March 7, 1950 L. GRIMES ET AL 2,499,496

THERMOSTATIC MIXING VALVE

Filed May 8, 1947

Fig. 1.

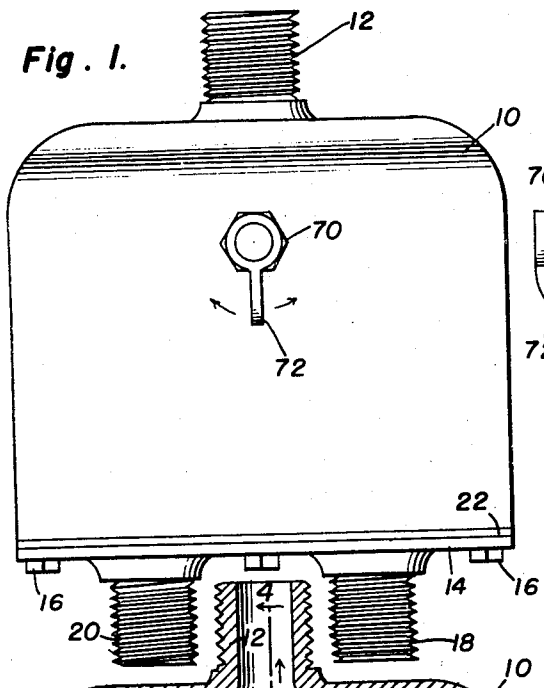


Fig. 2.

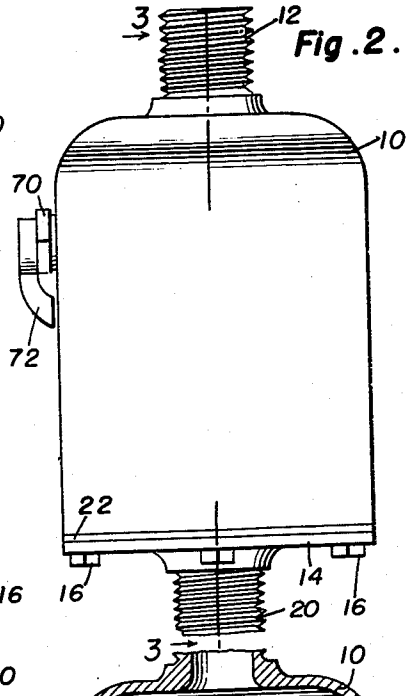


Fig. 3.

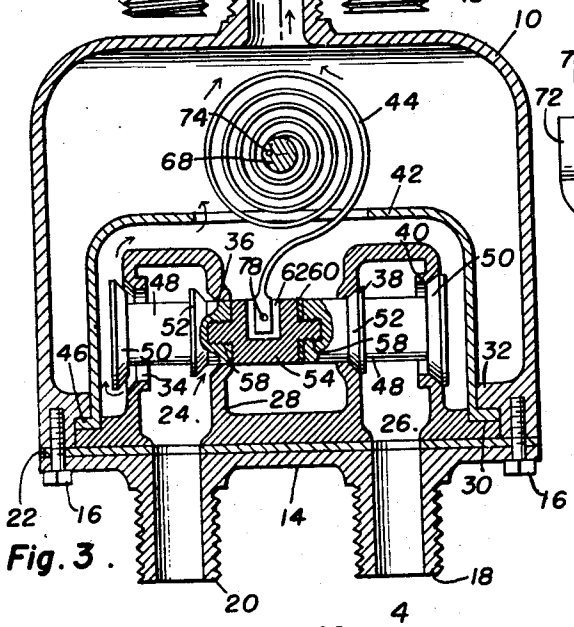


Fig. 4.

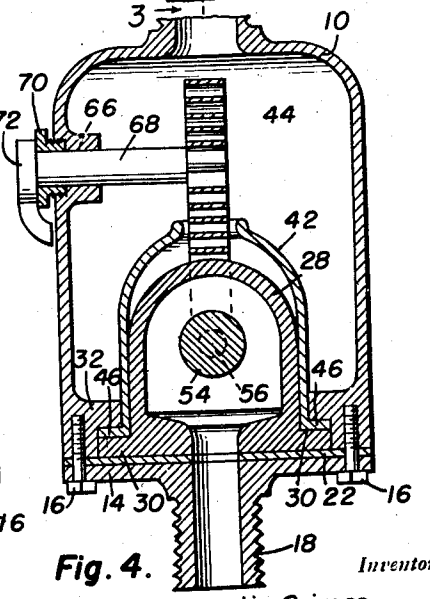


Fig. 5.

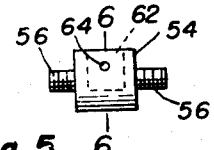
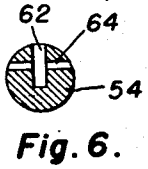


Fig. 6.



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THERMOSTATIC MIXING VALVE

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Application May 8, 1947, Serial No. 746,796

1 Claim. (Cl. 236—12)

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This invention appertains to new and useful improvements in mixing valves of the type particularly adapted to be used in environments where automatic water temperature control is desired.

An object of this invention is to provide means for conducting varied temperature liquids to a common mixing and distributing port.

Another object of this invention is to provide baffle means for admixing varied temperature fluids.

A further object of this invention is to provide means for controlling the inlet of selected hot and cold fluids.

A still further object of this invention is to provide means for regulating the length of the above mentioned means.

A still further object of this invention is to provide means for thermostatically controlling the travel of said control means.

Another object of this invention is to provide manual regulating means to vary the effectiveness of said thermostatic control means.

Ancillary objects and features of novelty shall become apparent to those skilled in the art in following the description of the illustrated prefered embodiment of the present invention, depicted in the accompanying drawings, wherein:

Figure 1 is an elevational side view of the preferred form of the present invention;

Figure 2 is an elevational end view of the invention disclosed in Figure 1;

Figure 3 is a longitudinal sectional view of the invention disclosed in Figure 2 and taken substantially on the line 3—3 thereof and in the direction of the arrows;

Figure 4 is a transverse sectional view of the invention disclosed in Figure 2 and taken substantially on the line 4—4 thereof and in the direction of the arrows;

Figure 5 is an elevational detail of a segment of the valve shank forming part of the present invention, and

Figure 6 is a transverse sectional view of the detail of construction shown in Figure 5 and taken substantially on the line 6—6 thereof and in the direction of the arrows.

This invention has been conceived and developed for use particularly where it is essential that the temperature of mixed fluids be kept substantially constant and where continual manipulation of a plurality of valves is not desired or practical. The invention is particularly well used in connection with showers, bath tubs and the like. Other uses of the present invention include the controlling of water prior to entering a washing machine and in connection with heating systems.

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A substantially bell shaped housing 10 is provided with an outlet port 12.

A cover plate 14 is provided on said housing 10 opposite to said outlet port 12. The said cover plate may be secured to said housing by any suitable conventional means, preferably ordinary bolts 16. It is noted that a pair of inlet nipples 18 and 20 respectively are provided integral with the said cover plate 14. Varied temperature fluids may be conducted to said nipples 18 and 20 respectively. Any conventional packink or sealing means 22 may be interposed between said cover plate 14 and the housing 10.

A pair of chamber members 24 and 26 respectively are provided in said housing 10 and are defined by the confines of a suitably configured member 28 which is received in said housing. It is noted that a peripheral flange 30 extends around said member 28 and is adapted to be received between the gasket 22 and a suitable annular perch 32 integral with said housing and extending therein. It is noted that the chambers 26, 24 have diametric apertures 34, 36, 38 and 40 respectively. Two of said apertures (34, 36) communicate with the said chamber 24 and the other two of said apertures communicate with the said chamber 26. Further, these apertures have beveled edges thereof which form valve seats.

A baffle means or bonnet 42 is received around the said member 28 and consequently the chambers 24 and 26. The construction of the bonnet is of import since, following the fluid flow by means of the arrows, it is seen that the fluid entering the invention is directed toward and over a bi-metallic thermostatic control means 44. The bonnet 42 has a peripheral flange 46 about one edge thereof and said flange is received between the perch 32 and the above mentioned peripheral extension 30. It is apparent from an inspection of Figure 3 that the bonnet, member 28 and plate 14 are received in fixed relation by tightening the securing means or bolts 16. The gasket 22 is interposed between selected of said members 30 and 14 for the obvious conventional purposes.

A slider valve means is received in said diametric apertures 34 to 40 inclusive for selectively opening and closing certain of said apertures. The construction of said slider valve forms an important part of the present invention and will be described at this time. A pair of identical shanks 48 are provided with valve heads 50 and

52 thereon. It is noted that the head 52 is small enough to slide through the aperture 34 in assembly and the valve head 50 is substantially larger. A connecting portion 54 of the shank is provided with oppositely aligned end threaded lugs 56 which are threadedly received in threaded apertures 58 provided in the shanks 48. A resilient biasing means, preferably a rubber gasket 60 or the like is adapted to be interposed between one of said shanks 48 and the segmental connecting portion of the shank 54. Of course, it is within the purview of this invention to provide a plurality of said gaskets, one on each side of said segmental portion 54, if so desired. By this means the shank members 48 may be drawn closer together to compensate for any wear which might take place in the valve heads or valve seats. A longitudinal notch 62 is provided in said segmental portion 54 and a transverse slot 64 intersects said notch 62.

An aperture 66 is provided in said housing 10 and a stub shaft 68 is rotatably received therein. Suitable conventional packing nut means 70 is provided around said shaft and is threadingly received in said aperture 66. It is noted that the shaft 68 is received within said housing 10 and extends thereout. On the outer portion of the shaft there is provided a suitable conventional handle 72 and indicia may be applied to said housing adjacent said handle. The opposite end of said shaft 68 has one extremity of the thermostatic means 44 secured thereto. A conventional pin 74 may be used for this purpose is so desired. The opposite end of the said thermostatic means 44 is received in the said slot 62 and a pin 78 may be driven through the transverse aperture 64, extending through the said end of said bimetallic thermostatic control means thereby holding the valve means and the thermostatic control means in a certain predetermined fixed relation.

It is apparent from an inspection of Figure 3 that varied temperature fluids enter the inlet ports 18 and 20 flow to the chambers 24 and 26 respectively and exit through selected apertures 34, 36, 38 and 40. The amount of fluid exiting through said apertures is controlled by the urging of the thermostatic means 44, which reacts on the valve means. The said thermostatic means may be set by the rotation of the handle 72 which in turn rotates or winds the thermostat to a tighter or looser position. When the fluid contacts the said thermostat, the inherent characteristics thereof will tend to urge said valve means in aperture opening and closing positions depending on the setting of the handle 72.

It is understood that suitable conventional valves are to be provided at the inlet ports 18 and 20. The varied temperature liquid is to be permitted to flow in said chambers 24 and 26 and the handle 72 set in order to determine the desired exiting temperature of the combined fluid which flows through the outlet port 12.

While there has been described a single preferred embodiment of the present invention, it is apparent to those skilled in the art that various changes including omissions, additions and rearrangement of elements may be made herein without departing from the spirit of the invention. Accordingly, limitation is sought only in accordance with the scope of the following claim.

Having thus described the present invention, what is claimed as novel and improved is as follows:

In a fluid mixing valve, a housing, valve chambers within said housing, a baffle secured to said housing and extending around said chambers, an outlet in said baffle, aligned ports in said chambers, a slider valve extending in said ports for closing said ports, means for adjusting the length of said slider valve, means for thermostatically controlling the travel of said slider valve and means for selectively regulating said thermostatic control means, including a shaft rotatably journaled in said housing and having said thermostatic means attached thereto, said thermostatic control means including a thermostat consisting of coils, and an arcuate part of one coil extending partially within said baffle means through said opening, said means for controlling the length of said slider valve comprising threaded shank segments having packing interposed therebetween, said packing being spaced from said ports.

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