June 14, 1927. 1,632,007

M. J. KEHOE

DISHWASHING MACHINE

Filed Nov. 8, 1922 3 Sheets-Sheet 1

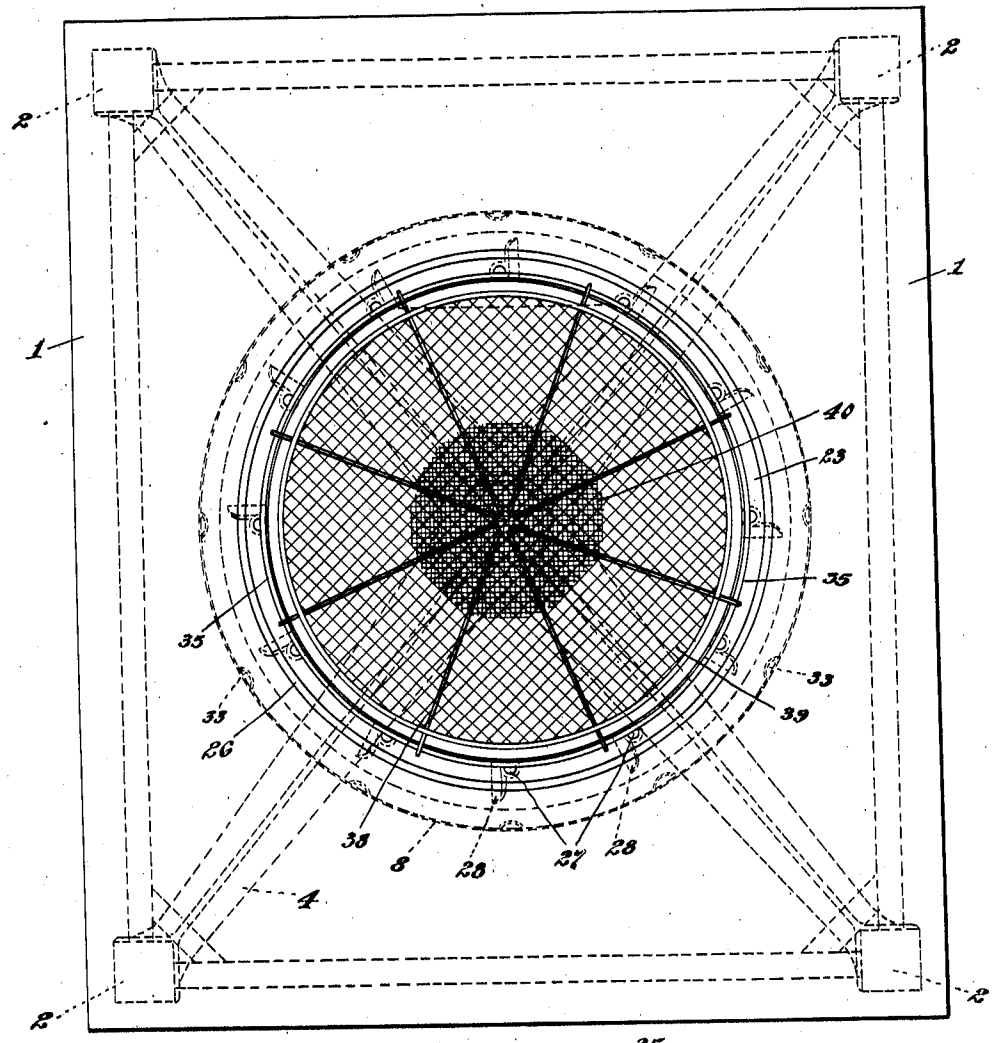


Fig. 1.

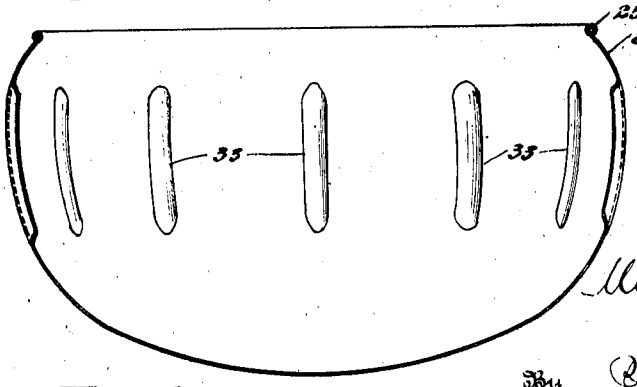


Fig. 2.

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Fig. 3.

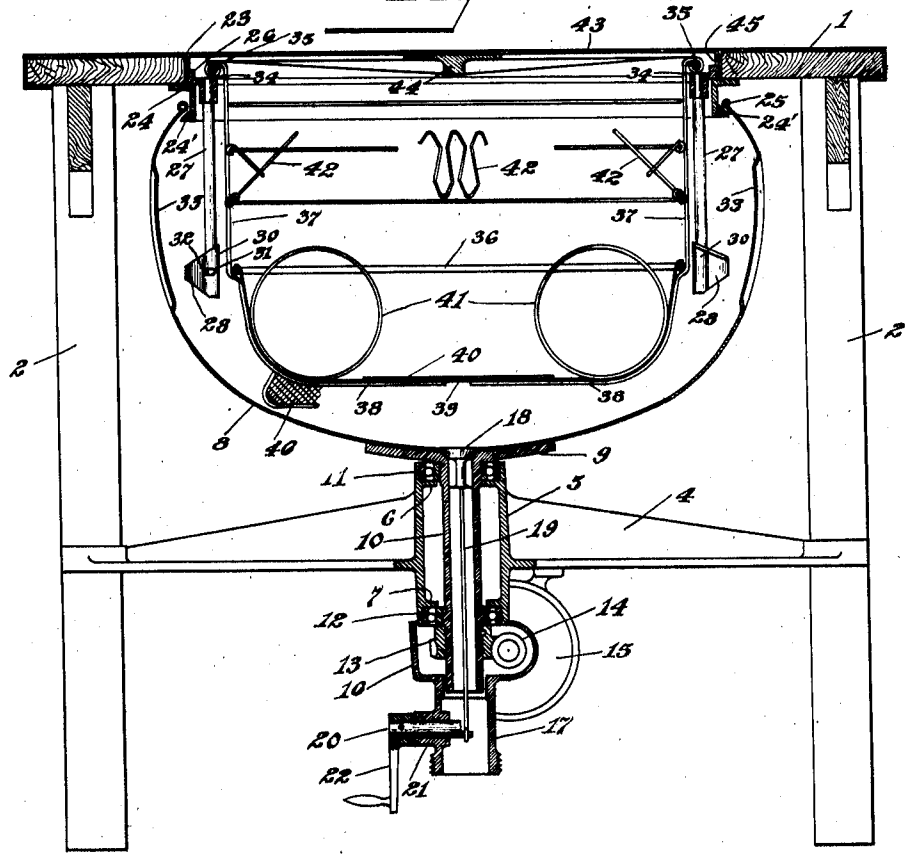


Fig. 4.

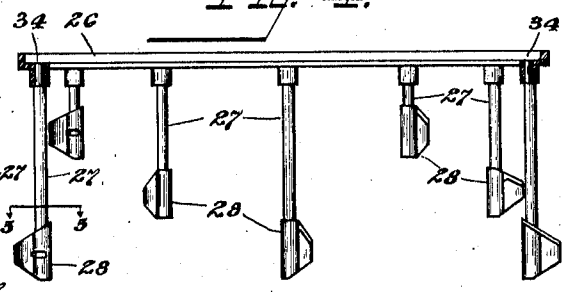
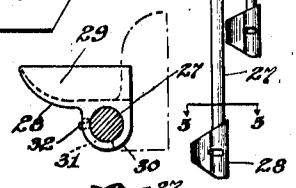


Fig. 5.



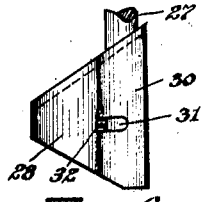


Fig. 6.

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Fig. 7.

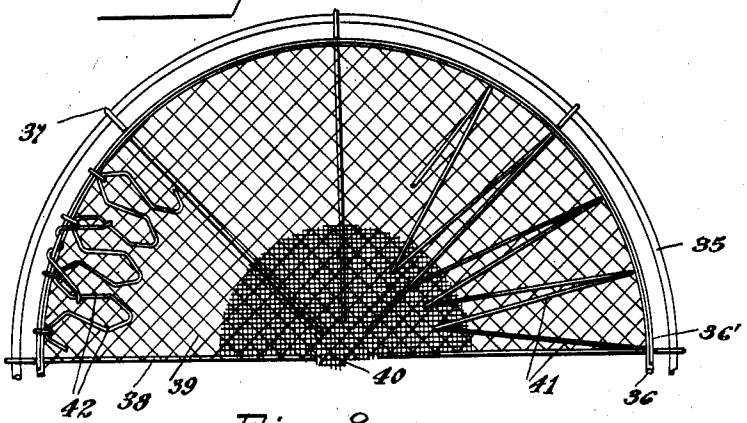
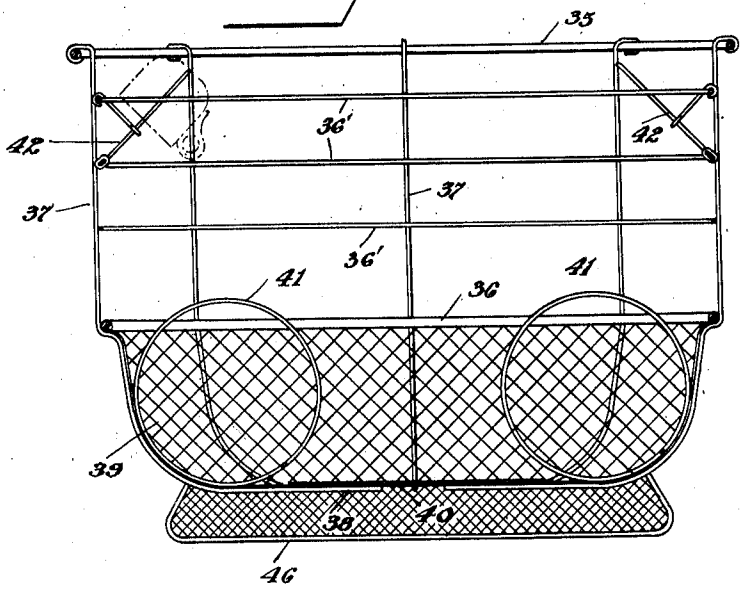


Fig. 8.



Inventor

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Patented June 14, 1927. 1,632,007

UNITED STATES PATENT OFFICE.

MICHAEL J. KEHOE, OF LONDON, OHIO, ASSIGNOR, BY MESNE ASSIGNMENTS, TO CASCADE MANUFACTURING COMPANY.

DISHWASHING MACHINE.

Application filed November 8, 1922. Serial No. 599,720.

This invention relates to improvements in dish washing, it particularly relating to washing dishes by raising a wall of washing fluid thereabout by centrifugal force, deflecting fluid from the wall against the dishes and allowing it to return to the source from which it was raised, and a machine for performing washing in this manner.

Minor objects of the invention and the manner in which they are achieved will appear as the description proceeds.

In the accompanying drawings:

Fig. 1 is a top plan view of the table which supports the operating parts of the apparatus with some of the parts shown in dotted lines.

Fig. 2 is a vertical section of the water container.

Fig. 3 is a vertical section of the apparatus.

Fig. 4 is a side elevation of the water intercepting and directing bucket.

Fig. 5 is a top plan view of one of the buckets and its supporting rod, the rod being shown in section on the line 5—5 of Fig. 4.

Fig. 6 is an enlarged side view of one of the buckets and a portion of its supporting rod.

Fig. 7 is a top plan of a portion of the dish supporting basket.

Fig. 8 is a vertical section of the basket.

Referring to the drawings 1 represents the top of a table preferably of rectangular form and provided with legs 2 which have their lower portions connected by spider-shaped supporting member 4. The member 4 has a centrally-arranged vertically-extending bearing support 5 provided with upper and lower inwardly projecting annular flanges 6 and 7. This member 4 and its centrally-arranged support 5 form the means for supporting a water container 8 and its driving mechanism. The container 8 is of a bowl shape, having the inner surface of its bottom formed on concave lines for a purpose to be explained and secured to the under surface of the bottom in a central position is a plate 9 having a downwardly projecting hollow shaft 10, which projects through the circular flanges 6 and 7. Ball bearings 11 are mounted on the upper flange 6 and serve as a direct bearing support for the shaft 10 and its plate 9 while additional ball bearings 12 for the lower end of the shaft are interposed between the under side of the flange 7 and the worm gear 13 secured to the shaft. A worm 14 driven from an electric motor 15 meshes with the worm gear 13 for the purpose of rotating the bowl; the motor being supported from the spider 4. The worm wheel and worm are enclosed by a casing 16, the lower end of which is provided with a threaded nipple 17 to which a hose connection may be attached for drainage purposes. The container 8 in line with the hollow shaft 10 is provided with a port which is controlled by a valve 18, the stem 19 of which has its lower end connected with an eccentric pin on a shaft 20 mounted in a bearing 21 in the nipple 17 and provided with a crank arm 22 whereby the valve 18 may be opened or closed.

The table 1 is provided with a circular opening 23 and to the lower surface of the table is attached an angle-shaped ring 24 which projects inwardly a short distance from the walls of the opening 23 so as to provide a shelf. The walls of the bowl 8 are extended on curved lines to a point within close proximity to the vertical web of the ring 24 and provided with a bead 25 which more or less closely hugs the ring, and the ring preferably also has an annular sealing ring 24′. Supported upon the shelf provided by the ring 24 is a second ring 26 provided with a series of downwardly-projecting rods 27 each of which has connected therewith a bucket 28. These rods 27 are of different lengths so that the buckets will be arranged in staggered relation as to height, as shown in Fig. 4. Each bucket is formed with a concave or cup-shaped side 29 as shown in Fig. 5 which is opposed to the direction of rotation of the bowl 8. Each of these buckets is rotatably mounted upon this rod 27 within certain limits and to this end the hub 30 of the bucket has a slotted opening 31 into which projects a pin 32, which extends from the rod 27, the purpose of this being to permit rotation of the pockets 29 so that the buckets may be inserted in or removed from the bowl when desired.

The side walls of the bowl 8 are indented at suitable intervals to provide inwardly projecting vertically-extending beads or ribs 33 which act on the water to prevent it from slipping and cause it to rotate with the rotating retainer.

The upper side of the ring 26 is provided

with a depression to form a shelf as indicated at 34 and upon this shelf is hung the dish supporting basket. This basket is formed of wire and consists of an upper horizontally disposed ring 35 which rests upon the shelf 34, a second horizontally disposed ring 36, a series of intermediate horizontal rings 36', a series of vertically disposed side arms 37 which are connected to the respective rings and have their lower ends bent inwardly in a horizontal direction as indicated at 38, a heavy mesh screen which is connected to the ring 36 and the lower portions of the arms 37 and their horizontal extensions 38, and a screen 40 of finer mesh which is centrally supported on the bottom of the screen 39. An annular outwardly and downwardly flaring screen 46, attached to the arms 38, is also provided to prevent food particles from circulating with the water as it is thrown upwardly along the side of the bowl. For the purpose of supporting dishes of a flat nature such as plates, saucers and the like, there is provided in the lower portion of the basket a coiled wire 41, the coils of which are arranged in circular fashion about the basket within the screen 39 and between the coils of which the dishes are inserted. For the purpose of supporting cups, glasses and dishes of such character, there is provided in the upper portion of the basket a circularly-arranged wire which is so bent as to provide spear-shaped spring clamps, the members of each of which are represented at 42. Each of these clamps 42 projects inwardly and upwardly at an angle as shown in Fig. 8 so that when a cup or other dish of that character is inserted the open side thereof projects downwardly and upwardly in a manner to oppose the direction of motion of cleansing water and to permit the water to readily drain therefrom.

The opening 23 in the top of the supporting table is closed by a removable cover 43 shown as constructed of sheet metal and reinforced by a metallic spider 44. This cover has a downturned peripheral flange 45 which rests upon the ring 26. When not in use as a dish washing apparatus, the table may be utilized for other domestic purposes.

The operation of the device is as follows: The dishes having been inserted in the basket, the basket is placed into the container through the opening 23 and the cover 43 replaced, water having been placed in the container to a suitable height. The motor being started and the water container thereby rotated centrifugal action causes the water to flow or creep up the side walls of the container, the projecting ribs 33 preventing the water from slipping and causing it to revolve substantially as fast as the container. The buckets 28 intercept the water and cause it to be dashed inwardly into the basket and among the dishes. Those dishes of the container type such as cups, glasses and the like, being supported with their open sides opposed to the direction of the motion of the water and being inclined downwardly, permit water to circulate freely within the same and drain readily therefrom.

The peculiar rounded form of the interior of the bowl, in addition to the function stated, also enables the bowl to be readily cleaned, this being accomplished by removing the dish basket and the ring carrying the buckets and holding a scrubbing brush or like utensil against the inner walls of the bowl while it is being revolved by the motor.

Having thus described my invention, I claim:

1. In a washing machine, a tank mounted rotatably about a substantially vertical axis, an article holder in the tank, and a deflector between the side of the tank and the holder, the tank having a greater horizontal diameter at the level of the deflector than it has near the bottom.

2. In a washing machine, a tank, means to rotate the tank about a substantially vertical axis, an article holder within the tank, and a deflector between the side of the tank and the holder, the interior of the bottom of the tank flaring outward and upward from its middle portion.

3. In a washing machine, a tank, means to rotate the tank about a substantially vertical axis, the side wall of the tank being bulged outward, an article holder within the tank, and a deflector in the bulge of the tank between the side of the tank and the holder.

4. In a washing machine, a tank, means to rotate the tank about a substantially vertical axis, the side wall of the tank being bulged outward and the bottom of the tank curving upward and outward to the bulge, an article holder within the tank, and a deflector in the bulge of the tank between the side of the tank and the holder.

5. In a washing machine, a tank, means to rotate the tank about a substantially vertical axis, there being an inlet opening in the bottom of the tank and the bottom curving outward and upward in a continuous curve from said inlet to the side wall of the tank, an article holder within the tank, and a deflector between the side of the tank and the holder.

6. In a washing machine, a tank having an opening in its bottom and having its interior curving continuously from said opening to the top of the tank along every vertical section, means to rotate the tank about a substantially vertical axis passing through said opening, an article holder within the

tank, and a deflector between the side of the tank and the holder.

7. In a washing machine, a substantially vertical hollow shaft, a tank mounted upon the upper end of the shaft, the hollow of the shaft communicating with the interior of the tank and the bottom of the tank curving upward and outward from said shaft, means to rotate the tank about the axis of said shaft, an article holder within the tank, and a deflector between the side of the tank and the holder.

8. In a washing machine, a tank, means to rotate the tank about a substantially vertical axis, the bottom of the tank flaring outwardly and upwardly from where the axis passes through the bottom, an article holder within the tank, a deflector between the side of the tank and the holder, and an annular screen between the holder and the bottom of the tank.

9. In a washing machine, a tank, means to rotate the tank about a substantially vertical axis, the bottom of the tank flaring outward and upward from where the axis passes through said bottom, an article holder within the tank, and a plurality of deflectors at different elevations between the side of the tank and the holder.

10. In a washing machine, a tank, means to rotate the tank about a substantially vertical axis, an article holder within the tank, and a deflector between the side of the tank and the holder, the face of the deflector being curved in a horizontal plane.

11. In a washing machine, a tank, means to rotate the tank about a substantially vertical axis, an article holder within the tank, the bottom of the tank being curved outward and upward from where the axis passes through the bottom of the tank to a plane above the bottom of the holder, and a stationary deflector between the side of the holder and the tank.

12. In a washing machine, a tank, means to rotate the tank about a substantially horizontal axis, an article holder within the tank, a stationary deflector between the side of the tank and the holder, a support for the deflector, and an independently removable support for the article holder, whereby the holder may be removed without moving the deflector.

13. In a washing machine, a tank, means to rotate the tank about a substantially vertical axis, a dish basket within the tank, inwardly and upwardly slanting dish holders within the basket adapted to hold dishes with their open sides directed downward and outward, and deflectors between the side of the tank and the basket and adapted to deflect fluid from the side of the tank and into dishes on said holders.

14. In a washing machine, a tank having an open top and an inwardly directed flange around the opening, means to rotate the tank about a substantially vertical axis, an article holder within the tank, means to spray fluid into the holder, and a cover for the tank having a flange directed outwardly beneath the first said flange.

In testimony whereof, I have hereunto set my hand this 31st day of October, 1922.

MICHAEL J. KEHOE.