June 28, 1966 D. S. CUSHING 3,258,127

RACK STRUCTURE FOR DISHWASHER

Filed Aug. 3, 1964

FIG. 1

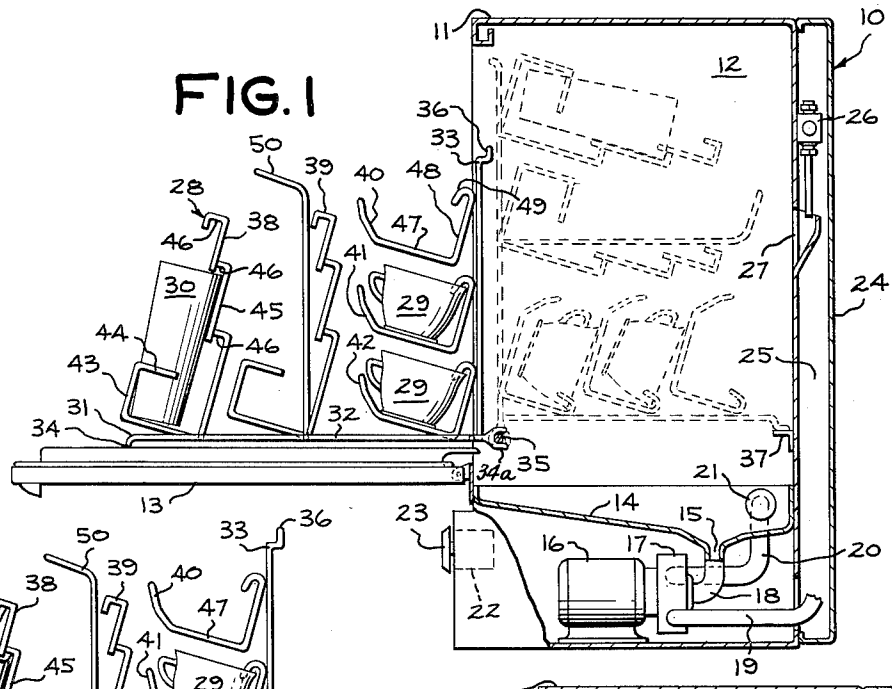


FIG. 3

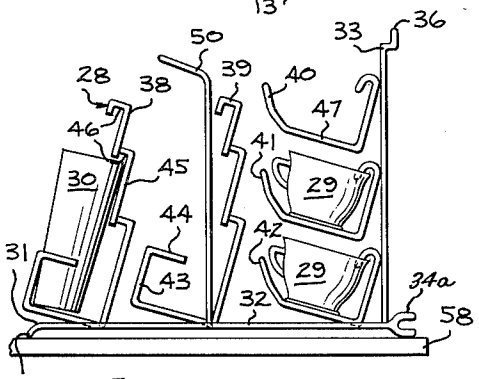


FIG. 2

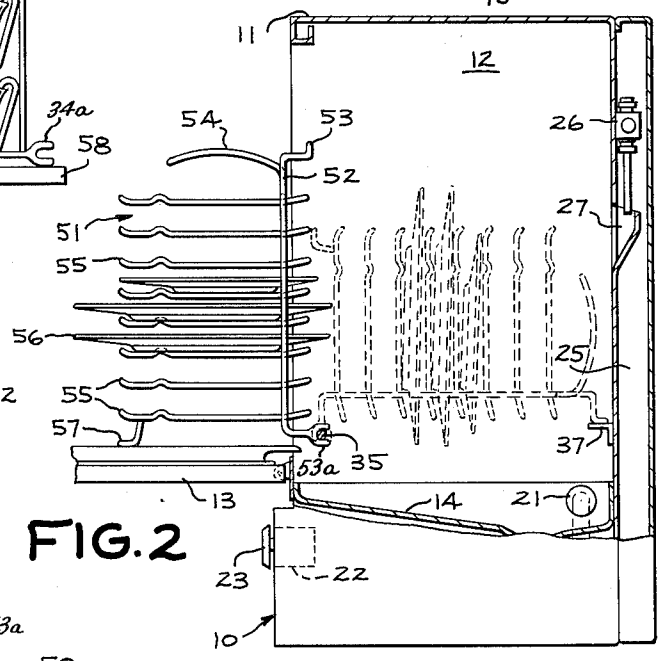
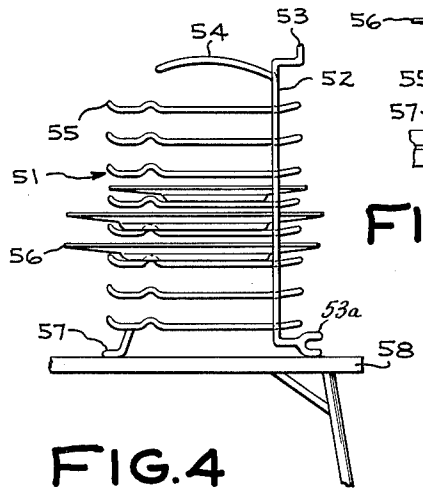


FIG. 4



INVENTOR.
DONALD S. CUSHING
BY James E. Espe
HIS ATTORNEY

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RACK STRUCTURE FOR DISHWASHER

Donald S. Cushing, Louisville, Ky., assignor to General Electric Company, a corporation of New York

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This invention relates generally to the art of dishwashing and more particularly, to an improved rack for use with an automatic dishwasher.

Although the automatic dishwasher has unquestionably reduced the time and the energy required of a housewife to effectively wash dishes, there still remain various chores associated with operating an automatic dishwasher which detract from its advantages. For example, loading soiled dishes into an automatic dishwasher can often be awkward and messy due to food particles, liquids and the like which remain on the dishes after the meal. It is usually necessary to stack the dishes at the table and carry them to the dishwasher and then unstack the dishes and insert them individually into the dishwasher wash chamber or onto extended supporting racks which are subsequently moved into the wash chamber. The stacking and unstacking of the dishes consume time and energy and increase the possibility of spilling food particles or liquid onto the kitchen floor.

Various means have been proposed heretofore for transporting dishes from the table to the dishwasher which obviate the aforementioned stacking and unstacking; however, these were not the full answers since it was still necessary to move the dishes from the table onto the transport means and then from the transport means into the dishwasher. Other prior attempts to minimize the mess and awkwardness of getting the solid dishes from the table into the dishwasher have included the concept of removing the supporting rack from the dishwasher and loading it at the table; however, this has heretofore always necessitated a drip tray or the like associated with the rack since the rack would only support dishes in a position to facilitate the washing thereof. This position is seldom such that the dishes are maintained in their normal use position. For example, the rack usually supports plates on their edge and glasses and cups inverted. In these positions, food particles and liquids would spill from the dishes as they are placed on the rack. It would therefore be desirable to provide an improved rack capable of transporting dishes from the table to the dishwasher which obviates the inconvenient drip tray but still minimizes spilling of food particles and liquids and which also obviates transferring the dishes to a second rack within the dishwasher.

Accordingly, it is an object of this invention to provide an improved dish supporting rack for a dishwasher.

It is another object of this invention to provide a dish supporting rack for a dishwasher which allows soiled dishes to be inserted into the dishwasher without undesired spillage of liquids and food particles which may be present on the dishes.

It is also an object of this invention to provide an improved dish supporting rack, capable of transporting soiled dishes from the dining table to the dishwasher, which minimizes spilling, obviates a drip tray and also supports the dishes within the dishwasher during operation thereof.

Briefly stated, in accordance with one aspect of the invention, I provide a dish rack, for use with an automatic dishwasher having a cabinet with a wash chamber therein, comprising a plurality of dish supporting members interconnected to form a unitary structure. Means are provided to support the unitary structure in a first position external of the wash chamber of the dishwasher.

Means are also provided to support the unitary structure in a second position within the wash chamber. In the aforementioned first position each of the dish supporting members is disposed to support a dish in substantially its normal use position. Each of the dish supporting members is disposed to support a dish in a position to facilitate the washing thereof by the dishwasher when the dish rack is in the aforementioned second position. Therefore, with the above described arrangement, it is possible to place dishes containing food particles and liquids onto the dish rack in their normal use position when the dish rack is in the aforementioned first position. This, of course, means that the dishes may be placed on the rack with a minimum of spillage of either food particles or liquid. After the dishes have been placed onto the dish supporting members, the unitary structure may be moved to its second position within the wash chamber of the dishwasher. As this movement occurs, the food particles and liquid are dumped into the wash chamber and the dishes are automatically oriented in a position which facilitates the washing thereof.

In a more specific embodiment of the present invention, a handle is provided on the dish rack and the dish rack is made removable from the dishwasher so that the rack may be carried to the table and the dishes loaded onto the rack in their normal use position at the table. The rack may then be transported to the dishwasher by means of the aforementioned handle, maintaining at all times the dishes in their normal use position. After the user arrives at the dishwasher, the rack is placed into the dishwasher and moved to its wash facilitating orientation.

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 view, partially cut away to show details, of an automatic dishwasher utilizing the dish supporting rack of the present invention with the rack shown in solid lines in one position and in dotted lines in another position;

FIGURE 2 is a view similar to FIGURE 1 but showing the dish supporting rack of the present invention as it is particularly adapted for use with plates rather than with cups and glasses;

FIGURE 3 is a view of a dish supporting rack, constructed in accordance with the present invention, as it sets on a table; and

FIGURE 4 is a view similar to FIGURE 3 but showing the dish supporting rack of FIGURE 2.

Referring now to the drawings, and particularly to FIGURE 1, there is illustrated an automatic dishwasher 10 having an outer cabinet 11 defining therein a wash chamber 12. A closure member or door 13 is provided in one wall of cabinet 11 to provide access to wash chamber 12. A bottom wall 14 defines the lower extremity of wash chamber 12 and is configurated to gradually slope toward an outlet 15.

Positioned below bottom wall 14, but within cabinet 11, is a motor 16 which drives a pump 17. Motor 16 is of the electrically reversible type well known in the electric motor art and may be directly mechanically linked to pump 17. The inlet to pump 17 communicates with outlet 15 by means of conduit 18. Pump 17 is a two-way pump, such type pumps being well known in the pump art, whereby, upon rotation of motor 16 in one direction, pump 17 will pump fluids from conduit 18 out through conduit 19. In the opposite direction of rotation of motor 16, pump 17 will pump fluids from conduit 18 out through conduit 20. Conduit 19 communicates with

the household sewer system (not shown) so that when pump 17 pumps through conduit 19, dishwasher 10 is drained into the sewer. Conduit 20 communicates with a spray device 21 which is designed to effectuate a wash action within chamber 12 when any fluids are pumped through the spray device. Spray device 21 may be a stationary tube having orifices therein or it may be an oscillating, rotating or reciprocating device, the exact arrangement not being critical to the present invention.

A sequence control means 22 is provided with a manually operable control knob 23 and is electrically connected to motor 16 to control motor 16 through the necessary sequence of operations to effectuate a complete wash cycle within wash chamber 12. Many sequence control means are presently commercially available and are well known in the washing machine art so that it is unnecessary to explain in detail the structure and operation of the sequence control means 22.

At the rear of cabinet 11, an additional member 24 is provided in spaced relation to cabinet 11 to thereby define an enclosure 25. Enclosure 25 houses a portion of conduit 19 and also houses a water inlet valve 26 which controls the admission of water from the standard household plumbing system (not shown). A water inlet opening 27 is provided in the rear wall of cabinet 11 so that when valve 26 is opened, the water will be directed into wash chamber 12. It is, of course, understood that sequence control means 22 also controls the opening and closing of inlet valve 26 in the manner well known in the automatic washing machine art.

In accordance with the present invention racks are provided to support dishes within wash chamber 12 in a manner to facilitate the washing thereof. In other words, the dishes are supported within wash chamber 12 in a position whereby the wash action generated by spray device 21 is most effectively applied to the individual dishes. It may be well to point out at this juncture that the word "dish" is used in its broadest sense to include plates, saucers, cups, drinking glasses, bowls and similar articles. As mentioned earlier, the racks constructed in accordance with the present invention are particularly directed toward minimizing spillage of food particles or liquids from the dishes until they are sufficiently positioned within an automatic dishwasher so that the food particles and liquid will be spilled into the wash chamber thereby to be carried away in the effluent discharge from the dishwasher.

Referring particularly to FIGURE 1, there is shown a dish rack 28 constructed in accordance with the present invention and particularly adapted to support cups 29 and drinking glasses 30. Dish rack 28 includes a frame member 31 of generally L-shaped configuration including a first arm 32 and a second arm 33. Arms 32 and 33 may be integral with each other or may be separate pieces secured together by such means as welding or brazing to form a reasonably rigid frame. One end of arm 32 has a short downward projection forming a foot 34 which rests upon door 13 when rack 28 is positioned as shown in FIGURE 1. The other end 34*a* of arm 32 is adapted to cooperate with a stationary pin 35 which projects into chamber 12 from the wall of cabinet 11. The distal end of arm 33 has a foot 36 somewhat similar to foot 34 of arm 32. When rack 28 is positioned within wash chamber 12, as shown in dotted lines in FIGURE 1, foot 36 rests upon a small shelf or ledge 37 which projects into wash chamber 12 from the rear wall of cabinet 11.

Disposed within the angle formed by arms 32 and 33 are a plurality of dish supporting members 38, 39, 40, 41 and 42. Dish supporting members 38 and 39 are identical and each is particularly adapted to support drinking glasses and includes a lower member 43 having an arm 44 which extends partially around the drinking glass 30. Arm 44 may be curved slightly to more closely follow the peripheral surface of the drinking glass. It is to be understood that there is an arm, identical to arm 44, which extends partially around the opposite side of drinking glass 30. Dish supporting member 38 also includes an upper member 45 of generally stepped configuration with each step providing a surface 46 against which the rim of the drinking glass will rest when rack 28 is positioned within wash chamber 12. Member 45 is provided with a series of steps so that it can accommodate glasses of various sizes.

It should also be noted that the portions of upper member 45 which extend between the individual steps project slightly downwardly below each surface 46 to thereby provide means to prevent the drinking glass from slipping away from surface 46. As can be seen in dotted lines in FIGURE 1, this projection projects into the glass slightly when the rim of the glass is engaging surface 46. It should be understood that there may be any reasonable number of dish supporting members 38 and 39 immediately behind the one visible in FIGURE 1. Dish supporting members 38 and 39 are connected at their lower ends to elements, not visible in FIGURES 1 and 3 which extend transversely to arm 32. These transverse elements are each secured, at one of their ends, to arm 32 and, at their other end, to an arm identical to arm 32 but lying directly behind arm 32 as seen in FIGURES 1 and 3. That is, a sufficient number of dish supporting members 38 may be provided to occupy the entire width of wash chmber 12.

Dish supporting members 40, 41 and 42 are adapted to support cups such as those illustrated at 29. Each of dish supporting members 40, 41 and 42 has a lower portion 47 upon which a cup will rest when rack 28 is positioned to support the dishes in substantially their normal use position as shown in solid lines in FIGURE 1. There is also an upper portion 48 having at its upper extremity a hook 49 which serves to support the cup when the dish rack is moved to its position within wash chamber 12. Again, there may be a plurality of dish supporting members such as 40 positioned side-by-side to substantially consume the entire width of wash chamber 12.

If desired, the connection between dish rack 28 and pin 35 may be separable so that rack 28 may be removed from the machine and carried to the dining table for loading. To facilitate the transport of rack 28 from the dishwasher to the table and the return thereof, loaded with dishes, to the dishwasher a handle 50 may be provided.

Referring now to FIGURE 2, an automatic dishwasher 10, identical in all respects to the dishwasher shown in FIGURE 1, is illustrated. A modification of the dish rack shown in FIGURE 1 is illustrated in FIGURE 2 and this rack is particularly adapted to support flat, shallow dishes such as plates, saucers and bowls, Dish rack 51 includes an upper arm 52 having at its distal end a foot 53 which rests upon shelf 37 when the rack is disposed within wash chamber 12 as shown in dotted lines. The other end 53*a* of arm 52 is adapted to cooperate with pin 35 in the same manner as discussed above with regard to dish rack 28. A handle 54 projects outwardly from arm 52 to facilitate the manual transport of rack 51 to and from the dining table if desired. Secured to, or formed integrally with, arm 52 are a plurality of dish supporting members 55. Dish supporting members 55 may be of any suitable configuration to support plates such as, for example, plate 56 in a reasonably stable normal use position when position when positioned as shown in soiled lines in FIGURE 2. When rack 51 is positioned within wash chamber 12, upper arm 52, and a second arm identical thereto but not visible in FIGURE 2 because it is disposed directly behind arm 52, cooperate to support plates 56 as shown in dotted lines in FIGURE 2. Secured to, or formed integrally with, the lowermost dish supporting member 55 is a foot 57 which rests upon door 13 when rack 51 is in the position shown in solid lines in FIGURE 2.

FIGURES 3 and 4 illustrate racks 28 and 51 as they rest upon a table 58 for loading thereof by the operator of dishwasher 10.

Thus, it can be seen that the dish rack of the present invention provides an arrangement capable of transporting soiled dishes from the dining table to the dishwasher which minimizes spilling, obviates a drip tray and also supports the dishes within the dishwasher during operation thereof. It should be realized, of course, that the present invention is not limited to a rack which is removable from the dishwasher for transport to a table. The present invention, in addition to providing the transport feature, clearly provides an improved dish rack which can be loaded at the dishwasher while maintaining the dishes in substantially their normal use position until the rack is loaded to thereby avoid spillage of food particles and liquid. Once the rack is loaded, then it may be moved into a second position within the dishwasher wash chamber whereby such movement dumps the food particles and liquid from the dishes into the wash chamber rather than onto the surrounding floor.

As will be evident from the foregoing description, certain aspects of the invention are not limited to the particular details of construction of the examples 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 from 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. A dish rack for use with an automatic dishwasher having a cabinet comprising:
   (a) a frame member,
   (b) at least one dish supporting member projecting from said frame member,
   (c) means to support the dish rack on a cabinet for pivotal movement between first and second positions,
   (d) said dish supporting member including means to support a dish in substantially its normal use position when the dish rack is in said first position,
   (e) said dish supporting member also including means to support a dish in a position to facilitate washing thereof when the dish rack is in said second position.

2. The dish rack defined in claim 1 further comprising a handle projecting from said frame member to facilitate the manual transport of said dish rack.

3. A dish rack adapted for use with an automatic dishwasher having a cabinet with a wash chamber therein comprising:
   (a) a plurality of dish supporting members interconnected to form a unitary structure,
   (b) means to support said unitary structure in a first position external of a wash chamber of a dishwasher,
   (c) means adapted to support said unitary structure in a second position within a wash chamber of a dishwasher,
   (d) each of said plurality of dish supporting members including means to support a dish in substantially its normal use position when the unitary structure is in said first position,
   (e) each of said plurality of dish supporting members also including means to support a dish in a position to facilitate washing thereof when the unitary structure is in said second position.

4. The dish rack defined in claim 3 further comprising a handle projecting from said unitary structure so as to be above said unitary structure when said unitary structure is in said first position to facilitate the manual transport of said unitary structure.

5. A dish rack adapted for use with an automatic dishwasher having a cabinet with a wash chamber therein comprising:
   (a) a plurality of dish supporting members interconnected to form a unitary structure,
   (b) means to support said unitary structure in a first position external of a wash chamber of a dishwasher and including feet extending from said unitary structure and adapted to rest upon a table top,
   (c) means adapted to support said unitary structure in a second position within a wash chamber,
   (d) each of said plurality of dish supporting members including means to support a dish in a position to facilitate washing thereof when the unitary structure is in said second position,
   (e) each of said plurality of dish supporting members also including means to support a dish in substantially its normal use position when the unitary structure is in said first position.

6. A dish rack for use with an automatic dishwasher having a cabinet and a wash chamber therein comprising:
   (a) a plurality of dish supporting members interconnected to form a unitary structure,
   (b) means to support said unitary structure on a dishwasher cabinet for pivotal movement,
   (c) said unitary structure being pivotal from a first position at least partially external of a dishwasher wash chamber to a second position within a wash chamber,
   (d) each of said plurality of dish supporting members including means to support a dish in substantially its normal use position when the unitary structure is in said first position,
   (e) each of said plurality of dish supporting members also including means to support the dish in a position to facilitate washing thereof when the unitary structure is in said second position.

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CLAUDE A. LE ROY, *Primary Examiner.*

W. D. LOULAN, *Assistant Examiner.*