

[54] DISHWASHING APPARATUS

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[51] Int. Cl.B08b 3/02, B08b 15/00

[58] Field of Search.....134/58 D, 95, 96, 104

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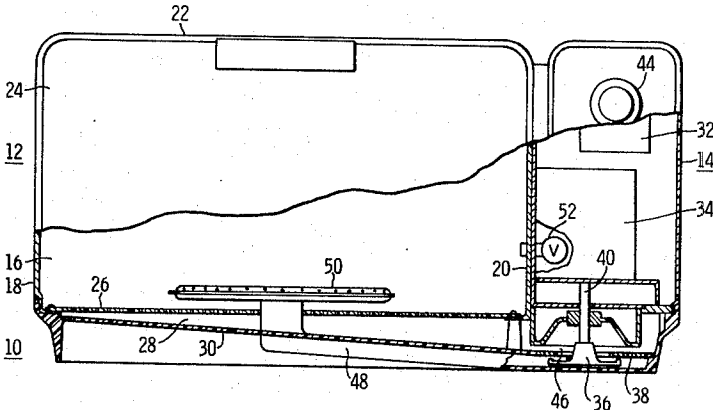
Primary Examiner—Robert L. Bluetge

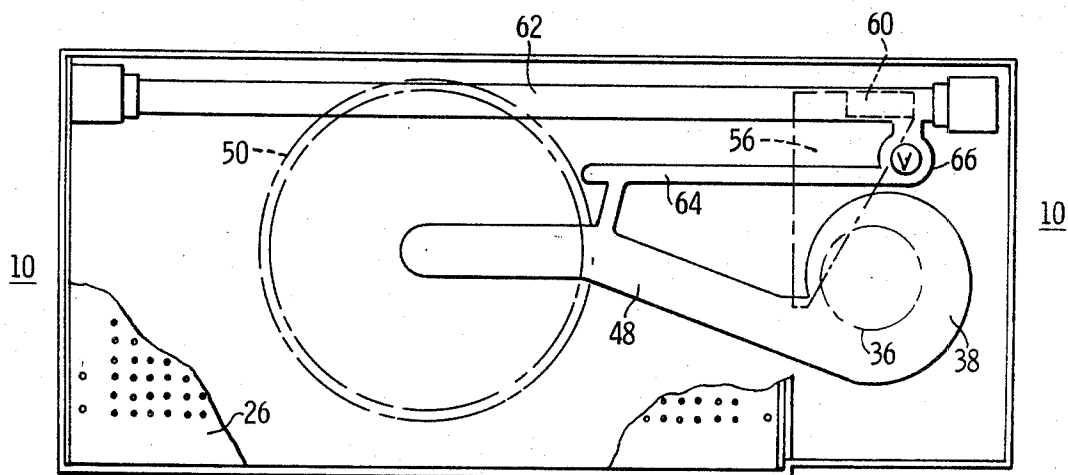
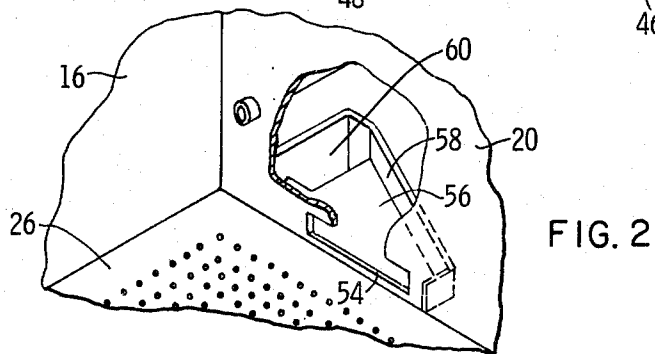
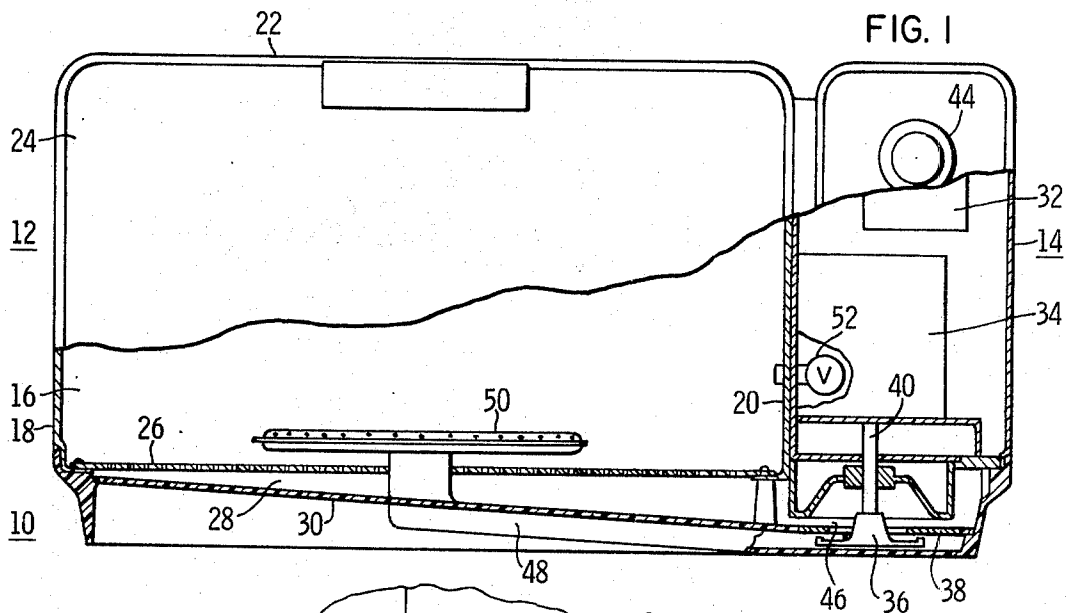
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[57] ABSTRACT

A dishwasher arrangement in which food particles separated from the articles being washed are separated from the water being circulated to effect the washing by momentarily stopping the circulation of the water in the washing chamber to permit the level of water in the sump to rise sufficiently to sweep the food particles out of an opening provided in a washing chamber wall.

3 Claims, 5 Drawing Figures





WITNESSES

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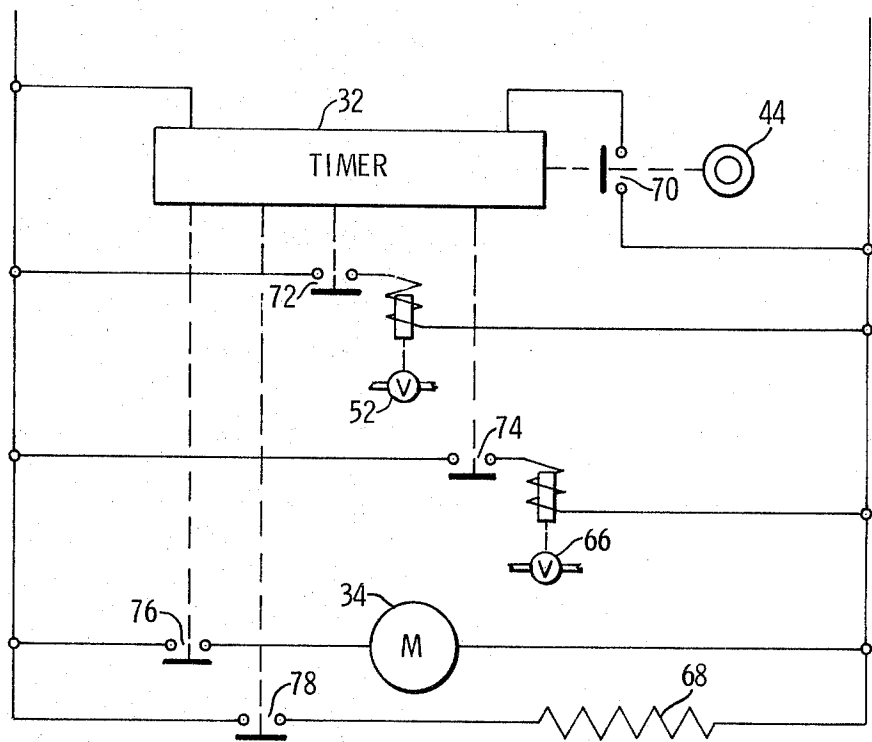


FIG. 4

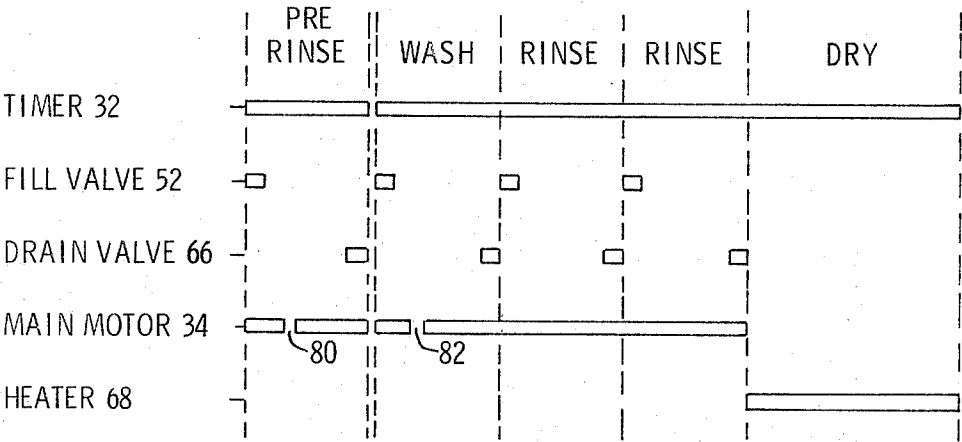


FIG. 5

DISHWASHING APPARATUS

BACKGROUND OF THE INVENTION

1. Field of the Invention

This invention pertains to the art of separating food particles in a dishwasher from the water being circulated to effect washing and rinsing.

2. Description of the Prior Art

In conventional dishwashers of which I am aware, one arrangement commonly used to separate water for recirculation in the dishwasher from food debris washed from the articles in the washing chamber is to pass the recirculation water through a screen which strains the food particles therefrom and directs the food particles into a space from which they are subsequently directed to drain when the washing or rinsing water is also flushed to drain. U.S. Pat. Nos. 3,034,518 and 3,210,009 are exemplary of such arrangements generally. The undercounter, and floor supported portable dishwashers in which such arrangements are typically provided are usually of sufficient height that no particular problem is encountered in providing a sloping screen arrangement which tends to channel and direct the food particles into a particular part of the sump. However, in a dishwasher in which the height of the machine is limited, such as a so-called countertop dishwasher, the provision of a screen with sufficient slope to direct the food particles during recirculation of the water to a particular space presents problems.

Accordingly, I have devised a way, especially useful in connection with portable countertop dishwashers, although not so limited in use, in which food particles and debris may be separated from the recirculation water without the provision of a screen of substantial slope.

SUMMARY OF THE INVENTION

In accordance with my invention, and as embodied in the countertop dishwasher, I provide a washing chamber with an underlying sump and a screening wall between the chamber and the sump, an opening in one of the walls at about the level of water normally obtaining during the circulation of water, and means for momentarily interrupting the circulation of the water during at least a washing or a rinsing operation for a sufficient period that the water dropping from the washing chamber space and off the articles being washed raises the level of the water in the chamber sufficiently to sweep the food particles and debris off the screening wall and out of the washing chamber through the opening provided in one of the side walls. In other words, I utilize the quantity of water being flung about the washing chamber and on the articles being washed to raise the level of water sufficient to sweep the food particles in a fashion analogous to a tidal wave.

DRAWING DESCRIPTION

FIG. 1 is a front elevation, partly broken, partly in section, and partly diagrammatic, illustrating a countertop dishwasher in which the invention may be embodied for example.

FIG. 2 is an interior isometric view directed toward the right, rear, lower corner of the washing chamber with a part of the wall of the motor compartment broken away;

FIG. 3 is a generally diagrammatic view in the nature of a horizontal section through the base of the unit illustrating the general relationship of the pump, supply and drain conduits;

FIG. 4 is a simplified schematic of a control arrangement which may be used in accordance with the invention; and

FIG. 5 is a chart illustrating a typical operational program for a dishwasher in which the invention may be embodied.

DESCRIPTION OF THE PREFERRED EMBODIMENT

The main parts of the countertop dishwasher shown in FIG. 1 include a base section 10, a washing chamber section 12, and a motor and control compartment 14. The wash chamber 12 is of generally rectangular box form and includes a rear wall 16, left and right side walls 18 and 20, top wall 22 and a

front hinged door 24 for access to the washing chamber space. The bottom of the washing chamber is defined by a foraminous member such as a plastic screen 26 overlying a sump space 28 defined on its bottom by the sloping bottom wall 30 of the base section 10.

Among the elements to be found in the machine compartment 14 is a timer 32 for controlling the duration of certain operations in the total operating cycle, a main motor 34 which drives the impeller 36 of a pump 38 connected to the motor by shaft 40. A control knob 44 is manually turned to energize the timer, with the timer then turning the knob with it as the operating cycle proceeds.

The sump space 28 underlying the washing chamber is in communication with the inlet 46 of the pump 38. The outlet of the pump 38 is connected to a conduit 48 molded into the plastic base section 10 for delivering water from the pump to one or more rotating arms 50 overlying the screen 26. The arm 50 is driven by the water being forced through the arm so that the arm flings the water about the washing chamber space and on to the articles (not shown) in the washing chamber for cleaning.

Water is initially supplied to the chamber from a connection to a house line, such as through the kitchen sink top, and through a supply line having a valve 52 controlled by the timer 32. The volume of water admitted during the various portions of the cycle may be controlled in accordance with time as is conventional, or by any other conventional means to provide the proper amount of water in the washing chamber for the particular operation to be carried out.

The water admitted to the washing chamber passes down through the screening wall 26 and flows along the bottom wall 30 to the inlet of the pump 38 and is then forced back through the conduit 48 to the rotating arm 50 and flung about the washing chamber space. The screening wall 26 is designed with holes of a diameter that is a substantial portion of the food particles washed off the articles being cleaned are retained on the surface of the screening wall 26, with the quantity of water in the washing chamber and in the circulating system being such that the level of water is about that level corresponding to the top surface of the screening wall 26.

Referring now to FIG. 2, the right side wall 20 of the washing chamber is provided with an opening 54 therein which is slightly above the level of the screening wall 26. In the machine compartment 14, a passage is formed by a horizontal wall 56 and an adjacent vertical wall 58 which lead to a food particle and debris collecting chamber 60. This debris collecting chamber is in open communication with the drain pipe 62 (FIG. 3) which extends for the length of the base of the dishwasher and along its rear, and is open-ended at both ends to permit a drain connection to the kitchen sink to be made from either end with the opposite end being capped. The location of the debris chamber 60 relative to the underlying drain pipe 62 is indicated by the broken line box of FIG. 3.

FIG. 3 also shows the relative location of the pump 38 and its connection to the conduit 48 leading to the spray arm 50, and the provision of a pump-out drain line 64 which communicates at its one end with the conduit 48 and is connected through a drain valve 66 controlled by the timer 32 to the drain pipe 62.

The dishwasher is also provided with the usual heater 68 for promoting the drying of dishes after washing and rinsing operations are completed.

A simplified schematic of a control system is shown in FIG. 4, with a chart indicating the various periods of energization of the electrical parts of the system shown in FIG. 5. It will be appreciated that various sequences of operation may be provided in accordance with the invention, the sequences shown in FIG. 5 simply being an example in which a pre-rinse operation is available.

To operate the dishwasher the timer knob 44 is first manually rotated to close the switch 70 to energize the timer motor 32. Thereafter operation of the timer effects closure and opening of switches 72, 74, 76 and 78 in accordance with

3

the selected operational program, as shown in FIG. 5 for example. Those versed in the art will find the chart of FIG. 5 self-explanatory, it is believed.

In accordance with the invention the supply of water admitted to the washing chamber is such that during operation of the pump 38 the level of water is about that level of the upper surface of the screening wall 26. Then, shortly after the water has been admitted and is being flung about the washing chamber by the rotating arm 50, the main motor 34 is momentarily interrupted during its energization as at 80, in the pre-rinse operation and at 82 in the wash operation. During such interruptions the airborne or suspended water in the washing chamber space drops back down onto the screening wall 26 and raises the level sufficiently to "swamp" the sump with a water motion similar to a tidal action. The food particles on the screening wall 26 move with the water flowing out the overflow opening 54 and into the collection chamber 60 in communication with the drain pipe. Thus the food particles are separated early during a rinsing or washing operation from the remainder of the water which is to be recirculated.

It is to be appreciated that the operation according to the invention is not limited to countertop dishwashers but finds its best application therein for the reasons outlined hereinbefore.

What I claim is:

1. In a dishwasher:

a washing chamber including side walls and a top wall for containing articles to be washed;

4

a sump underlying said chamber;

a screening wall between said chamber and sump;

means for circulating water from said sump to the space in said chamber and upon said articles for accomplishing washing and rinsing of said articles;

means for draining said sump;

an opening in one of said side walls at about the level of water normally obtained during said circulation of water; and

timing means for controlling said circulating and said draining operations, including means for momentarily interrupting circulation of said water during at least one of said washing and said rinsing operations for a sufficient period that water dropping from said space and off said articles being washed so raises the level of the water in said chamber as to sweep food particles on said screening wall out of said washing chamber through said opening, and for then resuming said operation.

2. In a dishwasher according to claim 1 wherein:

said draining means is maintained in a closed position during said interruption of circulation of said water.

3. In a dishwasher according to claim 1 wherein:

said dishwasher comprises a countertop dishwasher of relatively limited height; and

said screening wall is substantially planar.

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