June 1, 1965 L. F. BENDER 3,186,428

WASHER-RELEASER FOR DAIRY EQUIPMENT

Filed Oct. 31, 1963 2 Sheets-Sheet 1

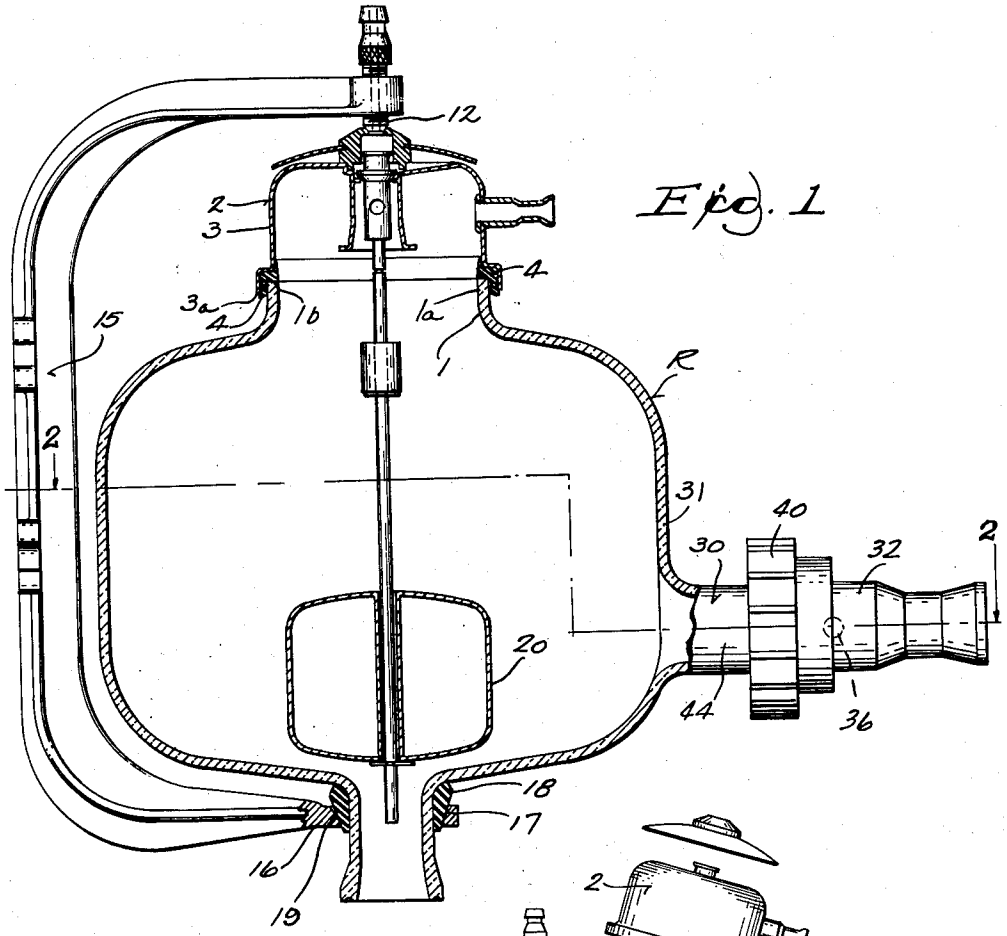


Fig. 1

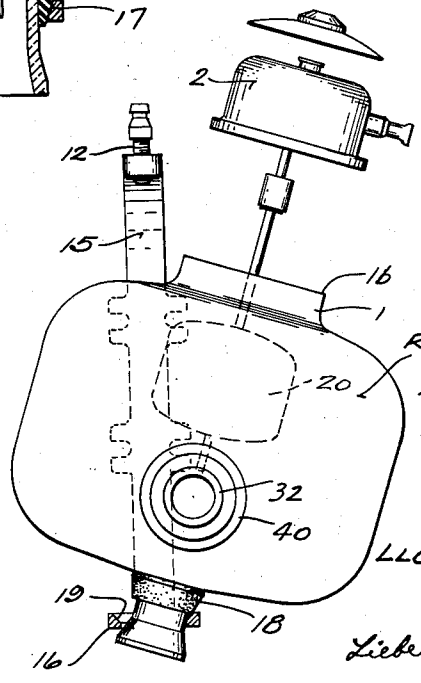


Fig. 3

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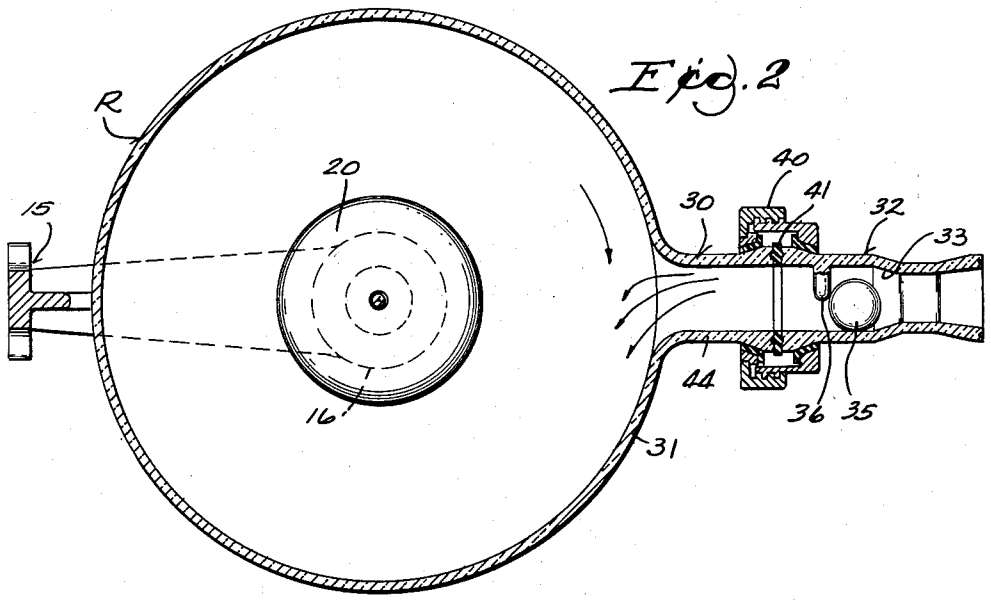


Fig. 2

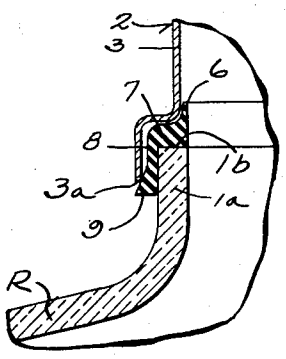


Fig. 4

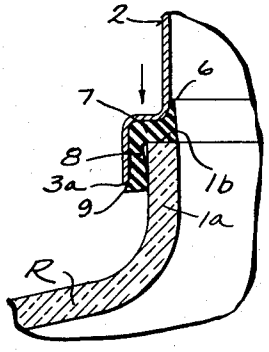


Fig. 5

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3,186,428

WASHER-RELEASER FOR DAIRY EQUIPMENT

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Filed Oct. 31, 1963, Ser. No. 320,352
14 Claims. (Cl. 137—376)

This invention relates generally to dairy equipment and more specifically to an improved washer-releaser for automatically washing and sterilizing milk conducting lines and the like.

Equipment of this type often has a large liquid receptacle from which the liquid, such as milk or cleansing fluid, must periodically be drawn off rapidly through a central opening in the bottom.

Some difficulty has been encountered in the past in being able to quickly empty these receptacles due to rotation or spinning of the fluid as a mass and against the side walls of the receptacle. This mass of liquid spins at a considerable rate, and centrifugal force holds it up against the side wall of the receptacle where it cannot enter the lower central opening for discharge therefrom. This spinning action in a clockwise direction, as viewed from the top, is a natural phenomenon in the Northern Hemisphere due to rotation of the earth, and as a result, it has been difficult to empty these receptacles, particularly with the rapidity which is desired in these pumping units.

In accordance with the present invention, fluid inlet means has been provided for receptacles of the above type which causes the above-mentioned spinning action of the fluid to be broken up whereby the fluid quickly drains by gravity out of the receptacle. The arrangement of this fluid inlet means is such that it can be adjusted to provide any degree of interference with the spinning fluid and consequent variation in intensity of fluid discharge from the receptacle.

Another problem in fluid handling receptacles of this type arises when the receptacle is disassembled from its mounting bracket and associated valve mechanism, conduits, float mechanism, and other parts. These receptacles are often rather large and awkward to handle, and it has been difficult for one man to disconnect the receptacle cap and valve mechanism and at the same time hold the receptacle which is thereby free at its top side and prevent it from tipping over and smashing on the floor.

Accordingly, another aspect of the present invention provides a secure mounting for the lower end of the receptacle which permits lateral tipping of the receptacle within limits and without the receptacle becoming dislodged even though it may be completely disconnected from its top connection with the valve and float mechanism. The arrangement is such that the operator can remove the top cap and valve mechanism from the receptacle, and the receptacle may tilt to a limited extent in its bottom mounting without becoming dislodged therefrom. Only a subsequent and directly upward movement of the receptacle will permit it to be removed from its lower mounting.

Still another problem in receptacles of this type is in the sealing of the cap on the receptacle in such a manner that fluid does not collect in the crevices in an unsanitary manner.

Accordingly, the present invention provides an improved seal between the receptacle top opening and the cap and in which as the cap is pushed downwardly on the seal the lower edge of the cap bears against the lower outer edge of the seal to cause the inner upper edge of the seal to bias tightly in sealing engagement with the inside of the cap. The result is a fluid-tight joint in which fluid cannot accumulate.

These and other objects and advantages will appear

hereinafter as this disclosure progresses, reference being had to the accompanying drawings in which:

FIGURE 1 is a vertical, sectional view through a washer-releaser made in accordance with the present invention;

FIGURE 2 is a plan view, in section, generally along line 2—2 in FIGURE 1;

FIGURE 3 is an elevational view of the washer-releaser shown in FIGURE 1, but showing the cap and valve mechanism removed and the receptacle tilting to one side and unsupported at its top;

FIGURE 4 is a vertical, cross-sectional view taken through the sealing means between the receptacle and its cap, and on an enlarged scale; and

FIGURE 5 is a view similar to FIGURE 4, but showing the distortion of the gasket when the cap is tightened thereon.

The present apparatus relates generally to that type shown in my U.S. Patents No. 2,897,828, issued August 4, 1959; No. 2,829,657, issued April 8, 1958; or No. 3,052,190, issued September 4, 1962. As shown in those patents, dairy equipment of the present type is used to convey milk from the various milking stations, or is used to pulsate cleansing fluid through the pipe lines, teat cups, associated equipment.

The present invention is concerned only with the receptacle and the parts associated immediately therewith, and a more detailed reference will now be made to the drawings illustrating those parts.

The washer-releaser provided by the present invention includes a receptacle R which is usually made of glass so that the contents can be viewed and inspected. The receptacle has a large central opening **1** in its top which is defined by the vertical flange **1***a* that terminates in an upper horizontal edge **1***b*.

A cap **2** has a vertical flange **3** that terminates in a lower edge **3***a* and is adapted to set over the opening and compress a rubber gasket **4** therebetween. The rubber gasket is comprised of an upper thin edge **6**, a horizontal flange portion **7**, a vertical flange portion **8**, and a lower outwardly and downwardly tapering flange portion **9**. The horizontal flange **7** is adapted to rest and abut against the horizontal edge **1***b* which defines the uppermost limit of the receptacle.

The action of the cap when it is urged downwardly by the threaded screw **12** is such that the lower edge **3***a* of the cap bears tightly against the tapered flange **9** of the gasket. The downward pressure on the gasket causes its upper thin edge **6** to flare outwardly and tightly against the inner surface of the cap. This distorting action caused by the tightening of the cap thus urges the thin upper edge of the seal to bear tightly against the inner surface of the cap and prevents any crevice from being exposed to the fluid and in which the fluid can accumulate. The joint so formed is absolutely fluid tight and completely sanitary in all respects. It is an easy matter to completely disassemble the cap and gasket for cleaning purposes, by the simple expedient of unscrewing the threaded member **12** and lifting the cap from the receptacle.

A downwardly extending neck is formed on the lower end of the receptacle and has a tapered outer wall which terminates in an enlarged lower end. Fluid is adapted to be discharged through this neck.

The receptacle is mounted by means of the large C-shaped clamp **15** which constitutes a mounting member that has a lower end **16** in which an opening **17** is formed. The neck of the receptacle has a tapered rubber grommet **18** therearound, and the neck is adapted to extend through the opening, and the grommet then bears firmly in the complementary tapered portion **19** of the opening.

The upper end of the mounting member contains the threaded member **12** which is adapted to engage the up-

per end of a vertical rod, and when the threaded member 12 is screwed downwardly, it urges the cap tightly against the rubber gasket as previously described.

When it is desired to disassemble the unit for cleansing purposes, the threaded member 12 is loosened, thus permitting the receptacle to be tipped as shown in FIGURE 3 and the cap, vertical rod, and its associated float 20 removed from the receptacle.

Heretofore, it has been a difficult task for one operator to remove these parts and at the same time prevent the receptacle from tilting excessively and thereby falling from the mounting member. The receptacle is usually quite large and awkward to handle, and heretofore many of these receptacles have been broken in the process of assembling or disassembling these washer-releaser units.

In accordance with the present invention, the receptacle is prevented from tilting excessively when its upper end has been detached from the mounting member as described. As shown in FIGURE 3, when the top of the receptacle is detached, the receptacle tilts so that the lower neck binds in the opening at the lower end of the mounting member. The tapered outer surface of the neck and the enlarged terminal end thereof prevent the neck from slipping upwardly out of the opening. In this manner, even though the upper end of the receptacle is detached, the receptacle can only tip within a predetermined limit. The operator need not be concerned with nor hold the receptacle when the cap and its associated mechanism are removed from the unit.

The receptacle also includes a side inlet conduit 30 which enters through the side wall 31 of the receptacle. This conduit includes a detachable portion 32 which has a tapered valve seat 33 formed on the interior thereof. A shiftable valve element in the form of a ball 35 is located within the conduit and is adapted to bear against the valve seat so as to prevent fluid from flowing from the receptacle and through the conduit. In other words, the conduit constitutes a one-way fluid inlet conduit. Also located within the conduit is a projection 36 which is spaced from the valve seat and is located on that side of the ball opposite from the seat. This projection has been shown as a short stub shaft member which extends from the one side of the conduit and inwardly to approximately the center of the conduit, when viewed in plan. Other forms of projections may be used with the present invention, but in any instance, this projection is so formed and arranged that the ball will be urged by incoming fluid against the projection and to the opposite side of the conduit, as viewed in plan, from which the fluid comes in its rotation around the receptacle. As a result, the major flow of the fluid through the conduit (as shown by the arrow in FIGURE 2) is at the same side of the conduit from which the fluid comes in its circular path around the receptacle. The majority of the resulting flow in the conduit thereby enters the receptacle at the side of the conduit past which the fluid in the receptacle first passes.

Due to the rotation of the earth, in the Northern Hemisphere fluid in a receptacle such as involved in the present invention tends to rotate or spin in a clockwise direction, when viewed in plan, and as shown by the curvilinear arrow in FIGURE 2. This phenomenon of fluid rotation is sometimes so severe as to cause the fluid, due to centrifugal force, to bear against the side walls of the receptacle and actually climb up a considerable distance along these walls. Consequently, there is formed a void in the center of the receptacle, and no fluid discharges by gravity through the lower neck.

Suitable threaded couplings 40 are provided, including a rubber gasket 41, for sealing the detachable conduit portion to the outwardly extending portion 44 of the receptacle. Thus, the removable portion of the conduit can be rotated so as to position the projection in any suitable circumferential location and thereby vary the circumferential position of the fluid flow into the receptacle.

By means of the present invention, wherein the flow of fluid enters the receptacle at that side of the conduit past which the fluid in the receptacle first flows, and this swirling or spinning motion of the fluid in the receptacle is broken up and turbulence is created so that the fluid drops into the lower portion of the receptacle and flows out the lower neck. I have discovered that by causing the fluid to flow into the receptacle at that described side of the conduit, it causes this effective break up of fluid spinning in the receptacle. I have also found that by varying the rotative or circumferential position of the flow path through the conduit and into the receptacle, the rate or amount of break up of fluid spin can be varied. In this manner, the rate or amount of fluid discharged through the lower neck can also be controlled. This is accomplished by rotating the neck portion containing the check ball and projection to any desired position. Maximum break up of fluid spin occurs when the fluid path is located to the extreme side of the conduit, as shown in FIGURE 2. By causing the fluid path to be located to the extreme opposite of the conduit from that shown in FIGURE 2, no appreciable fluid spin break up occurs.

Various modes of carrying out the invention are contemplated as being within the scope of the following claims particularly pointing out and distinctly claiming the subject matter which is regarded as the invention.

I claim:

1. A washer-releaser unit for dairy equipment comprising, a fluid receptacle having a circular side wall and a lower central discharge opening, a fluid inlet conduit in communication with said receptacle through said side wall thereof, said conduit having an interior valve seat, a shiftable ball in said conduit and abuttable against said seat to prevent fluid flow from said receptacle through said conduit, and a projection in said conduit and located on the right side of said conduit when viewed in plan so that said ball is urged by said flow of fluid against said projection and to the left side of said conduit whereby the major portion of fluid enters said receptacle via the right side of said conduit.

2. The combination set forth in claim 1 further characterized in that the circumferential position of said projection in said conduit can be varied to thereby vary the position of the major portion of said flow in said conduit.

3. A washer-releaser unit for dairy equipment comprising, a fluid receptacle having a side wall and a lower central discharge opening, a fluid inlet conduit in said side wall, said conduit having an interior valve seat, a shiftable element in said conduit and abuttable against said seat to prevent fluid flow from said receptacle through said conduit, and a projection in said conduit and spaced from said seat and on the side of said element opposite from said seat, said element abutting against said projection when fluid flows through said inlet conduit into said receptacle, said projection being so shaped and arranged that said element is urged by said flow of fluid to the left side of said conduit when viewed in plan whereby the major portion of fluid enters said receptacle via the right side of said conduit.

4. The combination set forth in claim 3 further characterized in that the circumferential position of said projection in said conduit can be varied to thereby vary the position of the major portion of said flow in said conduit.

5. A washer-releaser unit for dairy equipment comprising, a fluid receptacle having a circular side wall and a lower central discharge opening, a fluid inlet conduit in communication with said receptacle through said side wall thereof, said conduit having an interior valve

seat, a shiftable ball in said conduit and abuttable against said seat to prevent fluid flow from said receptacle through said conduit, and a projection in said conduit and spaced from said seat and on the side of said ball opposite from said seat, said ball abutting against said projection when fluid flows through said inlet conduit into said recepatcle, said projection being so shaped and arranged that said ball is urged by said flow of fluid to the left side of said conduit when viewed in plan whereby the major portion of fluid enters said receptacle via the right side of said conduit when viewed in plan.

6. The combination set forth in claim 5 including means for rotating said conduit about its axis to vary the position of said projection and consequently the position of the major portion of said flow in said conduit.

7. A washer-releaser unit for dairy equipment comprising, a fluid receptacle having a lower discharge neck extending downwardly therefrom, said neck having an outer surface tapering outwardly and downwardly and terminating in an enlarged lower end, a mounting member including a lower end having an opening through which said neck extends and on which end said receptacle rests, said mounting member including an upper end having means for detachably securing the upper end of said receptacle to said mounting member and holding said receptacle in an upright position, said receptacle assuming a tilted position when said upper end of said receptacle is detached from said mounting member, the tapered outer surface of said neck engaging said lower end of said mounting member and binding in said opening to hold said receptacle in said mounting member.

8. A washer-releaser unit for dairy equipment comprising, a fluid receptacle having a lower discharge neck extending downwardly therefrom, said neck diverging downwardly and terminating in an enlarged lower end, a mounting member having a lower end and an upper end, said lower end having an opening through which said neck extends and on which end said receptacle is supported, and means on said upper end of said member for detachably securing the upper end of said receptacle to said mounting member, said receptacle tilting about said lower end of said mounting member when said upper end of said receptacle is detached from said mounting member and said neck then binding in said opening to prevent said receptacle from tilting beyond a predetermined limit.

9. A washer-releaser unit for dairy equipment comprising, a fluid receptacle having a lower discharge neck extending downwardly therefrom, a mounting member including a lower end having an opening through which said neck extends and on which end said receptacle rests in an assembled position, said mounting member including an upper end having means for detachably securing the upper end of said receptacle to said mounting member to hold said receptacle in an upright position, said receptacle assuming a tilted position when said upper end of said receptacle is detached from said mounting member, the length of said neck being such that said neck engages the lower end of said member and binds in said opening to prevent said receptacle from falling out of said opening.

10. A washer-releaser unit for dairy equipment comprising, a fluid receptacle having an opening in its upper end, said opening defined by a vertical flange which terminates in an upper horizontal edge, a flexible gasket set around said opening and having an interior vertical flange and a horizontal flange bearing respectively against the vertical flange and horizontal edge of said receptacle, said gasket terminating at its upper end in a thin vertical edge, said gasket terminating at its lower end in an outwardly and downwardly inclined flange, and a hollow cap for said receptacle and extending over and around said gasket, said cap having a lower edge engageable with said inclined flange of said gasket whereby downward pressure of said cap on said inclined flange causes the gasket to distort and the thin vertical edge of said gasket to be urged in an outward direction and bear tightly against the inner surface of said hollow cap.

11. A washer-releaser unit for dairy equipment comprising, a fluid receptacle, a mounting member embracing said receptacle and engaging its lower end for support thereof, said fluid receptacle having an opening in its upper end, said opening defined by a vertical flange which terminates in an upper horizontal edge, a flexible gasket set around said opening and having an interior vertical flange and a horizontal flange bearing respectively against the vertical flange and horizontal edge of said receptacle, said gasket terminating at its upper end in a thin vertical edge, said gasket terminating at its lower end in an outwardly and downwardly inclined flange, a hollow cap for said receptacle and extending over and around said gasket to enclose said receptacle opening, said cap having a lower vertical flange which terminates in a lower edge that is engageable with said inclined flange of said gasket, and means on the upper end of said mounting member for securing the upper end of said receptacle by applying downward pressure on said cap and consequent downward pressure of said cap lower edge on said inclined flange to cause said thin vertical edge of said gasket to be urged in an outward direction and bear tightly against the inside of said cap in sealing relationship therewith.

12. Dairy equipment comprising, a fluid receptacle having at its upper end a vertical flange which terminates in a horizontal edge to define an opening in said receptacle, a flexible gasket having a vertical flange and a horizontal flange bearing respectively against the vertical flange and horizontal edge of said receptacle, said gasket terminating at its upper end in a thin vertical edge located above said horizontal edge, said gasket terminating at its lower end in an outwardly and downwardly inclined flange located below said horizontal edge, a hollow cap for said receptacle and extending over said gasket, said cap having a vertical flange and a horizontal flange bearing respectively against the vertical and horizontal flanges of said gasket, said cap vertical flange terminating in a lower edge which is engageable with said inclined flange of said gasket, and means for applying downward pressure on said cap and consequently on said inclined flange to cause the gasket to distort and the thin vertical edge of said gasket to be urged in an outward direction and bear tightly against the inner surface of said hollow cap.

13. A washer-releaser unit for dairy equipment comprising, a fluid receptacle, a mounting member embracing said receptacle and engaging its lower end for support thereof, said fluid receptacle having an opening in its upper end, said opening defined by a vertical flange which terminates in an upper horizontal edge, a flexible gasket set around said opening and having a vertical flange and a horizontal flange bearing respectively against the vertical flange and horizontal edge of said receptacle, said gasket terminating at its upper end in a thin vertical edge located above said horizontal edge, said gasket terminating at its lower end in an outwardly and downwardly inclined flange located below said horizontal edge, a hollow cap for said receptacle and extending over and around said gasket to enclose said receptacle opening, said cap having a vertical flange and a horizontal flange bearing respectively against the vertical and horizontal flanges of said gasket, said cap vertical flange terminating in a lower edge that is engageable with said inclined flange of said gasket, and means on said mounting member for applying downward pressure on said cap and consequently downward pressure of said cap lower edge on said inclined flange to cause the gasket to distort and the thin vertical edge of said gasket to be urged in an outward direction and bear tightly against the inside of said hollow cap.

14. A washer-releaser unit for dairy equipment comprising, a C-shaped mounting member having a lower end and an upper end, said lower end having an opening therethrough, a fluid receptacle having a lower discharge neck which extends through said opening in said mounting

member for support by said member, said receptacle having at its upper end a vertical flange that terminates in an upper horizontal edge to define an upper opening in said receptacle, a flexible gasket set around said opening and having an interior vertical flange and a horizontal flange bearing respectively against the vertical flange and horizontal edge of said receptacle, said gasket terminating at its upper end in a thin vertical edge, said gasket terminating at its lower end in an outwardly and downwardly inclined flange, a hollow cap for said receptacle and extending over and around said gasket to enclose said receptacle opening, said cap having a lower vertical flange which terminates in a lower edge that is engageable with said inclined flange of said gasket, and means on the upper end of said mounting member for securing the upper end of said receptacle by applying downward pressure on said cap and consequent downward pressure of said cap lower edge on said inclined flange to cause said

thin vertical edge of said gasket to be urged in an outward direction and bear tightly against the inside of said cap in sealing relationship therewith, said receptacle tilting about said lower end of said mounting member when said upper end of said receptacle is detached from said mounting member and said neck then binding in said opening to prevent said receptacle from tilting beyond a predetermined limit.

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