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(54) ELECTRONIC CIGARETTE

(57) An electronic cigarette includes an e-liquid extruder. The e-liquid extruder includes an e-liquid tank, a piston, a push rod, and a motor. The piston is disposed in a bottom opening of the e-liquid tank. The push rod includes an inner wall with a female thread and the rotor includes an outer wall with a male thread. The male thread corresponds to the female thread. The piston is disposed on the push rod; when the motor is energized and rotates, the push rod moves upward to extrude e-liquid out of the e-liquid tank.

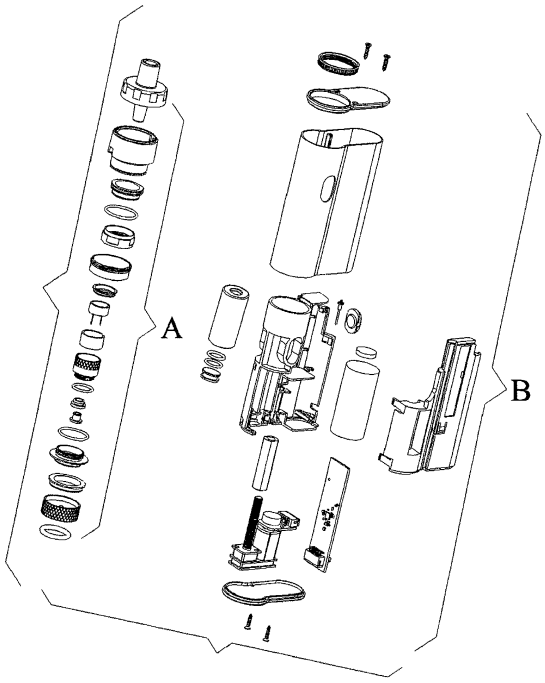


FIG. 1

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Description

[0001] The disclosure relates to an electronic cigarette.

[0002] The heating elements of conventional electronic cigarettes are immersed in the e-liquid. If the e-liquid is not used up for a long time, the quality of the e-liquid will be adversely affected.

[0003] The disclosure provides an electronic cigarette comprising an e-liquid extruder; the e-liquid extruder comprises an e-liquid tank, a piston, a push rod, and a motor; the piston is disposed in a bottom opening of the e-liquid tank; the push rod comprises an inner wall with a female thread and the rotor comprises an outer wall with a male thread; the male thread corresponds to the female thread; the piston is disposed on the push rod; when the motor is energized and rotates, the push rod moves upward to extrude e-liquid out of the e-liquid tank.

[0004] The electronic cigarette further comprises an atomizing assembly and a battery assembly; the battery assembly comprises a passage; the e-liquid extruder is disposed in the battery assembly; both the e-liquid tank and the atomizing assembly are disposed in the passage; and the atomizing assembly is disposed on the e-liquid tank.

[0005] The atomizing assembly comprises a heating assembly comprising a heating element; the heating assembly is fixed in the atomizing assembly; the atomizing assembly further comprises an e-liquid conduction channel communicating with a bottom portion of the heating element.

[0006] The heating element is in the shape of a bowl; the heating element comprises a first through hole disposed on the bottom portion and communicating with the e-liquid conduction channel; the heating element further a bottom surface, a peripheral wall, and a plurality of heating wires disposed on the bottom surface and/or the peripheral wall.

[0007] The heating assembly further comprises a first silicone ring and a base; the heating element is disposed in the first silicone ring to atomize the e-liquid; the first silicone ring is disposed between the heating element and the base to prevent leakage of the e-liquid.

[0008] The first silicone ring and the base each are a concave member comprising a bottom wall and each bottom wall comprises a second through hole; both the first through hole and the second through hole are a part of the e-liquid conduction channel; the heating assembly further comprises a plurality of metal wires spirally disposed on an inner surface of the heat element.

[0009] The heating assembly further comprises a joint comprising a third through hole; the e-liquid tank comprises a top portion comprising an e-liquid outlet; the e-liquid outlet and through holes of the heating element, the first silicone ring, the base, and the joint are disposed on a vertical line and communicate with each other; the e-liquid is extruded out of the e-liquid tank, flows through the e-liquid conduction channel, into the heating element, and is atomized to produce smoke or vapor.

[0010] The heating assembly further comprises a positive pin, a negative pin, and an insulating ring; the insulating ring is disposed in the second through hole of the base to isolate the positive pin and the negative pin; the joint is disposed in a fourth through hole of the insulating ring and contacts the positive pin and the negative pin for electronic conducting.

[0011] The e-liquid outlet is disposed under the atomizing assembly and communicates with the e-liquid conduction channel; the piston is movable in the e-liquid tank to extrude the e-liquid out of the e-liquid outlet; the e-liquid flows through the e-liquid conduction channel and enters the heating element, and is atomized to produce smoke and vapor.

[0012] The battery assembly comprises a battery, a power supply board, and a control board; the battery is disposed on an input terminal of the power supply board; the control board is disposed on the motor to control the rotational speed of the motor, thereby adjusting the amount of the e-liquid flowing out of the e-liquid tank; an output terminal of the power supply board is connected to the control board to energize the motor and the control board.

[0013] The battery assembly further comprises a screen board comprising a screen; the screen board is disposed in the battery assembly with the screen exposed outside the battery assembly to display the electrical parameters and function information of the electronic cigarette.

[0014] The battery assembly further comprises a power button, a regulation button, and a switch button; the power button is configured to turn on a power supply of the electronic cigarette, thus controlling the heating element and the motor to work; the switch button is configured to switch between a power control mode and a motor-controlled e-liquid supply mode; the regulation button is configured to adjust the two working modes; when the electronic cigarette works in the power control mode, the regulation button is configured to adjust the power, thereby adjusting the amount of heat generated by the heating element; when the electronic cigarette works in the motor-controlled e-liquid supply mode, the regulation button is configured to adjust a rotational speed of the motor.

[0015] The battery assembly further comprises a sensor disposed on the screen board; when external air is sucked into the electronic cigarette, the sensor detects air flow to control the amount of the e-liquid supplied.

[0016] The atomizing assembly further comprises a housing and a mouthpiece disposed on a top portion of the housing; the external air flows through an air inlet of the battery assembly into the atomizing assembly, causing the heating element to atomize the e-liquid; the smoke or vapor generated flows through the mouthpiece and is inhaled by a user.

[0017] The e-liquid extruder further comprises a seal ring disposed between the piston and the e-liquid tank to prevent the e-liquid from flowing out of the bottom opening of the e-liquid tank.

[0018] In a class of this embodiment, the piston is disposed on one end of the push rod.

[0019] In a class of this embodiment, one end of the push rod is secured to a bottom surface of the piston; when the motor rotates in reverse, the rotor rotates in a reverse direction as well, pulling the push rod to move toward the bottom opening of the e-liquid tank; and thus the e-liquid tank is filled with the e-liquid.

[0020] The battery assembly further comprises a bracket; the e-liquid extruder is fixed in the bracket; the bracket comprises a hollow column functioning as the passage of the battery assembly; and the e-liquid tank is disposed in the hollow column.

[0021] The following advantages are associated with the electronic cigarette of the disclosure:

1. The electronic cigarette comprises the e-liquid extruder in which the motor rotates and the piston is thus pushed into the e-liquid tank, thereby extruding the e-liquid into the heating element for atomization.

2. In conventional electronic cigarettes, the e-liquid is often attached to the heating elements for a long period of time, which affects the quality and taste of the e-liquid. The e-liquid extruder comprises the control board configured to adjust the rotational speed of the motor, thereby controlling the amount of the e-liquid flowing out of the e-liquid outlet into the heating element.

3. The electronic cigarette comprises the power button, the switch button, the regulation button, and the screen. The power button is configured to turn on and off the electronic cigarette. The switch button is configured to switch between a power control mode and a motor-controlled e-liquid supply mode and the regulation button is configured to adjust the two working modes. The screen is configured to display the electrical parameters and function information of the electronic cigarette.

4. The electronic cigarette comprises the sensor configured to detect air flow for control of the amount of the e-liquid supplied.

5. When the motor rotates in reverse, the piston is pulled to the bottom opening of the e-liquid tank, so that the e-liquid tank can be repeatedly filled with the e-liquid.

FIG. 1 is an exploded view of an electronic cigarette according to Example 1 of the disclosure;

FIG. 2 is an exploded view of an atomizing assembly according to Example 1 of the disclosure;

FIG. 3 is an exploded view of a battery assembly according to Example 1 of the disclosure;

FIG. 4 is a perspective view of an electronic cigarette according to Example 1 of the disclosure;

FIG. 5 is a cross-sectional view of an electronic cigarette according to Example 1 of the disclosure;

FIG. 6 is an exploded view of an electronic cigarette according to Example 2 of the disclosure;

FIG. 7 is an exploded view of an atomizing assembly according to Example 2 of the disclosure;

FIG. 8 is an exploded view of a battery assembly according to Example 2 of the disclosure;

FIG. 9 is a perspective view of an electronic cigarette according to Example 2 of the disclosure;

FIG. 10 is a cross-sectional view of an electronic cigarette according to Example 2 of the disclosure;

FIG. 11 is a cross-sectional view including arrows showing the direction of e-liquid flowing into the e-liquid tank according to Example 2 of the disclosure; and

FIG. 12 is a cross-sectional view including arrows showing the direction of airflow and smoke according to Example 2 of the disclosure.

[0022] In the drawings, the following reference numbers are used: 1. Mouthpiece; 2. First housing; 3. Compression member; 4. First seal ring; 5. Threaded base; 6. Threaded sleeve; 7. Atomizing cover; 8. Heating element; 9. First silicone ring; 10. Base; 11. Second seal ring; 12. Insulating ring; 13. Joint; 14. Third seal ring; 15. Fixing base; 16. Insulating member; 17. Connecting base; 18. Fourth seal ring; 19. First screw; 20. Threaded ring; 21. First cover; 22. Second housing; 23. E-liquid tank; 24. Fifth seal ring; 25. Piston; 26. Bracket; 27. Electrode; 28. Power button; 29. EVA foam gasket; 30. Battery; 31. Bracket cover; 32. Push rod; 33. Motor; 33-1. Rotor; 33-2. Control board; 34. Power supply board; 35. Second cover; 36. Second screw; 37. Screen bracket; 38. Screen board; 38-1. Sensor; 39. Regulation button; and 40. Switch button.

[0023] To further illustrate, embodiments detailing an electronic cigarette are described below. It should be noted that the following embodiments are intended to describe and not to limit the disclosure.

Example 1

[0024] Referring to FIGS. 1-5, an electronic cigarette comprises an e-liquid extruder, an atomizing assembly A, and a battery assembly B. The atomizing assembly A comprises a mouthpiece 1, a first housing 2, a compression member 3, a First seal ring 4, a threaded base 5, a

threaded sleeve 6, an atomizing cover 7, a heating element 8, a first silicone ring 9, a base 10, a second seal ring 11, an insulating ring 12, a joint 13, a third seal ring 14, a fixing base 15, an insulating member 16, a connecting base 17, and a fourth seal ring 18. The heating element 8 is disposed in the first silicone ring 9 to atomize e-liquid. The first silicone ring 9 is disposed between the heating element 8 and the base 10 to prevent leakage of the e-liquid. The atomizing cover 7 abuts against a top edge of the base 10 to fasten the heating element 8 on the base 10. The base 10 comprises a bottom portion and a first through hole is disposed on the bottom portion. The heating element 8 comprises a bottom portion, an e-liquid inlet, a positive pin and a negative pin. The e-liquid inlet is disposed on the bottom portion of the heating element 8. The insulating ring 12 is disposed in the first through hole to isolate the positive pin and the negative pin. The insulating ring 12 comprises a bottom surface and a second through hole is disposed on the bottom surface. The joint 13 is disposed in the second through hole and contacts the two pins for electrical conducting. The second seal ring 11 is disposed between the base 10 and the fixing base 15. The base 10 is disposed into the fixing base 15. The insulating member 16 is disposed in the connecting base 17 to prevent short circuit caused by contact between the fixing base 15 and the connecting base 17. The fourth seal ring 18 is disposed between the connecting base 17 and an e-liquid tank 23 to prevent leakage of the e-liquid. The third seal ring 14 is disposed on the fixing base 15. The threaded base 5 is screwed into the fixing base 15 and abuts against the third seal ring 14. The threaded sleeve 6 is disposed around the threaded base 5 to form a gap and the first housing 2 is disposed in the gap. The First seal ring 4 is disposed on the compression member 3 and the compression member 3 is disposed on the first housing 2, so that the first housing 2 abuts against the First seal ring 4 to prevent leakage of smoke or vapor. The mouthpiece 1 is disposed on a top portion of the first housing 2 to allow smoke to be inhaled by a user. The base 10, the insulating ring 12, the joint 13, the fixing base 15, and the connecting base 17 are hollow and constitute an e-liquid conduction channel.

[0025] The battery assembly B comprises a plurality of first screws 19, a threaded ring 20, a first cover 21, a second housing 22, a bracket 26, an electrode 27, a power button 28, two EVA foam gaskets 29, a battery 30, a bracket cover 31, a second cover 35, and a plurality of second screws 36. The e-liquid extruder comprises the e-liquid tank 23, a fifth seal ring 24, a piston 25, a push rod 32, a motor 33, a rotor 33-1, a control board 33-2, and a power supply board 34. The piston 25 is disposed in a bottom opening of the e-liquid tank 23. The push rod 32 comprises an inner wall with a female thread and the rotor 33-1 comprises an outer wall provided a male thread. The male thread corresponds to the female thread. The piston 25 is disposed on one end of the push rod 32. When the motor is energized and rotates, the push rod 32 moves upward to extrude the e-liquid out of the e-liquid tank. The fifth seal ring 24 is disposed around an outer wall of the piston 25 to prevent leakage of the e-liquid. The battery 30 is disposed on an input terminal of the power supply board 34. The control board 33-2 is disposed on the motor 32 to control a rotational speed of the motor 33, thereby adjusting the amount of the e-liquid flowing out of the e-liquid tank. An output terminal of the power supply board 34 is connected to the control board 33-2 to energize the motor 33 and the control board 33-2. The e-liquid extruder is fixed in the bracket 26. The bracket 26 comprises a hollow column and the e-liquid tank 23 is disposed in the hollow column. The two EVA foam gaskets 29 are disposed on both ends of the battery 30 to provide insulation. The electrode 27 is connected to the power supply board 34 via a conductive wire and abut against a top plate of the bracket 26 to contact the heating element for electrical conducting. The power button 28 is disposed on the power supply board 34 to turn on a power supply of the electronic cigarette, thereby controlling the motor 33 and the heating element 8 to work. The bracket cover 31 is disposed on the bracket 26 to protect the e-liquid extruder. The bracket 26 is secured within the second housing 22. The first cover 21 is disposed in the upper opening of the second housing 22 by the plurality of first screws 19. The threaded ring 20 is screwed through the first cover 21 into the threaded sleeve 6, so that the atomizing assembly is secured in the hollow column of the bracket 26. The second cover 35 is disposed on a lower opening of the second housing 22 by the plurality of second screws 36.

[0026] The working principle of the electronic cigarette is detailed as follows: when the power button is pressed, the motor 33 rotates, causing the rotor 33-1 to rotate as well; the push rod 32 moves upward with the rotation of the rotor 33-1 and pushes the piston 25 to an e-liquid outlet of the e-liquid tank; the e-liquid flows through the e-liquid tank, the e-liquid conduction channel, the e-liquid inlet, and enters the heating element 8, and is atomized to produce smoke or vapor.

Example 2

[0027] Referring to FIGS. 6-12, an electronic cigarette comprises an atomizing assembly A and a battery assembly B. The atomizing assembly A comprises a mouthpiece 1, a first housing 2, two first seal rings 4, an atomizing cover 7, a heating element 8, a first silicone ring 9, a base 10, a second seal ring 11, an insulating ring 12, a joint 13, a fixing base 15, a seal gasket 15-1, an insulating member 16, and a connecting base 17. The heating element 8 is disposed in the first silicone ring 9 to atomize e-liquid. The first silicone ring 9 is disposed between the heating element 8 and the base 10 to prevent leakage of the e-liquid. The atomizing cover 7 abuts against the top edge of the base 10 to fasten the heating element 8 on the base 10. The base 10 comprises a bottom portion and a first through hole is disposed on the bottom portion.

The heating element 8 comprises a positive pin and a negative pin. The insulating ring 12 is disposed in the first through hole to isolate the positive pin and the negative pin. The insulating ring 12 comprises a bottom surface and a second through hole is disposed on the bottom surface. The joint 13 is disposed in the second through hole and contacts the two pins for electrical conducting. The second seal ring 11 is disposed between the base 10 and the fixing base 15. The insulating member 16 is disposed on the fixing base 15 to prevent short circuit caused by contact of the atomizing assembly and the battery assembly. The bottom portion of the base 10 comprises an outer peripheral with an external thread and the fixing base 15 comprises an inner peripheral with an internal thread. The external thread corresponds to the internal thread. The top portion of the base 10 is secured within the first housing 2. One of the two first seal rings is disposed on an upper portion of the first housing 2 to seal a gap between the first housing 2 and the mouthpiece 1. The other one of the first seal ring 4 is disposed at the bottom of the first housing 2 to seal a gap between the atomizing assembly and the battery assembly. The mouthpiece 1 is disposed on the upper portion of the first housing 2, thus allowing smoke to be inhaled by a user. The seal gasket 15-1 is disposed in the fixing base 15 to seal an e-liquid outlet of an e-liquid tank, thereby preventing leakage of e-liquid. The connecting base 17 is disposed between the fixing base 15 and the e-liquid tank. The base 10, the insulating ring 12, the joint 13, and the fixing base 15 are hollow and constitute an e-liquid conduction channel.

[0028] The battery assembly B comprises a plurality of first screws 19, a threaded ring 20, a first cover 21, a second housing 22, the e-liquid tank 23, a fifth seal ring 24, a piston 25, a bracket 26, an electrode 27, a power button 28, two EVA foam gaskets 29, a battery 30, a bracket cover 31, a push rod 32, a motor 33, a rotor 33-1, a control board 33-2, a power supply board 34, a plurality of second screws 36, a screen bracket 37, a screen board 38, a sensor 38-1, a regulation button 39, and a switch button 40. The piston 25 is disposed in a bottom opening of the e-liquid tank 23. The fifth seal ring 24 is disposed between the piston 25 and the bottom opening of the e-liquid tank 23 to prevent leakage of the e-liquid. The push rod 32 comprises an inner wall with a female thread and the rotor 33-1 comprises an outer wall with a male thread. The male thread corresponds to the female thread. The motor 33 is disposed within the bracket 26. The bracket 26 further comprises a passage and the e-liquid tank 23 is disposed in the passage. The piston 25 is disposed on the push rod 32. When the motor is energized and rotates, the push rod 32 moves upward to extrude the e-liquid out of the e-liquid tank. The battery 30 is disposed on an input terminal of the power supply board 34. The control board 33-2 is disposed on the motor 32 to control the number of rotations of the motor 33, thereby adjusting the amount of the e-liquid flowing out of the e-liquid tank. An output terminal of the power supply board 34 is connected to the control board 33-2 to energize the motor 33 and the control board 33-2. The two EVA foam gaskets 29 are disposed on both ends of the battery 30 to provide insulation. The electrode 27 is connected to the power supply board 34 via a conductive wire and abut against a top plate of the bracket 26 to contact the atomizing assembly for electrical conducting. The battery 30 and the power supply board 34 are disposed within the bracket 26. The bracket cover 31 is disposed on the bracket 26. The bracket 26 is secured within the second housing 22 by the plurality of second screws 36. The threaded ring 20 is disposed on the first cover 21 to secure to the atomizing assembly. The sensor 38-1 is disposed on the screen board 38 to detect airflow sucked into the electronic cigarette, thereby controlling the amount of the e-liquid supplied. The screen board 38 comprises a screen and the screen bracket 37 is disposed on the screen. The first cover 21 comprises an opening and the screen board 38 is secured to the first cover 21, so that the screen is exposed outside the opening to display the electrical parameters and function information of the electronic cigarette. Another output terminal of the power supply board 34 is connected to the screen board 38 for supply of electricity. The first cover 21 is disposed in the upper opening of the second housing 22 by the plurality of first screws 19. The second housing comprises a wall comprising three holes through which the power button 28, the regulation button 39, and the switch button 40 are separately secured to the wall of the housing. The power button 28 is configured to turn on a power supply of the electronic cigarette, thus controlling the heating element 8 and the motor 33 to work. The switch button 40 is configured to switch between a power control mode and a motor-controlled e-liquid supply mode. The regulation button 39 is configured to adjust the two working modes. When the electronic cigarette works in the power control mode, the regulation button 39 is pressed to increase and decrease the power, thereby adjusting the amount of heat generated by the heating element 8. When the electronic cigarette works in the motor-controlled e-liquid supply mode, the regulation button 39 is pressed to adjust a rotational speed of the motor 33, thereby controlling the amount of the e-liquid extruded from the e-liquid tank. The first housing 2 comprises a threaded portion and the threaded portion is screwed to a threaded surface of the threaded ring 20. The first cover 21 further comprises an air inlet and the first housing 2 comprises a plurality of fifth through holes. The e-liquid outlet of the e-liquid tank 23 is disposed in the fixing base 15 and communicates with the e-liquid conduction channel. The air inlet, the plurality of fifth through holes, a hollow section of the first housing 2, and a hollow section of the mouthpiece 1 constitute an air conduction channel.

[0029] In certain embodiments, one end of the push rod 32 is secured to a bottom surface of the piston 25. The push rod 32 comprises the inner wall with the female thread and the rotor 33-1 comprises the outer wall with the male thread. The male thread corresponds to the

female thread. When the motor 33 rotates in reverse, the rotor 33-1 rotates in a reverse direction as well, pulling the push rod 32 to move toward the bottom opening of the e-liquid tank 23; and thus the e-liquid tank can be repeatedly filled with the e-liquid.

Claims

1. An electronic cigarette, comprising an e-liquid extruder; wherein the e-liquid extruder comprises an e-liquid tank, a piston, a push rod, and a motor; the piston is disposed in a bottom opening of the e-liquid tank; the push rod comprises an inner wall with a female thread and the rotor comprises an outer wall with a male thread; the male thread corresponds to the female thread; the piston is disposed on the push rod; when the motor is energized and rotates, the push rod moves upward to extrude e-liquid out of the e-liquid tank.

2. The electronic cigarette of claim 1, wherein the electronic cigarette further comprises an atomizing assembly and a battery assembly; the battery assembly comprises a passage; the e-liquid extruder is disposed in the battery assembly; both the e-liquid tank and the atomizing assembly are disposed in the passage; and the atomizing assembly is disposed on the e-liquid tank.

3. The electronic cigarette of claim 2, wherein the atomizing assembly comprises a heating assembly comprising a heating element; the atomizing assembly further comprises an e-liquid conduction channel communicating with a bottom portion of the heating element.

4. The electronic cigarette of claim 3, wherein the heating element is in the shape of a bowl; the heating element comprises a first through hole disposed on the bottom portion of the heating element and communicating with the e-liquid conduction channel; the heating element further a bottom surface, a peripheral wall, and a plurality of heating wires disposed on the bottom surface and/or the peripheral wall.

5. The electronic cigarette of claim 4, wherein the heating assembly further comprises a first silicone ring and a base; the heating element is disposed in the first silicone ring to atomize the e-liquid; the first silicone ring is disposed between the heating element and the base to prevent leakage of the e-liquid.

6. The electronic cigarette of claim 5, wherein the first silicone ring and the base each are a concave member comprising a bottom wall and each bottom wall comprises a second through hole; both the first through hole and the second through hole are a part of the e-liquid conduction channel; the heating assembly further comprises a plurality of metal wires spirally disposed on an inner surface of the heat element.

7. The electronic cigarette of claim 6, wherein the heating assembly further comprises a joint comprising a third through hole; the e-liquid tank comprises a top portion comprising an e-liquid outlet; the e-liquid outlet and through holes of the heating element, the first silicone ring, the base, and the joint are disposed on a vertical line and communicate with each other; the e-liquid is extruded out of the e-liquid tank, flows through the e-liquid conduction channel, into the heating element, and is atomized to produce smoke or vapor.

8. The electronic cigarette of claim 5, wherein the heating assembly further comprises a positive pin, a negative pin, and an insulating ring; the insulating ring is disposed in the second through hole of the base to isolate the positive pin and the negative pin; the joint is disposed in a fourth through hole of the insulating ring and contacts the positive pin and the negative pin for electronic conducting.

9. The electronic cigarette of claim 3, wherein an e-liquid outlet is disposed under the atomizing assembly and communicates with the e-liquid conduction channel; the piston is movable in the e-liquid tank to extrude the e-liquid out of the e-liquid outlet; the e-liquid flows through the e-liquid conduction channel and enters the heating element, and is atomized to produce smoke and vapor.

10. The electronic cigarette of claim 2, wherein the battery assembly comprises a battery, a power supply board, and a control board; the battery is disposed on an input terminal of the power supply board; the control board is disposed on the motor to control the rotational speed of the motor, thereby adjusting the amount of the e-liquid flowing out of the e-liquid tank; an output terminal of the power supply board is connected to the control board to energize the motor and the control board.

11. The electronic cigarette of claim 10, wherein the battery assembly further comprises a screen board comprising a screen; the screen board is disposed in the battery assembly with the screen exposed outside the battery assembly to display electrical parameters and function information of the electronic cigarette.

12. The electronic cigarette of claim 11, wherein the battery assembly further comprises a power button, a regulation button, and a switch button; the power button is configured to turn on a power supply of the

electronic cigarette, thus controlling the heating element and the motor to work; the switch button is configured to switch between a power control mode and a motor-controlled e-liquid supply mode; the regulation button is configured to adjust the power control mode and the motor-controlled e-liquid supply mode; when the electronic cigarette works in the power control mode, the regulation button is configured to adjust an amount of heat generated by the heating element; when the electronic cigarette works in the motor-controlled e-liquid supply mode, the regulation button is configured to adjust a rotational speed of the motor.

13. The electronic cigarette of claim 12, wherein the battery assembly further comprises a sensor disposed on the screen board; when external air is sucked into the electronic cigarette, the sensor detects air flow to control the amount of the e-liquid supplied.

14. The electronic cigarette of claim 3, wherein the atomizing assembly further comprises a housing and a mouthpiece disposed on a top portion of the housing; the external air flows through an air inlet of the battery assembly into the atomizing assembly, causing the heating element to atomize the e-liquid; the smoke or vapor generated flows through the mouthpiece and is inhaled by a user.

15. The electronic cigarette of claim 1, wherein the e-liquid extruder further comprises a seal ring disposed around an outer wall of the piston to prevent the e-liquid from flowing out of the bottom opening of the e-liquid tank.

16. The electronic cigarette of claim 1, wherein the piston is disposed on one end of the push rod; or one end of the push rod is secured to a bottom surface of the piston; when the motor rotates in reverse, the rotor rotates in a reverse direction, pulling the push rod to move toward the bottom opening of the e-liquid tank; and thus the e-liquid tank is filled with the e-liquid.

17. The electronic cigarette of claim 2, wherein the battery assembly further comprises a bracket; the e-liquid extruder is fixed in the bracket; the bracket comprises a hollow column functioning as the passage of the battery assembly; and the e-liquid tank is disposed in the hollow column.

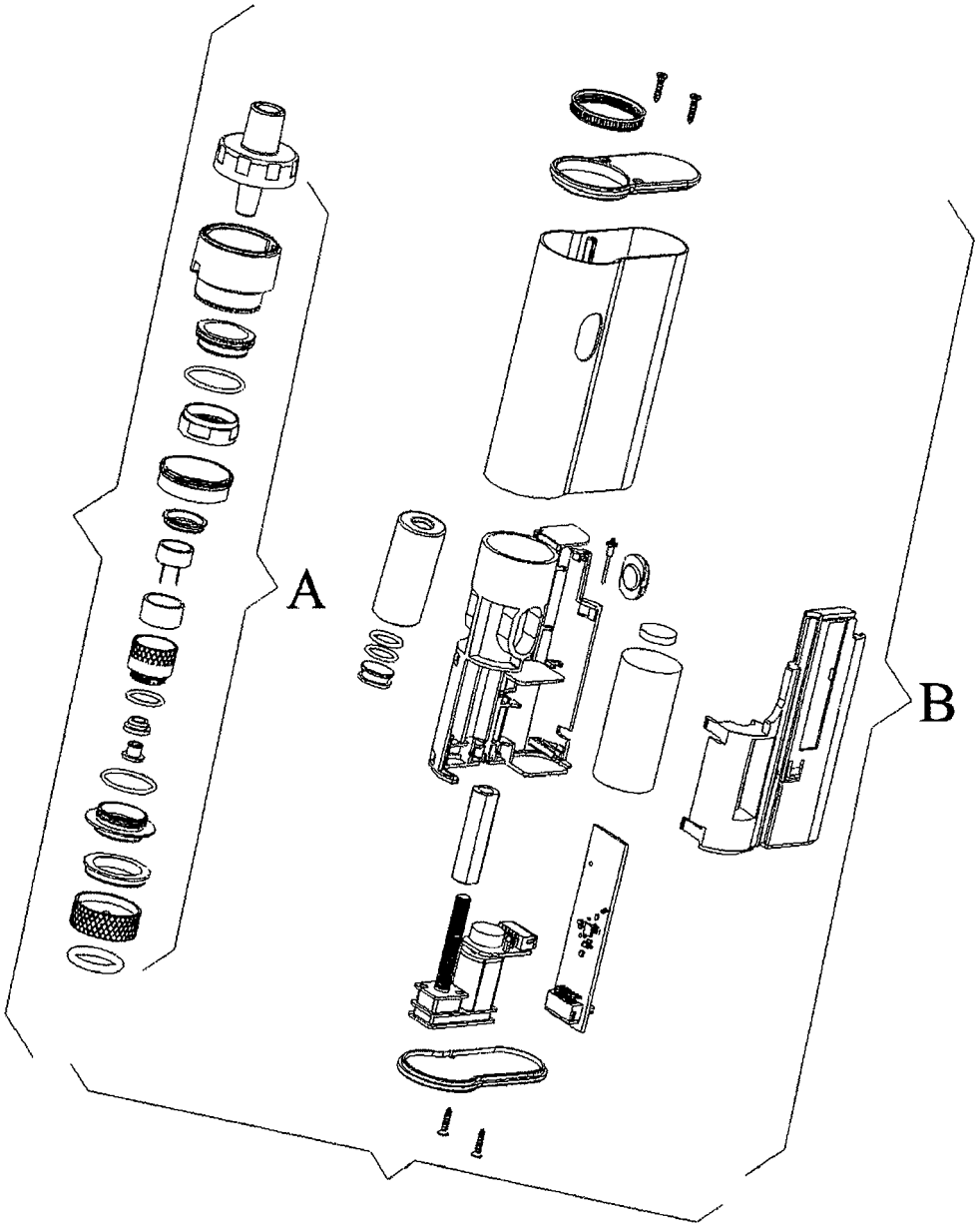


FIG. 1

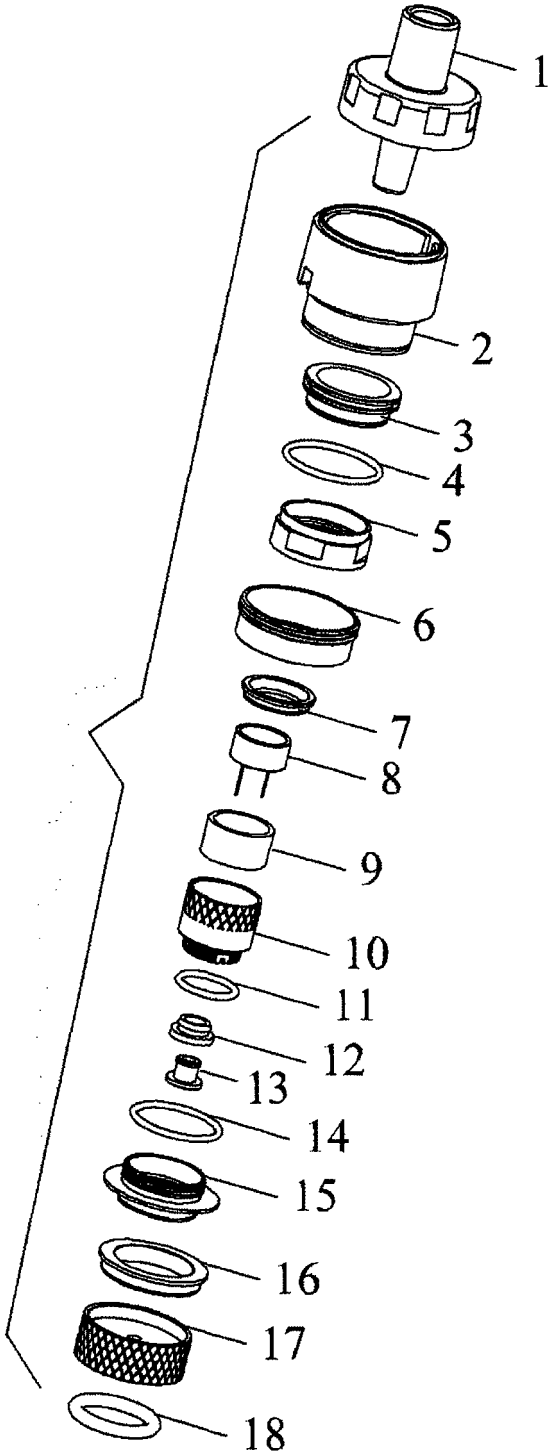


FIG. 2

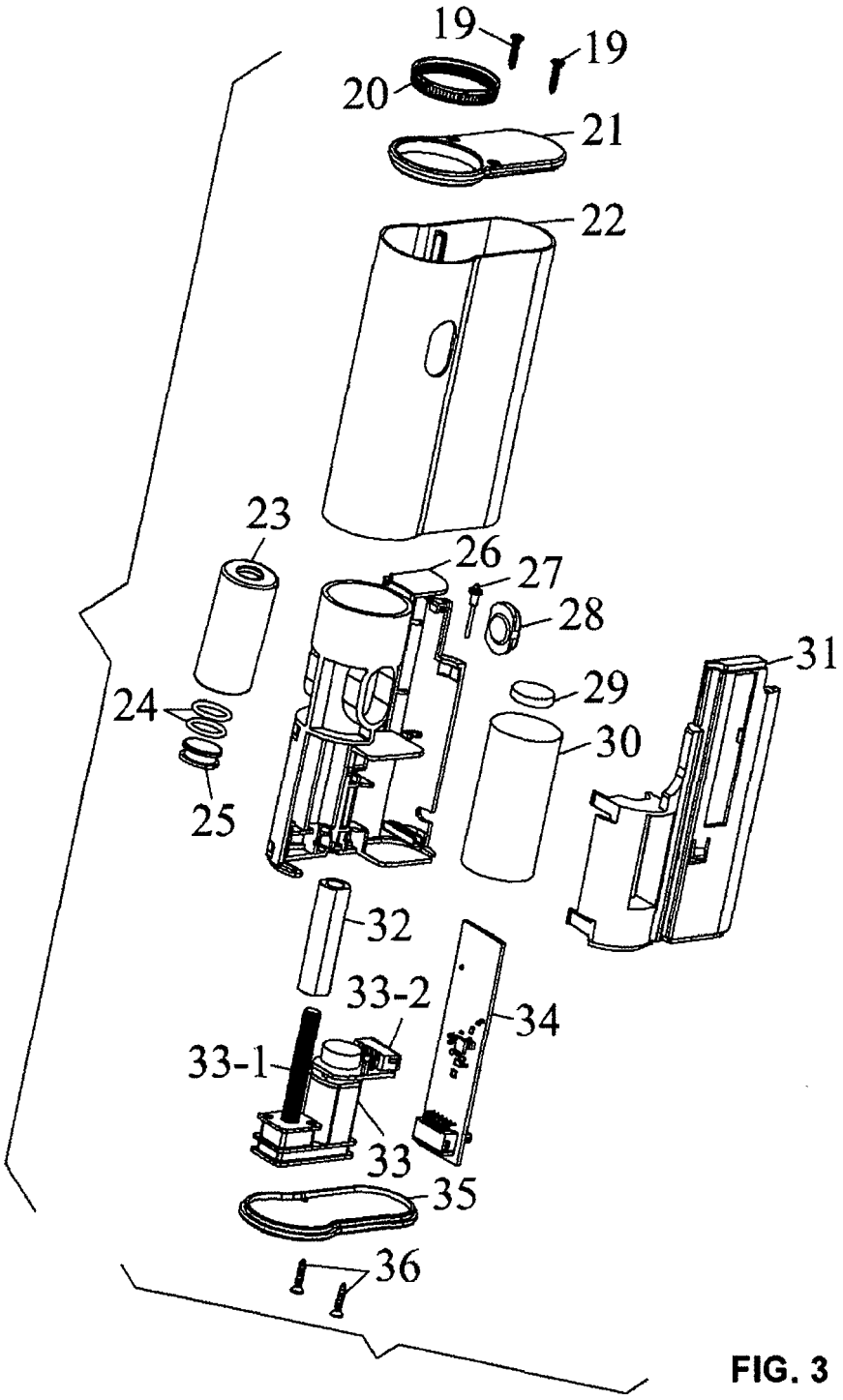


FIG. 3

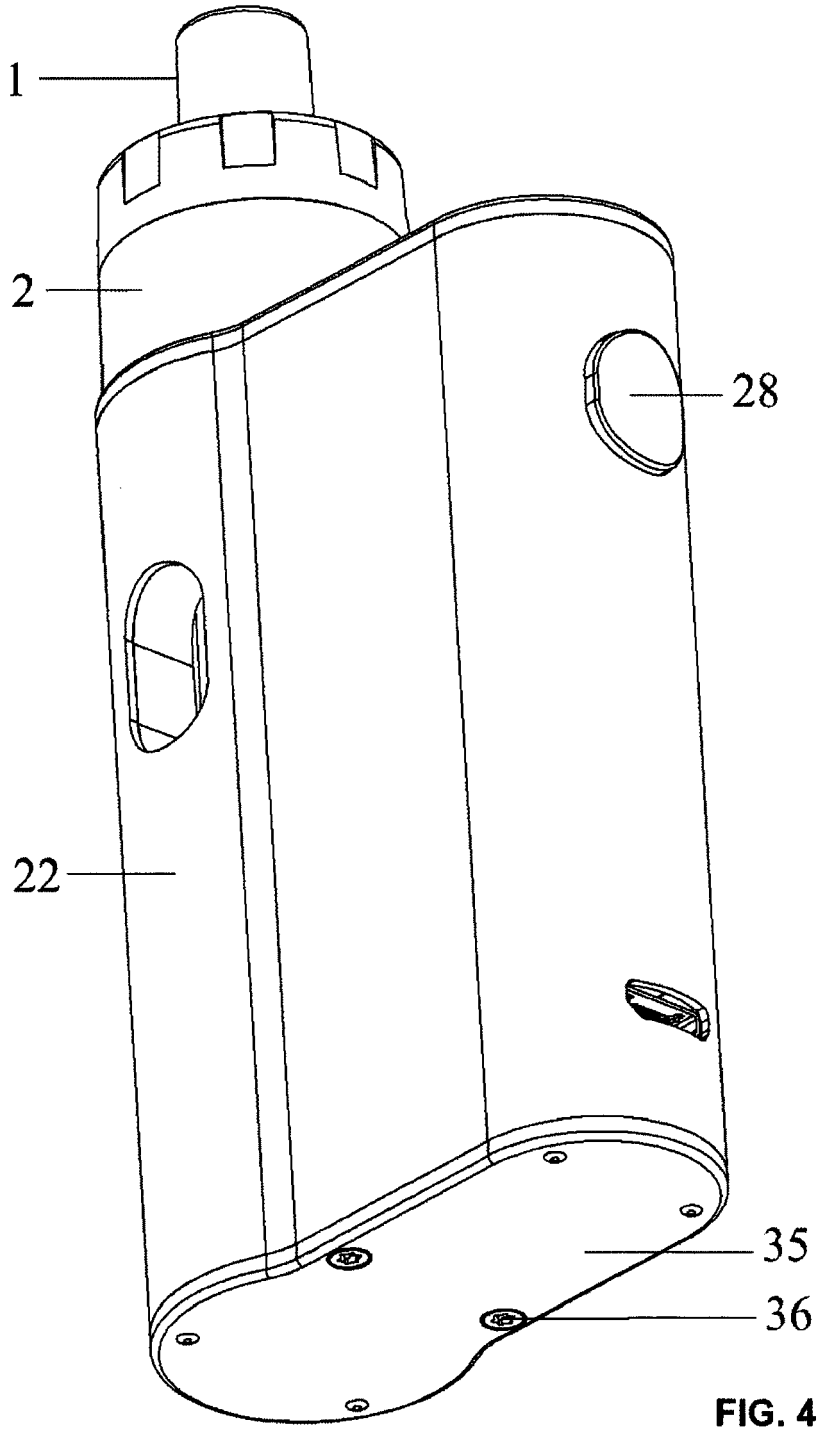


FIG. 4

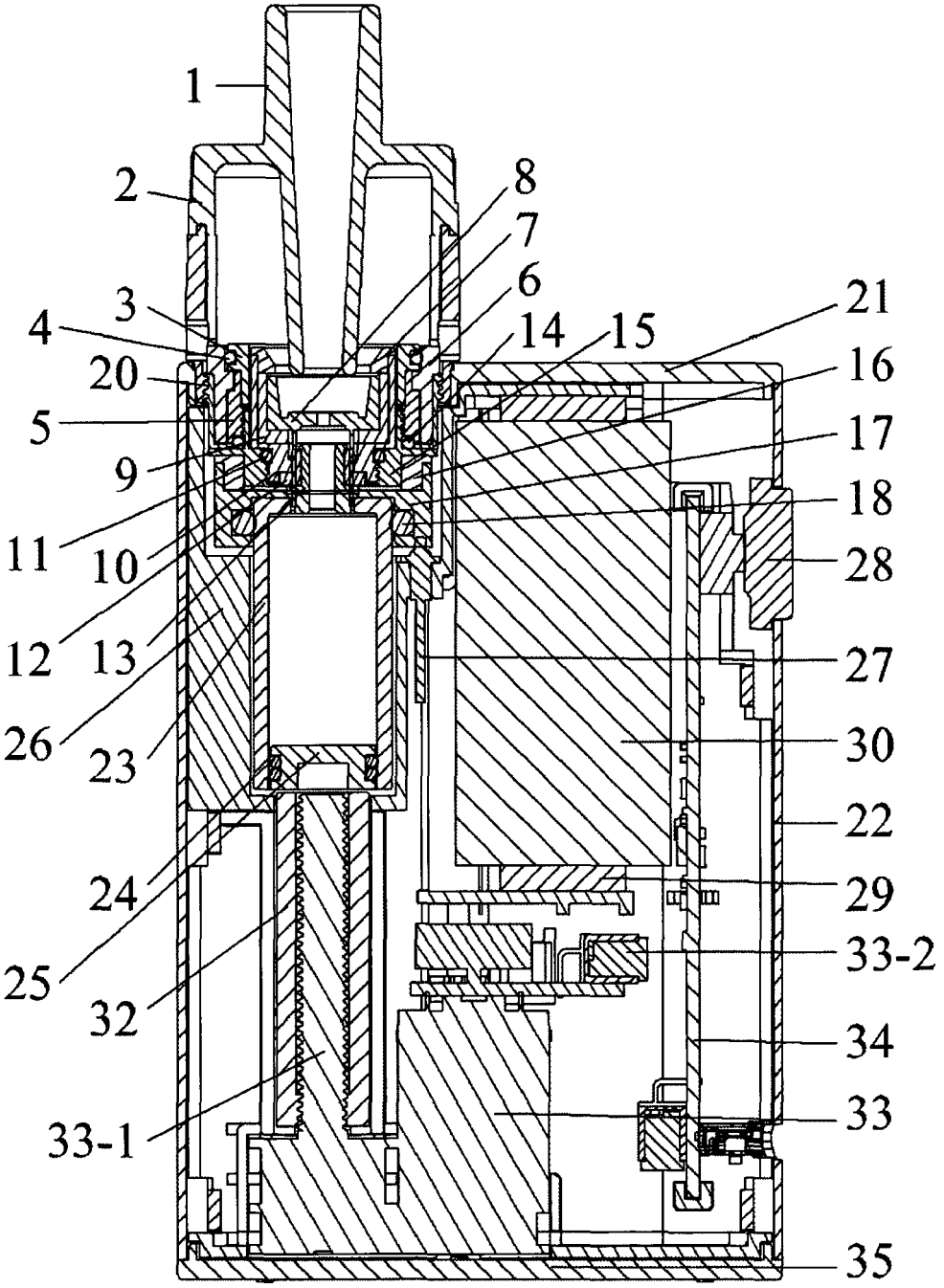

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FIG. 5

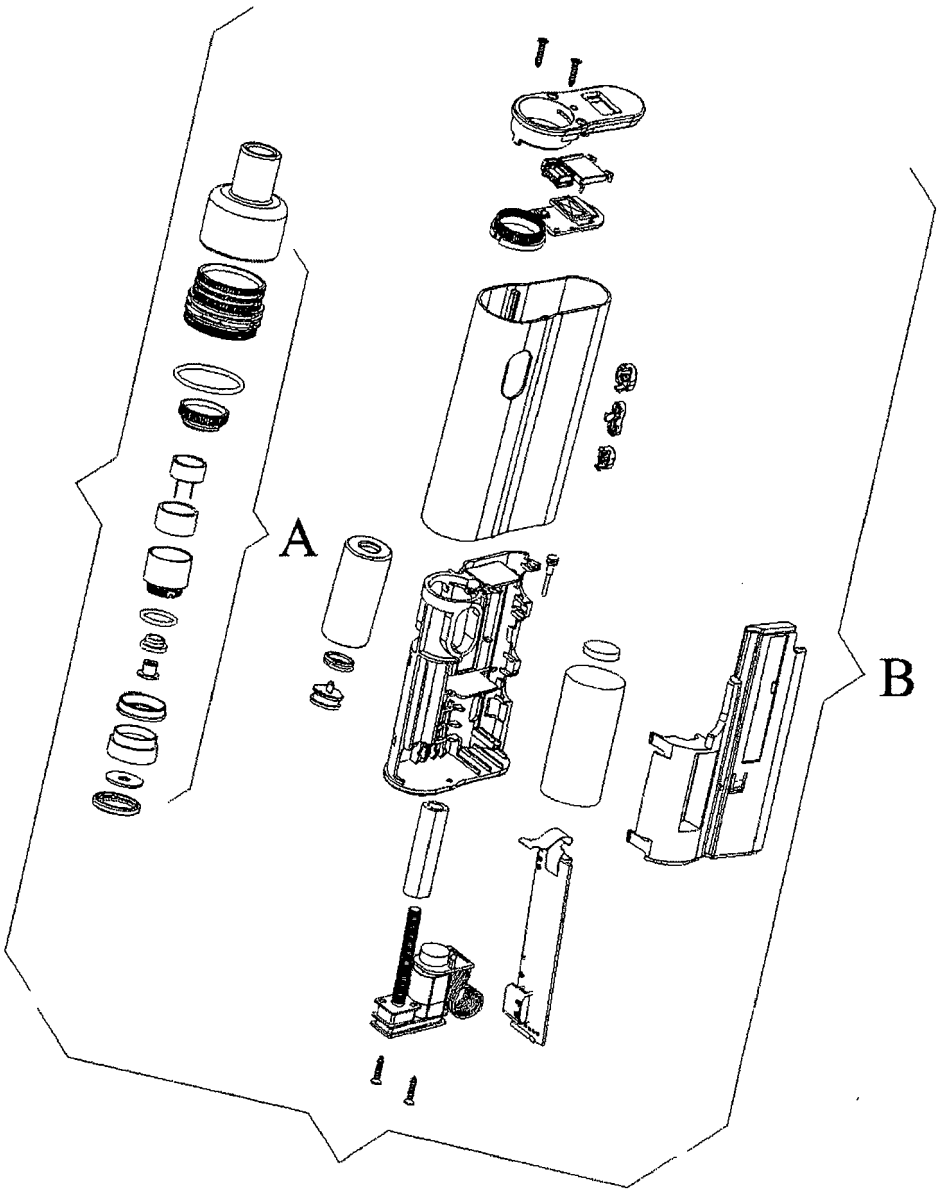


FIG. 6

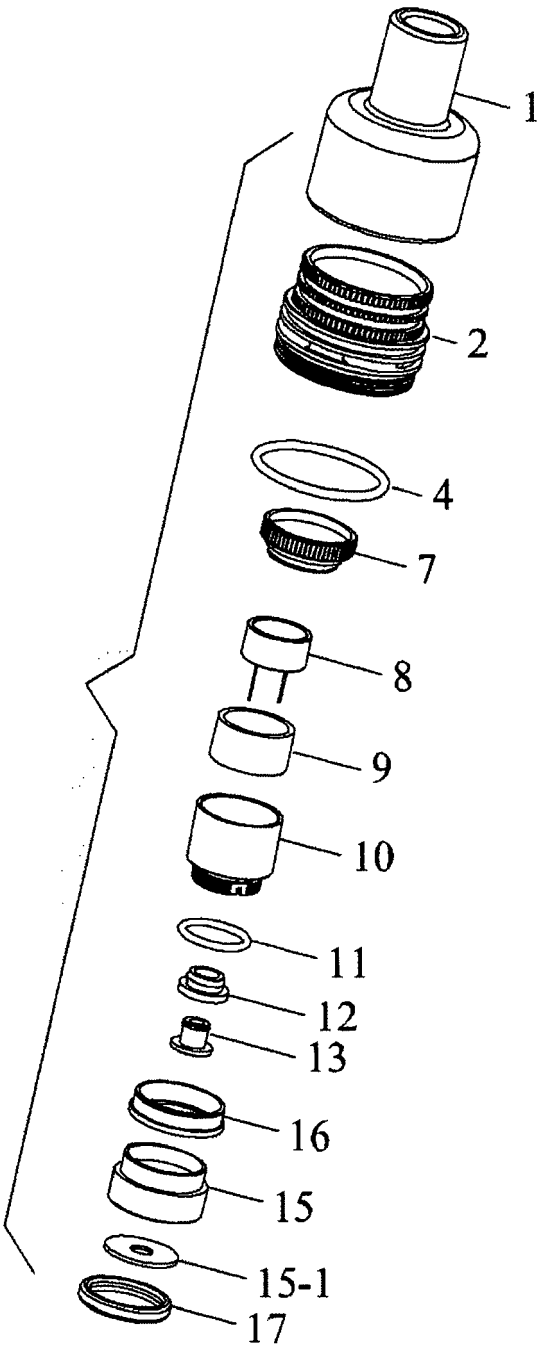


FIG. 7

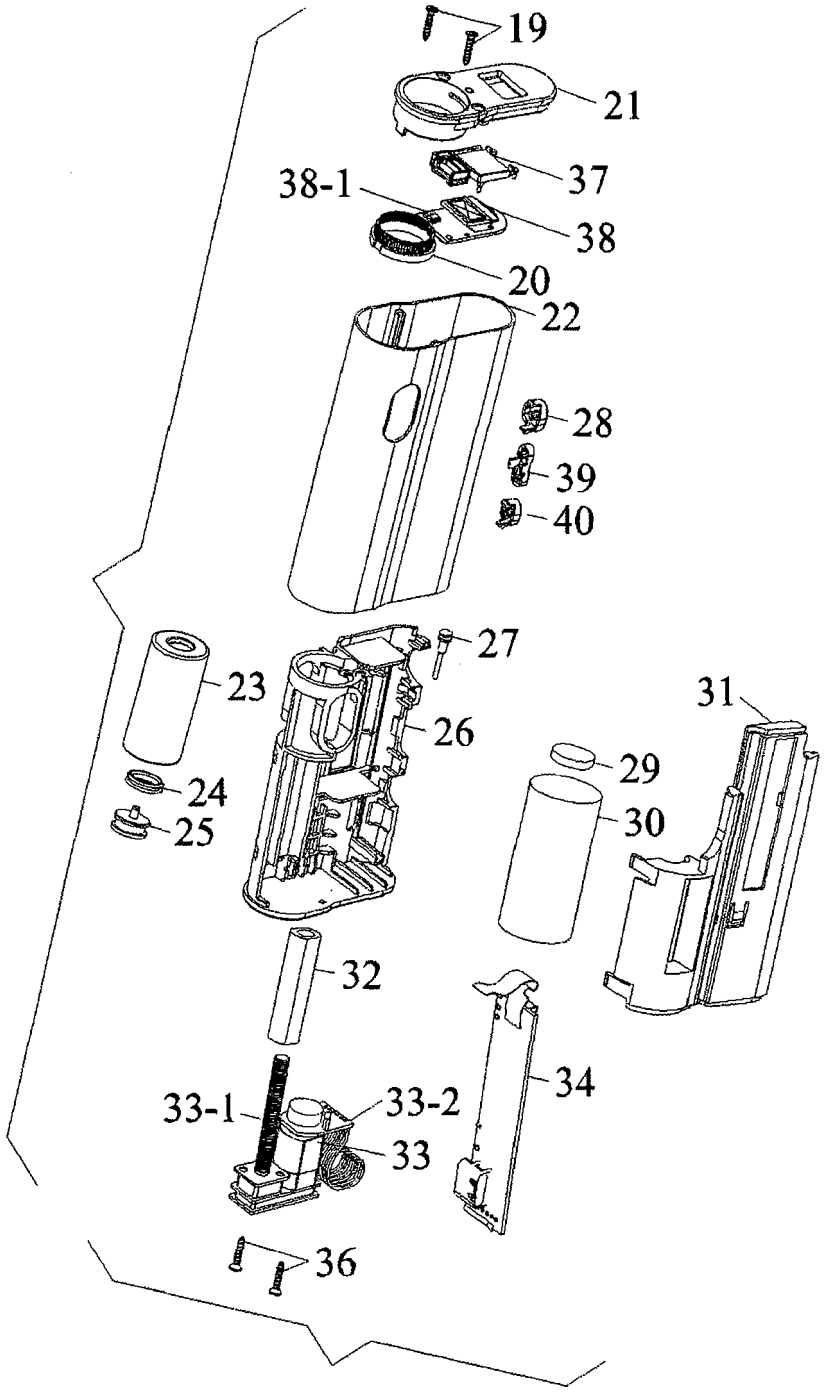

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FIG. 8

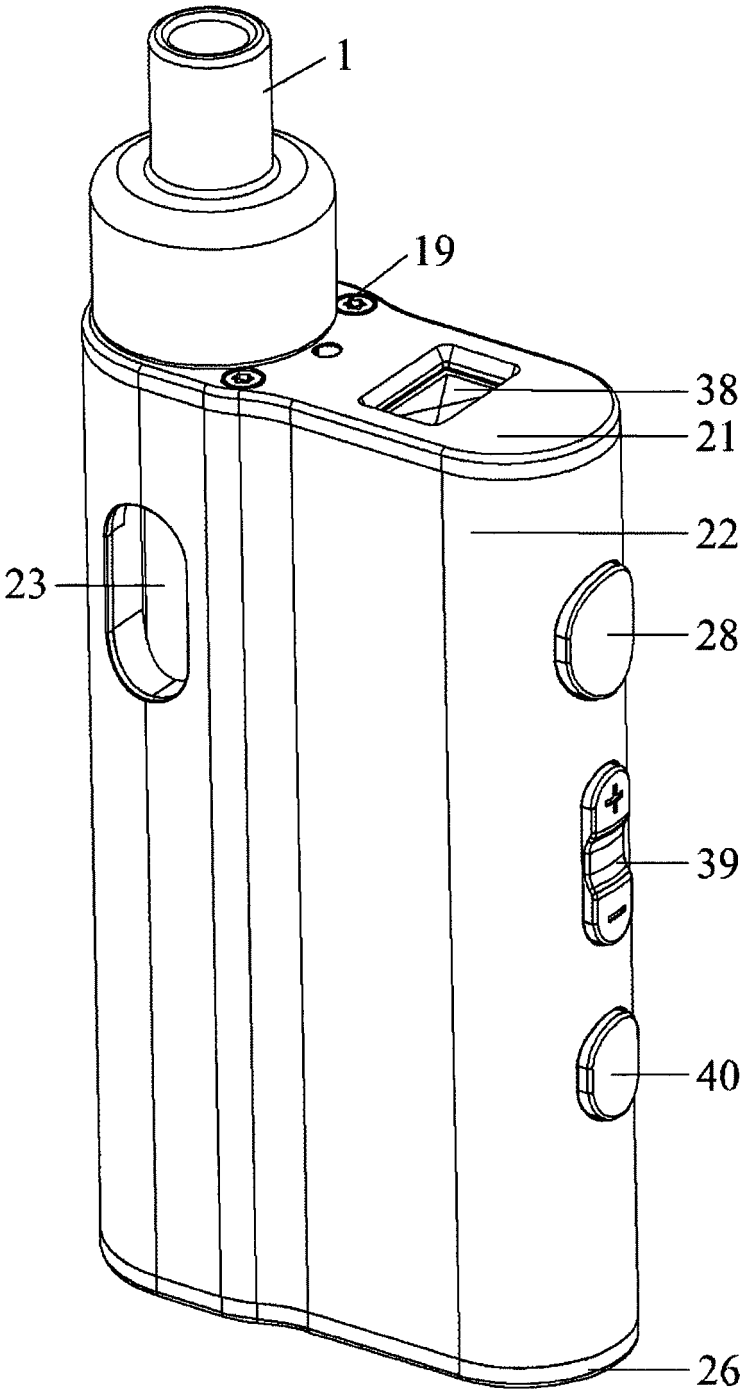


FIG. 9

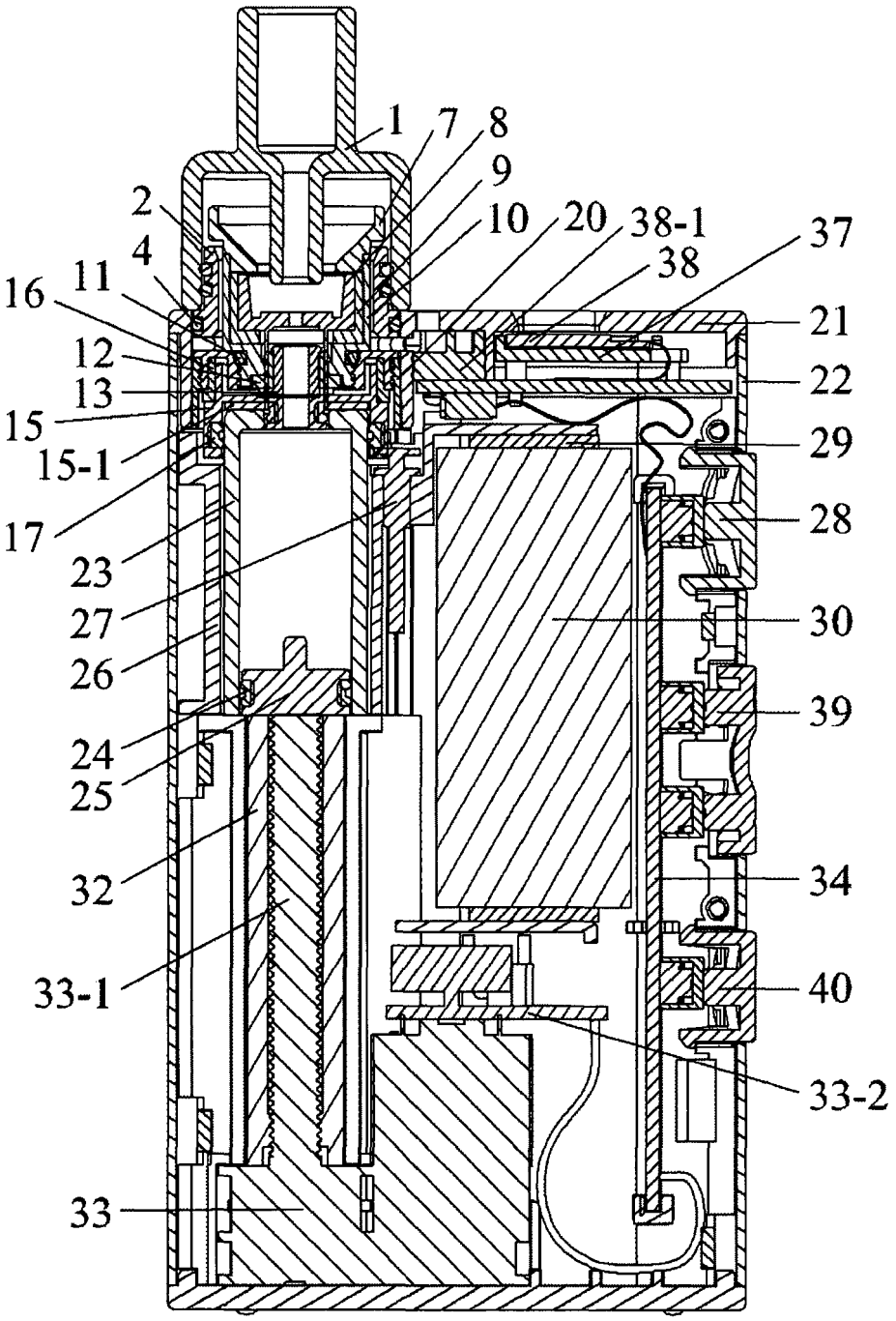

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FIG. 10

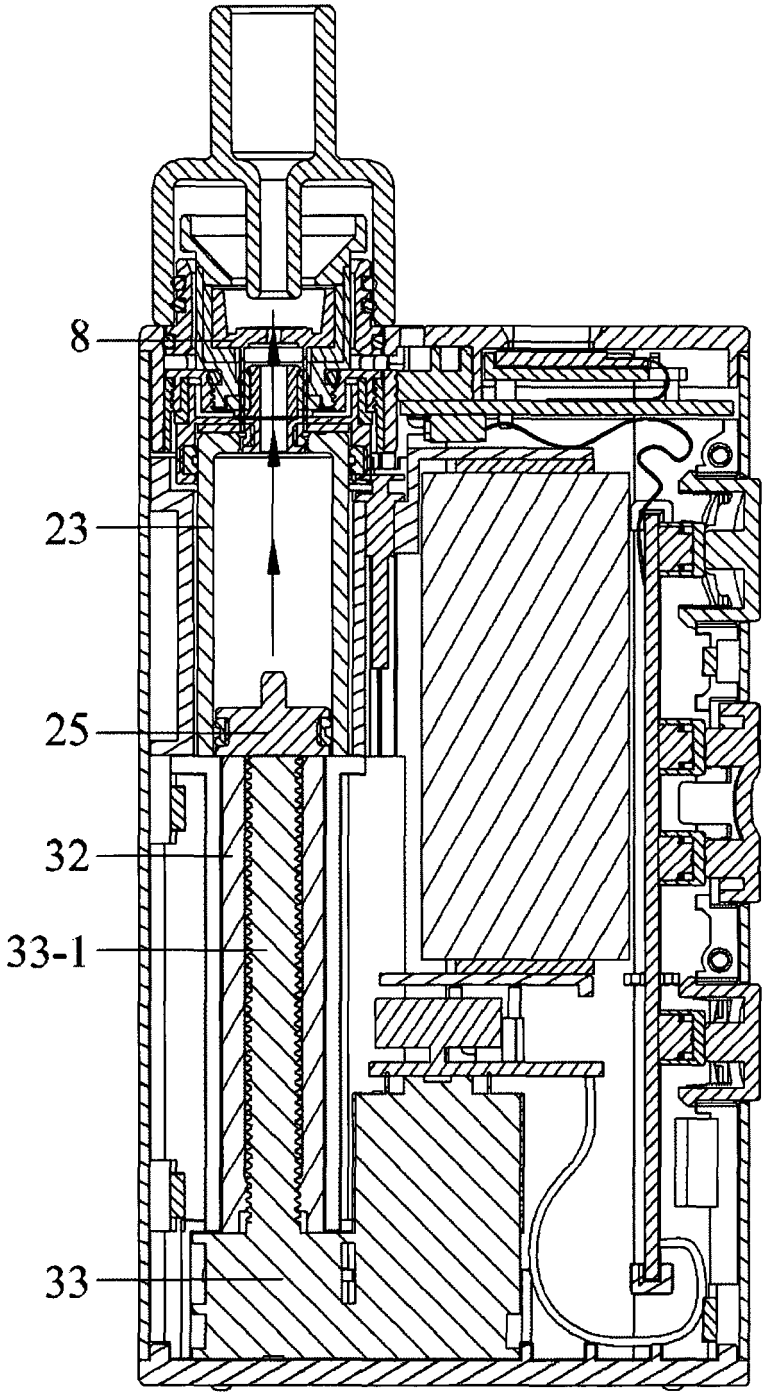


FIG. 11

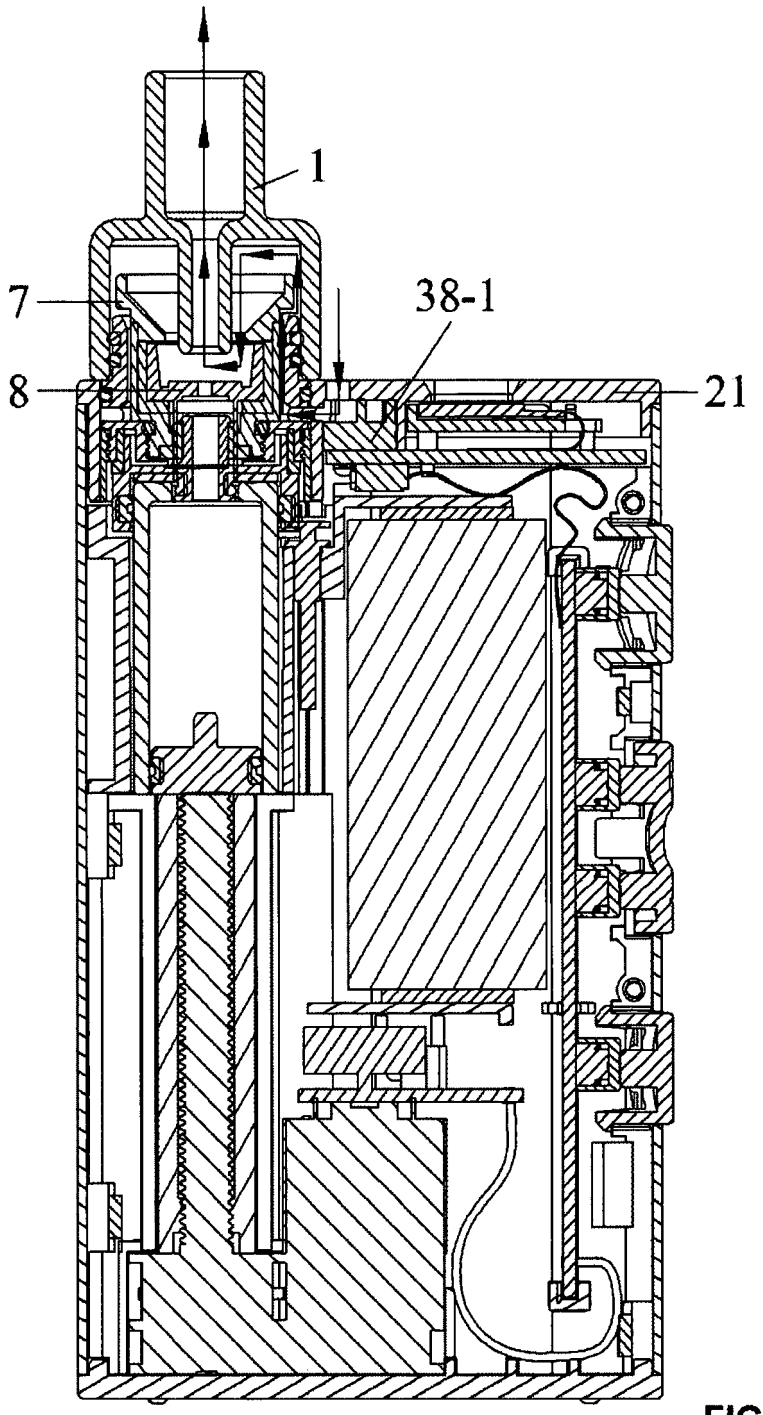


FIG. 12

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EUROPEAN SEARCH REPORT

Application Number
EP 21 00 0321

DOCUMENTS CONSIDERED TO BE RELEVANT

Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (IPC)
X	WO 2016/155316 A1 (SHENZHEN JIESHIBO TECH CO LTD [CN]) 6 October 2016 (2016-10-06)	1-4, 9-11,14, 16,17	INV. A24F40/10 A24F40/48 A24F40/50
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A	* the whole document *	5-8,12, 13	

TECHNICAL FIELDS SEARCHED (IPC)

A24F

The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
Munich	7 April 2022	Paulson, Bo

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07-04-2022

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CN 106880083 A	23-06-2017	NONE	

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