Nov. 29, 1966 N. T. SWETNAM 3,288,155

SILVERWARE WASHING SYSTEM

Filed Sept. 28, 1964 2 Sheets-Sheet 1

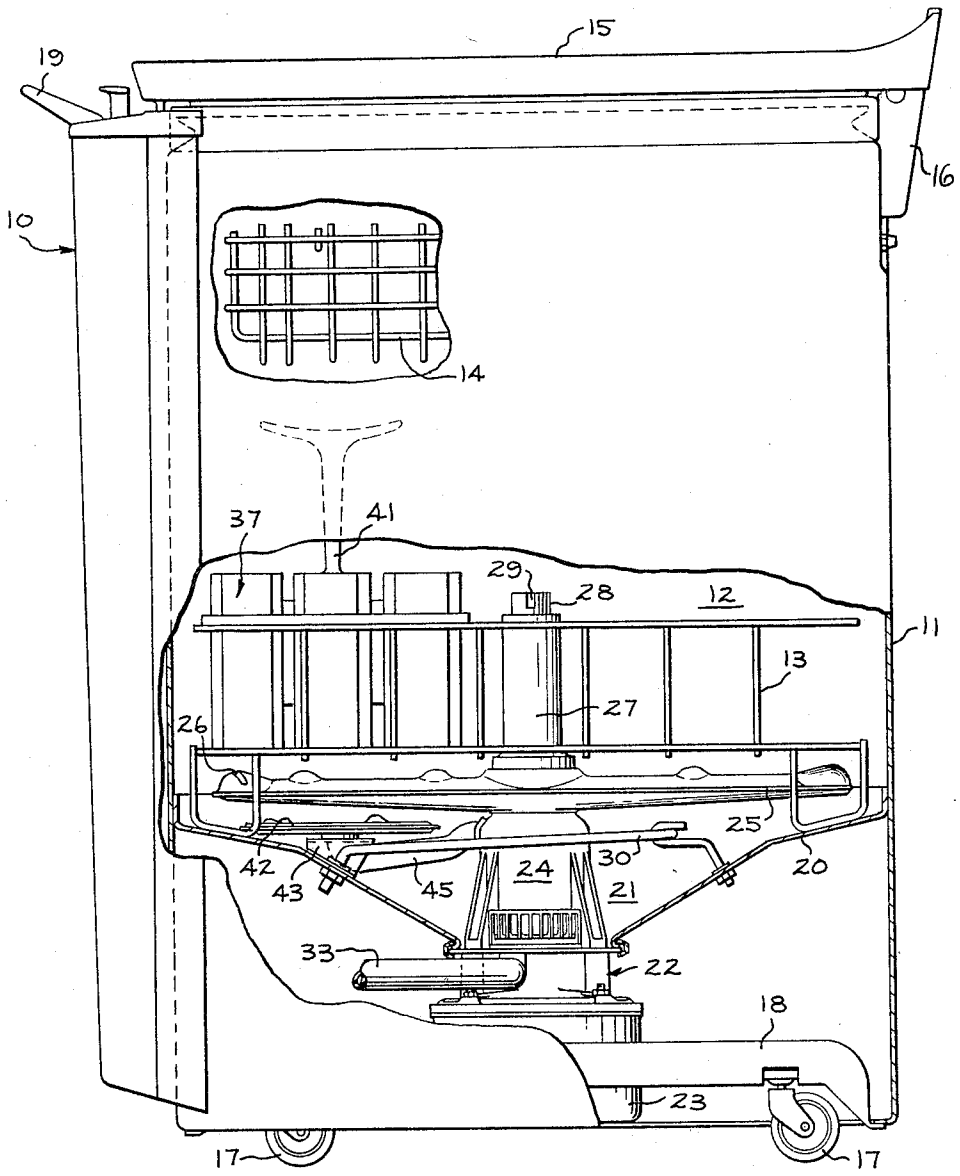

FIG. 1

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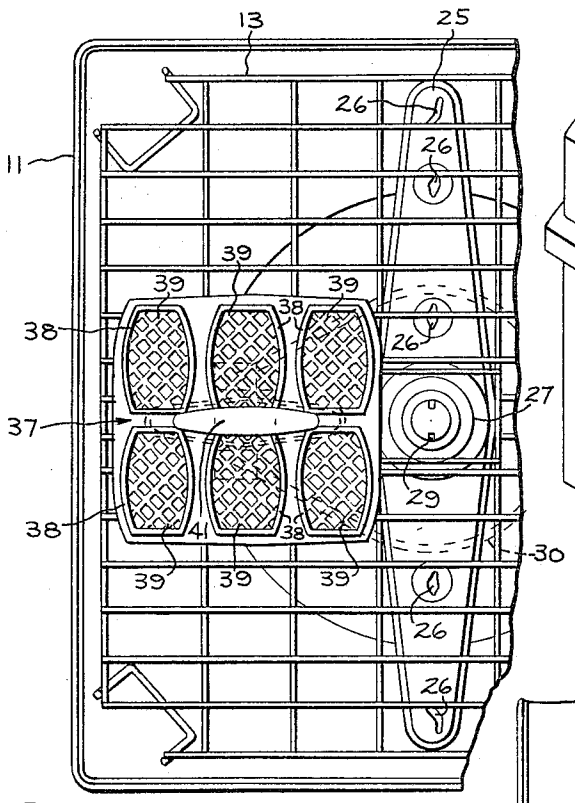

FIG. 4

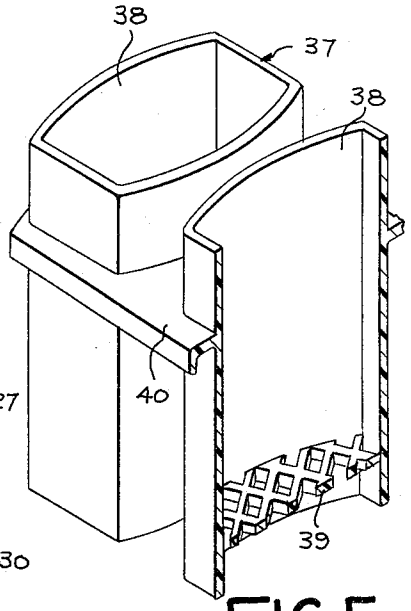

FIG. 5

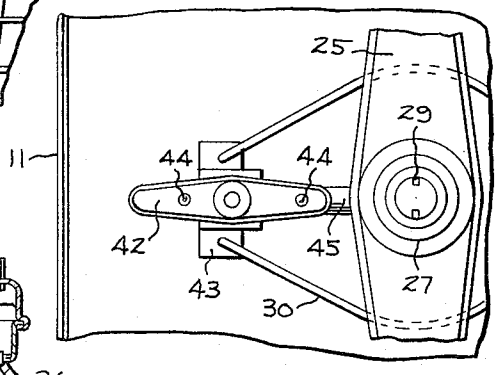

FIG. 3

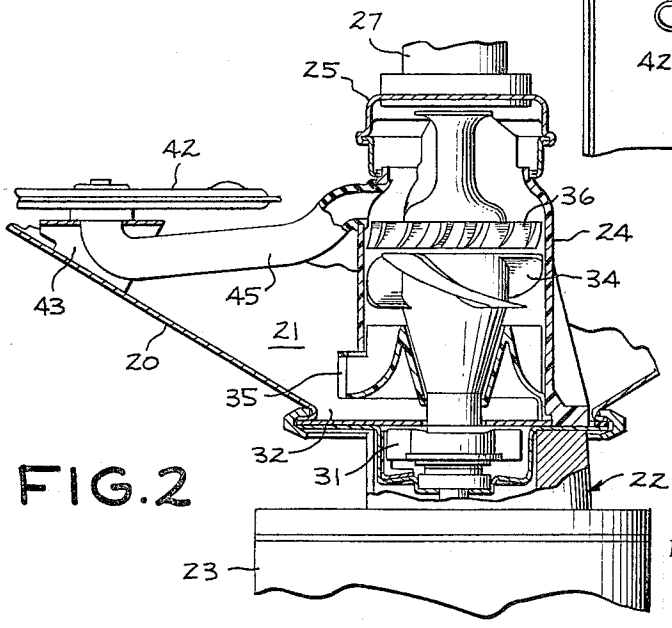

FIG. 2

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SILVERWARE WASHING SYSTEM

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3 Claims. (Cl. 134—176)

This invention relates generally to automatic dishwashers and, more particularly, to an improved silverware washing system for use in an automatic dishwasher.

It is generally accepted by those skilled in the art that a properly functioning automatic dishwasher will wash dishes cleaner than normally accomplished by hand washing. This also holds true for the silverware being washed; however, when certain pieces of silverware are exceptionally soiled or are soiled with matter particularly difficult to remove, the silverware may not be cleaned as well as could be accomplished by diligent hand scrubbing. A primary reason for the failure of a conventional dishwasher wash system to properly cleanse exceptionally soiled silverware is that the conventional wash system is designed to distribute the wash fluid evenly throughout the entire dishwasher wash chamber. Because the silverware supporting means within the wash chamber is most commonly in the form of a small basket, and thereby consumes only a small area of the wash chamber, it is difficult to design the conventional wash system to concentrate a wash action in the area of the silverware basket.

The convenience afforded by a domestic automatic dishwasher is enhanced if the silverware basket is readily removable from the wash chamber so that it may be carried to the dining table for loading of silverware at that location. When a silverware basket is intended to be transported between the dishwasher and the dining table, it is desirable, though not mandatory, to provide the silverware basket with substantially imperforate side walls to minimize the possibility of silverware escaping from the basket during transportation between the dining table and the dishwasher. When the silverware basket is provided with substantially imperforate side walls, the conventional wash system of the dishwasher is even less successful in effectuating a wash action within the confines of the imperforate walls. It should therefore be realized that room for improvement exists in the silverware washing systems heretofore available in domestic dishwashers.

Accordingly, it is an object of this invention to provide an improved silverware washing system for use in an automatic dishwasher.

It is also an object of this invention to provide a silverware washing system for an automatic dishwasher wherein a separate silverware basket is used.

It is a further object of this invention to provide a silverware washing system for an automatic dishwasher wherein a separate silverware basket is used which may be removed from the dishwasher and carried to a dining table for loading.

Briefly stated, in accordance with one aspect of the present invention, there is provided a silverware washing system for use in a dishwasher having a wash chamber, means to support dishes within the wash chamber, a main spray device to effectuate a wash action upon dishes supported within the wash chamber, and a pump to supply wash fluid to the main spray device. The silverware washing system comprises a silverware basket supported within the wash chamber and having substantially imperforate side walls. A secondary spray device is in substantially vertical alignment with the silverware basket and fluid conducting means are provided to interconnect the secondary spray device with the pump whereby a

portion of the fluid circulated by the pump is conducted to the secondary spray device to effectuate a wash action directed into the silverware basket.

While the specification concludes with claims particularly pointing out and distinctly claiming the subject matter which is regarded as the invention, it is believed the invention will be better understood from the following description taken in connection with the accompanying drawings, in which:

FIGURE 1 is a side elevational view, partially cut away to show details, of a dishwasher with which the present invention may be employed;

FIGURE 2 is a detailed sectional view of the pump mechanism of the present invention;

FIGURE 3 is a top view of the main and secondary spray devices of the present invention;

FIGURE 4 is a partial top view showing the silverware basket of the present invention and its position relative to the main spray device and a dish supporting rack of the dishwasher; and

FIGURE 5 is a partial perspective view, partially in section to show details, of the silverware basket of the present invention.

Referring now to the drawings, and particularly to FIGURE 1, there is illustrated an automatic dishwasher **10** having an outer cabinet **11** which defines therein a wash chamber **12**. Disposed within wash chamber **12** are dish supporting racks **13** and **14** which are adapted to support dishes while they are being washed by the dishwasher **10**. Access is provided to wash chamber **12** by means of a closure member or door **15** pivotally secured to cabinet **11** by means of a hinge member **16**. Dishwasher **10** may be of the portable type and, if so, may be provided with rollers **17** interconnected to cabinet **11** by a member **18**. A handle **19** may also be provided to facilitate the movement of dishwasher **10**.

The lower extremity of wash chamber **12** is defined by a bottom wall **20** which has a centrally depressed portion forming a sump **21**. Centrally disposed within sump **21** and supported by bottom wall **20** is a motor-pump assembly **22**. Motor-pump assembly **22** includes a reversible electric motor **23** and a pump **24** directly mechanically linked to the motor **23**. Rotatably supported atop pump **24** is a main spray device in the form of a reaction type spray arm **25** having therein a plurality of orifices **26** which create a wash action within wash chamber **12** when wash fluid is propelled therethrough by pump **24**. Extending upwardly from the central portion of spray arm **25** is a spray tube **27** which has a telescoping portion **28** that extends upwardly, under the influence of wash fluid pressure, to effectuate additional wash action upon dishes supported by rack **14** by means of wash fluid issuing from orifices **29**. An electrical resistance heating element **30** is supported from bottom wall **20** and is utilized to heat wash fluid within wash chamber **12** and/or to facilitate the drying of dishware supported by racks **13** and **14** upon the completion of the washing cycle.

It is to be understood, of course, that the foregoing description of the dishwasher illustrated in FIGURE 1 is of a general nature and should not be considered critical to the present invention. Similarly, many aspects of the motor-pump assembly **22** may vary a great deal from the specific details which are to be described in connection with the preferred illustrated embodiment.

Referring now primarily to FIGURE 2, a more detailed description of the motor-pump assembly **22** and its operation will be given. Pump **24** of motor-pump assembly **22** includes a lower impeller **31** directly mechanically linked to the shaft of motor **23** and, in one direction of rotation of motor **23**, impeller **31** draws wash fluid from sump **21** through an inlet **32** and propels this

wash fluid out through an effluent discharge conduit 33 (FIGURE 1) which communicates with the normal household sewer system (not shown). Pump 24 also includes an upper impeller 34 which, in the opposite direction of rotation of motor 23, draws wash fluid from sump 21 through an inlet 35 and propels the fluid up through spray arm 25 and spray tube 27 to effectuate a wash action within wash chamber 12. Flow straightening means 36 are provided within pump 24 between upper impeller 34 and spray arm 25 to remove any swirl imparted to the wash fluid by impeller 34.

In automatic dishwashers having pump and spray devices similar to that described above, it is customary to provide special means to support silverware in a manner whereby the spray arm 25 or spray tube 27 can effectuate a wash action upon the silverware supported therein. However, as mentioned earlier, when the silverware is exceptionally soiled or is soiled with matter particularly difficult to remove, the standard spray devices oftentimes do not provide a sufficiently concentrated spray to effect the desired cleaning results. This is primarily because the main spray device is designed to substantially evenly distribute wash fluid throughout the wash chamber 12 and it is virtually impossible to design the spray device to also concentrate sufficient spray in a particular area of the wash chamber 12 as would be necessary to effectively cleanse exceptionally soiled silverware.

In accordance with the present invention, a silverware basket 37 is positioned within wash chamber 12 and, in the preferred embodiment illustrated in FIGURE 1, silverware basket 37 is directly supported by dish supporting rack 13. Silverware basket 37 includes a plurality of individual silverware retaining compartments 38 each of which are formed by substantially imperforate side walls. Each compartment 38 has an open upper end to allow the insertion of silverware therethrough while the lower end is provided with a perforated or grid-like bottom wall 39. The perforations or openings in each of the bottom walls 39 are sufficiently small to prevent the silverware from slipping therethrough but at the same time are of sufficient size to allow wash fluid to pass therethrough to effectuate a wash action upon the silverware disposed within each compartment 38. The individual compartments 38 are secured together as an integral unit by means of a web 40 which may be molded integrally with the individual compartments 38. Extending upwardly from the central portion of web 40 is a handle 41 which facilitates the removal of basket 37 from wash chamber 12 so that it may be transported to a dining table for loading at that location.

In order to direct a concentrated wash fluid spray into the individual compartments 38 of silverware basket 37, a secondary spray device or spray arm 42 is rotatably supported from bottom wall 20 by a bracket 43. Spray arm 42 is provided with at least two orifices 44 which direct a spray of wash fluid into the compartments 38 of silverware basket 37. Fluid conducting means 45 interconnect spray arm 42 with the upper portion of pump 24 in a manner such that, when impeller 34 propels wash fluid up into spray arm 25 and spray tube 27, a portion of the wash fluid being moved by impeller 34 is conducted to spray arm 42.

Although the preferred embodiment of the invention comprises a secondary spray arm positioned below the silverware basket, it would be within the spirit of the invention to position the secondary spray arm above the silverware basket and direct the spray issuing therefrom down into the silverware basket. It should also be noted that in the preferred embodiment, the secondary spray arm 42 is positioned below the level of main spray arm 25 and that main spray arm also passes below silverware basket 37. This means, of course, that wash fluid issuing from main spray arm 25 also assists in creating a wash action upon silverware within basket 37.

In the operation of the dishwasher 10, wash fluids are withdrawn from sump 21 through inlet 35 and are propelled upwardly by impeller 34 through flow straightening means 36. A portion of the fluid passing through flow straightening means 36 is conducted, by means of fluid conducting means 45, to the secondary spray arm 42. The fluid entering secondary spray arm 42 issues therefrom through orifices 44 which direct this fluid into the individual compartments 38 of silverware basket 37. This provides a highly concentrated spray action which effects the desired cleansing of the silverware supported by basket 37. It is to be understood, of course, that the major portion of the fluid being propelled by the impeller 34 passes into spray arm 25 and spray tube 27 to be substantially evenly distributed throughout wash chamber 12.

As will be evident from the foregoing description, certain aspects of the invention are not limited to the particular details of construction of the example illustrated, and it is contemplated that various other modifications or applications will occur to those skilled in the art. It is therefore intended that the appended claims shall cover such modifications and applications as do not depart form the true spirit and scope of the invention.

What I claim as new and desire to secure by Letters Patent of the United States is:

1. In a dishwasher having a wash chamber, means to support dishes within the wash chamber, a main spray device movable within the wash chamber to effectuate a wash action upon dishes supported within the wash chamber, and a pump to supply wash fluid to the main spray device, a silverware washing system comprising:
   (a) a silverware basket having substantially imperforate side walls and supported within the wash chamber,
   (b) a secondary spray device in substantially vertical alignment with said silverware basket, and
   (c) fluid conducting means interconnecting said secondary spray device with the pump whereby a portion of the fluid circuiated by the pump is conducted to said secondary spray device to effectuate a wash action directed into said silverware basket,
   (d) said secondary spray device being positioned on the same side of said silverware basket as said main spray device and spaced from said silverware basket whereby said main spray device is free to pass between said silverware basket and said secondary spray device to assist in creating a wash action within said silverware basket.

2. In a dishwasher having a wash chamber, dish supporting racks within the wash chamber, a main spray device to effectuate a wash action upon dishes supported by the racks, and a pump to supply wash fluid to the main spray device, a silverware washing system comprising:
   (a) a silverware basket having substantially imperforate side walls and supported by one of the dish supporting racks,
   (b) a secondary spray device positioned below said silverware basket and adapted to spray wash fluid into said silverware basket, and
   (c) fluid conducting means interconnecting said secondary device with the pump whereby a portion of the fluid circulated by the pump is conducted to said secondary spray device,
   (d) said main spray device being mounted within said wash chamber for movement relative thereto,
   (e) said secondary spray device being positioned below the level of said main spray device whereby said main spray device has room to pass below said silverware basket to assist in creating a wash action within said silverware basket.

3. A silverware washing system for use in a dishwasher having a wash camber comprising:
   (a) means to support silverware within the wash chamber,

(b) a main spray device mounted for movement within the wash chamber and adapted to substantially evenly distribute wash fluid throughout the entire wash chamber including the area consumed by said silverware supporting means, and

(c) a secondary spray device in closed proximity to said silverware supporting means and adapted to direct the wash fluid substantially exclusively toward the silverware supported by said silverware supporting means,

(d) said main spray device and said secondary spray device both operating simultaneously,

(e) said secondary spray device being positioned on the same side of said silverware supporting means as said main spray device and spaced from said silverware supporting means whereby said main spray device is free to pass between said silverware supporting means and said secondary spray device to assist in creating a wash action within said silverware supporting means.

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