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(54) **ATOMIZER AND ELECTRONIC CIGARETTE COMPRISING SAME**

(57) An atomizer, comprising an atomizer body, and a tobacco tar cavity (4) and an atomizing core (5) both arranged in the atomizer body, the atomizing core (5) comprises an atomizing piece (51) and a tobacco tar guide body capable of guiding tobacco tar in the tobacco tar cavity (4) to an atomizing surface of the atomizing piece (51); and the tobacco tar guide body props against the atomizing piece (51), and the sum of areas of contact surfaces between the tobacco tar guide body and the atomizing piece (51) is smaller than the area of the at-

omizing surface of the atomizing piece (51). The time from the start of the work of the atomizing piece (51) to the start of oscillating atomization is shortened by decreasing the contact area of the tobacco tar guide body, and thus the smoke production speed is higher. Moreover, the phenomenon will not occur that atomization is difficult to implement after the tobacco tar guide body is in a tobacco tar absorption oversaturated state.

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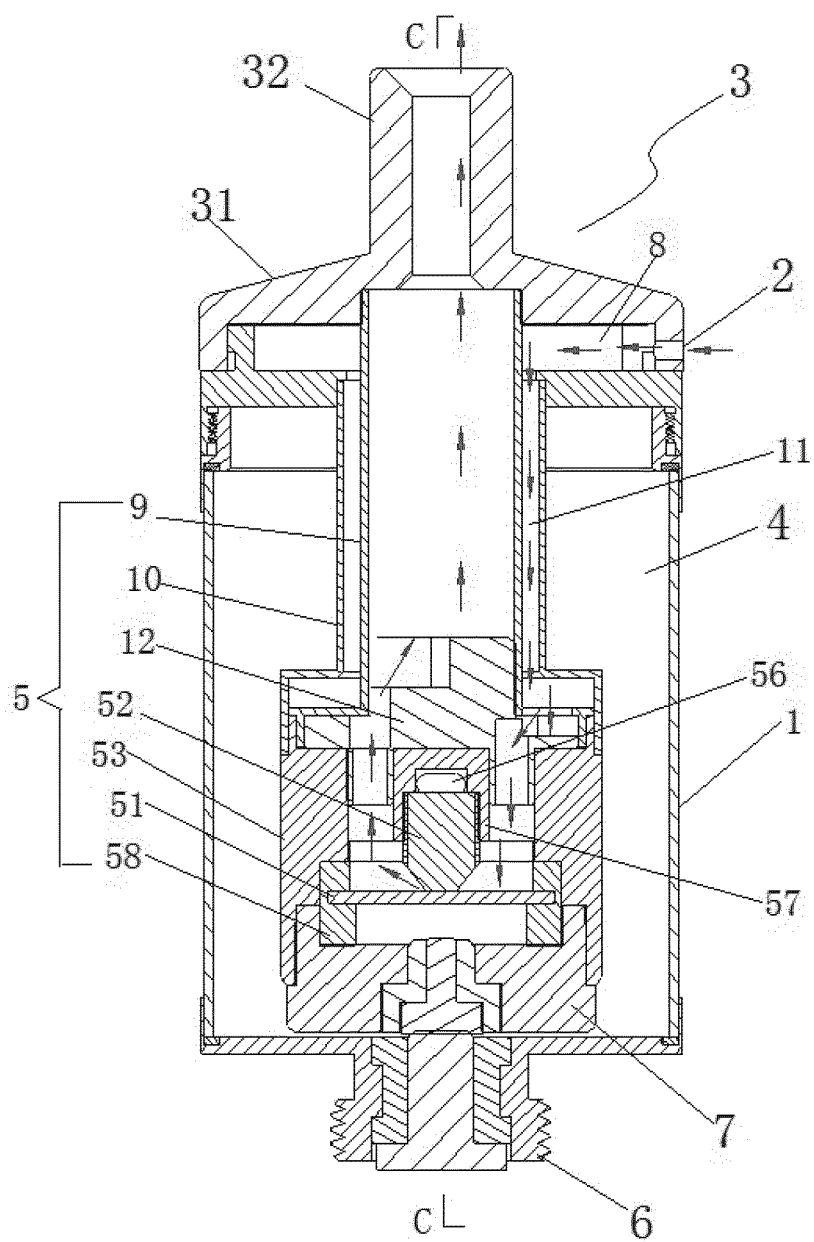


Fig. 2

Description

Field of the Invention

[0001] The present invention belongs to an atomizer and an electronic cigarette comprising the same.

Background of the Invention

[0002] At present, the existing ultrasonic high frequency atomization electronic cigarette is covered with a piece of tobacco tar guide cotton on the surface of an ultrasonic high frequency atomizing piece, and the contact between the tobacco tar guide cotton and the atomizing piece is surface contact.

[0003] With respect to a piezoelectric ceramic atomizing piece, after powering up, the piezoelectric ceramic piece does not immediately oscillate to atomize the tobacco tar guide cotton. Instead, after powering up, the piezoelectric ceramic first produces heat and then oscillates after the heat reaches a certain degree so as to atomize the tobacco tar guide cotton. Therefore, when the tobacco tar guide cotton is covered on the surface of the piezoelectric ceramic piece and is powered up, the piezoelectric ceramic piece produces heat, but as the tobacco tar guide cotton absorbs the heat itself, and the contact surface between the tobacco tar guide cotton and the piezoelectric ceramic piece is large, a part of heat will be transferred to the tobacco tar guide cotton, such that it takes the piezoelectric ceramic a long time to produce the heat necessary for the oscillation of itself. This causes an over long time from the start of the work of the piezoelectric ceramic piece to the start of oscillating atomization, and the user needs to wait for a long time to inhale the first puff of smoke, accordingly the user experience is poor.

[0004] Moreover, because of the contact between the tobacco tar guide cotton and the piezoelectric ceramic piece is surface contact, the phenomenon often occurs that atomization is difficult to implement after the tobacco tar guide cotton is in a tobacco tar absorption oversaturated state.

Summary of the Invention

[0005] In view of the above problems, the present invention aims at providing an atomizer having a high smoke production speed and a good atomization effect, and an electronic cigarette comprising the same.

[0006] The technical solution adopted to solve the problems in the present invention is as follows: an atomizer includes an atomizer body, and a tobacco tar cavity and an atomizing core both arranged in the atomizer body, and the atomizing core includes an atomizing piece and a tobacco tar guide body capable of guiding tobacco tar in the tobacco tar cavity to an atomizing surface of the atomizing piece; and the tobacco tar guide body props against the atomizing

piece, and the sum of areas of contact surfaces between the tobacco tar guide body and the atomizing piece is smaller than the area of the atomizing surface of the atomizing piece.

[0007] In the above solution, the contact area of the tobacco tar guide body and the atomizing piece is decreased, so the tobacco tar guide body hardly absorbs the heat produced by the atomizing piece, and the atomizing piece can quickly produce the heat and start oscillating so as to quickly produce the first puff of smoke through atomization. The solution shortens the time from the start of the work of the atomizing piece to the start of oscillating atomization, and thus the smoke production speed is higher.

[0008] Further, the atomizer body includes a shell, an air inlet, a suction nozzle installed at the top of the shell and a connecting electrode installed at the bottom of the shell, and the tobacco tar cavity and the atomizing core are both arranged in the shell;

an air inlet passage which communicates with the air inlet is arranged in the shell, and the air inlet passage extends to the atomizing surface of the atomizing piece; an air outlet passage which communicates with the suction nozzle is arranged in the shell; and the atomizing piece is electrically connected with the connecting electrode.

[0009] A preferred mode is that the tobacco tar guide body is a single piece of tobacco tar guide cotton A of a cylindrical structure, there is one contact surface between the tobacco tar guide cotton A and the atomizing piece, and the lower end of the tobacco tar guide cotton A is of inverted cone shape.

[0010] In a specific solution, the atomizing core further includes a first fixing seat of a hollow structure, the top of the first fixing seat is provided with an air inlet via hole and an air outlet via hole, a first tobacco tar inlet passage is arranged in the upper part of the first fixing seat in a horizontal penetration manner, and the first tobacco tar inlet passage communicates with the tobacco tar cavity; and

a fixing groove is formed in the inner cavity of the first fixing seat, the tobacco tar guide cotton A is fixed in the fixing groove, and the fixing groove communicates with the first tobacco tar inlet passage.

[0011] An atomizing piece fixing seat is arranged at the lower part of the inner cavity of the first fixing seat, the atomizing piece is installed on the atomizing piece fixing seat, and the atomizing surface of the atomizing piece props against the tobacco tar guide cotton A; and a non-atomizing surface of the atomizing piece is electrically connected with the connecting electrode through an electrode ring.

[0012] The suction nozzle includes a suction nozzle cover and a nozzle head, the air inlet is formed in the side wall of the suction nozzle cover, a first gap is reserved between the suction nozzle cover and the top of the shell, and the first gap communicates with the air inlet; a second air pipe which is hollow and communicates with the suction nozzle is installed at the top of the first fixing

seat, a first air inlet hole is formed in the second air pipe, a first air pipe is sheathed at the outside of the second air pipe, a second gap is reserved between the inner wall of the first air pipe and the outer wall of the second air pipe, and the second gap communicates with the first gap;

an air isolation device is arranged between the second air pipe and the top of the first fixing seat, an air inlet groove which communicates with the first air inlet hole is formed in the air isolation device, and the air inlet groove communicates with the air inlet via hole;

an air outlet groove which communicates with the air outlet via hole is further formed in the air isolation device, and the air outlet groove communicates with the hollow cavity of the second air pipe;

the air inlet, the first gap, the second gap, the first air inlet hole, the air inlet groove and the air inlet via hole communicate with each other in sequence to form the air inlet passage to extend to the atomizing piece in the inner cavity of the first fixing seat; and the air outlet via hole, the air outlet groove, the inner cavity of the second air pipe and the suction nozzle communicate with each other in sequence to form the air outlet passage.

[0013] In another specific solution, the atomizing core further includes a second fixing seat, a second tobacco tar inlet passage is arranged in the upper part of the second fixing seat in a horizontal penetration manner, and the second tobacco tar inlet passage communicates with the tobacco tar cavity; and

a fixing groove is formed in the second fixing seat, the tobacco tar guide cotton A is fixed in the fixing groove, and the fixing groove communicates with the second tobacco tar inlet passage.

[0014] A hollow cavity is formed in the lower part of the second fixing seat, an atomizing piece fixing seat is arranged at the lower part of the hollow cavity, the atomizing piece is installed on the atomizing piece fixing seat, and the atomizing surface of the atomizing piece props against the tobacco tar guide cotton A.

[0015] A third air pipe which is hollow and communicates with the suction nozzle is installed at the top of the second fixing seat; and

the air inlet is formed in the lower part of the second fixing seat, an air inlet passage A is arranged at the air inlet in a horizontal penetration manner, and the air inlet passage A directly extends to the atomizing surface of the atomizing piece; and at least one air outlet passage A whose direction is vertical to the direction of the air inlet passage A is provided in the second fixing seat, and the air outlet passage A communicates with the hollow cavity of the third air pipe.

[0016] The area of the contact surface between the tobacco tar guide cotton A and the atomizing piece accounts for 5%-25% of the area of the atomizing surface of the atomizing piece.

[0017] Further, the density of cotton fibers in the tobacco tar guide cotton A gradually increases from top to bottom. This design can reinforce the siphonage of the to-

bacco tar guide cotton A, thereby guarantee the continuity of tobacco tar supply and the amount of tobacco tar supply when the contact area is decreased, in order to guarantee that the amount of smoke is not decreased.

[0018] Further, a blind hole is provided in the center of the tobacco tar guide cotton A from top to bottom. This design also aims at guaranteeing the continuity of tobacco tar supply and the amount of tobacco tar supply when the contact area is decreased, in order to guarantee that the amount of smoke is not decreased. The principle is that a part of tobacco tar directly flows into the blind hole without siphonage and then disperses from the blind hole to the surrounding, thereby increasing the supply speed of tobacco tar and avoiding dry burning.

[0019] In a third specific solution, the tobacco tar guide body is tobacco tar guide cotton B which contains a plurality of rod-shaped structures, there are a plurality of contact surfaces between the tobacco tar guide cotton B and the atomizing piece, and thus the tobacco tar guide cotton B is of a multipoint contact structure.

[0020] The atomizing core further includes a fixing seat B, a tobacco tar inlet passage B is arranged in the upper part of the fixing seat B in a horizontal penetration manner, and the tobacco tar inlet passage B communicates with the tobacco tar cavity; and

a bracket is arranged in the fixing seat B, the tobacco tar guide cotton B is fixed in the bracket, and the bracket communicates with the tobacco tar inlet passage B.

[0021] A hollow cavity is formed in the lower part of the fixing seat B, an atomizing piece fixing seat is arranged at the lower part of the hollow cavity, and the atomizing piece is installed on the atomizing piece fixing seat.

[0022] An air pipe B which is hollow and communicates with the suction nozzle is installed at the top of the fixing seat B; and

the air inlet is formed in the lower part of the fixing seat B, an air inlet passage B is arranged at the air inlet in a horizontal penetration manner, and the air inlet passage B directly extends to the atomizing surface of the atomizing piece; and at least one air outlet passage B whose direction is vertical to the direction of the air inlet passage B is provided in the fixing seat B, and the air outlet passage B communicates with the hollow cavity of the air pipe B.

[0023] In a preferred solution, the bracket includes an upper bracket and a lower bracket;

the upper bracket includes a top seat, a plurality of cylindrical first tobacco tar guide passages are provided at the lower surface of the top base in an extension manner, a tobacco tar outlet hole is formed in the wall of each first tobacco tar guide passage, the top of each first tobacco tar guide passage is open, and the opening of the first tobacco tar guide passage communicates with the tobacco tar inlet passage B;

the lower bracket includes a bottom seat, a plurality of cylindrical second tobacco tar guide passages with open upper ends are provided at the lower surface of the bottom seat in an extension manner, the first tobacco tar

guide passages can be correspondingly inserted in the hollow cavities of the second tobacco tar guide passages, and the lower ends of the second tobacco tar guide passages are open;

the tobacco tar guide cotton B is flaky tobacco tar guide cotton that can undergo plastic deformation, the tobacco tar guide cotton B is arranged between the upper bracket and the lower bracket, and after the upper bracket is inserted in the lower bracket, the tobacco tar guide cotton B undergoes plastic deformation and stretches to form a structure which is the same as that of the upper bracket; and

the upper bracket, the lower bracket and the tobacco tar guide cotton B are assembled and then placed on the atomizing piece and prop against the atomizing surface of the atomizing piece to form a multipoint contact form.

[0024] In order to guarantee smooth flow guide of the tobacco tar, both of the first tobacco tar guide passages and the second tobacco tar guide passages are cones.

[0025] In another preferred solution, the bracket includes a lower bracket, the lower bracket includes a bottom seat, a plurality of cylindrical second tobacco tar guide passages with open upper ends are provided at the lower surface of the bottom seat in an extension manner, and the lower ends of the second tobacco tar guide passages are open;

the tobacco tar guide cotton B is made by integrally molding and includes a flaky body and a plurality of strip-shaped bodies fixed to the lower end of the flaky body, and the strip-shaped bodies can be correspondingly inserted in the hollow cavities of the second tobacco tar guide passages; and

the bracket and the tobacco tar guide cotton B are assembled and then placed on the atomizing piece and prop against the atomizing surface of the atomizing piece to form the multipoint contact form.

[0026] In order to guarantee smooth flow guide of the tobacco tar, both of the strip-shaped bodies and the second tobacco tar guide passages are cones.

[0027] Preferably, the sum of the areas of contact points of the tobacco tar guide cotton B and the atomizing piece accounts for 10%-75% of the area of the atomizing surface of the atomizing piece.

[0028] Preferably, the atomizing piece is a solid piezoelectric ceramic piece.

[0029] To conveniently inject the tobacco tar and clean the suction nozzle, the suction nozzle is detachably connected with the top of the shell.

[0030] Correspondingly, the present invention further provides an electronic cigarette, including an external power supply, as well as the atomizer in the above-mentioned solutions, and the external power supply is electrically connected with the connecting electrode of the atomizer.

[0031] The present invention has the following significant effects:

1. The area of the contact surface between the to-

bacco tar guide body and the atomizing piece is smaller than the area of the atomizing surface of the atomizing piece, and even can be small enough to be similar to a point contact structure form, so the tobacco tar guide body hardly absorbs the heat produced by the atomizing piece, and the atomizing piece can quickly produce the heat and start oscillating so as to quickly produce the first puff of smoke through atomization. The solution shortens the time from the start of the work of the atomizing piece to the start of oscillating atomization, accordingly the smoke production speed is higher, and the user experience is better.

2. As the contact area is small, the amount of tobacco tar transferred by the tobacco tar guide body to the atomizing piece will not be excessive, and thus the phenomenon will not occur that atomization is difficult to implement after the tobacco tar guide body is in a tobacco tar absorption oversaturated state.

Brief Description of the Drawings

[0032] The present invention will be further illustrated below in combination with the drawings.

Fig.1 is an appearance view of an atomizer in an embodiment 1.

Fig.2 is a section view of the embodiment 1.

Fig.3 is a C-C view of Fig.2.

Fig.4 is an explosive view of an atomizing core in the embodiment 1.

Fig.5 is an appearance view of an atomizer in an embodiment 2.

Fig.6 is a section view of the embodiment 2.

Fig.7 is a D-D view of Fig.6.

Fig.8 is an explosive view of the atomizer in the embodiment 2.

Fig.9 is a section view of tobacco tar guide cotton A in an embodiment 3.

Fig.10 is an appearance view of an atomizer in an embodiment 4.

Fig.11 is a section view of the embodiment 4.

Fig. 12 is an E-E view of Fig. 11.

Fig. 13 is an explosive view of an atomizing core in the embodiment 4.

Fig. 14 is a structure diagram of a bracket and tobacco tar guide cotton B in the embodiment 4.

Fig. 15 is a section view of the embodiment 5.

Fig. 16 is an F-F view of Fig. 15.

Fig. 17 is a structure diagram of a bracket and tobacco tar guide cotton B in an embodiment 5.

[0033] Reference signs: 1-shell, 2-air inlet, 3-suction nozzle, 4-tobacco tar cavity, 5-atomizing core, 6-connecting electrode, 7-electrode ring, 8-first gap, 9-second air pipe, 10-first air pipe, 11-second gap, 12-air isolation device, 13-third air pipe, 31-suction nozzle cover, 32-nozzle head, 51-atomizing piece, 52-tobacco tar guide cotton A, 53-first fixing seat, 54-air inlet via hole, 55-air outlet via hole, 56-first tobacco tar inlet passage, 57-fixing groove, 58-atomizing piece fixing seat, 59-second fixing seat, 60-second tobacco tar inlet passage, 61-air inlet passage A, 62-air outlet passage A, 70-air pipe B, 80-bracket, 91-first air inlet hole, 121-air inlet groove, 122-air outlet groove, 520-tobacco tar guide cotton B, 521-flaky body, 522-strip-shaped body, 530-upper bracket, 531-top seat, 532-first tobacco tar guide passage, 533-tobacco tar outlet hole, 540-lower bracket, 541-bottom seat, 542-second tobacco tar guide passage, 590-fixing seat B, 600-tobacco tar inlet passage B, 610-air inlet passage B, 620-air outlet passage B, and 800-blind hole.

Detailed Description of the Embodiments

Embodiment 1

[0034] As shown in Fig. 1 to Fig. 4, an atomizer includes a shell 1, an air inlet 2, a suction nozzle 3 detachably connected with the top of the shell 1, a tobacco tar cavity 4 and an atomizing core 5 both arranged in the shell 1, and a connecting electrode 6 installed at the bottom of the shell 1.

[0035] The atomizing core 5 includes an atomizing piece 51 and tobacco tar guide cotton A 52 capable of guiding tobacco tar in the tobacco tar cavity 4 to an atomizing surface of the atomizing piece 51. The tobacco tar guide cotton A 52 is a single cylindrical structure, and its lower end is inverted cone shape. The tobacco tar guide cotton A 52 props against the atomizing piece 51, and the area of the contact surface between the tobacco tar guide cotton A 52 and the atomizing piece 51 is smaller than the area of the atomizing surface of the atomizing piece 51. Preferably, the area of the contact surface between the tobacco tar guide cotton A 52 and the atomizing piece 51 accounts for 5%-25% of the area of the atomizing surface of the atomizing piece 51.

[0036] An air inlet passage which communicates with the air inlet 2 is arranged in the shell 1, and the air inlet passage extends to the atomizing surface of the atomizing piece 51. An air outlet passage which communicates

with the suction nozzle 3 is arranged in the shell 1. The atomizing piece 51 is electrically connected with the connecting electrode 6.

[0037] Specifically, the atomizing core 5 further includes a first fixing seat 53 of a hollow structure, and the top of the first fixing seat 53 is provided with an air inlet via hole 54 and an air outlet via hole 55. A first tobacco tar inlet passage 56 is arranged in the upper part of the first fixing seat 53 in a horizontal penetration manner, and the first tobacco tar inlet passage 56 communicates with the tobacco tar cavity 4.

[0038] A fixing groove 57 is formed in the inner cavity of the first fixing seat 53, the tobacco tar guide cotton A 52 is fixed in the fixing groove 57, and the fixing groove 57 communicates with the first tobacco tar inlet passage 56.

[0039] An atomizing piece fixing seat 58 is arranged at the lower part of the inner cavity of the first fixing seat 53, the atomizing piece 51 is installed on the atomizing piece fixing seat 58, and the atomizing surface of the atomizing piece 51 props against the tobacco tar guide cotton A 52.

[0040] A non-atomizing surface of the atomizing piece 51 is electrically connected with the connecting electrode 6 through an electrode ring 7.

[0041] The suction nozzle 3 includes a suction nozzle cover 31 and a nozzle head 32. The air inlet 2 is formed in the side wall of the suction nozzle cover 31, a first gap 8 is reserved between the suction nozzle cover 31 and the top of the shell 1, and the first gap 8 communicates with the air inlet 2.

[0042] A second air pipe 9 which is hollow and communicates with the suction nozzle 3 is installed at the top of the first fixing seat 53. A first air inlet hole 91 is formed in the second air pipe 9, a first air pipe 10 is sheathed at the outside of the second air pipe 9, a second gap 11 is reserved between the inner wall of the first air pipe 10 and the outer wall of the second air pipe 10, and the second gap 11 communicates with the first gap 8. An air isolation device 12 is arranged between the second air pipe 9 and the top of the first fixing seat 53. An air inlet groove 121 which communicates with the first air inlet hole 91 is formed in the air isolation device 12. The air inlet groove 121 communicates with the air inlet via hole 54.

[0043] An air outlet groove 122 which communicates with the air outlet via hole 55 is further formed in the air isolation device 12. The air outlet groove 122 communicates with the hollow cavity of the second air pipe 9.

[0044] The air inlet 2, the first gap 8, the second gap 11, the first air inlet hole 91, the air inlet groove 121 and the air inlet via hole 54 communicate with each other in sequence to form an air inlet passage to extend to the atomizing piece 51 in the inner cavity of the first fixing seat 53.

[0045] The air outlet via hole 55, the air outlet groove 122, the inner cavity of the second air pipe 10 and the suction nozzle 3 communicate with each other in se-

quence to form the air outlet passage.

[0046] Preferably, the atomizing piece 51 is a solid piezoelectric ceramic piece.

[0047] Correspondingly, the present invention further provides an electronic cigarette, including an external power supply, as well as the atomizer in the above-mentioned solution, and the external power supply is electrically connected with the connecting electrode 6 of the atomizer.

Embodiment 2

[0048] As shown in Fig. 5 to Fig. 8, an atomizer includes a shell 1, an air inlet 2, a suction nozzle 3 detachably connected with the top of the shell 1, a tobacco tar cavity 4 and an atomizing core 5 arranged in the shell 1, and a connecting electrode 6 installed at the bottom of the shell 1.

[0049] The atomizing core 5 includes an atomizing piece 51 and tobacco tar guide cotton A 52 capable of guiding tobacco tar in the tobacco tar cavity 4 to an atomizing surface of the atomizing piece 51. The tobacco tar guide cotton A 52 is a single cylindrical structure, and the lower end thereof is inverted cone shape. The tobacco tar guide cotton A 52 props against the atomizing piece 51, and the area of the contact surface between the tobacco tar guide cotton A 52 and the atomizing piece 51 is smaller than the area of the atomizing surface of the atomizing piece 51. Preferably, the area of the contact surface between the tobacco tar guide cotton A 52 and the atomizing piece 51 accounts for 5%-25% of the area of the atomizing surface of the atomizing piece 51.

[0050] An air inlet passage which communicates with the air inlet 2 is arranged in the shell 1, and the air inlet passage extends to the atomizing surface of the atomizing piece 51. An air outlet passage which communicates with the suction nozzle 3 is arranged in the shell 1. The atomizing piece 51 is electrically connected with the connecting electrode 6.

[0051] The atomizing core 5 further includes a second fixing seat 59. A second tobacco tar inlet passage 60 is arranged in the upper part of the second fixing seat 59 in a horizontal penetration manner, and the second tobacco tar inlet passage 60 communicates with the tobacco tar cavity 4.

[0052] A fixing groove 57 is formed in the second fixing seat 59, the tobacco tar guide cotton A 52 is fixed in the fixing groove 57, and the fixing groove 57 communicates with the second tobacco tar inlet passage 60.

[0053] A hollow cavity is formed in the lower part of the second fixing seat 59, and an atomizing piece fixing seat 58 is arranged at the lower part of the hollow cavity. The atomizing piece 51 is installed on the atomizing piece fixing seat 58, and the atomizing surface of the atomizing piece 51 props against the tobacco tar guide cotton A 52; and a third air pipe 13 which is hollow and communicates with the suction nozzle 3 is installed at the top of the second fixing seat 59.

[0054] The air inlet 2 is formed in the lower part of the second fixing seat 59, an air inlet passage A 61 is arranged at the air inlet 2 in a horizontal penetration manner, and the air inlet passage A 61 directly extends to the atomizing surface of the atomizing piece 51. Two air outlet passages A 62 whose directions are vertical to the direction of the air inlet passage A 61 is provided in the second fixing seat 59, and the air outlet passages A 62 communicate with the hollow cavity of the third air pipe 13.

Embodiment 3

[0055] The embodiment 1 or embodiment 2 is repeated, and the difference lies in that the structure of the tobacco tar guide cotton A 52 can be preferably one of the two designs as follows:

First, the density of cotton fibers in the tobacco tar guide cotton A 52 gradually increases from top to bottom. This design can reinforce the siphonage of the tobacco tar guide cotton A 52, thereby guaranteeing the continuity of tobacco tar supply and the amount of tobacco tar supply when the contact area is decreased, in order to guarantee that the amount of smoke is not decreased.

Second, as shown in Fig. 9, a blind hole 800 is formed in the center of the tobacco tar guide cotton A 52 from top to bottom. This design also aims at guaranteeing the continuity of tobacco tar supply and the amount of tobacco tar supply when the contact area is decreased, in order to guarantee that the amount of smoke is not decreased. The principle is that a part of tobacco tar directly flows into the blind hole 800 without siphonage and then disperses from the blind hole 800 to the surrounding, thereby increasing the supply speed of tobacco tar and avoiding dry burning.

Embodiment 4

[0056] As shown in Fig. 10 to Fig. 114, an atomizer includes a shell 1, an air inlet 2, a suction nozzle 3 installed at the top of the shell 1, a tobacco tar cavity 4 and an atomizing core 5 arranged in the shell 1, and a connecting electrode 6 installed at the bottom of the shell 1. The atomizing core 5 includes an atomizing piece 51 and tobacco tar guide cotton B 520 capable of guiding tobacco tar in the tobacco tar cavity 4 to an atomizing surface of the atomizing piece 51.

[0057] The atomizing core 5 further includes a fixing seat B 590, a tobacco tar inlet passage B 600 is arranged in the upper part of the fixing seat B 590 in a horizontal penetration manner, and the tobacco tar inlet passage B 600 communicates with the tobacco tar cavity 4.

[0058] A bracket 80 is arranged in the fixing seat B 590, a hollow cavity is formed in the lower part of the

fixing seat B 590, an atomizing piece fixing seat 58 is arranged at the lower part of the hollow cavity, and the atomizing piece 51 is installed on the atomizing piece fixing seat 58.

[0059] The bracket 80 includes an upper bracket 530 and a lower bracket 540. The upper bracket 530 includes a top base 531, a plurality of cylindrical first tobacco tar guide passages 532 are provided at the lower surface of the top seat 531 in an extension manner, and a tobacco tar outlet hole 533 is formed in the wall of each first tobacco tar guide passage 532. The top of each first tobacco tar guide passage 532 is open, and the opening communicates with the tobacco tar inlet passage B 600.

[0060] The lower bracket 540 includes a bottom seat 541, a plurality of cylindrical second tobacco tar guide passages 542 with open upper ends are provided at the lower surface of the bottom seat 541 in an extension manner, the first tobacco tar guide passages 532 can be correspondingly inserted in the hollow cavities of the second tobacco tar guide passages 542, and the lower ends of the second tobacco tar guide passages 542 are open.

[0061] The tobacco tar guide cotton B 520 is flaky tobacco tar guide cotton that can undergo plastic deformation, the tobacco tar guide cotton B 520 is arranged between the upper bracket 530 and the lower bracket 540, and after the upper bracket 530 is inserted in the lower bracket 540, the tobacco tar guide cotton B 520 undergoes plastic deformation and stretches to form a structure which is the same as that of the upper bracket 530.

[0062] The upper bracket 530, the lower bracket 540 and the tobacco tar guide cotton B 520 are assembled and then placed on the atomizing piece 51 prop against the atomizing surface of the atomizing piece 51 to form a multipoint contact form. The sum of area of the contact point between the tobacco tar guide cotton B 520 and the atomizing piece 51 is smaller than the area of the atomizing surface of the atomizing piece 51. Preferably, the sum of the areas of contact points of the tobacco tar guide cotton B 520 and the atomizing piece 51 accounts for 10%-75% of the area of the atomizing surface of the atomizing piece 51.

[0063] In order to guarantee smooth guide of the tobacco tar, both of the first tobacco tar guide passages 532 and the second tobacco tar guide passages 542 are cones.

[0064] A air pipe B 70 which is hollow and communicates with the suction nozzle 3 is installed at the top of the fixing seat B 590.

[0065] The air inlet 2 is formed in the lower part of the fixing seat B 590, an air inlet passage B 610 is arranged at the air inlet 2 in a horizontal penetration manner, and the air inlet passage B 610 directly extends to the atomizing surface of the atomizing piece 51. At least one air outlet passage B 620 whose direction is vertical to the direction of the air inlet passage B 610 is provided in the fixing seat B 590, and the air outlet passage B 620 communicates with the hollow cavity of the air pipe B 70.

[0066] The atomizing piece 51 is electrically connected

with the connecting electrode 6.

[0067] Preferably, the atomizing piece 51 is a solid piezoelectric ceramic piece.

[0068] The embodiment further provides an electronic cigarette, including an external power supply, as well as the atomizer in the above-mentioned solution, and the external power supply is electrically connected with the connecting electrode 6 of the atomizer.

Embodiment 5

[0069] As shown in Fig.15 to Fig. 17, the embodiment 4 is repeated, and the difference lies in that, the bracket 80 includes a lower bracket 540, the lower bracket 540 includes a bottom seat 541, a plurality of cylindrical second tobacco tar guide passages 542 with open upper ends are provided at the lower surface of the bottom seat 541 in an extension manner, and the lower ends of the second tobacco tar guide passages 542 are open.

[0070] The tobacco tar guide cotton B 520 is made by integrally molding and includes a flaky body 521 and a plurality of strip-shaped bodies 522 fixed to the lower end of the flaky body 521, and the strip-shaped bodies 522 can be correspondingly inserted in the hollow cavities of the second tobacco tar guide passages 542.

[0071] The bracket 80 and the tobacco tar guide cotton B 520 are assembled and then placed on the atomizing piece 51 and prop against the atomizing surface of the atomizing piece 51 to form the multipoint contact form.

[0072] The strip-shaped bodies 522 and the second tobacco tar guide passages 542 are cones.

Claims

1. An atomizer, comprising an atomizer body, and a tobacco tar cavity (4) and an atomizing core (5) both arranged in the atomizer body, wherein the atomizing core (5) comprises an atomizing piece (51) and a tobacco tar guide body capable of guiding tobacco tar in the tobacco tar cavity (4) to an atomizing surface of the atomizing piece (51); and the tobacco tar guide body props against the atomizing piece (51), and the sum of areas of contact surfaces between the tobacco tar guide body and the atomizing piece (51) is smaller than the area of the atomizing surface of the atomizing piece (51).
2. The atomizer of claim 1, wherein the atomizer body comprises a shell (1), an air inlet (2), a suction nozzle (3) installed at the top of the shell (1) and a connecting electrode (6) installed at the bottom of the shell (1), and the tobacco tar cavity (4) and the atomizing core (5) are both arranged in the shell (1); an air inlet passage which communicates with the air inlet (2) is arranged in the shell (1), and the air inlet passage extends to the atomizing surface of the atomizing piece (51); an air outlet passage which

communicates with the suction nozzle (3) is arranged in the shell (1); and
the atomizing piece (51) is electrically connected with the connecting electrode (6).

3. The atomizer of claim 2, wherein the tobacco tar guide body is tobacco tar guide cotton A (52) of one single cylinder with a lower end of inverted cone shape, there is one contact surface between the tobacco tar guide cotton A (52) and the atomizing piece (51).
4. The atomizer of claim 3, wherein atomizing core (5) further comprises a first fixing seat (53) of a hollow structure, the top of the first fixing seat is provided with an air inlet via hole (54) and an air outlet via hole (55), a first tobacco tar inlet passage (56) is arranged horizontally through the upper part of the first fixing seat (53), and the first tobacco tar inlet passage (56) communicates with the tobacco tar cavity (4); and; a fixing groove (57) is formed in the inner cavity of the first fixing seat (53), the tobacco tar guide cotton A (52) is fixed in the fixing groove (57), and the fixing groove (57) communicates with the first tobacco tar inlet passage (56).
5. The atomizer of claim 4, wherein an atomizing piece fixing seat (58) is arranged at the lower part of the inner cavity of the first fixing seat (53), the atomizing piece (51) is installed on the atomizing piece fixing seat (58), and the atomizing surface of the atomizing piece (51) props against the tobacco tar guide cotton A (52); and a non-atomizing surface of the atomizing piece (51) is electrically connected with the connecting electrode (6) through an electrode ring (7).
6. The atomizer of claim 4, wherein the suction nozzle (3) comprises a suction nozzle cover (31) and a nozzle head (32), the air inlet (2) is formed in the side wall of the suction nozzle cover (31), a first gap (8) is reserved between the suction nozzle cover (31) and the top of the shell (1), and the first gap (8) communicates with the air inlet (2); a second air pipe (9) which is hollow and communicates with the suction nozzle (3) is installed at the top of the first fixing seat (53), a first air inlet hole (91) is formed in the second air pipe (9), a first air pipe (10) is sheathed at the outside of the second air pipe (9), a second gap (11) is reserved between the inner wall of the first air pipe (10) and the outer wall of the second air pipe (9), and the second gap (11) communicates with the first gap (8); an air isolation device (12) is arranged between the second air pipe (9) and the top of the first fixing seat (53), an air inlet groove (121) which communicates with the first air inlet hole (91) is formed in the air isolation device (12), and the air inlet groove (121)

communicates with the air inlet via hole (54);
an air outlet groove (122) which communicates with the air outlet via hole (55) is further formed in the air isolation device (12), and the air outlet groove (122) communicates with the hollow cavity of the second air pipe (9);
the air inlet (2), the first gap (8), the second gap (11), the first air inlet hole (91), the air inlet groove (121) and the air inlet via hole (54) communicate with each other in sequence to form an air inlet passage to extend to the atomizing piece (51) in the inner cavity of the first fixing seat (53); and
the air outlet via hole (55), the air outlet groove (122), the inner cavity of the second air pipe (10) and the suction nozzle (3) communicate with each other in sequence to form the air outlet passage.

7. The atomizer of claim 3, wherein the atomizing core (5) further comprises a second fixing seat (59), a second tobacco tar inlet passage (60) is arranged horizontally through the upper part of the second fixing seat (59) and the second tobacco tar inlet passage (60) communicates with the tobacco tar cavity (4); and a fixing groove (57) is formed in the second fixing seat (59), the tobacco tar guide cotton A (52) is fixed in the fixing groove (57), and the fixing groove (57) communicates with the second tobacco tar inlet passage (60).
8. The atomizer of claim 7, wherein a hollow cavity is formed in the lower part of the second fixing seat (59), an atomizing piece fixing seat (58) is arranged at the lower part of the hollow cavity, the atomizing piece (51) is installed on the atomizing piece fixing seat (58), and the atomizing surface of the atomizing piece (51) props against the tobacco tar guide cotton A (52).
9. The atomizer of claim 8, wherein a third air pipe (13) which is hollow and communicates with the suction nozzle (3) is installed at the top of the second fixing seat (59); and the air inlet (2) is formed in the lower part of the second fixing seat (59), an air inlet passage A (61) is arranged at the air inlet (2) in a horizontal penetration manner, and the air inlet passage A (61) directly extends to the atomizing surface of the atomizing piece (51); and at least one air outlet passage A (62) whose direction is vertical to the direction of the air inlet passage A (61) is provided in the second fixing seat (59), and the air outlet passage A (62) communicates with the hollow cavity of the third air pipe (13).
10. The atomizer of any one of claims 1-9, wherein area of the contact surface between the tobacco tar guide cotton A (52) and the atomizing piece (51) accounts for 5%-25% of the area of the atomizing surface of

the atomizing piece (51).

11. The atomizer of any one of claims 3-9, wherein the density of cotton fibers in the tobacco tar guide cotton A (52) gradually increases from top to bottom. 5
12. The atomizer of any one of claims 3-9, wherein a blind hole (800) is formed in the center of the tobacco tar guide cotton A (52) from top to bottom. 10
13. The atomizer of claim 2, wherein the tobacco tar guide body is tobacco tar guide cotton B (520) which contains a plurality of rod-shaped structures, so that there are a plurality of contact surfaces between the tobacco tar guide cotton B (520) and the atomizing piece (51). 15
14. The atomizer of claim 13, wherein the atomizing core (5) further comprises a fixing seat B (590), a tobacco tar inlet passage B (600) is arranged in the upper part of the fixing seat B (590) in a horizontal penetration manner, and the tobacco tar inlet passage B (600) communicates with the tobacco tar cavity (4); and 20
a bracket (80) is arranged in the fixing seat B (590), the tobacco tar guide cotton B (520) is fixed in the bracket (80), and the bracket (80) communicates with the tobacco tar inlet passage B (600). 25
15. The atomizer of claim 14, wherein a hollow cavity is formed in the lower part of the fixing seat B (590), an atomizing piece fixing seat (58) is arranged at the lower part of the hollow cavity, and the atomizing piece (51) is installed on the atomizing piece fixing seat (58). 30
16. The atomizer of claim 14, wherein an air pipe B (70) which is hollow and communicates with the suction nozzle (3) is installed at the top of the fixing seat B (590); the air inlet (2) is formed in the lower part of the fixing seat B (590), an air inlet passage B (610) is arranged at the air inlet (2) in a horizontal penetration manner, and the air inlet passage B (610) directly extends to the atomizing surface of the atomizing piece (51); and at least one air outlet passage B (620) whose direction is vertical to the direction of the air inlet passage B (610) is provided in the fixing seat B (590), and the air outlet passage B (620) communicates with the hollow cavity of the air pipe B (70). 35
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17. The atomizer of claim 14, wherein the bracket (80) comprises an upper bracket (530) and a lower bracket (540); the upper bracket (530) comprises a top seat (531), a plurality of cylindrical first tobacco tar guide passages (532) are provided at the lower surface of the top seat (531) in an extension manner, a tobacco tar

outlet hole (533) is formed in the wall of each first tobacco tar guide passage (532), the top of each first tobacco tar guide passage (532) is open, and the opening communicates with the tobacco tar inlet passage B (600); the lower bracket (540) comprises a bottom seat (541), a plurality of cylindrical second tobacco tar guide passages (542) with open upper ends are provided at the lower surface of the bottom seat (541) in an extension manner, the first tobacco tar guide passages (532) can be correspondingly inserted in the hollow cavities of the second tobacco tar guide passages (542), and the lower ends of the second tobacco tar guide passages (542) are open; the tobacco tar guide cotton B (520) is flaky tobacco tar guide cotton that can undergo plastic deformation, the tobacco tar guide cotton B (520) is arranged between the upper bracket (530) and the lower bracket (540), and after the upper bracket (530) is inserted in the lower bracket (540), the tobacco tar guide cotton B (520) undergoes plastic deformation and stretches to form a structure which is the same as that of the upper bracket (530); and the upper bracket (530), the lower bracket (540) and the tobacco tar guide cotton B (520) are assembled and then placed on the atomizing piece (51) and prop against the atomizing surface of the atomizing piece (51) to form a multipoint contact form.

18. The atomizer of claim 17, wherein both of the first tobacco tar guide passages (532) and the second tobacco tar guide passages (542) are cones. 30
19. The atomizer of claim 14, wherein the bracket (80) comprises a lower bracket (540), the lower bracket (540) comprises a bottom seat (541), a plurality of cylindrical second tobacco tar guide passages (542) with open upper ends are provided at the lower surface of the bottom seat (541) in an extension manner, and the lower ends of the second tobacco tar guide passages (542) are open; the tobacco tar guide cotton B (520) is made integrally and comprises a flaky body (521) and a plurality of strip-shaped bodies (522) fixed to the lower end of the flaky body (521), and the strip-shaped bodies (522) can be correspondingly inserted in the hollow cavities of the second tobacco tar guide passages (542); and the bracket (80) and the tobacco tar guide cotton B (520) are assembled and then placed on the atomizing piece (51) and prop against the atomizing surface of the atomizing piece (51) to form the multipoint contact form. 35
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20. The atomizer of claim 19, wherein both of the strip-shaped bodies (522) and the second tobacco tar guide passages (542) are cones. 55

21. The atomizer of any one of claims 13-20, wherein the sum of the areas of contact points of the tobacco tar guide cotton B (520) and the atomizing piece (51) accounts for 10%-75% of the area of the atomizing surface of the atomizing piece (51). 5
22. The atomizer of claim 1, wherein the atomizing piece (51) is a solid piezoelectric ceramic piece.
23. An electronic cigarette, comprising an external power supply, wherein the electronic cigarette further comprises the atomizer of any one of claims 2-22, and the external power supply is electrically connected with the connecting electrode (6) of the atomizer. 10
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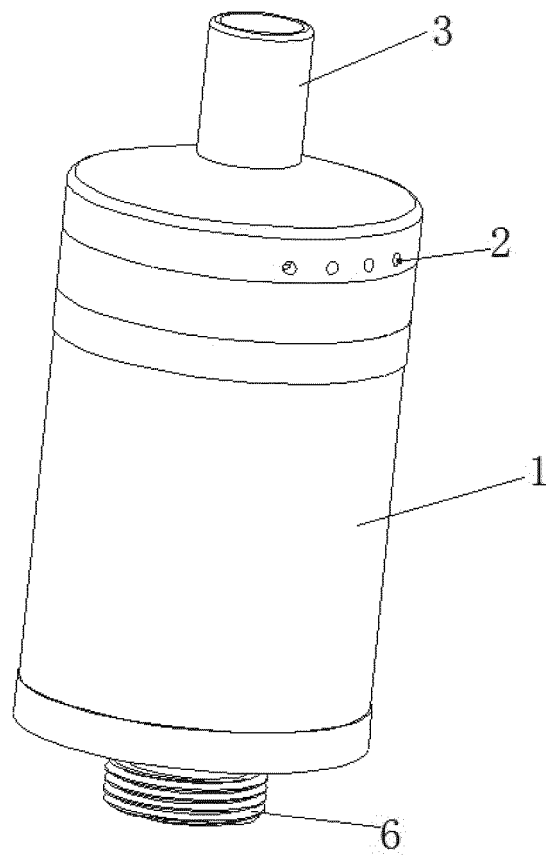


Fig. 1

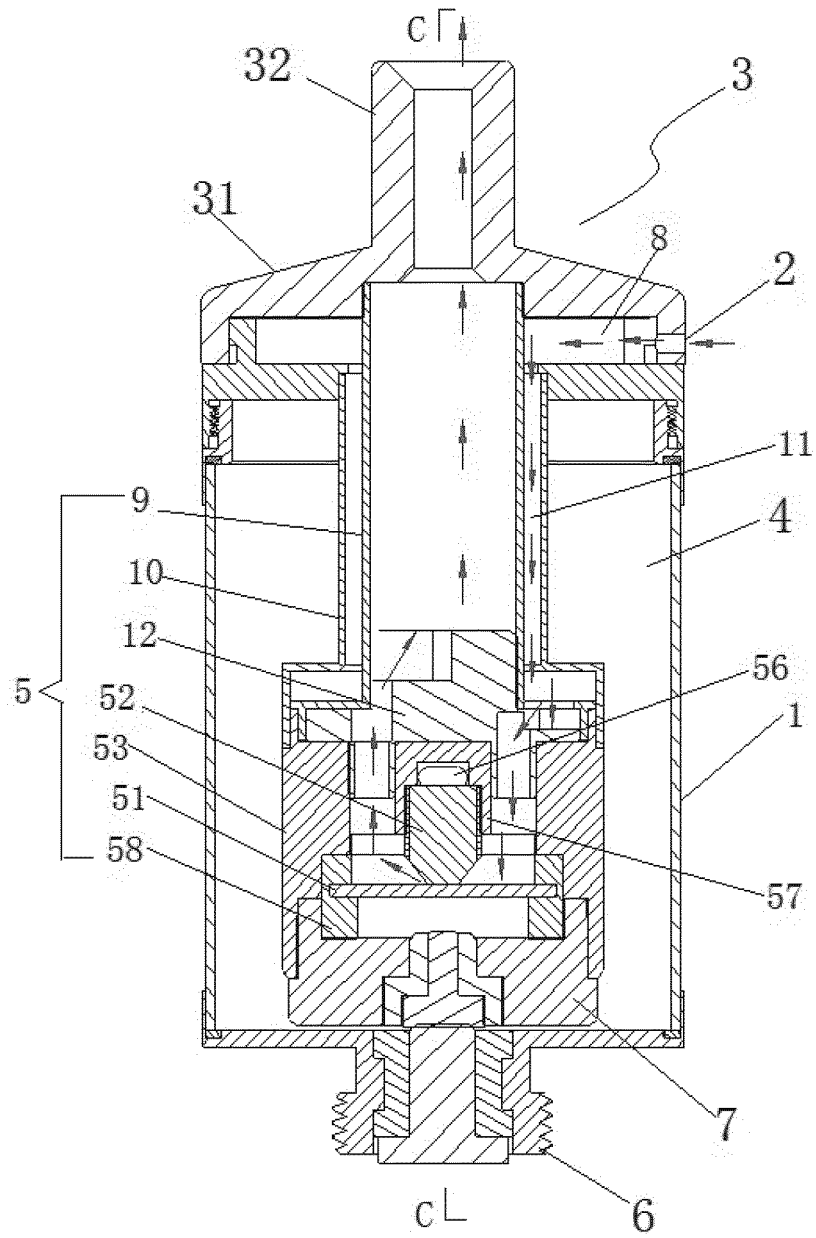


Fig. 2

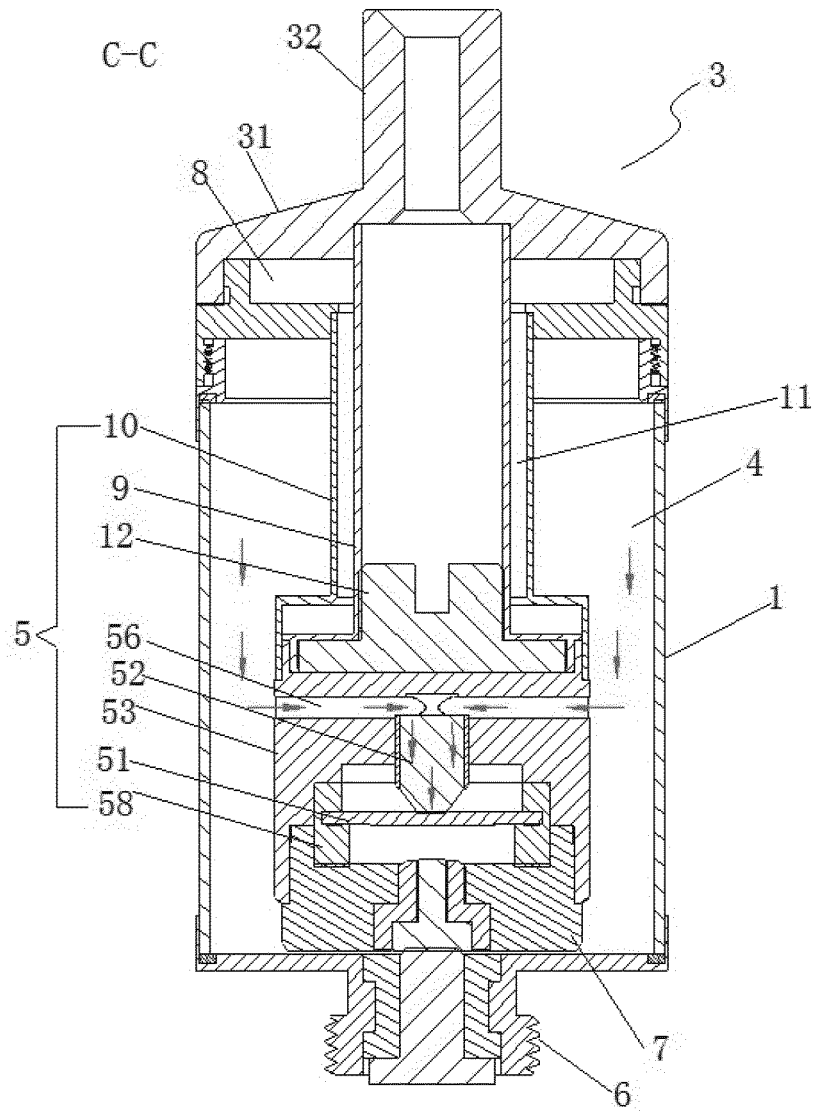


Fig. 3

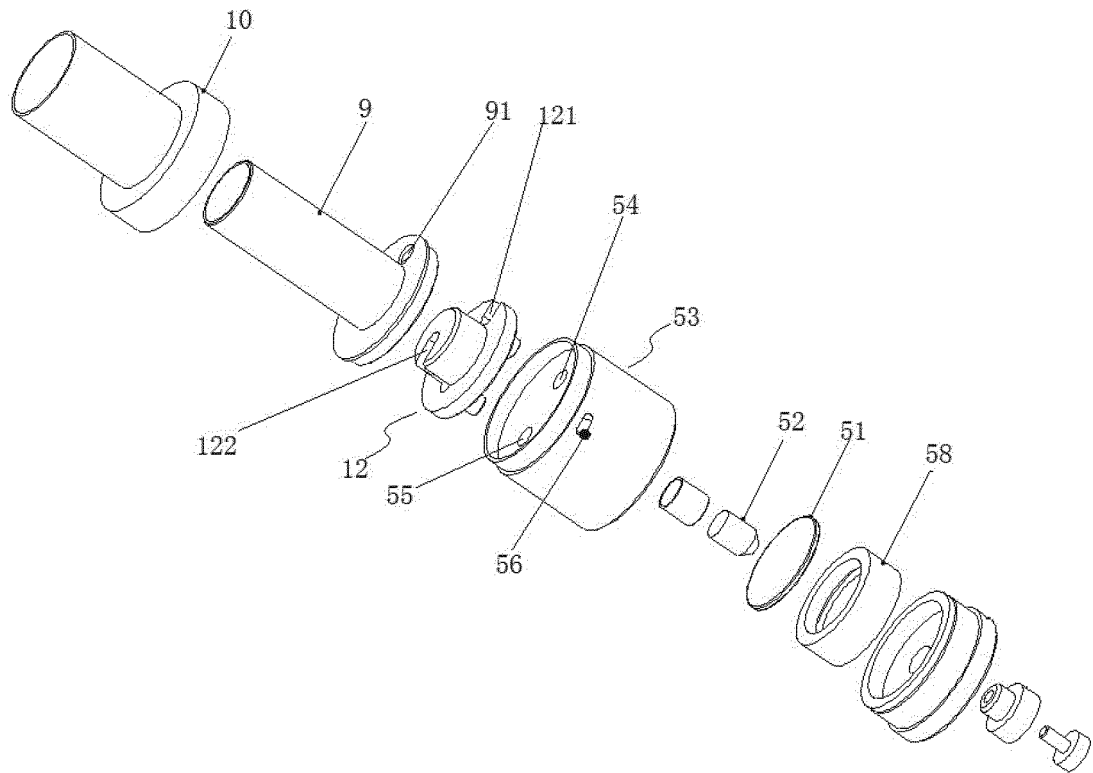


Fig. 4

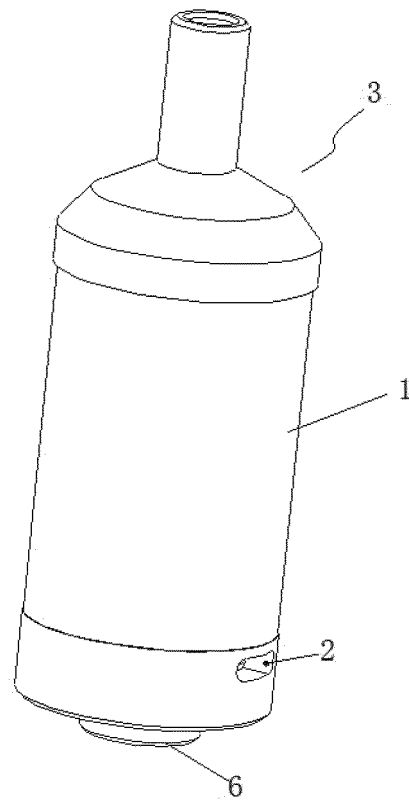


Fig. 5

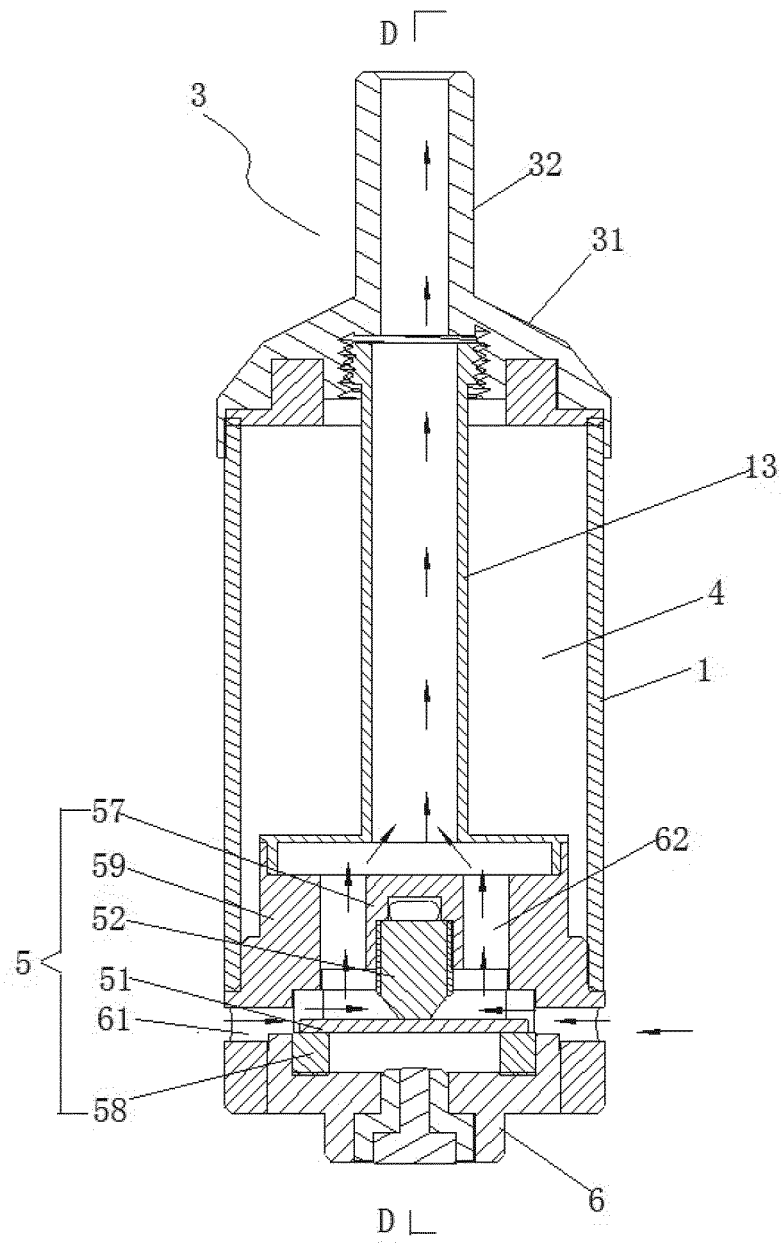


Fig. 6

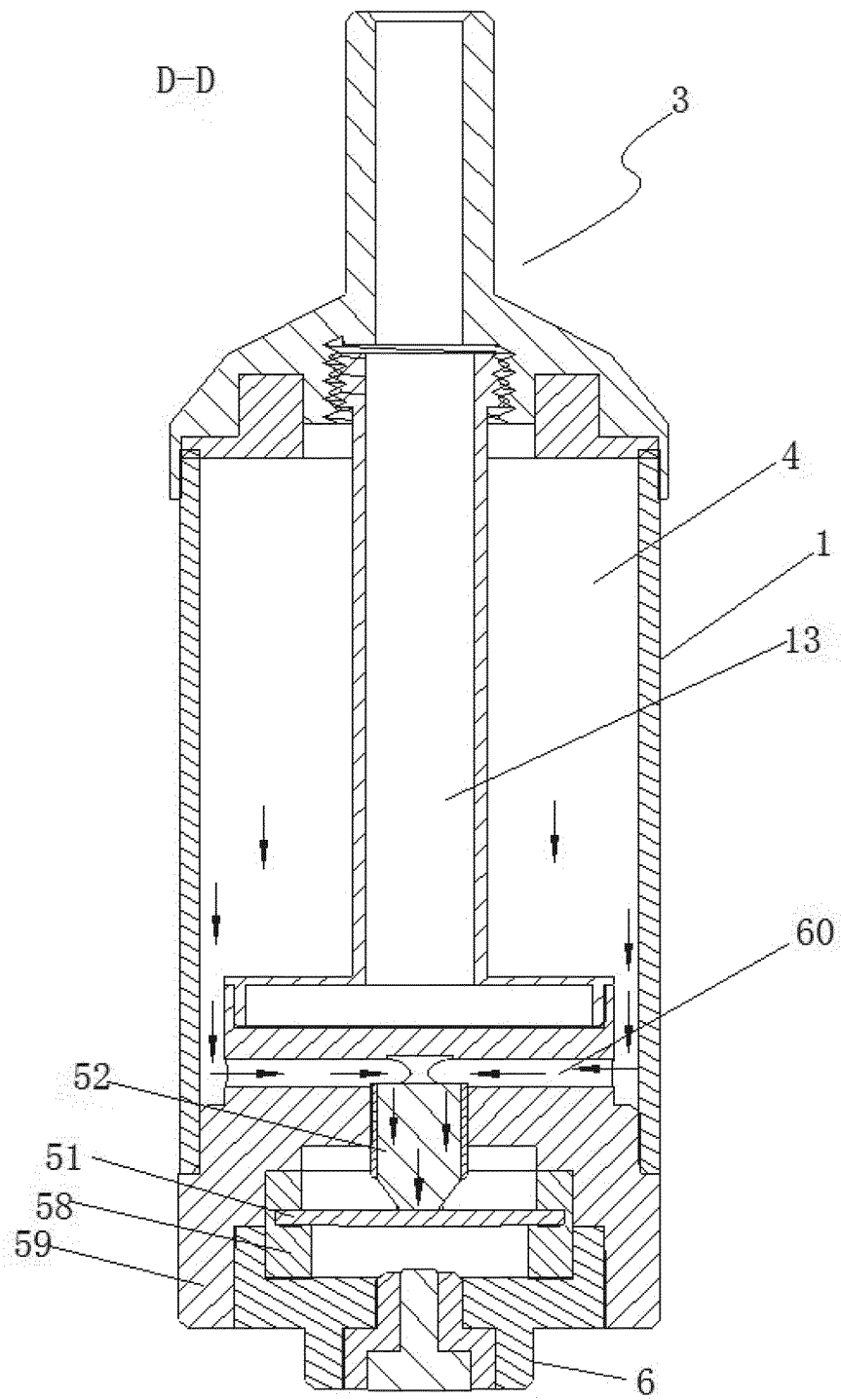


Fig. 7

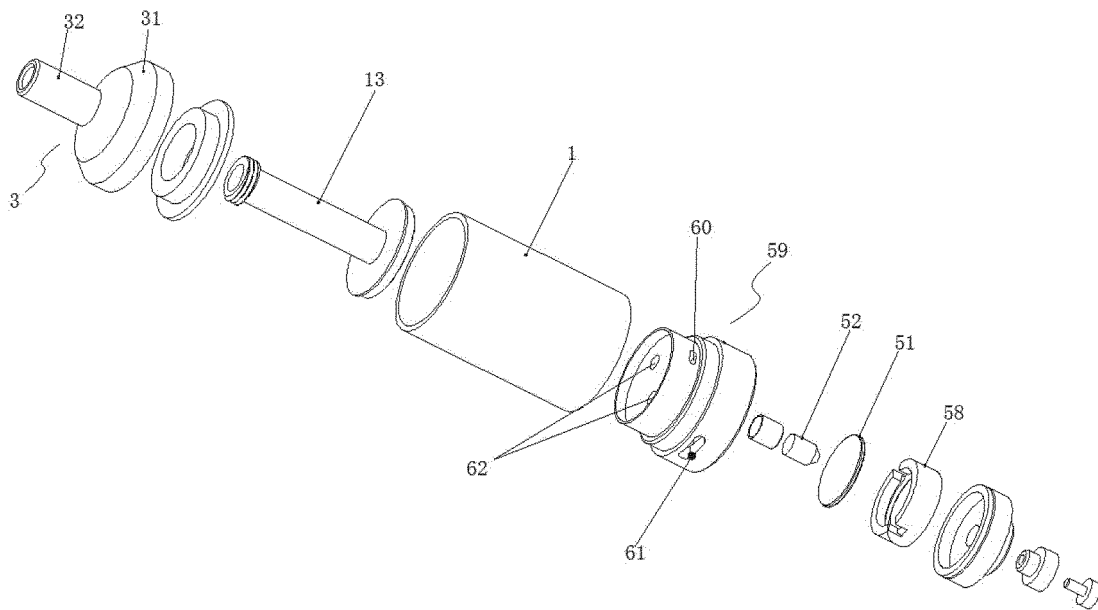


Fig. 8

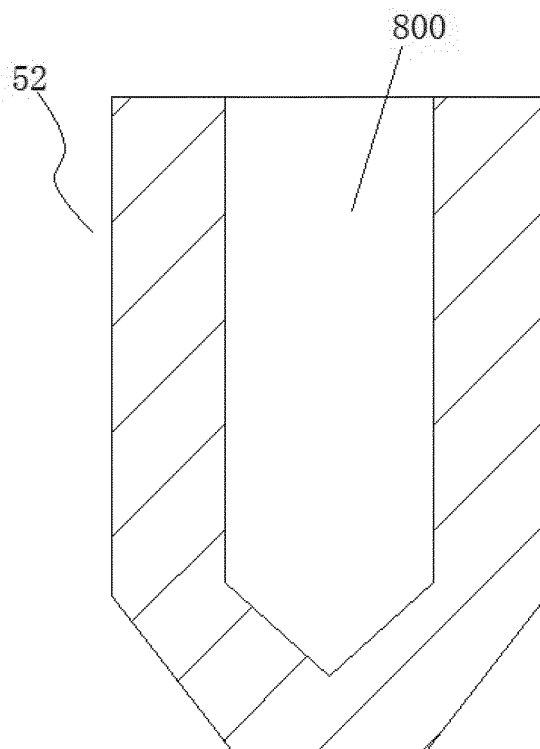


Fig. 9

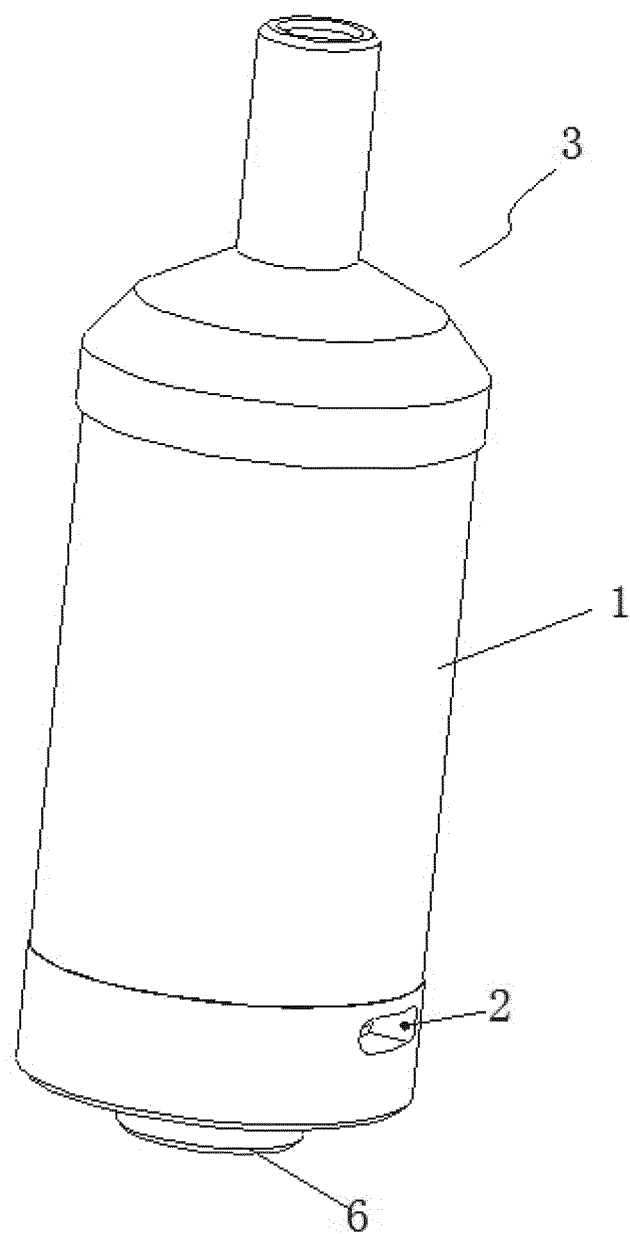


Fig. 10

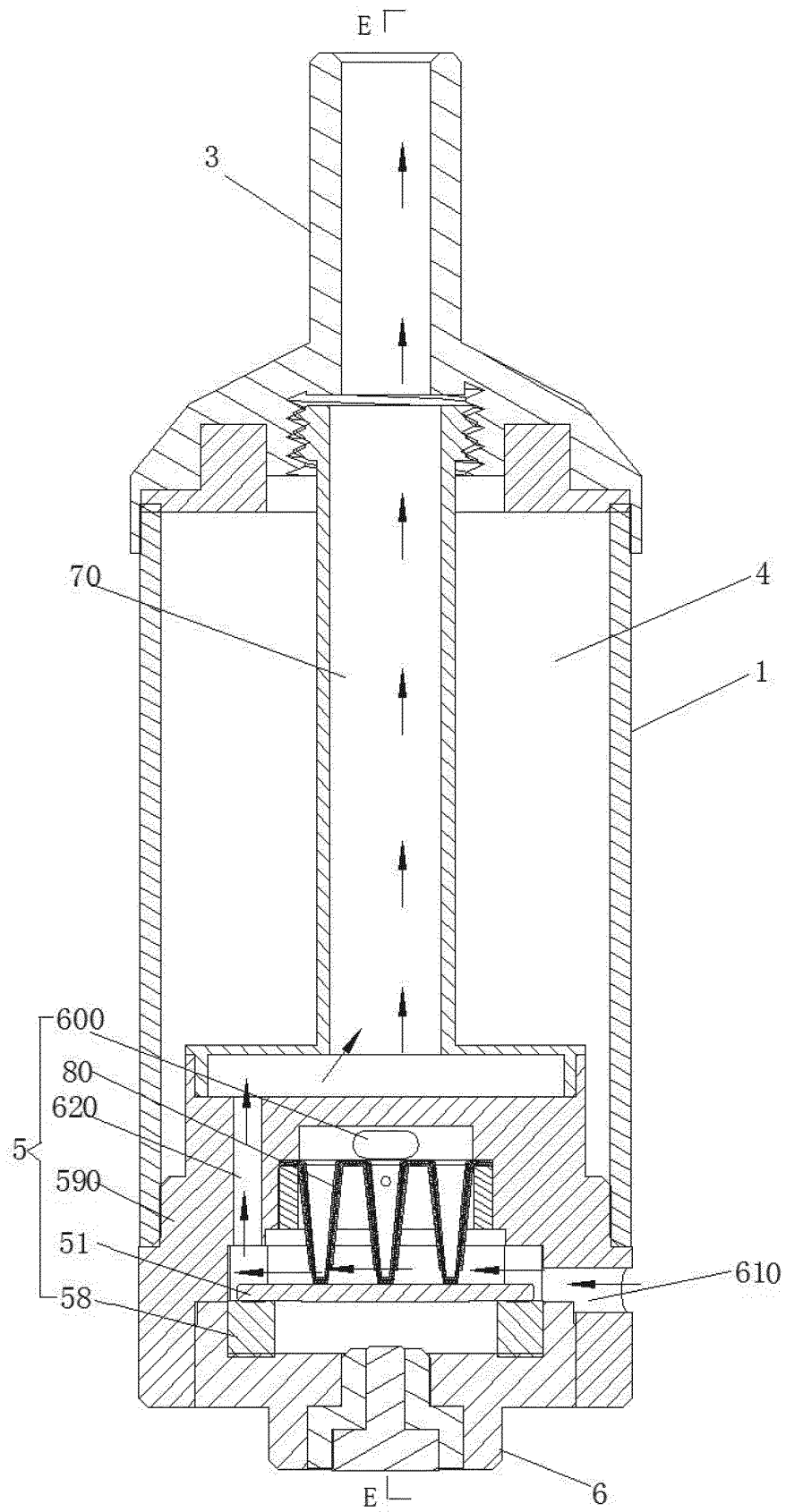


Fig. 11

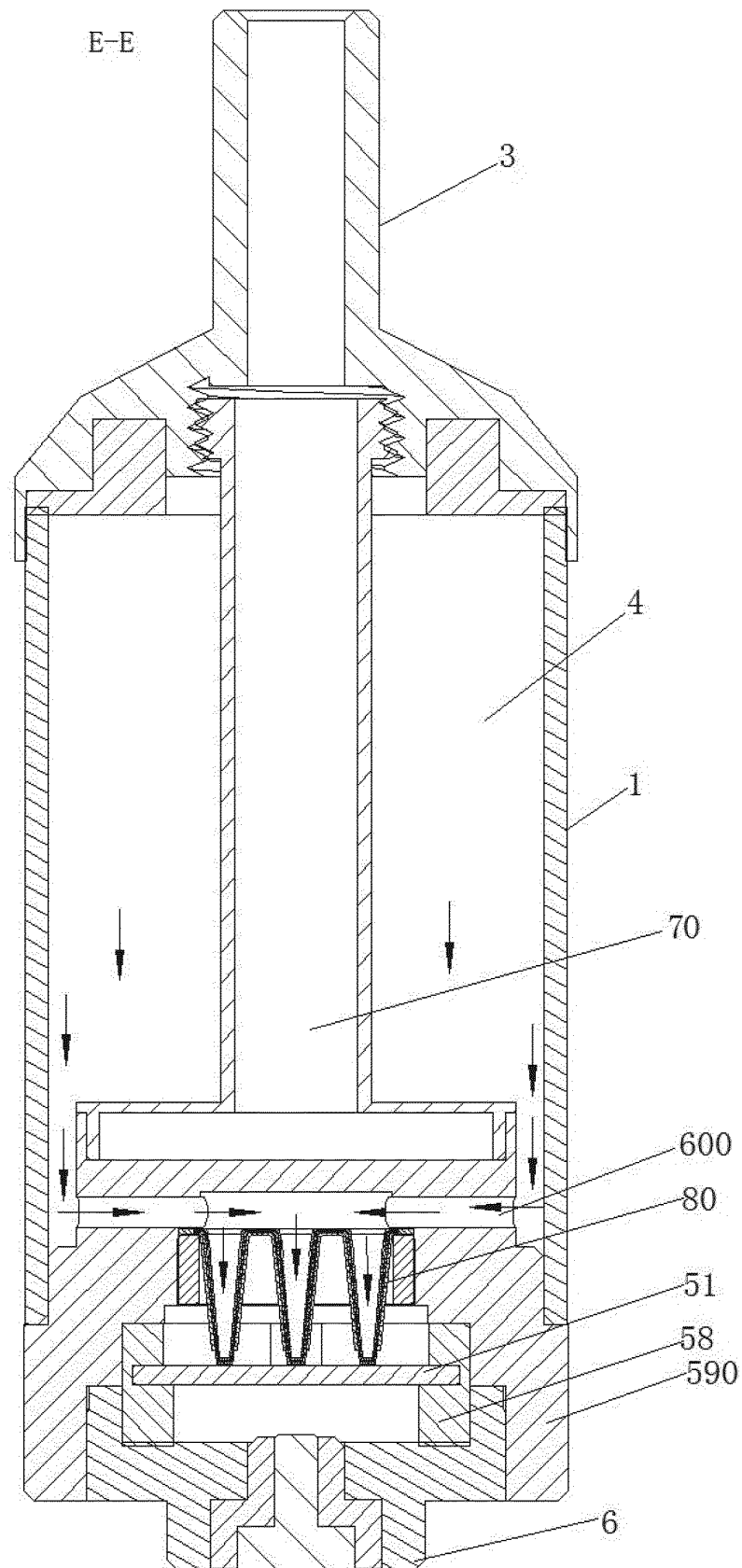


Fig. 12

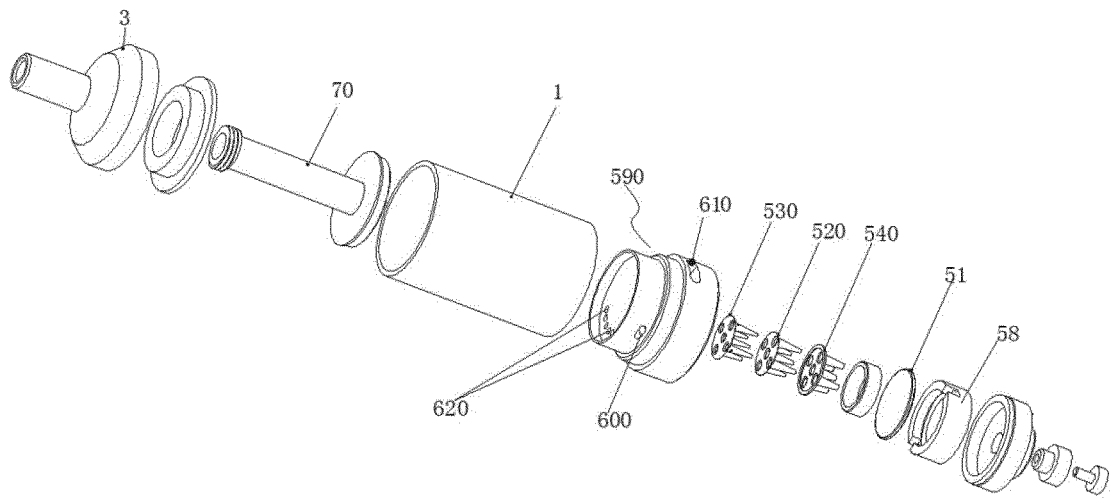


Fig. 13

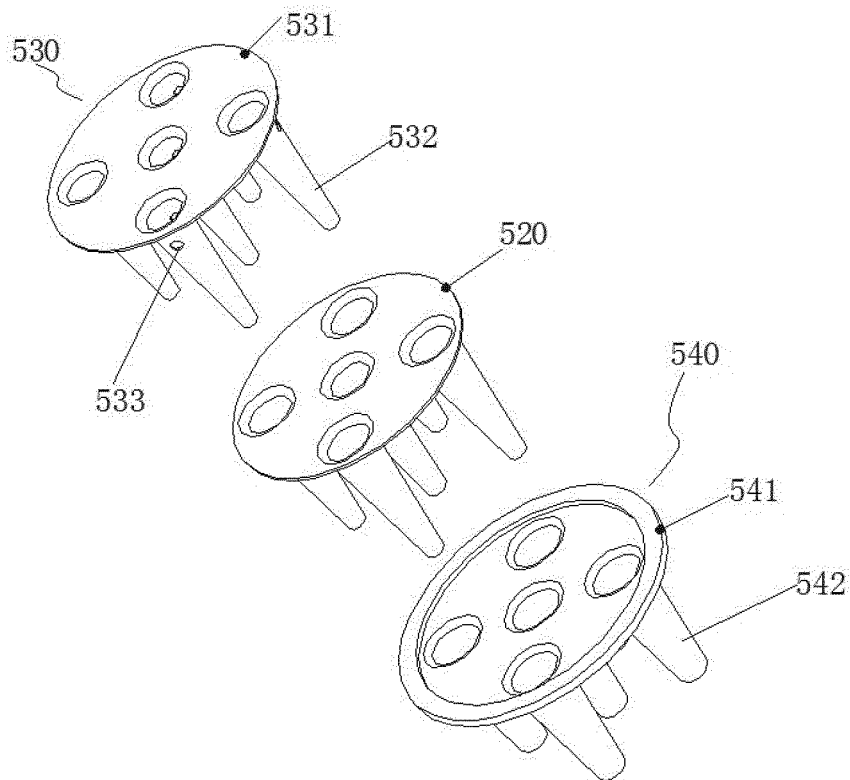


Fig. 14

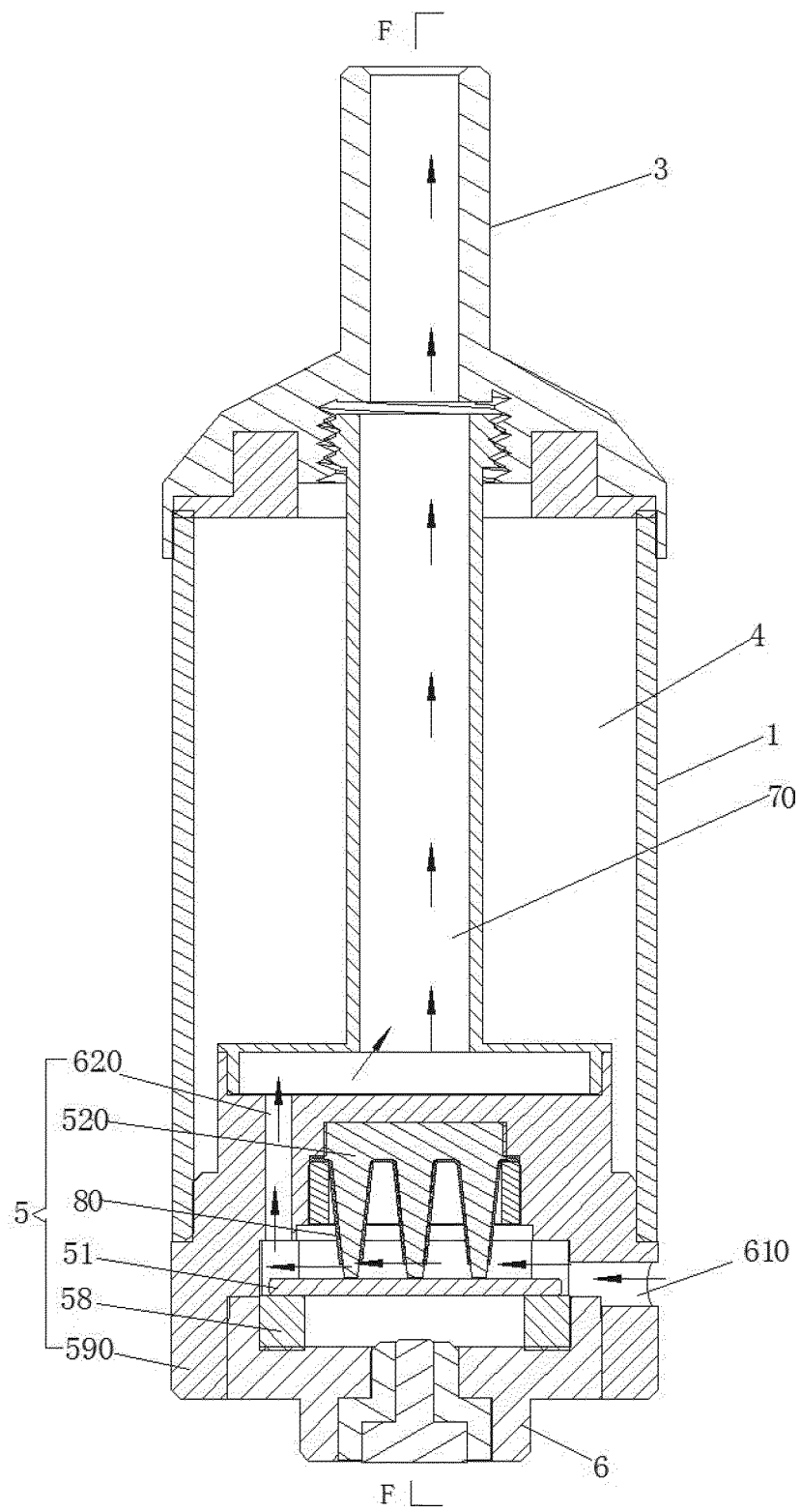


Fig. 15

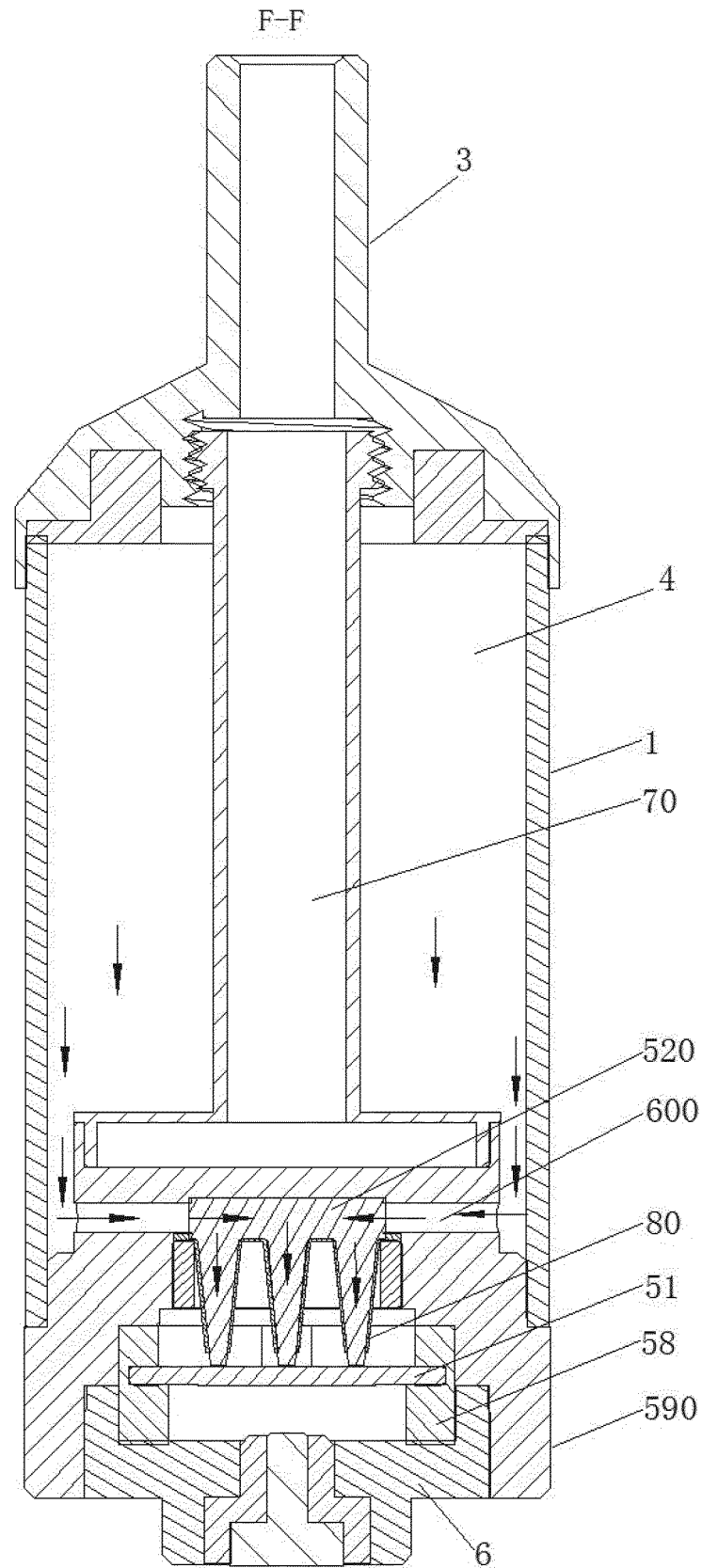


Fig. 16

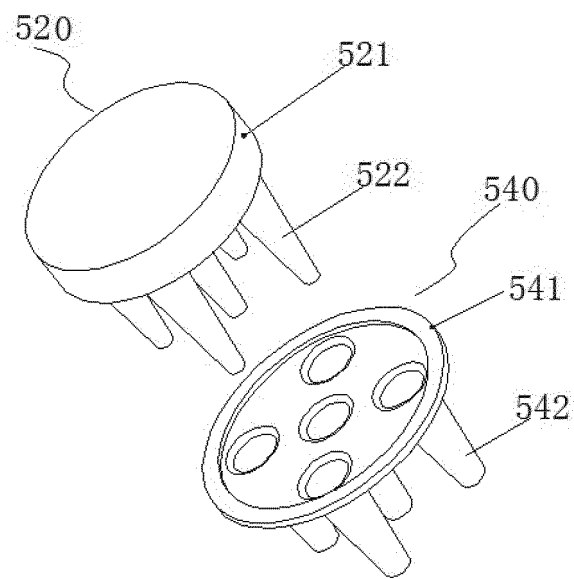


Fig. 17

INTERNATIONAL SEARCH REPORT

International application No.
PCT/CN2016/110390

A. CLASSIFICATION OF SUBJECT MATTER

A24F 47/00 (2006.01) i

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

A24F 47, A61M 11, A61M 15

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)

CNKI, CNTXT, VEN: 电子烟, 雾化, 加热, 吸入, 油, 液, 导, electronic, cigar+, smoking, tobacco, vapor+, atomiz+, heat+, inhal+,
oil, liquid, solution, guid+, direct+

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	CN 104382238 A (SHENZHEN JIAPIN JIANYI TECHNOLOGY CO., LTD. et al.) 04 March 2015 (04.03.2015), description, paragraphs [0007]-[0012], [0019], [0030] and [0031], and figure 5	1-23
X	CN 105559151 A (CHINA TOBACCO HUNAN INDUSTRIAL CO., LTD.) 11 May 2016 (11.05.2016), description, paragraphs [0022]-[0029], and figures 1 and 3	1-23
A	CN 105795526 A (CHINA TOBACCO HUNAN INDUSTRIAL CO., LTD.) 27 July 2016 (27.07.2016), entire document	1-23
A	US 20150184846 A1 (LIU, Qiuming) 02 July 2015 (02.07.2015), entire document	1-23

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

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

Date of the actual completion of the international search 03 May 2017	Date of mailing of the international search report 15 May 2017
Name and mailing address of the ISA State Intellectual Property Office of the P. R. China No. 6, Xitucheng Road, Jimenqiao Haidian District, Beijing 100088, China Facsimile No. (86-10) 62019451	Authorized officer WANG, Shuling Telephone No. (86-10) 62085649

Form PCT/ISA /210 (second sheet) (July 2009)

INTERNATIONAL SEARCH REPORT
Information on patent family members

International application No.
PCT/CN2016/110390

Patent Documents referred in the Report	Publication Date	Patent Family	Publication Date
CN 104382238 A	04 March 2015	CN 104382238 B	22 February 2017
CN 105559151 A	11 May 2016	None	
CN 105795526 A	27 July 2016	None	
US 20150184846 A1	02 July 2015	WO 2015096106 A1	02 July 2015