

- [54] **DISPOSABLE RESERVOIR PACKAGE FOR LIQUID-DISPENSER HAVING FLOAT-OPERATED VALVE**
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1,695,705	12/1928	Ball et al.....	137/430
1,881,929	10/1932	Pottenger.....	222/185
2,036,549	4/1936	Smith.....	222/322
2,620,097	12/1952	Titmas.....	222/453
3,173,579	3/1965	Curie et al.....	222/105
3,297,206	1/1967	Scholle.....	222/105

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- [58] Field of Search 222/453, 448, 437, 544, 222/500, 501, 105, 322, 349, 351, 183, 185, 137/453, 429, 430; 248/154, 146; 141/383, 222/162, 166

[56] **References Cited**

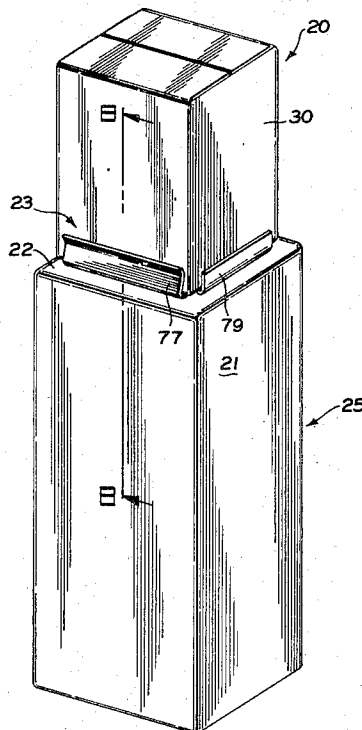
UNITED STATES PATENTS

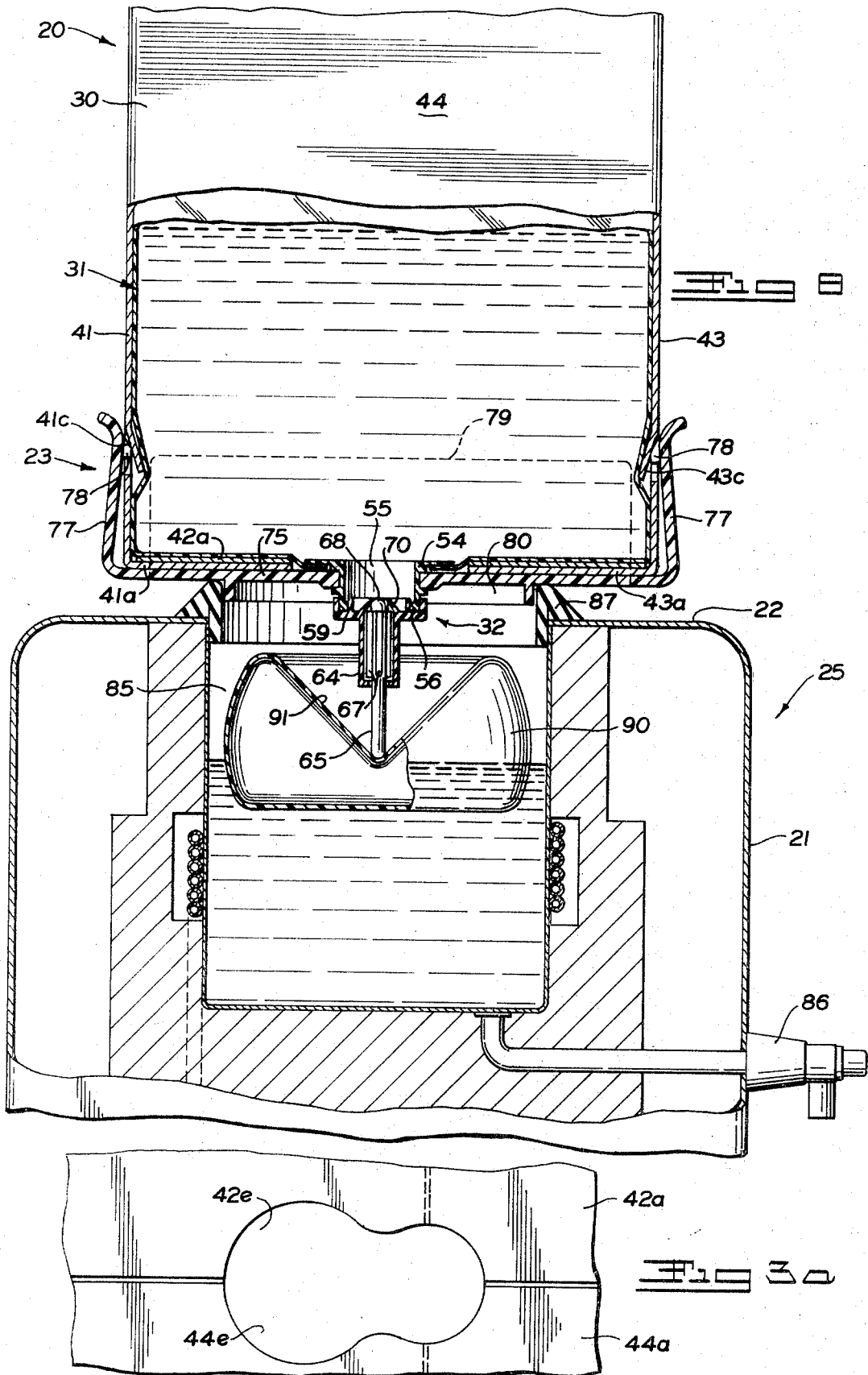
925,001	6/1909	Langstaff.....	222/500
962,529	6/1910	Rose.....	222/185
986,361	3/1911	Champ.....	222/437
1,313,029	8/1919	Stott.....	137/430
1,501,068	7/1924	Schultz.....	222/185

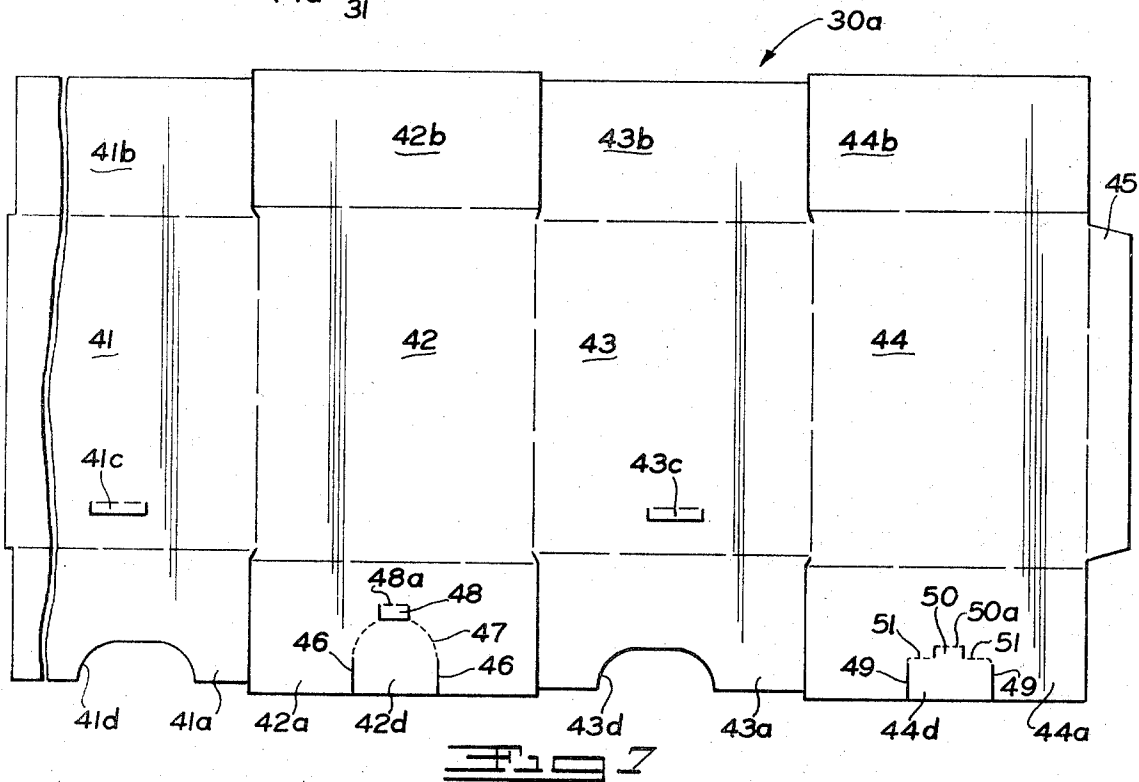
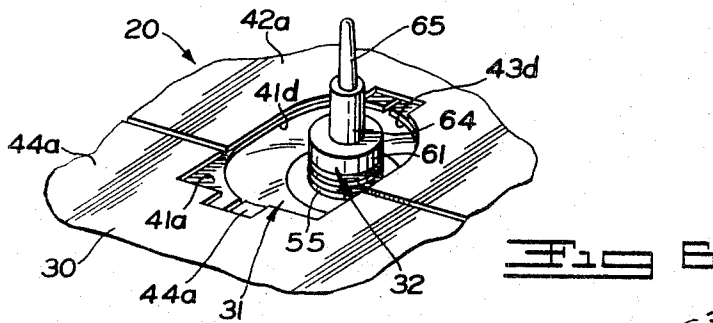
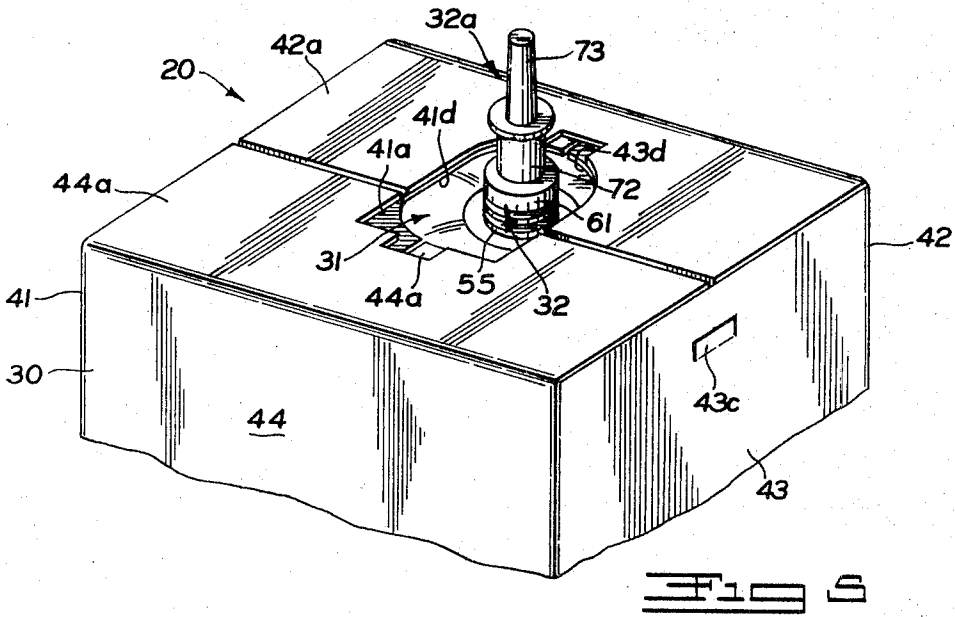
[57] **ABSTRACT**

A disposable reservoir for water-coolers, or similar liquid dispensers, comprising a package preferably consisting of a bag, box and valve assembly, the valve being of such a nature that when the package is mounted on a water-cooler or the like as its reservoir, the valve opens automatically to supply water into the well of the cooler and is closed by a float in that well whenever necessary to maintain a predetermined level of water in the well.

6 Claims, 13 Drawing Figures







DISPOSABLE RESERVOIR PACKAGE FOR LIQUID-DISPENSER HAVING FLOAT-OPERATED VALVE

This invention will be described with reference to the reservoirs for water-coolers but it is to be understood that the reservoir can be used on various liquid-dispensing devices which require periodic replacement of the emptied reservoir with a filled one.

As is well-known, water-dispensers of coolers now in use have a cabinet designed to receive a replaceable water-supply receptacle or reservoir at the upper end thereof to gravity-feed into a well from which the water is withdrawn by a spigot or faucet. The most commonly used reservoir is a large heavy glass returnable bottle which has the well-recognized disadvantages of being unwieldy, difficult to transport filled and empty, requiring sterilization before filling, sealing after filling, etc. For these reasons it has been proposed in recent years to replace the glass bottles with disposable-type packages consisting of a fibre-box enclosing a water-filled plastic bag. However, because of the fact that the bag is flexible and will collapse under atmospheric pressure as water is withdrawn therefrom, as compared to the rigid glass bottle which resists that pressure, it has been necessary to modify the water-cooler itself to provide controlled-flow from the bag into the receiving well on the water-cooler. These modifications of the water-cooler have ordinarily consisted of complicated valve arrangements, sometimes float-operated, which are expensive as original equipment or added attachments on the water-cooler, difficult to maintain, unsanitary, etc. Some water dispensers also include heating means and attempts have been made to use flexible bags for the reservoir thereof, the bag being so mounted that it is sealed to the well. However, this arrangement has not been practicable because steam from the well must be vented into the bag and, even if the seal can be maintained, this is not desirable. Therefore, disposable-type packages have not met with much success with the result that the heavy bottle type reservoirs are still in almost universal use.

The present invention provides a simple complete disposable package assembly which can serve as the reservoir for water-coolers or similar liquid-dispensing units. The package preferably is in the form of a bag and box which is relatively inexpensive so that it is economical to use it once and then discard it. The bag is preferably plastic and the box is preferably fibreboard. An important feature of the invention is that the package assembly itself includes a valve which controls flow of water from the bag into the well of the water-cooler, from which it is allowed to flow under control of the spigot. This valve is preferably of plastic, of a very simple nature, which opens by gravity and is automatically closed to maintain the desired level of water in the well by means of a simple float inserted therein, which may also be of plastic. No structural modification of the water-cooler itself will be necessary and it will not be necessary to provide expensive and hard-to-maintain valve attachments on the cooler since the control valve is part of the package assembly and is disposable therewith.

The best mode contemplated in carrying out this invention is illustrated in the accompanying drawings in which:

FIG. 1 is a perspective view showing the disposable package assembly mounted on a water-cooler to serve as the reservoir thereof.

FIG. 2 is a perspective view showing the end portion of a water-filled package assembly as supplied for use as a reservoir on the water cooler.

FIG. 3 is an enlarged fragmentary top plan view of the end of the filled package assembly showing the opening-producing tear-out sections.

FIG. 3a is a similar view showing tear-out sections for producing an opening of different shape.

FIG. 4 is a vertical sectional view taken on line 4-4 of FIG. 3.

FIG. 5 is a perspective view of the package assembly with the covered valve in the bag pulled up through the opening in the end of the box created by tearing out the sections thereof.

FIG. 6 is a fragmentary view of the end of the box of FIG. 5 but with the protective cover removed from the valve.

FIG. 7 is a flat view of the blank used in forming the box.

FIG. 8 is an enlarged sectional view taken on line 8-8 of FIG. 1 showing the disposable package assembly of FIG. 6 inverted and mounted on the water cooler.

FIG. 9 is an enlarged sectional view of the valve showing the package in the position it occupies on the water cooler.

FIG. 10 is a horizontal sectional view taken along line 10-10 of FIG. 9.

FIG. 11 is a horizontal sectional view taken along line 11-11 of FIG. 9.

FIG. 12 is an enlarged sectional view through the inverted valve and cover, the valve being locked in the adapter support of the water cooler.

With reference to the drawings, in FIG. 1 there is shown a bag and box disposable package assembly 20 which is removably mounted on the upper end of a water cooler 25 of a common type and provides a disposable reservoir for the cooler. As indicated, this package assembly is not limited to use on this particular type of water dispenser but may be used on various liquid-dispensing units. The water cooler shown includes the cabinet 21 which has a flat upper end 22 and the package assembly 20 is supported on this flat upper end preferably by means of an adapter support member 23.

The package assembly 20 preferably includes the box 30, the bag 31, and the valve 32, as indicated in FIGS. 2 to 6, 8 and 9. The bag and box shown are generally similar to these commonly in use for packaging liquids and similar to the assembly shown in U.S. Pat. No. 3,173,579 dated Mar. 16, 1965. However, the valve 32 is completely different in structure and operation and the box is designed with an end which has a removable section through which the valve can be pulled before the package is mounted on the water cooler 25. Also, the box is provided with means which cooperates with the adapter 23 to lock it in dispensing position on the water cooler.

The box 30 can be made from the blank 30a shown in FIG. 7. This blank is preferably made from a single flat sheet of material generally referred to as fiberboard and which may be corrugated board, paperboard or the like. The sheet is properly scored and slit to provide the joined side wall panels 41, 42, 43 and 44 with a connec-

tor flap 45 joined to the outer free edge of the panel 44, this flap overlapping the outer free edge of the panel 41 and being secured thereto when the box is set up. At the one edge of the blank the outwardly extending end closure flaps 41a, 42a, 43a and 44a are formed by scoring and slitting the blank and are hinged to the respective panels 41, 42, 43 and 44. At the other edge of the blank the outwardly extending end closure flaps 41b, 42b, 43b and 44b are formed and are hinged to the respective panels. The panel 41 has therein, adjacent the flap 41a, a hinged tab 41c which is produced by a U-shaped slit and a hinge score line so that it can be pushed inwardly to provide a locking slot when the box is mounted on the water cooler. The panel 43 has a similar tab 43c formed therein. The flaps 41a and 43a have formed in their respective outer edges the arcuate notches 41d and 43d. The flaps 42a and 44a have formed in their respective outer edges the tear-out sections 42d and 44d. The section 42d is provided by parallel slits 46 extending inwardly from the flap edge and a joining arcuate perforated portion 47. At the inner extremity of the arc 47 is a tab 48 provided by a U-shaped slit and an inner perforated line 48a. The section 44d is provided by the parallel slits 49 extending inwardly from the flap edge, the opposed inwardly extending perforated lines 51 and a tab 50 provided by a U-shaped slit and an inner perforated line 50a.

When the blank is set up as indicated in FIGS. 2 to 6, the one end will be formed by cooperation of the flaps 41a, 42a, 43a and 44a. The flaps 41a and 43a will be the inner flaps and will extend inwardly with their edges meeting. The notches 41d and 43d will meet forming a continuous opening. The flaps 42a and 44a will extend inwardly in overlapping relationship to the flaps 41a and 43a with their inner edges meeting and at these edges the tear-out sections 42d and 44d will align (FIG. 2). The sections 42d and 44d may be torn out by tearing from the inner edges of the respective flaps, to the respective lines 48a and 50a where the final tearing permits complete removal of the sections 42d and 44d.

The bag 31 which is to be enclosed within the box preferably is of plastic, as indicated in said patent, for example polyethylene. It is indicated in FIGS. 6, 8 and 9 as being provided with a neck 55 at one end which may be used both for filling and dispensing. The valve 32 is adapted to be mounted on the neck 55 by a sealing snap fit, in the example shown, although it could be formed as a part thereof. It will be noted best from FIGS. 8 and 9 that the neck has an outer thickened edge 56 and an adjacent exterior locking groove 57. The neck 55 is also provided with an inner peripheral flange 54 and an outer peripheral flange 58 spaced axially therefrom to provide an outwardly opening locking groove. The bag 31 is filled with water either through the neck 55 or the valve 32 mounted thereon. The valve may be on the neck of the bag when supplied and be removed for filling or, as indicated, may be formed in the neck and the filling occur through it. At this time the box will have its one or lower end closed by the overlapping closure flaps 41b, 42b, 43b and 44b and its opposite or upper end open with the closure flaps 41a, 42a, 43a and 44a extending outwardly. The bag is usually inserted in the box before filling and, when filled, will rest on the closed bottom thereof. The valve 32 will receive a cover or cap 32a and will tilt to one side as indicated in FIG. 4. The box can then be closed by fold-

ing the flaps 41a, 42a, 43a and 44a inwardly into superimposed relationship as indicated in FIGS. 2 to 4. In FIGS. 2 to 6, the box is shown in such a position that the valve 32 will be at the top, since the bag 31 will be in the position it is in for filling, shipping or storage of the package assembly. However, for dispensing, the package is inverted to position the valve downwardly in dependent position, as indicated in FIGS. 1, 8, 9 and 12 and the details of this valve will be described with reference to these Figures.

The valve 32 includes a flanged cap portion 59, which is used in mounting the valve on the neck 55, and which includes an internal axially extending sealing flange 60 and an external axially locking flange 61. The two flanges are concentric and provide an axially inwardly opening annular slot for receiving the thickened outer lip 56 on the neck 55. The internal sealing flange is tapered at its inner edge at 62 to facilitate insertion in the mouth of the neck and the external locking flange 61 is provided with an inwardly extending annular locking rib 61a which will snap into the annular groove 57 in the exterior of the neck 55. Thus, the cap portion 59 when snapped on the neck 55 will be effectively sealed thereon.

The cap portion carries an axially outwardly extending tubular valve guide 64, which has a valve stem 65 mounted therein for axial sliding movement. The guide 64 has a radially inwardly extending stop flange 66 at its outer extremity surrounding an opening through which the valve stem 65 projects. The inner portion of the valve stem has formed thereon a guide section 67, of cross-shaped cross-section to permit passage of water, which fits slidably within and is guided by the tubular guide sleeve 64. The outer end of this section 67 will contact the flange 66 to limit outward movement of the stem 65. The inner end of the stem 65 is provided with a valve surface 68 preferably of spherical form. The outer end of the stem preferably has a similar spherical contact surface 69. The valve surface 68 is adapted to cooperate with an annular valve seat surface provided by an annular flange 70, on the interior of the cap portion 59, which converges axially inwardly to provide the annular concave valve seat surrounding a central opening, but, the seat and valve surfaces could be reversed or other complementary seating surfaces could be provided.

It will be apparent that if the package is in dispensing position with the valve 32 in a dependent position, as shown in FIG. 9, the valve stem 65 of the valve shown will drop by gravity, aided by water pressure, until the lower end of the guide section 67 rests on the stop flange 66. This will unseat the valve surface 68 from the flange 70, allowing the liquid to flow out through the guide tube 64 of the valve. To close the valve and interrupt this flow, it is necessary to push upwardly on the depending valve stem 65 to seat the surface 68 on the flange 70.

As indicated, the bag 31 is filled with water while it is in the box 30 and may be filled through the neck 55 with the valve 32 removed. Then the valve is positioned on the neck. A cover or cap 32a is slipped over the projecting valve stem 65. This cover is shown best in FIG. 12 and has a conical outer shell 73 and an integral skirt 72 on its inner end. The skirt 72 of this cover is slipped over the outwardly extending guide sleeve 64 and is provided with axially spaced internal annular sealing ribs 71 which frictionally engage the exterior or the

sleeve to hold the cover in place and provide a seal. At this time, the outer end 73 of the cap may engage the contact end 69 of the stem 65 to seat the inner end 68 on the valve seat 70 and hold the valve closed until the cap 71 is pulled off the neck 55, although the valve need not be held in closed position, since the cover 32a can provide the necessary seal to prevent leakage of the package at the valve. The cover 32a not only seals the valve against leakage but also provides a sanitary cover.

The package 20, with the bag 31 filled with water, is supplied to the user with the box closed and sealed in the condition illustrated in FIGS. 2 to 4. When the user wishes to open the package, he tears out the sections 42d and 44d from the end of the box. This exposes the valve 32 with its cover 32a which will be below the opening on the inner flaps created by the flap notches 41d and 43d. Then the covered valve is pulled outwardly through the opening as indicated in FIG. 5. If the cover 32a is removed, the valve stem 65 will be exposed as indicated in FIG. 6, the valve stem projecting upright from the end of the box. Adapter 23 is preferably positioned on the valve end of the box before inversion to dispensing position. Preferably, as indicated in FIG. 12, the box inversion may take place with the cover 32a still in sealing position and the cover can be removed just before mounting on the cooler.

This frame 23 is preferably made of plastic and comprises a flat support plate or panel 75 upon which the end of the box is rested. This plate has a keyhole slot 76 located centrally thereof through which the valve 32 and neck 55 are adapted to extend as shown in FIGS. 8, 9, 11, and 12. The plate 75 has opposed upstanding, inwardly angled, resilient box-gripping flanges 77 at opposite edges. These flanges carry inwardly extending locking lugs 78 adjacent their upper edges which will press the tabs 41c and 43c, respectively, on the box sides 41 and 43 inwardly so as to interlock with the resulting slots to hold the package 20 firmly in place in the receiving socket on the frame 23. The other two edges of the frame 23 carry the upstanding locating flanges 79 for the box. The plate 75 has a depending annular locating lip 80 on its lower surface around the slot 76. In mounting the package 20 on the cooler 25, the valve 32 and neck 55 are first passed through the enlarged circular part of the keyhole slot 76. Then the neck 55 is pushed laterally into the position indicated in FIG. 11 to lock it in the narrow circular part of the keyhole slot, the flange 58 on the neck being on one side of the plate 75 and the flange 54 of the neck being on the other side thereof to lock the neck from axial movement in a centered position in the plate.

As shown in FIG. 8, the water cooler 25 has the flat upper wall 22 and below this wall is the annular well 85 in which a supply of water is to be maintained and from which it can be withdrawn through the spigot 86. Above the well 85, is a central opening surrounded by the usual annular gasket 87, upon which the large bottle reservoir is usually rested. However, when the reservoir package 20 of this invention is placed on the water cooler, the annular guide lip 80 of the adapter frame 23 projects within the annular gasket 87 and the plate 75 thereof rests on the upwardly projecting gasket. The stem 65 of the valve 32 centered in the well 85 will, at this time, drop downwardly by gravity and open the valve allowing water to flow into the well 85.

To control the level of the water in the well 85, a simple float 90 is provided for use in the water cooler. This float may also be of plastic and is of hollow annular form, being less in diameter than the internal diameter of the well 85. In order that the float will be centered and free of the wall of the well 85, it is provided with a concave centering socket in its upper side formed by the inwardly and downwardly tapering wall 91. The wall 91 will contact the depending valve stem 65, at the contact end 69, and the float 90 will be centered in the body of water in the well 85 in which it floats. As long as the water in the well 85 is below a predetermined level, due to dispensing through the spigot 86, the valve stem 65 will drop downwardly and unseat the valve surface 68 from the seat 70, allowing water to be supplied to the well. However, as the water in the well rises, the float 90 will push upwardly on the stem 65 until the valve surface 68 seats on the seat 70 and closes the valve. The valve will not open again until the float moves downwardly, due to a drop in water level in the well 85, caused by withdrawal from the well through the spigot 86.

When the package 20 is completely emptied, it can be easily removed and discarded. Then it can be replaced with a filled package.

It is possible to form the keyhole slot, for locating the valve axially, in the box end instead of the plate 23 as indicated in FIG. 3a. In this instance, the tear-out portions 42e and 44e will be in the respective box flaps 42a and 44a and will be shaped to produce a keyhole slot through which the neck 55 of the bag can be passed and then moved laterally to lock it axially. A more simple frame or other locating means can then be used instead of the frame 23 to locate the package assembly on the water cooler. If the keyhole slot is formed in the split panel at the box end, the material of that end is preferably moisture resistant.

It will be apparent that this invention provides a simple complete disposable package assembly which can serve as the reservoir for water coolers or similar liquid-dispensing units. The bag and box type package preferably used is inexpensive so that it is economical to use it once and discard it. No structural modification of the water cooler itself will be necessary and it will not be necessary to provide expensive and hard to maintain valve attachments on the cooler since the control valve is part of the package assembly and is disposable therewith.

Having thus described the invention, what is claimed is:

1. A package assembly for use as a disposable reservoir in a liquid dispensing unit comprising an outer protective box and an inner flexible bag disposed within and protected by the outer box, said box having a substantially flat wall adapted to rest on a support surface when in dispensing position on the dispensing unit with the bag filled with liquid, said bag having a neck which is adjacent said flat wall with the bag filled, a valve member on the neck for controlling discharge of liquid through said neck in cooperation with a valve seat on the neck, said valve member comprising a stem slidably mounted on the neck for axial movement between seated and unseated positions relative to said seat, said valve stem extending axially outwardly of the neck, said substantially flat box wall having an opening through which the valve stem and neck can project, means for locking the neck in said opening in a position such that

the axis of the slidable valve stem will be substantially normal to the flat wall and the neck will be locked in fixed axial position, said valve member seating on said valve seat when moved axially inwardly but dropping downwardly by gravity when the box with the filled bag is resting on said flat wall in dispensing position with the valve stem projecting below the flat wall, said means for locking the neck in said opening comprising a locking panel at said flat wall having a keyhole slot at said opening, said neck having a radially outwardly opening locking groove on its exterior, said keyhole slot having a wide portion through which the neck can pass axially and a communicating narrow portion into which the neck can be moved laterally to lock it axially at said locking groove, said locking panel being part of an adapter which is adapted to support the box on the support surface of the dispensing unit which is substantially horizontally disposed, said panel of the adapter having a flat surface providing said flat support surface on which the flat wall of the box rests, said panel having said keyhole slot formed therein, and locating means extending from said flat support surface of said panel for locating the flat wall of the box on said flat support surface of the panel to locate said opening in said box wall in cooperation with said keyhole slot in said adapter panel.

2. A package assembly according to claim 1 in which said box has side walls at right angles to said flat wall, said locating means on the adapter panel including a pair of opposed resilient box-gripping flanges which extend outwardly from said flat support surface of the panel and are adapted to extend over and grip said side walls of the box when the box is inserted therebetween.

3. A package assembly according to claim 2 in which said box side walls have locking slots therein adjacent said box flat wall, and inwardly-extending locking lugs on said box-gripping flanges for interlocking with said slots to retain the box on the adapter with its flat wall resting on the support surface of the adapter panel.

4. A package assembly according to claim 3 in which the panel of the adapter has a second flat surface opposite the flat support surface, and an annular centering guide lip on said second flat surface surrounding said key-hole slot and concentric with the narrow portion thereof.

5. A package assembly according to claim 1 in which the neck has a tubular valve guide sleeve extending axially outwardly therefrom in which said valve stem is mounted for axial sliding movement, said valve guide sleeve having an outer outlet end through which the valve stem axially outwardly projects and having said valve seat formed therein axially inwardly of said outlet end, said valve stem having a valve surface at its inner end for cooperating with said valve seat, and a tubular cover fitted over said valve guide sleeve to enclose the outer outlet end thereof and the projecting valve stem to prevent contamination thereof and to seal said outlet end.

6. A package assembly according to claim 5 in which said cover has a closed outer end which engages the outer end of the projecting stem to hold the stem in its innermost position with said valve surface on said valve seat.

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