(12) INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

(19) World Intellectual Property Organization
International Bureau

(43) International Publication Date
29 July 2004 (29.07.2004)

PCT

(10) International Publication Number
WO 2004/063478 A1

(51) International Patent Classification[7]: E03C 1/046

(21) International Application Number:
PCT/KR2004/000018

(22) International Filing Date: 8 January 2004 (08.01.2004)

(25) Filing Language: Korean

(26) Publication Language: English

(30) Priority Data:
20-2003-0000529 8 January 2003 (08.01.2003) KR
20-2003-0001870 21 January 2003 (21.01.2003) KR

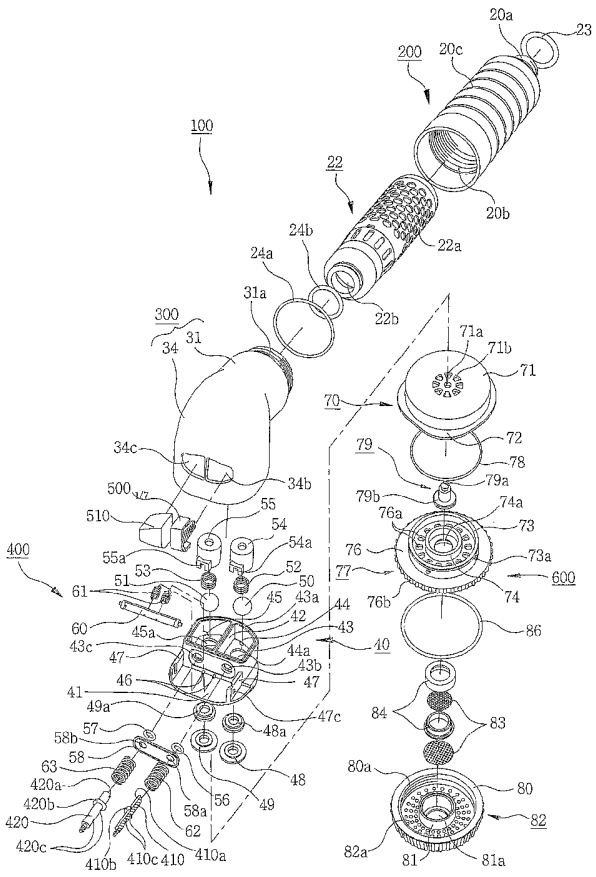
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[Continued on next page]

(54) Title: HEAD APPARATUS USED FOR AQUEDUCT CAPABLE OF PURIFYING WATER



(57) Abstract: Disclosed is a head apparatus for an aqueduct capable of classifying water supplied through the aqueduct into original water and purified water, and allowing users to selectively use water as shower water or foaming water, thereby improving convenience of use, expanding a life span of the filter and saving management cost for the filter. The head apparatus is fixedly connected to an aqueduct and includes a handle section having a first end connected to the aqueduct and accommodating a filter housing having a filter member therein in a non-contact manner, a head section connected to the handle section in order to allow purified water or original water to flow therethrough, a water path switching unit coupled to the head section for selectively discharging original water or purified water, and a water-status switching unit coupled to the head section at a lower portion of the water path switching unit in order to change a status of original water or purified water into foaming water or shower water.

WO 2004/063478 A1

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(81) **Designated States** *(unless otherwise indicated, for every kind of national protection available)*: AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BW, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, EG, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NA, NI, NO, NZ, OM, PG, PH, PL, PT, RO, RU, SC, SD, SE, SG, SK, SL, SY, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, YU, ZA, ZM, ZW.

(84) **Designated States** *(unless otherwise indicated, for every kind of regional protection available)*: ARIPO (BW, GH, GM, KE, LS, MW, MZ, SD, SL, SZ, TZ, UG, ZM, ZW), Eurasian (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European (AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HU, IE, IT, LU, MC, NL, PT, RO, SE, SI, SK, TR), OAPI (BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG).

Published:

— *with international search report*

For two-letter codes and other abbreviations, refer to the "Guidance Notes on Codes and Abbreviations" appearing at the beginning of each regular issue of the PCT Gazette.

HEAD APPARATUS USED FOR AQUEDUCT CAPABLE OF PURIFYING WATER

Technical Field

The present invention relates to a head apparatus capable of purifying water supplied through an aqueduct, and more particularly to a head apparatus for an aqueduct, capable of classifying water supplied through the aqueduct into original water and purified water, and allowing users to selectively use water as shower water or foaming water.

Background Art

Recently, a source of potable water gets contamination day by day due to the illegal discharge of waste water and wastes.

For this reason, more chemicals are inputted into the potable water source in order to purify water supplied from the potable water source, so persons are leery of drinking original water supplied from the potable water source through an aqueduct.

In this regard, a filter is provided in the aqueduct to purify water. However, since water supplied through the aqueduct is always filtered through the filter regardless of usage of water, the filter may be contaminated in a short period of time, so it is required for users to frequently exchange the filter, thereby causing inconvenience to users with increasing cost for managing the filter.

Disclosure of the Invention

Therefore, the present invention has been made in view of the above-mentioned problems, and it is an object of the present invention to provide a head apparatus for an aqueduct, capable of classifying water supplied through the aqueduct into original water and purified water according to usage of water, and allowing users to selectively use water as shower water or foaming water, thereby improving convenience of use, extending a life span of a filter, and saving cost for managing the filter.

In order to accomplish the above object, there is provided a head apparatus fixedly connected to an aqueduct for classifying water into original water or purified water and for allowing a user to selectively use foaming water or shower water, the head apparatus comprising: a handle section having a first end connected to the aqueduct and accommodating a filter housing having a filter member therein in a non-contact manner; a head section connected to the handle section in order to allow purified water or

original water to flow therethrough; a water path switching unit coupled to the head section for selectively discharging original water or purified water; and a water-status switching unit coupled to the head section at a lower portion of the water path switching unit in order to change a status of original water or purified water into foaming water or shower water.

Brief Description of the Drawings

The foregoing and other objects, features and advantages of the present invention will become more apparent from the following detailed description when taken in conjunction with the accompanying drawings in which:

FIG. 1 is an exploded perspective view showing a head apparatus for an aqueduct capable of purifying water according to one embodiment of the present invention;

FIG. 2 is a partially sectional view showing a head apparatus for an aqueduct capable of purifying water according to one embodiment of the present invention;

FIG. 3 is an exploded perspective view showing an internal portion of a head section of a head apparatus for an aqueduct capable of purifying water according to one embodiment of the present invention and a division member of a water path switching unit provided in the head section;

FIG. 4 is a sectional view showing a water status switching unit of a head apparatus for an aqueduct capable of purifying water according to one embodiment of the present invention;

FIG. 5a is a sectional plan view showing a water path when original water is used in a head apparatus for an aqueduct capable of purifying water according to one embodiment of the present invention;

FIG. 5b is a sectional plan view showing a water path when purified water is used in a head apparatus for an aqueduct capable of purifying water according to one embodiment of the present invention;

FIG. 6a is a side sectional view showing a water path when shower water is

used in a head apparatus for an aqueduct capable of purifying water according to one embodiment of the present invention;

FIG. 6b is a side sectional view showing a water path when foaming water is used in a head apparatus for an aqueduct capable of purifying water according to one embodiment of the present invention;

FIG. 7 is an exploded perspective view showing a water-status switching unit of a head apparatus for an aqueduct capable of purifying water according to another embodiment of the present invention according;

FIG. 8 is a partially sectional view showing a head apparatus for an aqueduct capable of purifying water and having a water-status switching unit according to another embodiment of the present invention according;

FIG. 9 is an exploded perspective view of a water-status switching unit according to another embodiment of the present invention;

FIG. 10a is a side sectional view showing a foaming water feeding path formed by a water-status switching unit according to another embodiment of the present invention;

FIG. 10b is a side sectional view showing a shower water feeding path formed by a water-status switching unit according to another embodiment of the present invention;

FIG. 11 is an exploded perspective view of a water path switching unit according to another embodiment of the present invention; and

FIG. 12 is a partially sectional view showing a head apparatus for an aqueduct capable of purifying water and having a water path switching unit according to another embodiment of the present invention.

Best Mode for Carrying Out the Invention

Reference will now be made in detail to the preferred embodiments of the present invention.

In the following description of the present invention, a detailed description of known functions and configurations incorporated herein will be omitted when it may

make the subject matter of the present invention rather unclear. In addition, it is noted that a basic concept of the present invention is to allow a user to selectively use original water or purified water in the form of shower water or foaming water by installing a filter member for filtering original water in a head apparatus.

Hereinafter, a preferred embodiment of a head apparatus for an aqueduct capable of purifying water and having the above basic concept will be described with reference to accompanying drawings.

FIG. 1 is an exploded perspective view showing a head apparatus for an aqueduct capable of purifying water according to one embodiment of the present invention, and FIG. 2 is a partially sectional view showing the head apparatus according to one embodiment of the present invention.

As shown in FIGS. 1 and 2, the head apparatus includes a handle section 200, a head section 300, a water path switching unit 400 and a water-status switching unit 600.

The handle section 200 is connected to the aqueduct and provided at an inner portion thereof with a filter housing 22 having a filter member 21 in such a manner that the filter housing 22 does not make contact with an inner wall of the handle section 200.

The handle section 200 is provided at one end thereof with a fixing screw part 20a, which is detachably coupled to the aqueduct through a packing member 23, and at an inner peripheral portion of the other end thereof with a coupling screw part 20b, which is detachably coupled to a screw 31a of the head section through packing members 24a and 24b.

In addition, the handle section 200 is formed at an outer peripheral portion thereof with an anti-sliding part 20c including a plurality of slots.

One end of the filter housing 22 accommodated in the handle section 200 is closed in vicinity of the fixing screw part 20a of the handle section 200. In addition, an outlet hole 22b is formed at the other end of the filter housing 22 in vicinity of the head section 300. A plurality of inlet holes 22a are formed in the filter housing 22.

The packing member 24 is disposed at an outer peripheral portion of the outlet hole 22b in such a manner that the packing member 24b is coupled to a protrusion 32c of the head section 300.

In addition, the filter member 21 is provided at an inner portion thereof with a cylindrical core member so as to allow original water to pass therethrough. The core member is sequentially formed at an outer surface thereof with an inner non-woven fabric layer, an absorption layer and an outer non-woven fabric layer.

The head section 300, which is screw-coupled to the handle section 200, includes a coupling part 31 and an exhausting part 34.

The coupling part 31 is provided at one end thereof with the screw 31a coupled to the coupling screw part 20b of the handle section 200. In addition, as shown in FIG. 2, a partition wall 32 is formed at an inner portion of the coupling part 31. The protrusion 32c, which is coupled to the outlet hole 22b of the filter housing 22, is formed at one side of the partition wall 32.

The exhausting part 34 is integrally formed with the coupling part 31 and smoothly bent therefrom. As shown in FIG. 3, a division bar 33 is formed at an inner upper portion of an exhaust port 34a of the exhausting part in such a manner that an original water port 32b and a purified water port 32a acting as paths for original water and purified water are separated from each other by means of the partition wall 32 and the division wall 33. The purified water port 32a is communicated with the outlet hole 22b of the filter housing 22. An original water adjusting hole 34b and a purified water adjusting hole 34c, which match with the original water port 32b and the purified water port 32a, are formed at an upper end of the exhaust port 34a.

As shown in FIGS. 1 and 3, the water path switching unit 400, which is coupled to the exhausting part 34 of the head section 300 in order to selectively exhaust original water or purified water, includes a division member 40, ball members 50 and 51, cap members 54 and 55, adjusting bars 410 and 420, compression springs 62 and 63, and a rotating plate 60.

The division member 40 has a base plate 41, and a division plate 42 provided at one side of the base plate 41 corresponding to the division bar 33, thereby forming an original water receiving section 45 and a purified water receiving section 44. An original water feeding hole 45a and a purified water feeding hole 44a are formed at bottom surfaces of the purified water receiving section 44 and the original water

receiving section 45, respectively.

In addition, a division column section 43 is provided in order to receive the division plate 42 therein. A coupling slot 43a is formed between the division column section 43 and the division plate 42 so as to receive the division bar 33 therein.

The ball members 50 and 51 are provided in the original water receiving section 45 and the purified water receiving section 44, respectively, in order to open or close the original water feeding hole 45a and the purified water feeding hole 44a.

In addition, the cap members 54 and 55 have cylindrical shapes and lower portions of which are opened for receiving the ball members 50 and 51 in order to operate the ball members 50 and 51.

The springs 52 and 53 are positioned between the cap members 54 and 55 and the ball members 50 and 51 in order to apply pressure to the ball members 50 and 51 in such a manner that the ball members 50 and 51 securely open or close the original water feeding hole 45a and the purified water feeding hole 44a.

Packing members 48a and 49a are provided in the original water feeding hole 45a and the purified water feeding hole 44a, respectively, through packing fixing members 48 and 49 in order to seal the original water feeding hole 45a and the purified water feeding hole 44a.

In addition, the adjusting bars 410 and 420 pass through the division column section 43 and the division plate 42.

The adjusting bars 410 and 420 are formed at first ends thereof with locking slots 410a and 420a engaged with connection slots 54a and 55a of the cap members 54 and 55. Locking rings 410b and 420b are formed at predetermined portions of the adjusting bars 410 and 420 spaced from the locking slots 410a and 420a and stepped fixing slots 410c and 420c are formed at second ends of the adjusting bars 410 and 420.

A fixing plate member 58 having holes 58a and 58b corresponding to perforated holes 43a of the division column section 43 is fixed to the division column section 43, through which the adjusting bars 410 and 420 pass. The holes 58 and 58b are provided with O-rings 56 and 57 for improving waterproof property thereof.

In addition, the rotating plate 60 is provided at one side of the division member

40 spaced from the fixing plate member 58.

The rotating plate 60 is rotatably hinged to a hole 47c of a guide plate 47, both ends of which are installed on the division member 40.

An upper end of the rotating plate 60 is inserted into fixing slots 410c and 420c of the adjusting bars 410 and 420 and a lower end of the rotating plate 60 is provided with a tension spring 61.

Both ends of the tension spring 61 are connected to a coupling hole 46a formed in a fixing protrusion 46 provided at a lower end of the division column section 43 and a fixing hole 59a formed in a locking protrusion 59 provided at a lower end of the rotating plate 60, thereby providing restoring force to the rotating plate 60.

In addition, the locking rings 410b and 420b of the adjusting bars 410 and 420 are positioned between the rotating plate 60 and the division column section 43. The compression springs 62 and 63 are positioned between the locking rings 410b and 420b and the division column section 43 in order to provide restoring force to the adjusting bars 410 and 420.

FIGS. 11 and 12 are views showing a water path switching unit 400' according to another embodiment of the present invention. In FIGS. 11 and 12, the same reference numerals are used to refer the same parts and redundant description is omitted.

Referring to FIG. 11, the water path switching unit 400' includes a rotating member 60' in stead of the compression springs 62 and 63, rotating plate 60, and tension spring 61 shown in FIG. 1. Hereinafter, a structure of the rotating member 60' will be described.

The rotating member 60' is formed at a center thereof with a hinge hole 60'a, to which the fixing plate member 58 is hinged. In addition, a plurality of U-shaped locking members 60'b are provided at both sides of the rotating member 60' while spacing from the hinge hole 60'a. The U-shaped locking members 60'b are longitudinally arranged at both sides of the rotating member 60'.

In addition, a hinge plate 58c is protruded from a center of the fixing plate member 58, to which the rotating member 60' is fixed. The hinge plate 58c is provided at an upper surface thereof with a hinge protrusion 58d, which is inserted into the hinge

hole 60'a formed in the rotating member 60'.

In addition, the water-status switching unit 600 has a fixing member 70, an exhaust water adjusting member 77, an opening/closing member 79 and a coupling member 82 as shown in FIGS. 1 and 4.

The fixing member 70 has a cylindrical shape, a lower end of which is opened. The fixing member 70 is formed at a center of an upper surface thereof with an insertion hole 71a. A plurality of exhausting holes 71b are radially arranged in the fixing member 70 while spacing from the insertion hole 71a.

In addition, an insertion part 71 downwardly extends from an upper peripheral portion of the fixing member. An inclined guide slot 71c is formed at an inner circumferential portion of the insertion part 71 and a flange part 72 is formed at a lower end of the fixing member 70.

The exhaust water adjusting member 77 is provided with an insertion column part 73, which is screw-coupled to the insertion part 71 of the fixing member 70. A foaming water column part 74 having a foaming water hole 74a is formed at an inner portion of the exhaust water adjusting member 77 while spacing from the insertion column part 73. A plurality of shower water holes 76a are formed between the foaming water column part 74 and the insertion column part 73. In addition, a coupling part 75 formed at an outer peripheral portion thereof with a screw 75a is formed at a lower portion of the exhaust water adjusting member 77 while spacing from the foaming water column part 74.

A coupling protrusion 73a, which is screw-coupled to the guide slot 71c, is formed at the insertion column part 73 of the exhaust water adjusting member 77.

An adjusting plate 76 of the exhaust water adjusting member 77 is formed at an outer peripheral portion thereof with an embossing section 76b so as to allow a user to easily rotate the exhaust water adjusting member 77.

In addition, the opening/closing member 79 has a fixing part 79a inserted into the insertion hole 71a of the fixing member 70 while passing through the foaming water hole 74a of the exhaust water adjusting member 77 so as to seal the insertion hole 71a. A contact part 79b is protruded from a lower outer peripheral portion of the fixing part

79a so as to open/close the foaming water hole 74a.

In addition, the coupling member 82 has a receiving part 80. The receiving part 80 is detachably coupled to the coupling part 75 of the exhaust water adjusting member 77 and is protruded from a lower outer peripheral portion of the coupling member 82. A coupling column part 81 having an exhaust hole 81a communicated with the foaming water hole 74a is formed at an inner portion of the coupling member 82 while spacing from the receiving part 80 and is coupled to the foaming water column part 74. A plurality of shower water holes 82a, which are communicated with shower water holes 76a, are formed between the coupling column part 81 and the receiving part 80.

A plurality of foaming water meshes 83 are installed in the exhaust hole 81a of the coupling member 82 by means of a plurality of fixing members 84 in order to provide foaming water.

In addition, the insertion part 71 of the fixing member 70 is coupled to the insertion column part 73 and the receiving part 80 of the coupling member 82 is coupled to the coupling part 75 of the exhaust water adjusting member 77 through packing members 78 and 86 in order to improve waterproof property thereof.

FIGS. 7 to 10 show a water-status switching unit 700 according to another embodiment of the present invention.

As shown in figures, the water-status switching unit 700 includes a fixing member 710, a rotating member 730, a coupling member 740, an adjusting member 750 and fixing cap 760.

As shown in FIG. 9, the fixing member 710 has a cylindrical shape, a lower portion of which is opened. In addition, the fixing member 710 is formed at a center portion thereof with a pair of perforated holes 711a, which are symmetrically arranged. A coupling slot 711b is formed at an inner portion of the fixing member in vertical to the perforated holes 711a.

In addition, a plurality of locking strips 712 are symmetrically arranged at an inner portion of the fixing member 710 while spacing from the perforated holes 711a and the coupling slots 711b.

The fixing member 710 is provided at an outer peripheral portion thereof with an

insertion part 714 and a flange 715 is provided at a lower end of the insertion part 714. A coupling column section 713 is formed at an inner portion of the fixing member 710 while spacing from the insertion part 714. The coupling column section 713 is formed at an outer peripheral portion thereof with elongated recesses 713a.

An anti-leakage member 720 is provided at an inner portion of the fixing member 710. The anti-leakage member 720 is formed with a plurality of discharge holes 720b, which are symmetrically formed with each other corresponding to perforated holes 711a of the fixing member 710. An insertion piece 720a inserted into the coupling slot 711b of the fixing member 710 is formed between the discharging holes 720b.

In addition, as shown in FIG. 9, the rotating member 730 includes a cylindrical column section 713, a screw section, and a flange section 732 arranged between the cylindrical column section 713 and the screw section 731e. The cylindrical column section 713 is formed with foaming water holes 731a and shower water holes 731b and 731c, which are selectively communicated with the perforated holes 711a of the fixing member 710.

The cylindrical column section 713 is provided at an outer wall thereof with a pair of locking protrusions 731d, which are locked with the locking strips 712 so as to limit a rotation of the rotating member 730.

A plurality of protrusions 731f are circumferentially formed between the flange section 732 and the screw section 731e.

In addition, the coupling member 740 is formed at a center thereof with a perforated hole 740a, into which the rotating member 730 is inserted. An insertion member 742, which is coupled with the coupling column section 713 of the fixing member 710, is formed at an outer peripheral portion of the coupling member 740. A plurality of shower water exhaust holes 740b are circumferentially formed between the insertion member 742 and the perforated hole 740a.

The insertion member 742 is formed at an inner peripheral portion thereof with insertion protrusions 742a, which are inserted into the elongated recesses 713a of the coupling column section 713.

In addition, the coupling member 740 is coupled to the rotating member 730 by interposing an anti-leakage ring 743 therebetween and is coupled to the coupling column section 713 by interposing a packing member 741 therebetween.

As shown in FIG. 9, the rotating member 730 passes through a perforated hole 750a formed at the center of the adjusting member 750. The adjusting member 750 is provided at an outer peripheral portion thereof with a recess section 751 for receiving the insertion member 742 of the coupling member 740. A plurality of elongated holes 750c, which are communicated with the shower water exhaust holes 740b of the coupling member 740, are circumferentially formed between the recess section 751 and the perforated hole 750a.

In addition, a plurality of slots 750b are formed at an inner wall of the perforated hole 750a in such a manner that the protrusions 731f are engaged with the slots 750b.

The adjusting member 750 is provided at an outer wall thereof with a gripping projection 752 so as to allow the user to easily rotate the adjusting member 750.

The fixing cap 760 is screw-coupled with the screw section 731e of the rotating member 730, which passes through the adjusting member 750, at a lower portion of the adjusting member 750, so that the adjusting member 750 is fixed to the fixing member 710.

A mesh 762 for forming foaming water is accommodated between the adjusting member 750 and the fixing cap 760.

Hereinafter, an operation of the head apparatus having the above structure will be described.

Firstly, the head apparatus 100 is fixedly connected to the aqueduct. In this state, if it is required to use original water, the user pushes a purified water adjusting button 500 protruded from an outer surface of the exhausting part 34 of the head section 300 as shown in FIGS. 1 to 4, 5a, 6a and 6b.

If the user pushes the purified water adjusting button 500, an adjusting bar 410 is inserted into the exhausting part 34 so that the compression spring 62 is compressed. At the same time, the rotating plate 60 rotates in a pushing direction while extending the tension spring 61. Thus, the cap member 54 connected to one end of the adjusting bar

410 moves towards the purified water feeding hole 44a of the purified water receiving section 44. Accordingly, bias force of the spring 52 may apply to the ball member 50 accommodated in the cap member 54, so that the ball member 50 securely closes the purified water feeding hole 44a.

At this time, as shown in FIG. 5a, the rotating plate 60 rotates along the pushing direction of the adjusting bar 410 and is separated from the fixing slot 410c of the adjusting bar 410. At the same time, elastic force of the tension spring 61 is applied to the rotating plate 60 so that the rotating plate 60 returns to its initial position. At this time, the rotating plate 60 is locked with the fixing slot 410c formed at a front of the adjusting bar 410, so that the adjusting bar 410 is securely fixed.

If the rotating plate 60 is released from the fixing slot 410c, elastic force of the compression spring 63 is applied to the adjusting bar 420, which is not subject to external force, so that the adjusting bar 420 is released and the fixing slots 420c formed at a rear portion of the adjusting bar 420 is locked with an upper end of the rotating plate 60. At this time, the locking ring 420b of the adjusting bar 420 makes contact with the rotating plate 60, and the cap member 55 and the ball member 51 move forward of the original water receiving section 45, thereby opening the original water feeding hole 45a.

Accordingly, the original water feeding hole 45a is opened and the purified water feeding hole 44a is closed, so that only original water is supplied.

As shown in FIG. 5b, the similar procedure is carried out when supplying purified water.

When the water path switching unit 400' according to another embodiment of the present invention as shown in FIGS. 11 and 12 is used, if the purified water adjusting button 500 is pushed, the adjusting bar 410 is moved corresponding to the purified water adjusting button 500. Thus, the rotating member 60' provided at both sides thereof with U-shaped locking members 60'b, which are rotatably connected to the adjusting bars 410 and 420, performs a leverage movement on the hinge plate 58c of the fixing plate member 58 so that the adjusting bar 420 and an original water adjusting button 510 are ejected. Accordingly, the original water feeding hole 45a is opened and

the purified water feeding hole 44a is closed. According to this embodiment, the adjusting buttons 500 and 510 are always engaged with the adjusting bars 410 and 420 by means of the rotating member 60'.

Water supplied from the aqueduct through the original water feeding hole 45a is introduced into the inner portion of the handle section 200. Then, water flows along an outer peripheral portion of the filter housing 22, which is accommodated in the handle section 200 in such a manner that the filter housing 22 does not make contact with the inner peripheral portion of the handle section 200. After that, water is introduced into the exhausting part 34 through the original water port 32b formed in the partition wall 32 of the coupling part 31 of the head section 300 and is discharged into the original water receiving section 45.

Original water received in the original water receiving section 45 is discharged trough the original water feeding hole 45a. That is, as shown in FIG. 6a, original water is discharged towards the exhaust water adjusting member 77 through the exhausting holes 71b formed on the upper surface of the fixing member 70. Then, exhausted original water is deformed into shower water through the shower water holes 76a of the exhaust water adjusting member 77 and shower holes 82a of the coupling member 82.

If the user want to use foaming water instead of shower water, as shown in FIG. 6b, the exhaust water adjusting member 77 of the water-status switching unit 600 is rotated in one direction in such a manner that the exhaust water adjusting member 77 moves along the guide slot 71c of the fixing member 70.

Accordingly, the opening/closing member 79 opens the foaming water hole 74a of the exhaust water adjusting member 77, and the foaming water column part 74 makes contact with an underside of the fixing member 70 so that a fluid path formed between the exhausting holes 71b of the fixing member 70 and the shower water hole 76a is shut off.

Accordingly, original water discharged through the original water feeding hole 45a may be deformed into foaming water through the foaming water hole 74a and the mesh 83 of a foaming water forming member 85.

When it is required to use purified water, as shown in FIG. 5b, the user pushes

the original water adjusting button 510, which is protruded from an outer surface of the exhausting part 34 of the head section 300.

Accordingly, with the same manner as described above, the original water feeding hole 45a is closed and the purified water feeding hole 44a is opened.

Original water is supplied from the aqueduct as the purified water feeding hole 44a is opened. At this time, because the original water feeding hole 45a is closed, original water is introduced into the inlet holes 22a of the filter housing 22 and is purified while passing through the filter member 21. Accordingly, purified water is introduced into the purified water port 32a of the head section 300 through the outlet hole 22b of the filter housing 22.

Purified water introduced into the purified water port 32a flows into the water-status switching unit 600 or 700 through the purified water feeding hole 44a of the purified water receiving section and is deformed into shower water by means of the water-status switching unit 600 or 700, so purified shower water is exhausted to an exterior.

In this state, if the user rotates the exhaust water adjusting member 77 or 750 of the water-status switching unit 600 or 700, purified water passes through the mesh 83 or 762, so purified foaming water is exhausted.

Industrial Applicability

As can be seen from the foregoing, the head apparatus for an aqueduct according to the present invention can classify water supplied through the aqueduct into original water and purified water, and allow users to selectively use water as shower water or foaming water, thereby improving convenience of use, expanding a life span of the filter and saving management cost for the filter.

While this invention has been described in connection with what is presently considered to be the most practical and preferred embodiment, it is to be understood that the invention is not limited to the disclosed embodiment and the drawings, but, on the contrary, it is intended to cover various modifications and variations within the spirit and scope of the appended claims.

Claims

1. A head apparatus fixedly connected to an aqueduct for classifying water into original water or purified water and for allowing a user to selectively use foaming water or shower water, the head apparatus comprising:

a handle section 200 having a first end connected to the aqueduct and accommodating a filter housing 22 having a filter member 21 therein in a non-contact manner;

a head section 300 connected to the handle section 200 in order to allow purified water or original water to flow therethrough;

a water path switching unit 400 or 400' coupled to the head section 300 for selectively discharging original water or purified water; and

a water-status switching unit 600 or 700 coupled to the head section 300 at a lower portion of the water path switching unit 400 in order to change a status of original water or purified water into foaming water or shower water.

2. The head apparatus as claimed in claim 1, wherein both sides of the handle section 200 are detachably coupled to the aqueduct and the head section 300 by interposing packing members 23, 24a and 24b therebetween, and an anti-sliding part 20c is formed at an outer surface of the handle section 200.

3. The head apparatus as claimed in claim 2, wherein the filter housing 22 has a first end adjacent to the aqueduct and a second end adjacent to the head section, the first end being closed and the second end being opened, a plurality of inlet holes 22a being formed in the filter housing 22 for receiving original water.

4. The head apparatus as claimed in claim 1, wherein the head section 300 is formed at an inner portion thereof with an original water port 32b and a purified water port 32a by means of a partition wall 32 and a division bar 33 and an outlet hole 22b of the filter housing 22 coupled to the partition wall 32 so that the outlet hole 22b is

communicated with the purified water port 32a.

5. The head apparatus as claimed in claim 1, wherein the water path switching unit 400 comprises:

a division member 40 having a division plate 42 installed on a base plate 41 and inserted into both sides of the division bar 33 of the head section 300, an original water receiving section 45 formed with an original water feeding hole 45a and a purified water receiving section 44 formed with a purified water feeding hole 44a;

ball members 50 and 51 provided in the original water feeding hole 45a and in the purified water feeding hole 44a in order to open/close the original water feeding hole 45a and the purified water feeding hole 44a;

cap members 54 and 55 surrounding the ball members 50 and 51;

adjusting bars 410 and 420 having first ends coupled to the cap members 54 and 55, and second ends sequentially passing through the division plate 42 and the head section 300 in such a manner that the adjusting bars 410 and 420 moves through the division plate 42 and the head section 300;

compression springs 62 and 63 interposed between locking rings 410b and 420b of the adjusting bars 410 and 420 and the division plate 42 so as to apply biasing force to the adjusting bars 410 and 420; and

a rotating plate 60 locked with front portions of the locking rings 410b and 420b of the adjusting bars 410 and 420, both ends of the rotating plate 60 being rotatably coupled to the division member 40.

6. The head apparatus as claimed in claim 1, wherein the water path switching unit 400' comprises:

a division member 40 having a division plate 42 installed on a base plate 41 and inserted into both sides of the division bar 33 of the head section 300, an original water receiving section 45 formed with an original water feeding hole 45a, and a purified water receiving section 44 formed with a purified water feeding hole 44a;

ball members 50 and 51 provided in the original water feeding hole 45a and in

the purified water feeding hole 44a in order to open/close the original water feeding hole 45a and the purified water feeding hole 44a;

cap members 54 and 55 surrounding the ball members 50 and 51;

adjusting bars 410 and 420 having first ends coupled to the cap members 54 and 55, and second ends sequentially passing through the division plate 42 and the head section 300 in such a manner that the adjusting bars 410 and 420 moves through the division plate 42 and the head section 300; and

a rotating member 60', a center of which is rotatably coupled to the division member 40, first ends of the adjusting bars 410 and 420 being rotatably coupled to both sides of the rotating member 60'.

7. The head apparatus as claimed in claim 5, wherein the adjusting bars 410 and 420 are formed at predetermined sides thereof with a plurality of fixing slots 410c and 420c, to which an upper end of the rotating plate 60 is coupled, and a tension spring 61 is provided between a lower end of the rotating plate 60 and the division member 40 so as to apply bias force to the rotating plate 60.

8. The head apparatus as claimed in claim 5 or 6, wherein springs 52 and 53 are provided between ball members 50 and 51 and cap members 54 and 55 so as to bias the ball members 50 and 51 in such a manner that an opening/closing operation of the ball members 50 and 51 is facilitated.

9. The head apparatus as claimed in claim 5 or 6, wherein packing members 48a and 49a are provided in the original water feeding hole 45a and the purified water feeding hole 44a, and O-rings 56 and 57 are provided in the adjusting bars 410 and 420, which pass through the division plate 42.

10. The head apparatus as claimed in any one of claims 1, 5 and 6, wherein the water-status switching unit 600 comprises:

a fixing member 70 formed at one side thereof with plurality of exhausting holes

71b, which are radially arranged, and provided at an outer peripheral portion thereof with an insertion part 71 downwardly extending form an upper peripheral portion of the fixing member 70 so as to be inserted into the head section 300;

an exhaust water adjusting member 77 provided with an insertion column part 73, which is screw-coupled to the insertion part 71 of the fixing member 70, a foaming water column part 74 having a foaming water hole 74a being formed at an inner portion of the exhaust water adjusting member 77 while spacing from the insertion column part 73, a plurality of shower water holes 76a being formed between the foaming water column part 74 and the insertion column part 73, a coupling part 75 being formed at a lower portion of the exhaust water adjusting member 77 while spacing from the foaming water column part 74;

an opening/closing member 79 having a fixing part 79a inserted into the insertion hole 71a of the fixing member 70 while passing through the foaming water hole 74a of the exhaust water adjusting member 77 so as to seal the insertion hole 71a, a contact part 79b being protruded from a lower outer peripheral portion of the fixing part 79a so as to open/close the foaming water hole 74a; and

a coupling member 82 having a receiving part 80 detachably coupled to the coupling part 75 of the exhaust water adjusting member 77, a coupling column part 81 having an exhaust hole 81a communicated with the foaming water hole 74a being formed at an inner portion of the coupling member 82 while spacing from the receiving part 80 and coupled to the foaming water column part 74, a plurality of shower water holes 82a, which are communicated with shower water holes 76a, being formed between the coupling column part 81 and the receiving part 80.

11. The head apparatus as claimed in claims 10, wherein an inclined guide slot 71c is formed at an inner circumferential portion of the insertion part 71 of the fixing member 70, and a coupling protrusion 73a, which is screw-coupled to the guide slot 71c, is formed at the insertion column part 73 of the exhaust water adjusting member 77.

12. The head apparatus as claimed in claims 10, wherein a foaming water mesh is installed in the exhaust hole 81a of the coupling member 82 in order to provide foaming water.

13. The head apparatus as claimed in claims 10, wherein the exhaust water adjusting member 77 is formed at an outer peripheral portion thereof with an embossing section 76b so as to allow a user to easily rotate the exhaust water adjusting member 77.

14. The head apparatus as claimed in claims 10, wherein the insertion part 71 of the fixing member 70 is coupled to the insertion column part 73 and the receiving part 80 of the coupling member 82 is coupled to the coupling part 75 of the exhaust water adjusting member 77 through packing members 78 and 86, respectively.

15. The head apparatus as claimed in any one of claims 1, 5 and 6, wherein the water-status switching unit 700 comprises:

a fixing member 710 formed at one side thereof with a perforated hole 711a and provided at an outer peripheral portion thereof with a coupling column section 713;

a rotating member 730 formed with a foaming water hole 731a and shower water holes 731b and 731c, which are selectively communicated with the perforated hole 711a of the fixing member 710;

a coupling member 740 formed at one side thereof with an insertion member 742, which is coupled with the coupling column section 713 of the fixing member 710, a plurality of shower water exhaust holes 740b being formed between the insertion member 742 and the rotating member 730, the rotating member 730 passing through the coupling member 740;

an adjusting member 750 provided at a lower portion of the coupling member 740 such that the rotating member 730 passes through the adjusting member 750, the adjusting member 750 being formed at one side thereof with a plurality of elongated holes 750c, which are communicated with the shower water exhaust holes 740b of the coupling member 740; and

a fixing cap 760 screw-coupled with the rotating member 730, which passes through the adjusting member 750, at a lower portion of the adjusting member 750, so that the adjusting member 750 is fixed to the fixing member 710.

16. The head apparatus as claimed in claims 10, wherein a plurality of protrusions 731f are provided at the rotating member 730, which passes through the adjusting member 750, and a plurality of slots 750b are formed at the adjusting member 750 corresponding to the protrusions.

17. The head apparatus as claimed in claims 15, wherein the adjusting member 750 is provided at an outer wall thereof with a gripping projection 752 so as to allow the user to easily rotate the adjusting member 750.

18. The head apparatus as claimed in claims 15, wherein an anti-leakage member 720 having a plurality of discharge holes 720b corresponding to perforated holes 711a of the fixing member 710 is provided between the fixing member 710 and the rotating member 730.

19. The head apparatus as claimed in claims 15, wherein the fixing member 710 is provided at an inner circumferential portion thereof with locking strips 712 and the cylindrical column section 713 is provided at an outer wall thereof with a pair of locking protrusions 731d, which are locked with the locking strips 712 so as to limit a rotation of the rotating member 730.

20. The head apparatus as claimed in claims 15, wherein a mesh 762 for forming foaming water is provided between the adjusting member 750 and the fixing cap 760.

21. The head apparatus as claimed in claims 15, wherein the coupling member 740 is coupled to the rotating member 730 by interposing an anti-leakage ring 743 therebetween and is coupled to the coupling column section 713 of the fixing member

719 by interposing a packing member 741 therebetween.

22. The head apparatus as claimed in claims 15, wherein the coupling column section 712 of the fixing member 710 is formed at an outer peripheral portion thereof with elongated recesses 713a, and the insertion member 742 is formed at an inner peripheral portion thereof with insertion protrusions 742a corresponding to the elongated recesses 713a.

FIG. 1

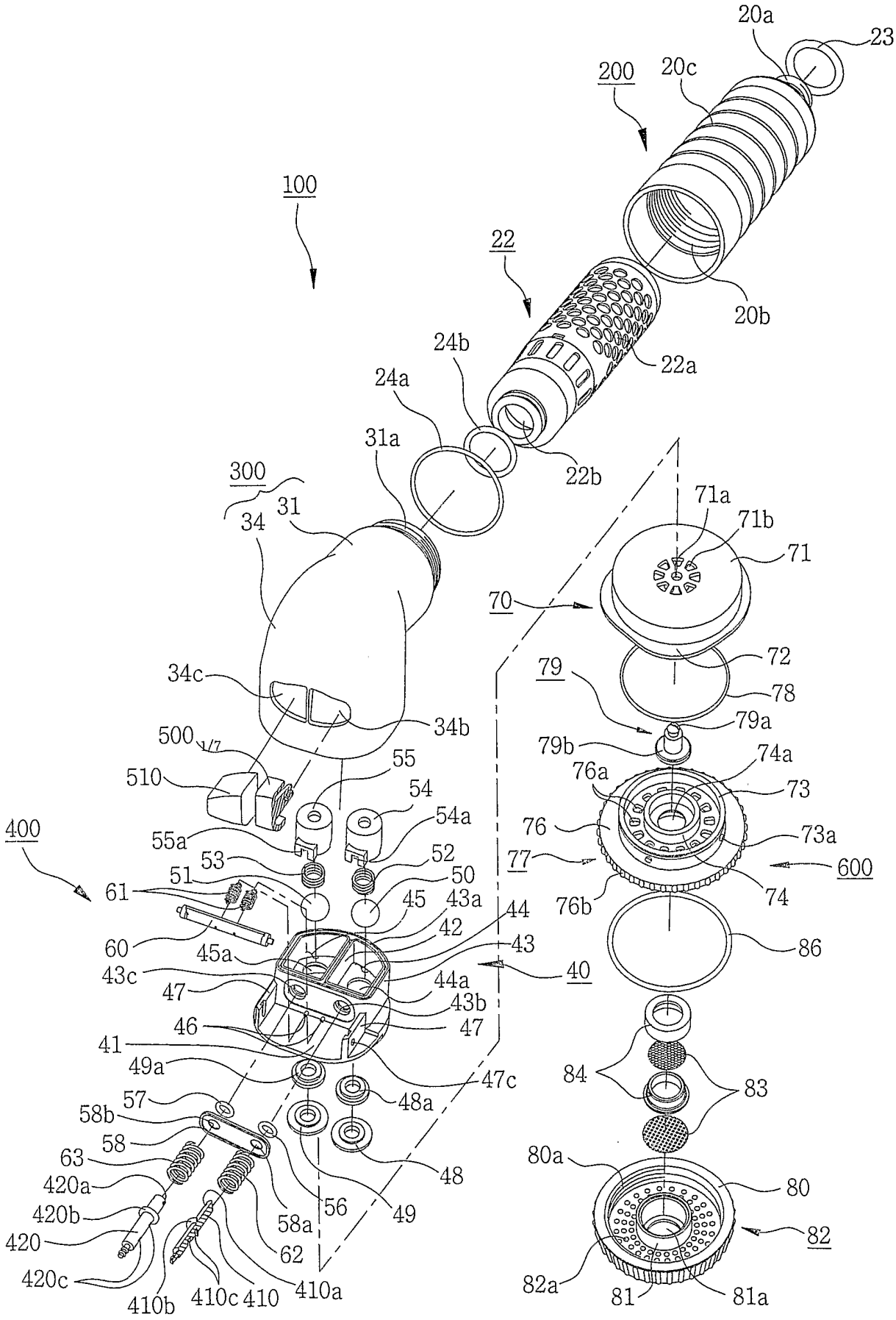

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23
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20c
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22
20b
24b
22a
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31a
22b
300
31
34
71a
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72
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78
79a
34c
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74a
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76a
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40
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58
80a
63
48
80
420a
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62
82a
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81a
420c
410b
410c
410
410a

FIG. 2

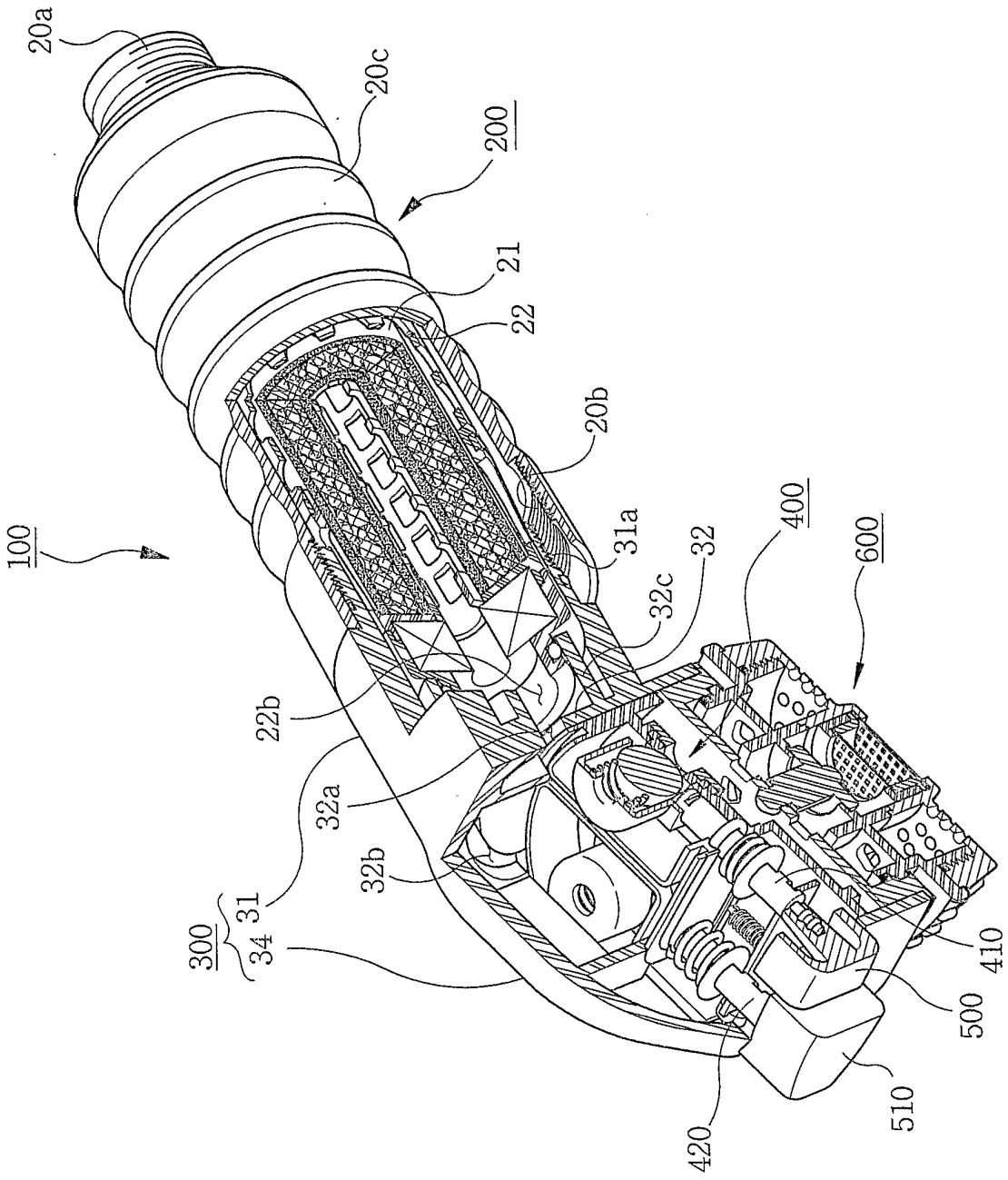

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21
22
20b
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400
600
32c
22b
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34
410
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510
420

FIG. 3

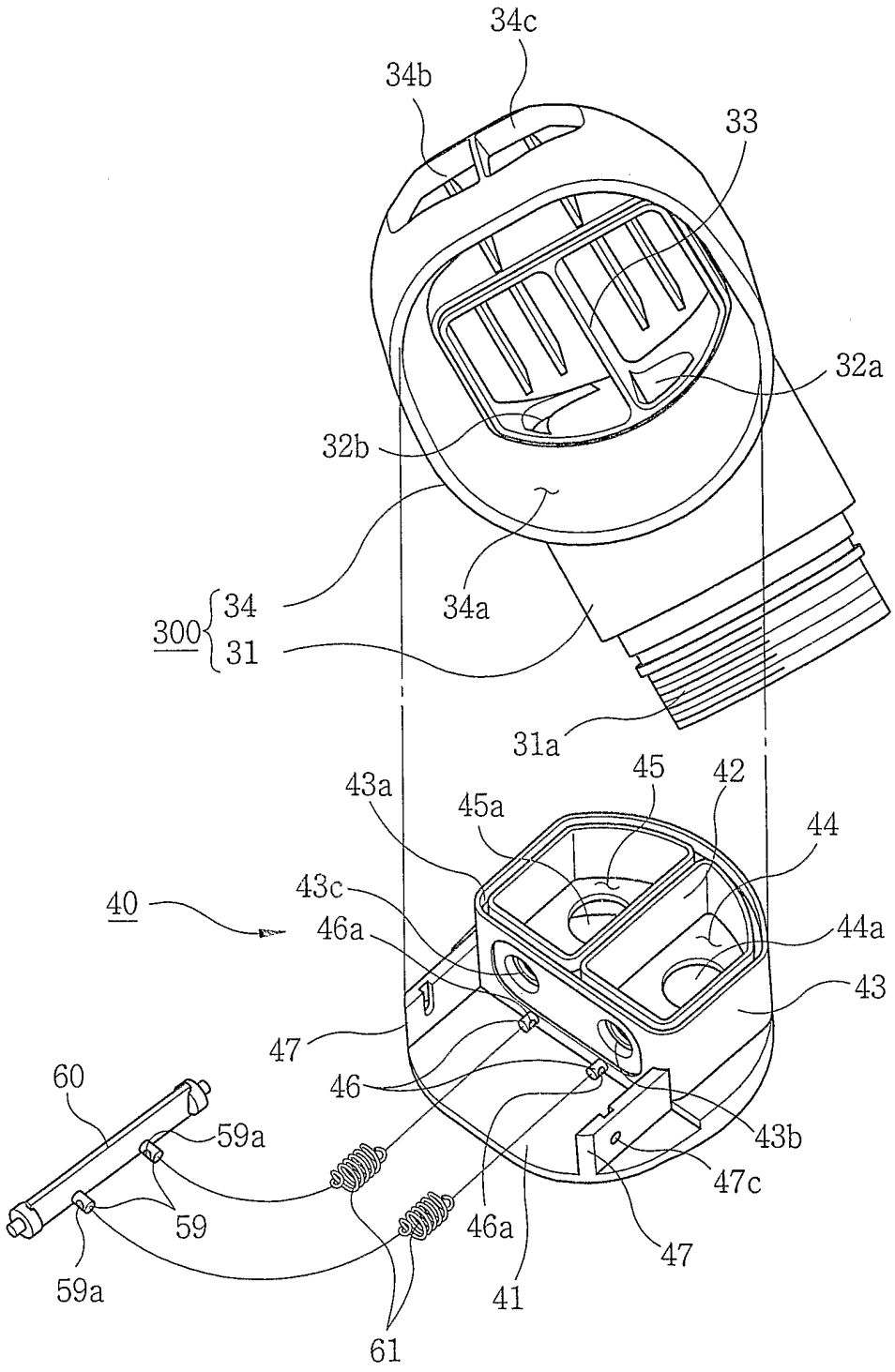

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34b
33
32a
32b
34a
300
34
31
31a
45
42
43a
45a
44
43c
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47
46
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59a
43b
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46a
47
59a
41
61

FIG. 4

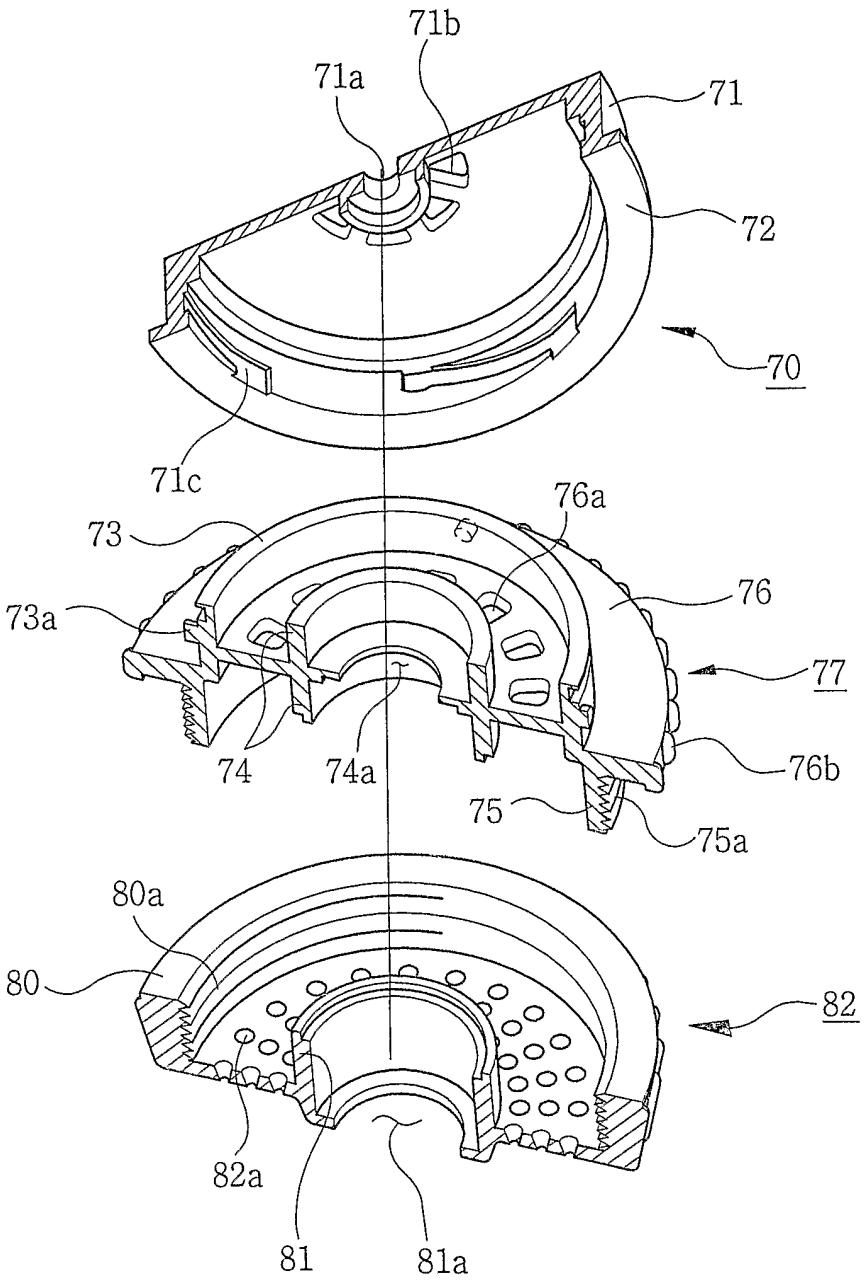

71b
71a
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72
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71c
76a
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76b
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75a
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81a

FIG. 5A

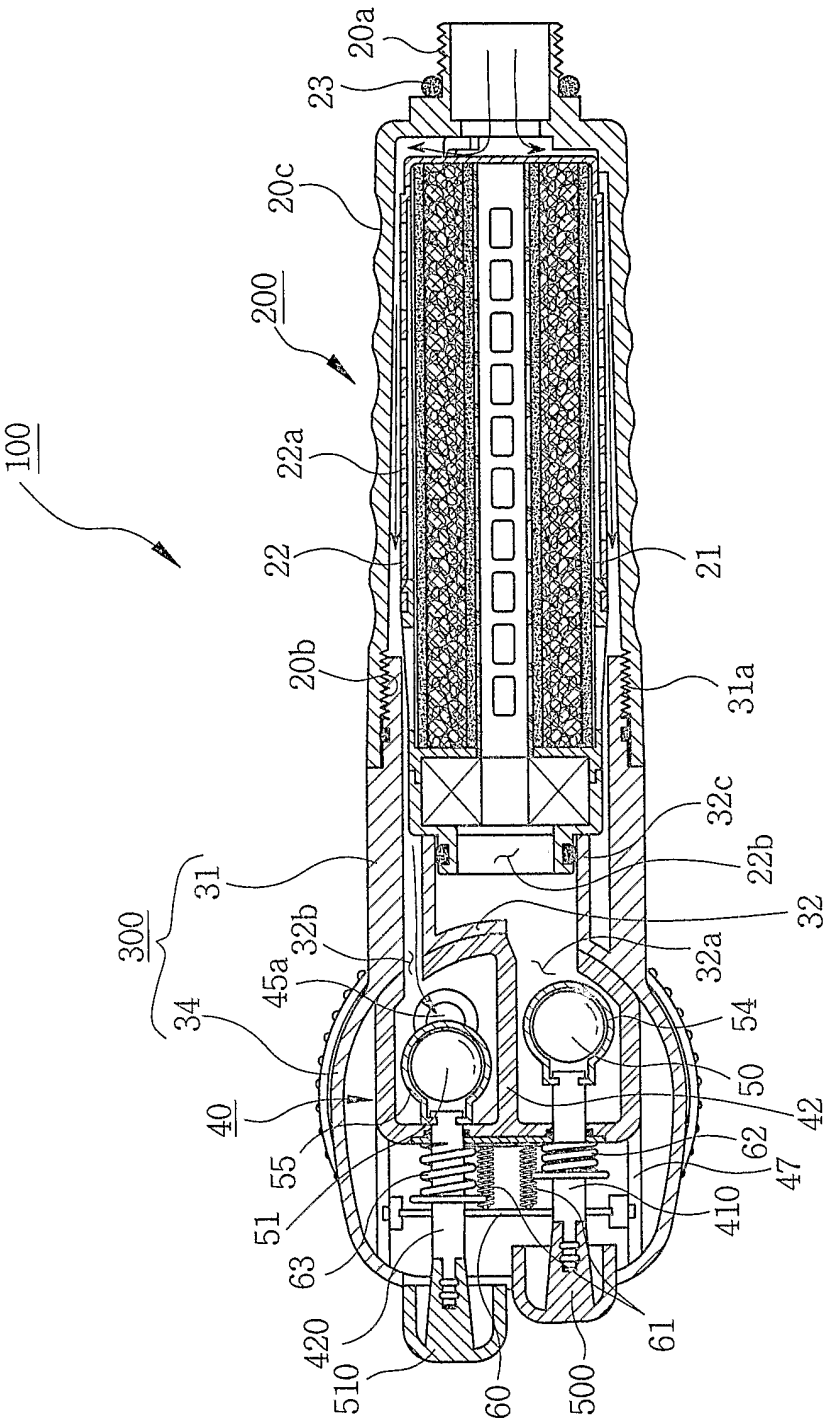

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32c
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FIG. 5B

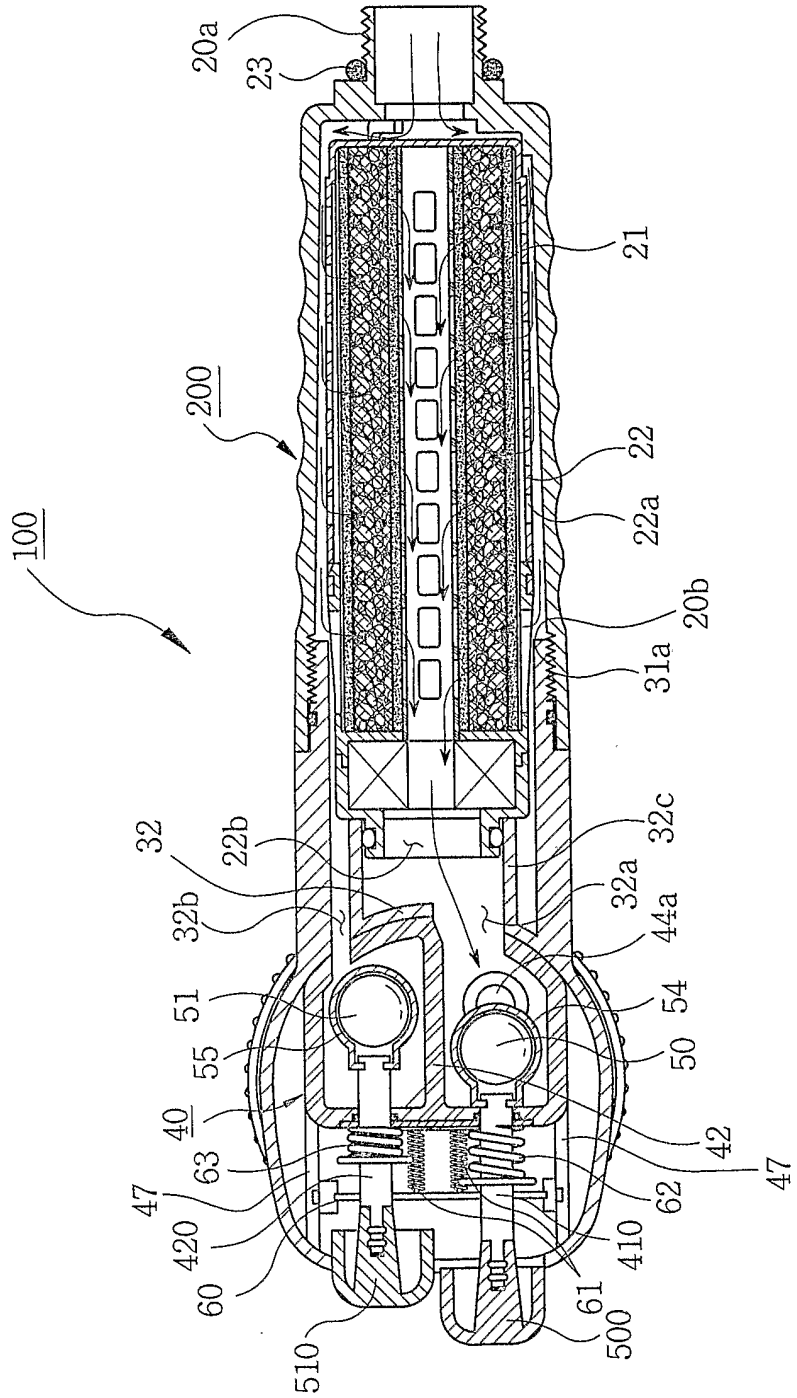

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32
22b
32c
32b
32a
44a
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47
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410
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500

FIG. 6A

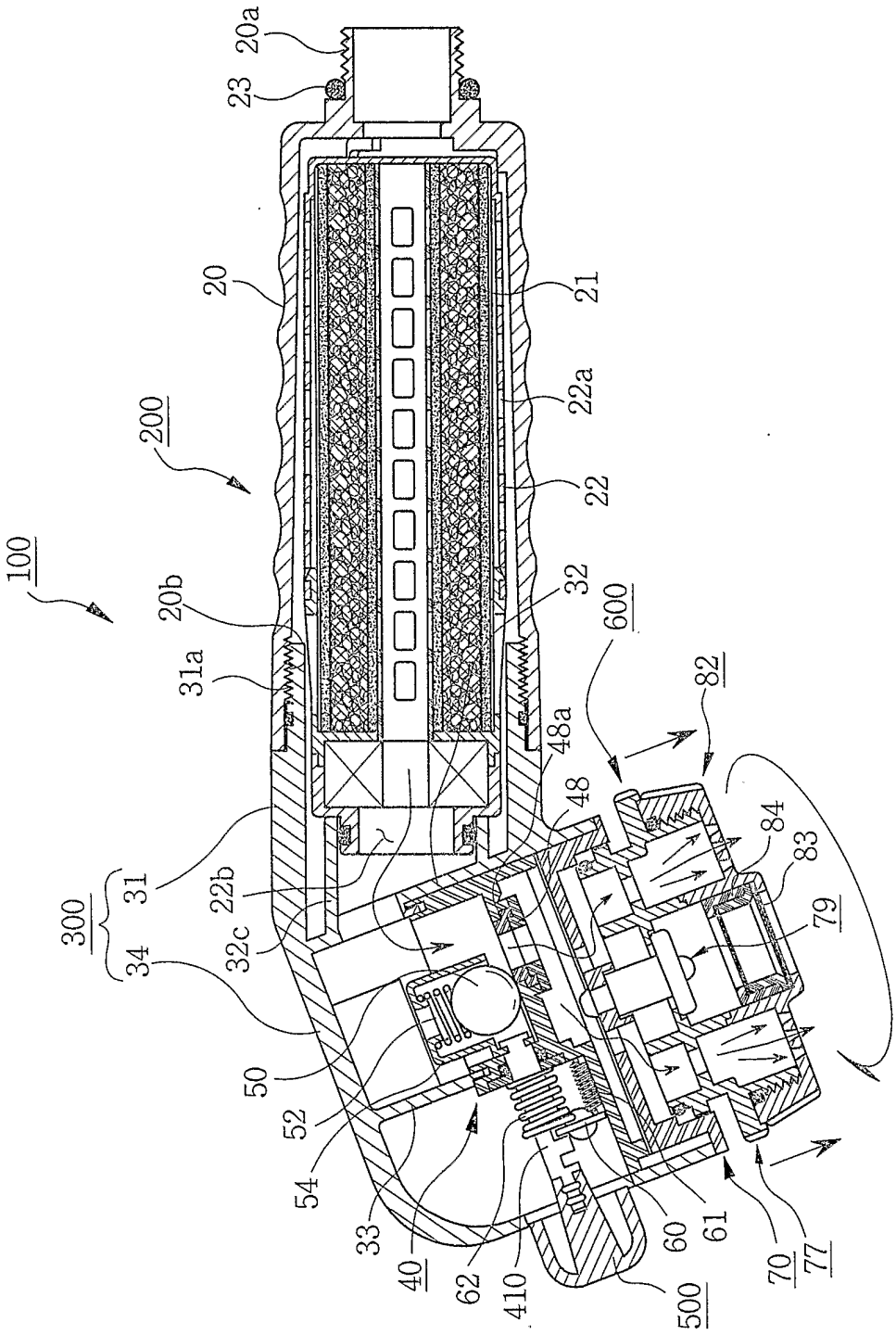

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22a
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31a
82
48a
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83
31
22b
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300
34
32c
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52
54
33
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410
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61
70
77

FIG. 6B

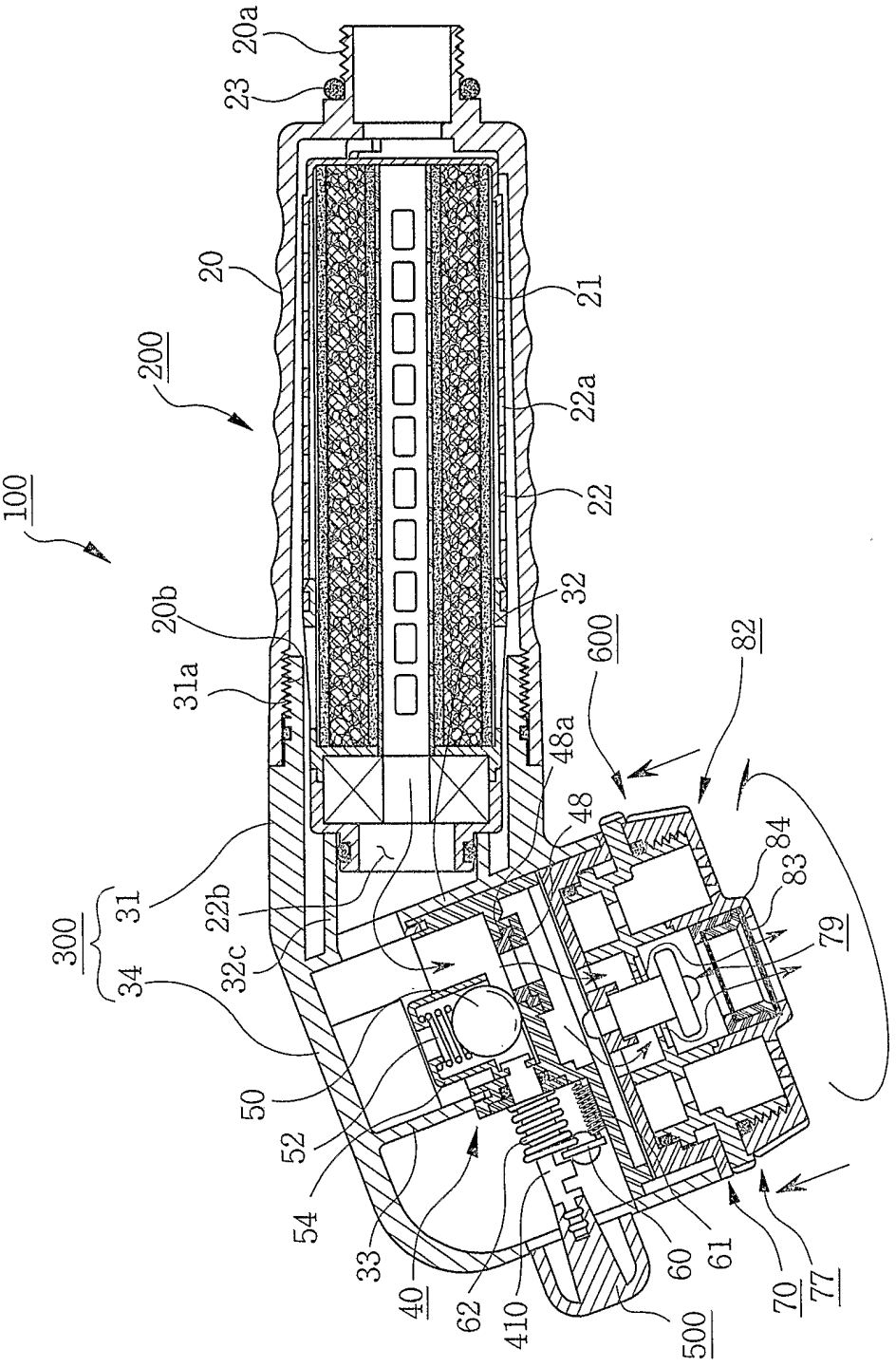

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600
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48a
48
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83
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22b
32c
34
50
52
54
33
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62
410
500
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70
77

FIG. 7

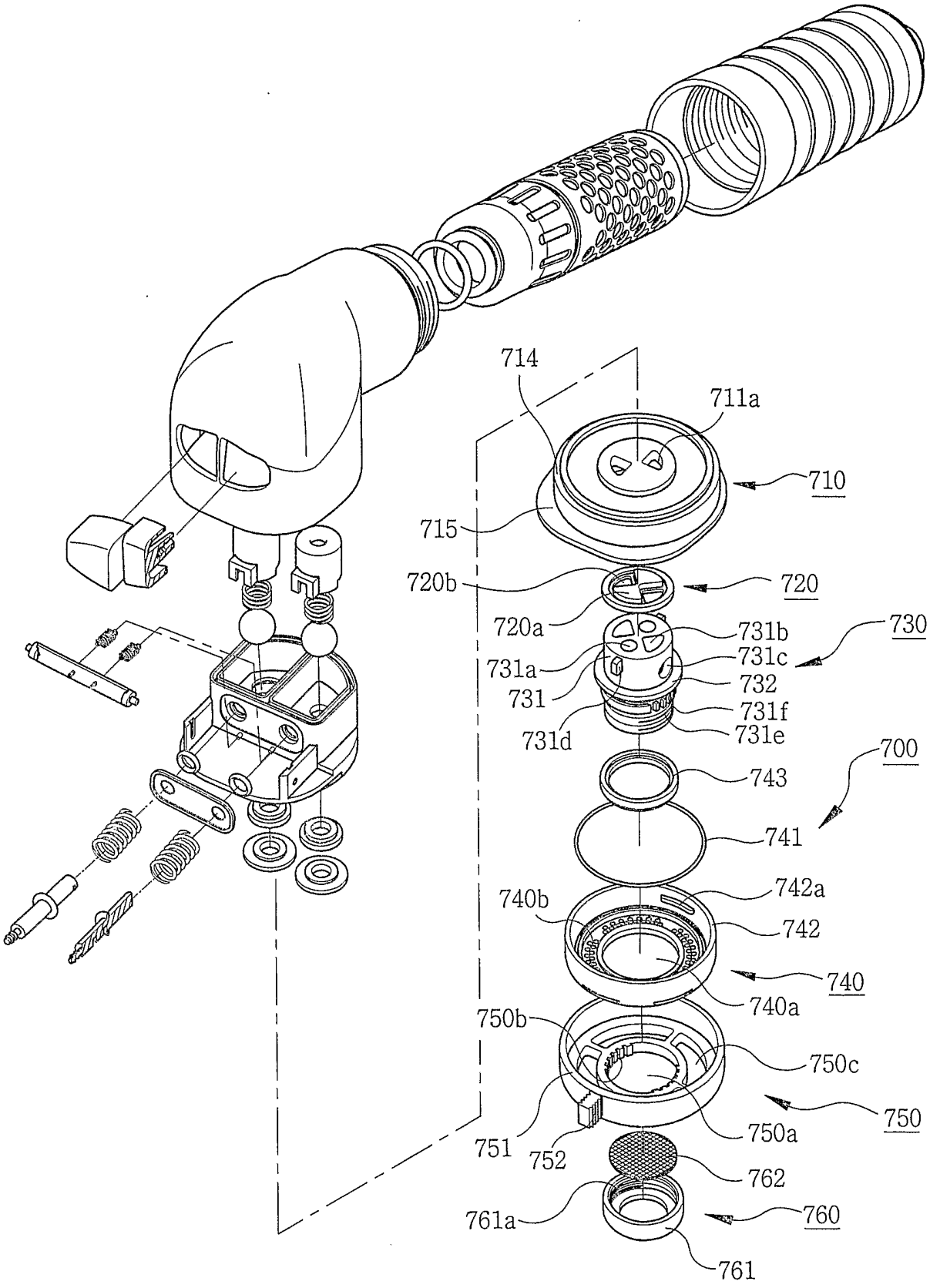

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711a
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715
720b
720
720a
731b
730
731a
731c
731
732
731f
731d
731e
700
743
741
742a
740b
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740a
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750c
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751
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750a
762
761a
760
761

FIG. 8

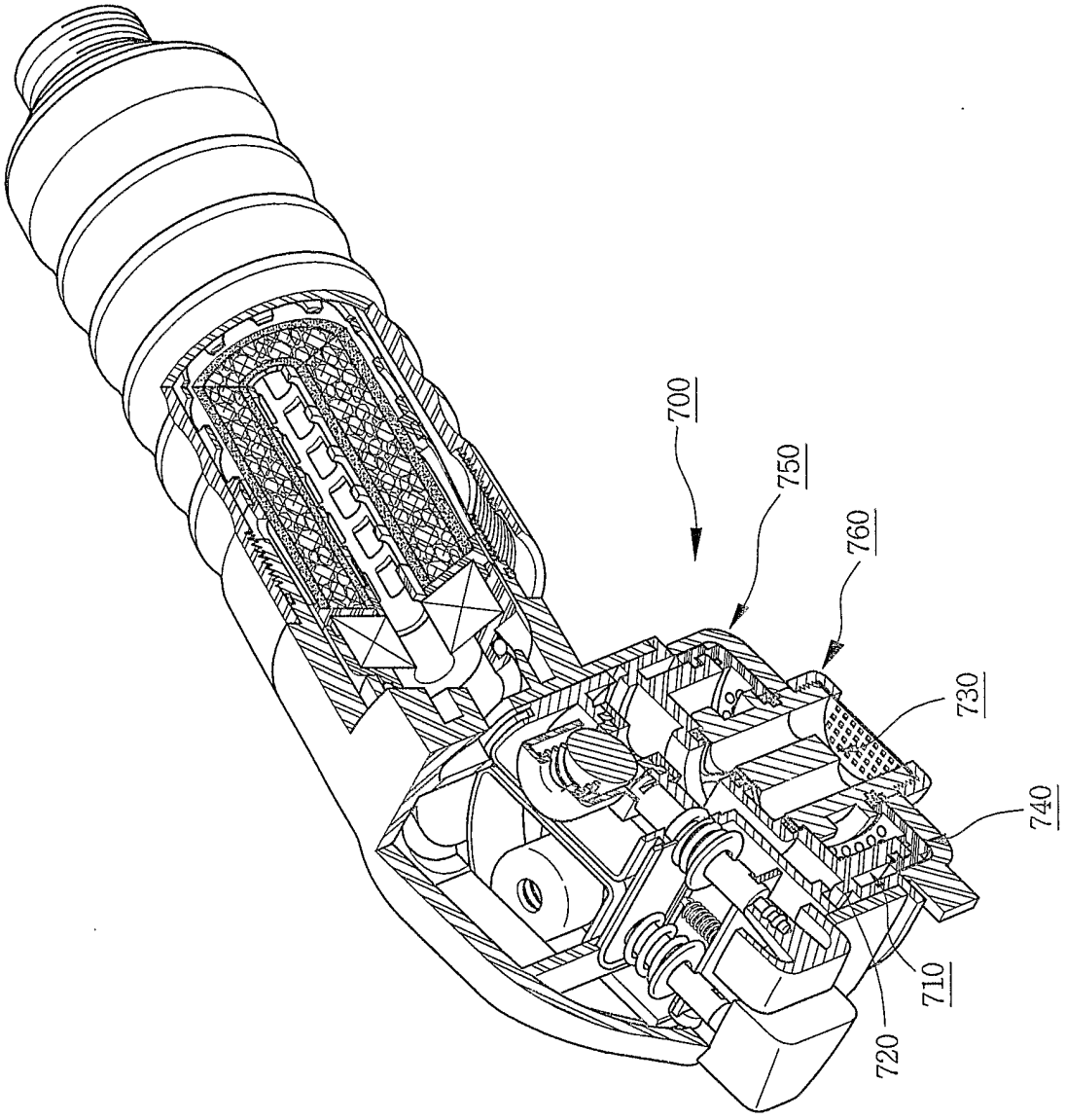


FIG. 9

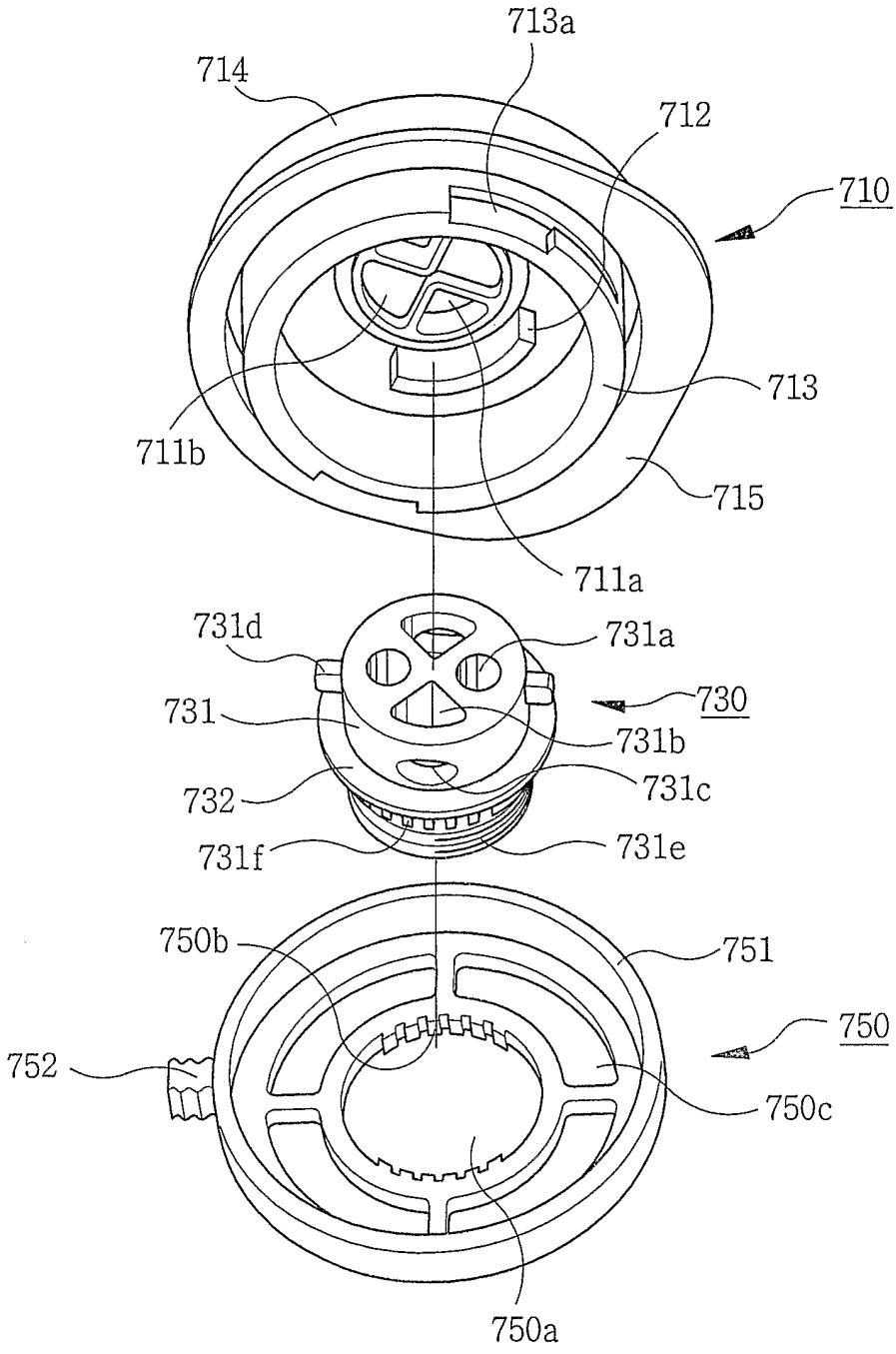

713a
714
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711b
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732
731c
731f
731e
750b
751
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750c
750a

FIG. 10A

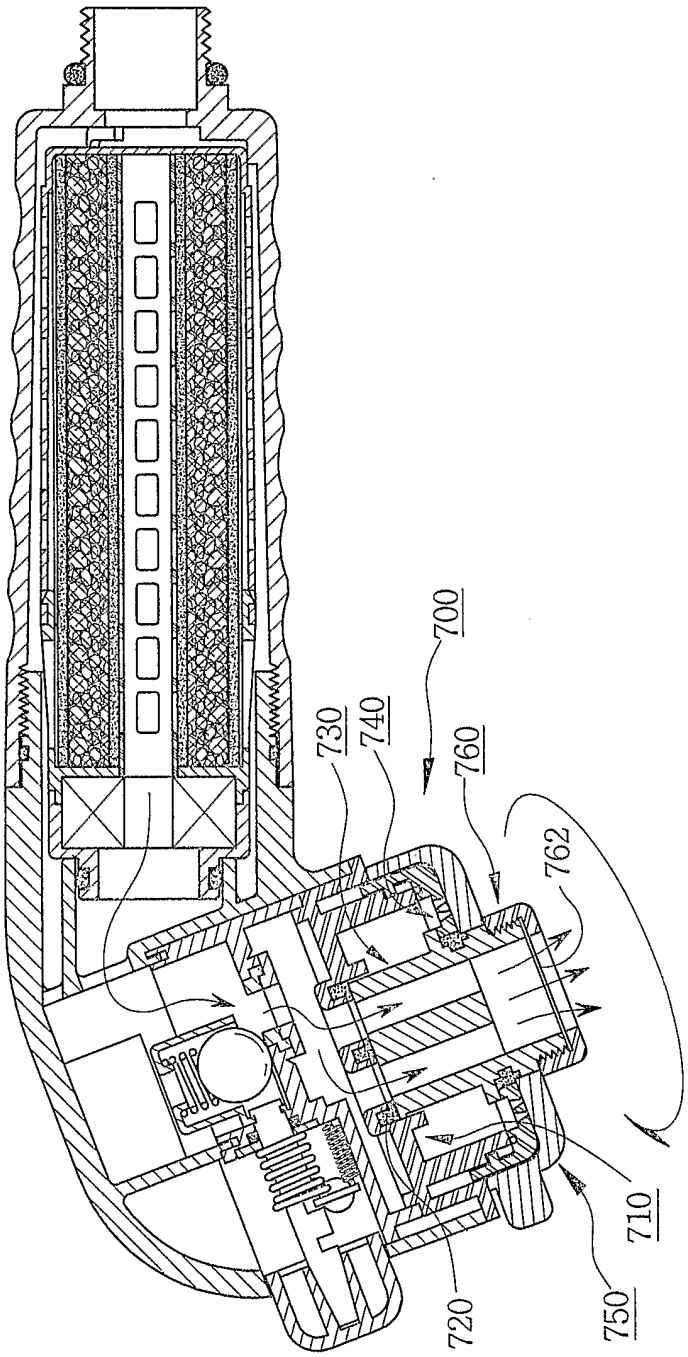


FIG. 10B

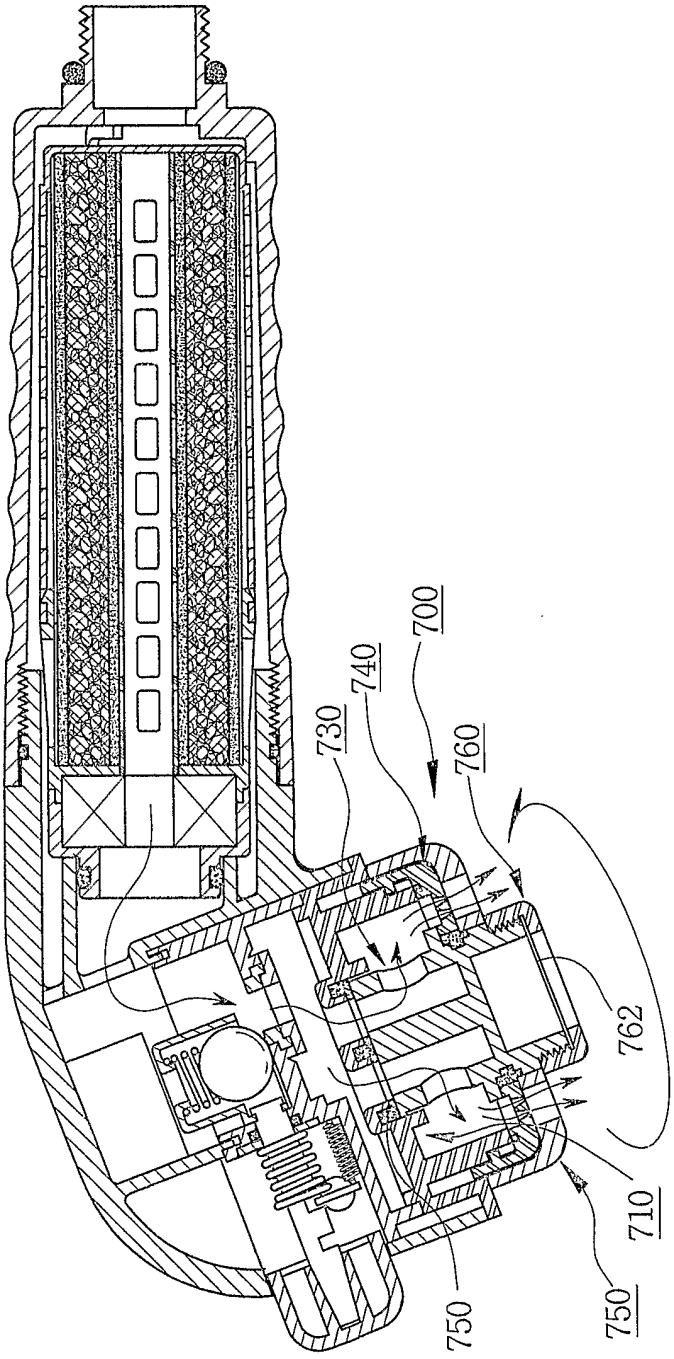


FIG. 11

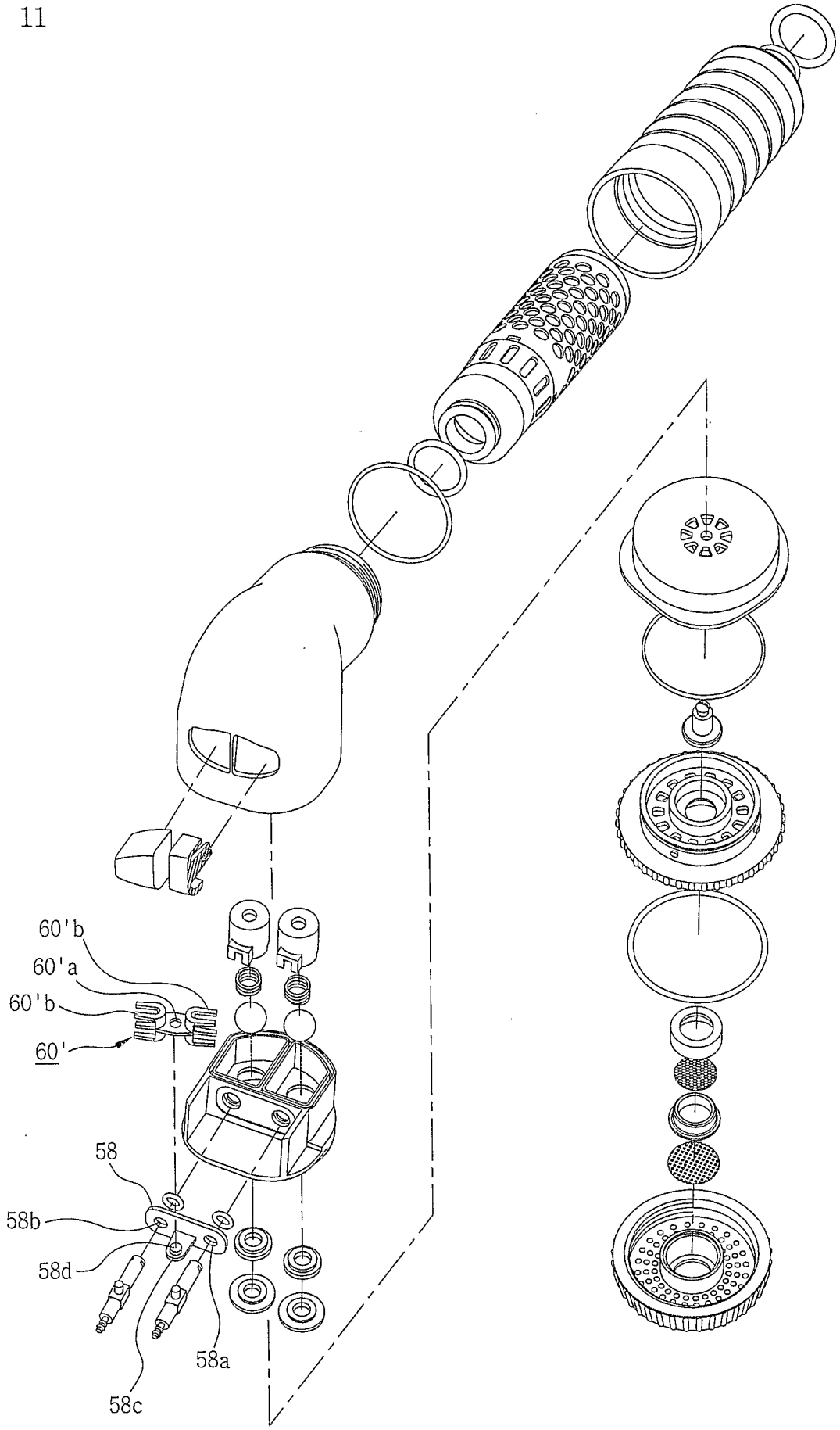
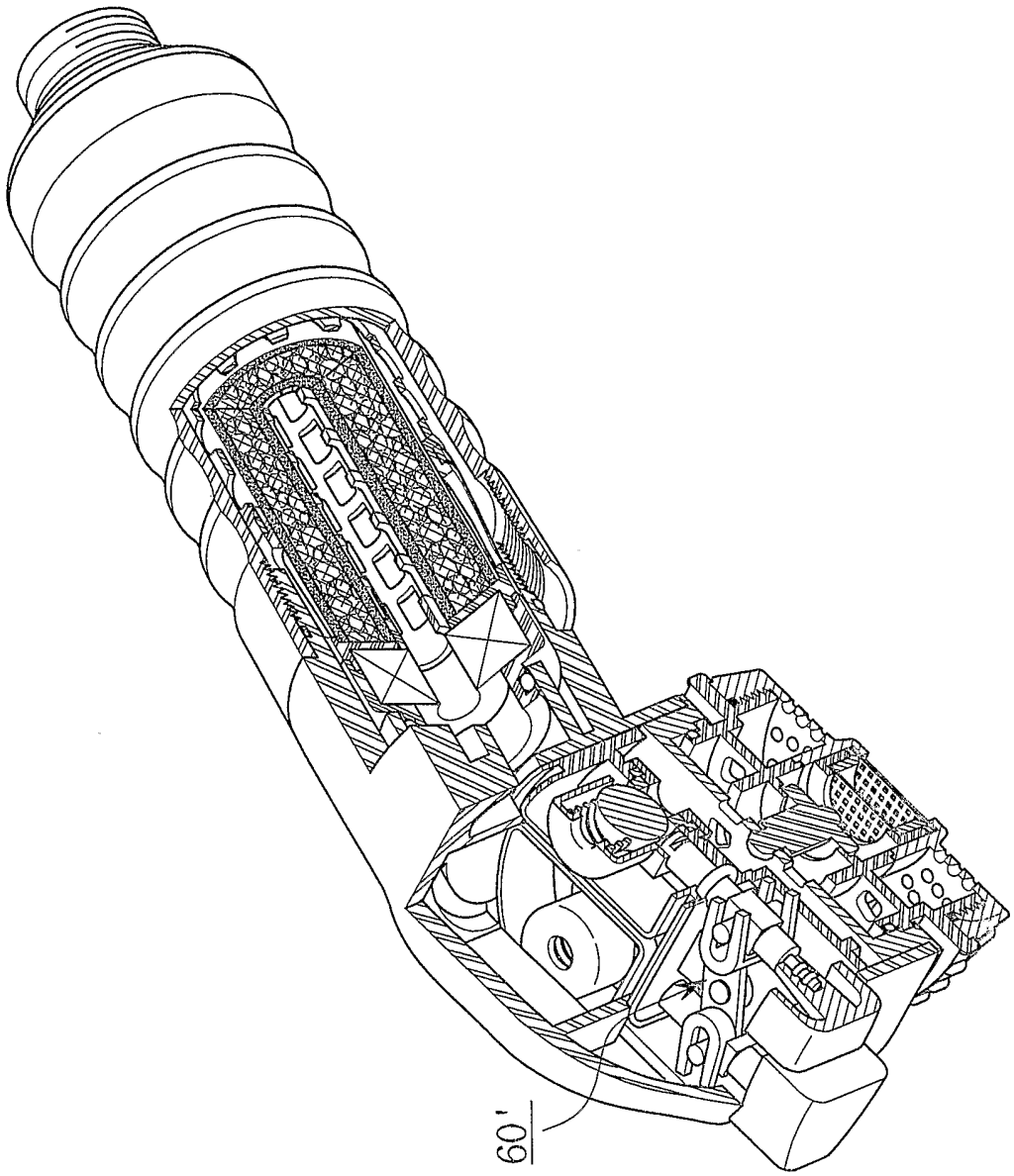


FIG. 12



INTERNATIONAL SEARCH REPORT

International application No.
PCT/KR2004/000018

A. CLASSIFICATION OF SUBJECT MATTER

IPC7 E03C 1/046

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)
IPC7 A47K 3/22, A47K 3/28, B05B 1/18, E03C 1/042, E03C 1/044, E03C1/046

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched
KR, JP IPC as above

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

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X Y	JP 2001-137143A (Kotobuki Tsusho Corp.) 22 May 2001	1-9 10-22
Y	JP 03-133411A (TOTO Ltd.) 6 June 1991	10-22
A	JP 2002-106006A (San-Ei Faucet MFG Co. Ltd.) 10 April 2002	1-12
A	JP 2002-165719A (MYM Corp.) 11 June 2002	5-22
A	JP 08-275902A (INAX Corp.) 22 October 1996	5-22

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

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"O" document referring to an oral disclosure, use, exhibition or other means
"P" document published prior to the international filing date but later than the priority date claimed

"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention
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"Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents,such combination being obvious to a person skilled in the art
"&" document member of the same patent family

Date of the actual completion of the international search	Date of mailing of the international search report
09 APRIL 2004 (09.04.2004)	20 APRIL 2004 (20.04.2004)

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