

632201

COMMONWEALTH OF AUSTRALIA

Patents Act 1952

CONVENTION APPLICATION FOR A STANDARD PATENT

I/WE, FRIEDRICH GROHE ARMATURENFABRIK GmbH & CO.
of, HAUPTSTRASSE 137, D-5870 HEMER,
FEDERAL REPUBLIC OF GERMANY.

hereby apply for the grant of a Standard Patent for an invention
entitled:

" WATER TAP FITTING WITH REVERSE-SUCTION PREVENTION"

Which is described in the accompanying complete specification.

This application is made under the provision of Part XVI of the
Patents Act 1952 and is based on an application for a patent
or similar protection made

in FEDERAL REPUBLIC OF GERMANY
FEDERAL REPUBLIC OF GERMANY

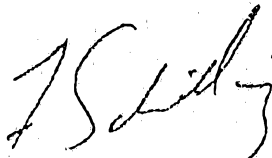
on 5 FEBRUARY 1990.
10 MAY 1990

(No. P 4003353.8)
P 4014968.4

My/Our address for service is:-

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Dated this 17th day of JANUARY 1991.

By: 

Registered Patent Attorney

To: The Commissioner of Patents
COMMONWEALTH OF AUSTRALIA

SO19478 18/01/91

Commonwealth of Australia
The Patents Act 1952
DECLARATION IN SUPPORT

In support of the (Convention) Application made by:

Friedrich Grohe Armaturenfabrik GmbH + Co., of Hauptstrasse 137,
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for a patent for an invention entitled:

"Water tap fitting with reverse-suction prevention"

X (We) VOLKHARD SPLITTGERBER, ROLF-DIETER KOLSCH.

of and care of the applicant company do solemnly and sincerely declare as follows:

~~a) I am (We are) the applicant(s) for the patent~~

~~or~~

b) I am (We are) authorised by the applicant(s) for the patent to make this declaration on its behalf.

Delete the following if not a Convention Application.

The basic application(s) as defined by section 141 (142) of the Act ~~was (were)~~ made

- a) on 5 February 1990 in Federal Republic of Germany
b) on 10 May 1990 in Federal Republic of Germany

~~or~~

~~in~~

by the present applicant company

The basic application(s) referred to in this paragraph ~~is (are)~~ the first application(s) made in a Convention country in respect of the invention the subject of the application.

~~a) I am (We are) the actual inventor(s) of the invention~~

for a) or	Werner Gnauert	Hans-Jürgen Jensen	for b) Werner Gnauert
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	Federal Republic	Federal Republic	Federal Republic
	of Germany	of Germany	of Germany

~~is (are)~~ the actual inventor(s) of the invention and the facts upon which the applicant company

is ~~(are)~~ entitled to make the application are as follows:

by virtue of assignments for a) dated 15 January 1990
for b) dated 02 May 1990

Declared at Hemer this 07th day of November 1990

Friedrich Grohe Armaturenfabrik GmbH + Co.

Signed

ppa

Status

ppa

Marketing Director

Marketing Manager for special projects

Declarant's Name

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This form is suitable for any type of Patent Application. No legalisation required.

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- (56) Prior Art Documents
US 4827538
US 2324084
US 2219259
- (57) Claim

1. A water tap fitting, particularly for wash basins and/or sinks, with a housing which can be connected to the supply line and a water outlet constructed as a shower rose which can be pulled out, whereas to prevent a reverse suction of the waste water through the shower rose a venting device is provided between the housing and shower rose characterised in that in the line to the water outlet at least one interrupting valve is provided, the valve closing member of which is provided movably in a valve housing between two oppositely situated valve seats whereas one valve seat defines an opening to the atmosphere and the other valve seat defines an inflow opening of the outflowing water, while an outlet opening for the water outlet is provided in the valve housing between valve seats, whereas the valve closing member is biased against the valve seat defining the inflow opening in such a manner that it abuts against it when there is at least an atmospheric pressure in the outlet pipe.

Water tap fitting with reverse-suction prevention

5 The invention concerns a water tap fitting, particularly for wash basins and/or sinks, with a housing which can be connected to the supply line and a water outlet constructed as a shower rose which can be pulled out, whereas to prevent a reverse suction of the waste water through the shower rose a venting device is provided.

10 Such a device is known from the publication DE 36 03 503 A1. This venting device is integrated above the wash basin and sink into the housing of the valve of the water tap, so that the housing has to be made correspondingly large. However, for
15 aesthetic reasons, for example, often the fitting for the water outlet on the wash basin needs to be small. In addition, venting devices are not compulsory in some countries, so that for reasons of pricing, for example, the outlet fitting is offered with and without venting device.

Furthermore, in the publication DE 37 08 169 A1 a device to
20 prevent the reverse suction of waste water for household machines is disclosed, where a pipe-shaped, elastic folding bellows is provided as the venting member. However, in case of water outlet fittings having a shower rose outlet there is an
25 outlet resistance caused by the shower stream former. Therefore, this folding bellows construction is not very suitable for the above mentioned outlet fitting, especially because the absorbance of pressure and water hammer by the folding bellows is a problem.

30 The task of the invention is to produce a reliably working venting device which can be installed basically independently from the water tap fitting, particularly underneath the wash basin or sink.

~~35 According to the invention this task is solved so that in the line for the water outlet at least one interrupting valve is provided, the valve closing member of which is provided movably in a valve housing between two opposite situated valve seats, whereas one valve seat encompasses an opening to the atmosphere
40 and the other valve seat encompasses the inflow opening for the outflowing water, while the outlet opening for the water outlet is provided in the valve housing outside the valve seat, whereas the valve closing member is pressed with a certain force against the valve seat containing the inflow opening in such a manner
45 that it abuts against it when there is at least an atmospheric pressure in the outlet pipe. This design achieves that the venting device consisting essentially of an interrupting valve can be installed in the wash basin or the sink independently from the highest possible water level especially below the wash basin or the sink. At the same time the interrupting valve is
50 constructed as a two-way valve, whereas the valve closing member in case of a line pressure exceeding the atmospheric one closes the ventilation opening and unblocks the water flow to the water outlet, while in case of an atmospheric pressure in the line the valve closing member with the aid of a spring, for example, is
55 pressed from the opening to the atmosphere in the direction of the valve seat containing the inflow opening and will close the inflow opening. By this on the one hand a reverse flow of the~~



According to the invention there is provided a water tap fitting, particularly for wash basins and/or sinks, with a housing which can be connected to the supply line and a water outlet constructed as a shower rose which can
5 be pulled out, whereas to prevent a reverse suction of the waste water through the shower rose a venting device is provided between the housing and shower rose characterised in that in the line to the water outlet at least one interrupting valve is provided, the valve closing member
10 of which is provided movably in a valve housing between two oppositely situated valve seats whereas one valve seat defines an opening to the atmosphere and the other valve seat defines an inflow opening of the outflowing water, while an outlet opening for the water outlet is provided
15 in the valve housing between valve seats, whereas the valve closing member is biased against the valve seat defining the inflow opening in such a manner that it abuts against it when there is at least an atmospheric pressure in the outlet pipe. This design achieves that the venting
20 device consisting essentially of an interrupting valve can be installed in the wash basin or the sink independently from the highest possible water level especially below the wash basin or the sink. At the same time the interrupting valve is constructed as a two-way valve, whereas the valve
25 closing member in case of a line pressure exceeding the atmospheric one closes the ventilation opening and unblocks the water flow to the water outlet, while in case of an atmospheric pressure in the line the valve closing member with the aid of a spring, for example, is pressed
30 from the opening to the atmosphere in the direction of the valve seat containing the inflow opening and will close the inflow opening. By this on the one hand a reverse flow of the



water in the direction of the water tap valve is prevented, and on the other the remaining hose line to the shower rose is ventilated through the opening to the atmosphere. Consequently, with the device an undesirable reverse suction of the waste
5 water can be safely prevented.

Further advantageous refinements of the invention are stated in claims 2 to 13.

10 Embodiment of the invention are illustrated in the drawing and are described in detail as follows. Shown is:

in Fig.1 - a schematically illustrated sink;

15 in Fig.2 - the interrupting valve shown in Fig.1 on an enlarged scale, in longitudinal cross-section;

in Fig.3 - another schematically illustrated sink;

20 in Fig.4 - the interrupting valve shown in Fig.3 on an enlarged scale, in longitudinal cross-section.

For simplicity the same or corresponding elements of the embodiments in the drawing have the same reference numbers.

25

In case of the wash basin or sink 1 shown in Fig.1 a rinsing basin 10 is constructed, whereas on the table a pivoting valve 2 is fastened. The pivoting valve 2 is fed with cold and hot water through the connecting lines 21, 22. With the aid of an

30 adjustable actuating handle 23, having two degrees of freedom, tempered mixture of water can be produced in the pivoting valve 2. For example, by an adjustment in the first degree of freedom the mixing ratio and the temperature, respectively, of the mixed water can be set, while in the second degree of freedom the
35 total water throughput can be adjusted. The mixed water produced in the pivoting valve 2 is fed through the outlet pipe 24, the hose 25, the shower rose 26 to the water outlet 261, constructed as a shower base.

40 As it can be seen particularly from Fig.2, the interrupting valve 3 is constructed in duplicate behind each other in a housing 31, whereas the housing 31 is arranged in a box 4, in the bottom region of which a connection 41 is provided for a pipeline 43 to the waste water pipe 11 of the sink 1. On the
45 wall of the box 4, above the connection 41, an opening 42 is provided for venting and possible overflow of the water.

The housing 31 is fixed in the box 4 by the means of connecting spigots, in which connecting openings 36 and 37 are formed. The
50 connecting opening 36 is constructed vertically and serves for the connection of the outlet pipe 24 of the pivoting valve 2. Downstream, behind the connecting opening 36 there is a two-way valve provided as a component in a bore. In the two-way valve a valve-closing member 32 is provided in the form of a ball, which
55 can move between two valve seats 33, 34 arranged vertically above each other. In the valve seat 33 an inflow opening is provided for the mixed water produced in the pivoting valve 2, whereas the valve seat 34 has an opening to the atmosphere. In addition, outlet openings 38 are formed in the jacket surface

between the valve seats 33, 34. Subsequent to the upstream constructed interrupting valve 3 an identical interrupting valve 3 arranged, whereas in the valve housing 31 an angular channel is constructed, which connects the outlet opening 38 of the upstream provided valve with the inlet opening of the valve seat 33 of the subsequent valve. In each of the interrupting valve 3 a spring 35 is provided, with which the valve closing member 32 is pressed against the valve seat 33. At the same time the force of the spring 35 is dimensioned so, that at least when the pressure in the connecting opening 36 is equal to that of the atmospheric one, the valve closing member 32 is pressed into its closing position on the valve seat 33.

The venting device functions as follows: in case of the sink arrangement shown schematically in Fig.1, tempered water mixture is produced in the pivoting valve, which [the water] is introduced through the outlet pipe 24 of the connecting opening 36 into the valve housing 31 of both interrupting valves 3. At the same time both valve closing members 32 are pressed against the respective valve seat 34 by the water pressure overcoming the force of the spring 35, so that the opening to the atmosphere in the valve seat 34 is closed, and the water cannot flow into the box 4. Thus the mixed water flows through both outlet openings 38 in the connecting spigot 37, to which the hose 25 with the shower rose 26 is connected, whereas the mixed water exits at the water outlet 261 of the shower base into the open or in this case into the water-filled sink 10. When during this process in the supply lines 21, 22 a vacuum develops due to, for example, a burst pipe in the supply line, etc., then the pressure in the outlet pipe 24 also falls below that of the atmospheric, so that now the springs 35 press the respective valve closing members 32 immediately into their closing position on the valve seat 33 and by this a reverse suction from the hose 25 into the outlet pipe 24 is prevented. Simultaneously the opening to the atmosphere in the valve seat 33 is unblocked, so that now at least the essential portion of the water present in the valve housing 31 can enter into the box 4 through the openings 310 in the lower region of the valve housing 31, due to which the hose 25 will be connected with the atmosphere through the opening 42 in the box 4. Thus the hose 25 is securely separated from the pivoting valve 2. An undesirable reverse suction of contaminated water is prevented. When the pressure increases anew in the supply lines 21, 22 the valve closing members 32 are once again pressed against their respective valve seats 34 by the pressure of the fluid, so that the flow of the mixed water to the shower rose 26 is unblocked again. The water accumulated in the box 4 reaches the waste water pipe 11 through the connection 41 and line 43.

Because the pressure in the outlet pipe 24 drops to atmospheric when the flow of the water in the pivoting valve 2 is closed, the valve closing members 32 are pressed into their safety position, i.e. against the valve seat 33, so that the hose 25 is connected to the atmosphere through the valve seat 34. To prevent an emptying of the hose 25 after every use of the tap, in an appropriate manner a reverse-flow preventing device may be provided in the region of the shower rose 26. In many cases such a reverse-flow preventing device is provided in the shower rose during its manufacture.

In case of the above described venting device the interrupting valve 3 is duplicated, while the level of the outlet opening 38 of the upstream situated valve is situated above the valve seat 33 of the subsequently arranged valve. The duplex-design has
5 been chosen purely in view of ensuring a particularly high safety against reverse suction of contaminated water. Naturally, the venting device can function together with one interrupting valve 3 also.

- 10 The venting device integrated in the box 4 is secured on the outlet pipe 24 under the sink in the vicinity of the pivoting valve 4. Naturally, the venting device can be installed at other suitable positions, while it is absolutely irrelevant as to at
15 what height the venting device is relative to the water level in the sink 10.

In case of the wash basin or sink 1 shown in Fig.3 a rinsing basin 10 is provided, whereas on the table a pivoting valve 2 is fastened. The pivoting valve 2 is fed with cold and hot water
20 through the connecting lines 21, 22. With the aid of an adjustable actuating handle 23, having two degrees of freedom, tempered mixture of water can be produced in the pivoting valve 2. For example, by an adjustment in the first degree of freedom the mixing ratio and the temperature, respectively, of the mixed
25 water can be set, while in the second degree of freedom the total water throughput can be adjusted. The mixed water produced in the pivoting valve 2 is fed through the outlet pipe 24, the hose 25, the shower rose 26 to the water outlet 261, constructed as a shower base.

30 Between the outlet pipe 24 and the hose 25 an interrupting valve 3, having a duplex construction, is provided. Here in a valve housing 31 two valve closing members 32 are arranged behind each other. Each closing member 32 interacts with a valve seat 33 on
35 the water inlet opening 33 and with a valve seat 34 to the atmosphere. The valve closing member 32, constructed as a ball, is pressed against the valve seat 33 by a spring 35. At the same time the valve seat 34 is directly connected with the atmosphere through a respective opening 310. On the valve housing 31 a
40 connecting opening 36 is vertically constructed and horizontally downstream a further connecting opening 37 is provided for the connection of the hose 35. In the venting process the water can exit from the valve housing 31 through the openings 310.

45 The valve housing 31 is provided in a box 4, whereas the valve housing 31 is fixed in the box 4 with the spigots of the connecting openings 36,37. Below the valve housing 31 an opening 42 is provided in the wall of the box 4 for ventilation and a possible overflow of the waste water. In the region of the box 4
50 a connection 41 is formed.

In the connection 41, as this can be seen in Fig.4, in an approximately cylindrical stepped bore, a float valve 5 is inserted as a component. In a sleeve 54, in the upper region, a
55 sealing seat 53 is formed, below which a floating ball is allocated to it as closing member 51. To guide and to hold the closing member 51, an additional supporting cage 52 is provided. Thus the component of the float valve 5 combined in the sleeve 54 can, with the aid of a sealing ring 55 provided in

the external jacket of the sleeve 54, pressed into the stepped bore of the connection 41, so that is sealing on the outside. The connection 41 is, as this can be particularly seen from Fig.3, connected with the waste water pipe 11 through the line 43 with the waste water pipe 11 below the wash basin 10. The connection of the line 43 to the waste water pipe 11 takes place upstream before the odour lock 12, so that a problem-free introduction of the water from the box 4 can take place. In this case the float valve 5 will effectively prevent waste water entering into the box 4 through the line 43 when damming occurs before the odour lock 12 during the discharging of the used water, as in this case the closing member 51 would float upwards and would prevent the exit by interacting with the sealing seat 53. The closing member can be made as floatable hollow or solid ball or in another suitable shape.

THE CLAIMS DEFINING THE INVENTION ARE AS FOLLOWS:-

1. A water tap fitting, particularly for wash basins and/or sinks, with a housing which can be connected to the supply line and a water outlet constructed as a shower rose which can be pulled out, whereas to prevent a reverse suction of the waste water through the shower rose a venting device is provided between the housing and shower rose characterised in that in the line to the water outlet at least one interrupting valve is provided, the valve closing member of which is provided movably in a valve housing between two oppositely situated valve seats whereas one valve seat defines an opening to the atmosphere and the other valve seat defines an inflow opening of the outflowing water, while an outlet opening for the water outlet is provided in the valve housing between valve seats, whereas the valve closing member is biased against the valve seat defining the inflow opening in such a manner that it abuts against it when there is at least an atmospheric pressure in the outlet pipe.
2. Water tap fitting according to claim 1, characterised in that the interrupting valve is provided underneath the wash basin or the sink.
3. Water tap fitting according to claim 1 or 2, characterised in that two interrupting valves are provided behind each other.
4. Water tap fitting according to any one of the claims 1 to 3, characterised in that a ball or a disc each is provided as a valve closing member, said ball or disc being pressed against the valve seat by a spring.
5. Water tap fitting according to any one of the claims 1 to 4, characterised in that the interrupting valves are provided in the valve housing whereas the connecting opening for a water inlet is vertically and the connecting opening for the water outlet is horizontally constructed.
6. Water tap fitting according to any one of the claims



1 to 5, characterised in that the level of the outlet opening of the upstream provided interrupting valve is situated above the valve seat of the subsequently arranged interrupting valve.

- 5 7. Water tap fitting according to any one of the claims 1 to 6, characterised in that the valve housing is arranged in a box in the bottom region of which at least one connection is provided for a pipeline to take away the waste water and above the connection one or more
- 10 sufficiently large openings are provided for air entry and overflow of the water.

8. Water tap fitting according to any one of the claims 1 to 7, characterised in that the valve housing with the connecting opening for a water inlet is fastened on the
- 15 pivoting tap fixed on the wash basin or sink.

9. Water tap fitting according to claim 7 or 8, characterised in that the connection is connected to the waste water pipe through a pipeline.

10. Water tap fitting according to any one of the
- 20 previous claims, characterised in that the venting device for the removal of the water is connected with the waste water pipe through a line upstream before an odour lock whereas for the prevention of an overflow of backward flowing water from the waste water pipe a float valve is
- 25 provided in the line upstream of the odour lock.

11. Water tap fitting according to claim 10, characterised in that the float valve is provided in the connection of the box.

12. Water tap fitting according to claim 10 or 11,
- 30 characterised in that as float valve a supporting cage with a sealing seat is provided in the line whereas as closing member a floatable ball is provided and the sealing seat is situated above the ball.

13. Water tap fitting according to any one of the claims
- 35 10 to 12, characterised in that the float valve comprising



the closing member sealing seat supporting cage is provided as a component in a cylindrical sleeve accommodating a sealing ring in an external groove in such a manner that the unit can be pressed into a stepped bore of the connection sealed and is secured with the connection of the line in the inserted position.

14. A water tap fitting substantially as hereinbefore described with reference to the accompanying drawings.

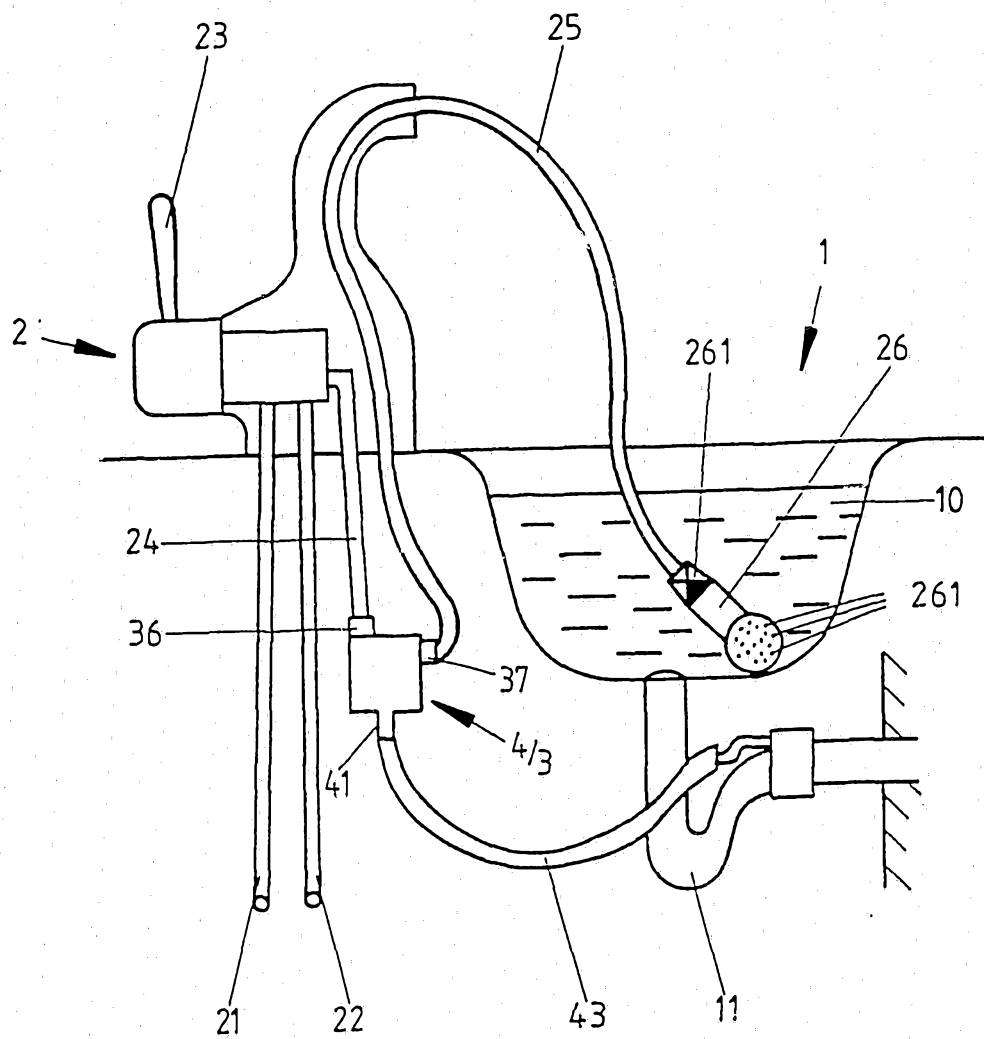
DATED this 25th day of September 1992

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Fig.1



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Fig. 2

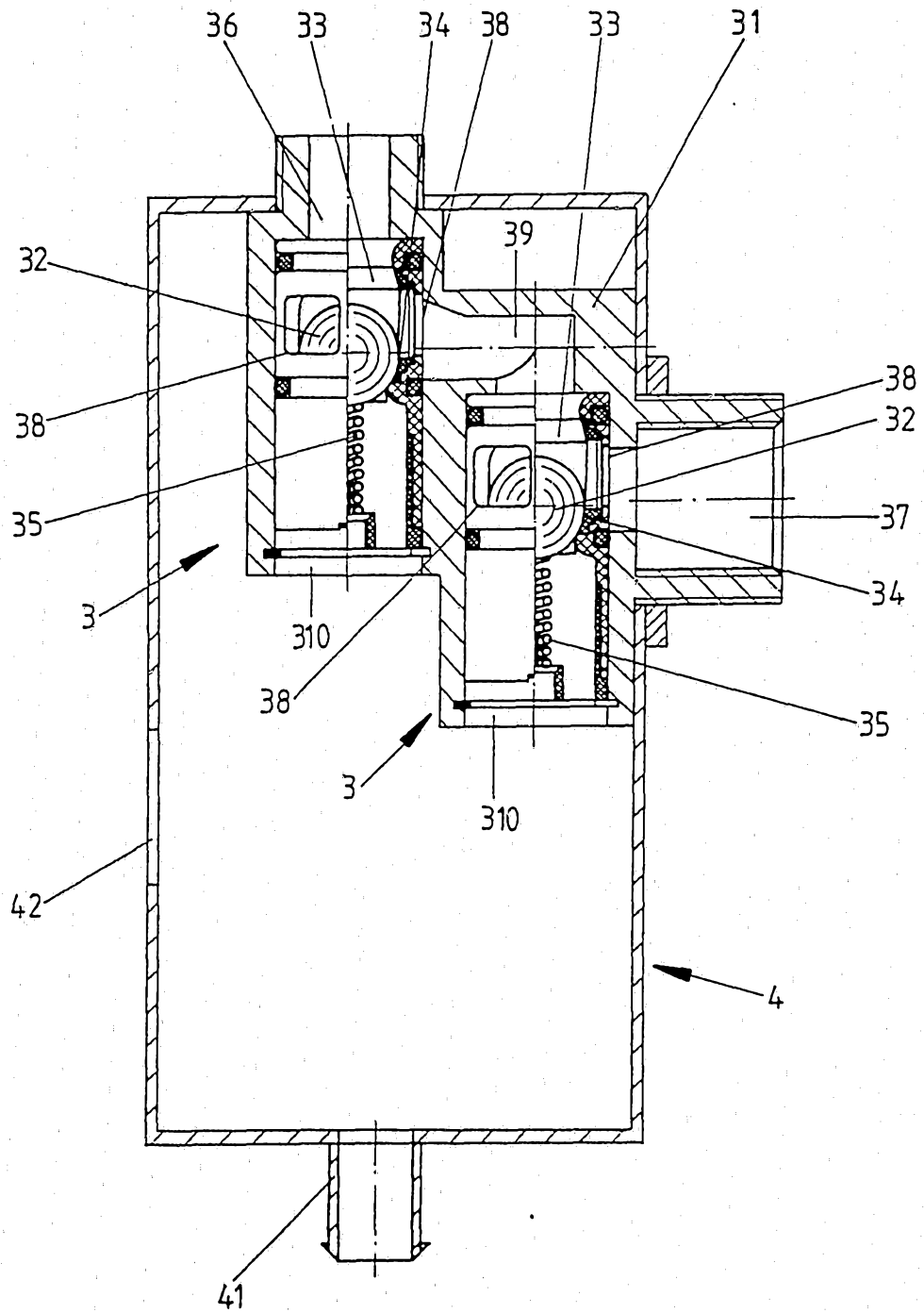


Fig.3

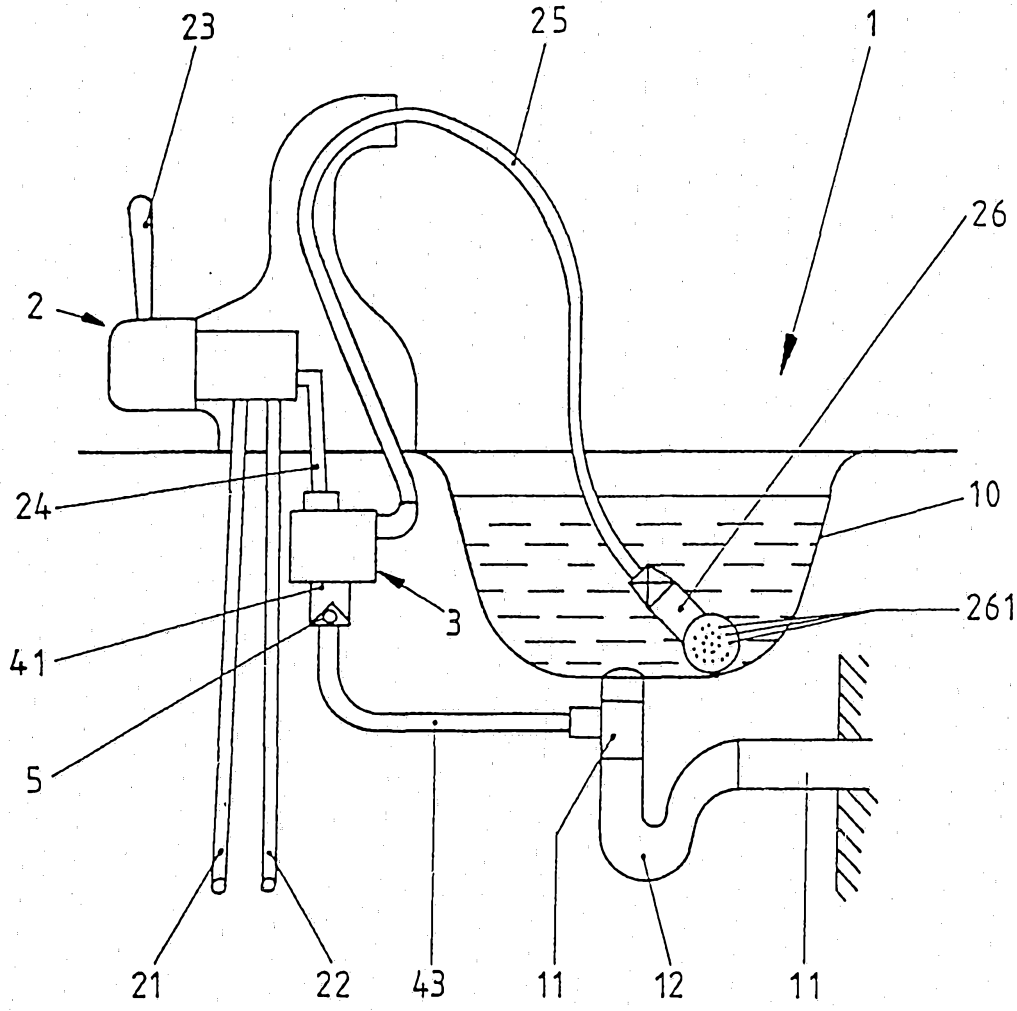


Fig. 4

