

May 20, 1969

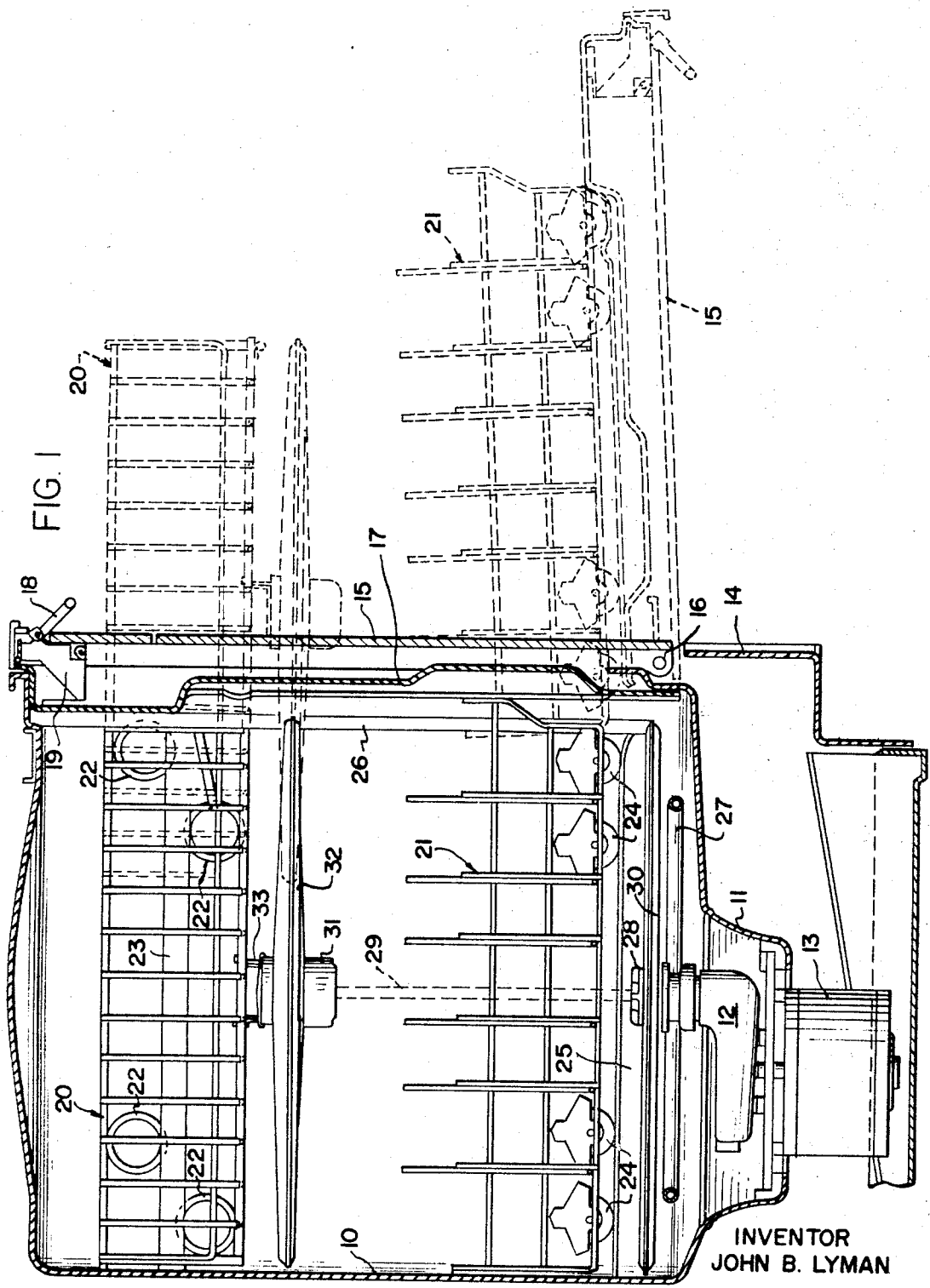
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3,444,870

ARTICLE WASHING APPARATUS

Filed Dec. 12, 1966

Sheet 1 of 2



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FIG. 2

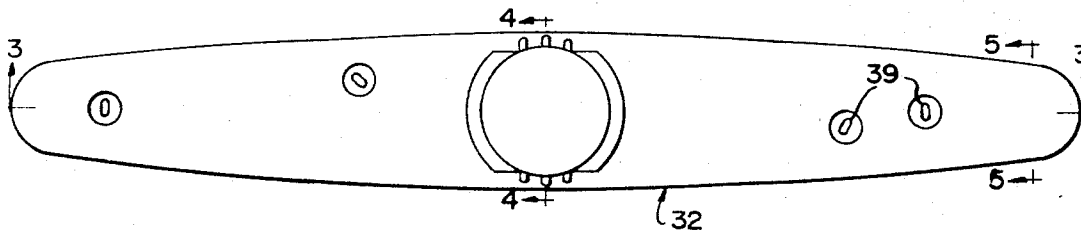


FIG. 3

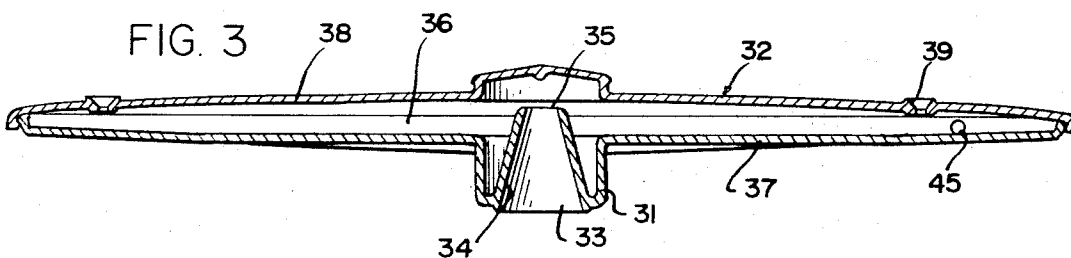


FIG. 4

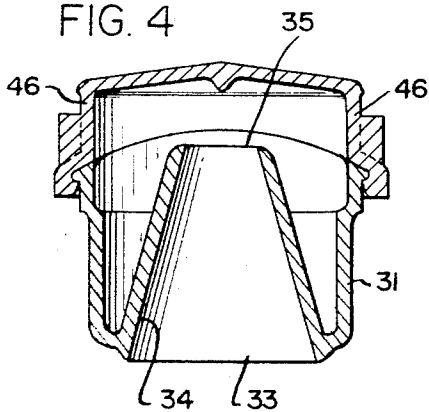
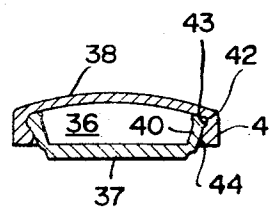


FIG. 5



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ARTICLE WASHING APPARATUS

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2 Claims

ABSTRACT OF THE DISCLOSURE

A dishwasher or similar article washing apparatus comprising an article holder for retaining the articles during the washing thereof and a hollow spray arm that receives liquid on its interior and sprays the liquid under pressure on the holder and the articles held therein in which the spray arm comprises parts separably joined at their peripheries to form the arm, the separable parts having interengaging fastening means at the peripheries, some of which are distortable by the liquid pressure on the interior of the arm into more secure engagement with the other fastening means.

This invention relates to an article washing apparatus such as a dishwashing machine and particularly to an improved spray arm for spraying liquid under pressure on an article holder and thus articles held therein as a part of the cleaning process.

In Patent 3,180,348 dated Apr. 27, 1965 and assigned to the same assignee as the present application there is disclosed and claimed an article washing apparatus in which a jet of liquid is projected through space in the apparatus and received by a receiver that converts the velocity energy of the jet to pressure energy. The pressure liquid is thereupon directed into a rotatable spray arm which sprays the pressure liquid on the articles being cleaned. The apparatus of this invention is essentially of this type but includes an improved receiver and spray arm for the liquid jet.

One of the features of this invention is to provide an improved article washing apparatus that comprises an article holder, a hollow spray arm means for receiving and spraying liquid under pressure on the holder and thus on articles held therein and means for supplying liquid under pressure to the arm with the arm comprising separable parts having interengaging fastening means so that the arm can be disassembled as for cleaning with some of the interengaging fastening means being distortable by the liquid pressure within the arm into more secure engagement with the other fastening means so that regardless of the internal liquid pressure normally encountered the parts of the arm do not become separated.

Other features and advantages of the invention will be apparent from the following description of one embodiment of the invention taken in conjunction with the accompanying drawings. Of the drawings:

FIGURE 1 is a vertical sectional view through a dishwasher embodying the invention with certain movable parts being shown in solid lines in their operating positions and in broken lines in withdrawn positions.

FIGURE 2 is a plan view of the upper spray arm of the embodiment of FIGURE 1.

FIGURE 3 is a section taken substantially along line 3—3 of FIGURE 2.

FIGURE 4 is a section taken substantially along line 4—4 of FIGURE 2.

FIGURE 5 is a section taken substantially along line 5—5 of FIGURE 2.

FIGURE 1 discloses an under-the-counter type washing machine comprising a tub 10 having a bottom provided with a liquid collecting sump 11 in which is located

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a pump 12 driven by an electric motor 13. An enclosing cabinet 14 is provided with a door 15 so that the door when opened to the dotted line position provides access to the interior of the machine. The door is hinged at the bottom, as indicated at 16, and carries an inner closure member 17 for the open front of the tub 10. The door is provided with the customary handle 18 and latch 19.

Located in the top of the tub 10 is a customary article or dish holder 20 in the form of a wire basket. This first basket 20 is positioned above a similar article holding basket 21 at the bottom of the tub 10. The first basket 20 is provided with upper and lower side wheels 22 engaging tracks 23 so that the basket 20 can be withdrawn for loading and unloading as shown by the dotted lines in FIGURE 1.

The second or lower wire basket 21 is provided with a plurality of side wheels 24 engaging a track 25 so that it too can be withdrawn for loading and unloading as shown by the dotted lines in FIGURE 1. When the lower basket 21 is withdrawn the wheels 24 ride on tracks 26 that are located on the inner surface of the closure 17.

Positioned in the bottom of the tub 10 is a customary electric resistance heater rod 27.

When the parts are in operating position the pump 12 is substantially centrally located beneath the lower basket 21 and the upper basket 20. This pump is provided with a nozzle structure 28, as described in the above-mentioned Patent 3,180,348, for projecting a jet 29 of liquid toward the upper basket 20 and the articles held therein. Also as disclosed in the above patent, associated with the nozzle 28 is a bottom rotatable spray arm 30.

The jet of liquid 29 is received in an energy converter 31 that is integral with a spray arm 32 with both being attached to the bottom of the upper basket 20 as by attaching means 33.

The integral energy converter 31 and spray arm 32 are disclosed in detail in FIGURES 2-5. As is shown there, the converter 31 is provided with an open bottom 33 for receiving the jet 29. Extending upwardly from this open bottom is a truncated cone 34 having an open top 35 emptying into the interior 36 of the spray arm 32. Thus the energy converter 33 and spray arm 32 are integral and the cone 34 of the converter converts the low pressure high velocity jet 29 into low velocity high pressure liquid for use within the spray arm 32.

The spray arm 32 comprises separable parts here shown as a lower part 37 containing the converter 31 and an upper or covering part 38 containing spray openings 39 for spraying liquid upwardly onto articles held within the first holder or basket 20. These separable parts 37 and 38 have interengaging fastening means some of which are distortable by the liquid pressure within the interior space 36 of the arm in order to urge the fastening means into more secure engagement with each other. In the embodiment illustrated this interengaging fastening means comprises overlapped inner 40 and outer 41 peripheral areas with cooperating sockets and projections received within the sockets and with the inner peripheral area 40 being distortable outwardly by the liquid pressure in the space 36 to provide more secure engagement.

Again, in the embodiment illustrated, the interengaging fastening means comprises a continuous socket groove 42 around the inner surface of the outer peripheral section 41 while the projection is in the form of a continuous bead 43 normally located in the groove 42. The bead is on the outer surface of the inner peripheral section 40. As is shown most clearly in FIGURES 4 and 5 the groove 42 is bounded on its outer edge by a ridge 44 which extends inwardly of the outer surface of the bead 43 so that the ridge resists separation of the parts under the low pressure in the space 36.

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With this arrangement, the parts of the spray arm of the dishwasher are held securely in assembly but can be readily separated for cleaning. Furthermore, the locking means for the parts is so arranged that the locking pressure of the parts against each other increases with increasing internal pressure.

As is customary in dishwashers of this type the liquid within the spray arm space 36 is also used to rotate the spray arm. In the disclosed embodiment this is accomplished by having openings 45 at the extremities of the arm 32.

Having described my invention as related to the embodiment shown in the accompanying drawings, it is my intention that the invention be not limited by any of the details of description, unless otherwise specified, but rather be construed broadly within its spirit and scope as set out in the accompanying claims.

The embodiment of the invention in which an exclusive property or privilege is claimed is defined as follows:

1. Article washing apparatus, comprising: an article holder; hollow spray arm means for receiving liquid therein and spraying said liquid under pressure on said holder and thus on articles held therein; and means for supplying liquid under pressure to said arm, said arm comprising parts separably joined at their peripheries to form said arm, said separable parts having continuous overlapping inner and outer peripheral areas around their

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entire peripheries with cooperating sockets and projections received in said sockets, said inner peripheral areas being distortable outwardly toward said outer peripheral part by said liquid pressure to provide more secure engagement therebetween.

2. The apparatus of claim 1 wherein said outer peripheral areas contain said sockets which are inwardly opening and said inner peripheral areas contain said projections which are outwardly projecting and each in the form of a bead.

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U.S. Cl. X.R.

134—198; 239—251, 600; 285—107