Feb. 4, 1941. G. T. FIELDING 2,230,350

SUBMERGED DISHWASHER

Filed Oct. 14, 1936 2 Sheets-Sheet 1

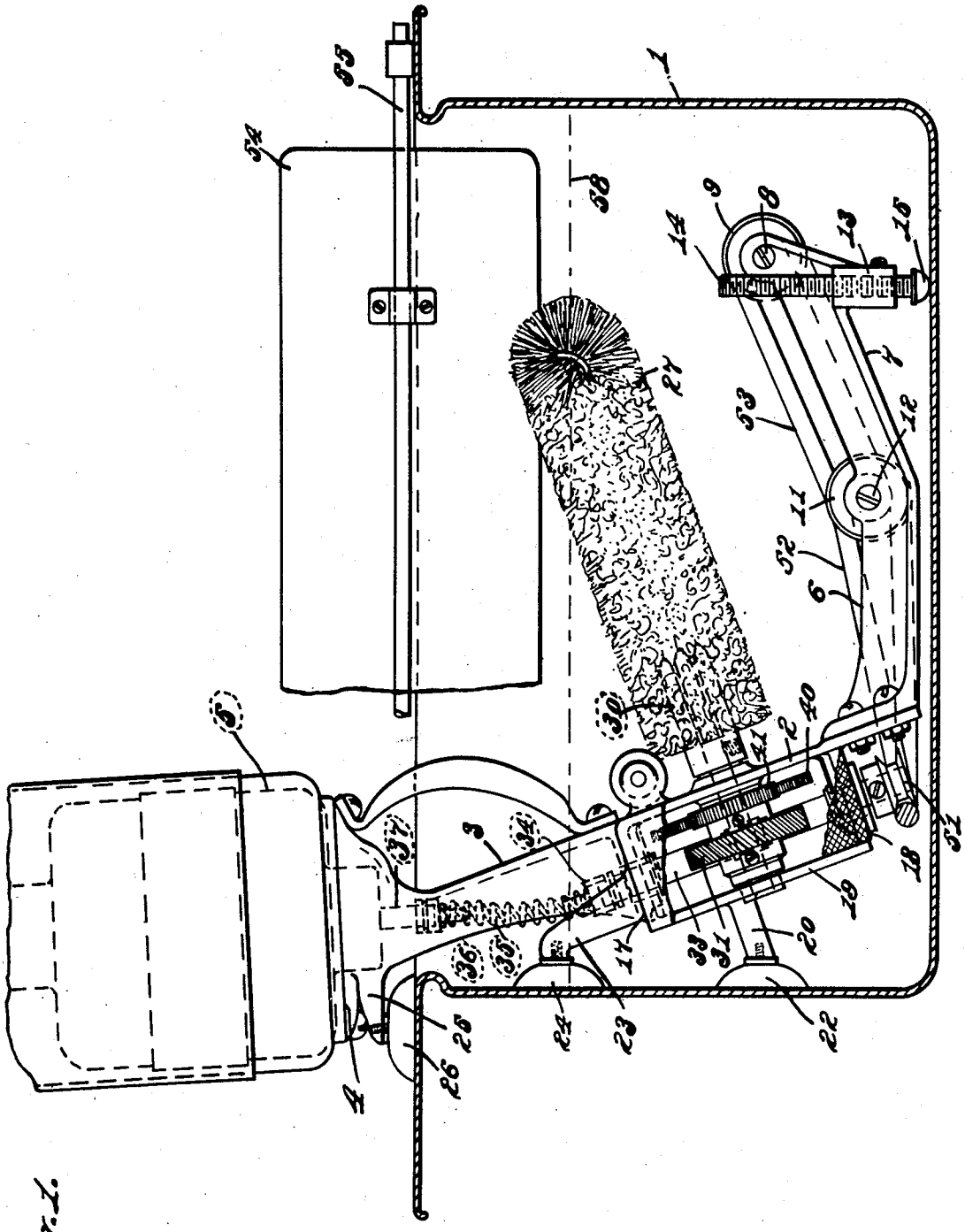


Fig. 1.

INVENTOR.
George T. Fielding,
BY Hood & Hahn.
ATTORNEYS.

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Fig. 2.

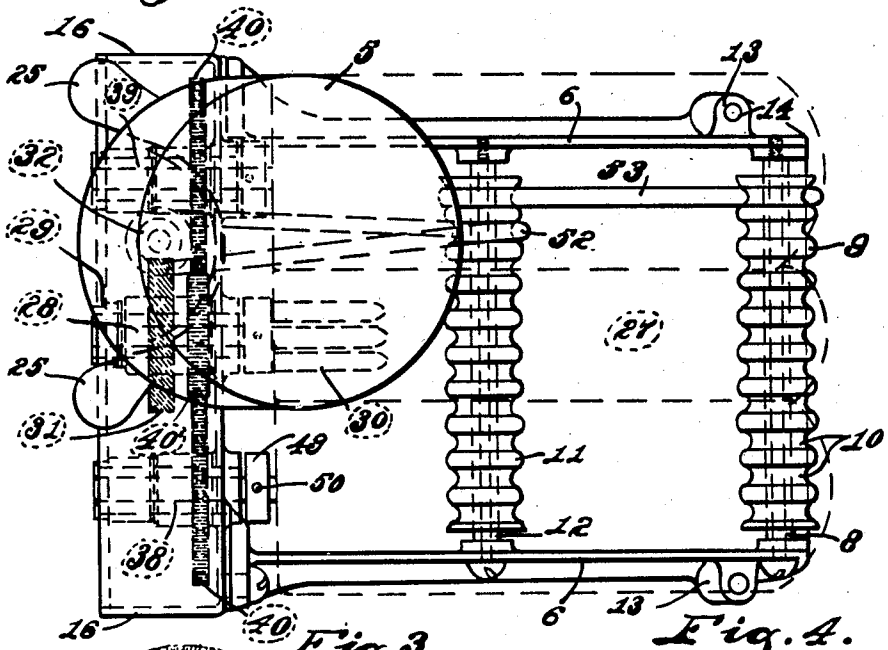


Fig. 3.

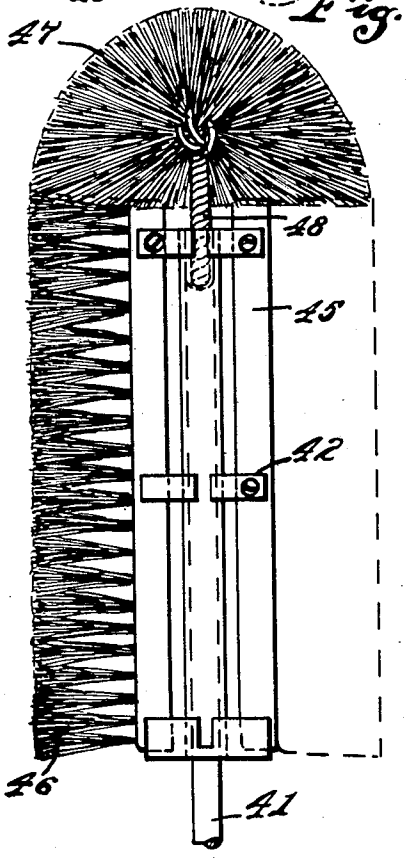


Fig. 4.

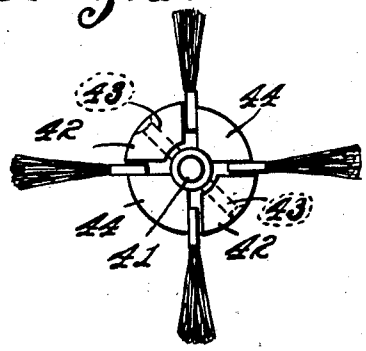
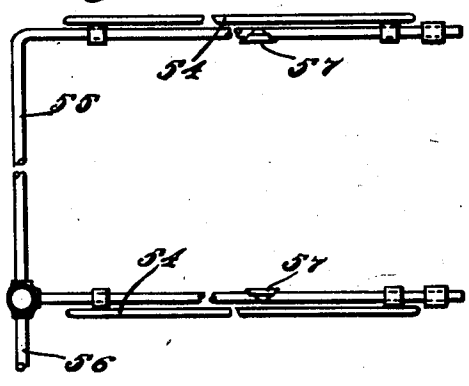


Fig 5.



INVENTOR.

BY George T. Fielding,
Hood & Hahn.
ATTORNEYS.

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UNITED STATES PATENT OFFICE

2,230,350

SUBMERGED DISHWASHER

George T. Fielding, Stamford, Conn.

Application October 14, 1936, Serial No. 105,489

1 Claim. (Cl. 15—74)

My invention relates to improvements in glass and dish washing machines, particularly that type wherein rotating brushes are adapted for cleansing the articles to be washed.

One of the objects of my invention is to provide a motor-driven brush washer adapted to be operated in a sink or other water receptacle with the brushes submerged or partially submerged in the water contained in the sink.

Another object of my invention is to provide a brush washer, particularly of the type above mentioned, wherein the brushes will be so disposed that during the washing operation of glassware and other hollow articles, the liquid will tend to drain from the glassware during the scrubbing operation of the brushes on the interior of the glassware and, at the same time, the glassware will not be so positioned as to cause air pockets therein when the same is submerged in the water or other cleansing liquid.

Another object of my invention is to provide a brush washing machine for dishes and the like wherein the dishes or other flat articles to be cleansed are positively rotated between the brushes to enable the brushes to thoroughly scrub all of the surface of the article.

Another object of my invention is to provide a motor-driven brush washing machine wherein, while the brushes are adapted to be submerged or partially submerged in the cleansing fluid, the motor is arranged clear of the fluid so that the same will not be short-circuited or the operation interfered therewith.

A still further object of my invention is to provide a self-contained portable machine which may be readily deposited in a sink or other receptacle to permit the submergence or partial submergence of the cleansing brushes.

For the purpose of disclosing my invention, I have illustrated an embodiment thereof in the accompanying drawings, in which:

Fig. 1 is a side elevation of a washing apparatus embodying my invention;

Fig. 2 is a plan view thereof;

Fig. 3 is a detail side elevation of one of the cleansing brushes;

Fig. 4 is an end elevation thereof; and

Fig. 5 is a plan view of a splash guard and spray delivery device.

In the embodiment illustrated, I have indicated a sink in which the apparatus is adapted to be placed at 1. The ordinary sink in soda fountain use is approximately ten inches wide, eight inches deep and fourteen inches long, and the structure illustrated in the accompanying drawings is proportioned so that it may be readily placed in such a sink. In this construction illustrated, I provide a mounting plate 2 which at its upper end is somewhat constructed to form an upwardly extending neck 3, this neck forming a continuation of the plate 2. This supporting structure is preferably arranged so that, when in position, it is inclined at about thirty degrees from the vertical. The upper end of the neck 3 has a supporting platform 4, forming a continuation of the neck 3, on which is mounted a driving electric motor 5.

At the bottom end of the supporting member 2—3, on the face of the plate 2, I provide a bottom platform which preferably takes the shape of a frame having two side-rails 6. The rear portion, that is, next to plate 2, of these side-rails is substantially horizontal and, therefore, extend at an obtuse angle to the face of the plate 2 and the front portion of these side-rails is inclined upwardly as at 7. Between these side-rails or walls, at the front end, is arranged a cross-rod 8, preferably in the form of an elongated bolt screw-threading at one end into one of the side-rails. This cross rod not only provides a means for connecting the side-rails, at their free ends, together, but also has mounted thereon a roller 9 having a series of grooves 10 in the periphery thereof. At about the point where the portion 7 of the side-rails starts to extend upwardly, I mount a second roller 11, grooved like the roller 9 and supported upon a cross-rod 12 similar to the cross-rod 8.

The front ends of the side-rails 6 are each provided with a downwardly extending foot 13 having threaded therein an adjustable foot rod 14 rubber-tipped as at 15.

On the rear face of the plate 2 are mounted the driving gears for the brushes. These driving gears are mounted within an enclosing housing formed by integral rearwardly extending side-walls 16 and integral rearwardly extending top and bottom walls 17 and 18. A cover-plate 19 is secured to the rear edges of these walls to form a closure for the housing and extending rearwardly from this cover-plate, are a pair of supporting feet 20 suction-cupped as at 22. Likewise extending upwardly and inclined rearwardly from the top 17 of the housing is a second pair of feet 23 suction-cupped as at 24. The ends of the rods 14 are adapted to rest on the bottom of the sink and the two sets of feet 20 and 23 bear against the side of the sink to properly position the frame in the sink. Due to the fact that the feet 20 and 23 are suction-

cupped, when the frame is placed in position, they serve to more or less rigidly hold the frame in position. By providing the adjustment rods or screws 14 at the front end of the frame, the front end may be properly positioned to coincide with the rear feet 20 and 23. Immediately beneath the motor table 4, I provide additional rearwardly extending feet 25, each of which is suction-cupped as at 26 and these cups are adapted to rest on the top of the sink or on the drain-board leading to the sink. By this arrangement of supporting feet, the entire structure is rigidly maintained in its position in the sink. At the same time, it may be readily lifted therefrom.

Within the gear housing, I mount the driving gears for the brushes, of which I provide three, extending forwardly at right angles from the plate 2 and arranged in the same horizontal plane. The center brush 27 is driven from a center shaft 28 journaled in fiber or other non-metallic bushings 29 supported in the gearing housing. This shaft has a plurality, preferably four, of forwardly extending prongs or fingers 30 which embrace the shaft or stem of the brush, being inserted between the bristles thereof. The shaft or stem of the brush, which may be of twisted wire for the purpose of maintaining the bristles in position, is projected rearwardly into the driving shaft 28 which, for the reception of the shaft or stem of the brush, is made hollow. This driving shaft 28 is provided with a spiral gear 31, in turn meshing with a spiral pinion 32 mounted on a vertically extending shaft 33 journaled in the top and bottom wall of the gear casing in suitable fiber or other non-metallic and oilless bushings or bearings. It is to be noted that the gears for driving the brushes and that the bearings for the brushes are adapted to be submerged so that they are water-lubricated. To this end, the housing for the gears closed by the cover plate 19, is provided with a screen opening in its side walls. This opening permits the free admission of water to the interior of the housing while the screen prevents the ingress of any foreign particles or the like which would tend to clog the gears. This screen opening being at the bottom of the housing will also permit quick drainage of the housing when the device is lifted from the sink. The top of this shaft 33, which extends beyond the top 17 of the gear housing, has a driving connection 34 with a coiled spring 35 comprising a flexible driving shaft having a driving connection 36 at its upper end, with the shaft 37 of the motor 5. Arranged on either side of the hollow shaft 28 are similar hollow shafts 38 and 39, each being adapted to be driven from the shaft 28. These shafts 38 and 39, like the shaft 28, are mounted in fiber or other non-metallic and oilless bearings and each of the shafts is provided with a driven gear 40 meshing with a driving gear 40' mounted on the shaft 28 so that as the shaft 28 is driven, the two shafts 38 and 39 will be driven in opposite directions with respect to the center shaft. Each of these hollow shafts 38 and 39 is adapted to receive a spindle 41 of a cleansing brush. Each of the brushes is of the same construction and the description of one will be sufficient. This spindle 41 is provided at spaced intervals along its length with sets of segmental clamping members. Each of the sets of segmental clamping members comprises four segmental clamps 42 which are adapted to be secured to the spindle 41 by means of suitable screws 43 or at least two of the segments are so secured, the other two segments 44 being more or less rigidly secured to the spindle 41. The rotary brushes are formed of a series of flat bristle brushes, each having a metal back 45 in the form of a more or less elongated strip in which the bristles 46 of the brush are secured. This comprises an independent unit and by loosening the two segments 42 of each of the sets of segments and sliding the brushes in the slots between the segments 42 and 44 and then again tightening the segments in position, it will be seen that I provide a brush with four radially extending sets of bristles. This arrangement is particularly advantageous as it permits the use of an inexpensively made brush and as it likewise permits the renewal of worn out sets of bristles at a minimum of cost and labor. Each of the complete brushes is tipped with a tufted end 47 formed by twisting the bristles in a twisted wire 48 which is secured in the drilled end of spindle 41 by a set screw. The spindle 41 of each of the two side brushes, is adapted to be inserted in each of the hollow spindles 38 and 39 against a holding collar 49 and clamped in this hollow shaft by means of bolts 50 extending through the collars.

The vertical driving shaft 33 is provided at its lower end with a driving pulley 51 over which passes a driving belt 52, in turn passing over the grooved roller 11 and driving this roller. A second driving belt 53, drivingly connecting the roller 9 with the roller 11 so that the forward roller is likewise positively driven.

If there is a tendency to splash when the scrubbing brushes are rotated, undue splashing may be guarded against by splash guards in the form of plates 54 hinged on a U-shaped frame 55 supported upon the sink. This U-shaped frame is formed of hollow pipe, closed at one end and having a hose connection 56 adapted to be connected with a source of water supply. The inner edges of the sides of the frame are provided with spray nozzles 57 which direct sprays of liquid toward one another so that in event a rinsing bath is desired, a rinsing spray may be sent through the nozzles so that the articles will be rinsed in clear water as they are withdrawn from the cleansing operation.

In operation, in washing glasses, it will be noted that the brushes are more or less submerged in the liquid which extends to about the level indicated in dotted lines as at 58. In washing a glass, the glass is forced over one of the brushes, gripped an instant to scrub the inside, then let revolve to scrub the outside surface, and it will be noted that the angle of the brushes is such that it insures the glass being positioned at an angle relatively to the water level with the open end tilted downwardly. This arrangement insures a complete drainage of the foreign particles of food or other material within the glass loosened by the operation of the brushes, but the angle of inclination is such that in submerging the glass in placing the same over the brush, there is no danger of air pockets being formed in the glass thereby preventing complete access of water to the interior of the glass. If, for instance, the brush were arranged so that the glass had to be placed vertically or with a vertical right-line movement, there would be danger of air pockets being formed in the glass and the water would not have access to all of the interior of the glass. However, by inclining the glass at an angle, as is required by the inclination of the brushes, air pockets are prevented and drainage is insured.

If the brushes, for instance, were inclined in the other direction so that the open end of the glass would tilt upwardly, while air pockets would not form, there would be a tendency for the foreign particles of food and the like to accumulate in the bottom of the glass.

In washing dishes or other flat articles, the dishes are inserted between a pair of brushes, being adapted to be supported on the rollers 9 and 11. With the brushes rotating in opposite directions and in a direction to draw the dish downwardly against the rollers, a thorough scrubbing action is effected on both faces of the dish simultaneously and, due to the rotation of the rollers 9 and 11, the rotation of the dish between the brushes is insured so that every portion of the surface of the dish is thoroughly scrubbed.

I claim as my invention:

In a dish-washing device adapted for removable positioning in a tank, in combination, a supporting member having front and rear sides adapted to be inserted in the tank, said member having substantially horizontally disposed rearwardly extending supporting feet at its top comprising suction cups and adapted to overhang the edge of the tank, and a plurality of feet extending from the rear side of said supporting member comprising suction cups adapted to engage the side walls of the tank, a frame extending forwardly from the lower end of said supporting member and adapted to lie along the bottom of said tank and having supporting legs at its free end, a pair of oppositely rotatable brushes supported on said member in an upwardly and forwardly inclined position and adapted to rotate in contiguous relation, driving means housed on the rear side of said member, and a driving motor mounted on the top of said member and drivingly connected with the driving means for said brushes.

GEORGE T. FIELDING.