electronic cigarette of one of the preceding claims, wherein the electrical control assembly (30) includes an electrical control assembly (30) housing (40) formed of a first electrical control assembly (30) housing (40) portion and a second electrical control assembly (30) housing (40) portion, wherein the first electrical control assembly (30) housing (40) portion meets with the second electrical control assembly (30) housing (40) portion to enclose, a battery (33), and a microphone (32), and wherein electrical control assembly (30) housing (40) fits inside the housing (40),

12. The electronic cigarette of claim 11, wherein the electrical control assembly (30) housing (40) has a first through hole (311) and a second through hole (312), wherein a battery (33) cooling air channel passes along the battery (33) beginning at the first through hole (311) and ending at the second through hole (312).

13. The electronic cigarette of claim 11 or 12, wherein the electrical control assembly (30) further includes a pair of pin contacts (35), wherein the pair of pin contacts (35) electrically connect the vaporizer assembly (20) to the electrical control assembly (30).

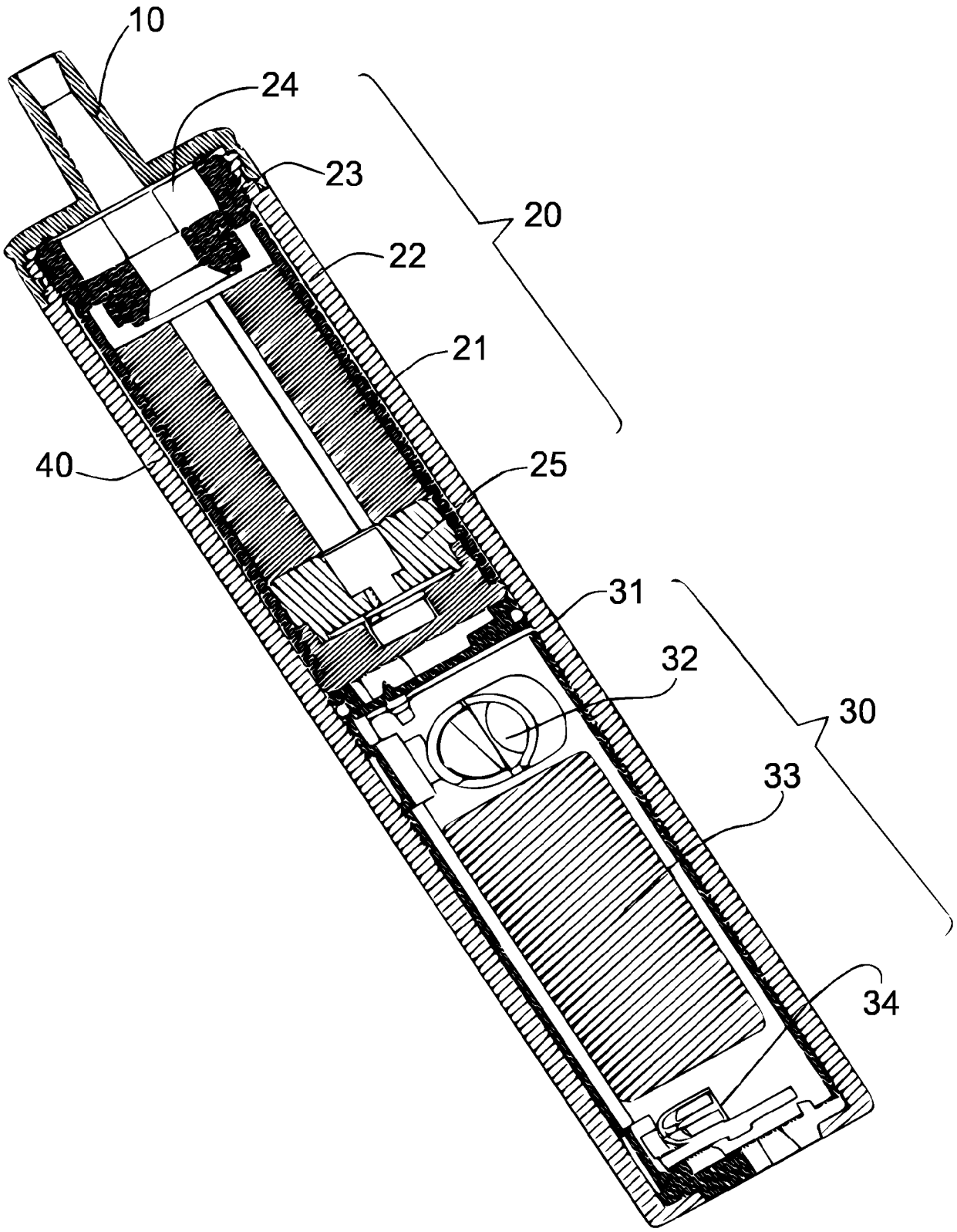

Fig. 1

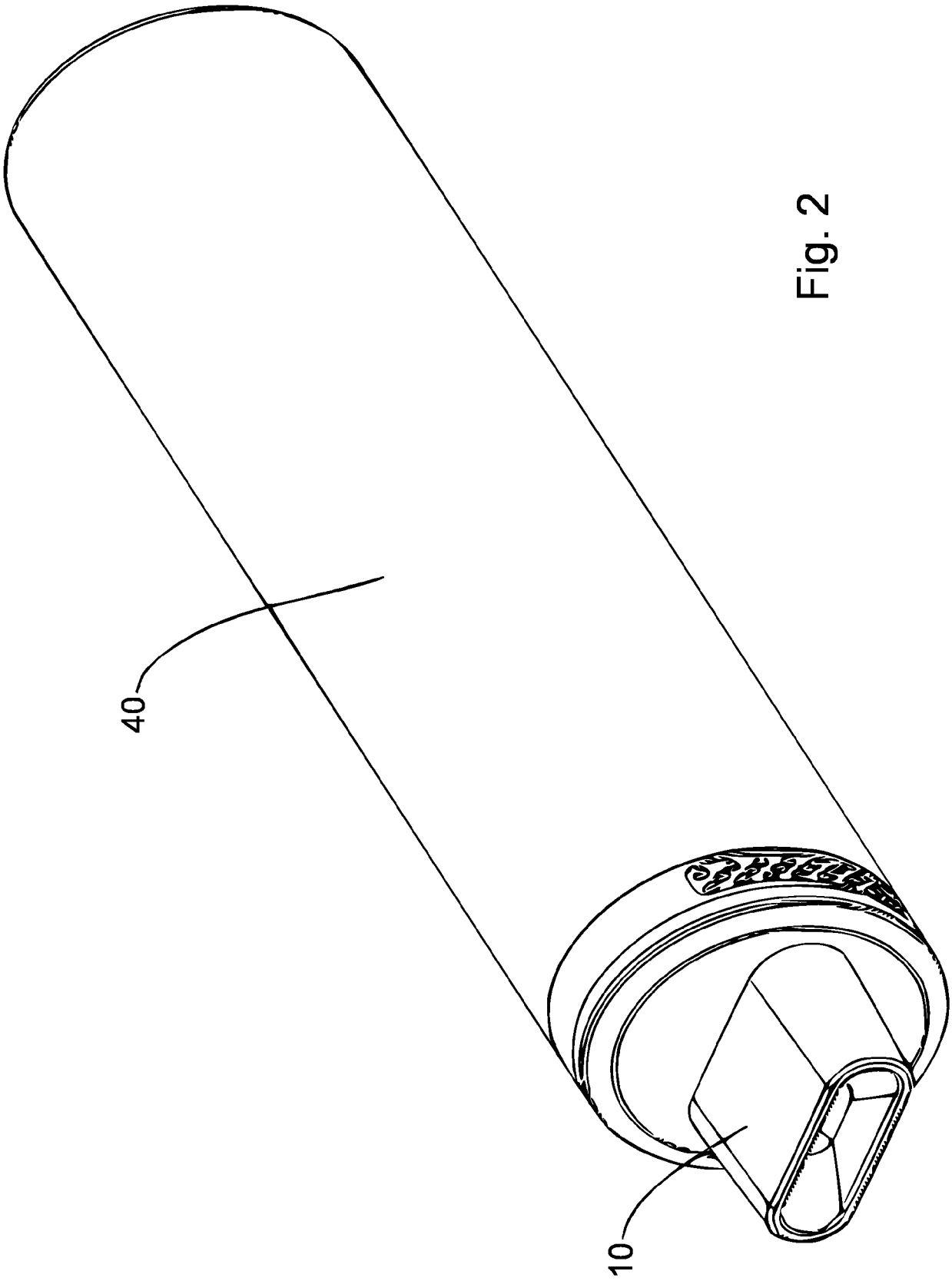

Fig. 2

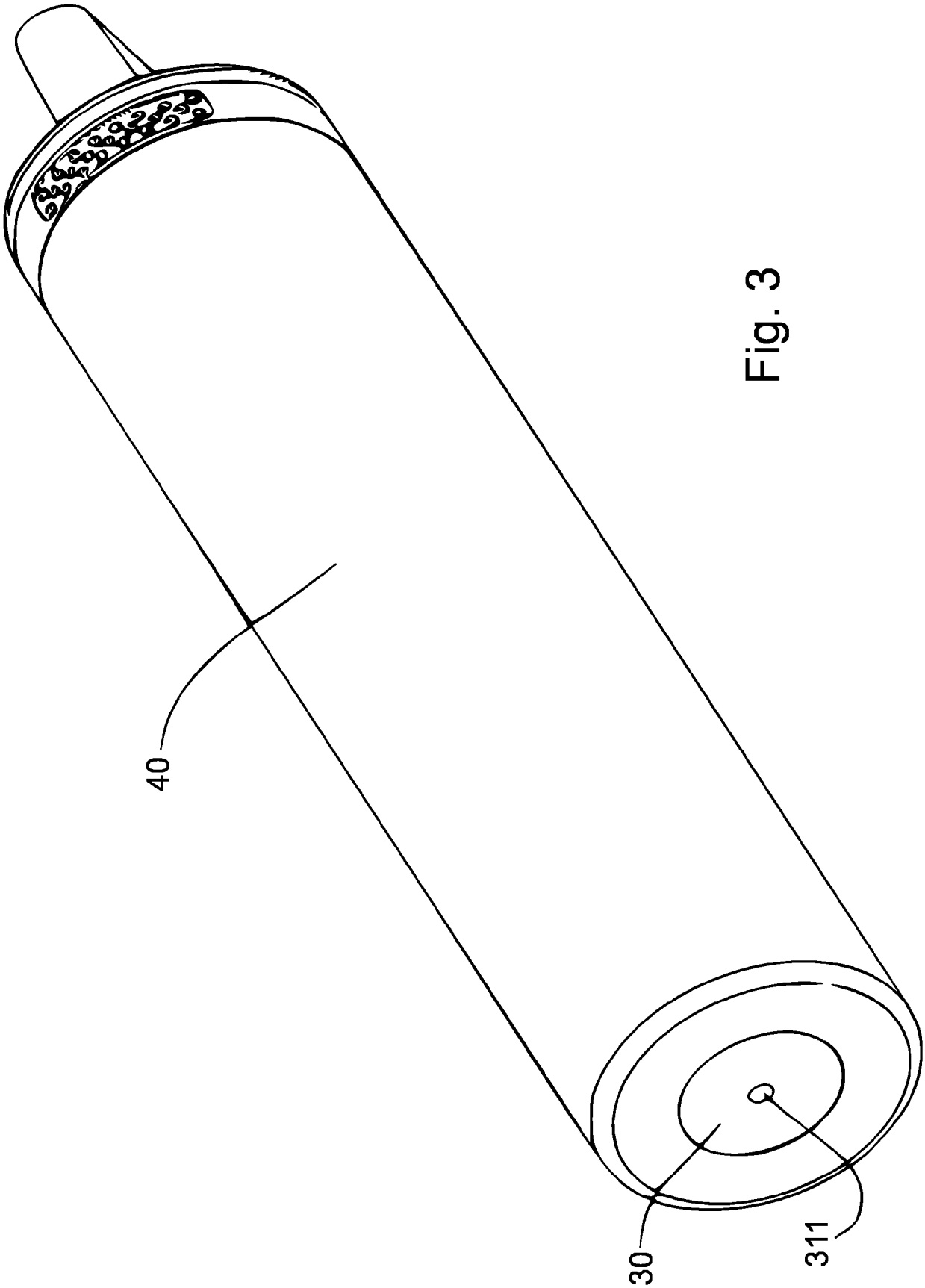

Fig. 3

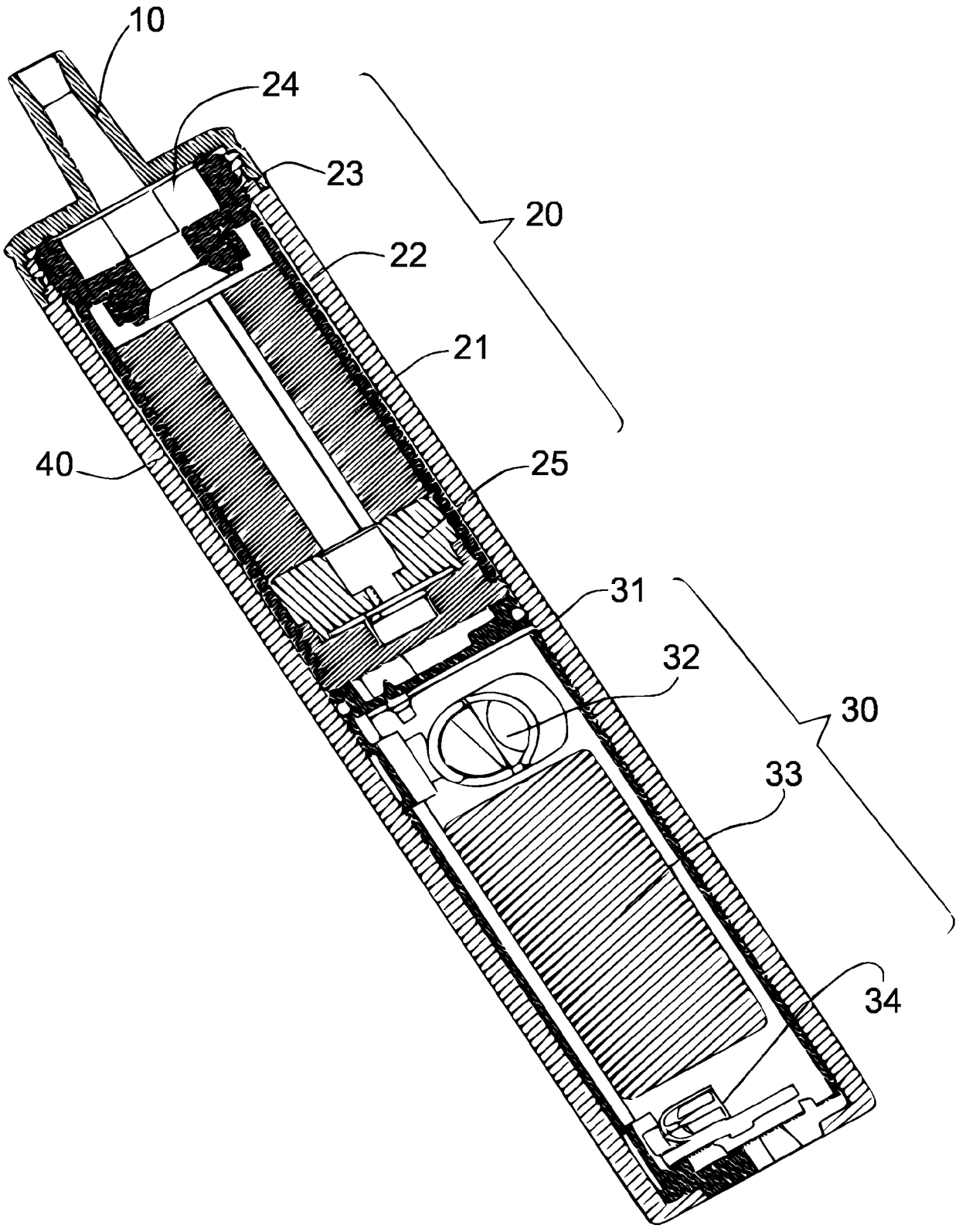

Fig. 4

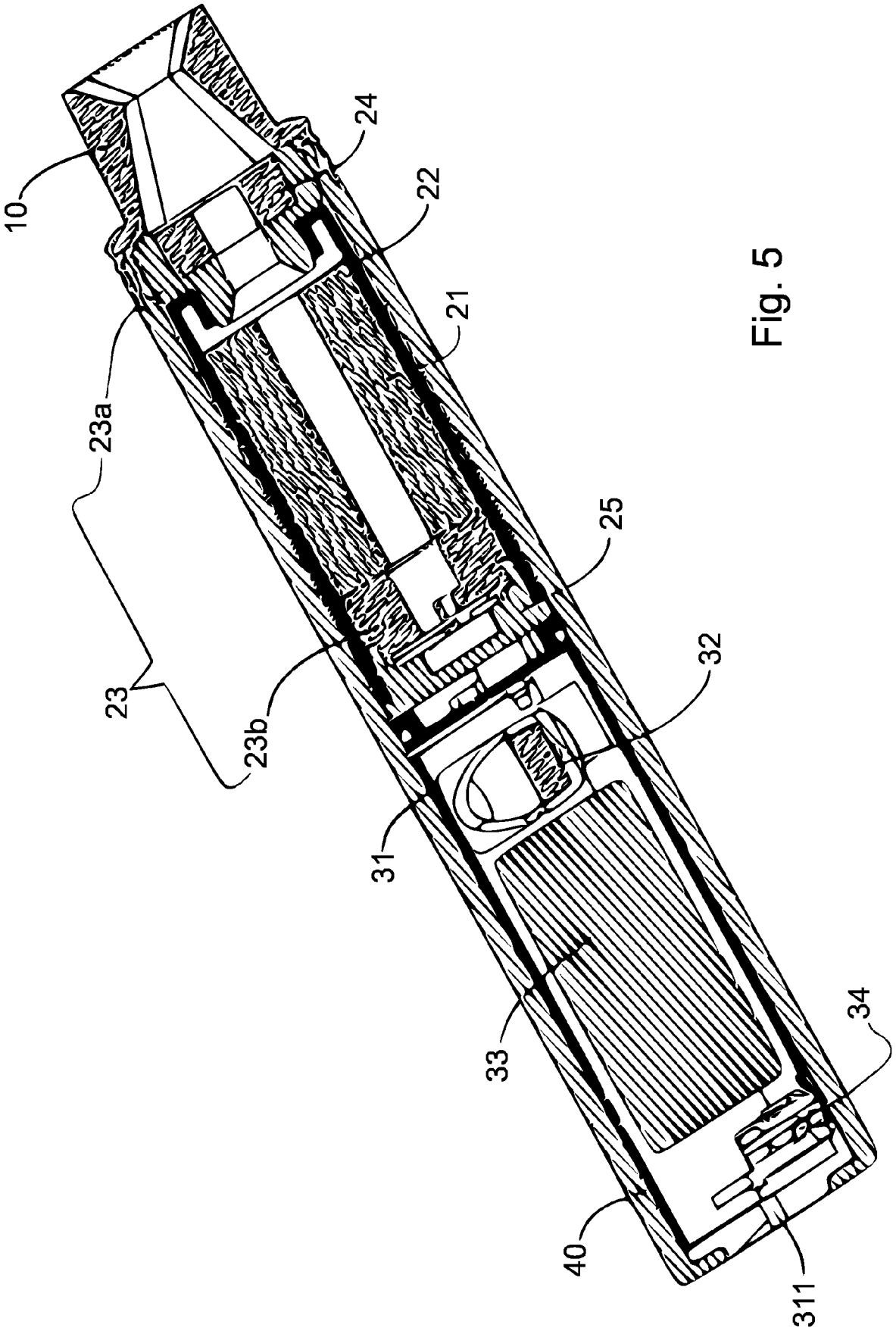

Fig. 5

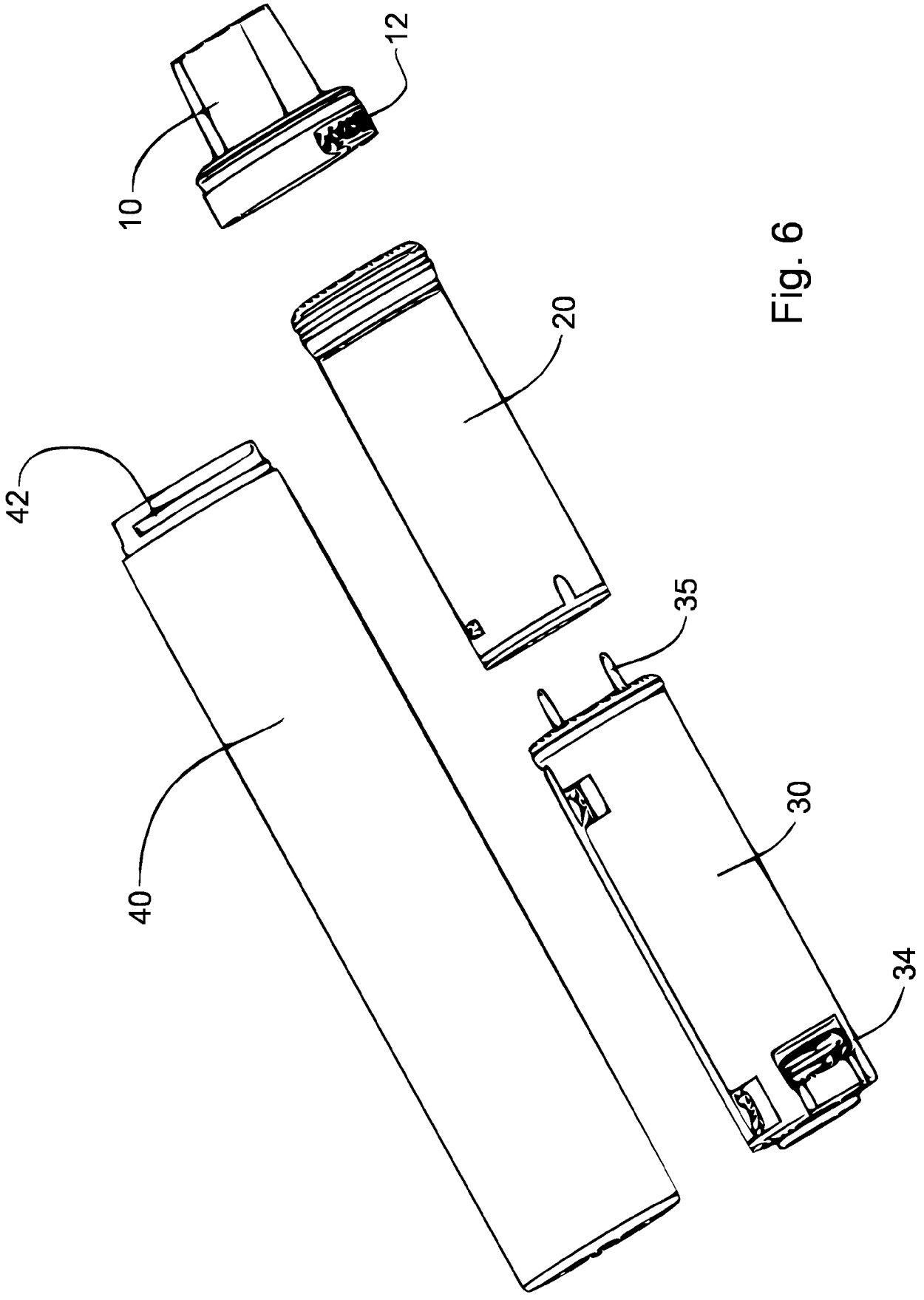

Fig. 6

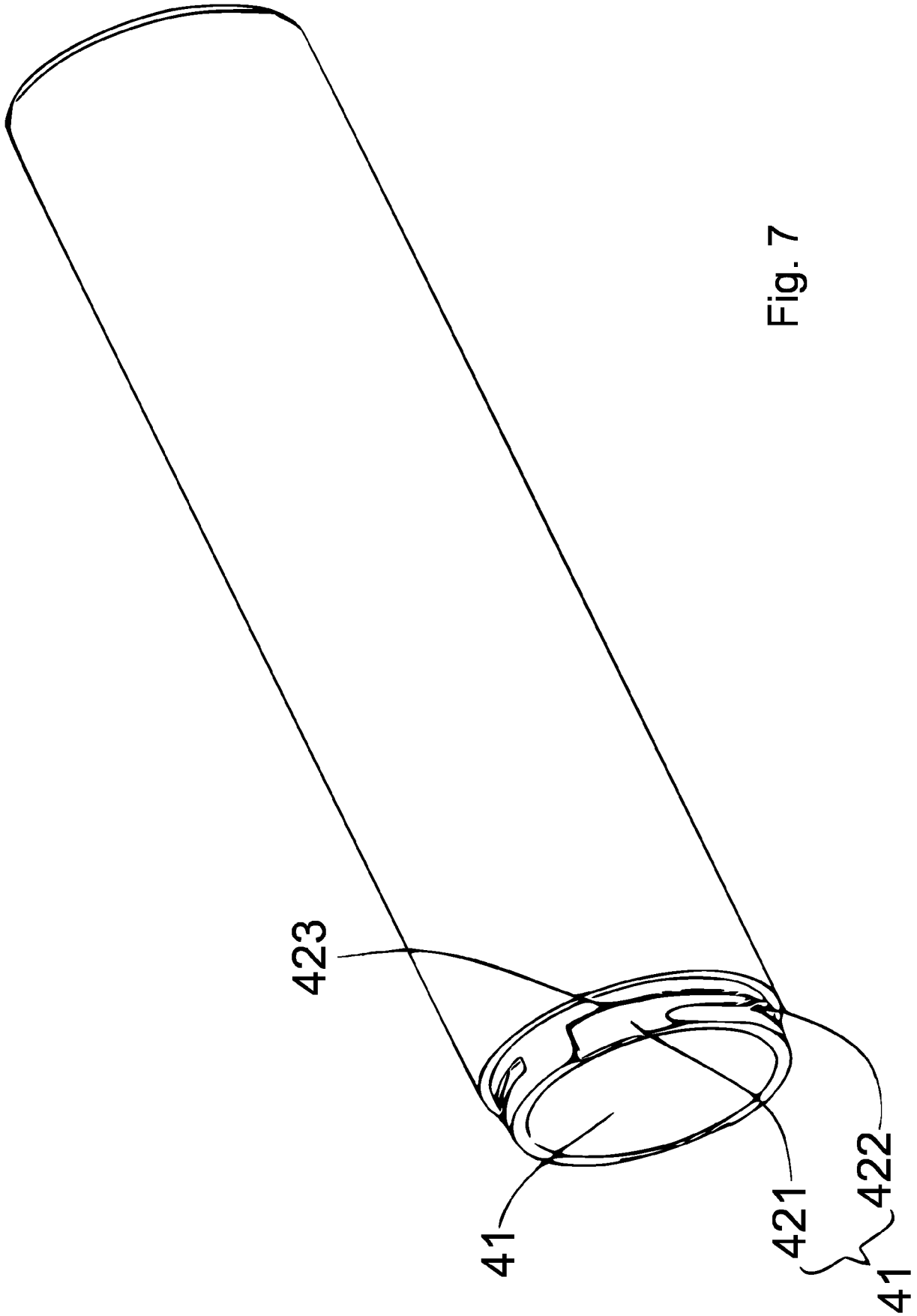

Fig. 7

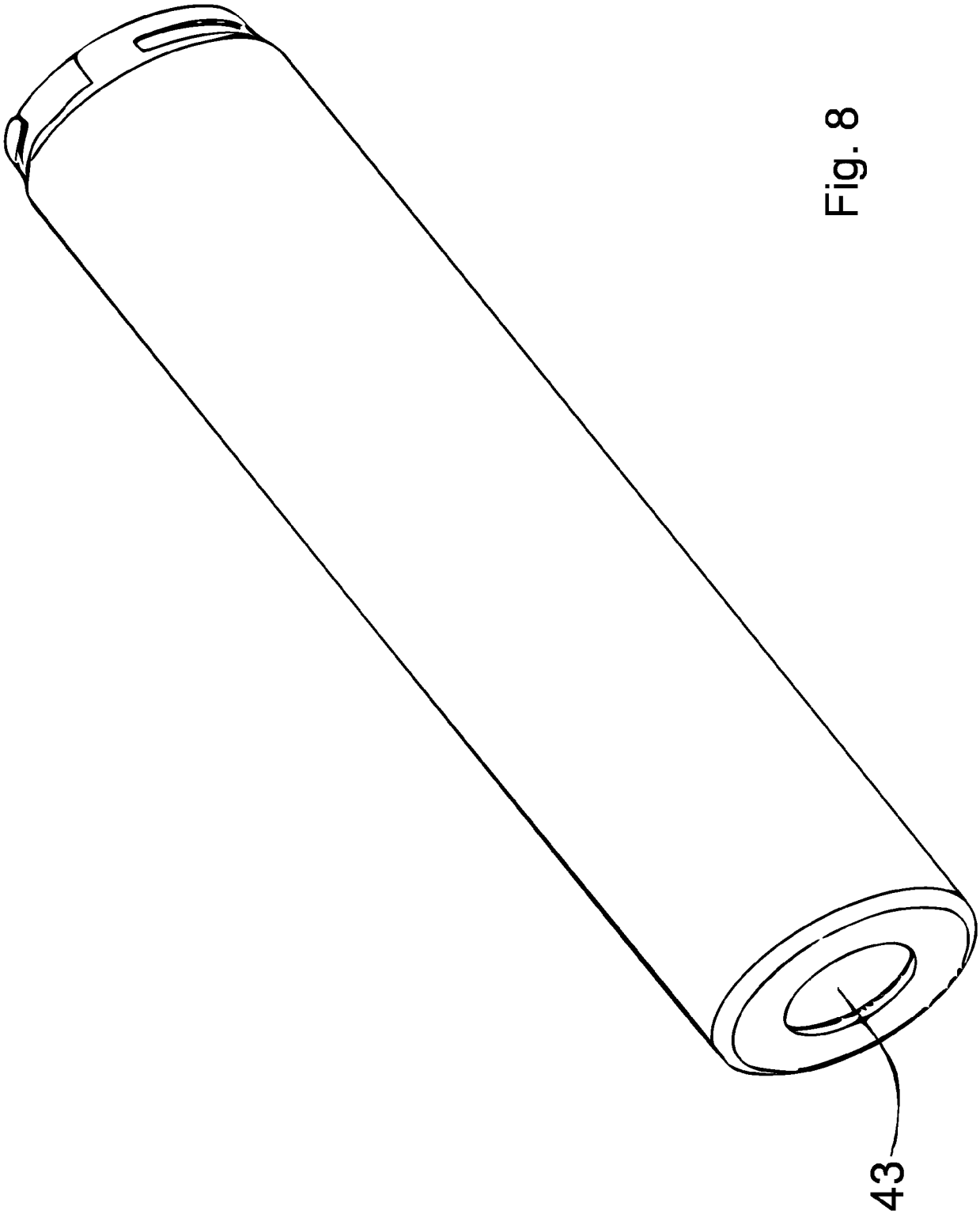

Fig. 8

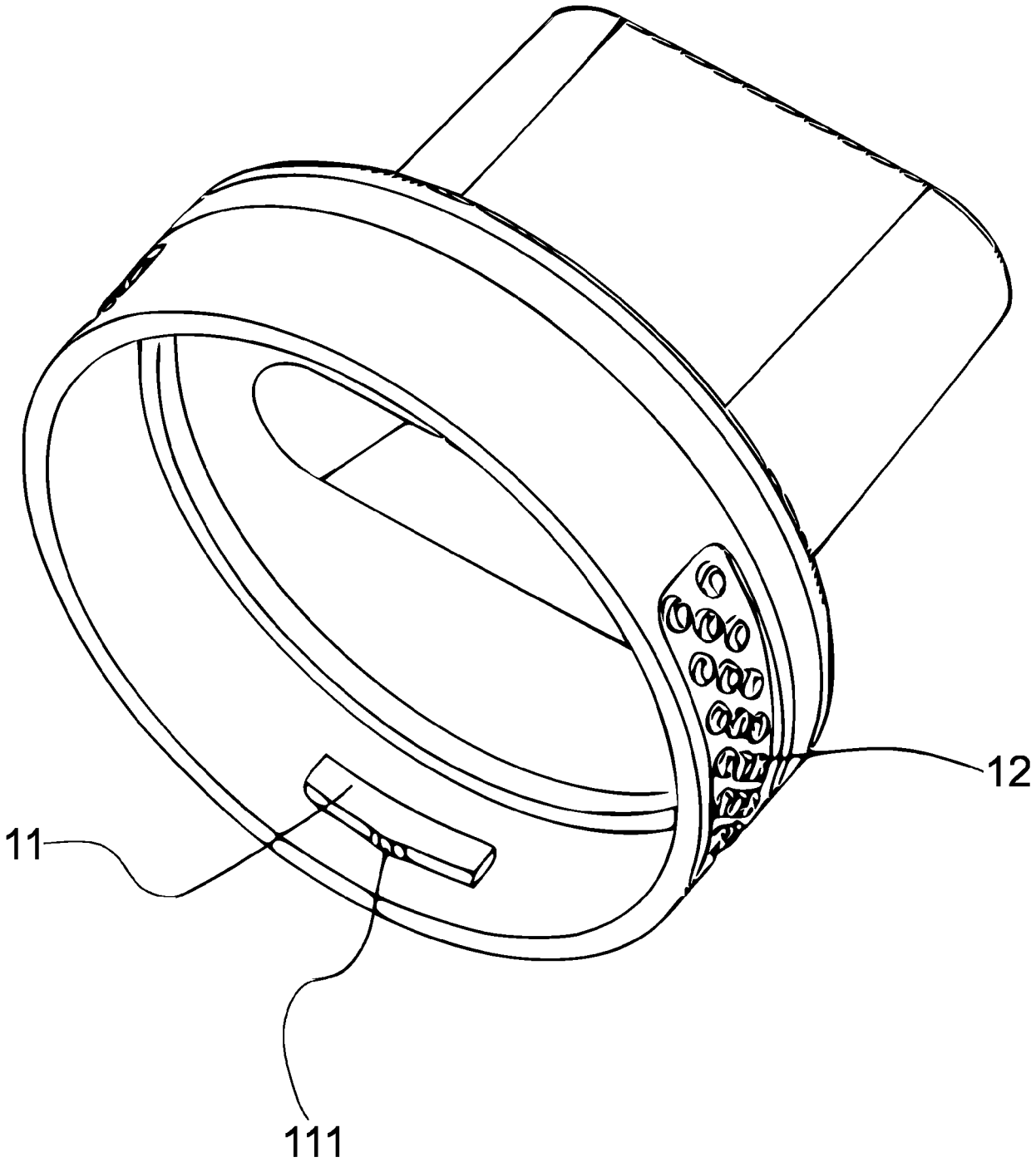

Fig. 9

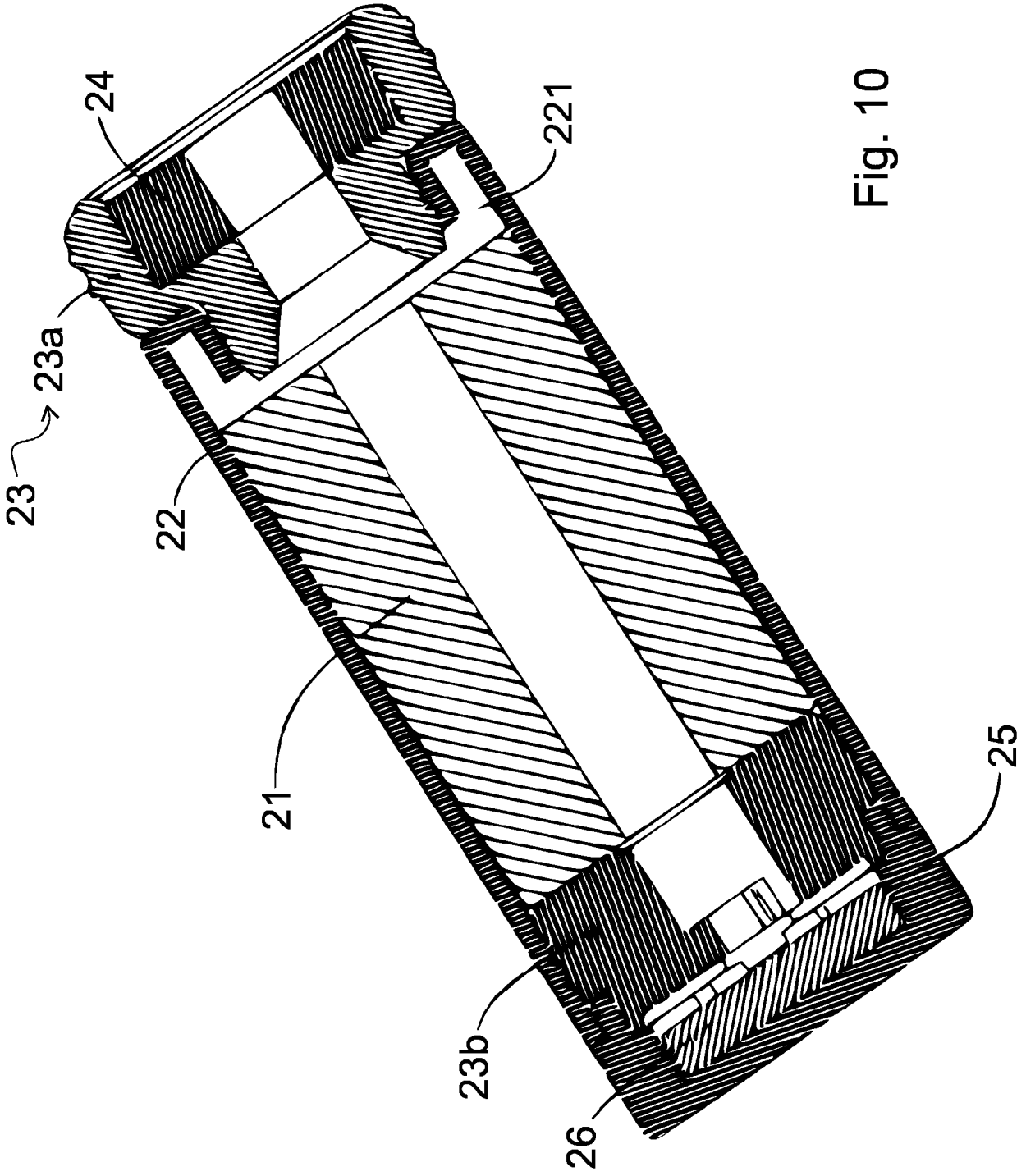

Fig. 10

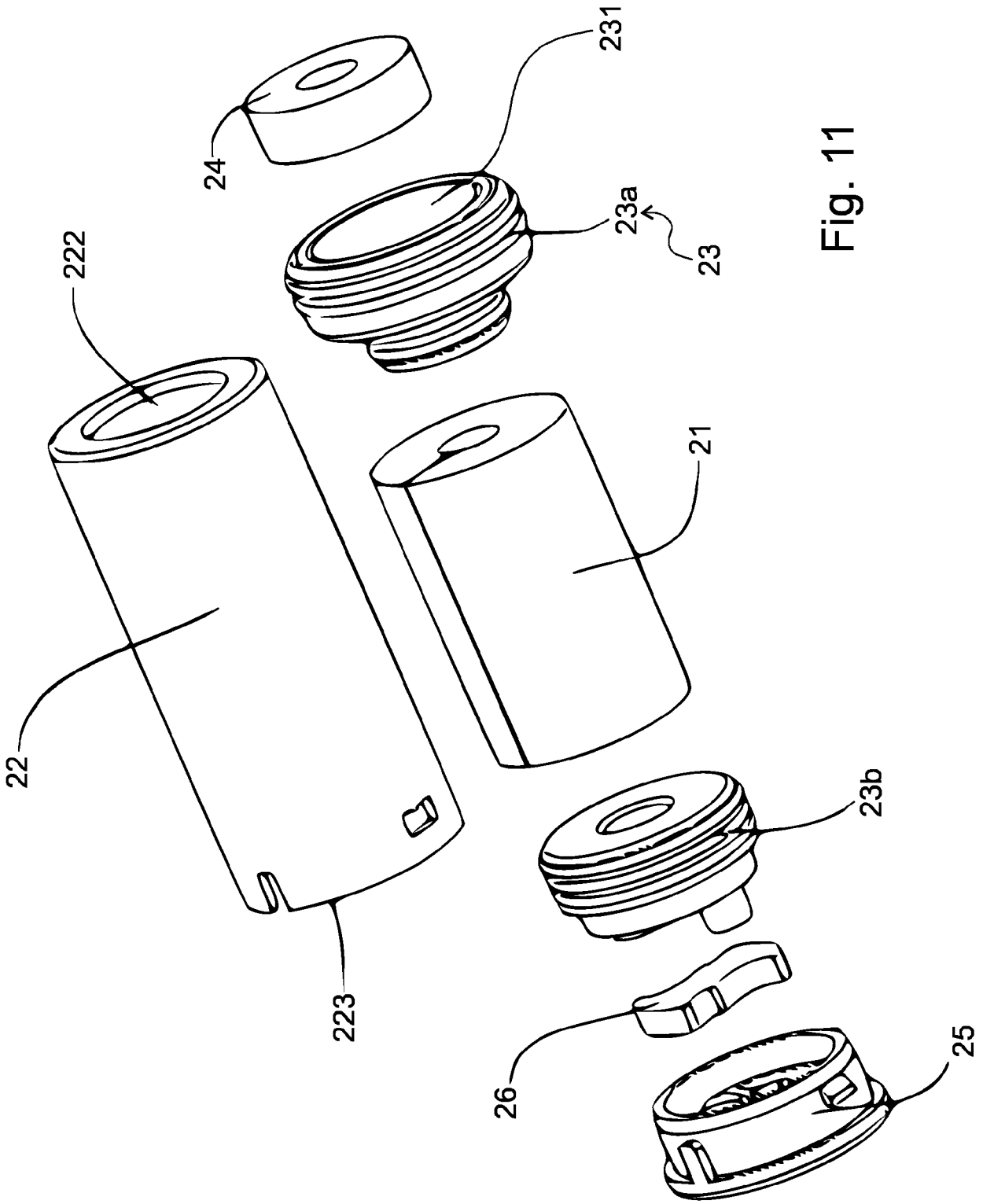

Fig. 11

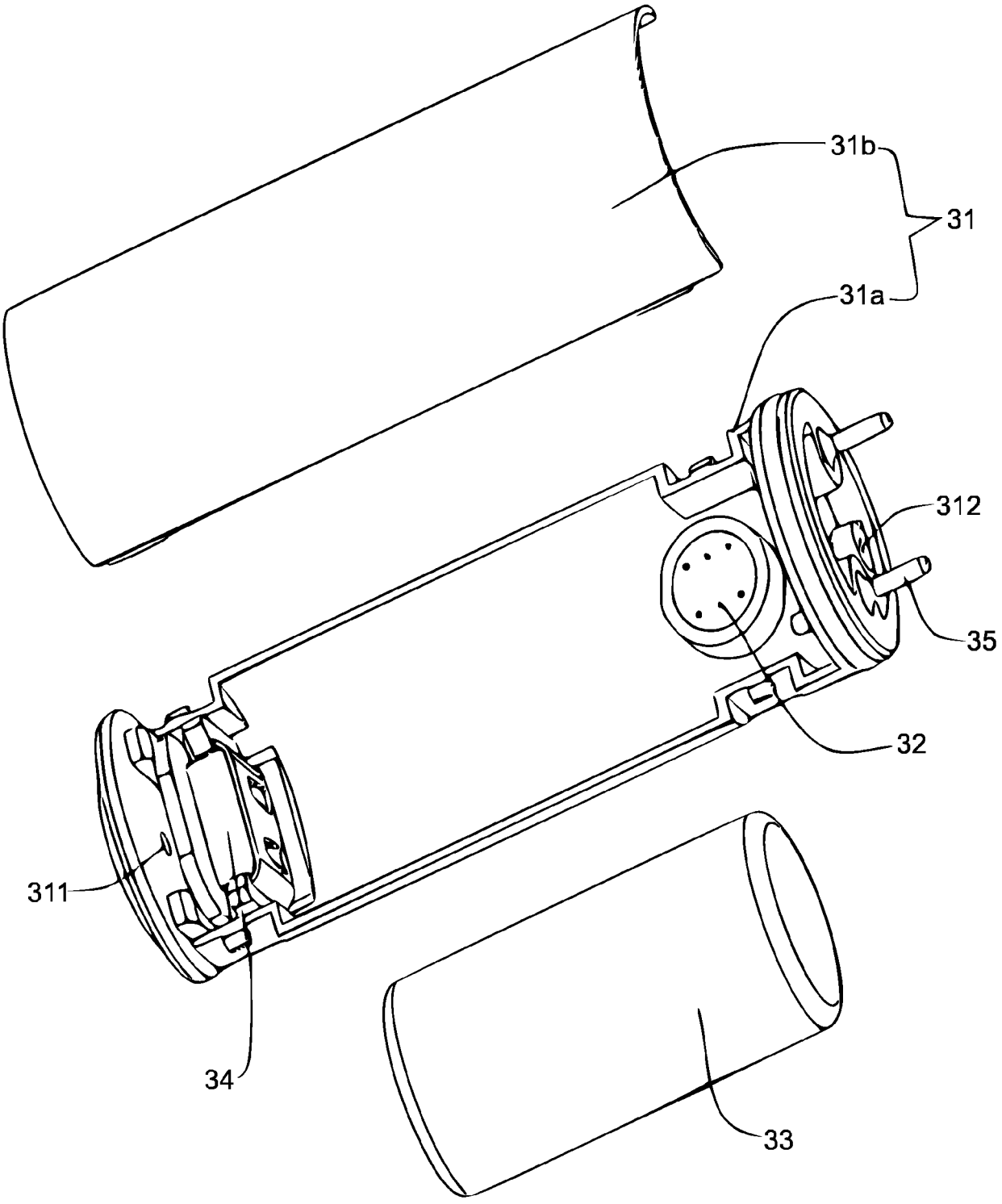

Fig. 12

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Application Number
EP 23 17 3652

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The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
Munich	7 November 2023	Alaguero, Daniel

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