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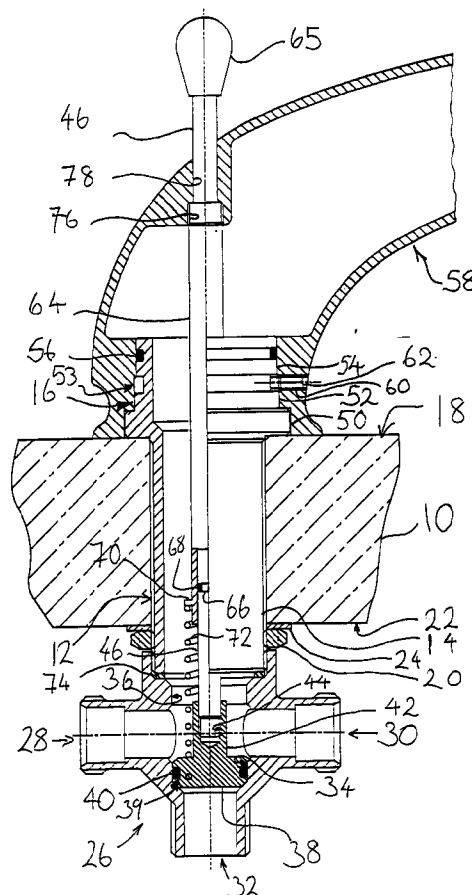
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(54) **Diverter taps**

(57) There is disclosed a diverter tap for mounting through an aperture (12) in which access to wearing parts can be gained from the same side of the aperture (12) as the user control (65). In the case of a bath tap, this avoids the need to access the space below the bath. In a preferred embodiment, a water delivery spout (58) is removably secured to a tap body (14) such that it can be removed along with a valve spool (38) and a control rod (46). Access to three O-ring seals (40,56,68) for inspection and replacement can then be readily achieved.



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Description

The present invention relates to diverter taps.

A diverter tap is used most typically in a bathroom to allow a user optionally to direct water to a tap outlet to fill a bath or, alternatively, to a shower outlet.

A common type of diverter tap comprises a spout mounted on a bath, a basin or a wall and having an outlet arranged to fill the bath or the basin, as the case may be. The spout is fixed to a body which passes through the material of the bath and which receives water from a diverter valve assembly secured to a lower part of the column. A control rod connected to operate the valve assembly passes upwardly through the column to emerge at an operating handle projecting from the spout.

As will be appreciated, virtually any type of water valve incorporates one or more components which wear with time and use until eventually the valve ceases to operate satisfactorily. With the above-described type of diverter tap, a significant disadvantage is that the valve assembly is mounted adjacent a lower surface of the bath at the bottom of the column, which in many installations, can mean that it is extremely difficult to replace the wearing components of the valve. This is an operation which in many circumstances will necessitate dismantling of decorative panels enclosing the bath.

It is an aim of the present invention to provide a diverter tap which is capable of ready maintenance.

According to a first aspect of the invention, there is provided a diverter tap adapted for mounting through a mounting aperture, the tap having a user diverter control to a first side of the aperture, operation of which acts on a valve assembly to selectively direct water flow from an inlet to one of a plurality of outlets, wherein maintenance access to wearing components of the valve assembly can be gained from the first side of the aperture.

For example, when the mounting aperture is formed in a bath, an arrangement of the present invention enables maintenance to be undertaken without the need to access the valve from the underside of the bath, so reducing the difficulty of such maintenance.

In a typical embodiment, the valve assembly has a first outlet through which water is conveyed to a spout, for example adapted to be mounted on the upper surface of a bath through which water is deposited into the bath. Typically, the valve assembly will have a second outlet through which water is conveyed to a shower or to some other destination. Such second outlet may be on a second side of the apertures, for example on the underside of a bath.

The valve may have a single inlet through which water is received. Alternatively, it may have two inlets, one for hot water and the other for cold water, mixture of hot and cold water taking place after entry to the valve assembly.

In one embodiment, the valve assembly comprises

a valve body having first and second outlet ports connected, respectively, to first and second outlets of the valve assembly, and a sealing means movable to selectably close one or other outlet port. In such embodiments, the sealing means typically carries sealing element such as an O-ring, which, in the present invention, may be removed from the first side of the aperture for replacement when worn. In a particularly preferred embodiment, the sealing means comprises a plunger on which is carried a sealing element constituted by an O-ring seal. In the case of a diverter tap mounted on a bath, this allows replacement of the O-ring seals to be carried out without the need to gain access to the underneath of the bath.

In a second of its aspects, the invention provides a diverter tap adapted for mounting through a mounting aperture comprising:

a body on which is carried a water delivery spout on a first side of the aperture and a valve assembly on a second side of the aperture;

the valve assembly having a water inlet and a second water outlet, and a valve spool movable, under the control of a user, to divert water flow from the water inlet selectively to one of the spout or the second water outlet;

the spout being removable from the body in order to gain access from the first side of the aperture for maintenance to wearing components in the valve assembly.

The invention also provides a bathroom installation comprising a bath having a mounting aperture therein through which a diverter tap according to claim 18 is mounted, the spout disposed for delivery of water into the bath, and the second water outlet being connected to a shower.

An embodiment of the present invention will now be described in detail, by way of example, with reference to the sole accompanying drawing in which is shown a part-sectional view of a mixer tap embodying the present invention.

The mixer tap is mounted on a substantially horizontal part 18 of a bath 10, at which a circular mounting aperture 12 extends through the material of the bath 10. A first side of the aperture 12 opens to an upper surface 18 of the bath 10. A second side of the aperture 12 opens below the bath 10, this being often concealed from view, for example, by side decoration panels.

The tap comprises a hollow cylindrical body 14 which extends through the aperture 12. A head portion 16 of the body 14 is of diameter larger than that of the aperture 12, and rests upon an upward surface 18 of the bath 10. A lower portion of the body 14 is externally threaded, and has applied to it a nut 20 which bears against a lower surface 22 of the bath 10 through an intermediate washer 24 to secure the body 14 in place and to pull the head portion 16 into firm contact with the

bath 10.

A valve body 26 is threadingly secured and sealed against leakage by a washer 74 to a lower portion of the body 14. The valve body 26 comprises first and second water inlets 28,30 for receiving respectively, hot and cold water under the control of, respective, hot and cold water valves (not shown). The valve body 26 further comprises a first water outlet 32 to which a connection (not shown) may be made to carry water to a remote device, such as a shower. A second water outlet is constituted by a flow connection between the valve body 26 and the interior of the body 14.

The valve body comprises first and second outlet ports 32,36 constituted by cylindrical aligned, spaced flow passages through which water entering by the flow inlets 28,30 must flow in order to reach, respectively, the first and second water outlets. Within the valve assembly 26 there is disposed a valve spool 38. The spool 38 has a cylindrical head of diameter just less than that of the ports 34,36. A radial groove 39 is formed in the head to retain an O-ring seal 40.

The spool 38 has a shank 42 within which is formed an internally threaded, cylindrical bore 44 coaxial with the head. A control rod 46 is screwed into and projects from the shank 42 to extend through the body 14 co-axially with the outlet ports 34,36.

The head portion 16 has an outer surface which is cylindrical in section, and has three regions between which there is a step change in diameter.

The first region 50 is the largest, and abuts the bath 10. Adjacent that, the second region 52 has a radial groove 53 formed therein. Adjacent that, the third region 54 also has a radial groove, in which is located an O-ring seal 56.

A water delivery spout 58 is mounted on the head portion 16. The spout 58 has an inlet port also of stepped diameter which mounts as a close but sliding fit on the head. The O-ring seal 56 provides a water-tight seal between the head portion 16 and the spout 58.

A tapped bore 60 extends through the spout 58 in the region of the inlet port. Within that bore 60, there is retained a grub screw 62. The bore 60 and grub screw 62 are located and sized such that the grub screw 62 is in alignment with the groove 53 in the second region 52 of the head portion 16 when the spout 58 is properly mounted thereon. Thus, the grub screw 62 can be advanced into the groove 53 to resist removal of the spout 58 from the head 4 and, optionally, to resist rotational movement of the spout 58. However, when it is required to remove the spout 58, e.g. for maintenance purposes, this can readily be achieved by withdrawing the grub screw 60 from the groove 53.

The spout 58 comprises a long cylindrical bearing tube 64 which projects into the body 14 and is retained and sealed in a tapped hole 76 in the spout 58. A control rod 46 extends through the bearing tube 64 to project freely upwardly therefrom through a hole 78 in the spout 58 and to be terminated with an operating knob 65.

Within the bearing tube 64, the control rod 46 has a radial groove 66 in which there is an O-ring seal 68 to provide a water-tight seal and thus prevent leakage of water from the body 14 through the tube 64.

As shown in the drawing, water entering either inlet port 28,30 is prevented from reaching the first water outlet 32 by the valve spool 38, the head of which is located in and seals the first outlet port 34. Water can move upwardly, through the body 14, to enter the spout 58. Should, however, the knob 65 be pulled upwardly, the valve spool 38 will follow. The head will then locate and seal the second outlet port 36, such that water no longer flows to the spout 58 but instead flows downwardly to the first outlet 32.

Over time, it is likely that the three O-ring seals 40,56,68 will become worn, and their sealing effectiveness will be reduced. When this happens, the grub screw 60 is withdrawn from its groove 53, and the spout 58 is then withdrawn from the head portion 16. Clearly, the O-ring seal 56 on the head portion 16 can then be readily replaced. Additionally, the valve spool 38 and the control rod 46 will be withdrawn, still connected to the spout 58. Thus, ready access can be gained to the O-ring seal 40 on the valve spool 38 without further complication. If the O-ring seal 68 on the control rod 46 is worn, access to it can be gained by removing the spool 38 from the control rod 46, whereupon the control rod 46 may be withdrawn from the tube 64.

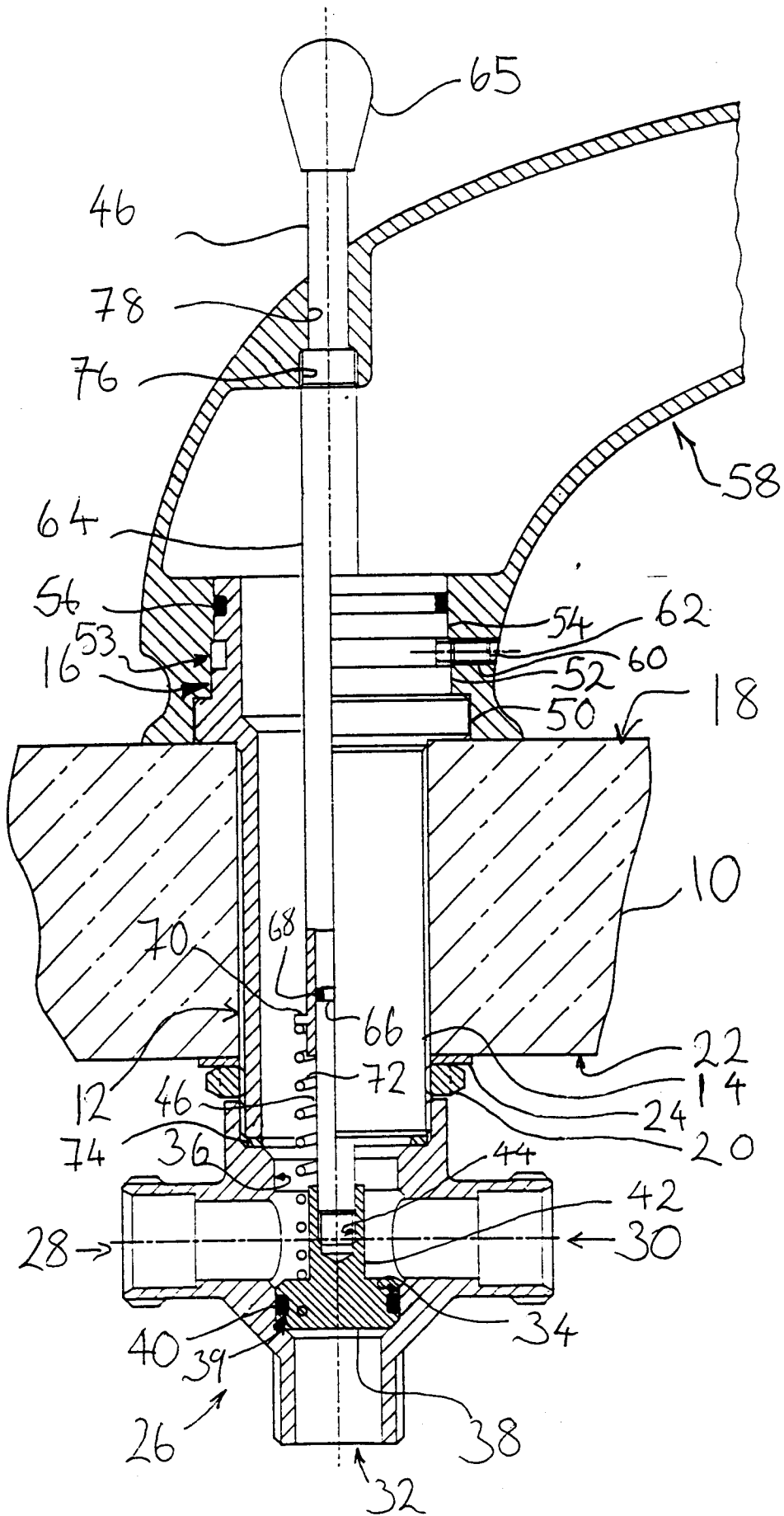
The valve spool 38 is maintained in its upper position, sealing the second outlet port 36, by pressure of water flowing into the valve. Once this pressure is removed, the valve spool 38 returns to its lower position. In some cases, this can be achieved simply by action of the weight of the valve spool 38 alone. However, there may be cases where this is not possible or undesirable.

As shown in the Figure, an outwardly extending annular flange 70 may be provided on the tube 64, and a helical compression spring 72 may be disposed to act between the flange 70 and the head of the spool 38. Thus, the spool 38 is forcibly urged into its lower position when the water supply is stopped, leaving the diverter tap to provide flow to the spout 58.

Claims

1. A diverter tap adapted for mounting through a mounting aperture, the tap having a user diverter control to a first side of the aperture, operation of which acts on a valve assembly disposed to a second side of the material of the aperture to selectively direct water flow from an inlet to one of a plurality of outlets, wherein maintenance access to wearing components of the valve assembly can be gained from the first side of the aperture.
2. A diverter tap according to claim 1 in which the valve assembly has a first outlet through which water is conveyed to a spout.

3. A diverter tap according to claim 2 in which the spout is adapted to be mounted on the upper surface of a bath to deposit water into the bath.
4. A diverter tap according to any preceding claim in which the valve assembly has a second outlet through which water is conveyed to a shower or to some other destination. 5
5. A diverter tap according to claim 4 in which the second outlet is disposed on the underside of a bath. 10
6. A diverter tap according to any preceding claim in which the valve assembly has a single inlet through which water is received. 15
7. A diverter tap according to any one of claims 1 to 4 in which the valve assembly has two inlets, one for hot water and the other for cold water, mixture of hot and cold water taking place after entry to the valve assembly. 20
8. A diverter tap according to any preceding claim in which the valve assembly comprises a valve body having first and second outlet ports connected, respectively, to first and second outlets of the valve assembly, and a sealing means movable to selectively close one or other outlet port. 25
9. A diverter tap according to claim 8 in which the sealing means carries a sealing element which can be removed from the first side of the aperture for replacement when worn. 30
10. A diverter tap according to claim 9 in which the sealing means is an O-ring. 35
11. A diverter tap according to claim 8 in which the sealing means comprises a plunger on which is carried a sealing element constituted by an O-ring seal. 40
12. A diverter tap according to claim 11 in which the plunger is connected to the user control by a control rod. 45
13. A diverter tap according to claim 12 in which the control rod is carried slidingly within a tube, sealing means being provided to prevent water flow within the tube. 50
14. A diverter tap adapted for mounting through a mounting aperture comprising:
 - a body on which is carried a water delivery spout on a first side of the aperture and a valve assembly on a second side of the aperture; 55
 - the valve assembly having a water inlet and a second water outlet, and a valve spool movable, under the control of a user, to divert water flow from the water inlet selectively to one of the spout or the second water outlet;
 - the spout being removable from the body in order to gain access from the first side of the aperture for maintenance to wearing components in the valve assembly.
15. A diverter tap according to claim 14 in which the valve spool is connected to a control rod, the rod extending therefrom such that a free end portion projects from the spout for manipulation by a user for control of the valve spool.
16. A diverter tap according to claim 15 in which the control rod is guided for sliding movement in a tube sealingly secured to the spout, sealing means being provided between the rod and the tube.
17. A diverter tap according to claim 16 in which the spout, the tube, the control rod and the valve spool are removable from the body as a unit to provide maintenance access to wearing components associated therewith.
18. A diverter tap substantially as herein described with reference to the accompanying drawing.
19. A bathroom installation comprising a bath having a mounting aperture therein through which a diverter tap according to claim 18 is mounted, the spout disposed for delivery of water into the bath, and the second water outlet being connected to a shower.





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EUROPEAN SEARCH REPORT

Application Number
EP 96 30 8001

DOCUMENTS CONSIDERED TO BE RELEVANT			
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (Int.Cl.6)
X	FR 2 665 200 A (PORCHER)	1-4,6-19	E03C1/04
Y	* the whole document * ---	5	
Y	DE 14 84 897 A (FÖRSTER)	5	
	* the whole document * ---		
A	EP 0 503 585 A (HANSA METALLWERKE)	1-19	
	* the whole document * ---		
A	US 4 989 640 A (STEFFES)	1-19	
	* the whole document * -----		
			TECHNICAL FIELDS SEARCHED (Int.Cl.6)
			E03C F16K
The present search report has been drawn up for all claims			
Place of search		Date of completion of the search	Examiner
THE HAGUE		20 March 1997	Van Beurden, J
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