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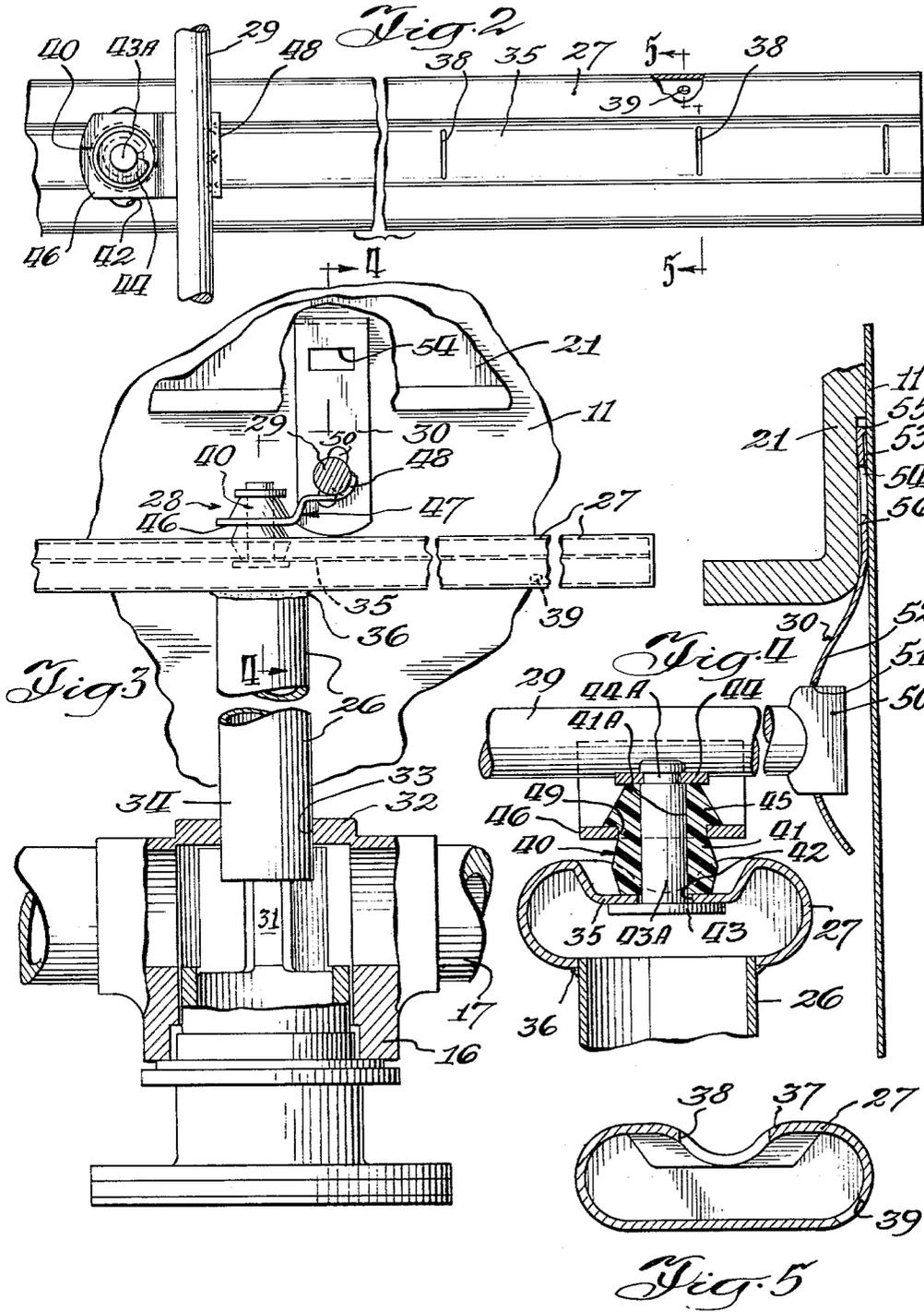
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DISHWASHER

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2 Sheets-Sheet 2



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3,184,166
DISHWASHER

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This invention relates to dishwashers, and in particular to means for delivering washing liquid therein.

In one form of conventional dishwasher, a housing is provided defining a washing chamber. Basket type racks are disposed within the chamber for holding dishes and the like to be washed. The washing of the dishes is effected by delivering streams of washing liquid against the dish surfaces. Conventionally, the liquid is delivered in the form of a spray from a rotating arm having suitable jet nozzles for delivering the washing liquid forcibly against the dishes to effectively scour and clean the surfaces thereof.

The present invention comprehends the provision of an additional spray apparatus disposed in an upper portion of the chamber for providing improved washing of the dishes and the like therein. Thus, a principal feature of the present invention is the provision of a new and improved dishwasher apparatus.

Another feature of the invention is the provision of such apparatus having new and improved means for delivering spray against the articles to be washed therein.

A further feature of the invention is the provision of such apparatus having a new and improved supplemental spray means, including a conduit member in fluid transfer association with a means for delivering the washing liquid to the lower spray arm and extending upwardly therefrom to an upper portion of the chamber, spray means on the upper portion of the conduit member for delivering washing liquid therefrom into the upper portion of the chamber, and means engaging a basket support means in the upper portion of the chamber for retaining the conduit and spray arm positionally therein.

Still another feature of the invention is the provision of such apparatus wherein the supplemental spray means is readily removably connected to the liquid supply means and the retaining means is readily removably connected to the housing in the upper portion of the chamber.

A still further feature of the invention is the provision of such apparatus wherein the retaining means comprises securing means releasably secured to the guide tracks provided for carrying an upper basket of the dishwasher.

Still another feature of the invention is the provision of such a dishwasher apparatus wherein the supplemental spray means is arranged for rotation independently of the lower spray means.

Other features and advantages will be apparent from the following description taken in connection with the accompanying drawing wherein:

FIGURE 1 is a side elevation of a dishwasher provided with spray apparatus embodying the invention, portions thereof having been broken away to facilitate illustration of the invention;

FIGURE 2 is a fragmentary top plan view of the upper spray means with a portion of the retaining means in association therewith, a portion of the spray means being broken away to illustrate the arrangement of the propelling orifice therein;

FIGURE 3 is a fragmentary elevation of the supplemental spray means installed in association with the lower spray device;

FIGURE 4 is a fragmentary vertical section taken substantially along the line 4—4 of FIGURE 3; and

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

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In the exemplary embodiment of the invention as disclosed in the drawing, a dishwasher generally designated 10 is shown to comprise a conventional housing structure 11 having a hinged lid 12 providing access to a dishwashing chamber 13 within the housing 11. The dishwasher further includes a conventional filter-
5 sump 14, a high pressure pump 15 for recirculating the washing liquid from the sump to an inlet 16 in a lower portion of the chamber 13. Formed integrally with the inlet 16 is a spray arm 17 for delivering the washing liquid forcibly into the chamber 13 for washing dishes and the like carried in a suitable conventional basket 18 immediately above the spray arm 17.

The dishwasher may further include a conventional electric heating element 19 for maintaining the dish-
15 washing liquid hot during the washing operation and for providing drying heat during the drying cycle. A conventional basket 20 for holding silverware and the like is further provided in the lower portion of the chamber 13.

A pair of tracks 21 is installed on opposite sides of housing 11 in an upper portion 22 of the chamber 13 for carrying a pair of baskets 23 and 24 on suitable conventional rollers 25 and facilitated loading thereof.

The present invention is concerned with the provision of washing liquid to the upper portion 22 of the chamber 13 for washing the articles in the baskets 23 and 24 in an improved manner. More specifically, the invention comprehends the provision of a conduit member 26 extending upwardly from inlet 16 to just below the level of the tracks 21. A spray arm 27 is formed integrally with the conduit member 26 to extend horizontally across the chamber 13 below the baskets 23 and 24 for deliver-
25 ing the washing liquid forcibly upwardly thereto. The conduit member and spray arm unit is positionally retained at the upper end of the conduit member by a retaining device 28 including a cross-rod 29 extending horizontally across the chamber 13 and having fitted to the opposite ends thereof a retaining clip 30 which is releasably secured in position between the cabinet 11 and the track 21, as best seen in FIGURE 4.

Turning now more specifically to FIGURES 2 through 5, the inlet member 16 defines an inlet chamber 31. The upper wall 32 of the inlet 16 is provided with an opening 33 through which the lower end 34 of the conduit member 26 rotatably extends to have fluid transfer associa-
35 tion with the chamber 31. The conduit member 26 comprises an elongated tubular member formed of a suitable material such as stainless steel or plastic. The spray arm 27 comprises a tubular member having a flattened cross-section as shown in FIGURE 5 and secured at its mid-portion 35 to the upper end of the conduit member 26 as by a welding 36. As shown in FIGURE 5, the upper surface of the spray arm 27 is provided with a depressed portion 37 having a plurality of longitudinally spaced slots 38 through which the washing liquid is sprayed upwardly toward the upper portion 22 of chamber 13. Further, the spray arm is provided with a laterally directed opening 39 for imparting a rotation to the spray arm and conduit member 26 about the vertical axis of the conduit member.

The retaining device 28 comprises a grommet 40 having a mid-portion 41 extending downwardly through an opening 49 in a Z-bar generally designated as 47. The retaining device further includes a shaft portion 43A having a disc-like enlargement 43 at one of its ends received within the interior of the spray arm 27 and a groove 44A at its other end for receiving a snap ring 44. Shaft portion 43A extends upwardly through a central opening 42 located in the mid-portion 35 of spray arm 27 and continues through a bore 41A of grommet 40.

Snap ring 44 bears against a frusto-conical upper portion 45 of grommet 40 which is carried on one end 46 of the Z-bar 47. The opposite end 48 of the Z-bar is cylindrically turned and attached to cross-rod 29 as by spot welding, as best seen in FIGURE 3. Thus, the upper end 45 of grommet 40 and snap ring 44 support the upper end of the assembled conduit member 26 and spray arm 27 for rotation about the vertical axis of the assembly which as shown in FIGURE 1 comprises the central vertical axis of chamber 13.

As illustrated in FIGURE 4, the ends 50 of the cross-rod 29 comprise flat portions extending through slots 51 in the retaining clips 30. The retaining clips include a lower bowed portion 52 in which the slots 51 are provided and an upper generally flat portion 53 in which an opening 54 is provided. The upper end 55 of the portion 53 is turned to define a shoulder. The upper portion 53 of the retaining clip is wedged between the track 21 and the cabinet wall 11 in downwardly opening recess 56 therebetween, as shown in FIGURE 4. Thus, the retaining clips are effectively retained by the tracks 21. The cross-rod 29 may be readily removed when desired as by bringing the bowed portion 52 of clips 30 toward the wall 11 to clear the flatted ends 50 of the cross-rod 29 to and allow the removal of the cross-rod 29 from slots 51 of the clips 30. Further, as the rounded portion 48 of the Z-bar upper bar 47 is secured to the cross-rod 29, the conduit member 26 and the spray arm 27 assembly is removed with cross-rod 29.

Thus, the invention comprehends an improved auxiliary spray means arranged to provide improved washing of the articles, such as dishes and the like, in the baskets 23 and 24 disposed in the upper portion 22 of the dish washing chamber. The auxiliary spray means is readily removably installed in association with the primary spray means at the bottom of the chamber, utilizing the conventional track means 21 of the dishwasher for positively retaining the auxiliary spray means in operative position within the chamber. The apparatus is extremely simple and economical to manufacture, and by virtue of the simple arrangement provides long trouble-free life.

When I have shown and described one embodiment of my invention, it is to be understood that it is capable of many modifications. Changes, therefore, in the construction and arrangement may be made without departing from the spirit and scope of the invention as defined in the appended claims.

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

1. In a dishwashing apparatus having means defining a washer chamber, and liquid delivering means in a lower portion of the chamber for delivering washing liquid thereinto, spray apparatus comprising: a conduit member in fluid transfer association with the liquid delivering means and extending upwardly therefrom to an upper portion of the chamber; spray means on an upper portion of the conduit member for delivering washing liquid therefrom into the upper portion of said chamber; support means connected to said spray means; and securing means engaging the support means for positionally main-

taining the upper portion of the conduit member, said securing means comprising a plurality of spring clips releasably engaging said support means.

2. In a dishwashing apparatus having means defining a washing chamber, and liquid delivering means in a lower portion of the chamber including a first rotatable spray arm for delivering washing liquid thereinto, spray apparatus comprising: a conduit member rotatably carried by and in fluid transfer association with said liquid delivering means and extending upwardly therefrom to an upper portion of the chamber; a second spray arm on an upper portion of the conduit member for delivering washing liquid therefrom into the upper portion of said chamber; support means connected to said upper portion of said second spray arm; and securing means engaging the support means for positionally maintaining the upper portion of the conduit.

3. In a dishwashing apparatus having means defining a washing chamber having opposite side walls, and liquid delivering means in a lower portion of the chamber for delivering washing liquid thereinto, spray apparatus comprising: a conduit member in fluid transfer association with the liquid delivering means and extending upwardly therefrom to an upper portion of the chamber; spray means on an upper portion of the conduit member for delivering washing liquid therefrom into the upper portion of said chamber; and means engaging the spray means for positionally maintaining the conduit and spray means including a cross-member extending across the chamber between said side walls, means at opposite ends of the cross-member securing the cross-member to said chamber side walls, and means secured to the mid-portion of the cross-member and rotatively retaining the conduit member and spray means.

4. In a dishwashing apparatus having means defining a washing chamber, and liquid delivering means in a lower portion of the chamber for delivering washing liquid thereinto, spray apparatus comprising: a conduit member in fluid transfer association with the liquid delivering means and extending upwardly therefrom to an upper portion of the chamber; spray means on an upper portion of the conduit member for delivering washing liquid therefrom into the upper portion of said chamber; support means connected to said spray means; and securing means engaging the support means for positionally maintaining the upper portion of the conduit member, said conduit member being rotatably connected to said liquid delivering means for rotation of said spray means independently thereof.

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