

Feb. 14, 1933.

G. POLI

1,897,821

DISHWASHING DEVICE

Filed Aug. 22, 1931

3 Sheets-Sheet 1

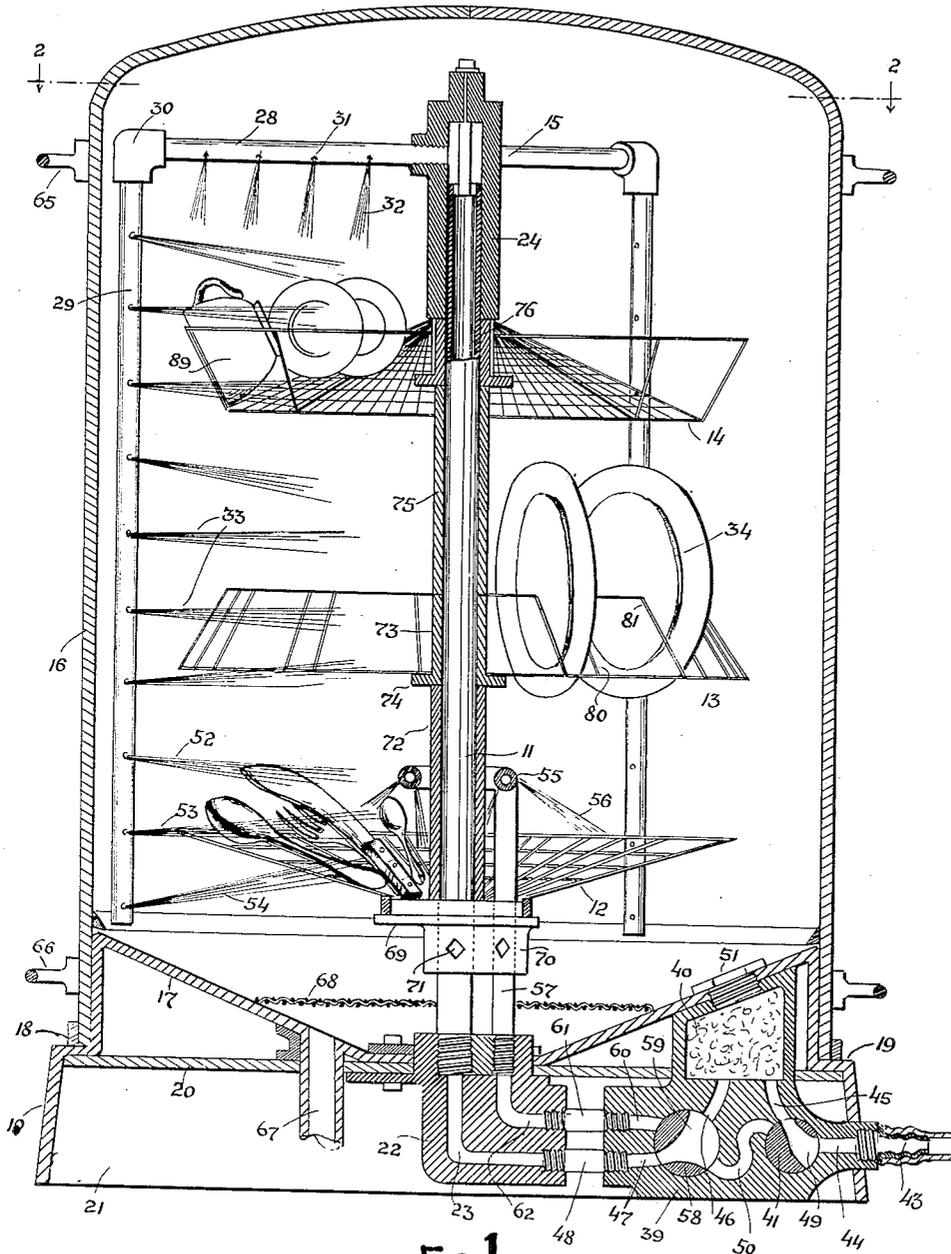


FIG. 1

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3 Sheets-Sheet 2

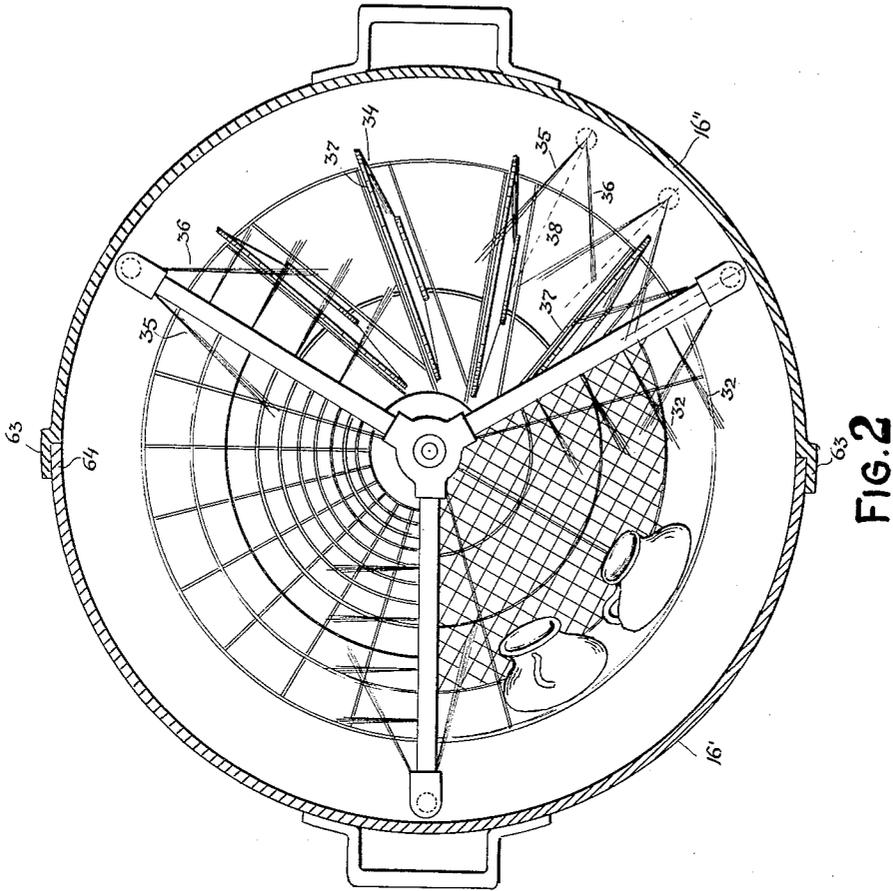


FIG. 2

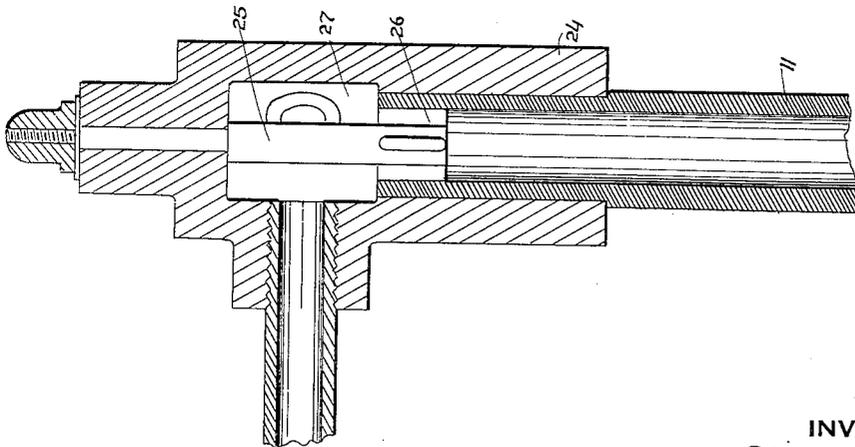


FIG. 3

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3 Sheets—Sheet 3

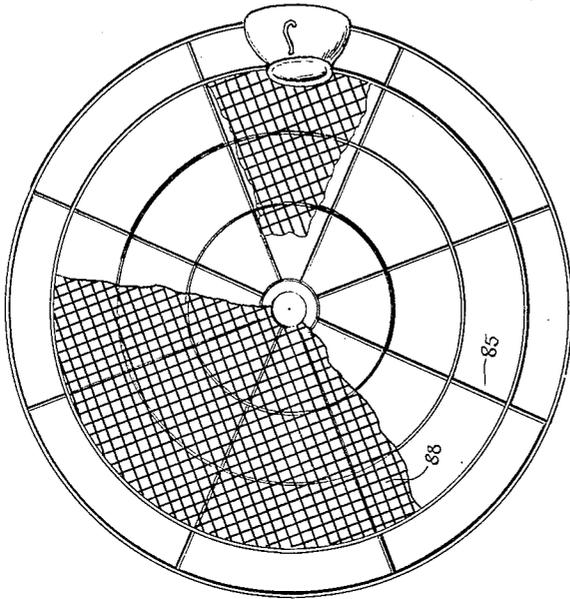


FIG. 6

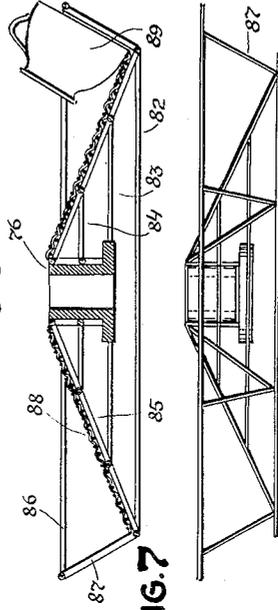


FIG. 7

FIG. 8

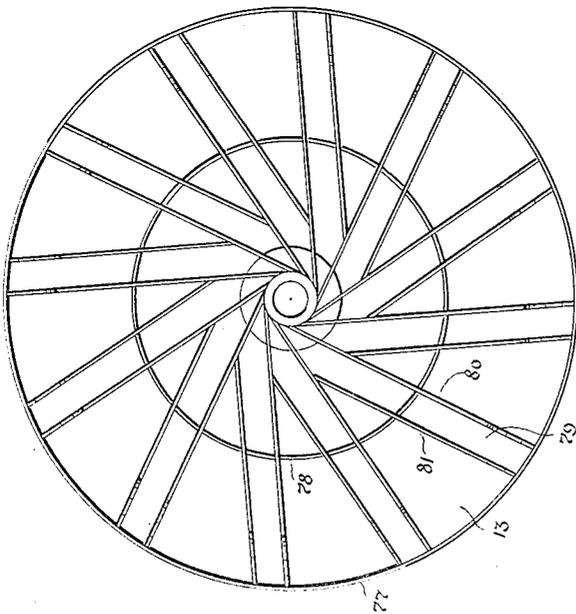


FIG. 4



FIG. 5

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# UNITED STATES PATENT OFFICE

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## DISHWASHING DEVICE

Application filed August 22, 1931. Serial No. 558,709.

This invention relates to household appliances and more particularly refers to improvements in dishwashing devices especially suitable for family use.

The primary object of this invention is to provide a dishwashing device of a relatively simple and inexpensive construction, affording a convenient and practical arrangement whereby hand washing and drying of dishes may be completely eliminated.

Another object of the invention is to provide in a dishwashing device spraying means of a novel and improved design, insuring thorough washing and rinsing of all the articles placed in the same.

A further object is to provide a dishwashing device of a compact and efficient design, adapted to be placed on the drainboard adjoining an ordinary kitchen sink, and adapted to be connected to and to be operated by the water issuing from one of the faucets generally used as an item of standard kitchen equipment.

With these and other objects in view which will more fully appear as the description proceeds, this invention furthermore consists of certain novel and improved constructions and arrangements of parts as will be hereinafter fully described and claimed in the appended claims.

The use of more than one tray or crate within a receptacle which is loaded from the top is objectionable because it entails the necessity of making the upper trays or crates removable if the lower one is to be reached.

In my improved device, the trays or crates provided for the various articles to be washed are mounted upon a stand in columnar arrangement, but are accessible from the side, and, therefore, all of them are accessible at any time with equal ease. This makes it possible to use more than two crates if desired and to both limit their diameter and do away with the necessity of removing one crate in order to reach the one underneath.

In connection with this arrangement I also use a novel and improved type of rotating spraying spider, which makes it pos-

sible for the cleansing water to reach all the points of the surfaces of the articles placed upon the trays or crates, said spider being actuated by the pressure of the water admitted therethrough.

My invention is illustrated by way of example in the accompanying drawings in which:

Fig. 1 is a vertical section of my improved dishwashing device;

Fig. 2 is a plan sectional view thereof through line 2-2 of Fig. 1; showing parts of the upper trays removed to uncover the lower trays;

Fig. 3 is a detail vertical section in an enlarged scale of the pivotal support of the rotatable spider.

Fig. 4 is a plan view of the special type of supporting tray for dishes adapted for use in connection with my device;

Fig. 5 is a view in elevation thereof;

Fig. 6 is a plan view with parts broken away of a supporting tray, also adapted for use in connection with my machine, said tray being especially designed for holding cups, glasses and like articles;

Fig. 7 is a vertical section thereof; and

Fig. 8 is a view in elevation of the same without the wire netting shown in Figs. 6 and 7.

Referring to Figs. 1, 2, 3 of the drawings, it will be seen that my improved device essentially comprises a base 10, a tubular stand 11 vertically extending from the center thereof, a plurality of vertically spaced trays or crates, 12, 13, 14, mounted on said stand, a spraying spider 15 rotatably mounted on said stand, and a shell 16, adapted to be placed on the base 10 and to entirely cover the other parts of the device.

The base 10 has an upper portion 17 which is preferably funnel shaped and is of a diameter somewhat smaller than the lower portion of the base, forming therewith a circumferential recess 18, providing a supporting shoulder 19 for the shell 16. The base is further provided with a horizontal partition 20 forming a recessed lower chamber 21, said partition together with

the bottom of funnel shaped portion 17, forming a means for securing in position the support 22 from which the vertical stand 11 extends.

5 In correspondence of the lower end of said stand, support 22 has a passage 23, which may be connected to the water supply system, and through which water under pressure is admitted to the tubular stand 11.

10 At the top of the stand is rotatably mounted the hub 24 of the spider. Said hub is supported on a stud 25 vertically projecting from the upper end of the tubular stand 11, said stud being secured onto said upper end by means of radial wings such as 26 integral with the lower end of said stud, said wings being forced or otherwise secured within tubular stand 11.

20 Hub 24 is provided with a chamber 27 which communicates with the interior of tubular stand 11, through the passages formed between wings 26 and the spider structure is completed by a number of spraying members, preferably three, each consisting of a horizontal section 28 radially extending from hub 24, and communicating with chamber 27 and a vertical section 29 depending from and connected to said radial section by an elbow 30.

30 The radial or horizontal tract of each spraying member is provided with a number of downwardly inclined perforations such as 31, causing water admitted through tubular stand 11 to issue therefrom in the form of downwardly directed sprays inclined at about 45° to the vertical.

35 The perforations 31 of each radial section 28 are directed at right angles to the axis of said section and in the same sense of the corresponding perforations of the radial sections of the other elements of the spider.

40 The action of the jets of water issuing from said perforations will, therefore, cause the spider to rotate in the sense opposite to that of the jets of water, so that the water sprays will reach every point of the area covered by the horizontal arms of the rotating spider. This manner of causing the rotation of the spider is illustrated in Fig. 2 where it is seen that the water jets 32 issuing from perforations 31 cause the spider to rotate in a counter clockwise direction.

45 The vertical sections of the spider's arms extend downwardly to a point close to the base, and are provided with vertically spaced perforations causing inwardly directed jets of water to issue therefrom. Said jets are preferably arranged at an angle to the vertical radial plane passing through the arm of the spider at each side thereof.

50 More particularly and preferably at least in connection with the inwardly directed jets directed against dishes 34 supported upon the intermediate crate 13, the jets 35

at one side of said vertical radial plane are directed at about a 15° angle thereto, whereas the jets 36 at the opposite side of said plane are directed at about a 35° to 45° angle.

70 Through a special arrangement of the tray provided for dishes 34, the dishes may be placed upon said tray in a direction circumferentially spaced from and somewhat at an angle to the radial direction, so as to have their front surfaces 37 facing jets 36 and their rear surfaces 38 facing the jets 35, during the rotation of the spider. By virtue of this arrangement a thorough and efficient washing of the entire surface of the dishes will be effected.

80 It will be observed that the jets 36 directed at a wider angle flow in the same sense as jets 32 issuing from the horizontal sections 28, and, therefore, more than overcoming as they do the tendency of jets 35 to cause the rotation of the spider in the opposite direction, they assist said jets 32 in causing the rotation of the spider.

90 Suitable arrangement may be made for admitting to the spraying system clear water or water containing dissolved soap or some other cleansing agent. To this end I provide a valve block 39, which is preferably adapted to be placed within lower chamber 21, and which is provided with a soap receptacle 40 and a two-way valve cock 41, controlling the flow of water from the supply system and causing said water to be delivered to conduit 23 direct, or else causing it to be delivered to said conduit 23 after having been caused to pass through the soap receptacle 40.

95 In the position shown, the water which is admitted to the device through a hose attachment 43 and passage 44 is deflected by cock 41, to passage 45 leading to the soap receptacle and from there the water will issue through passages 46, 47 and will be directed to passage 23 by connection 48 interposed between said passage 23 and passage 47. If cock 41 is rotated a suitable angle in a counter clockwise direction its passage 49 will establish direct communication between passage 44 and passage 50, cutting off the soap receptacle so that clear water will be delivered to passage 47 and through connection 48 to passage 23.

100 The soap receptacle may be filled from time to time with scraps of soap through an opening at the top controlled by a plug 51.

105 In practice I have found that knives, forks, spoons, and similar articles, which are likely to be placed in a jumble in a tray provided therefor, are not easy to clean when only relatively small jets of water such as 52, 53, 54 are made to reach them from the lower end of the spider arms. The average faucet supplies a stream of water

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which is generally not more than half an inch in diameter and when this stream is subdivided into a relatively larger number of streamlets, issuing from the perforations of the spider arms, the volume of water reaching any single article within the device is necessarily small.

It is, therefore, desirable to provide means permitting of directing the entire volume of water delivered by the faucet against the silver placed on the lower tray, in order to effect a preliminary energetic washing of said silver before starting the spraying of the entire load of the device by means of the spider. To this end, I provide a perforated tubular ring 55 surrounding stand 11, directly above tray 12, said ring having perforations causing strong jets of water such as 56 to issue therefrom and to strike the silver underneath with relatively great force, due to the proximity of said ring 55 to the silver.

Water is admitted to the tubular ring from a tubular stand 57, supporting the same, the lower end of said stand being screwed into and extending upwardly from support 22.

In order to selectively direct water to tubular stand 11, or to tubular stand 57, I interpose another multiple-way valve cock 58 between valve cock 41 and the outlet end of valve block 39. In the position shown, cock 58 directs the water coming from either passage 46 or passage 50 to passage 47 leading to tubular stand 11, as explained. If cock 58 is rotated a certain angle in a clockwise direction its passage 59 will establish communication between passages 46 and 50 and another passage 60 leading through a connection 61, to another passage 62 registering with stand 57, cutting off passage 47.

By virtue of this arrangement it becomes then possible to control the delivery of clear or soapy water by means of cock 41 and to control the supply of said water to either the rotating spider or ring 55 by means of cock 58.

As stated before, shell or cover 16, is designed so as to permit access to the various trays from the side, and, therefore, said shell is preferably made removable. Said shell may consist of one bell-shaped piece, or else, it may be in sections; for instance, the drawings show the same consisting of two halves, 16', 16'', part 16'' having longitudinal flanges such as 63 overlapping the edges 64 of part 16', both said parts 16' and 16'' being equipped with handles such as 65, 66, facilitating their ready handling.

When the washing and rinsing operations take place, shell 16 is of course placed in position so as to entirely enclose the device and its contents. After the washing and rinsing operations are completed the shell is preferably removed so as to expose the dishes

and other articles to the air, thus facilitating their drying.

Funnel shaped top 17 of base 10 collects the water delivered by the various sprays and is provided with a discharge outlet 67, which may be directed to the sink adjacent the drainboard.

In order to prevent clogging of outlet 67, it is preferable to place a disk 68 of strong wire netting above the lower portion of the funnel shaped trough formed by top 17, so that solid matter may be collected thereon, and prevented from reaching the discharge outlet.

The various trays are preferably supported in position so as to be rotatable by hand. This makes it very convenient to load or unload said trays by bringing the desired tray sections directly in front of the operator, and makes it unnecessary for the operator to bend and twist his arms in order to reach sections of trays back or around the stand.

In order to support the trays so that they may be rotated by hand, the lower tray 12 is rotatably inserted over supporting plate 69 of the bracket 70, secured by means of set screws such as 71 onto stationary stands 11, 57.

A sleeve 72 is loosely inserted over tubular stand 11 so as to rest on top of bracket 70.

Tray 13 is provided with a sleeve or bushing 73 having a lower flange 74 and the same is also inserted over stand 11, so as to rest upon the upper end of sleeve 72. Another sleeve 75 is inserted over stand 11 above sleeve or bushing 73 and then sleeve or bushing 76 of tray 14 is inserted over stand 11, so as to rest upon the upper end of sleeve 75.

Sleeves 72, 75, therefore, merely fulfill the function of spacing means, determining the relative vertical positions of the various trays. When the trays are loaded, they remain virtually stationary because the force of the water sprays is not sufficient to cause them to rotate; on the other hand, they can be easily rotated by hand as will be understood.

In Figs. 4 and 5 I illustrate in detail the preferred construction of tray 13. In said figures it will be seen that said tray comprises an outer base ring 77 and an inner base ring 78, forming a two-point edge support for the dishes placed thereon, as Fig. 1 clearly shows. From said base rings project upwardly a plurality of open outer end housings 79, circumferentially spaced around the entire circumference of the tray, said housings being each formed by two wire frames, such as 80, 81, spaced apart sufficiently to accommodate a dish of average height.

Said housings 79 are preferably not radially directed but are circumferentially spaced from a radial plane, frame 80 being

slightly at an angle to a radial plane passing through their outer end, and frame 81 being parallel thereto, the result being a turbine-like structure such as illustrated in Fig. 4. This arrangement is adopted in order to set the dishes at the proper angle to jets 35, 36, as previously explained.

It will be observed that the construction of tray just described, makes it possible to insert or remove the dishes therefrom endwise, so that a rapid and safe manipulation results.

Tray 14 provided for holding cups, glasses and like articles is preferably designed so as to insure proper draining of said articles. To this end, the frame work is composed of a plurality of rings 82, 83, 84 of gradually decreasing diameter, placed one above the other, so as to form a substantially conical structure completed by radial members 85, and by another border ring 86 joined to the rest of the structure by inclined stays 87. The central conical portion of the resulting structure is preferably covered with a disk of wire netting, as shown at 88. Stays 87 are inclined inwardly, being substantially at right angles to inclined radial members 85, and, therefore, the cups, glasses and similar articles may be placed on the tray with their open end facing outwardly, as shown at 89 in Figs. 1 and 7, remaining in an inclined position automatically insuring their proper draining.

The constructions of trays just described are merely illustrative of the ideas upon which they should preferably be based, and it is obvious that their details could vary to a considerable extent from those shown without departing from the inventive idea.

The same remark may be made in connection with the device as a whole, the showing of which is not intended in a limiting sense. I accordingly reserve myself the right to carry my invention into practice in all those ways and manners which may enter, fairly, into the scope of the appended claims.

I claim:

1. In a device of the class described the combination, with a base, of an upright extending vertically therefrom, supporting trays mounted on said upright, a spider having a plurality of tubular arms, rotatably mounted on said upright, each arm comprising a horizontally extending section, and a vertical section in continuation thereof, said sections having perforations through which liquid sprays directed against said trays may issue, an additional spraying member arranged directly above one of said trays, and means for selectively supplying cleansing liquid to either said spider or said spraying member.

2. In a device of the class described the combination, with a base, of an upright extending vertically therefrom, supporting

trays mounted on said upright, and a spider having a plurality of tubular arms, rotatably mounted on said upright, each arm comprising a section horizontally extending above said trays, and a vertical section depending therefrom in continuation thereof, said horizontal sections having downwardly inclined perforations causing the reaction of the water issuing therefrom to propel said spider, said vertical sections having inwardly directed perforations at each side of a radial plane passing therethrough, the perforations at one side being at a different angle from the perforations at the other side of said plane, the sprays issuing from the perforations directed at the wider angle and the sprays issuing from said horizontal sections together generating a torque tending to rotate the spider in the same direction.

3. A dishwashing device comprising a base, a tubular upright vertically extending therefrom, a plurality of vertically spaced trays rotatably mounted on said upright, a spider having a plurality of tubular arms also rotatably mounted on said upright, each arm comprising a radially extending horizontal section, and a vertical section depending from the outer end thereof, said sections having perforations directed at an angle to their respective radial planes through which liquid sprays directed against said trays may issue, said horizontal sections being in communication with the interior of said tubular upright, the reaction of said sprays resulting in a torque causing a rotatory movement of said spider, and means for selectively supplying to said upright and spider clear water, or water charged with a cleansing material.

4. A dishwashing device comprising a base, a tubular upright vertically extending therefrom, a plurality of vertically spaced trays rotatably mounted on said upright, a spider having a plurality of tubular arms also rotatably mounted on said upright, each arm comprising a radially extending horizontal section, and a vertical section depending from the outer end thereof, said sections having perforations through which liquid sprays directed against said trays may issue, said horizontal sections being in communication with the interior of said tubular upright, an additional spraying member arranged directly above one of said trays, means for selectively supplying cleansing liquid to either said upright and spider or said spraying member, and means for selectively supplying to said cleansing liquid supplying means, clear water, or water charged with a cleansing material.

5. A dish washing machine comprising a base, a vertical upright extending therefrom, a tray supported on said upright between the ends thereof, and a rotatable fluid ejector mounted on said upright having a vertically

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extending portion provided with inwardly directed perforations on opposite sides of a vertical plane passing through said upright and vertically extending portion at different angles with respect to said plane, whereby jets of water issue from said perforations in diverging relation toward said upright in such relation as to produce an unbalanced force tending to rotate said vertically extending portion.

In testimony whereof I affix my signature.  
GLAUCO POLI.

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