

[54] **OVERFLOW FLOAT ARRANGEMENT
FOR DISHWASHER**

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[51] Int. Cl. **H01h 35/18**

[58] Field of Search **200/61.2, 84 R, 84 A, 84 B,
200/84 C; 134/56 D, 57 D; 137/386, 387**

[56] **References Cited**

UNITED STATES PATENTS

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FOREIGN PATENTS OR APPLICATIONS

137,772 10/1948 Australia 200/84

Primary Examiner—Herman J. Hohaus

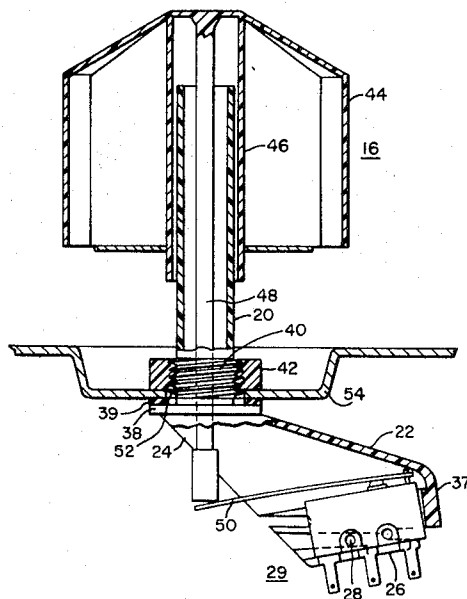
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[57] **ABSTRACT**

An overflow control float arrangement in which a structurally integral member secured to the bottom wall of the dishwasher tub includes a float guide portion projecting up into the tub and a switch mounting portion located below the tub wall so that as assembled the adjusted relation between the float and control switch is automatically obtained.

3 Claims, 5 Drawing Figures



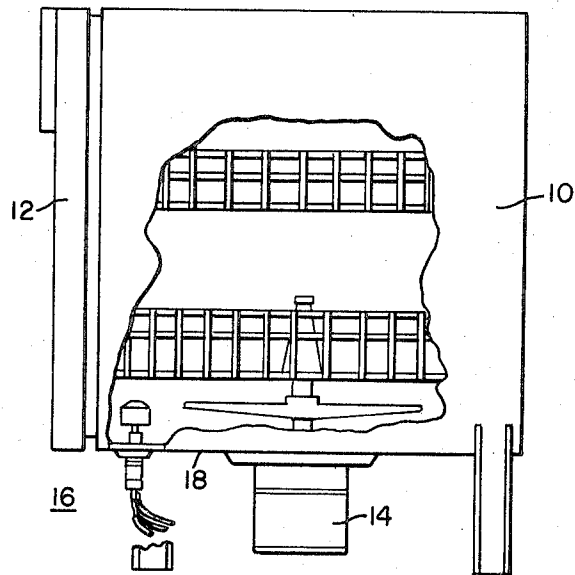


FIG. 1

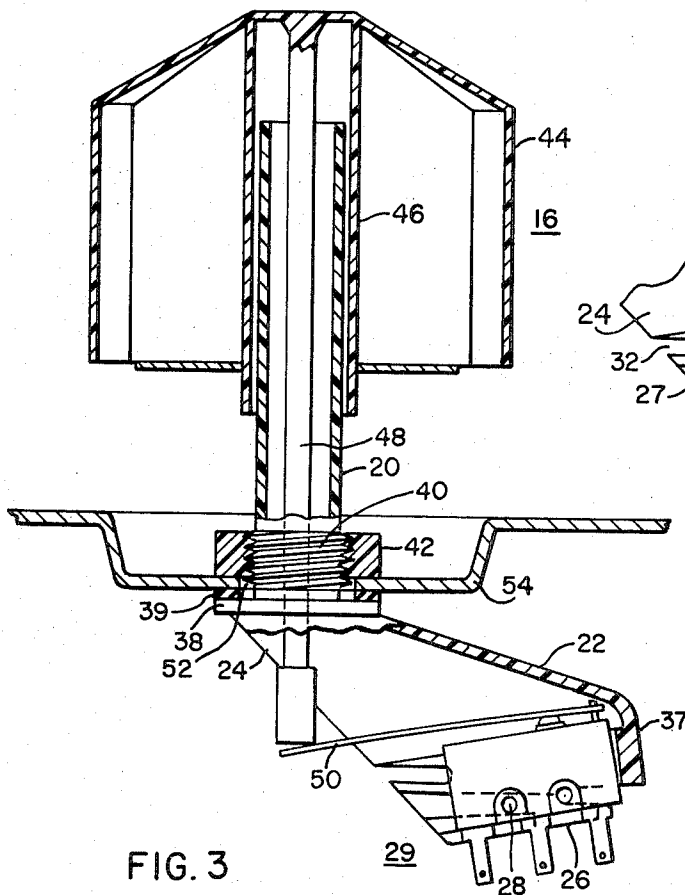


FIG. 3

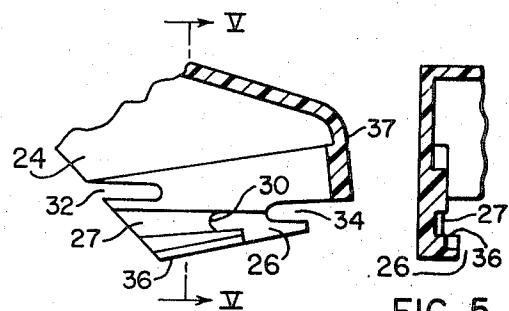
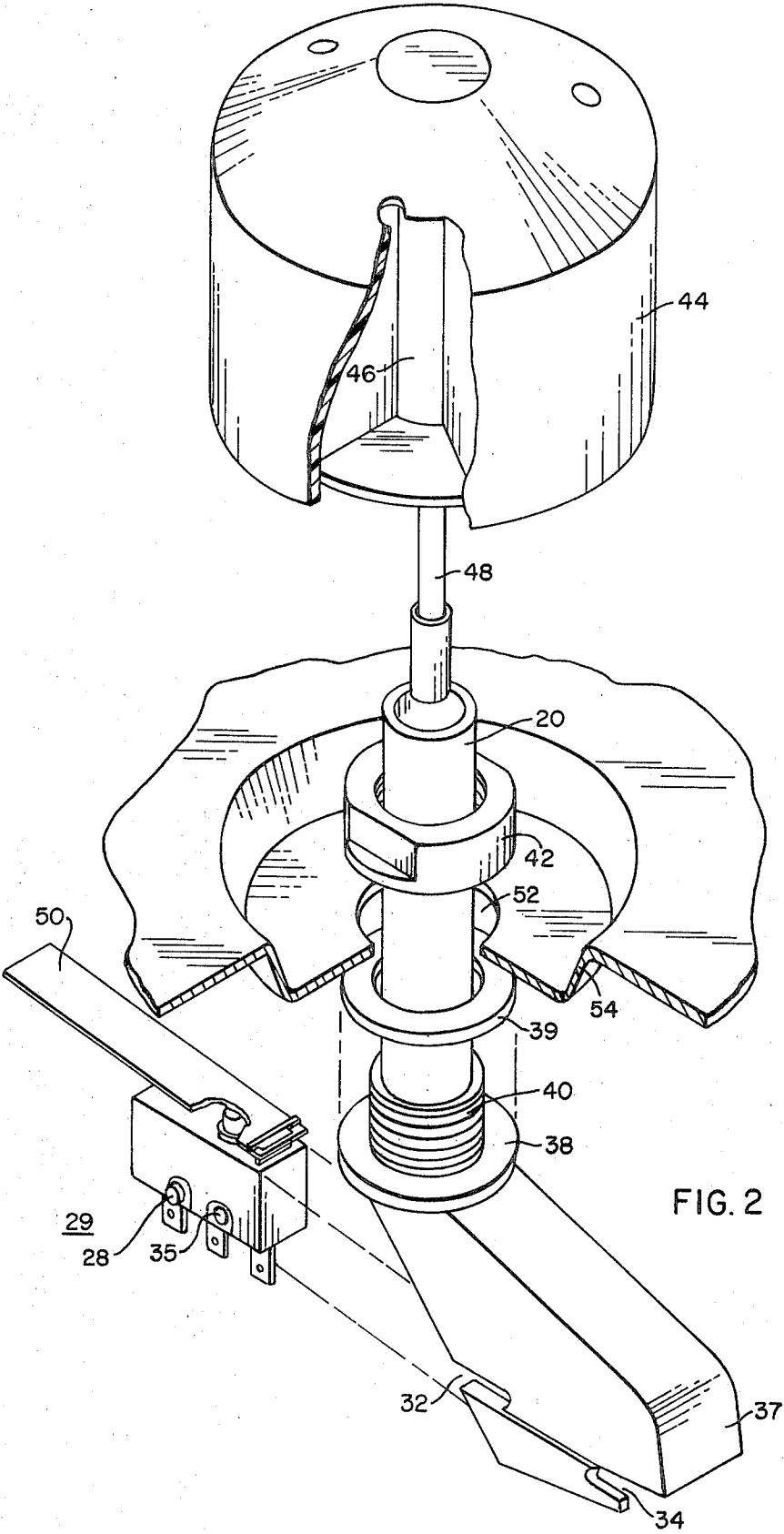


FIG. 4

FIG. 5



OVERFLOW FLOAT ARRANGEMENT FOR DISHWASHER

BACKGROUND OF THE INVENTION

1. Field of the Invention

The invention pertains to the art of float arrangements for obtaining overflow control in dishwashers.

2. Description of the Prior Art

While I am not aware of any prior art considered particularly pertinent to my invention, patents which deal generally with one aspect or another of flood control and which in some cases include float means therein are U.S. Pat. Nos. 3,490,486; 3,439,687; 3,331,374; and 2,882,366.

However, as a general aid in better understanding my invention, the following background is considered pertinent. Any typical dishwasher flood protection arrangement basically comprises a float, means for guiding the float, and a switch responsive to the position of the float. The float and guide are typically located inside the dishwasher tube and the switch must be located outside of the tub. It is my view that unnecessary problems may be experienced in obtaining the proper dimensional relationships between the float and the switch to be actuated where the switch is mounted on a separate bracket or the like outside the tub wall. The proper relationship between the float and the switch requires that the part of the float which controls actuation of the switch will always hold the switch in one position while the water level is within its normal range, but with the dimensional relationships being sufficiently close that with a potential overflow or flood condition occurring, a relatively small movement of the float will result in the switch being actuated to a position to avert the flood condition. The reasons for requiring a relatively close adjustment between the float switch may be discerned from the following general information relating to flood control. The proper level of water in a dishwasher for washing and rinsing will usually be within perhaps three-fourths of an inch of an overflow condition. Also, with the water being flung about the interior of the dishwasher, the level of the water is not static but may be sufficiently turbulent that the float will bounce up as much as three-eighths of an inch simply from the turbulence. Additionally, with the typical timed fill arrangement in which water is permitted to enter the dishwasher for a given time period, the tolerance in the timer can result in a different water level. The typical fill valve also has a flow control washer to compensate for different water pressures to the valve but which does not completely equalize the total volume of water admitted at different pressures in the supply line. All of these factors taken together require that the adjustment between the float and the float operated switch be relatively close.

One aim of my invention is to provide an arrangement in which for all practical purposes no adjustment of such is required.

SUMMARY OF THE INVENTION

In accordance with my invention, I provide a structurally integral member, preferably a one-piece member, which includes the float guide portion which projects up into the tub, and a switch mounting portion which underlies the bottom wall of the tub. With this arrangement, when the switch is mounted on the switch

mounting portion and the float means is mounted on the float guide portion, the adjustment is automatically obtained.

The arrangement is also such in the currently preferred form of the structurally integral member that the switch is simply forced into a seat so that it is easily assembled. Further, the switch mounting portion may be located in various angularly displaced locations to accommodate the particular location of other parts in the motor compartment underlying the dishwasher tub.

DRAWING DESCRIPTION

FIG. 1 is a partly broken and generally schematic side view of an undercounter dishwasher showing the location of the float arrangement according to the invention;

FIG. 2 is an exploded isometric view of the arrangement according to the invention showing the relationship of the parts to each other and to the tub wall during assembly;

FIG. 3 is a fragmentary side view of the arrangement in assembled relation with one side of the switch mounting portion broken away;

FIG. 4 is an elevational view of the inside face of a fragmentary part of a side wall of the housing; and

FIG. 5 is a vertical section corresponding to one taken along the line 5—5 of FIG. 4.

BRIEF DESCRIPTION OF THE PREFERRED EMBODIMENT

Referring to FIG. 1, the schematically illustrated dishwasher includes a tub 10 which is forwardly open and is adapted to be closed by the swing-down door 12. The dishwasher may take any of a number of forms and includes the conventional elements such as the main motor 14 and associated pumps for effecting a water distribution in the tub and for pumping out drain water, the usual racks, a water inlet valve and the controls for effecting the desired sequence of operations. The overflow control float arrangement generally designated 16 is located adjacent the front, bottom, right-hand corner of the tub and is secured to the bottom wall 18 of the tub.

The parts which comprise the overflow control float arrangement and their relationships before and after assembly, are best seen in FIGS. 2 and 3. The structurally integral member is comprised of a tubular float guide portion 20 which is open at both its top and bottom ends, and a switch mounting portion 22 which has the general form of an irregularly shaped hollow box with both the diagonal face 24, and bottom face 26 being open. The switch mounting portion is provided with a track 27 (FIGS. 4 and 5) on the inner face of each of the side walls of the switch mounting portion for receiving the outwardly projecting dimples 28 at each side of the switch 29 when it is slipped into the mounting housing through the diagonal open face 24. The web part of each track angles slightly toward the inside of the housing, as with a ramp, and an offset toward the outside of the housing is provided at 30 into which the dimples snap when they reach that point. The forwardly open slots 32 may be used as strain reliefs for the two of the connecting wires if desired, while the rearwardly open slots 34 permit the insertion of a stabilizing pin (not shown) through the open bore

35 (FIG. 2) of the switch. It will be noted from FIG. 3 that the switch as installed seats in the housing on bottom ledge 36, and against the closed end wall 37 at the rear.

At the juncture of the float guide portion and the switch mounting portion, a shoulder 38 is provided to form a seat for a washer shaped sealing gasket 39. An enlarged lower portion of the float guide tube is exteriorly threaded as at 40 to receive thereon the nut 42 which is slipped down over the tubular guide portion 20 during the assembly.

The float means comprises an inverted cup-shaped member 44 which is at least partly open on its bottom face and is buoyant to respond to the level of water in the dishwasher tub. The interior structure of the float means includes an outer sleeve 46 of greater diameter than the guide portion so that the guide portion tube 20 may be closely received therewithin, and a center depending post 48 which is loosely received within the guide tube 20 and extends down to a position to bear against the actuating lever 50 of the switch 29.

While it is believed to be relatively clear from FIGS. 2 and 3, how the assembly of the parts proceeds, the following description of the assembly may aid. The switch 29 is mounted in its proper location by simply sliding it all the way into the switch mounting housing 22 through the diagonally open face 24, with the switch being properly positioned by the interrelationship between the internal track means 27 of the housing and the received dimples 28. The sealing washer 38 is then slipped down the tube guide 20 before the tube guide 20 is inserted through the opening 52 in the downwardly dished portion 54 of the tub bottom wall 18. The one-piece structure is then positioned in place with the tube guide 20 projecting up into the tub interior. The nut 42 is then dropped down over the tube guide 20 and is turned onto the threaded portion 40 to secure the one-piece structure in place and to provide a fluid tight seal by means of the gasket 39. The inverted cup float means 44 is then placed on the tube guide with the post 48 projecting down through the hollow tube guide.

It will be appreciated that the angular direction that the switch mounting housing 22 takes (depending upon the location of other parts in the machine compartment) is established before the nut 42 is tightened. However, it is not critical with respect to the function of the arrangement or the tightness of the seal that the switch mounting housing be in any particular angular disposition. The dished portion 54 of the tub bottom wall 18 establishes a flat surface for the seal and also establishes the level of the assembly for a particular tub with a desired particular water level.

The integral structure comprising the tube guide and switch mounting housing and associated parts intended for commercial use is of one piece construction of molded nylon. It will be appreciated that in some instances, it may be preferable to form the integral structure of more than one piece, but which as assembled has the character of an integral structure in which any substantial dimensional tolerances are avoided. In other words, so long as the mounting for the switch is a part of the overall structure which also serves as the

float guide any variations in a part of the tub bottom wall upon which a switch might normally be mounted and thus be different from one tub to another is avoided.

The exact circuitry in which the switch 30 is included is not considered important to my invention, and does not form a part thereof. However, for the purpose of describing generally how the switch may be connected in a circuit, it may be a single-pole, single-throw switch in series with a solenoid fill valve and having a closed position so long as the water level does not reach a potential flood condition. Then as the water level rises to such position, the float 44 rises and permits the switch 29 to be actuated through its internal bias to an open position to deenergize a fill valve solenoid. Of course in such an arrangement a flood condition could occur if the fill valve mechanically stuck in an open position. Thus, in the currently contemplated use of the switch, a single-pole, double-throw switch is used in which operations from a non-flood to a potential flood position of the switch not only opens a circuit to the fill solenoid, but also completes an independent circuit to the main motor for driving the drain pump and for holding a drain in an open position. Thus, even though water would continue to flow into the tub, the operation of the main motor with the drain open would remove the water as fast as it entered.

I claim as my invention:

1. In a dishwasher:

- a tub including a bottom wall having an opening therein;
- a structurally integral molded one-piece member having a tubular float guide portion open at both the top and bottom ends, and a switch mounting portion;
- a switch;

means securing said structurally integral member to said bottom wall with said float guide portion projecting up into said tub through said opening to a height that said open upper end is above a typical overflow water level, and said switch mounting portion being located below said bottom wall; float means responsive to the water level in said tub and guided for vertical movement by said guide portion and including a depending rod extending freely and in unconnected relation down through said guide portion to control said switch; and said switch is carried by said switch mounting portion in a position to be operated to alternate positions in accordance with vertical movement of said rod.

2. In a dishwasher according to claim 1 wherein:

said float guide portion is substantially vertically aligned and centered with said opening and said tub wall, and said switch mounting portion located below said tub wall extends generally radially to one side from said tub wall opening.

3. In a dishwasher according to claim 2 wherein:

said switch mounting portion comprises a generally hollow housing open on one face, and includes track means and seat means on the inner faces of a pair of opposite sides for slidably receiving and frictionally holding said switch in a single predetermined position in said housing.

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