

[54] **DISHWASHER AND SINK COMBINATION**

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[58] Field of Search 134/57 D, 95, 107, 115 R,
134/115 G, 193, 194

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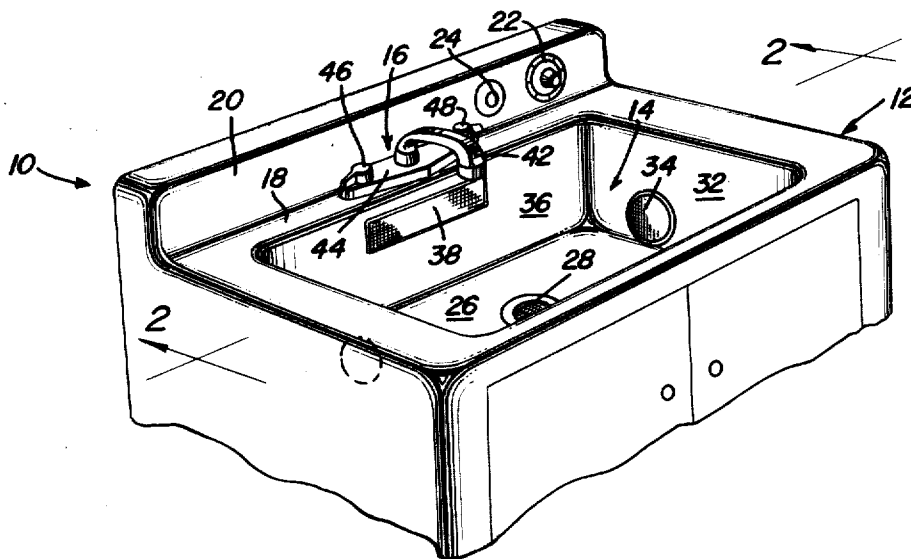
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[57] **ABSTRACT**

A conventional type kitchen sink, spigot valve and drain, is equipped with apparatus for automatically washing dishes carried in a basket placed in the sink basin. The basin is provided with screened openings through which water is recirculated and heated airflow conducted during wash, rinse and drying phases of an automatic cycle of operations.

8 Claims, 7 Drawing Figures



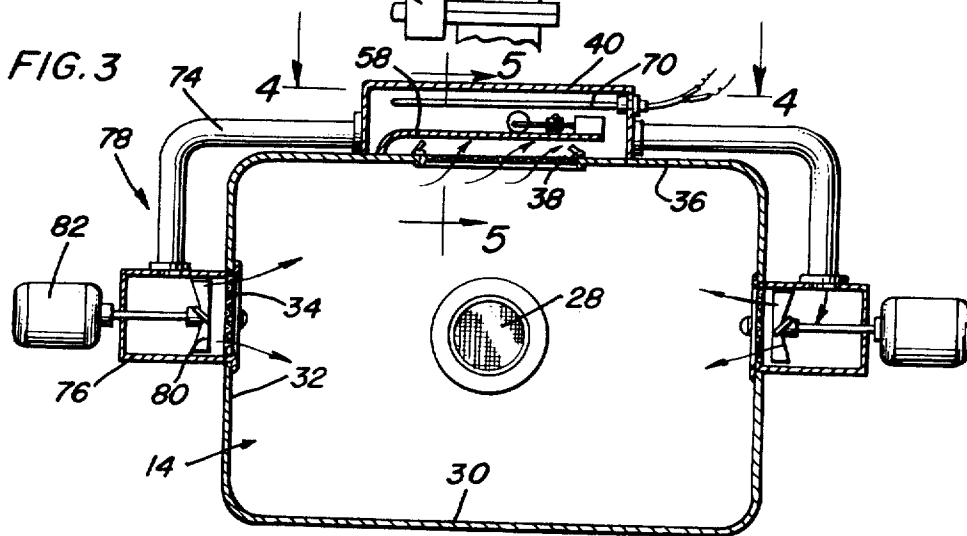
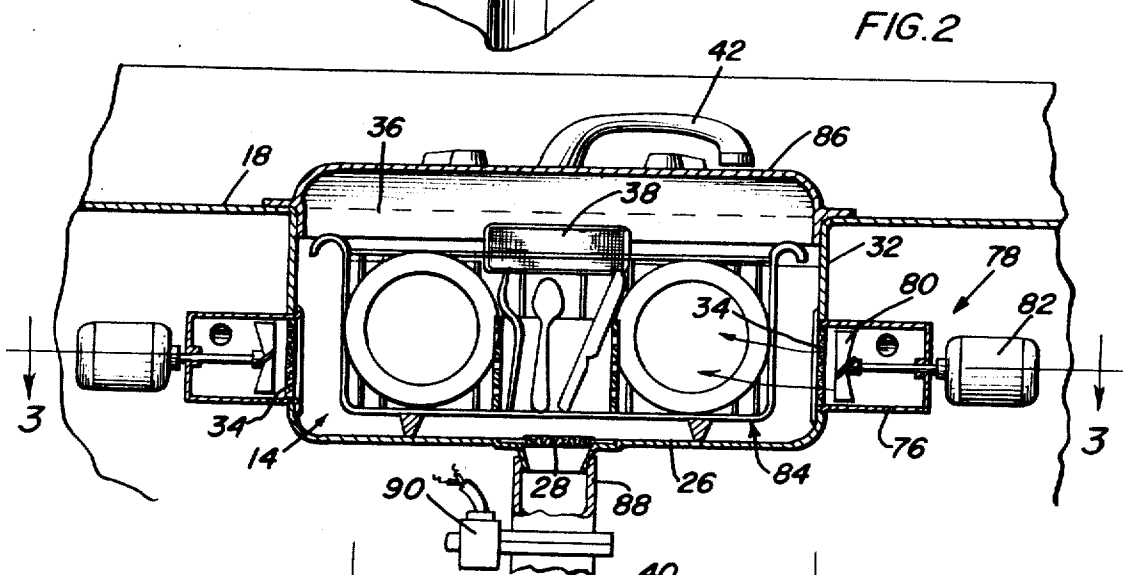
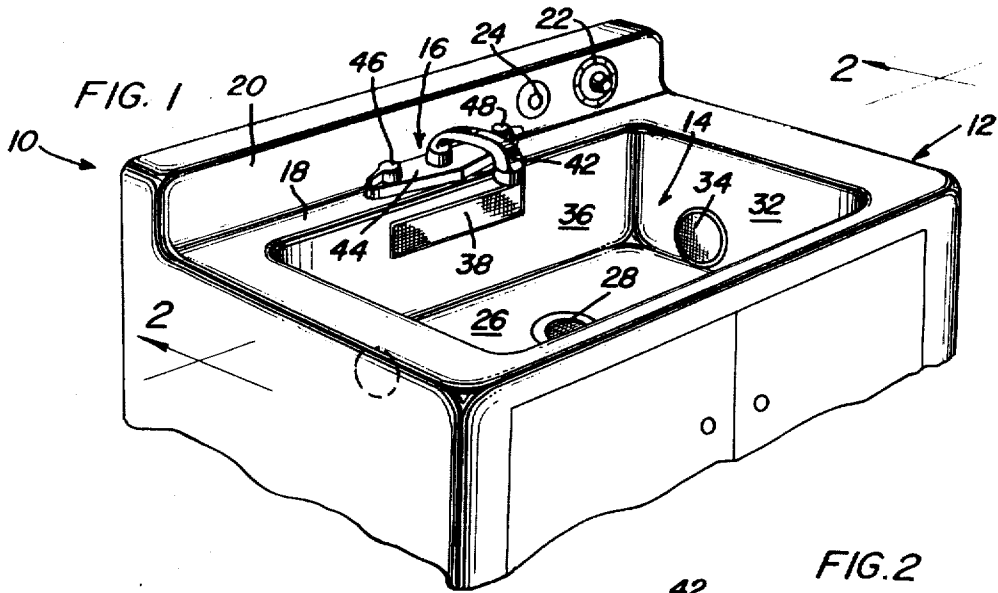


FIG. 4

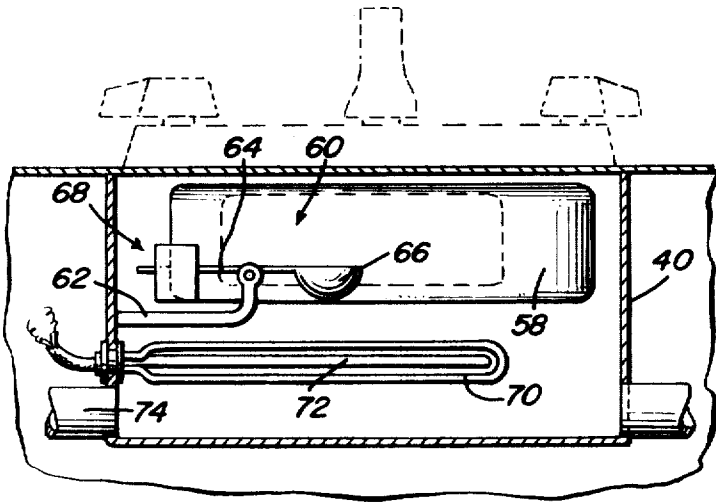


FIG. 5

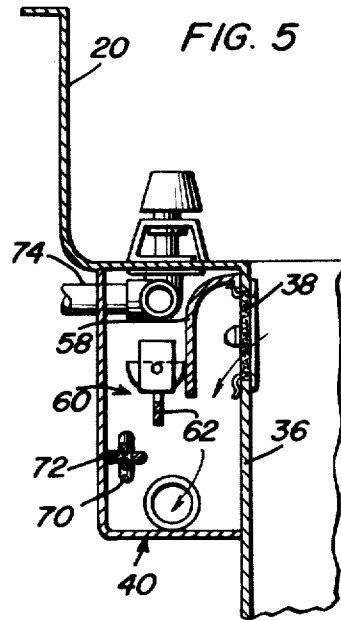


FIG. 6

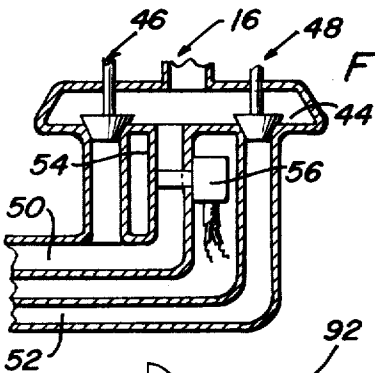
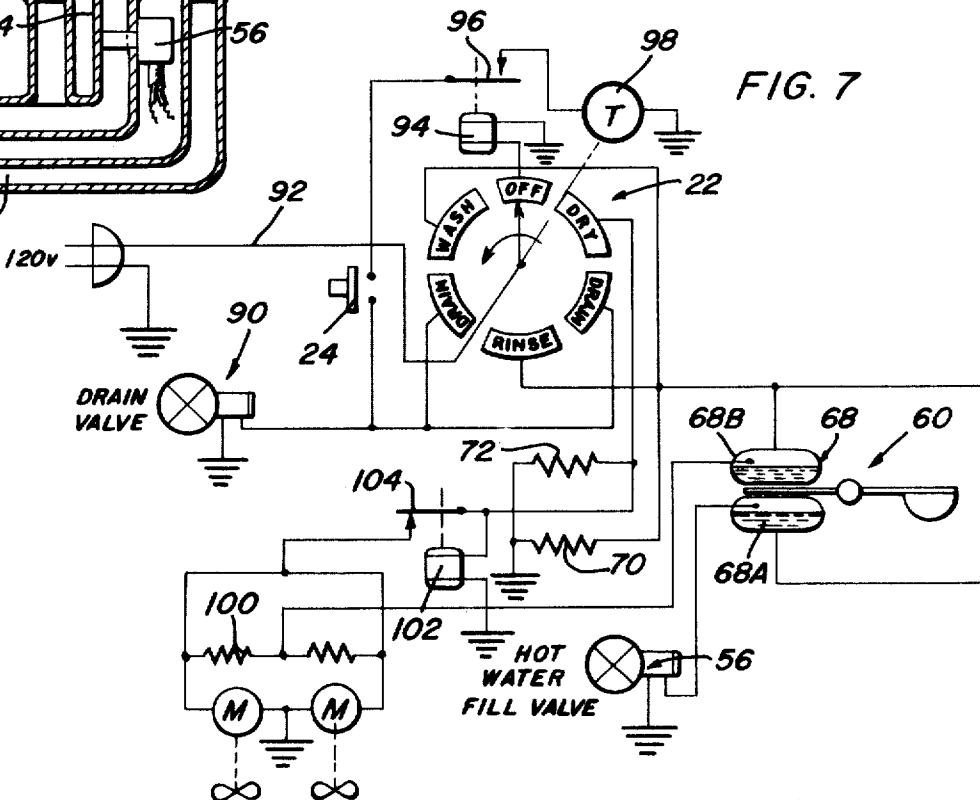


FIG. 7



DISHWASHER AND SINK COMBINATION

This invention relates to a combined kitchen sink and automatic washer for dishes and like articles.

Dishwashing machines combined with other kitchen equipment such as the conventional kitchen sink, have been proposed heretofore. Such combination types of kitchen equipment are generally characterized by separate basins or compartments for the usual storing and hand washing of dishes and the like to which a drain is connected for removal of both water and food scraps, and a separate washing compartment within which agitators and/or water jet devices are located to be utilized for automatic washing. Such combined types of kitchen equipment are quite expensive since they involve independent sink and washer constructions, although integrally connected to each other, in a single cabinet, for example. It is therefore an important object of the present invention to provide a combined kitchen sink and automatic dishwasher which is considerably less costly than those heretofore proposed and which is more convenient to use.

In accordance with the present invention, the combined sink and dishwasher is provided with a common sink basin within which articles such as dishes may be placed for rinsing and soaking in the usual fashion followed by an automatically controlled sequence of washing operations. The washing operations are performed within the same sink basin without use of any agitators or jet sprays. Instead, water filling the sink basin above a predetermined level is recirculated by flow induced through the side walls of the basin from a water storing receptacle in fluid communication with the sink basin through a screened opening in the back wall. After draining of the water from the sink basin, a flow of heated air is induced through the sink basin for drying the articles placed therein. Common motor driven impeller assemblies are utilized to both recirculate the water during the wash and rinse phases of the cycle and to induce flow of the heated air for drying. Toward this end, the impeller motors are operated at a low speed for water recirculation. Also, heater elements are mounted within the water storing receptacle for both heating the recirculating water as well as the air. Operation of the motor for water recirculating purposes and a hot water fill valve is controlled by a level sensing device within the water storing receptacle. A timer controlled switch assembly controls the supply of electrical energy to the heaters, the solenoids for the drain and hot water fill valves and the impeller motors.

These together with other objects and advantages which will become subsequently apparent reside in the details of construction and operation as more fully hereinafter described and claimed, reference being had to the accompanying drawings forming a part thereof, wherein like numerals refer to like parts throughout.

FIG. 1 is a perspective view showing the upper portion of a combined kitchen sink and automatic dishwasher cabinet assembly constructed in accordance with the present invention.

FIG. 2 is a partial side sectional view taken substantially through a plane indicated by section line 2—2 in FIG. 1.

FIG. 3 is a top sectional view taken substantially through a plane indicated by section line 3—3 in FIG. 2.

FIG. 4 is an enlarged partial sectional view taken substantially through a plane indicated by section line 4—4 in FIG. 3.

FIG. 5 is an enlarged partial sectional view taken substantially through a plane indicated by section line 5—5 in FIG. 3.

FIG. 6 is a somewhat simplified sectional view through the spigot valve assembly associated with the apparatus of the present invention.

FIG. 7 is an electrical circuit diagram corresponding to the control system associated with the present invention.

Referring now to the drawings in detail, FIG. 1 illustrates a typical combined kitchen sink and dishwasher assembly constructed in accordance with the present invention and generally denoted by the reference numeral 10. The assembly 10 includes an externally enameled cabinet 12, having an open top sink basin formed therein and generally referred to by reference numeral 14. A spigot valve assembly 16 may be mounted on the top surface rim 18 of the basin, this spigot valve assembly being modified however in accordance with the present invention as will be hereafter described. The cabinet may also be provided with an upstanding panel portion 20 on which a timer control 22 is mounted as well as a push button drain control switch 24. The timer control 22 and push button switch 24 form part of the control system to be described hereafter.

Referring now to FIGS. 1, 2 and 3, the sink basin 14 includes a bottom wall 26 provided with a centrally positioned screened drain opening 28, a front wall 30, a pair of side walls 32 provided with screened inlet openings 34 and a back wall 36 provided with a screened outlet opening 38. While the inlet openings 34 are positioned on the side walls 32 adjacent the bottom wall 26, the screened outlet opening 38 on the back wall 36 is positioned above the bottom wall so that a predetermined quantity of water may be retained within the sink basin 14 before it overflows and spills into a water storing receptacle 40 mounted on the back wall 36 as more clearly seen in FIG. 3.

The spigot valve assembly 16 includes an outlet spigot 42 through which hot and cold water is discharged into the sink basin as is well known. The spigot 42 is thus pivotally mounted on a water manifold 44 on which hot and cold water valve assemblies 46 and 48 are also mounted. As shown in FIG. 6, the valve assemblies 46 and 48 selectively admit water under pressure from hot and cold water conduits 50 and 52 connected to the spigot valve assembly 16. The spigot valve assembly is modified, however, in accordance with the present invention so as to provide an additional conduit connecting section 54 between the hot water conduit 50 and the manifold 44, which is normally closed by a solenoid operated valve 56. Thus, the spigot valve assembly 16 may be utilized in a conventional manner with the valve assembly 56 closed, the valve assembly 56 being opened for a filling operation as will be explained hereafter.

As more clearly seen in FIGS. 4 and 5, the receptacle 40 will store water that spills over through the screened opening 38. A splash shield 58 is mounted on the back wall 36 of the basin and extends rearwardly therefrom within the receptacle 40 in spaced relation to the screened opening 38 in order to protect a level sensing device 60 from any turbulent inflow of water into the

receptacle. The level sensing device includes a fixedly mounted pivot bracket 62 on which a lever 64 is pivotally mounted. A float element 66 is connected to one end of the lever while mercury type of position signaling switch assembly 68 is mounted on the other end of the lever. The level sensing device 60 will therefore provide signals when the water within the receptacle rises above a predetermined level or drops below a predetermined level in order to control the hot water fill valve assembly 56 aforementioned as well as other components associated with the automatic washing operation.

Also mounted within the receptacle 40 below the level sensing device 60, are a pair of electrical heating elements 70 and 72 as more clearly seen in FIGS. 4 and 5. These heating elements are respectively operative to heat water and air within the receptacle. The flow of water and air is induced by suction applied to opposite sides of the receptacle adjacent the bottom through a pair of laterally extending suction conduits 74 as more clearly seen in FIGS. 3 and 4. The suction conduits interconnect the receptacle 40 with a pair of housings 76 mounted on the side walls 32 of the sink basin, in communication therewith through the screened inlet openings 34 aforementioned. The housings 76 form part of powered impeller assemblies 78 rendered operative to induce flow of water or air. Each impeller assembly thus includes a bladed impeller 80 enclosed within the housing 76 and connected by a power shaft to an electric motor 82. Rotation of the bladed impellers 80 induces axial flow into the sink basin through the inlet openings 34 resulting in two inflow streams of water that meet centrally within the basin causing turbulence and outflow through the screened outlet opening 38 into the receptacle 40. The physical action and interaction of the two inflow streams of water is effective to wash and rinse articles such as dishes and utensils carried within an open mesh basket 84 placed in the sink basin as shown in FIG. 2. If desired, a cover 86 may be placed over the sink basin as shown in FIG. 2 in order to avoid splashing of water during the washing and rinsing phases of the automatic washing operation.

With continued reference to FIG. 2, during the automatic washing operation, water is retained within the basin by closing of the drain pipe 88 in communication with the sink basin through the drain outlet 28. Toward this end, a normally closed solenoid operated valve assembly 90 is mounted on the drain pipe. The drain control valve assembly 90 is adapted to be automatically opened during the drain phases of the automatic cycle as will be explained hereafter and may also be opened at any other time desired by actuation of the push button switch 24 aforementioned.

Referring now to FIG. 7, an available source of electrical energy is connected by power line 92 to the cycle control switch assembly 22 and through the normally opened push button switch 24 to the drain control valve 90. Closing of the push button switch 24 will accordingly energize the solenoid of the drain control valve 90 in order to open the drain. The drain valve will otherwise remain closed in order to permit the filling of the sink basin with water for the automatic washing operation which is initiated by displacement of the cycle control switch assembly 22 from the off position shown in FIG. 7. When displaced from the off position, in the embodiment illustrated by way of example only, a relay 94 is deenergized so as to permit closing of its

relay switch 96 thereby energizing a timer motor 98 to initiate the automatic washing cycle. With the receptacle 40 empty, the mercury switch 68a associated with the level sensing device 60, will complete a circuit to the hot water fill valve assembly 56 thereby automatically supplying hot water under pressure through the spigot valve assembly to the sink basin causing filling thereof at the beginning of the wash cycle. When the level of the water within the sink basin has risen sufficiently high and overflows through the outlet opening 38 into the receptacle 40, the level sensing device 60 will be pivoted counterclockwise as viewed in FIG. 7, thereby disconnecting the fill valve assembly from the power line and at the same time completing a circuit through the impeller motors 82 in series with the mercury switch 68b and the speed reducing resistors 100. The impellers 80 will then operate as pumps to circulate water between the receptacle 40 and the sink basin for the duration of the wash phase of operation. During the wash phase of the cycle, the power line is also connected to the heater 70 in order to elevate the temperature or maintain the high temperature of the hot water supplied to the sink basin from the hot water line. At the end of the wash phase, power is disconnected from the impeller motors and heater in preparation for a drain phase of the washing cycle. During the drain phase, electrical power is connected to the drain control valve 90 in order to open the drain pipe 88 and thereby drain all of the water within the sink basin. Following this drain phase of operation, a rinse operation ensues which is similar to that of the wash operation aforementioned. After this rinse operation, the sink basin is again drained during a following drain operation. During a final drying phase of operation, electrical energy is supplied to a second heater 72 and to a cutout relay switch 102 which is operative to close its normal opened relay switch 104 thereby completing an energizing circuit through the impeller motors 82 bypassing the speed reducing resistors 100. The impeller assemblies are thus operated at a higher speed to induce a rapid flow of air through the sink basin, the air being heated by the heater 72 within receptacle 40. Any water remaining in the bottom of the receptacle 40 will, of course, be displaced therefrom by the airflow at the beginning of the drying phase.

Washing dishes and the like within the sink basin in an automatic fashion, is apparent from the foregoing description. It will be noted that both water and heated air are circulated by the same impeller assemblies and through the same conduits. Dishes and like articles could be soaked in a detergent solution within the sink basin prior to initiating the automatic washing operation since agitators and jet sprays are avoided whereby a conventional type of kitchen sink basin may be utilized with a minimum amount of modification.

The foregoing is considered as illustrative only of the principles of the invention. Further, since numerous modifications and changes will readily occur to those skilled in the art, it is not desired to limit the invention to the exact construction and operation shown and described, and accordingly all suitable modifications and equivalents may be resorted to, falling within the scope of the invention.

What is claimed as new is as follows:

1. In combination with a sink having a basin, a drain connected to the basin and a supply of water under pressure including a water outlet spigot, hot and cold

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water conduits and a manifold to which the spigot and the water conduits are connected, means for washing articles placed in the basin including receptacle means mounted on the basin for receiving water therefrom above a predetermined level, drain control means connected to the drain for selectively maintaining water in the basin and impeller means connected to the basin and the receptacle means for alternatively recirculating water and inducing flow of air through the basin, said basin including bottom, side and back walls, the impeller means being connected to the side walls and the drain means to the bottom wall, said receptacle means being mounted on the back wall and in fluid communication with the basin through an opening in the back wall.

2. The combination of claim 1 including speed control means connected to the impeller means for operation at a lower speed while recirculating the water and at a higher speed while inducing said flow of air.

3. The combination of claim 2 including fill control means connected to the hot water conduit for supply of water through the spigot to the basin, and level sensing means mounted within the receptacle means for alternatively operating the fill and drain control means.

4. The combination of claim 3 including time-controlled cycle means connected to said control means for sequential operation thereof and heating means mounted in the receptacle means and connected to the cycle means for operation while said flow of air is being induced by the impeller means.

5. The combination of claim 4 wherein said impeller means includes a housing, a bladed rotor enclosed

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within the housing and passage means interconnecting the housing with the receptacle means and the basin through the side wall.

5 6. The combination of claim 1 wherein said impeller means includes a housing, a bladed rotor enclosed within the housing and passage means interconnecting the housing with the receptacle means and the basin through the side wall.

10 7. In combination with a sink having a basin, a spigot valve assembly through which water is supplied to the basin and a drain connected to the basin, means for washing and drying articles placed in said basin comprising fill control means for selectively supplying water to the basin through said spigot valve assembly, 15 drain control means connected to the drain for selectively storing the water in the basin, impeller means connected to the basin for inducing recirculating inflow of the water into the basin along two opposing flow streams to wash the articles, and drying means connected to the impeller means for operation thereof after the water has been drained from the basin to induce flow of air through the basin.

20 8. The combination of claim 7 wherein said impeller means includes a pair of bladed impellers, and a pair of drive motors simultaneously energized to drive said impellers inducing axial inflow into the basin in opposite flow directions and water sensing means connected to the drive motors for operation thereof at a relatively 25 low speed while recirculating the water as compared to operation thereof while inducing the flow of air.

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