(19) Europäisches Patentamt
European Patent Office
Office européen des brevets

(11) EP 2 631 376 A2

(12) EUROPEAN PATENT APPLICATION

(43) Date of publication:
28.08.2013 Bulletin 2013/35

(51) Int Cl.:
E03C 1/08 *(2006.01)*

(21) Application number: **12382405.4**

(22) Date of filing: **19.10.2012**

(84) Designated Contracting States:
AL AT BE BG CH CY CZ DE DK EE ES FI FR GB GR HR HU IE IS IT LI LT LU LV MC MK MT NL NO PL PT RO RS SE SI SK SM TR
Designated Extension States:
BA ME

(30) Priority: **20.10.2011 ES 201101136**

(71) Applicant: **Aqmax General, S.L.**
28050 Madrid (ES)

(72) Inventor: **Maezo Gonzalez, Cristina**
28050 Madrid (ES)

(74) Representative: **Carpintero Lopez, Francisco et al**
Herrero & Asociados, S.L.
Alcalá 35
28014 Madrid (ES)

(54) Manually adjustable flow saving device for spraying atomised water in household and industrial sanitation fittings

(57) The present invention relates to a device especially contrived for providing a considerably water consumption savings, the device of the invention being formed from a tubular main metal body (1) wherein there is defined a lower neck (11) with a smaller diameter open at the lower portion, also having an upper threading (13) for being coupled to the corresponding tap. A purifying filter (3) is arranged in the centre of the main body, encircling a plastic drum (4) provided with grooves (15) for the passage of water, in which centre a plastic screw (5) is inserted with the interposition of a rubber washer (6), such that the lower neck (11) of the main metal body (1) is connected to a metal outer part (9), open at the lower portion, through which the reduced water flow finally exits. The device can be made according to two embodiments, in one of which the outgoing water flow is manually adjustable.

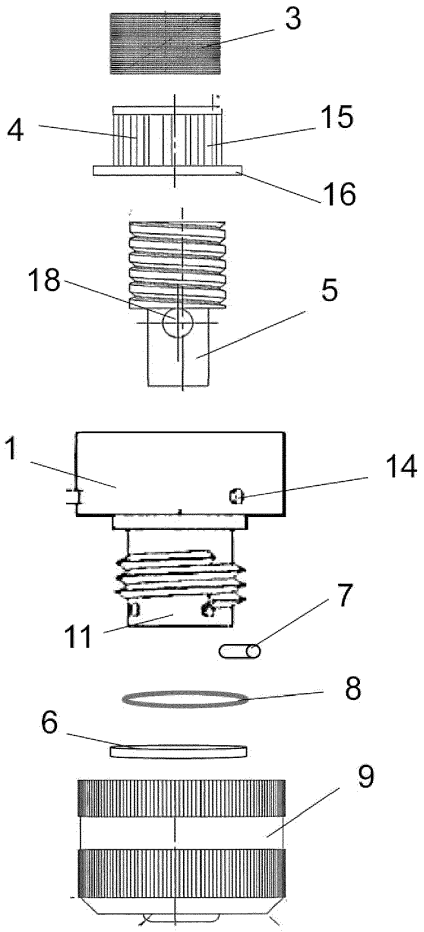

FIG. 11

EP 2 631 376 A2

Description

Sector of the Art

[0001] The present invention is encompassed within mixers of household and industrial sanitation fittings and more specifically within the different water saving systems which are installed in taps, called flow regulators.

Object of the Invention

[0002] The object of the invention is to provide a new device the purpose of which is to achieve high saving ratios considerably greater than current systems, reaching a consumption saving of 90% without loosing efficiency as a result in the outflow of water in fittings installed in homes, public establishments, etc.

State of the Art

[0003] There is a wide variety of water flow regulators in fittings, the function of which is to save water and/or limit the flow for that purpose. There is also a variety both in size and in manufacturing materials which are installed or come installed in household or industrial fittings, etc., but they all have in common the particularity of mixing air with non-atomised water, or the need of depending on the pressure existing in the network to save water. The purpose for which they have been designed is to curb water consumption in homes, public establishments, etc.

[0004] Certain systems which successfully allow a moderate water saving, largely enhanced by greater ecological awareness for preserving natural resources such as water, have arisen in parallel to the evolution of design, new materials and construction methods which water saving devices of this type have experienced over time.

[0005] Currently there are several systems for saving in water consumption or flow in sanitation fittings, the following being highlighted:

- By means of installing timers with sensors or mechanical switches in the opening of taps. Interrupting the outflow of taps after a short period of time determined by the manufacturer has elapsed, or by the sensor detecting the absence of movement.
- Perlators, atomisers, or regulators which are also installed in the fittings, being a system based on mixing non-atomised water with air, achieving saving ratios which do not usually exceed 60% in water outflow.

[0006] Generally, the drawback involved with the described systems can be that the saving ratios are limited by the system itself, loosing the practical function, for example, of washing ones hands comfortably if the saving exceeds a ratio of 60%, which is the approximate maximum saving limit in systems which are currently marketed for taps.

Description of the Invention

[0007] The proposed device has been contrived for solving the problem disclosed above in a simple but highly effective manner.

[0008] To that end, due to the design of the manually adjustable flow saving device for spraying atomised water in household and industrial sanitation fittings, it accelerates the water inside it, the atomised water exiting in the form of spray.

[0009] Reducing the consumption or flow is achieved with it, but comfort is not lost, rather further increased, giving the sensation of receiving more water.

[0010] This new device has been designed with two embodiment variants; a first variant, in which the device works as a fixed flow accessory and a second variant, in which said flow is adjustable, such that the amount of water can be manually adjusted depending on the needs of the end user.

[0011] To that end and more specifically, the disclosed device is formed from a tubular main metal body the section of which decreases in a downward direction, such that its upper end is coupled by means of screwing it onto the outlet of the conventional tap (depending on whether the outlet is male or female, there are devices suitable to both outlets).

[0012] This element is intended for receiving a purifying filter in its centre, encircling a plastic drum, under which assembly a plastic screw is arranged with the cooperation of a cylindrical washer.

[0013] When the tap is turned on, the water enters through the upper portion of the device, going through the purifying filter where the possible particles carried by the water become adhered, the water passing through the plastic drum to flow down towards the plastic screw, such that the water, which has passed through the filter through the side face of the drum, is forced to go towards the inner channel of the screw by means of the two side slits or grooves therein.

[0014] The water flows through the inner channel of the plastic screw, exiting through the two circular orifices facing one another therein, and flows down, circulating in the space between the lower portion of the plastic screw (with a smooth outer surface and smaller diameter) and the inner walls of the main metal body, which has a larger diameter than the plastic screw, which have an inner thread, creating a helical internal current and increasing its speed as the passage surface is reduced.

[0015] This main metal body is open at the lower portion and also includes a series of perimetric orifices in its lower area in which there is defined a neck with a smaller diameter on which a metal outer part is coupled.

[0016] According to a first embodiment variant of the invention, the metal outer part is coupled to the main body by means of including a sealing gasket and at least

one pin, such that the side orifices of said main body are blocked, allowing water to pass exclusively through the lower orifice of said body, such that as the water experiences great acceleration, it exits in the form of spray, limiting water consumption to only 10% of the flow compared with the normal outlet of the same tap, thus saving 90% of the water.

[0017] In a second embodiment variant, the outer metal part is movable, being able to be screwed and unscrewed with respect to the main metal body, such that if it is partially unscrewed, a space is created between the two metal devices exposing the side orifices of the lower neck of the main body, causing the water, which up until that time circulated at high speed inside the fixed part, to now have an exit through the orifices and to circulate through the space created between the metal parts, emptying into the outlet orifice of the movable part which facilitates the exit of a greater water flow since the diameter is larger than the outlet orifice of the fixed part, thus preventing the water from exiting in the form of spray as in the case described above.

[0018] An extremely effective, easily adjustable device with a very significant water consumption reduction is thus achieved.

Description of the Drawings

[0019] To complement the description which is being made and for the purpose of aiding to better understand the features of the invention according to a preferred practical embodiment thereof, a set of drawings is attached as an integral part of said description in which the following has been depicted with an illustrative and non-limiting character:

Figure 1 shows a perspective view of the main metal body which is part of the flow saving device object of the present invention.

Figure 2 shows a perspective view of the wrench provided for coupling the device of the preceding figure to a conventional tap.

Figure 3 shows a perspective view of the purifying filter which is part of the device of the invention.

Figure 4 shows a perspective view of the plastic drum which is part of the device of the invention.

Figure 5 shows a perspective view of the plastic screw which is part of the device of the invention.

Figure 6 shows a perspective view of the washer associated with the screw of the preceding figure which is part of the device of the invention.

Figure 7 shows a perspective view of the pin which is part of the device of the invention.

Figure 8 shows a perspective view of the sealing gasket intended for being interposed between the main metal body and the metal outer part.

Figure 9 shows a perspective view of the metal outer part which is part of the device of the invention.

Figure 10 shows a transparent perspective view of the element of Figure 1, to which the metal outer part is coupled, according to the first embodiment variant provided for the invention.

Figure 11 shows an exploded elevational view of the different elements which are part of the device of the invention, according to the second practical embodiment variant provided for the invention.

Figure 12 finally shows a perspective view of the device of the invention duly assembled, according to the second practical embodiment variant provided for the invention.

Preferred Embodiment of the Invention

[0020] As seen in the discussed figures, in the proposed device there is a tubular main metal body (1) in which there is defined a lower neck (11) with a smaller diameter, provided with perimetric orifices (12), and it is also open at the lower portion, also having an upper threading (13) for being coupled to the corresponding tap, which threading can indistinctly be an outer threading, as shown in Figure 1, or inner threading, depending on the tap.

[0021] This main metal body (1) is provided with notches (14) facilitating its assembly by means of a wrench (2), shown in Figure 2.

[0022] A purifying filter (3) is arranged in the centre of this main metal body (1), shown in Figure 3, encircling a plastic drum (4), in which centre a plastic screw (5) is inserted with the interposition of a rubber washer (6).

[0023] The plastic drum (4) is made from a cylindrical shaped part moulded in heavy-duty plastic closed at its upper portion and open at the lower portion, finished with a perimetric flange, on the side of which there is arranged a series of rectangular parts defining grooves (15) for the passage of water, where at the end of which the lower portion of the part and the attachment thereof with the purifying filter (3) are supported, they are located above the upper portion of the plastic screw (5), enveloping and covering it, such that the water which has passed through the filter through the side face of the drum is forced to go towards the inner channel of the screw through the two horizontal side slits or grooves which the plastic screw (5) has.

[0024] The plastic screw (5) is moulded in heavy-duty plastic, having a larger diameter at the upper portion than at the lower portion of the part, with a hole through the centre along the longitudinal axis but not completely, the upper portion of the screw (the one with the largest diameter) having threads on its entire side perimeter, being smooth in the upper area and with the aforementioned two horizontal side slits or grooves (15). The lower portion of the screw is smooth on its outer surface and has a circular orifice (18) crossing its entire diameter perpendicular to the axis of the cylinder and resulting in two holes facing one another, being hollow mostly throughout, except at its end, having a cylindrical shaped cover and two side grooves.

[0025] When the tap is turned on, the water enters through the upper portion of the device. The water goes through the purifying filter where the possible particles carried by the water become adhered. The water, which has passed through the filter through the side face of the drum, is forced to go towards the inner channel of the screw by means of the two side slits or grooves (17) therein.

[0026] The water flows through the inner channel of the plastic screw, exiting through the two existing circular orifices (18) facing one another and flows down, circulating in the space between the lower portion of the plastic screw (with a smooth outer surface and smaller diameter) and the inner walls of the main metal body (1) (with a larger diameter than the plastic screw), which have an inner thread, creating a helical internal current and increasing its speed as the passage surface is reduced.

[0027] The main body is complemented with a metal outer part (9) which can be connected to it according to two practical embodiment variants.

[0028] In a first variant, that shown in Figure 10, the metal outer part (9) is screwed tightly to the main metal body (1) as a result of the pin (7) and a sealing gasket (8) which are arranged between the two devices, such that the water circulating in the space between the lower portion of the plastic screw (5) (with a smooth outer surface and smaller diameter) and the inner walls of the main body (1) (with a larger diameter than the plastic screw) which have an inner thread, circulates at a high speed and is provided with a helical flow movement increasing its speed as the passage surface is reduced, this action being created by the actual inner threading of the main metal body (1) and the idiosyncrasy of the plastic screw, exiting through the narrow orifice of the fixed device in the form of spray, limiting the water consumption to only 10% of the flow compared with the normal outlet of the same tap, thus saving 90% of the water.

[0029] In a second embodiment variant, the metal outer part can be selectively screwed, unscrewed with respect to the thread (19) of the neck (11) of the main body, such that if said outer metal part (9) is rotated, unscrewing it, a space is created between the two metal bodies, exposing the perimetric orifices (12) internally traversing it in the main metal body (1), causing the water, which up until that time circulated at high speed inside the fixed part, to now also have an exit through the orifices and to circulate through the space created between the metal parts, emptying into the outlet orifice of the movable part, which facilitates the exit of a greater water flow since the diameter is larger than the outlet orifice of the fixed part, thus preventing the water from exiting in the form of spray as in the first embodiment variant.

Claims

1. Manually adjustable flow saving device for spraying atomised water in household and industrial sanitation fittings, **characterised in that** it has a tubular main metal body (1) in which there is defined a lower neck (11) with a smaller diameter open at the lower portion, also having an either inner or outer upper threading (13) for being coupled to the corresponding tap, it having been envisaged that a purifying filter (3) is arranged in the centre of the main body, encircling a plastic drum (4) provided with grooves (15) for the passage of water, in which centre a plastic screw (5) is inserted with the interposition of a rubber washer (6), it having been envisaged that the lower neck (11) of the main metal body (1) is connected to a metal outer part (9), open at the lower portion, through which the reduced water flow finally exits.

2. Manually adjustable flow saving device for spraying atomised water in household and industrial sanitation fittings according to claim 1, **characterised in that** the metal outer part (9) is screwed tightly to the main metal body (1) by means of a pin (7) and a sealing gasket (8) which are arranged between the two devices, such that the water circulating in the space between the lower portion of the plastic screw (5) with a smooth outer surface and smaller diameter and the inner walls of the main metal body (1) with a larger diameter than the plastic screw and which have an inner thread, circulates at a high speed and is provided with a helical flow movement through the actual inner threading of the main metal body (1), exiting through the lower narrow orifice of the metal outer part (9) in the form of spray.

3. Manually adjustable flow saving device for spraying atomised water in household and industrial sanitation fittings according to claim 1, **characterised in that** the metal outer part can be selectively screwed, unscrewed with respect to the thread (19) of the neck (11) of the main body, such that it can block or unblock the perimetric orifices (12) of the neck (11), making the water circulate through said orifices and consequently through the space created between the metal parts, emptying into the outlet orifice of the movable part, with a larger diameter than the outlet orifice of the fixed part.

4. Manually adjustable flow saving device for spraying atomised water in household and industrial sanitation fittings according to claim 1, **characterised in that** the main metal body (1) is provided with notches (14) for being assembled in the tap by means of the corresponding wrench (2).

5. Manually adjustable flow saving device for spraying atomised water in household and industrial sanitation fittings according to claim 1, **characterised in that** the plastic screw (5) is moulded in heavy-duty plastic, having a larger diameter at the upper portion than at the lower portion of the part, with a hole

through the centre along the longitudinal axis without reaching its lower end, the upper portion of the screw, the one with the largest diameter, having threads on its entire side perimeter, being smooth in the upper area and with two horizontal side slits or grooves (15), it having been envisaged that the lower portion of the screw is smooth on its outer surface, having a circular orifice (18) crossing its entire diameter perpendicular to the axis of the cylinder and resulting in two holes facing one another, the lower end having a cylindrical shaped cover and two side grooves.

6. Manually adjustable flow saving device for spraying atomised water in household and industrial sanitation fittings according to claim 1, **characterised in that** the plastic drum (4) is made from a cylindrical shaped part moulded in heavy-duty plastic closed at its upper portion and open at the lower portion, finished with a perimetric flange, on the side of which there is arranged a series of rectangular parts defining grooves (15) for the passage of water, where at the end of which the lower portion of the part and the attachment thereof with the purifying filter (3) are supported, they are located above the upper portion of the plastic screw (5), enveloping and covering it, such that the water which has passed through the filter on the side face of the drum is forced to go towards the inner channel of the screw through the two horizontal side slits or grooves (17) which the plastic screw (5) has.

7. Manually adjustable flow saving device for spraying atomised water in household and industrial sanitation fittings according to claim 1, **characterised in that** the main metal body (1) is provided with notches (14) facilitating its assembly by means of a wrench (2).

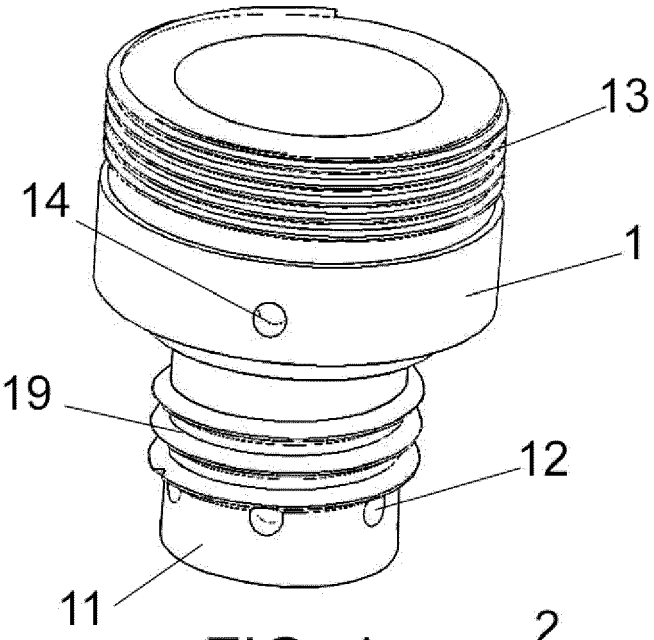

FIG. 1

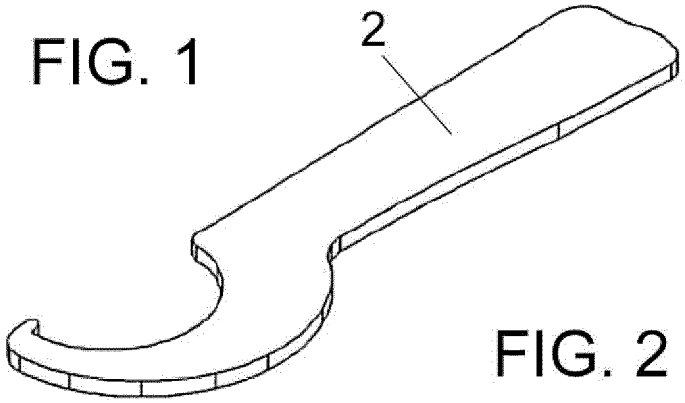

FIG. 2

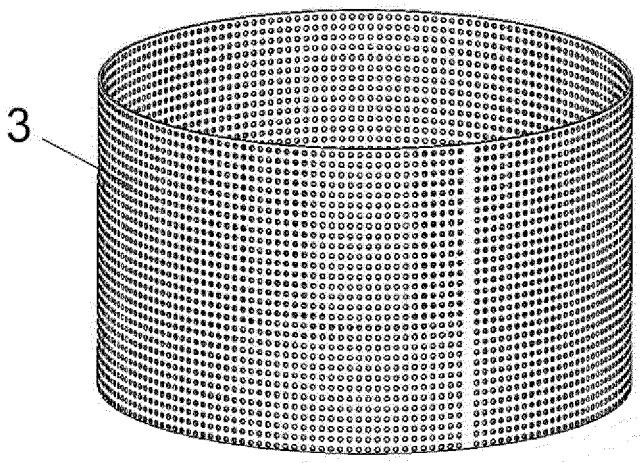

FIG. 3

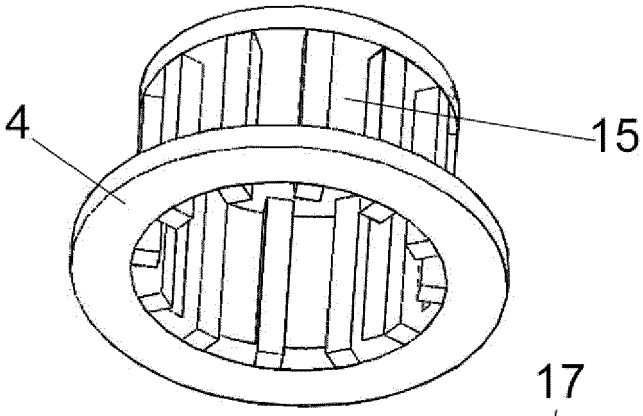

FIG. 4

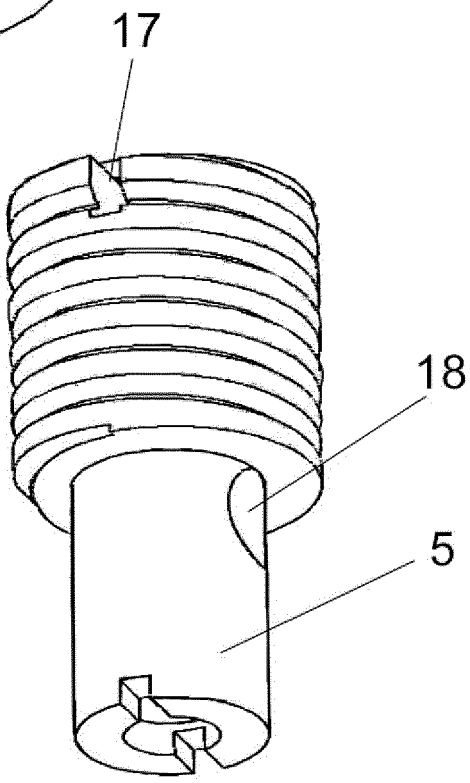

FIG. 5

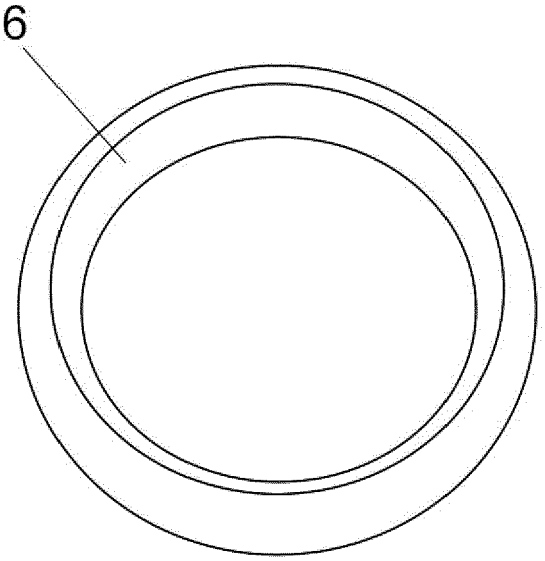

FIG. 6

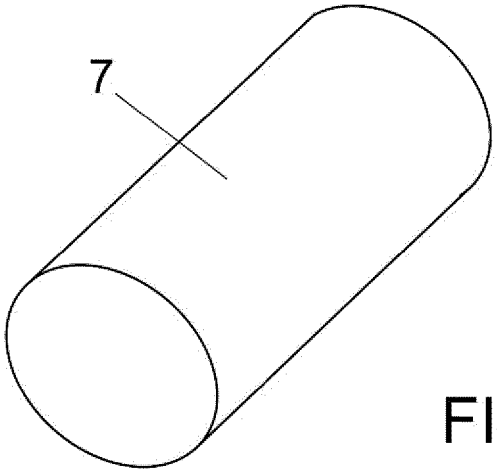

FIG. 7

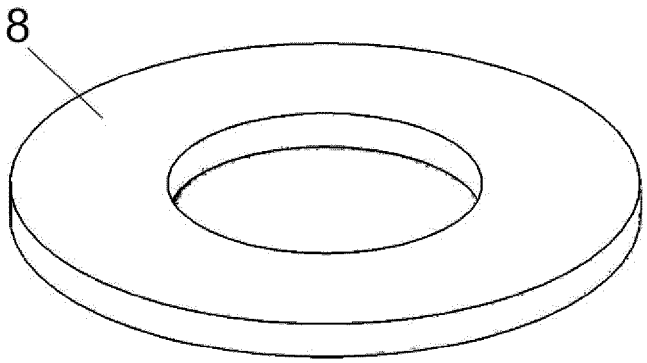

FIG. 8

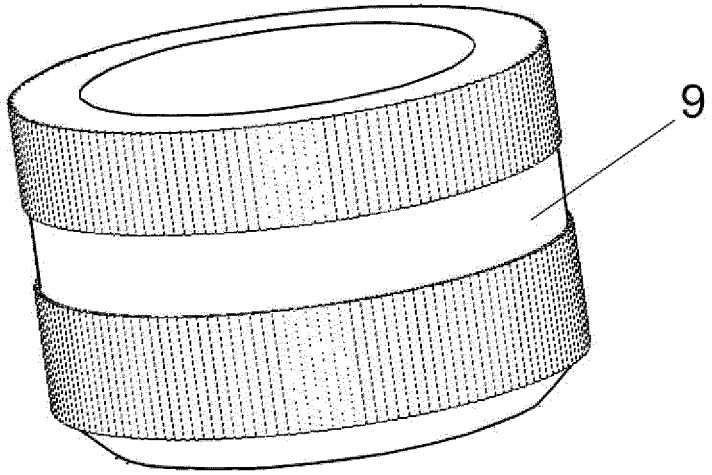

FIG. 9

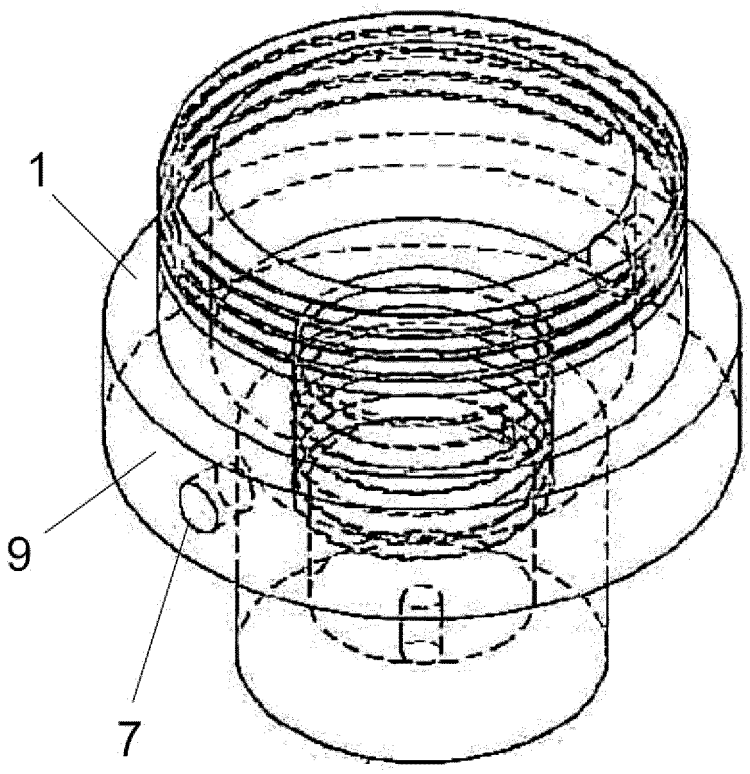

FIG. 10

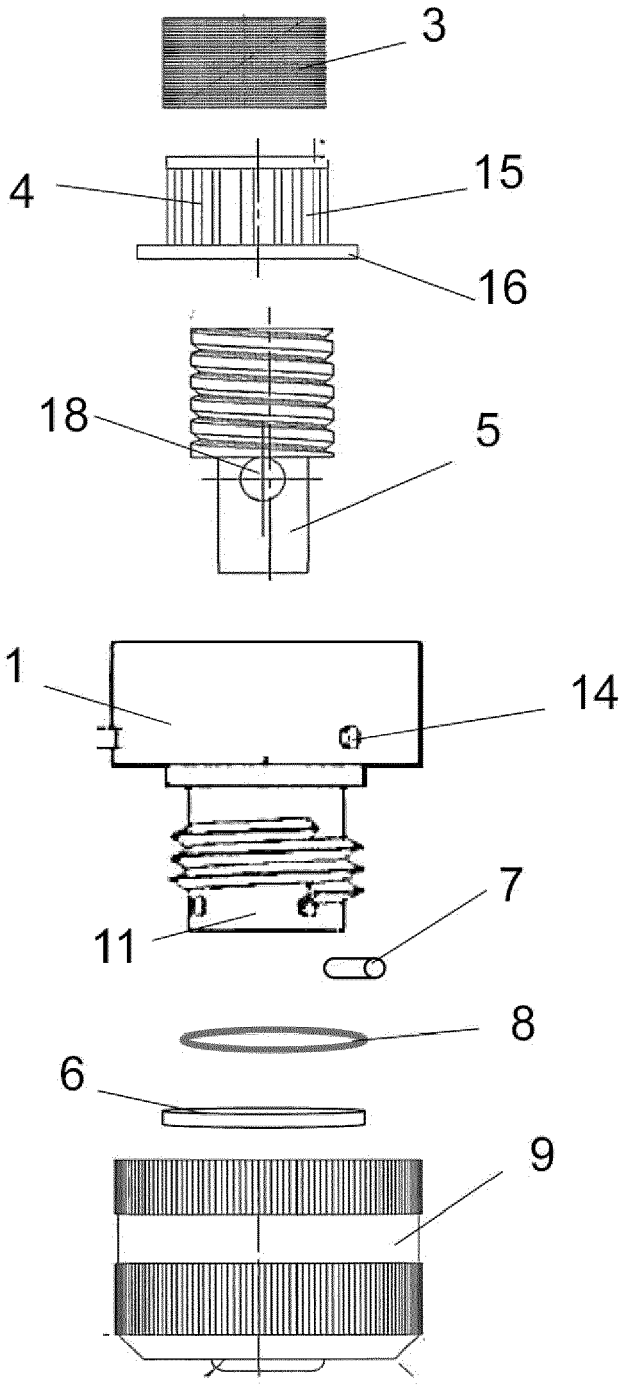

FIG. 11

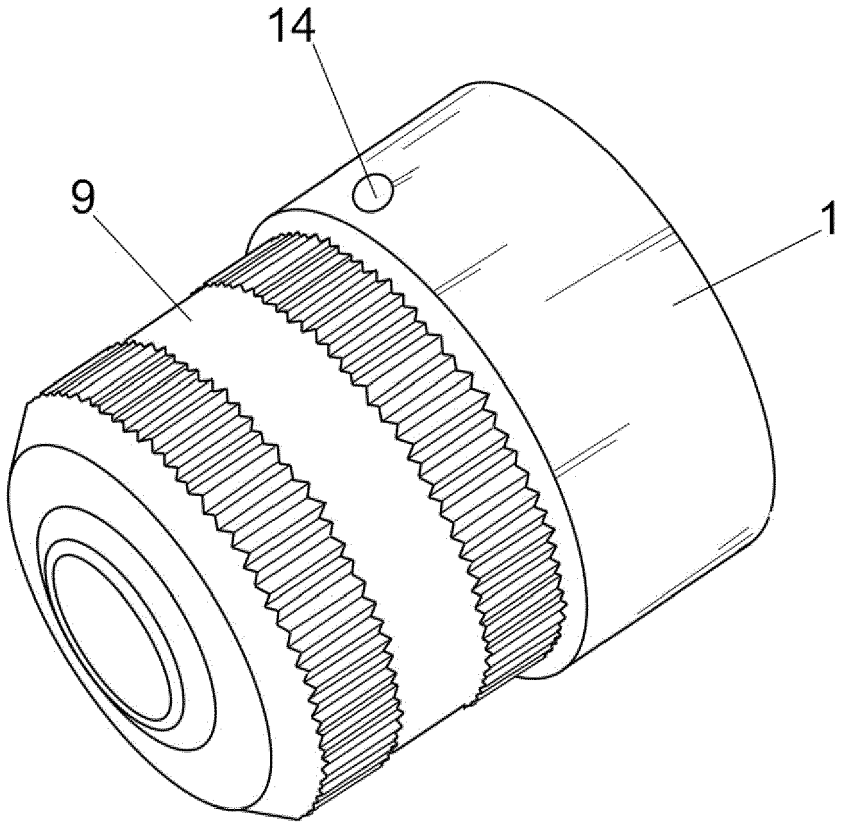

FIG.12