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Invention entitled (54) MIXER TAP FOR USE WITH SHOWER ATTACHMENT

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The following statement is a full description of this invention, including the best method of performing it known to the inventors: X702-69-1D-13PC
This invention relates to mixer taps for use with shower attachments.

Mixer taps for use with shower attachments comprise separate hot and cold water inlets having independent valve operating mechanisms, an outlet for water to flow to a bath or washbasin, another outlet for connection to a shower attachment, and flow directing means within the tap to direct the water through one outlet or the other at the choice of the user. In use of the tap, water of the required temperature may be released through the tap into the bath or basin, or alternatively may be diverted within the tap to the shower attachment.

It is convenient to provide a control mechanism externally of the tap whereby the user is able to stop the water issuing into the bath or basin and to divert the flow of water to the shower attachment.

Hitherto the actuation of the internal flow directing means by the external control means has necessitated a special aperture in the tap to allow for connection of the control means to the flow directing means and provision of this special aperture requires sealing means to prevent leakage of water therethrough.

An object of the present invention is to obviate the need for such a special aperture and associated sealing means.

According to the present invention, a mixer tap for use with a shower attachment comprises separate
hot and cold water inlets and respective inlet valve operating mechanisms, a mixing chamber, water passageways providing communication between the inlets and the mixing chamber, a first outlet for water from the mixing chamber for water to flow to a bath or basin, a second outlet for water from the mixing chamber for water to flow to a shower attachment, a flow directing means within the tap, the mixing chamber to either the first or second for diverting the flow of water from one outlet to the other and having control means connected to the flow directing means, the control means passing through said first outlet and being mounted on the exterior of the tap.

Conveniently the tap comprises an outlet spout for the bath or basin, the spout having an outlet adjacent its free end, a passageway providing communication between the mixing chamber and the outlet, and the control means mounted on the exterior of the spout.

Preferably, the control means comprises a lever slidably mounted upon a guide beneath the spout.

Preferably also, the control means comprises a rigid control rod which connects the lever to the flow directing means. However, if the flow directing means is continuously urged in one direction automatically to open one of the outlets and to close the other upon the supply of water being switched off, then as an alternative to the rod, the connection member may be in the form of a flexible member, for example,
a cord or chain whereby the flow directing means is positively moved manually in one direction only.

In modern designs of mixer tap, when the tap is mounted on a bath or basin, the outlet spout extends horizontally or is inclined upwardly as it projects from the body of the tap. Consequently, water tends to run back from the outlet in the spout and along the under surface of the spout to the top of the bath or basin. In tap constructions of the present invention wherein the control means is mounted on the under surface of the spout, it is desirable, therefore, to shape a part of the control means adjacent the outlet to have a downwardly directed projection from which water may drip into the bath or basin.

One embodiment of the invention will now be described by way of example, with reference to the accompanying drawings, in which:

Figure 1 is a cross-sectional view through a mixer tap along a longitudinal centre-line of the outlet spout of the tap, and

Figure 2 is a sectional view along line II-II of Figure 1.

A mixer tap as shown in the drawings comprises a body which extends between two valve operating mechanisms associated with tail-pipes which are the inlets for hot and cold water to the tap. A knob of one of these valve operating mechanisms and its associated tail-pipe are shown. Water passageways, one of which is shown, connect the tailpipes with
a mixing chamber 5 for the hot and cold water supplies at a position midway between the tailpipes. An outlet spout 6 extends from a front of the tap body 1 and terminates in a first outlet 7 for water passing along a passageway 8 in the spout from the mixing chamber to a bath or basin. Another or second outlet 9 for water is provided in a top surface of the tap on the longitudinal centre-line of the spout and towards the rear 10 of the tap. Received within the outlet 9 is a connection 11 for connecting this outlet to a shower attachment (not shown). Adjacent the outlet 7, the undersurface of the spout 6 at the rear of the outlet has a groove 6a to prevent water running along the outside of the spout.

The body of the tap between the two tailpipes is of channel shape and is provided with a closure plate 12 which extends across the open sides of the channel to define with the remainder of the body the passageways 4 from the tailpipes 3 to the mixing chamber 5. In this case, the body of the tap is constructed in a manner described in the complete specification of our British patent 1 216 121.

The tap also incorporates a flow directing means 13 which is manually operable to direct the flow of water alternatively through either one of the two outlets 7 and 9. The means 13 are more particularly described in the complete specification of our copending patent application 28467/71. Briefly the means 13 comprises an annular plunger 14 having O-ring seals 15 and 16, the plunger being disposed within
the mixing chamber 5 for axial movement longitudinally in relation to the spout 6 by virtue of a cylindrical projection 17 of the plunger being slidably received within a sleeve 18 of a carrying element 19. This element 19 is attached to the body 1 by a screw 26 in the rear of the tap. The seal 15 is co-operable with a frusto-conical seating surface 24 formed at the junction of the tap body 1 and the outlet spout 6. The seal 16 is co-operable with a frusto-conical seating surface 23 provided on the carrying element 19.

Axial movement of the plunger 14 is controlled manually by a control means denoted generally by numeral 27. This control means 27 comprises a rigid control rod 20 extending axially along the passageway 8 and slidably mounted within a guide 25 formed integrally with two opposed radial arms (not shown) connected to the sides of the passageway 8. A compression spring 28 is provided between the radial arms and the plunger 14 to urge the plunger to the right to the position in Figure 1 when the water supply is cut off. In this position, the seal 16 seats against surface 23 and water will then flow along passageway 8. One end portion of the rod 20 extends into the body 1 and is secured in the plunger 14 by means of a bifurcated pin 14a. The other end portion 29 of the rod 20 is bent downwardly to project into the outlet 7. The end portion 29 is slidably received in a hole 30 formed in the end of a limb 31 of a lever 21. A second limb 32 of the lever 21 has in its inner surface a T-shaped
slot 33 (Figure 2). A stop 34 projects from the base of the slot 33 to provide a transverse channel 35 at the forward end thereof, and spaced from the inner surface of the limb 31. The slot 33 forms a slideway for a guide 22 of complementary T-shaped cross-section, the guide being secured to the underside of the spout 6 by two countersunk screws 36. It will be seen from Figure 1 that the screws 36 are engaged in lugs 37 on the spout and that the lever 21 has appropriately spaced holes 38 to provide access to the screws 36. The outer surface of the lever 21 at the junction of its limbs 31, 32 is shaped to form a nose portion 39 from which water can drip instead of running back along the limb 32 of the lever.

In use of the mixer tap, with the parts assembled as shown in Figure 1, and connected in a domestic water supply circuit having a shower attachment, the compression spring 28 normally maintains the plunger 14 in the position shown in the drawing. In this position the plunger seals off the outlet 9 to the shower attachment and, upon opening one or both of the inlet valve mechanisms, allows water to flow from the mixing chamber 5 through the outlet 7 to a bath or basin.

When it is required to operate the shower attachment, the user slides the lever 21 forwardly, i.e. to the left in Figure 1, along the guide 22 thereby moving the rod 20 and the plunger 14 against the action of spring 28, and separating the seal 16 from its seating 23 until the seal 15 seals against
the seating surface 24. Water from the mixing chamber 5 is then prevented from flowing through the outlet 7 but is diverted through the outlet 9 to the shower attachment. The pressure of the water acting over the rear face of the plunger 14 overcomes the resistance of the spring 28 and maintains the seal 15 against surface 24.

On turning off the water supply at the inlet valve operating mechanisms, the pressure of the water on the plunger 14 is reduced and the spring 28 returns the plunger, and thus the rod 20 and lever 21 to the positions shown in Figure 1.

By virtue of the connection between the flow directing means 13 and the control means 27 taking place through the outlet 7, the need for additional apertures and sealing means is obviated.

In one modification, the spring 28 may be omitted and the user then moves the lever both forwardly and rearwardly as required to divert the flow of water.

In another modification, the spring 28 is retained but the rigid rod 20 is replaced by a flexible link chain since the chain merely has to transmit a tensile force to move the plunger 14 against the action of the spring.
The claims defining the invention are as follows:—

1. A mixer tap for use with a shower attachment comprising separate hot and cold water inlets and respective inlet valve operating mechanisms, a mixing chamber, water passageways providing communication between the inlets and the mixing chamber, a first outlet for water from the mixing chamber for water to flow to a bath or basin, a second outlet for water from the mixing chamber for water to flow to a shower attachment, a flow directing means within the tap for diverting the flow of water from one outlet to the other and having control means connected to the flow directing means, the control means passing through said first outlet and being mounted on the exterior of the tap.

2. A mixer tap according to claim 1 and comprising an outlet spout for the bath or basin, the spout having an outlet adjacent its free end, a passageway providing communication between the mixing chamber and the outlet, and the control means mounted on the exterior of the spout.

3. A mixer tap according to claim 2 wherein the control means comprises a lever slidably mounted upon a guide beneath the spout.

4. A mixer tap according to claim 3 wherein the control means comprises a rigid control rod which connects the lever to the flow directing means.

5. A mixer tap according to claim 4 wherein resilient means are provided to urge the flow directing means continuously in one direction. 

5. A mixer tap according to claim 4 wherein—
6. A mixer tap according to any one of claims 1 to 3 wherein resilient means are provided to urge the flow directing means continuously in one direction, and the control means comprises a flexible member which connects the lever to the flow directing means to transmit a tensile force to move the flow directing means against the action of the resilient means.

7. A mixer tap according to any one of claims 2 to 6 and wherein the control means is mounted on the undersurface of the spout, a part of the control means adjacent the outlet having a downwardly directed projection from which water may drip into the bath or basin.

8. A mixer tap for use with a shower attachment constructed and arranged substantially as described herein with reference to and as shown in Figures 1 and 2 of the accompanying drawing.

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