W. T. HOOFNAGLE.

DISH WASHING MACHINE.

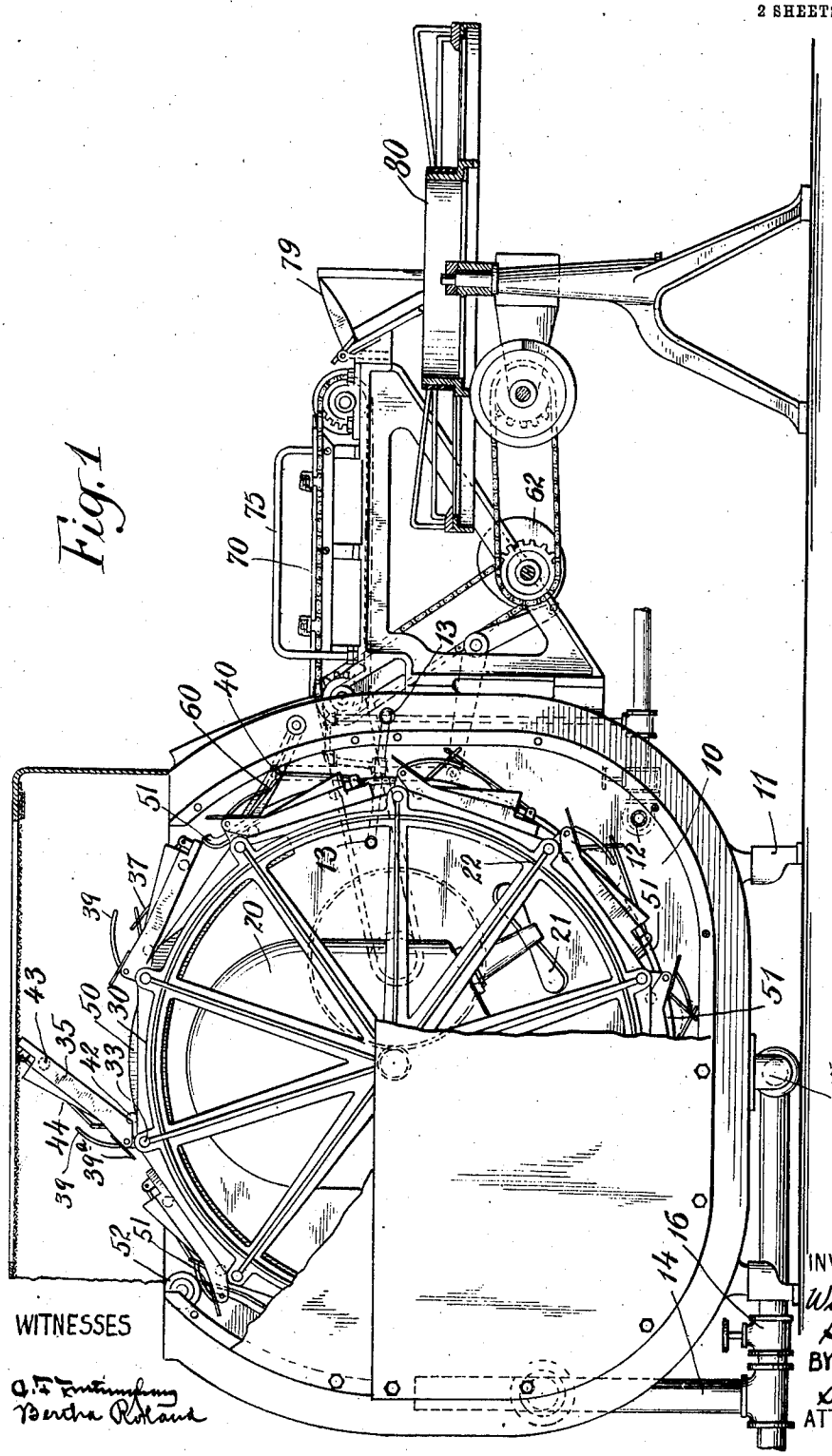
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1,043,010.

Patented Oct. 29, 1912.

2 SHEETS—SHEET 1.

Fig. 1



WITNESSES

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2 SHEETS—SHEET 2.

Fig. 3.

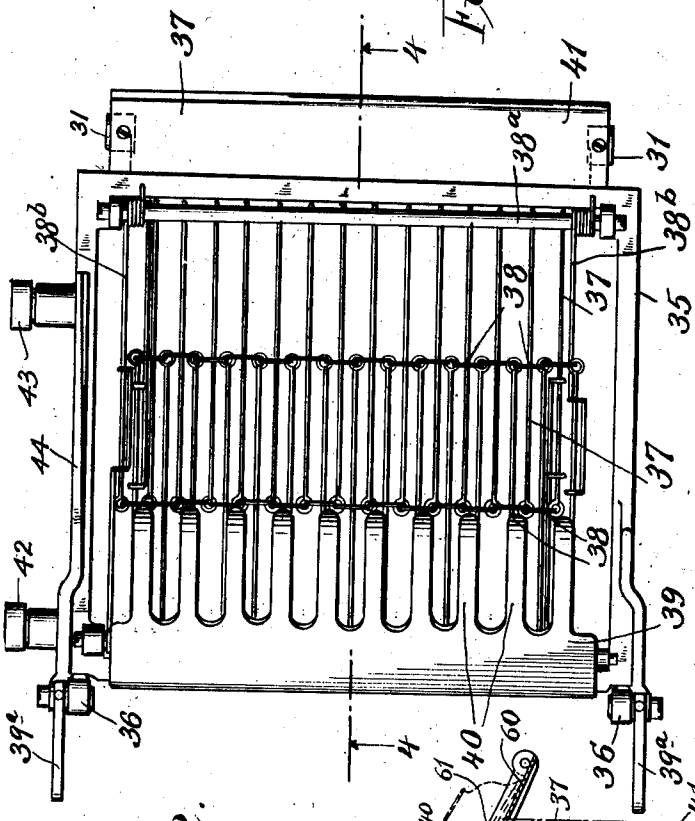


Fig. 4.

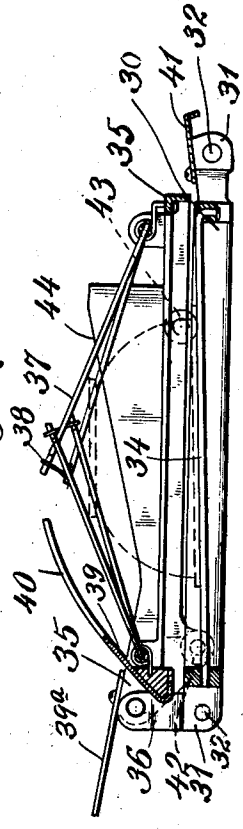
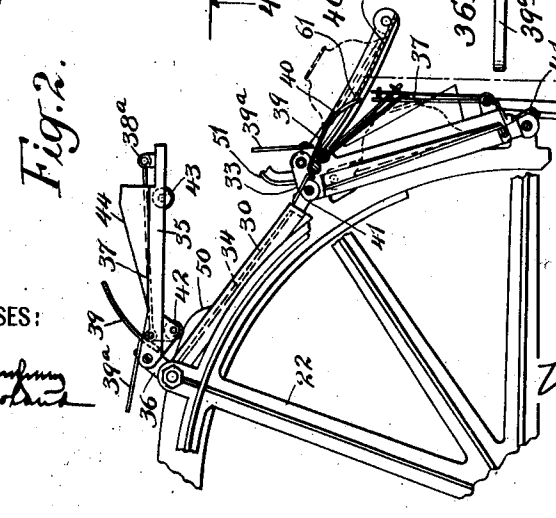


Fig. 2.



WITNESSES:

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DISH-WASHING MACHINE.

1,043,010. Specification of Letters Patent. Patented Oct. 29, 1912.

Application filed March 25, 1912. Serial No. 685,982.

To all whom it may concern:

Be it known that I, WILLIAM T. HOOFNAGLE, a citizen of the United States, and a resident of Glen Ridge, in the county of Essex and State of New Jersey, have invented certain new and useful Improvements in Dish-Washing Machines, of which the following is a specification.

The invention relates to machines for washing dishes and the like; and more particularly to a machine employing a suitable tank or tanks containing the washing water and through which the dishes or the like are carried and washed. The carrier is designed to bring the dish retaining means out of the water during a part of the movement, whereby the dishes may be conveniently fed, rinsed and finally delivered from the machine.

One of the objects of the invention is to provide a suitable basket to retain dishes of various sizes and shapes, to properly locate the same therein, and to effect a positive opening and closing of such dish retaining means.

A further object of the invention is to provide means for the removal of the dishes from the carrier without shock and to provide suitable bridging means to prevent the dropping of the smaller dishes.

The nature of the invention will best be understood when described in connection with the accompanying drawings, in which—

Figure 1 is a front elevation of the improved dish washing machine, a portion of the front of the tank and cover being broken away. Fig. 2 is a detail side elevation, partly in section, of a portion of the carrier and two dish retaining means, one of which has delivered a dish to a suitable take-off member. Fig. 3 is an enlarged plan of the dish retaining means. Fig. 4 is a longitudinal section taken on the line 4—4, Fig. 3.

Similar characters of reference designate corresponding parts throughout the several views.

Referring to the drawings, 10 designates the tank, which is mounted on a suitable base 11 and contains the washing water fed thereto through a suitable inlet 12, as well as through suitable spray pipes 13, the level of the water in the tank being maintained by an overflow 14. An outlet or clean out-pipe 15 is provided in the bottom of the tank and is connected with the overflow pipe 14, a valve 16 being inserted ahead of the connection.

The tank 10 is provided with an inwardly projecting casing 20, containing a portion of the driving mechanism; and from this casing extend downwardly into the tank two propellers 21 for washing the dishes. These dishes are arranged to be brought past the propellers, which direct streams of water toward the same, by means of a rotatable wheel 22 which is mounted about said inwardly projecting casing, and is rotated by suitable driving mechanism, (not shown). This wheel carries upon its periphery suitable baskets, shown in detail in Figs. 5 and 6. These baskets consist of a rigid longitudinal frame or dish saddle 30, having end lugs 31 provided with suitable perforations 32 to receive rods 33 of the rotatable wheel 22; and these frames are strung with wires or other suitable material 34 to provide a support for a dish. A rigid top or cover frame 35 is pivoted at one end to an extension 36 projecting upwardly from a lug 31. This top or cover frame is provided with oppositely disposed wires 37 extending from opposite ends of the frames. The wires terminate beyond the middle of the frame and their ends are provided with eyes respectively connected to one another by links 38, whereby an interlocking flexible cover is provided which will readily adapt itself to the various sizes and shapes of the dishes and at the same time will not open to allow a dish to drop out. Furthermore, each set of the wires is fixed to a corresponding rod 38^a loosely mounted in the frame 35, and a spring 38^b is arranged to hold the rod and corresponding wires in a depressed position through the action of the opposite end of said spring on the opposite set of wires, a portion of the spring being loosely wound about said rod to increase the elasticity of said spring and its other end being fixed to the frame 35. The advancing end of the frame 35 is provided, furthermore, with a fixed member 39 having a plurality of curved fingers 40 extending inwardly toward the middle of the frame, and with a stop bar 39^a to limit the rearward movement of the cover frame. To the other side of the frame 35 is secured a bridge piece 41, the purpose of which will be hereinafter set forth. One side of the frame or cover 35 carries a cam roller 42 and a supplementary cam roller 43,

as well as an upper cam surface 44. These baskets are permanently fixed to the rotatable wheel 22 and form, therefore, a polygonal supporting surface for the dishes.

The individual baskets are arranged to be periodically opened, during certain periods of the rotation of the wheel 22, to permit of the insertion of a dish; whereupon, on further rotation of said carrier, the cover 35 closes and firmly holds the dish within the respective basket and during its progress through the water of the washing tank 10. The opening and closing of frame 35 is effected respectively by an opening cam 50, secured to the tank 10 and adapted to engage said roller 42, and by means of a closing cam 51 forming part of the tank 10 and likewise adapted to engage the said roller 42. An additional closing means is provided in the roller 52 carried by the tank, said roller being adapted to engage the top or cam surface 44. This insures the closing of the basket, to hold the dish, before the actual closing cam 51 comes into effect, whereby sudden closing and consequent shock is obviated, the roller 52 effecting the gradual closing of the basket as it rides upon the inclined surface 44. The supplementary roller 43 then follows under cam 51 and holds the top and cover in closed position at its extreme outer end, thus reducing friction on rollers 42 and accommodating, also, any wear. As the dishes, thus held by the baskets with their upper surfaces toward the axis of rotation, pass through the water of tank 10, these surfaces meet the streams of water directed toward the same by the propellers 21. The propellers are arranged, furthermore, such that the streams thus directed thereby toward the dishes shall not strike the same perfectly normal but at a slight inclination thereto, whereby greater pressure will exist at one side and produce a swirl which causes the water to pass about the ends of the dishes and through the baskets to wash also the back of the dishes. Upon leaving the water, the dishes are removed from the rotary carrier by a cam actuated take-off frame 60 which is provided with a plurality of longitudinal slots 61 arranged to permit the passing therethrough of the fingers 40 of the baskets, as the same move past the said take-off frame 60.

The member 39 with fingers 40 coöperating with the take-off frame 60, and the bridge piece 41 constitute a bridge over which a dish may be guided from a preceding dish support to the said take-off frame when the clamp, coöperating with the last named support, is removed therefrom, whereby a smooth delivery of the dish is insured. This said frame is oscillated through intermediate mechanism from a cam 62 driven from the driving mechanism of the rotary carrier 22; and its motion is so timed that it will be in the proper position to receive a dish from a basket, then rise further to deliver the dish to a table 70, remain out of the way of the succeeding basket until it has passed sufficiently to clear said frame 60, which then drops to its original position and begins again its upward movement to receive the dish from said latter basket. From the take-off frame 60, the dish slides by gravity upon the table 70 over which it is moved in any suitable manner and delivered therefrom to an inclined trough 79 wherein the dishes roll by gravity upon a storing and drying table 80 suitably driven. The cups, bowls or the like are preferably arranged to encounter a diagonal deflecting rod 75, which directs the same into a suitable receiving frame at one side of the table.

I claim:—

1. In a dish washing machine: a suitable tank to contain water; a carrier, and means to move the same through said tank; suitable dish retaining means supported by said carrier; an opening cam, and a closing cam; and means carried by said dish retaining means adapted to engage said opening and said closing cams to respectively open and close the said dish retaining means.

2. In a dish washing machine: a suitable tank to contain water; a carrier, and means to move the same through said tank; dish retaining means including a dish supporting frame, and a cover pivotally connected thereto; an opening cam, and a closing cam; and a cam roller carried by said pivoted cover adapted to engage said opening cam and said closing cam to respectively open and close the said dish retaining means.

3. In a dish washing machine: a suitable tank to contain water; a carrier, and means to move the same through said tank; dish retaining means including a dish supporting frame, and a cover pivotally connected thereto; an opening cam, and closing cam; and a cam roller carried by said pivoted cover at one end thereof, and a supplementary cam roller carried by said pivoted cover at the other end thereof, the said cam roller being adapted to engage the said opening and closing cams and the said supplementary roller the said closing cam.

4. In a dish washing machine: a suitable tank to contain water; a carrier, and means to move the same through said tank; dish retaining means including a dish supporting frame, and a cover pivotally connected thereto; an opening cam and a closing cam secured to said tank; a closing roller secured to said tank; and a cam roller carried by said pivoted cover at one end thereof, and a supplementary cam roller carried by said pivoted cover at the other end thereof, the said cam roller being adapted to engage

the said opening and closing cams and the said supplementary roller the said closing cam, and the said cover being further provided with an upper cam surface adapted to engage with said closing roller.

5. In a dish washing machine: a suitable tank to contain water; a carrier, and means to move the same through said tank; suitable dish retaining means supported by said carrier and including a dish supporting frame, a rigid frame pivotally connected thereto, and a flexible dish retaining top supported by said rigid frame; an opening cam, and a closing cam; and means carried by said dish retaining means adapted to engage said opening and said closing cams to respectively open and close the said dish retaining means.

6. In a dish washing machine: a suitable tank to contain water; a carrier, and means to move the same through said tank; dish retaining means including a dish supporting frame, a rigid frame pivotally connected thereto, and a flexible dish retaining top supported by said rigid frame; an opening cam, and a closing cam; and a cam roller carried by said pivoted frame adapted to engage said opening cam and said closing cam to respectively open and close the said dish retaining means.

7. In combination with a suitable carrier; a rigid supporting frame; end lugs extending therefrom and provided with perforations; rods fitting said perforations and suitably connected with said carrier; a rigid frame pivotally connected to said supporting frame; and a flexible retaining cover supported by said rigid frame.

8. In a dish washing machine, a carrier, a plurality of dish supports thereon, a dish clamp for each support, a slotted take-off frame, a bridge piece (39) attached to the advancing end of the dish clamp and provided with fingers adapted to pass through the slots in the take-off frame whereby a dish may be guided from a preceding dish support to the take-off frame when the clamp, coöperating with the last-named support, is removed therefrom.

9. In a dish washing machine, a carrier, a plurality of dish supports thereon, a dish clamp for each support, a slotted take-off frame, a bridge piece (39) attached to the advancing end of the dish clamp and provided with fingers adapted to pass through the slots in the take-off frame, and a bridge piece (41) attached to the rear end of the preceding dish support, whereby a dish may be guided over the bridge piece at the rear end of the preceding dish support and over the bridge piece (39) to the said take-off frame when the clamp, coöperating with the last-named support, is removed therefrom.

10. In a dish washing machine: the combination with a suitable carrier; of dish retaining means moved thereby and comprising a dish supporting frame, a rigid frame pivotally connected thereto, a flexible retaining cover supported thereby; means to open and to close said rigid frame with respect to the dish supporting frame; and a stop bar extending outwardly from the advancing end of the said rigid frame.

Signed at New York, in the county of New York, and State of New York, this 23rd day of March, A. D. 1912.

WILLIAM T. HOOFNAGLE.

Witnesses:

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LAURA E. SMITH.