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(54) **Shower installation for filtered water**

(57) A shower installation providing filtered water includes a faucet (1), a filter device (2), and a diverter valve (3). The output of the faucet is connected to the input of the filter device, and the output of the filter device is in turn connected to the input of the diverter valve. One of the outputs of the diverter valve is connected to a shower handle through a water hose whereas the other output of the diverter valve is connected to a fixed overhead shower head through another water hose. In operation, hot water and cold water are mixed in the faucet and is supplied to a shower handle and to the shower head whereby in both cases water is filtered by the filter device. Thus, one filter device can be used for both the shower handle and the shower head.

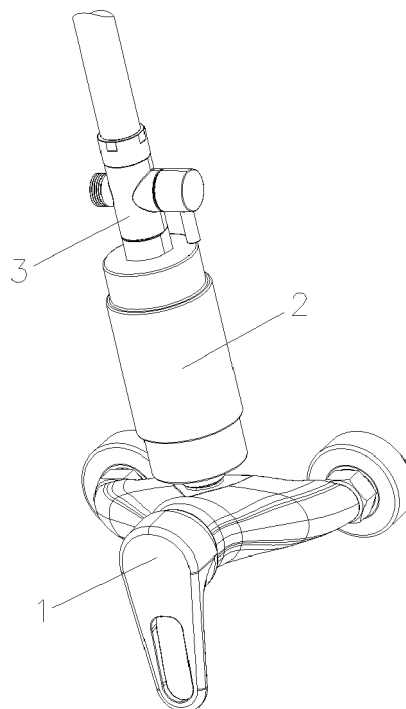


Fig. 1

Description

BACKGROUND OF THE INVENTION

FIELD OF INVENTION

[0001] The present invention relates to a shower water ejection system, and in particular to a shower water ejection system having a filter device.

THE PRIOR ARTS

[0002] Presently, for an existing shower water ejection system, after mixing hot water with cold water, it can only achieve supplying filtered water to a bathroom shower head or a flower shower head, yet it can not realize supplying filtered water to a bathroom shower head, a flower shower head, and more water output devices at the same time. In addition, the existing shower water ejection system has the drawbacks of having difficulty in replacing the filter device.

[0003] Therefore, presently, the design and performance of the shower water ejection system is not quite satisfactory, and it has much room for improvement.

SUMMARY OF THE INVENTION

[0004] In view of the problems and drawbacks of the prior art, the present invention provides a shower water ejection system having a filter device, to effectively overcome the shortcomings of the prior art.

[0005] A major objective of the present invention is to provide a shower water ejection system having a filter device, that is capable of supplying mixed and filtered hot water and cold water to a bathroom shower head and a flower shower head, and more water output devices at the same time.

[0006] To achieve the object of the present invention, the present invention provides a shower water ejection system having a filter device, including: a faucet, a filter device, and a 3-way valve. Wherein, the output of the faucet is connected to the input of the filter device, and the output of the filter device is connected to the input of the 3-way valve. Moreover, one of the outputs of the 3-way valve is connected to a bathroom shower head through a water hose; while another output of the 3-way valve is connected to a flower shower head through another water hose.

[0007] In one aspect of the present invention, the filter device includes: an upper shell, a lower shell, an upper cover, a lower cover, and a filter core. The upper shell is sleeved around the outer side of the lower shell. The water channel of the upper shell is sleeved around the outer side of water channel of the upper cover. The lower end of the water channel in the upper shell is provided with a fastening slot; while the lower end of the water channel of the upper cover is provided with a fastener to match and work in cooperation with the fastening slot of

the upper shell water channel. A spring is provided between the upper shell and the upper cover, to keep the upper cover fastened to the lower cover. The filter core is placed in an inner chamber of the lower cover. The upper end outer side of the lower cover is connected to the upper end inner side of the lower shell through the respective inner threads and outer threads.

[0008] In another aspect of the present invention, the water channel outer side of the upper cover is provided with a tight seal slot, and an O-shape tight seal ring is provided in the tight seal slot, to work in cooperation with the water channel inner side of the upper shell.

[0009] In a yet another aspect of the present invention, the water channel outer side of the lower cover is provided with a tight seal slot, and an O-shape tight seal ring is provided in the tight seal slot, to work in cooperation with the water channel inner side of the lower shell.

[0010] In another aspect of the present invention, the upper end of the upper shell is provided with outer threads working in cooperation with the input of the 3-way valve, while the lower end of the lower shell is provided with inner threads working in cooperation with the output of the faucet.

[0011] In a further aspect of the present invention, the filter device is installed below the faucet, the 3-way valve is installed above the faucet, and the output of the filter device is connected to the input of the 3-way valve through a pliable tube.

[0012] Compared with the prior art, the shower water ejection system having a filter device of the present invention has the following advantages: it can supply mixed and filtered hot water and cold water to a bathroom shower head, a flower shower head, and other water output devices at the same time through a filter device and a 3-way valve. In addition, the filter device can be detached and replaced readily, to provide user with convenience in practical application, thus having a good competitive edge in the market.

[0013] Further scope of the applicability of the present invention will become apparent from the detailed descriptions given hereinafter. However, it should be understood that the detailed descriptions and specific examples, while indicating preferred embodiments of the present invention, are given by way of illustration only, since various changes and modifications within the spirit and scope of the present invention will become apparent to those skilled in the art from this detailed descriptions.

BRIEF DESCRIPTION OF THE DRAWINGS

[0014] The related drawings in connection with the detailed descriptions of the present invention to be made later are described briefly as follows, in which:

Fig. 1 is a schematic diagram of a shower water ejection system having a filter device according to a first embodiment of the present invention;

Fig. 2 is a schematic diagram of a filter device ac-

cording to a first embodiment of the present invention;

Fig. 3 is a schematic diagram showing the process of ejecting upward the upper shell of the filter device after rotation according to a first embodiment of the present invention;

Fig. 4 is a schematic diagram showing a state after ejecting upward the upper shell of the filter device according to a first embodiment of the present invention;

Fig. 5 is a cross section view of a shower water ejection system having a filter device according to a first embodiment of the present invention;

Fig. 6 is a schematic diagram showing a state after an upper shell shown in Fig. 5 is retracted downward according to a first embodiment of the present invention;

Fig. 7 is a schematic diagram showing a state after an upper shell shown in Fig. 6 is pressed downward and fastened according to a first embodiment of the present invention;

Fig. 8 is a schematic diagram showing a state after a lower shell and a faucet shown in Fig. 7 are detached according to a first embodiment of the present invention; and

Fig. 9 is a schematic diagram of a shower water ejection system having a filter device according to a second embodiment of the present invention.

DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENT

[0015] The purpose, construction, features, functions and advantages of the present invention can be appreciated and understood more thoroughly through the following detailed description with reference to the attached drawings.

[0016] Refer to Figs. 1 and 5-8 for a shower water ejection system having a filter device according to the first embodiment of the present invention. As shown in Figs. 1 and 5-8, the shower water ejection system having a filter device includes: a faucet 1, a filter device 2, and a 3-way valve 3. Wherein, the output of the faucet 1 is connected to the input of the filter device 2, and the output of the filter device 2 is connected to the input of the 3-way valve 3. Moreover, one of the outputs of the 3-way valve 3 is connected to a bathroom shower head through a water hose; while another output of the 3-way valve 3 is connected to a flower shower head through another water hose.

[0017] As shown in Figs. 2-4, in a first embodiment of the present invention, the filter device 2 includes: an upper shell 21, a lower shell 22, an upper cover 23, a lower cover 24, and a filter core 25. Wherein, the upper shell 21 is sleeved around the outer side of the lower shell 22. The water channel of the upper shell 21 is sleeved around the outer side of water channel of the upper cover 23. The lower end of the water channel in the upper shell 21

is provided with a fastening slot 26; while the lower end of the water channel of the upper cover 23 is provided with a fastener 27 to match and work in cooperation with the fastening slot 26 of the upper shell 21 water channel.

A spring 28 is provided between the upper shell 21 and the upper cover 23, to keep the upper shell 23 fastened to the lower cover 24. The filter core 25 is placed in an inner chamber of the lower cover 24. The upper end outer side of the lower cover 24 is connected to the upper end inner side of the lower shell 22 through the respective inner threads and outer threads.

[0018] Moreover, as shown in Figs. 2-4. In a first embodiment of the present invention, in order to strengthen the tight seal between the water channel of the upper cover 23 and the water channel of the upper shell 21, the water channel outer side of the upper cover 23 is provided with a tight seal slot, and an O-shape tight seal ring 29 is provided in the tight seal slot, to work in cooperation with the water channel inner side of the upper shell 21. Further, in order to strengthen the tight seal between the water channel of the lower cover 24 and the water channel of the lower shell 22, the water channel outer side of the lower cover 24 is provided with a tight seal slot, and an O-shape tight seal ring 29 is provided in the tight seal slot, to work in cooperation with the water channel inner side of the lower shell 22.

[0019] Furthermore, as shown in Figs. 2-4. In a first embodiment of the present invention, in order for the filter device 2 to connect to the faucet 1 and the 3-way valve 3, the upper end of the upper shell 21 is provided with outer threads working in cooperation with the input of the 3-way valve 3, while the lower end of the lower shell 22 is provided with inner threads working in cooperation with the output of the faucet 1.

[0020] The operation principle of the first embodiment of the present invention is as follows: hot water and cold water is mixed in the faucet 1, then it is output from the faucet 1 to the filter device 2 placed above the faucet 1 for filtering. Subsequently, the mixed and filtered water is supplied to the bathroom shower head or a flower shower head, after passing through a 3-way valve 3. In installing the filter device 2, firstly, connect the lower shell 22 to the faucet 1, then rotate the upper shell 21 as shown in Fig. 3, to detach the fastening slot 26 from the fastener 27. At this time, the upper shell 21 is ejected upward due to the action of the spring 28, then connect and fix the upper shell 21 to the 3-way valve 3, to complete the installation process. When the filter core 25 requires replacement after certain period of usage, it can be replaced as follows: turn loose the upper shell 21 to detach it from the 3-way valve 3 as shown in Fig. 6. Then, press the upper shell 21 downward as shown in Fig. 7, so that the fastening slot 26 of the upper shell 21 is fastened to the fastener 27 of the upper cover 23. Subsequently, as shown in Fig. 8, turn loose the lower shell 22, to detach it from the faucet 1. At this time, the entire filter device 2 is detached from the faucet 1, so that the filter device 2 can be taken out to replace the filter core 25.

[0021] In the second embodiment, as shown in Fig. 9, in order to facilitate assembly and detaching, the input on the upper portion of the filter device 2 is connected to the output of the faucet 1 on its lower portion. The 3-way valve 3 is installed above the faucet 1, so that the output on the lower portion of the filter device 2 is connected to the input of the 3-way valve 3 through a pliable tube 4. The 3-way valve 3 can be fixed onto the faucet 1.

[0022] The operation principle of the second embodiment of the present invention is as follows: hot water is mixed with cold water in the faucet 1, then it is output from the faucet 1 and input to the filter device 2 placed below the faucet 1 for filtering. Then, the mixed and filtered water is supplied to a 3-way valve 3 via a pliable tube 4, to be supplied to a bathroom shower head or a flower shower head, after passing through the 3-way valve 3. In installing the filter device 2, firstly, connect the upper end of the filter device 2 directly to the output of the faucet 1 at its lower portion by means of threads. Then, connect the filter device 2 and the 3-way valve 3 through the pliable tube 4. When the filter core 25 requires replacement after certain period of usage, it can be replaced simply by turning loose and detaching the filter device 2 from the faucet 1 and the pliable tube 4, to replace the filter core 25 readily.

[0023] The above detailed description of the preferred embodiment is intended to describe more clearly the characteristics and spirit of the present invention. However, the preferred embodiments disclosed above are not intended to be any restrictions to the scope of the present invention. Conversely, its purpose is to include the various changes and equivalent arrangements which are within the scope of the appended claims.

Claims

1. A shower water ejection system having a filter device, comprising:

a faucet, a filter device, and a 3-way valve, such that an output of said faucet is connected to an input of said filter device, and said output of said filter device is connected to said input of said 3-way valve, one of said outputs of said 3-way valve is connected to a bathroom shower head through a water hose; while another output of said 3-way valve is connected to a flower shower head through another water hose.

2. The shower water ejection system having a filter device as claimed in claim 1. wherein said filter device includes: an upper shell, a lower shell, an upper cover, a lower cover, and a filter core, said upper shell is sleeved around outer side of said lower shell, a water channel of said upper shell is sleeved around outer side of said water channel of said upper cover, a fastening slot is provided at lower end of said water

channel in said upper shell; while a fastener is provided at lower end of said water channel of said upper cover to match and work in cooperation with said fastening slot of said water channel of said upper shell, a spring is provided between said upper shell and said upper cover, to keep said upper cover fastened to said lower cover, a filter core is placed in an inner chamber of said lower cover, outer side of upper end of said lower cover is connected to inner side of upper end of said lower shell through respective inner threads and outer threads.

3. The shower water ejection system having a filter device as claimed in claim 2. wherein a tight seal slot is provided on outer side of said water channel of said upper cover, and an O-shape tight seal ring is provided in said tight seal slot, to work in cooperation with inner side of said water channel of said upper shell.
4. The shower water ejection system having a filter device as claimed in claim 2. wherein said tight seal slot is provided on outer side of said water channel of said lower cover, and said O-shape tight seal ring is provided in said tight seal slot, to work in cooperation with inner side of said water channel of said lower shell.
5. The shower water ejection system having a filter device as claimed in claim 2. wherein upper end of said upper shell is provided with outer threads working in cooperation with an input of said 3-way valve, while lower end of said lower shell is provided with inner threads working in cooperation with an output of said faucet.
6. The shower water ejection system having a filter device as claimed in claim 1. wherein said filter device is installed below said faucet, said 3-way valve is installed above said faucet, said output of said filter device is connected to said input of said 3-way valve through a pliable tube.

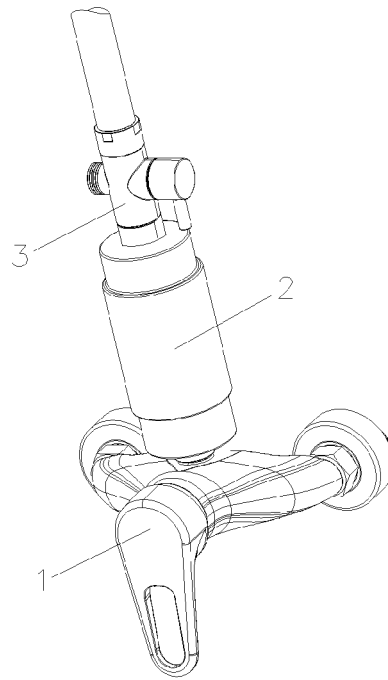


Fig. 1

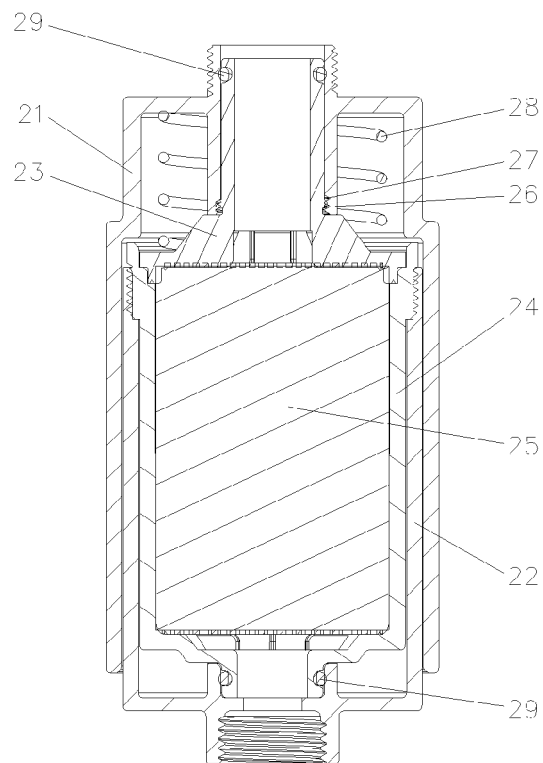


Fig. 2

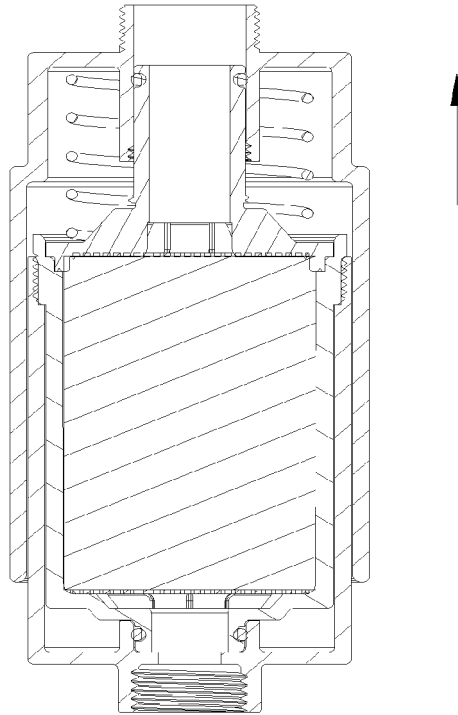


Fig.3

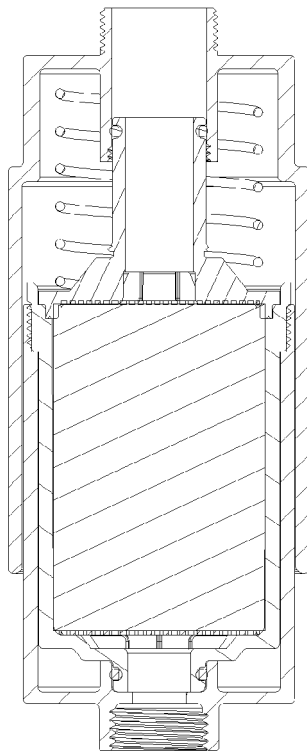


Fig.4

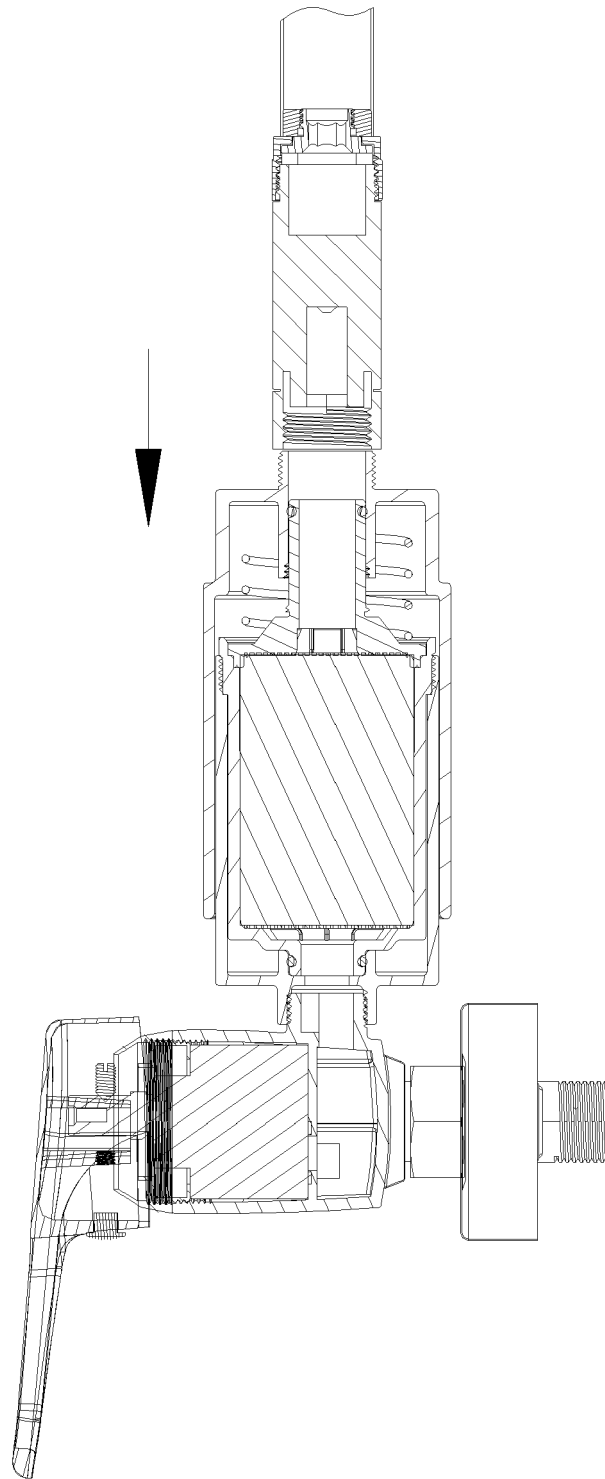


Fig.5

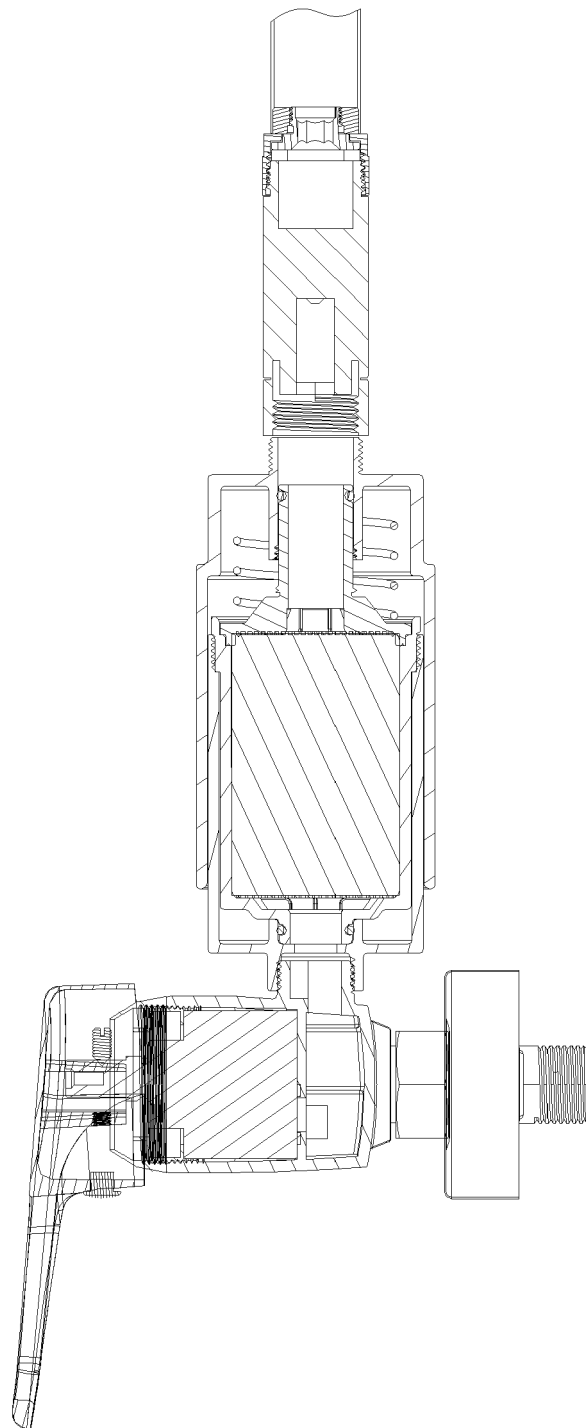


Fig.6

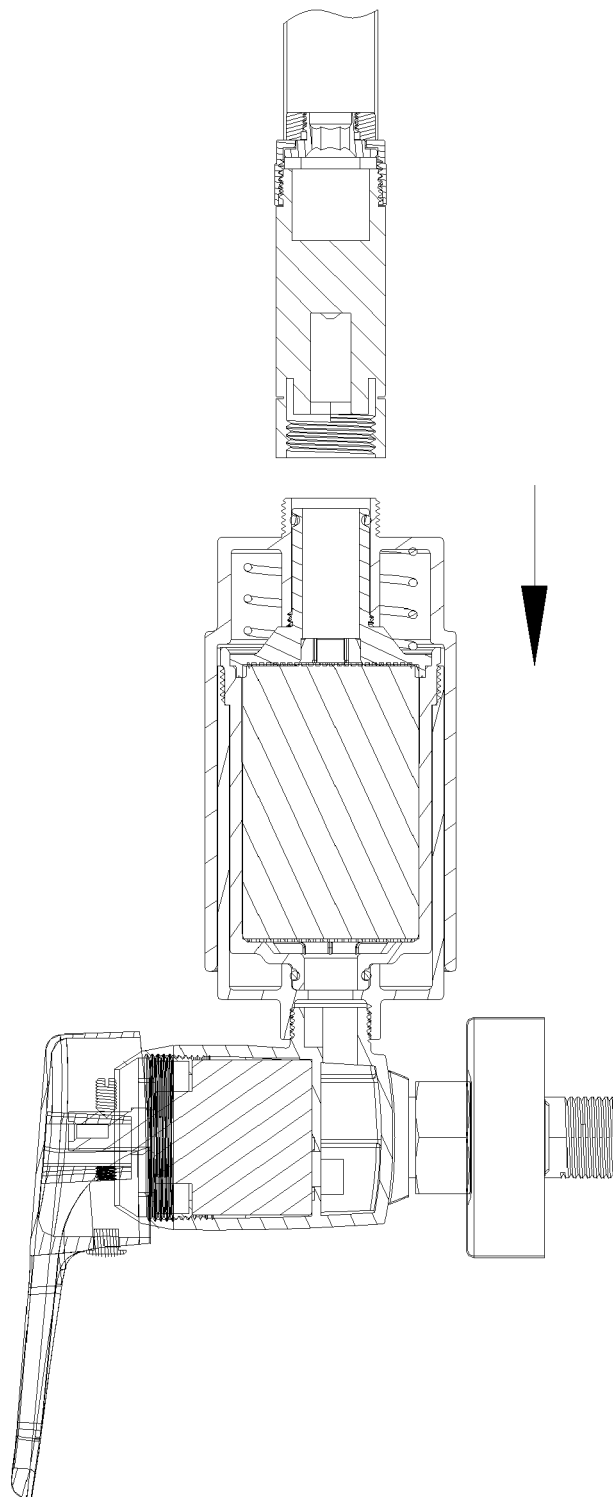


Fig. 7

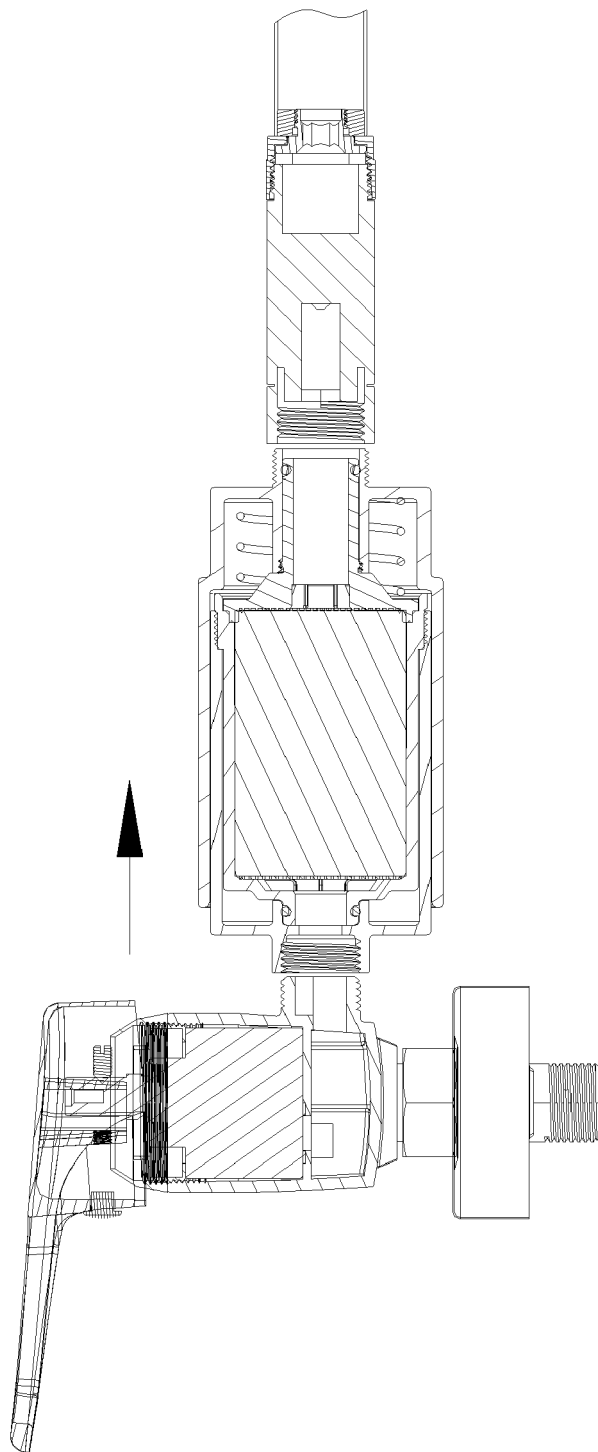


Fig. 8

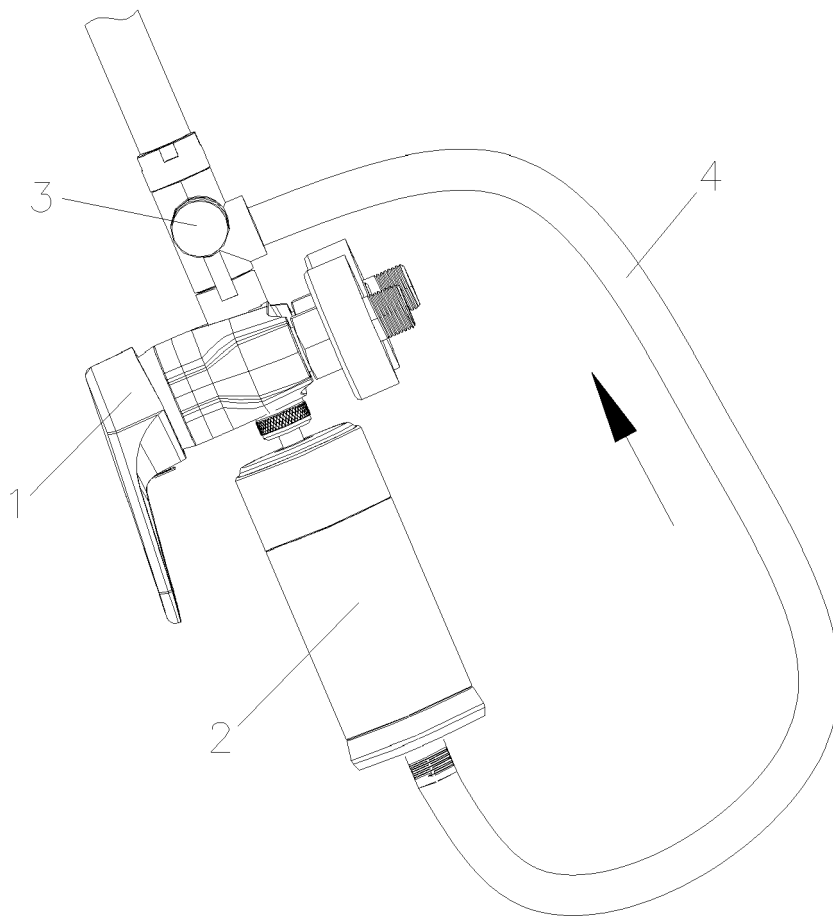


Fig.9



EUROPEAN SEARCH REPORT

Application Number
EP 14 17 3561

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DOCUMENTS CONSIDERED TO BE RELEVANT			
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (IPC)
X	KR 2013 0022553 A (LEE YOUNG HOON [KR]) 7 March 2013 (2013-03-07)	1,6	INV. E03C1/04
Y	* the whole document *	2-5	

X	US 2012/031511 A1 (FARLEY DAVID AARON [US]) 9 February 2012 (2012-02-09) * figures 1,4,6-8 *	1	

Y	US 7 094 334 B1 (GUZMAN GUILLERMO [US] ET AL) 22 August 2006 (2006-08-22) * the whole document *	2-5	

Y	US 2 568 181 A (ZIMMERMAN ROBERT M ET AL) 18 September 1951 (1951-09-18) * the whole document *	2-5	

Y	CH 700 587 B1 (FILOPUR AG [CH]) 30 September 2010 (2010-09-30) * figure 2 *	2-5	

A	KR 101 253 007 B1 (PARK BONG DUK [KR]) 15 April 2013 (2013-04-15) * the whole document *	1	TECHNICAL FIELDS SEARCHED (IPC) E03C

The present search report has been drawn up for all claims			
Place of search Munich		Date of completion of the search 12 December 2014	Examiner Geisenhofer, Michael
CATEGORY OF CITED DOCUMENTS X : particularly relevant if taken alone Y : particularly relevant if combined with another document of the same category A : technological background O : non-written disclosure P : intermediate document T : theory or principle underlying the invention E : earlier patent document, but published on, or after the filing date D : document cited in the application L : document cited for other reasons & : member of the same patent family, corresponding document			

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**ANNEX TO THE EUROPEAN SEARCH REPORT
ON EUROPEAN PATENT APPLICATION NO.**

EP 14 17 3561

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This annex lists the patent family members relating to the patent documents cited in the above-mentioned European search report.
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Patent document cited in search report	Publication date	Patent family member(s)	Publication date
KR 20130022553 A	07-03-2013	NONE	
US 2012031511 A1	09-02-2012	NONE	
US 7094334 B1	22-08-2006	NONE	
US 2568181 A	18-09-1951	NONE	
CH 700587 B1	30-09-2010	NONE	
KR 101253007 B1	15-04-2013	NONE	

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