

Nov. 25, 1924.

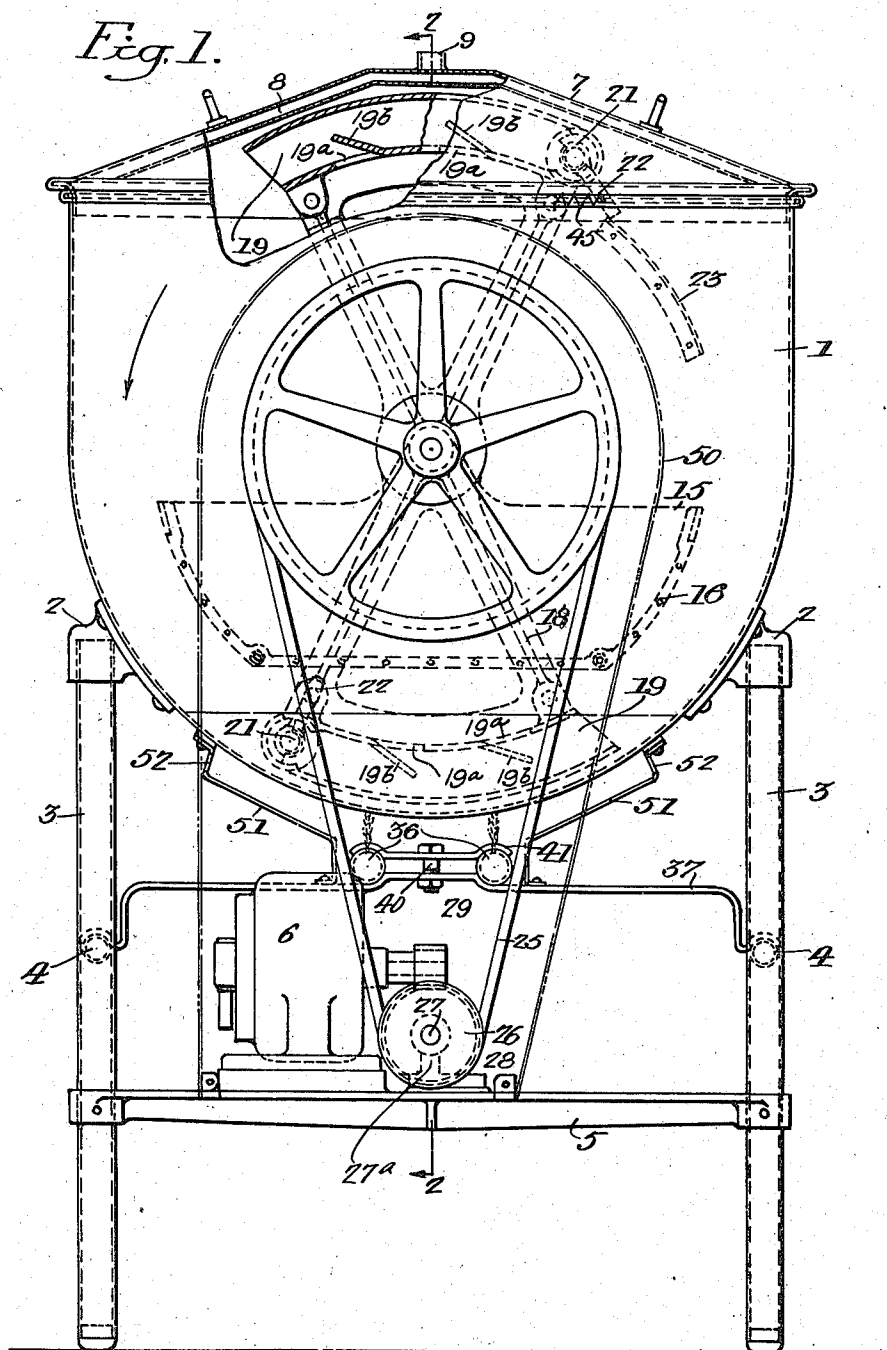
1,517,218

R. MARX

DISHWASHING MACHINE

Filed Sept. 30, 1920

2 Sheets-Sheet 1



Inventor:  
Richard Marx.  
By his Attorneys,  
Hewson + Hewson

Nov. 25, 1924.

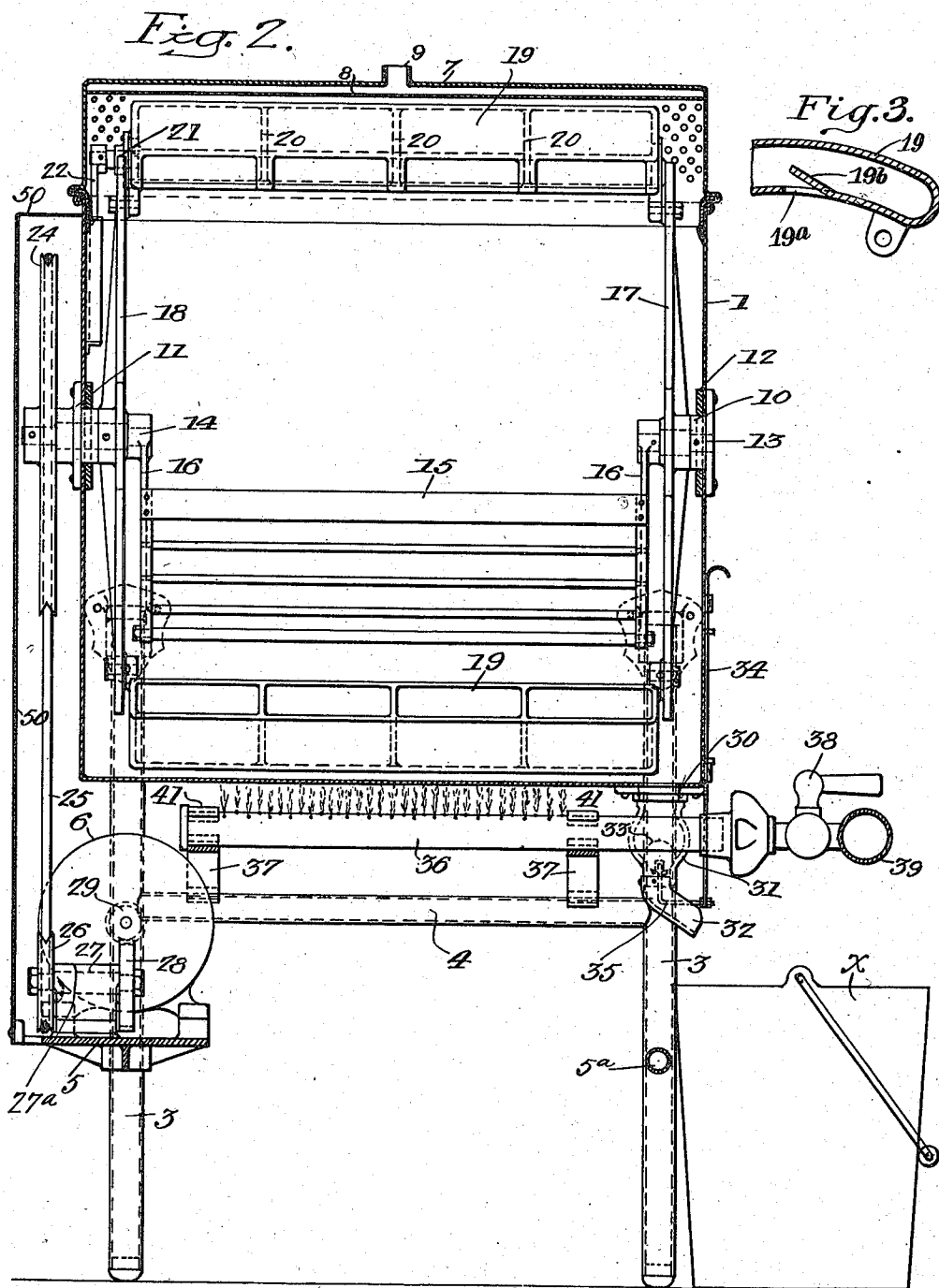
1,517,218

R. MARX

DISHWASHING MACHINE

Filed Sept. 30, 1920

2 Sheets-Sheet 2



Inventor:  
Richard Marx.  
By his Attorneys,  
Howson & Howson

Patented Nov. 25, 1924.

1,517,218

# UNITED STATES PATENT OFFICE.

RICHARD MARX, OF PHILADELPHIA, PENNSYLVANIA.

## DISHWASHING MACHINE.

Application filed September 30, 1920. Serial No. 413,901.

*To all whom it may concern:*

Be it known that I, RICHARD MARX, a citizen of the United States, residing in Philadelphia, Pennsylvania, have invented certain new and useful improvements in Dishwashing Machines, of which the following is a specification.

One object of my invention is to provide a device involving a novel combination of parts, particularly designed for washing dishes and which shall be especially characterized by the means for causing circulation and agitation of the water within the container in which the dishes are placed.

My invention further contemplates a relatively simple, compact and efficient machine for delivering heated water to and circulating it around a container for dishes or the like to be washed; the invention contemplating an inexpensive and convenient apparatus.

These objects and other advantageous ends I attain as hereinafter set forth, reference being had to the accompanying drawings, in which,

Fig. 1 is a side elevation of a dish washing machine constructed in accordance with my invention;

Fig. 2 is a vertical section on the line 2-2, Fig. 1, the bucket being shown in elevation; and

Fig. 3 is a fragmentary section of a modified form of bucket.

In the above drawings 1 represents a sheet metal container, substantially square in plan and having a semi-cylindrical bottom portion. At opposite sides of its two ends, this container has fixed to it a pair of pads or brackets 2 for the reception of vertical frame members 3 of which there are two at each end.

At the front and back of the machine the end members are braced by horizontal cross members 4 and at one end of the machine said end members are connected by and serve to support a platform 5, constituting a support for an electric motor 6. At the opposite end of the machine the vertical supports are braced by a transverse member 5<sup>a</sup>.

The open top of the container 1 is provided with a cover 7 within which is mounted a transverse perforated partition 8 constituting with the top of said cover a chamber having an inlet 9 for the reception of water. This inlet may be connected to a

source of supply through a hose or other pipe and by means of the perforated partition, any incoming water is distributed so that it falls in a series of drops or streams through the interior of the casing.

One end of the casing 1 has fixed to it a flanged bushing 10 riveted to a plate 12 and serving as a support for a fixed spindle 13. The other head or end of said casing has a similar flanged bushing 11 fixed in it, which provides a bearing for a second and rotary spindle 14 in line with the spindle 13. These two spindles serve to support a stationary carrier or basket 15 formed by a pair of segmental ends 16 loosely engaging said spindles 13 and 14 and rigidly connected by a series of bars or slats so that they normally hang without rotating with their ends 16 spaced away from the ends of the casing 1.

The spindle 13 has also loosely mounted upon it between the arms 16 and the bushing 10 a spider or wheel frame 17. A second and similar spider 18 is pinned or otherwise fixed to the spindle 14 so as to cooperate with said first spider in supporting a pair of buckets or scoops 19, which latter with said spiders 17 and 18 are rotatable in the casing 1. These buckets are preferably formed as flat, laterally elongated, boxes, preferably curved concentrically with the spindles 13 and 14 and open at their advancing edge, the design of the parts being such that they rotate between the basket 15 and the adjacent parts or bottom of the casing.

Each of said scoops is preferably transversely divided by a number of partitions into a series of elongated independent chambers, each having in its inner side one or more laterally elongated openings 19<sup>a</sup> over each of which is mounted a flat inclined plate 19<sup>b</sup>, having one edge attached to and projecting within the bucket from one edge of such opening. At its closed or rear end each scoop may in some cases be provided with a valve 21 preferably of the rotary type, whereby at certain times said rear end may be opened. For this purpose each of the rotary valves has a projecting arm 22 designed to cooperate with a cam 23 mounted on the inside face of one of the heads or ends of the casing adjacent the top thereof so that as each scoop reaches or approaches a predetermined position, usually at the top of its path of movement, said

arm will engage the cam and so rotate the valve as to permit the escape of the liquid in the scoop.

The spindle 14 extends outside of the casing and has fixed to it a pulley wheel 24, designed to receive a belt 25 passing around a second pulley 26. The latter is fixed to a shaft or spindle 27 carried in a bearing 27<sup>a</sup> on the platform or shelf 5 and also having fixed to it a worm wheel 28 meshing with a worm 29 on the armature shaft of the motor 6.

The casing 1 adjacent one end has an outlet fitting 30 to which is connected a valve 31 designed to deliver into a laterally bent spout 2 extended into position to discharge into a bucket or other container *x*. The valve 31 while it may be of any desired construction, is preferably so made as to receive a ball 33 seating in its lower portion and conveniently actuated by a vertically guided pull rod 34 in the lower part of the front of the casing 1, to which it is connected through an angularly bent rod 35, so that vertical movement of said pull rod will unseat the valve and permit the contents of the casing to be discharged.

For heating the water in the casing 1, I preferably provide a pair of parallel fuel burners 36 under and immediately adjacent the bottom of said casing, and support them on two suitably formed cross bars 37, preferably carried by the frame members 4. Said burners are extended at one end of the casing 1 where they are provided with fuel controlling valves 38, and are connected to a gas supply main 39. If desired, said burner pipes may be removably held to their supporting bars 37 by clamps 41 each held to its corresponding bar by a bolt 40.

Under conditions of operation with the valve 31 closed, the dishes to be washed are placed in the basket 15 and water with the necessary amount of soap, is delivered to the casing through the inlet 9, being distributed with substantial uniformity to all parts of the casing by the perforated partition 8. Thereafter the burners 36 are supplied with fuel and lighted and the motor 6 is put in operation so that the scoops 19 are rotated in a counter-clockwise direction.

As each of said scoops moves through the water in the lower part of the casing, it is filled and begins to discharge said water over the dishes in the basket 15 as it swings toward the top of the casing on the right hand side thereof. When each scoop reaches what is substantially its highest position, the cam 13 engages its valve operating arm 22 and so turns the valve as to cause immediate delivery from the scoop of all the water still remaining therein, so that this drops on the dishes from the top of the casing. There is thus an intermittent fall of water upon the dishes in the basket which

is alternately of a more or less violent nature as each scoop moves toward and into its topmost position. A spring 45 operative on each of the valve arms 42 serves to hold the valves 21 closed except when said arms are engaged by the cam 23.

The repeated discharge upon the dishes of the highly heated water raised up by the scoops has been found to very effectually and quickly clean them, and after they have been washed for the required time, they may be removed, the fuel being turned off from the tubes 36 by means of the stop cocks 38 and the pull rod 34 thereafter raised to permit discharge of the water from the casing.

In order to remove any greasy or other film which may adhere to the otherwise clean dishes after the above treatment, as well as to effectually sterilize them, I may leave in the casing a small quantity,—as a quart—of the washing water instead of discharging it all, and allow this to be partly or wholly converted into steam by continuing the operation of the burners. Such steam effectually sterilizes not only the dishes but the casing and its contained parts, and in addition it condenses to a greater or less extent on the dishes. The pure water so formed in running off, has been found to remove the above noted film and give the dishes a highly polished appearance.

If desired I may and in some cases prefer to substitute a closed end for the valves 21 in the buckets as shown in Fig. 3 and omit the arms and the cams 23, as I have found that at a speed of about twenty revolutions per minute, the buckets will then so discharge water from their side opening or openings 19<sup>a</sup> and ultimately from their advancing open ends respectively as to forcibly remove foreign material from the dishes and otherwise effectually clean them.

As a measure of precaution I preferably enclose the pulleys 24 and 26 with their connecting belt by a casing 50 and also to some extent enclose the burner tubes by sheet metal plates 51 connected to the burner-supporting bars 37 and to the under side of the bottom of the casing 1, thereby forming a heat retaining chamber having outlets 52 at the upper parts of its opposite sides.

In some cases I have found it desirable to hasten or assist the operation of my machine by placing therein a mass of small bodies, which when raised with the water in the buckets and more or less forcibly delivered therefrom, serve to cut or break and otherwise remove from dishes, pots, pans or the like, hardened or solidified pieces of material. As typical of such bodies I have successfully used pieces of a woody nature such as cherry stones, cork in pieces approximately one-quarter of an inch in diameter, coarse saw dust and the like.

## I claim:

1. The combination in a dish washing machine of a casing; a pair of arms rotatably mounted in the casing; at least one elongated container carried by the arms and formed with a series of partitions dividing it into chambers each provided with an outlet; means for rotating the arms with said container and a dish holder in the casing positioned to receive water delivered from the container when this has been moved to the upper part of the casing.
2. The combination in a dish washing machine of a casing; a scoop mounted to rotate on a horizontal axis in said casing and having a valve controlled outlet; a dish holder in the casing; and means for causing opening of the valve of the scoop to permit discharge of water therefrom as it moves in the upper part of the casing.
3. The combination in a dish washing machine of a casing; at least one scoop rotatably mounted in the casing and having its advancing side open; a valve normally closing the opposite side of the scoop; a cam for causing opening of said valve as the scoop moves in the upper part of the casing; and a dish holder mounted in the lower part of the casing; with means for rotating the scoop.
4. The combination in a dish washing machine of a casing; means therein for holding dishes; at least one rotatably mounted bucket in the casing having its advancing end open with means dividing said bucket into compartments, each having at least one opening in its inner side; and means for rotating said bucket about the dishes.
5. The combination in a dish washing machine of a casing; a dish holder suspended at its ends within the casing; arms rotatably mounted at opposite ends of the casing; at least one bucket carried by the arms and consisting of a flattened container extending for substantially the full width of the holder and movable in an annular space between said holder and the casing, the advancing end of said container being open and there being at least one transverse opening in its inner side; with means for rotating the arms with the bucket; and a series of vertical partitions dividing the interior of the bucket into chambers.

RICHARD MARX.