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(54) **SYSTEM TO ELIMINATE CLOGS IN WASTE PIPES**

(57) The invention is directed to a device to eliminate a clog in a drain, which device comprises: a first pipe (150); and a ball valve (100) comprising a housing and a spherical body inserted therein, said housing comprising: a first portion (160) for being connected to a sanitary fixture; a second portion connected to an access element (104), which access-element (104) is suitable for being connected to the first pipe (150) for providing a connection to hot or cold water, and which pipe (150) connecting access (104) to hot or cold water, and which access-element comprises a closure valve (110) therein; a third portion (170) to be connected to a pipe to be unclogged; wherein the spherical body comprises a hole (101) which, when the ball valve (100) is in closed position, and when the closure valve (110) of the access-element (104) is in its open position, allows water to flow from the first pipe (150), through the access-element (104), towards the third portion (107).

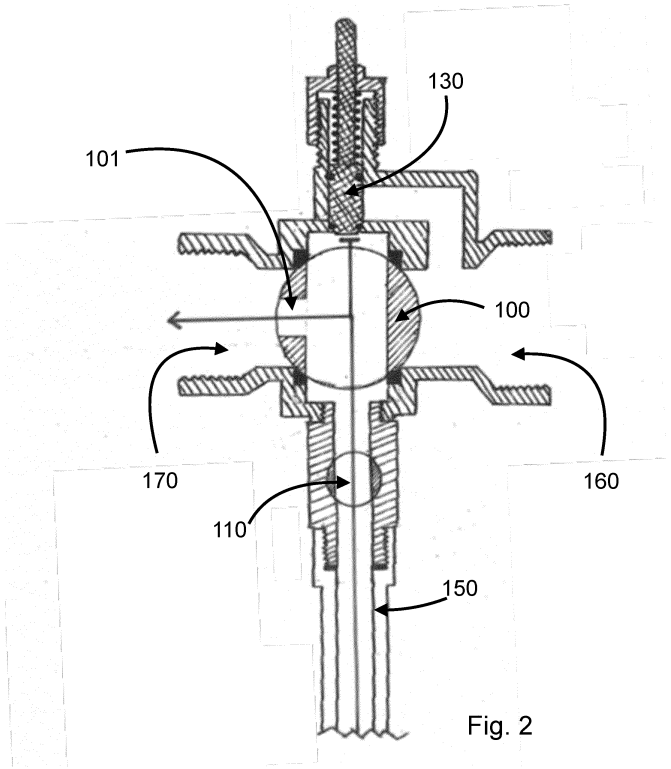

Fig. 2

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Description

Field of the invention

[0001] . The present invention is directed to a device to eliminate clogs in waste pipes, which device does not require the use of chemical additives or external equipment but mainly uses pressure of the water network as a power take-off.

Background of the invention

[0002] . In all homes and even more so in the kitchens of restaurants it happens to see that a drain struggles to dispose of the flow of the tap. Gradually, the rate of outflow from the exhaust decreases to zero. At that point, you can use commercially available acid or base chemicals, which can sometimes restore the drain, but generally fail to solve the problem. Alternatively, mechanical tools such as suction cups are available, which although they are low cost and have no side effects, very often do not to solve the problem.

[0003] . At that point, it will be necessary the intervention of a plumber that with mechanical means will eliminate the block. This involves the disassembly of the exhaust, the use of the mechanical means and the replacement of the exhaust. The cost of the intervention is therefore considerable.

[0004] . Thus, there is a great need for a device to eliminate clogs in waste pipes that do not require external intervention and that is able to quickly and effectively solve the problem.

Summary of the invention

[0005] . The present invention is directed to a device to eliminate a clog in a drain, which device comprises a ball valve 100 comprising a housing and a spherical body inserted therein, said housing comprising: a first portion 160 for being connected to a sanitary fixture; a second portion connected to an access-element 104, which access-element 104 is suitable for being connected to a first pipe 150 for providing a connection to hot or cold water, and which pipe 150 connecting access 104 to hot or cold water, and which access-element comprises a closure valve 110 therein; a third portion 170 to be connected to a pipe to be unclogged; wherein the spherical body comprises a hole 101 which, when the ball valve 100 is in closed position, and when the closure valve 110 of the access-element 104 is in its open position, allows water to flow from the first pipe 150, through the access-element 104, towards the third portion 107.

Brief description of the figures

[0006]

. Figure 1 shows a section of an embodiment of the device according to invention during normal discharge operation.

. Figure 2 shows a section of the device of Figure 1 during use to eliminate a clog.

. Figure 3 shows a section of the device of Figure 1 during use to eliminate a clog in a drain and with the by-pass valve open.

Detailed description of the invention

[0007] . Figure 1 shows a ball valve 100 for use in the present invention in open position, that is, in the position to be used during the normal operation of the exhaust. The ball valve 100 is modified compared to commonly available ball valves. In fact, on the spherical body there is a hole 101 highlighted in figure 1, in which we see that the cavity 104 present in the body of the ball valve is in liquid communication with the exhaust pipe through the hole 101. Valve 110 is used to prevent water in tube 150 from flowing into the drain.

[0008] . Figure 2 shows the device in the operating position to eliminate a clog in an exhaust. With respect to the position of figure 1, the two valves 100 and 110 are rotated by 90°, the ball valve 100 is in closed position; the hole 101 is also rotated by 90° and is now aligned with the pipe to be unplugged, thus maintaining communication between cavity 104 and the pipe. The opening of valve 110 and the alignment of hole 101 with the pipe to be unplugged means that water can flow from pipe 150 to the pipe to be unplugged, while passage from pipe 150 to the pipe leading to the sanitary, for example a sink, is prevented.

[0009] . Figure 3 shows the device in the operating position to eliminate a clog in a drain when the pressure in valve 100 reaches a value greater than a maximum fixed value. Exceeding the maximum value causes the opening of the bypass valve 130 that allows water coming from pipe 150 to pass into the pipe that leads to the sanitary. The presence of a bypass valve is not mandatory but is recommended to limit the risk of a rupture in the exhaust pipes. If present, the bypass valve can be adjusted to a pressure value that reflects the characteristics of the pipe. In fact, it is evident that in the presence of a copper or metal pipe in general, a high value of pressure can be fixed, or one can even do without the valve. However, in new or fairly recent constructions the drains are generally made of plastic that resists to a much lower pressure.

[0010] . If the excessive pressure produces the opening of the bypass valve, the operator will observe arrival of water in the sanitary and will suspend the procedure of cleaning the drain.

[0011] . In addition to or as an alternative to the bypass valve, a pressure regulating valve can be inserted into the first pipe 150. In this way, it is possible to ensure that the pressure in pipe 150 and therefore, during the use of the device, in the exhaust pipe, does not exceed the value fixed by the pressure control valve (not shown in the fig-

ures).

[0012] . In a preferred embodiment, the pressure used to remove a clog in the exhaust may vary in the range between 0.5 and 6.0 bar, more preferably between 1.5 and 3.0 bar. The upper limit of pressure is determined by water pressure in the water network. However, even if the water network were at a pressure of more than 6.0 bar, it is convenient to use a lower pressure to avoid damage to the drain. In case the device of the invention is equipped with a bypass valve and/or a pressure regulating valve, it is possible to vary the pressure used to obtain the desired result.

[0013] . The installation of the device according to the invention can be done in a very simple way on the discharge of any sink or sanitary present in a house or in a commercial establishment such as a restaurant; for simplicity we will refer to the discharge of a sink, but the same reasoning applies to any discharge. The installation of the device can be carried out by inserting the ball valve 100 on the drain. The ball valve 100, compared to a conventional ball valve, is characterized by the presence of hole 101 that keeps open the water passage from pipe 150 to the exhaust pipe when valve 100 is in closed position.

[0014] . When valve 100 is in closed position, that is, when the valve interrupts the communication between the upper part 160 and the lower part 170, hole 101 is aligned with opening 104 to which the tube 150 is connected. It is therefore necessary to insert a valve 110 to close pipe 150 to prevent water from flowing from pipe 150 to the exhaust pipe even during normal operation of a drain. Valve 110 must then be opened in conjunction with or immediately after the closure of valve 100 to begin the procedure of elimination of a clog in the exhaust pipe.

[0015] . Valve 100 can be made of any material suitable for use under specific conditions. In particular, the valve can be made of steel, preferably stainless steel, brass, or plastic.

[0016] . Pipe 150 is preferably connected to one of the hoses under the sinks. In a preferred construction mode, pipe 150 is connected to the hot water hose. Using the hot water hose, hot water is used for the operation of the device, facilitating the cleaning of the exhaust pipe, which is cleaned in this case both by the pressure and by the temperature of water. Often clogs in exhaust pipes contain large amounts of grease that are dissolved at temperatures of 40-50°C, corresponding to the temperature of domestic hot water. Then the passage in the drain of water at a temperature of 40-50°C facilitates and improves cleaning of the drain.

[0017] . Valve 110 is opened preferably after or during valve 100 closure. In fact, if valve 110 is opened before valve 100 is closed, the water from pipe 150 would go into the tube connected with the first portion 160 and then fill the sink connected to it.

[0018] . To prevent this from happening, it is preferable to connect the movements of the two valves in such a way that closing of the valve 100 causes valve 110 to open. This can be done with a crank that acts simultaneously on the two valves.

[0019] . The device of the present invention can be used both when the discharge is blocked to remove the clog, and in a preventive way to clean the drain before the clog forms.

Claims

1. A device to eliminate a clog in a drain, which device comprises:

   a. A first pipe (150); and
   b. a ball valve (100) comprising a housing and a spherical body inserted therein, said housing comprising:

      i. a first portion (160) for being connected to a sanitary fixture;
      ii. a second portion connected to an access element (104), which access-element (104) is suitable for being connected to the first pipe (150) for providing a connection to hot or cold water, and which pipe (150) connecting access (104) to hot or cold water, and which access-element comprises a closure valve (110) therein;
      iii. a third portion (170) to be connected to a pipe to be unclogged;

   wherein the spherical body comprises a hole (101) which, when the ball valve (100) is in closed position, and when the closure valve (110) of the access-element (104) is in its open position, allows water to flow from the first pipe (150), through the access-element (104), towards the third portion (107).

2. The device of claim 1, wherein the ball valve (100) and the closure valve (110) are operated by a unique crank mechanism which guaranties that, when ball valve (100) is in closed position, closure valve (110) is open position, and when ball valve (100) is in open position, closure valve (110) is in closed position.

3. The device of claims 1-2, wherein the ball valve (100) further comprises a bypass valve (130) which opens when reaching a predetermined pressure value and during removal of the clog allows water from the first pipe (150) to flow into the first portion (160) connected to the sanitary fixture.

4. The device of claims 1-3, further comprising a pressure regulation valve preferably located on the first pipe (150).

5. The device of claims 1-4, wherein the ball valve (100)

is made of stainless steel.

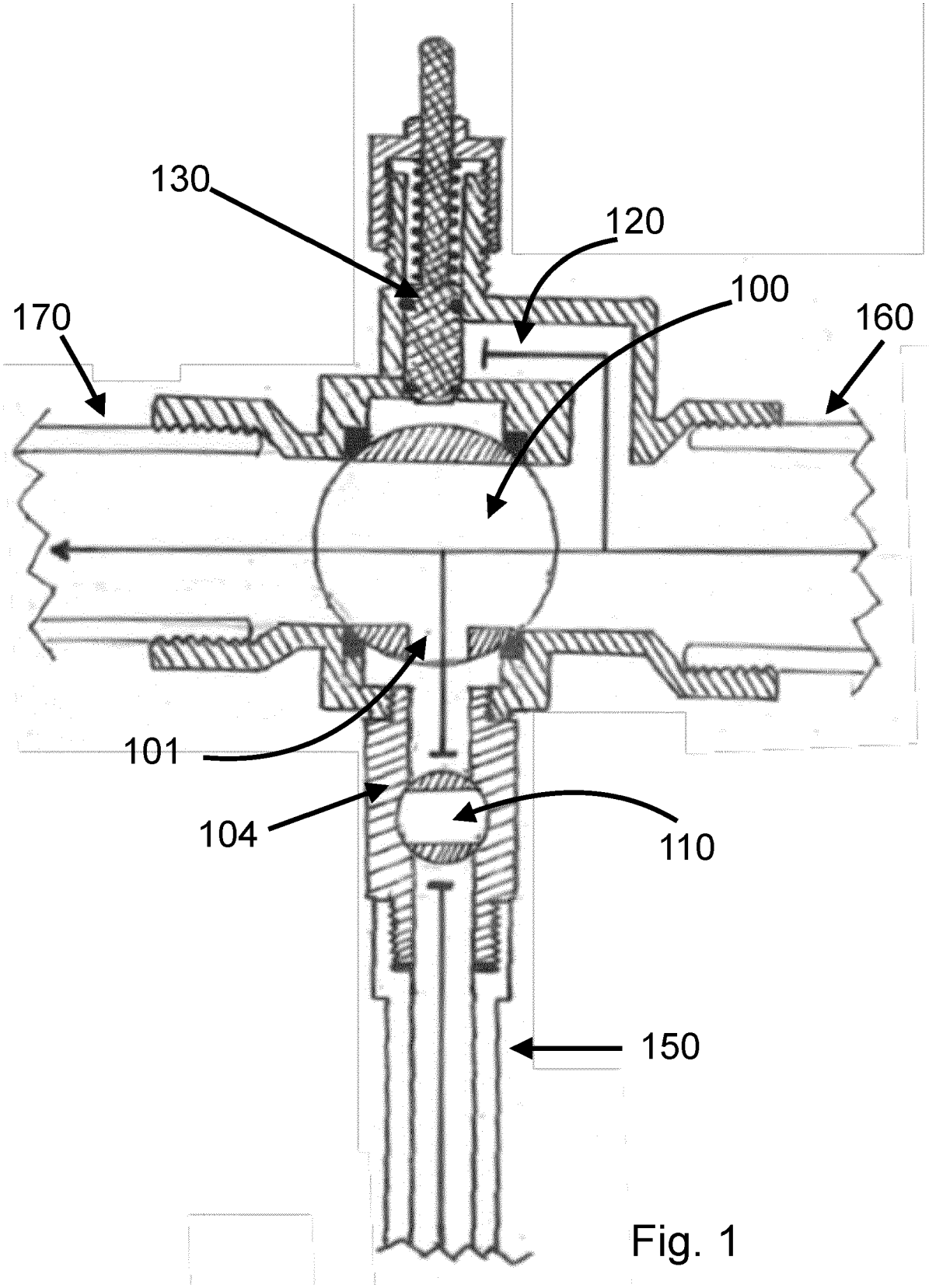

Fig. 1

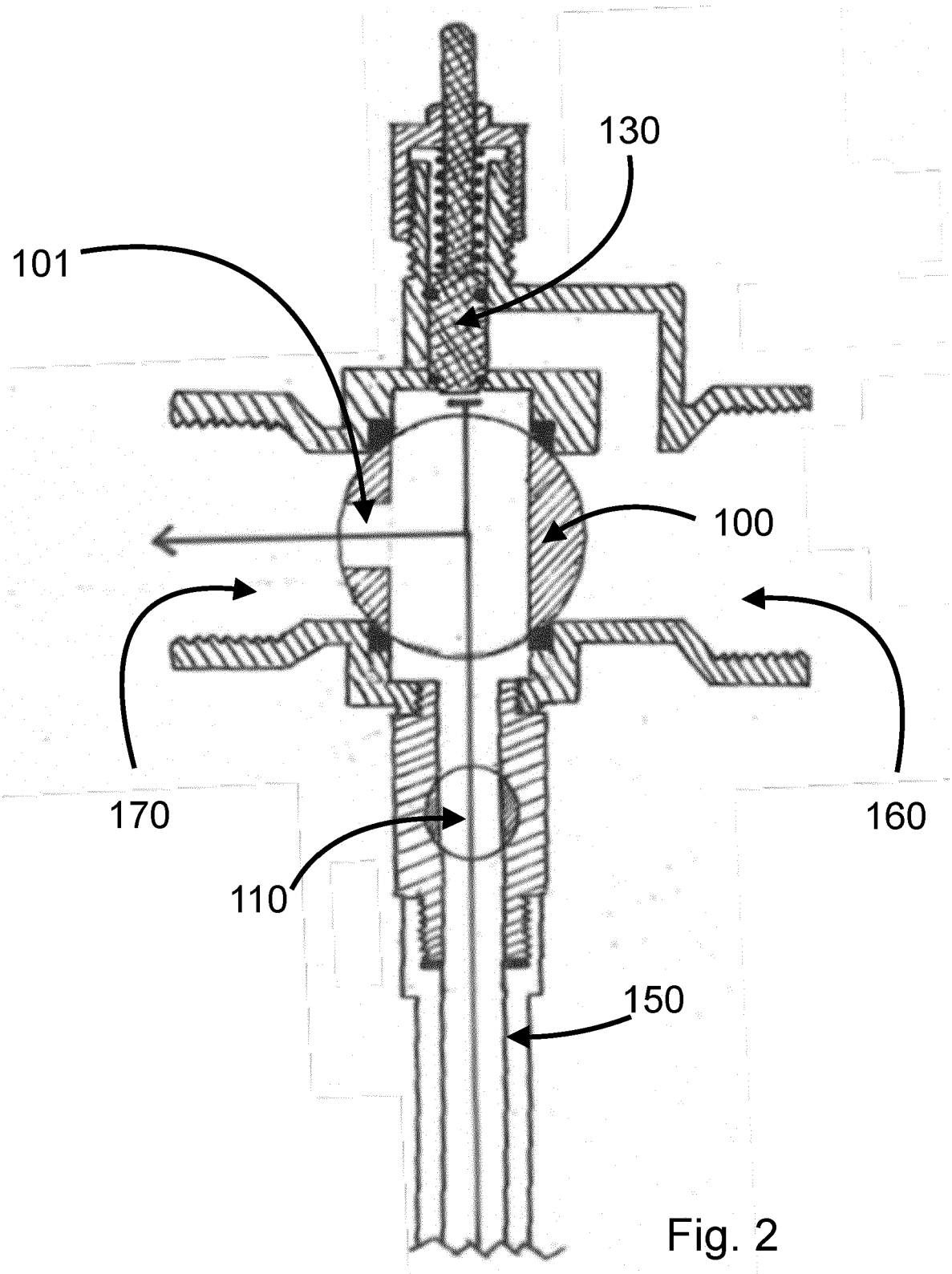

Fig. 2

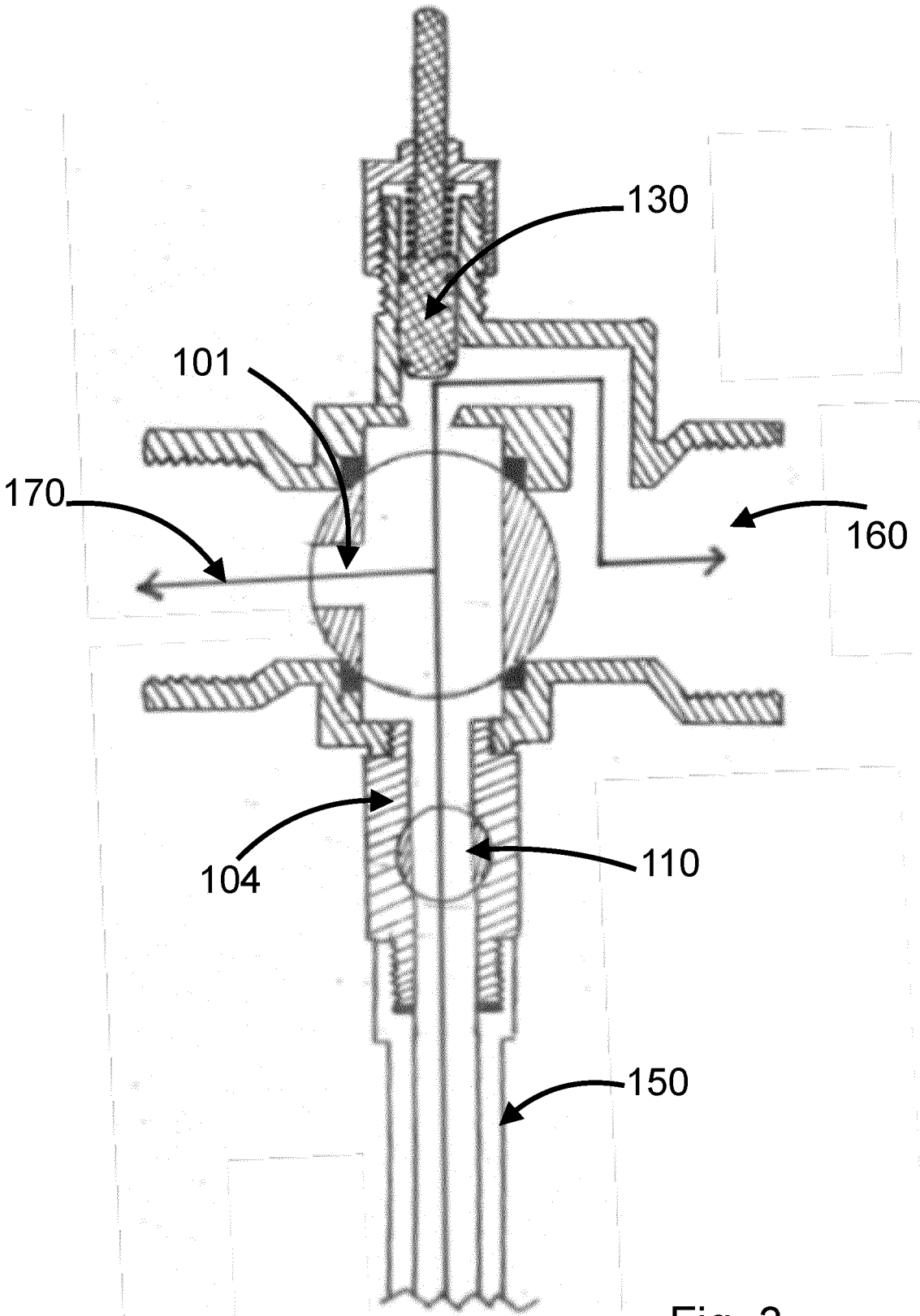

Fig. 3

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EUROPEAN SEARCH REPORT

Application Number
EP 22 17 5598

DOCUMENTS CONSIDERED TO BE RELEVANT

Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (IPC)
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A	CN 109 098 233 A (ZHOU SIMING) 28 December 2018 (2018-12-28) * figures *	1-5	
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A	ES 2 676 736 A1 (JIMENEZ BARBECHO SERGIO [ES]) 24 July 2018 (2018-07-24) * figure 1 *	1	
A	DE 20 2019 004459 U1 (WICHMANN BODO [DE]) 23 January 2020 (2020-01-23) * figures *	1	TECHNICAL FIELDS SEARCHED (IPC) E03C

The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
Munich	12 October 2022	Isailovski, Marko

CATEGORY OF CITED DOCUMENTS

X : particularly relevant if taken alone
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ANNEX TO THE EUROPEAN SEARCH REPORT ON EUROPEAN PATENT APPLICATION NO. EP 22 17 5598

This annex lists the patent family members relating to the patent documents cited in the above-mentioned European search report. The members are as contained in the European Patent Office EDP file on
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For more details about this annex : see Official Journal of the European Patent Office, No. 12/82