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WATER DISPENSER

Orville H. Landreth, Houston, Tex., assignor, by mesne assignments, to Igloo Manufacturing Company, Houston, Tex., a corporation of Texas

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This invention pertains to apparatus commonly known as a water cooler comprising a receptacle for drinking water, in which ice may be placed if desired and having a manual valve controlled outlet or faucet near the bottom through which water can be withdrawn whenever anyone wishes a drink. Because the common name water cooler implies the presence of some means for cooling the water whereas actually the device may be merely a water storage and dispensing tank, the device will hereinafter be referred to as a water dispenser. The device may be portable or permanently installed and the storage chamber may be filled either manually by pouring water in from a bucket or pitcher or placing it under a faucet or by means of a water inlet pipe controlled by a float valve or in any other way. The device will be illustrated as a portable unit adapted to be filled as required through a manually removable and replaceable top and having insulated walls to exclude heat.

A difficulty experienced with certain prior known devices using a push button type valve on which devices the present invention is an improvement is that after the valve is closed following someone filling a cup from the unit, a small amount of water will leak out of the faucet at an indeterminate time following the valve closure. It is an object of the invention to prevent such leakage, which is objectionable because it produces a slippery wet place on the floor.

Another difficulty experienced with such known devices is that perspiration, dirt and other obnoxious materials on the hands of persons operating the push button valve and which are transferred to the push button can run or fall down onto the water outlet, contaminating the water next dispensed. It is an object of the invention to prevent such contamination.

It is a general object of the invention to provide an improved valve controlled outlet for a water dispenser.

Other objects and advantages of the invention will appear from the following description of a preferred embodiment thereof in which

Figure 1 is a vertical section through a water dispenser embodying the invention;

Figure 2 is an enlargement of the valve controlled outlet of the dispenser shown in Figure 1; and

Figure 3 is a still further enlargement of the push button operator and a portion of the valve stem of the valve controlled outlet shown in Figure 2.

Referring now to Figure 1, there is shown a water storage chamber 10 formed by cylindrical side wall 11, bottom wall 12 and removable top 13, all of which are formed by spaced inner and outer sheet metal portions such as 14, 15 separated by suitable heat insulating material 16 such as glass wool. A cup 17 extending inwardly from a hole in sheet 14 near the bottom of wall 11 provides a recess in which is disposed a valve controlled outlet or faucet 18.

As best shown in Figure 2, the faucet 18 comprises a die cast zinc valve body having a tubular inlet 21 exteriorly threaded at 22, a concentric tubular valve operator

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portion 23 having an outwardly flaring flange 24 at the outer end thereof, and an intersecting downwardly inclined tubular outlet 25. An annular shoulder 26 bears against cup 17. Between cup 17 and sheet 15 is a neoprene washer 27. Inside sheet 15 there is a neoprene washer 28 around inlet 21 and a metal retaining cap 29 over the washer preventing outward extrusion of the washer when nut 30 is screwed up tight on threads 22 to hold the faucet in place.

The internal diameter of inlet 21 is greater than the internal diameter of operator tube 23, forming a shoulder 35 which provides a valve seat. A valve stem 36 has an enlarged inner end 37 having an annular groove 38 therein. A neoprene valve ring 39 is forced up on tapered end 40 of the valve stem and snapped into groove 38. The inner diameter of the valve ring 39 is slightly smaller than the diameter of groove 38 so as to form a tight fit providing a seal therebetween.

Referring now also to Figure 3, near the outer end of the valve stem there is an annular groove 45. A neoprene diaphragm ring 46 is disposed around the stem in this groove. The inner diameter of the diaphragm ring is slightly smaller than the diameter of the groove 45 so as to form a tight fit providing a seal therebetween. The diaphragm has portion of reduced thickness at 47 to make it more flexible. The diaphragm is also assembled by stretching it over the conical end 40 of the valve stem and pushing it down the stem until it snaps into groove 45. A tubular expander may be used as a tool to assist in placing diaphragm ring 46 in place, helping it over groove 38.

At the outer end of the valve stem 36 there is formed a push button or operator 50 integral with the valve stem. The inner face 51 of the push button provides an abutment against which bears the outer end of helical spring 52 disposed around the valve stem concentric therewith. The inner end of the spring 52 bears against the outer periphery of diaphragm ring 46 which in turn bears against the outwardly facing shoulder internal flange 53 in operator tube 23. The spring has a relaxed length greater than the distance between the diaphragm ring 46 and face 51 of the push button when valve ring 39 is in engagement with seat 35. Therefore the spring tends to hold the valve ring tight against its seat to form a seal, and at the same time it holds the outer periphery of diaphragm ring 46 tight against flange 53 to form a seal.

Pressure on push button 50 will compress spring 52 and move the valve stem inwardly disengaging the valve ring 39 from its seat 35 allowing water to flow from storage chamber 10 out through outlet tube 25. It is to be noted that the vertical plane of the end of outlet tube 25 is disposed inwardly from the vertical plane of guard flange 24 so that drippings from flange 24 will not contact the outlet tube 25.

When pressure on push button 50 is removed, spring 52 forces the valve stem outwardly until the valve ring 39 engages seat 35 closing the valve. Water still in operator tube 23 and outlet tube 25 after the valve closes will remain there indefinitely since there is no leakage of air past diaphragm 46 into the annular space between the valve stem and operator tube. The diaphragm 46 is sufficiently flexible to permit inward and outward movement of the valve stem without breaking the sealing engagement between the diaphragm ring and flange 53 nor between the diaphragm ring and the valve stem.

While a preferred embodiment of the invention has been shown and described, many modifications can be made therein by one skilled in the art without departing from the spirit of the invention, and it is desired to protect by Letters Patent all forms of the invention falling within the scope of the following claims.

I claim:

1. A water dispenser comprising a storage chamber formed by side and bottom walls and a removable top all made of inner and outer spaced apart sheets of metal having a heat insulating material disposed therebetween, the outer sheet of said side wall having an opening therein near the bottom, a cup made of a metal sheet disposed in said opening providing a recess in said wall, said wall having a passage therethrough opening into said recess, a faucet disposed in said recess, said faucet including an inlet tube extending through said passage into said chamber, means to seal between said inlet tube and said wall around said passage, an operator tube coaxial with said inlet tube extending outwardly from the outer end of said inlet tube and terminating in an outwardly flaring flange adjacent the plane of the outer sheet of the side wall, an outlet tube in the same vertical plane as said inlet and operator tubes intersecting said inlet and operator tubes and extending downwardly therefrom, said outlet tube terminating at a point inwardly spaced from said flange on said operator tube, an inwardly facing valve seat formed inside said coaxial tubes, a valve stem coaxial with said coaxial tubes, a valve ring on said stem adapted to engage said seat to close said passage, spring means to urge said stem outwardly to engage said valve ring with said seat, a push button on the end of said stem disposed within said flange by means of which said stem can be pushed inwardly with a person's thumb to disengage said valve ring from said seat, and means to seal air tight between said valve stem and operator tube.

2. A water dispenser comprising a storage chamber including side and bottom walls, a recess in a side wall, a faucet disposed in said recess, said faucet including an inlet tube extending through said side wall from the interior of the chamber to the interior of said recess, an operator tube extending outwardly from the inlet tube and terminating in an outwardly flaring flange adjacent the plane of the outer surface of the side wall around said recess, an outlet tube extending downwardly from the outer portion of the inlet tube beneath said operator tube, said outlet tube terminating at a point inwardly spaced from said flange on said operator tube, means including a check valve for preventing flow of liquid through said inlet tube to said outlet tube, and means for opening said check valve disposed in said operator tube and including a push button at the end of said tube surrounded by said flange.

3. A water dispenser comprising a storage chamber including a side wall, a recess in said wall, a faucet dis-

posed in said recess, said faucet including a casting having an inlet portion extending from inside the chamber to inside said recess and having a flow passage therethrough, an outlet portion having a flow passage extending downwardly from the part of the flow passage of the inlet portion that is within said recess, an inwardly flaring valve seat in said inlet portion, a valve comprising an integral valve stem having an inner end and an outer end, an annular groove around said stem adjacent said inner end, said inner end tapering down at its extremity to a diameter smaller than that of said groove, an elastic valve ring in said groove having a low modulus of elasticity and having an internal diameter smaller than the diameter of said stem adjacent said groove but larger than that of the extremity of said stem whereby said ring can be easily forced up said tapered end into said groove, said valve ring cooperating with said valve seat, an aperture in said faucet leading from said flow passage in the inlet portion to the exterior of the faucet, said valve stem extending through said aperture to the exterior of the faucet, said valve stem having an integral push button on the outer end thereof, an outwardly facing shoulder in said aperture, a second annular groove around said stem between said button and said first annular groove, an elastic diaphragm having a low modulus of elasticity and having an opening therethrough smaller than the diameter of said stem adjacent said second annular groove, said diaphragm being disposed in said groove and its outer periphery disposed against said outwardly facing shoulder, and a helical spring around said stem between said button and said diaphragm both urging said stem outwardly to close said valve and maintaining said diaphragm at its outer periphery against said shoulder despite reciprocation of said valve stem, the flexibility of said diaphragm allowing it to remain sealed against both said shoulder and said stem despite said reciprocation whereby no liquid will leak out of said faucet after said valve has been closed following withdrawal of water from said chamber through said faucet.

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