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(71) Applicant(s): Triton plc (Incorporated in the United Kingdom) Shepperton Park, Caldwell Road, NUNEATON, Warwickshire, CV11 4NR, United Kingdom		(56) Documents Cited: EP 0866180 A2 JP 080184082 A SU 001470882 A1	DE 029504481 U1 JP 2001090871 A
(72) Inventor(s): Philip Andrew Finney		(58) Field of Search: UK CL (Edition X) F2G INT CL E03C, F16L Other: Online: WPI, EPDOC	
(74) Agent and/or Address for Service: Forrester Ketley & Co Chamberlain House, Paradise Place, BIRMINGHAM, B3 3HP, United Kingdom			

(54) Abstract Title: **Elbow connector with hidden fixings**

(57) An elbow connector is intended to attach exposed (surface mounted) supply pipes to a bar mixer shower. The connector body has a recess which receives a mounting element. The body may be fastened to the mounting element by a grub screw, and the mounting element may be a disc with a F-shaped recess around its circumference to receive the grub screw, and allow rotational adjustment of the elbow relative to the mounting element. The body may have an indentation such that the grub screw is substantially concealed from view when assembled.

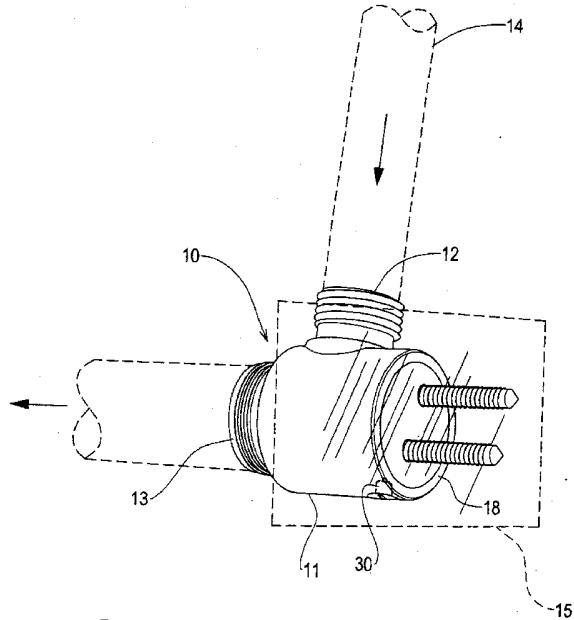


FIG. 3

At least one drawing originally filed was informal and the print reproduced here is taken from a later filed formal copy.

This print takes account of replacement documents submitted after the date of filing to enable the application to comply with the formal requirements of the Patents Rules 1995

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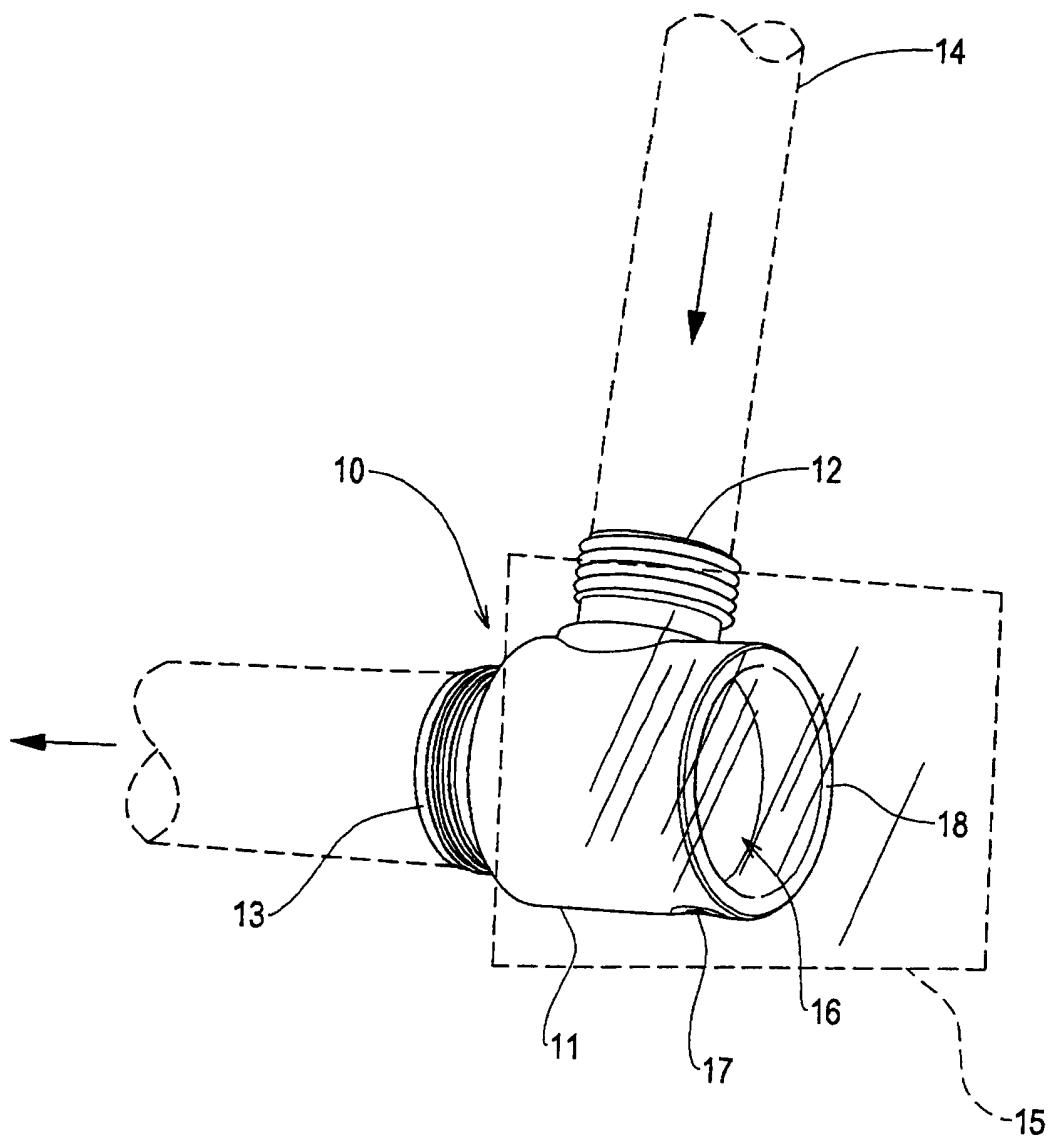
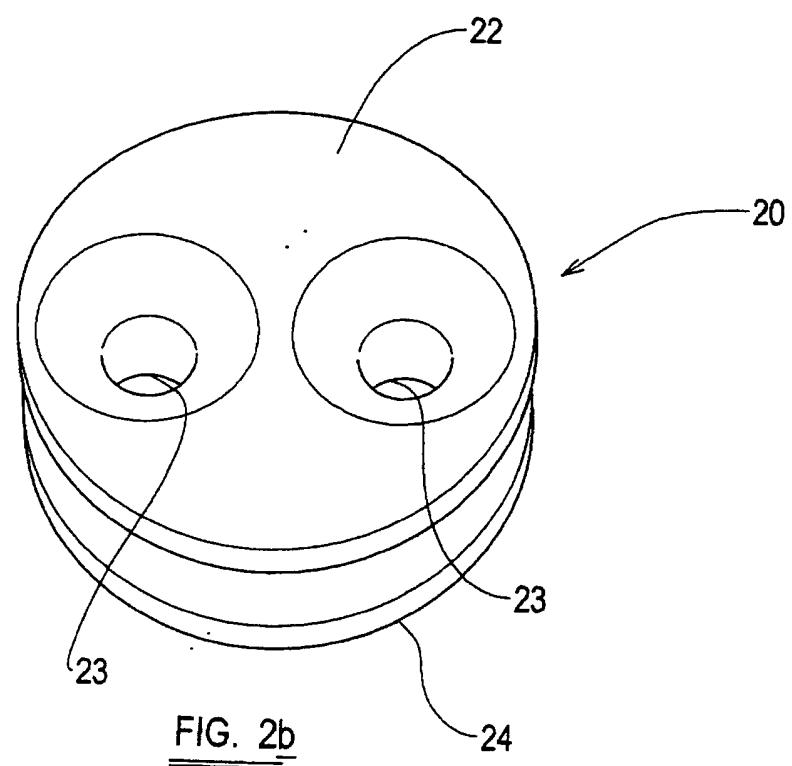
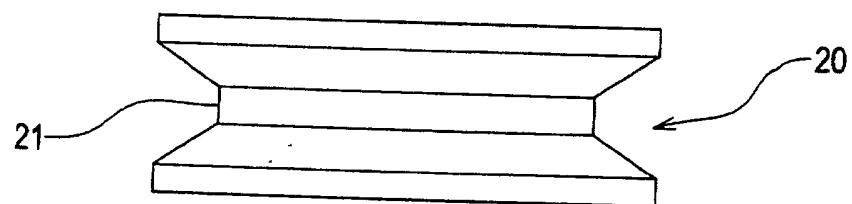


FIG. 1



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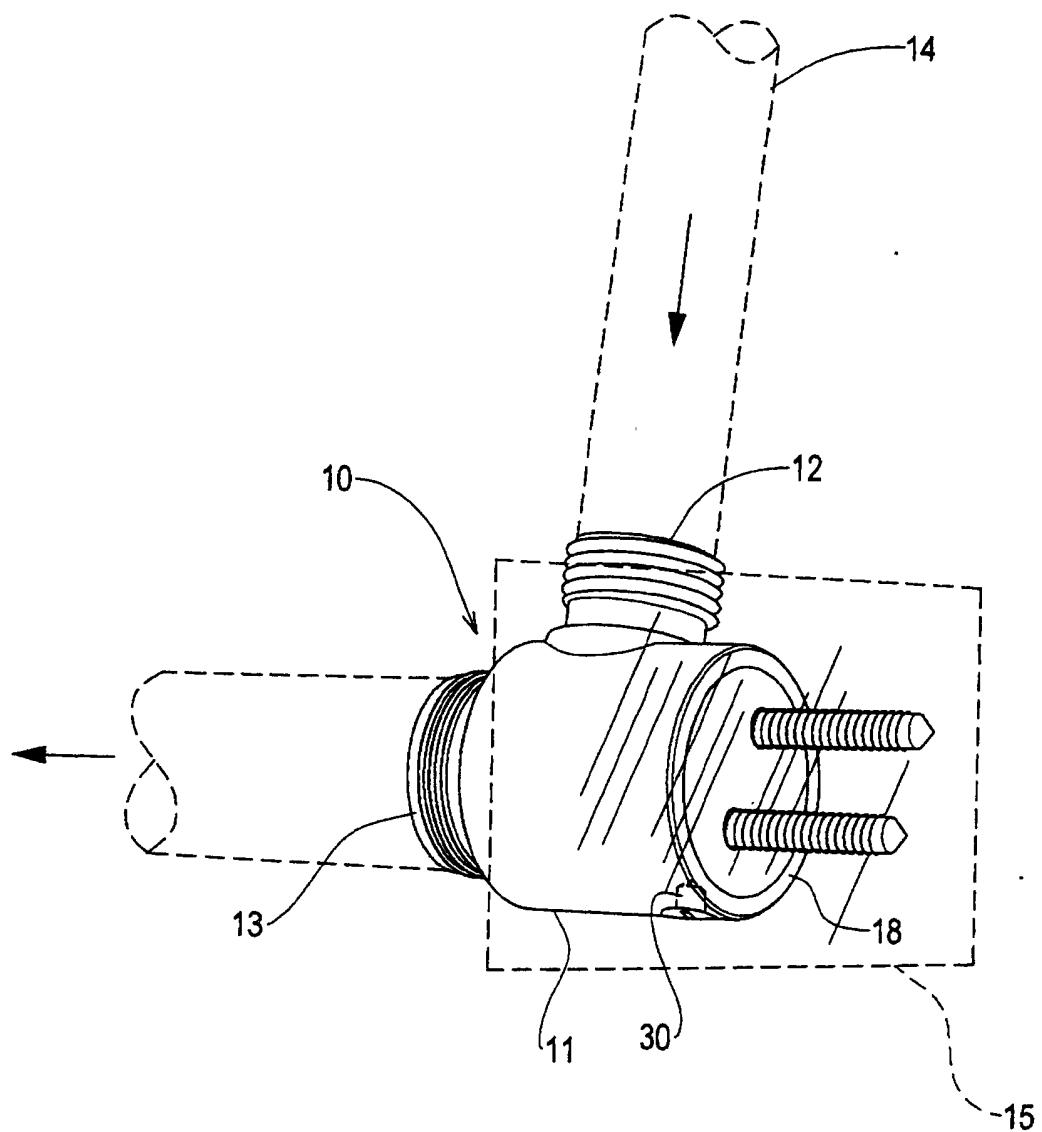
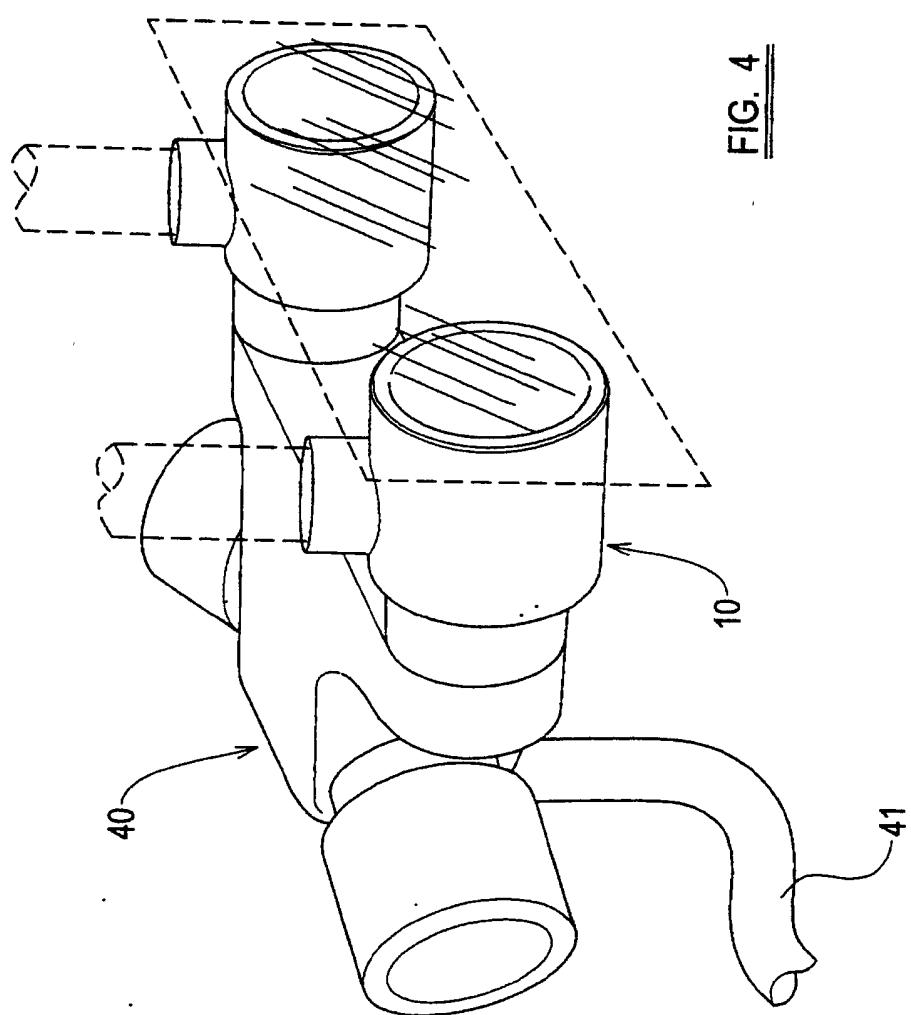


FIG. 3

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FIG. 4



Title: A Connector for a Fluid Flow Control Device

Field of the Invention

5 This invention relates, in broad terms, to the field of fluid flow control devices such as shower valves, temperature regulators and the like and relates in particular, although by no means exclusively, to connectors which enable such devices to be connected to fluid supplies in a bathroom or shower environment.

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Background to the Invention and Overview of the Prior Art

In recent years, shower design has evolved in many areas, both technical and aesthetic, with advances having been made in mixer, pumped and general

15 electric shower technologies. Whilst not being limited to this particular domain, the present invention is concerned largely with the area of mixer showers, in which separate hot and cold water supplies are mixed in a valve arrangement prior to being dispatched to a shower head, for example. A variety of mixer shower arrangements are of course known, with a recent
20 trend having been towards the use of "bar mixers" which comprise a generally unitary bar-shaped mixing device to which the hot and cold water supplies are fed.

When installing showers having bar mixers of this type, a common approach

25 has been to conceal the hot and cold water supply pipes behind a stud partition or wall, with connectors being used to provide both a mounting platform for the bar mixer and a fluid flow passage from the water supply pipes to the mixer assembly. Depending upon the orientation of the supply pipes, straight inlet connectors or elbow (i.e. L-shaped) connectors can be used, with
30 the outlet parts of these connectors having a suitably-configured (e.g.

threaded) configuration for engagement with a corresponding part of an inlet to the mixer valve assembly.

Concealing the supply pipes in this way, whilst giving rise to an aesthetically-pleasing and "clean" finish, does however increase the time taken to complete the installation process and can give rise to repair/maintenance issues in the event of a supply pipe leakage, for example. In addition, modern designs of domestic showers, in particular, have started to use the supply pipes as a design feature, with it thus being required to leave the pipes exposed - i.e.

5 10 proud (in front) of the bathroom/shower cabinet wall.

This invention, in broad terms, is concerned with connectors which are suitable for use with such exposed arrangements.

15 Summary of the Invention

In accordance with a first aspect of the present invention, there is provided a connector for a fluid flow control device, the connector having a body in which is disposed a passage for the supply of fluid to the control device and a recess

20 for the location of a mounting element with which the connector may be mounted to a support surface.

The mounting element may be securable to the body by way of a fastening element which passes through a wall of the body.

25 The mounting element may have a recess in its periphery which, in use, receives part of the fastening element.

30 Preferably, the recess is a channel which extends around the periphery of the mounting element.

The mounting element may be generally disc-shaped, with the recess desirably being provided by a channel which extends around the circumference of the disc.

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The channel may be generally V-shaped.

The connector recess may have a depth equal to or greater than that of the mounting element such that, in use, the connector may be flush-mounted to the support surface.

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The connector recess may be generally circular such that the connector may rotate relative to the mounting element.

15 The fastening element may be a threaded fastener, conveniently a grub screw or the like.

The wall of the body may have an indentation therein to receive a head of the fastening element such that, when the mounting element is secured to the body, the fastening element is substantially concealed from view.

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In a preferred embodiment, the fluid flow control device with which the connector is used, is a shower valve.

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The fluid flow control device may conveniently be a bar mixer for a shower.

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In accordance with a second aspect of the present invention, there is provided an elbow connector for a shower control valve comprising a body in which is disposed a passage for the supply of fluid to the control valve and a recess for the location of a mounting element with which the connector may be mounted to a support surface.

The elbow connector may comprise one or more of the features set out in the preceding paragraphs.

5 In accordance with a third aspect of the present invention, there is provided a shower mixer set comprising a bar mixer and at least one elbow connector having a body in which is disposed a passage for the supply of fluid to the bar mixer and a recess for the location of a mounting element with which the connector may be mounted to a support surface.

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The shower mixer set preferably comprises an elbow connector in accordance with the second aspect of the present invention.

15 In accordance with a fourth aspect of the present invention, there is provided a method of installing an elbow connector for a shower valve comprising attaching a mounting element to a support surface such as a bathroom or shower cabinet wall, offering to the mounting element a connector having a body in which is disposed a passage for the supply of fluid to the shower valve and a recess for the location of a mounting element with which the connector

20 may be mounted to the support surface, locating the mounting element within the connector recess and passing a fastening element through a wall of the body into a channel or groove disposed around the periphery of the mounting element.

25 Brief Description of the Drawings

Specific and non-limiting embodiments of the present invention, in its various aspects, will now be described, strictly by way of example only, by reference to the accompanying drawings, of which:

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FIGURE 1 is a schematic view of a bar valve connector assembly, abutting a support surface such as a bathroom wall, without a mounting element in position;

5 FIGURE 2a is a side (edge-on) view of a mounting element suitable for use with the connector body of Figure 1;

FIGURE 2b is a perspective view of the mounting element shown in Figure 2A;

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FIGURE 3 shows a similar view to that of Figure 1, but with the mounting element located in position and attached to the support surface; and

FIGURE 4 shows two bar valve connectors attached to a bathroom wall, with

15 hot and cold supply pipes and the bar mixer valve assembly also being shown.

Detailed Description of the Preferred Embodiments and Best Mode of the Invention

20 Referring to the drawings, Figure 1 shows an elbow connector 10 having a body 11, a water inlet 12 and a water outlet 13. The inlet/outlet 12 and 13 are provided with an external (male) threaded configuration to facilitate their engagement with, respectively, a water supply pipe (shown schematically in dotted outline at 14) and an inlet configuration of a bar mixer arrangement, 25 shown in Figure 4.

The body, which may be cast or stamped from a non-corroding metallic material such as brass or stainless steel, is generally cylindrical, with there being provided an internal passage, between the inlet and outlet 12/13, for the 30 supply of water from the pipe 14 to the mixer valve arrangement.

Also illustrated, schematically, in Figure 1 is a support surface such as a bathroom wall 15, which, in use, the body 11 abuts in a flush-mounted condition, as explained hereafter. The part of the body which, in use, abuts 5 the wall 15 (hereinafter known as the "rear" of the body) is provided with a relatively shallow circular recess 16 and a threaded aperture 17 in the circular wall 18 which is thus defined. The outer end of the threaded aperture 17 is countersunk, so that the head of an appropriately-configured fastener may be substantially concealed from view when engaged, as described in more detail 10 below.

In order to attach the connector 10 to the support surface/bathroom wall 15, a mounting element 20 (see Figures 2a and 2b) is employed. The mounting element 20 is generally disc-shaped, with a V-shaped groove/channel 21 15 extending around the periphery of the disc.

When seen in side view (as per Figure 2a), therefore, the mounting element is substantially symmetrical, although it need not necessarily be so. In addition, whilst it is preferable for there to exist a groove/channel which extends around 20 the entire periphery of the mounting element, it will be appreciated, from what follows, that the groove need not, in fact, be continuous.

As shown in Figure 2b, one face 22 of the mounting element 20 is provided 25 with a pair of countersunk apertures 23, with the other face 24 also having a pair of aligned apertures therein, but which need not be countersunk. It will of course be understood that more, or fewer, apertures (which need not be countersunk) may be provided.

In order to attach the connector body 11 to the support surface/bathroom wall 30 15, it is first necessary to secure the mounting element to the wall 15, by the use of a pair of threaded fasteners which pass through the mounting element

20, from the face 22 to the face 24, into the wall 15. As indicated above, it will be appreciated, of course, that more than two such fasteners may conceivably be employed, depending upon the weight of the bar valve to be used, the condition of the support surface and other factors.

5

Once the mounting element has been secured firmly to the support surface 15, the connector body 11 is brought into register with the mounting element such that the mounting element 20 is introduced into the recess 16 of the connector body 11. It will be understood, of course, that a degree of rotational movement is permitted, given the circular nature both of the mounting element 20 and the recess 16, which gives an installer a degree of "play" and flexibility.

10 Once the rotational position of the body has been decided upon (it is noteworthy in that respect, that whilst Figure 1 is illustrative of a "top-fed" arrangement, it is also possible for the water supply pipes to come from below, 15 simply by rotating the body through 180°), the body is secured to the mounting element by the use of a short grub screw which is introduced through the threaded aperture 17 in the wall 18 of the connector body. This is illustrated in more detail in Figure 3, with the grub screw shown at 30. The grub screw, having a bevelled head suitable for countersinking, passes through the wall 18 20 of the connector body and enters into the groove 21 which extends around the periphery of the mounting element 20. Continued advancement of the grub screw 30 leads to engagement of the tip of the screw with the bottom of the groove 21, which locks the body 11 and mounting element 20 together, with the countersunk nature of the grub screw head and the threaded aperture 17 25 leading to substantial concealment from view of the grub screw 30.

It will thus be appreciated that the result is the attachment of the connector body to the wall 15 in a manner which is both firm and aesthetically pleasing, given that no connection elements, fasteners or the like are visible, once the 30 process has been completed.

Noting, of course, that it is necessary to repeat the process for the other (hot or cold) supply pipe, it is then a relatively straightforward matter to attach a generally conventional bar valve construction to the water outlets 13 of the two newly-installed connector bodies, using threaded collars, brazing techniques, 5 adhesives or the like. It will be understood, of course, that the manner in which the bar valve construction is attached to the connector bodies 11 does not form part of the present invention.

The resulting assembly is shown in Figure 4, in which the bar valve 10 construction is shown generally at 40, with a schematic shower hose arrangement being shown at 41. As alluded to above, the "top-fed" configuration shown in Figure 4 is merely exemplary, given that a "bottom-fed" construction would be equally simple to achieve. Indeed, given the ability of the bodies 11 to rotate relative to the mounting elements 20, prior to the grub 15 screws 30 being tightened, it would even be possible for "side-fed" arrangements to be provided, should design briefs or aesthetic requirements dictate that. It will also be understood that the nature of the cast bodies 11 is such that integral flow regulators (such as those available commercially under the trade mark "NEOPERL") and filters may be provided, in cases where 20 variable water pressures or qualities may require this.

It will also be appreciated that, whilst the present invention lends itself particularly well to elbow connectors, there is no reason, in principle, why the inventive concepts described herein could not also be applied to straight 25 connectors, in which the water supply pipes are parallel with (as opposed to perpendicular to) the main axes of the cylindrical bodies 11. In order to accommodate this, it would of course be necessary to provide a generally axial fluid flow passage from the rear of the body to the water outlet 13, with that necessitating an aperture in a generally central part of the mounting 30 element 20. Whilst it may be necessary to increase some of the dimensions, over and above those of a typical elbow connector, there is no technical

reason why such a construction could not be viable, although it is acknowledged that additional seals may be required in order to ensure that no leakage occurs around the periphery of the mounting element 20.

- 5 When used in this specification and claims, the terms "comprises" and "comprising" and variations thereof mean that the specified features, steps or integers are included. The terms are not to be interpreted to exclude the presence of other features, steps or components.
- 10 The features disclosed in the foregoing description, or the following claims, or the accompanying drawings, expressed in their specific forms or in terms of a means for performing the disclosed function, or a method or process for attaining the disclosed result, as appropriate, may, separately, or in any combination of such features, be utilised for realising the invention in diverse
- 15 forms thereof.



CLAIMS

1. A connector for a fluid flow control device, the connector having a body in which is disposed a passage for the supply of fluid to the control device and 5 a recess for the location of a mounting element with which the connector may be mounted to a support surface.
2. A connector according to claim 1 wherein the mounting element is securable to the body by way of a fastening element which passes through a 10 wall of the body.
3. A connector according to claim 2 wherein the mounting element has a recess in its periphery which, in use, receives part of the fastening element.
- 15 4. A connector according to claim 3 wherein the recess is a channel which extends around the periphery of the mounting element.
5. A connector according to any one of the preceding claims wherein the mounting element is generally disc-shaped.

20

6. A connector according to any one of claims 3 to 5 wherein the recess is a channel which extends around the circumference of the disc.
- 25 7. A connector according to claim 6 wherein the channel is generally V-shaped.
- 30 8. A connector according to any one of the preceding claims wherein the connector recess has a depth equal to or greater than that of the mounting element such that, in use, the connector may be flush-mounted to the support surface.

9. A connector according to any one of the preceding claims wherein the connector recess is generally circular such that the connector may rotate relative to the mounting element.

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10. A connector according to any one of claims 2 to 9 wherein the fastening element is a threaded fastener.

11. A connector according to any one of claims 2 to 10 wherein the 10 fastening element is a grub screw.

12. A connector according to any one of claims 2 to 11 wherein the wall of the body has an indentation to receive a head of the fastening element such that, when the mounting element is secured to the body, the fastening element 15 is substantially concealed from view.

13. A connector according to any one of the preceding claims wherein the fluid flow control device is a shower valve.

20 14. A connector according to any one of the preceding claims wherein the fluid flow control device is a bar mixer for a shower.

15. An elbow connector for a shower control valve comprising a body in which is disposed a passage for the supply of fluid to the control valve and a 25 recess for the location of a mounting element with which the connector may be mounted to a support surface.

16. An elbow connector further comprising the features set out in any one of claims 1 to 14.

17. A shower mixer set comprising a bar mixer and at least one elbow connector having a body in which is disposed a passage for the supply of fluid to the bar mixer and a recess for the location of a mounting element with 5 which the connector may be mounted to a support surface.

18. A shower mixer set according to claim 17 wherein the elbow connector is in accordance with claim 15 or claim 16.

10 19. A method of installing an elbow connector for a shower valve comprising attaching a mounting element to a support surface such as a bathroom or shower cabinet wall, offering to the mounting element a connector having a body in which is disposed a passage for the supply of fluid to the shower valve and a recess for the location of a mounting element with 15 which the connector may be mounted to the support surface, locating the mounting element within the connector recess and passing a fastening element through a wall of the body into a channel or groove disposed around the periphery of the mounting element.

20. A connector substantially as hereinbefore described and/or as shown in the accompanying drawings.

21. A method of installing an elbow connector substantially as hereinbefore described and/or as shown in the accompanying drawings.

25 22. Any novel feature or novel combination of features described herein and/or in the accompanying drawings.



- 13 -

Application No: GB0607629.3

Examiner: Peter Middleton

Claims searched: 1-21

Date of search: 7 August 2006

Patents Act 1977: Search Report under Section 17

Documents considered to be relevant:

Category	Relevant to claims	Identity of document and passage or figure of particular relevance
X	1-8, 10-14	EP0866180 A2 (INAX) see abstract and e.g. figure 2: tap body is located on mounting element 30
X	1, 5, 8-9, 13-17	SU1470882 A1 (EKHLAKOV) see figure and WPI abstract accession number 1989-315099 [43]: elbow connectors suitable for mixer taps with separate mounting elements
X	1, 5, 8-9, 13-16	DE29504481 U1 (GROHE) see figures and WPI abstract accession number 1996-322569 [33]: note disc 5 which may be used for mounting
X	1-3, 10, 13-15	JP08184082 A (TOTO) see figures and WPI abstract accession number 1996-379537 [38]: elbow 2 with recess 28 for attachment to mounting member
X	1, 13, 17	JP2001090871 A (MOORE) see figures and WPI abstract accession number 2001-333848 [35]: connection elbow with separate fastening member

Categories:

X	Document indicating lack of novelty or inventive step	A	Document indicating technological background and/or state of the art
Y	Document indicating lack of inventive step if combined with one or more other documents of same category	P	Document published on or after the declared priority date but before the filing date of this invention.
&	Member of the same patent family	E	Patent document published on or after, but with priority date earlier than, the filing date of this application

Field of Search:

Search of GB, EP, WO & US patent documents classified in the following areas of the UKC^X:

F2G

Worldwide search of patent documents classified in the following areas of the IPC

E03C; F16L

The following online and other databases have been used in the preparation of this search report

Online: WPI, EPODOC