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2,922,526

DRAIN FUNNEL

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2 Sheets-Sheet 1

FIG. 1

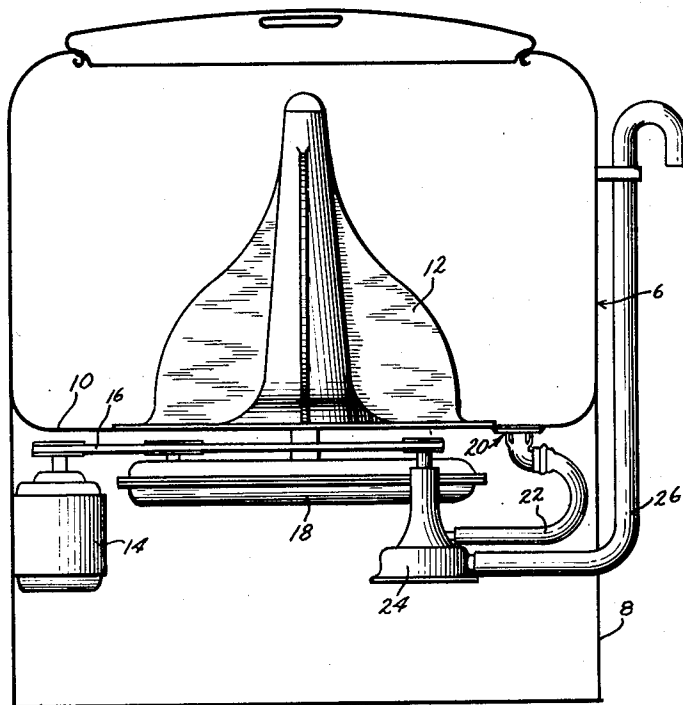


FIG. 2

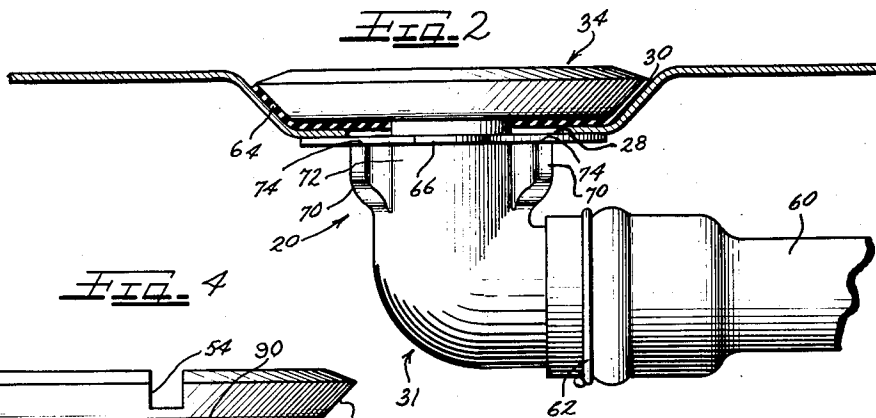
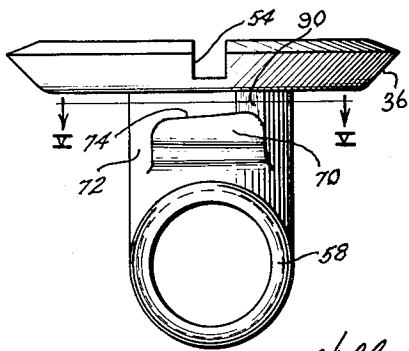


FIG. 4



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FIG

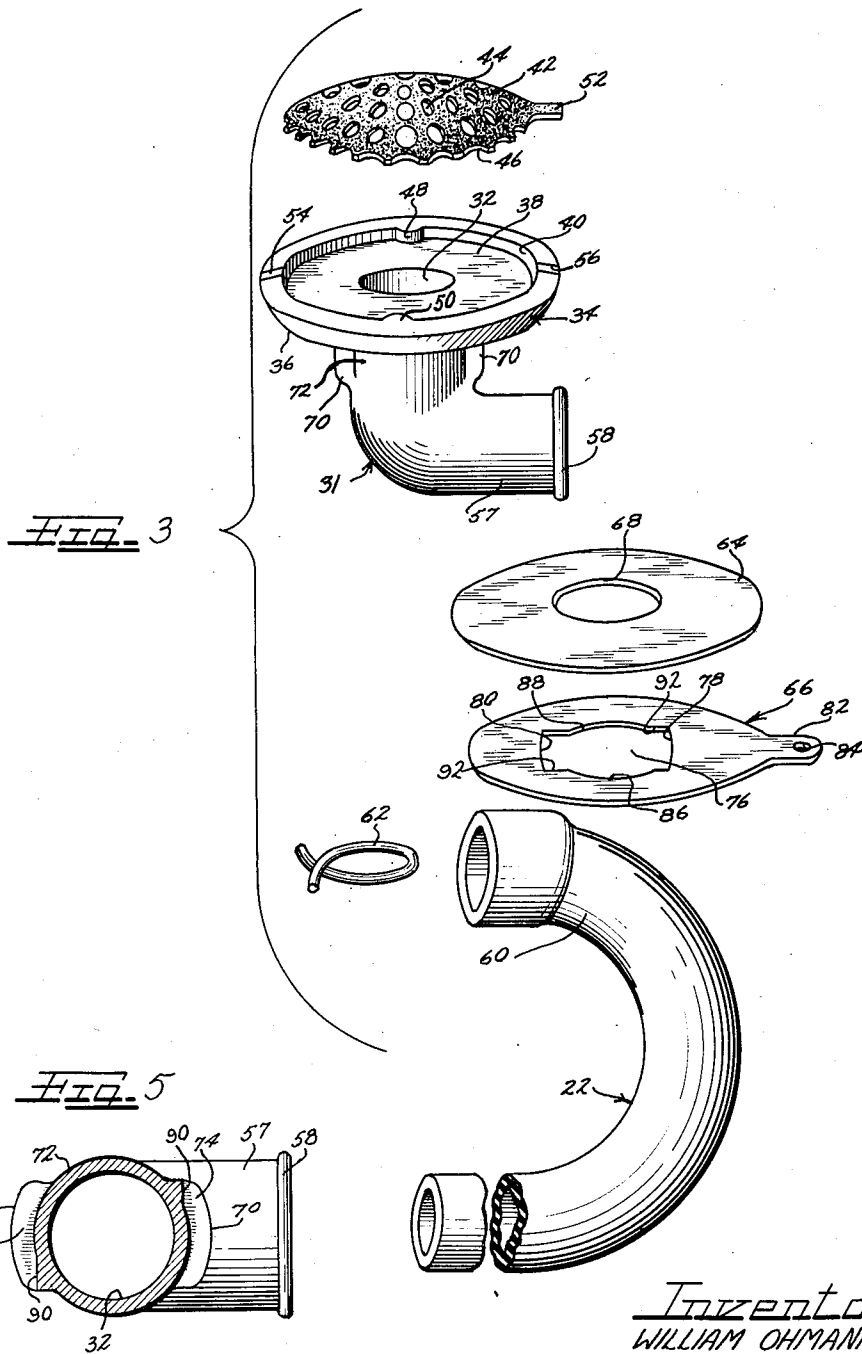
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## DRAIN FUNNEL

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1 Claim. (Cl. 210—455)

The present invention relates to improvements in drain fittings for attaching to drain openings of fluid containers, such as are required for draining the washing fluid from washing machine tubs and like fluid containers.

An object of the invention is to provide an improved form of drain funnel which will fit the drain opening of a fluid container and which will receive an improved form of clamping ring to avoid difficulties encountered with fittings heretofore used.

Another object of the invention is to provide an improved drain fitting for a fluid container which is manufactured with parts which require no expensive machining or thread cutting operations and can be formed by simple manufacturing processes.

Another object of the invention is to provide an improved drain fitting for a fluid container which can be quickly and easily assembled, lending itself to high speed production assembly.

A further object of the invention is to provide an improved drain fitting of parts which will avoid breakage and damage in shipping and in assembly and which will form an improved leakproof connection with the container not susceptible to vibrations, jars or shocks.

A still further object of the invention is to provide an improved drain fitting which will not damage the fluid containing tank or tank surfaces, and which will also conform to both minor and major dimensional deviations of the tank and drain opening and will insure the provision of a leakproof connection.

Another object of the invention is to provide an improved drain fitting which can be quickly assembled and will insure that no damage will ensue to the fitting due to the application of excessive or improper forces.

Another object of the invention is to provide a stop means integral with the drain fitting which insures proper assembly and prevents excessive forces on the leakproof connection.

Other objects and advantages will become more apparent with the teaching of the invention in the disclosure of the principles, methods and structure as utilized in the preferred embodiment described in the accompanying specification and illustrated in the drawings in which:

Figure 1 is a side elevation view, partly in section, illustrating the interior construction of a washing machine tub to show the utilization of a preferred embodiment of the invention;

Figure 2 is an enlarged detailed vertical sectional view taken through the drain fitting to illustrate the details of assembly;

Figure 3 is a detailed exploded view illustrating the elements of the fitting and the order in which they are assembled.

Figure 4 is another end elevational view of the drain fitting; and

Figure 5 is a sectional view taken along line 5—5 of Figure 4.

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In the preferred embodiment, as illustrated in Figures 1, 2 and 3, the fitting is illustrated as being used in combination with a home washing machine, wherein the washing fluid is drained to a drain pump for purposes of emptying the washing machine tub. While certain advantages and effects are obtained from utilizing the particular combination shown as the preferred embodiment, it will be understood by those skilled in the art that features of the invention may be adapted to use in environments other than the one illustrated in which the invention enjoys particular utility, without departing from the principles of the invention.

In the washing machine illustrated at 6 in Figure 1, the washer is provided with a cabinet 8 housing the operating mechanism including a tub 10 enclosing an agitator 12. For the washing operation a washing fluid is placed in the tub 10 along with the clothing to be laundered, and the agitator 12 is driven by an operating motor 14 which, through suitable drive connections 16, operates a gear transmission 18 to drive the agitator 12. At the end of the washing operation, the fluid from within the tub 10 is drained through the drain fitting shown generally at 20, which leads to the drain hose 22 connecting to the drain pump 24. The drain pump has a drain line 26 connected thereto which can be lead to an adjacent laundry sink for disposing of the waste washing fluid, or, if desired, can be lead to a floor drain for emptying the tub 10 by gravity or by aid of the pump 24.

As illustrated in Figure 2, the tub or fluid container 10 is provided with a circular drain opening 28 at the base of a depression or tub sump 30 in the base of the said tub.

The drain fitting assembly, shown generally at 20, is attached to the tub sump 30 in a leakproof manner to drain the washing fluid from the tub 10. The fitting includes a drain member or funnel 31, also shown in Figure 3, having an interior conduit or passageway 32 for conducting the washing fluid from the fluid container. The funnel 31 is shown in the shape of an elbow, but may extend downwardly to form a straight conduit 32 or to angle off in varying degrees depending on the installation desired. At the top, the funnel carries an enlarged head 34 which is larger than the drain opening 28 so as to prevent the funnel passing through the opening when installed in the container, as shown in Figure 2. The head has a rounded face 36 which conforms to the inner face of the sump for tight contact therewith and in assembly a gasket 64 is positioned between the surface of the sump 30 and the head 34 of the funnel to prevent leakage.

The upper face of the funnel contains a circular depressed surface 38 surrounded by an annular wall 40 in which is held a screen 42 for preventing large articles from entering the conduit 32 to plug the conduit or to damage the pump 24. The screen is in the shape of an inverted bowl having perforations 44 and the continuation of the perforations forms a serrated edge 46. At spaced points along the wall 40 in the top surface of the funnel are small protuberances 48 and 50 which engage in the serrations or notches to prevent rotation of the strainer. The strainer also has a small projection 52, projecting radially from the edge and this projection seats one of the notches 54 or 56 in the upper edge of the funnel to also prevent rotation and the projection 52 permits the operator to lift the screen from the top depressed surface 38 of the funnel for cleaning purposes.

At the lower terminal edge of the funnel is an annular rib or bead 58 which aids in keeping the hose 60 in place over the end of the funnel. For assembly, the hose is forced over the lower end of the funnel and a hose clamp 62, which is formed of spring biased wire, is clipped over

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the hose to firmly grip it to the lower end of the funnel for a fixed but detachable connection. The hose 60 may be in several sections joined by connectors and leads downwardly and is shown in its entirety at 22 in Figure 1 as connecting to the drain pump 24.

When the fitting is assembled on the fluid container, the gasket 64 is first slid over the lower end 57 of the funnel and the funnel is slid into the drain opening 28 from the inside of the tub 10. A clamping member 66 is then slid over the lower end 57 of the funnel and pushed up against the tub 10 and rotated to lock the assembly in place.

The gasket 64 is annular in shape and has a central opening 68 which permits it to be slid over the funnel. The gasket is made of a soft resilient material, such as rubber or cork and will be forced down into the sump 30 to conform to the shape of the lower surface of the funnel head 34 and the sump 30, as is shown in Figure 2.

To clamp the funnel in place and to pull the head of the funnel down tightly within the sump 30 of the container, the clamping member 66 is pushed up into place against the tub and rotated to lock it in place. For obtaining locking engagement between the clamping ring 66 and the funnel 31 a rotatable connection is provided.

The funnel carries a plurality of locking bosses or embossments 70, 70 which project radially outwardly from the lower shank portion 72 of the funnel that extends downwardly beneath the head 34. The bosses carry stop members 90, 90 as shown in Figs. 4 and 5. The bosses have an inclined locking upper face 74 which faces upwardly toward the enlarged head 34 of the funnel. These locking faces are also inclined upwardly toward the head so that as the clamping ring 66 is rotated it will be pulled firmly against the container surface adjacent the drain opening 28. Although various numbers of bosses 70, 70 may be employed, the preferred embodiment utilizes two of these members placed diametrically opposite each other on the shank 72 of the funnel. The stop members 90, 90 coact with the locking faces 92, 92 of the clamping ring 66 to control and limit the amount of rotation of the clamping ring in relation to the shaft 72 of the funnel.

The clamping ring contains a central opening 76 to permit it to be slid up over the lower end 57 of the funnel 31 and moved into place and a pair of cut-out portions or notches 78 and 80 are cut into the inner edge of the opening 76 in order that the ring may be slid up over the bosses. The edge of the inner opening 76 between these bosses then forms elongated arcuate fingers 86 and 88 which can move in sliding locking engagement with the locking surfaces 74 of the bosses 70, 70.

For rotating the clamping ring 66, it is provided with an integral radially extending tab 82 which is provided with means, such as a hole 84, for inserting a tool to rotate the clamping ring 66. It is to be noted that this is a convenient element for applying a tool and even more important this element, being formed of the same material as the ring, will yield when excess pressure is applied so as to avoid damaging the locking ring or the other parts due to the excess pressure or due to improper pressure, such as may be applied in the wrong direction.

It is also to be specifically noted that the locking ring is formed of a thin flat metal which provides a member easily manufactured and the ring and the central opening may be easily formed by a stamping operation. Also of considerable importance is the fact that the thin flat ring is yieldable in nature so that it will readily conform to major dimensional deviations in the material of the tub which surrounds the drain hole 28. To permit conformity of the clamping ring 66 to variations in thicknesses of the tub sump or to conform to minor inaccuracies of the position of the head 34 of the funnel, the clamping ring is locked to the funnel at spaced locations which engage the inner splines 86 and 88 of the locking ring. Thus, although the metal of the clamping ring presses upwardly against the container or tub 10 at all

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locations around the circumference of the ring, the ring is free to deform and grip the tub firmly with inaccuracies in manufacture of the mating parts. Small deformities in the metal or foreign materials which may get between the clamping parts are accommodated by the soft gasket and therefore with the combined elements of the gasket and the clamping ring both minor and major dimensional deviations and deformities are accommodated to obtain a firm clamping relationship between the fluid container and the drain and fitting.

This firm connecting relationship is important in use in machines, such as a washer; wherein continual vibrations are encountered during operation due to the operation of the mechanical parts, such as the motor, the gearing, the agitator, etc. In addition to providing a firm resilient grip of the drain fitting it will accommodate stresses and strains, such as encountered during assembly and shipping and the parts are not highly machined and therefore are not susceptible to being made useless by minor imperfections or damages, such as are likely to occur.

Although the function and operation of the various elements as a combination will be understood from the foregoing detailed description, a summary of the structure will be helpful in understanding and reviewing the objectives and advantages of the invention. In usage and in assembly the tub 10, which contains a washing fluid to be drained therefrom at some point in the operation, has a centrally located drain hole 28 in the middle of the pressed sump 30. The gasket 64 is slid up over the lower end 57 of the funnel and positioned up against the lower surface of the enlarged head 34. The end 58 of the drain fitting is then inserted through the drain opening 28 so that the lower shank 72 extends downwardly through the drain hole and the head 34 and gasket 64 rest against the upper surface of the sump. The clamping ring 66 is next slid up over the end 57 and moved into place with the notches 78 and 80, permitting the ring to slide up over the bosses 70, 70 projecting from the shank 72 of the funnel. The arcuate fingers 86 and 88, between the notches 78 and 80, co-operate with the upper inclined locking surfaces 74 of the bosses 70, 70 to force the locking ring tightly against the surface of the tub 10 when the locking ring is rotated. The opening 28 in the sump is sufficiently large to permit the bosses 70, 70 to pass. Thus, the arcuate fingers are supported within the confines of the opening 28, and only the outer edge of the clamping ring 66 locks the funnel and the outer edge will yield with stresses to obtain a resilient lock. For rotation, the locking ring is provided with a radial tab 82 with an opening 84 for purposes of connecting a tightening tool. The clamping ring 66 is formed of a yieldable thin sheet of material so that it will conform to deviations in the upper locking surfaces of the bosses 70 and will accommodate other dimensional defects so as to form a firm but yieldable clamp. The pipe or conduit 60 is then slid over the rib 58 on the end 57, and the spring ring 62 is snapped in place to complete the assembly.

Thus, I have provided an improved drain fitting which meets the objectives and advantages hereinbefore set forth. The apparatus is readily and simply assembled and is of simplified construction so that it is inexpensive to manufacture and does not require complex costly machining operations. The fitting is well adapted to use where vibrations are encountered in operation and where stresses may occur to the conduit leading from the fitting.

I have, in the drawings and specification, presented a detailed disclosure of the preferred embodiments of my invention, but it is to be understood that I do not intend to limit the invention to the specific form disclosed but intend to cover all modifications, changes and alternative constructions and methods falling within the scope of the principles taught by my invention.

I claim as my invention:

In a drain fitting particularly adapted for sealing a re-

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cessed sump of a laundry machine tub, a generally funnel-shaped body member having a head having a flat undersurface and a peripheral face tapering outwardly from said flat undersurface to conform to the sump, said body member having a drain conduit leading downwardly from said flat undersurface forming a drain passageway, said head having an annular rib extending thereabout and also having a depressed surface intermediate said rib and said drain passageway, a screen fitting within the inner margin of said rib, said rib having protuberances projecting inwardly therefrom for interengagement with the marginal portion of said screen, and said screen having a tab extending radially therefrom and overlying and spaced from said rib, enabling ready removal of said screen for cleaning purposes, means sealing said body member to said recessed sump comprising a yieldable gasket fitting on said drain conduit for engagement with the flat undersurface of said head and the peripheral face thereof, bosses projecting from the wall of said conduit in vertically spaced relation with respect to said flat undersurface and having inclined upper surfaces inclined upwardly toward said head, a flat thin annular metal locking ring having an inner margin fitting along said conduit and having opposite notched portions forming continuations of said inner margin and generally conforming to the configuration of said bosses for accommodating said locking ring to pass over said bosses and cooperating with said in-

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clined surfaces of said bosses upon turning movement of said locking ring to wedge said locking ring against the bottom of said sump recess and simultaneously force said gasket into engagement therewith, a tab projecting from said locking ring, accommodating turning movement thereof by hand to clamp said drain fitting to the sump, and stop members in the space between the upper ends of said inclined surfaces and the flat undersurface of said head and engageable with said notched portions of said clamping ring and limiting movement of said locking ring in a clamping direction.

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