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Diebel et al.

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[54] **APPARATUS FOR WASHING ARTICLES**

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[51] **Int. Cl.** **B08b 3/02**

[58] **Field of Search** 134/78–81, 134/172, 198, 199, 200; 239/600; 285/DIG. 5, 159

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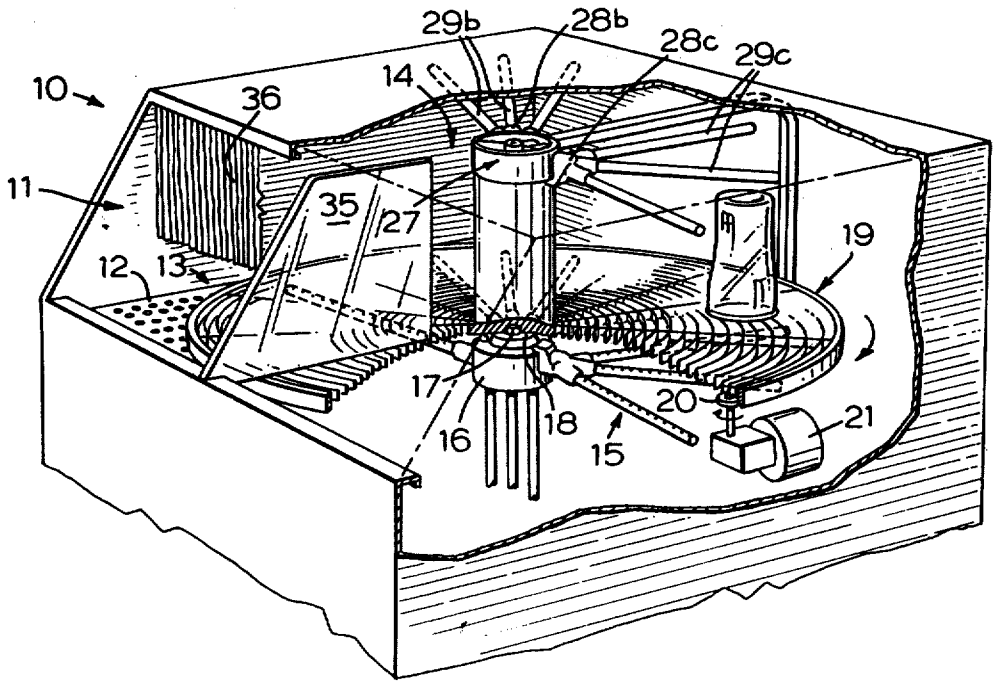
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Attorney, Agent, or Firm—Stanley J. Rogers

[57] **ABSTRACT**

In apparatus for washing articles such as drinking glasses a central bearing member supports a constantly-driven rotary conveyor on which the articles are carried through successive pre-rinse, wash and rinse stations. Each station has a different set of spray tubes extending over a different sector of the conveyor to provide a corresponding specific period of spray time, each set being carried by a single connector having a respective non-interchangeable mechanical connection with the central bearing member, which bearing member also receives the pipes feeding liquid to the spray tubes.

3 Claims, 4 Drawing Figures



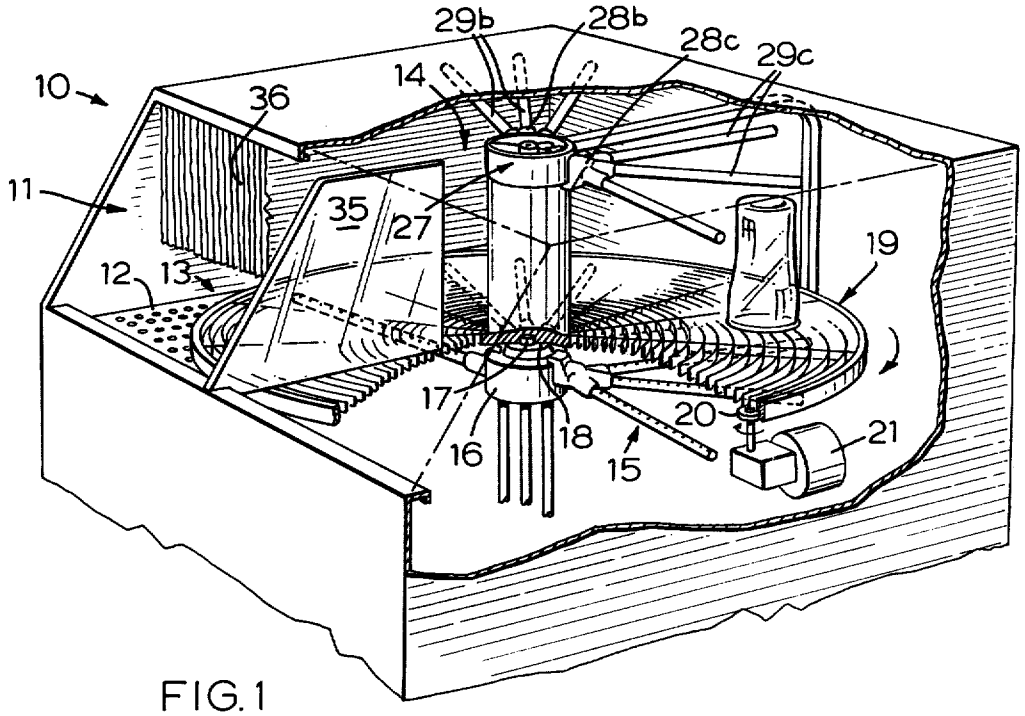

29b
28b
28c
29c
14
10
36
11
35
27
19
12
13
17
20
21
16
18
15

FIG. 1

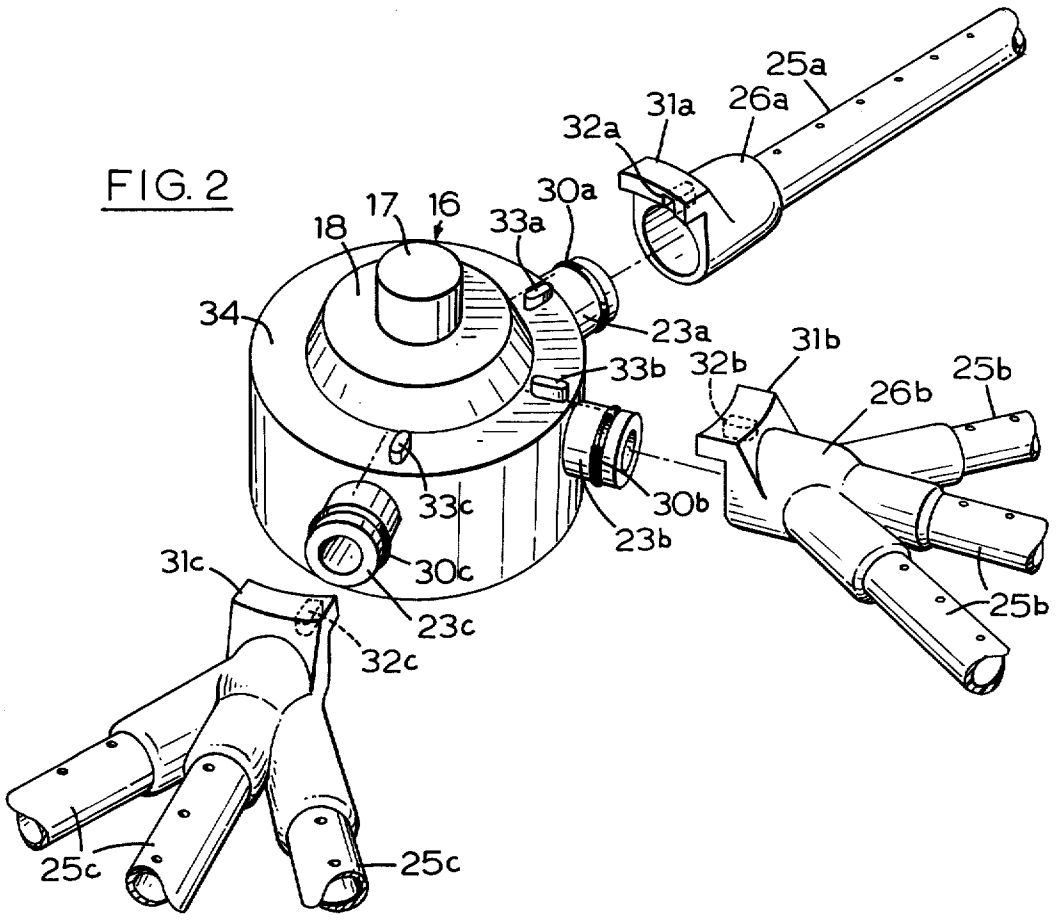

25a
31a
26a
32a
30a
17
16
18
33a
34
23a
31b
32b
33b
26b
25b
33c
30b
23b
31c
30c
23c
32c
25b
25c
25c

FIG. 2

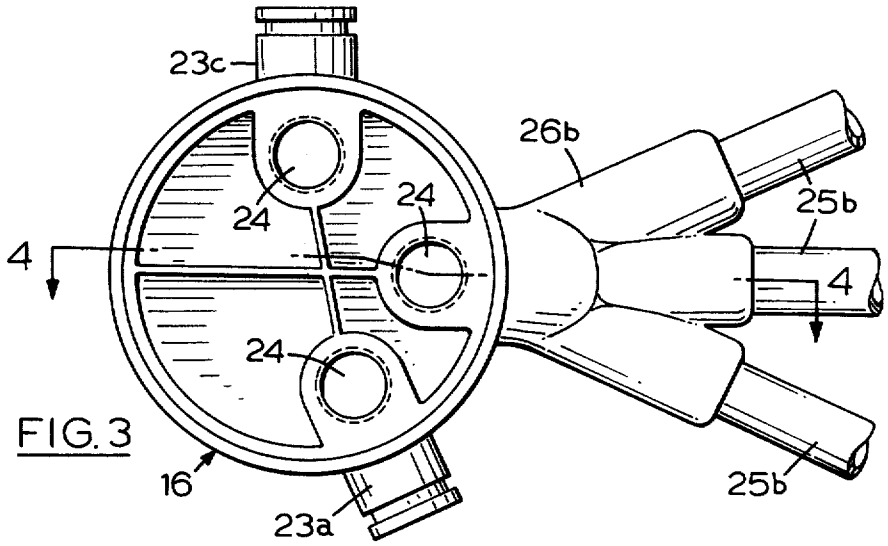

23c
26b
24
24
25b
4
4
24
16
23a
25b

FIG. 3

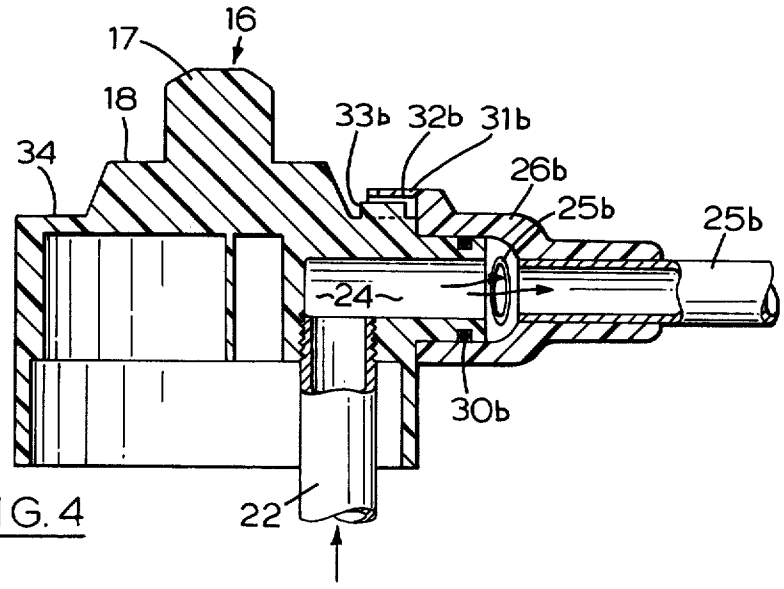

16
17
18
34
33b
32b
31b
26b
25b
25b
24
30b
22

FIG. 4

APPARATUS FOR WASHING ARTICLES

FIELD OF THE INVENTION

The present invention is concerned with improvements in or relating to apparatus for washing articles, such as cups and glasses, and of the kind employing a rotary conveyor for carriage of the articles.

REVIEW OF THE PRIOR ART

As the labour of individuals becomes more expensive there is a constant search to provide new and better machines for carrying out simple tasks that previously were performed by hand. There is also a constant endeavour to provide such apparatus that is robust and adapted for maintenance and service by relatively unskilled personnel.

DEFINITION OF THE INVENTION

It is an object of the present invention to provide a new machine for washing small articles such as cups and glasses.

It is a more specific object to provide a new such apparatus that is especially simple to disassemble and reassemble without error.

In accordance with the present invention there is provided new apparatus for washing articles, such as drinking glasses, the apparatus comprising a frame, a central bearing member mounted by the frame and adapted to receive pipe means for conveying liquids thereto, a rotary conveyor mounted by the bearing member for rotation about a vertical axis to convey the articles through a pre-rinse station, a wash station and a rinse station each of predetermined radial extent, motor means operatively connected with the conveyor to rotate it at a predetermined speed, radial spray means for each of the said stations extending from the said central bearing member detachably connected thereto and receiving a respective liquid from said pipe means, and different non-interchangeable detachable mechanical connections between each spray means and the bearing member.

DESCRIPTION OF THE DRAWINGS

A glass washing machine which is a particular preferred embodiment of the invention will now be described, by way of example, with reference to the accompanying diagrammatic drawings, wherein:

FIG. 1 is a general side elevation of the upper conveyor portion of the apparatus, part of the outer casing thereof being shown broken away to reveal the interior,

FIG. 2 is an exploded perspective view to a larger scale of a central bearing member of the machine and its attached radial spray means,

FIG. 3 is a view from below of the bearing member of FIG. 2, and

FIG. 4 is a section along the line 4—4 in FIG. 3.

DESCRIPTION OF THE PREFERRED EMBODIMENTS

The machine to be particularly described is an especially compact apparatus intended for use in restaurants, hotels and the like where space in the liquor serving area is at a premium and yet provision must be made for glass washing. The apparatus comprises a cabinet indicated generally by the reference **10**, of approximately square shape in plan, and having an access opening **11** at its front just at waist height of a standing

individual so that glasses to be washed can easily be inserted by the operator. The various pumps, heaters, switches filters and tanks which are used in supplying the liquids for washing and rinsing do not form part of the present invention, and therefore are not described; they are accommodated in the cabinet in the compartment formed between a floor **12** and the bottom of the machine.

This floor **12** forms the bottom of a series of drain compartments corresponding to a pre-rinse station **13**, a washing station **14** and a rinse station **15**. A central cylindrical bearing member **16** of a suitable material, such as cast nylon, is mounted to the bottom of the tank **12**. An upstanding central boss **17** and a surrounding annular surface **18** together constitute a bearing for a rotary conveyor **19** mounted thereon for rotation about a vertical axis.

In this particular embodiment this conveyor consists of a series of spaced concentric rings of non-corrosive material, e.g., stainless steel, connected together by radial arms. A pulley **20** driven by a motor **21** engages the outer periphery of the conveyor and rotates it on the bearing at a substantially constant speed.

The bearing member **16** also serves as a junction for connecting pipes such pipe **22** (FIG. 4), carrying the washing and rinsing liquids, to the different radial spray means therefor. To this end the member is provided with three radially-outwardly extending bosses, **23***a*, **23***b* and **23***c* each of which connects with an internal bore **24** into which the respective connecting pipe **22** can be screwed.

On the first boss **23***a* is mounted a single perforated tube **25***a* by means of a corresponding single-arm connector **26***a*, this single tube providing a pre-rinse wash by forcing jets of water upwardly into the inverted glassware mounted on the conveyor. A multiple set of perforated pipes **25***b* carried by a corresponding connector **26***b* are mounted on the second boss **23***b* and extend over the section of the conveyor constituting the wash station. A member **27** mounted to the top of the cabinet coaxially with the bearing member **16** serves as a plumbing connector only and is provided with a corresponding boss (not seen), connector **28***b* and set of pipes **29***b*, but does not perform any bearing function in the machine. The third boss **23***c* of the lower member and the second boss **28***c* of the upper member are each provided with another set of pipes **25***c* and **29***c* respectively constituting a rinse station.

It is essential because of their different characteristics that the pipes **25** do not become interchanged, and to this end each connecting member **26** has an aperature therein so as to fit snugly over the corresponding boss with the intervention of a corresponding O ring **30** to provide a liquid tight seal therebetween. Each connecting member is provided with a flange **31** having therein a radially-extending recess **32** which will engage over a corresponding upward projection **33** immediately adjacent the respective boss on an annular surface **34** of the bearing member. The flange **31** engages the surface **34** to hold the spray nozzles against rotation on the boss.

Unless the connecting member **26** has a recess **32** that corresponds in position with the respective projection **33** then the set of pipes cannot be mounted on the boss. It is impossible therefore for the pipes to become interchanged. In the embodiment illustrated there are three stations and accordingly the projections are lo-

cated either to one or other side of the longitudinal axis of the bosses, or centrally thereto. It will be apparent however that a greater number of different positions can be accommodated. The location of the recesses and projections can be reversed.

In operation of the machine the operator switches it on and places the glasses in inverted position to the left of a dividing partition **35.** The glasses are carried by the conveyor through a hanging spray-containing curtain **36** and past the pre-rinse station, at which the glasses are pre-rinsed by spraying with water. Thereafter, the conveyor passes the glasses through the wash and rinse stations in which they are sprayed with liquid from above and below. Because of the constant speed of the conveyor the glasses are in the respective stations for a specified period of time; they are sprayed in the wash station with hot detergent solution and in the rinse station with a sterilizer solution. The washed glasses are removed from the conveyor as they butt against the partition **35.**

The spray nozzles require constant maintenance during which they must be removed cleaned and replaced. The different non-interchangeable mechanical connection provided for each nozzle or group of nozzles ensures that these parts cannot be wrongly replaced, which would completely alter the cycle of the machine. In many jurisdictions there are specific requirements laid down for the washing and drying of glassware, especially in public service rooms, and such requirements will always be met by an apparatus in accordance with the invention.

We claim:

1. Apparatus for washing articles, the apparatus comprising a frame, a central bearing member mounted by the frame and adapted to receive pipe means for conveying liquids thereto, a rotary conveyor mounted by the bearing member for rotation about a vertical axis to convey the articles mounted thereon through a pre-rinse station, a wash station and a rinse station each of which extends over a sector of the conveyor of predetermined angular extent, motor means operatively connected with the conveyor to rotate it at a predetermined speed, a set of radially-extending spray pipes for each of the said stations extending from the said central bearing member over a sector of angular extent corresponding to that of the respective station, being detachably connected to the central bearing member by a single common detachable mechanical pipe connection having a respective axis that extends radially from the said vertical axis and receiving a respective liquid from said pipe means, each of said detachable mechanical pipe connections between each set of spray pipes and the bearing member being mechanically non-interchangeable to ensure connection of each set of spray pipes only to operate in the respective station.

2. Apparatus as claimed in claim **1,** wherein each non-interchangeable mechanical pipe connection includes a radially and circumferentially extending flange on the respective spray pipe set engaging a corresponding horizontal annular surface of the central bearing member coaxial with the vertical axis, a recess in the flange, and a co-operating projection on the said surface, the circumferential location of each projection and its co-operating recess relative to the radial axis of the respective common detachable pipe connection being different for each connection to render the connections non-interchangeable.

3. Apparatus as claimed in claim **1,** and including a second central member coaxial with the said bearing member and mounted by the frame above the conveyor, sets of radially-extending spray pipes for at least two of the said stations extending from the second central member, each set of pipes extending over a sector of angular extent corresponding to that of the respective station, being detachable connected to the central bearing member by a single common detachable pipe connection, and receiving a respective liquid from said pipe means, each of said detachable mechanical pipe connections between each of the last-mentioned sets of spray pipes and the second central member being non-interchangeable to ensure connection of each set of spray pipes to operate only in the respective station.

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