J. T. McGRATH.

DISH WASHING MACHINE.

APPLICATION FILED JUNE 19, 1914.

1,142,187.

Patented June 8, 1915.

2 SHEETS—SHEET 1.

Fig. 1.

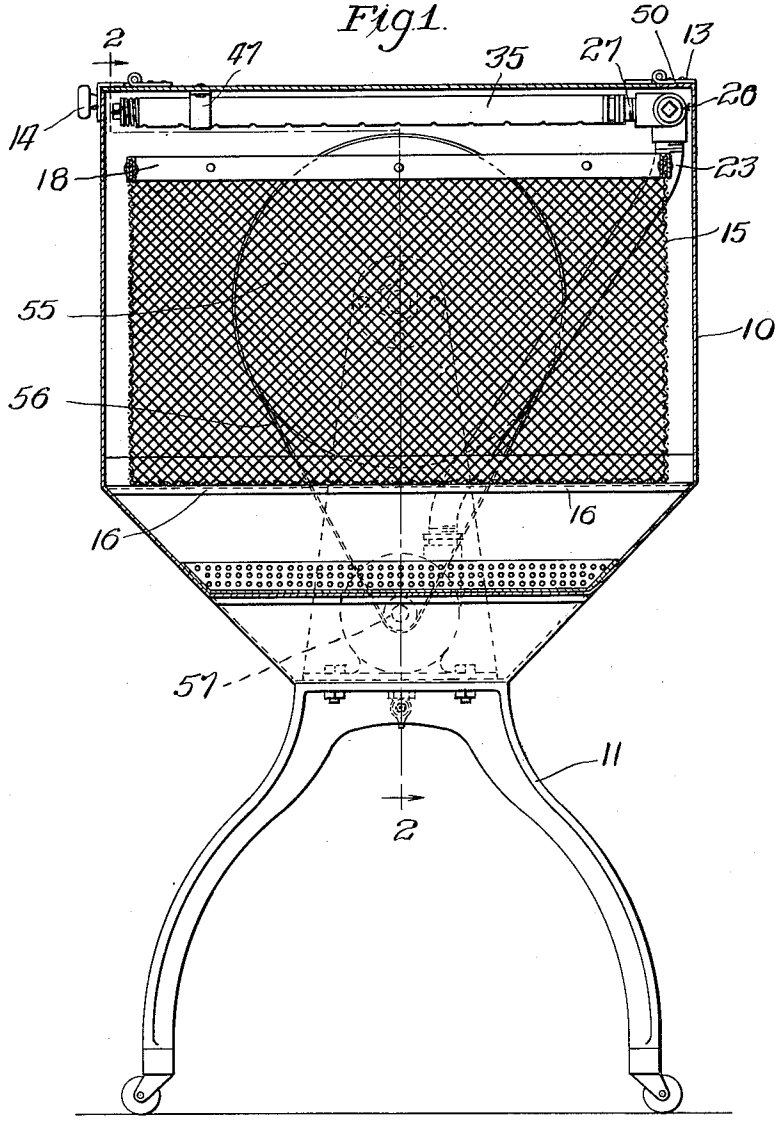


Fig. 4.

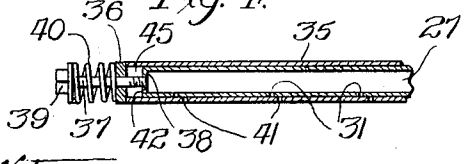
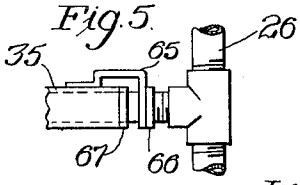


Fig. 5.



Witnesses:
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2 SHEETS—SHEET 2.

Fig. 2.

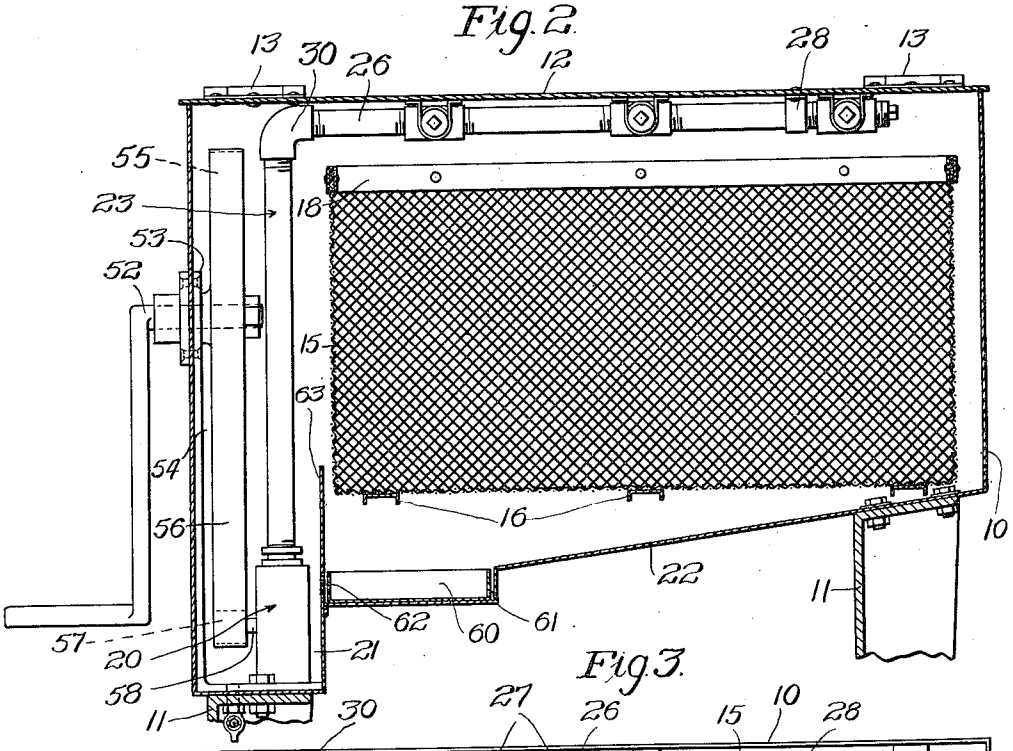
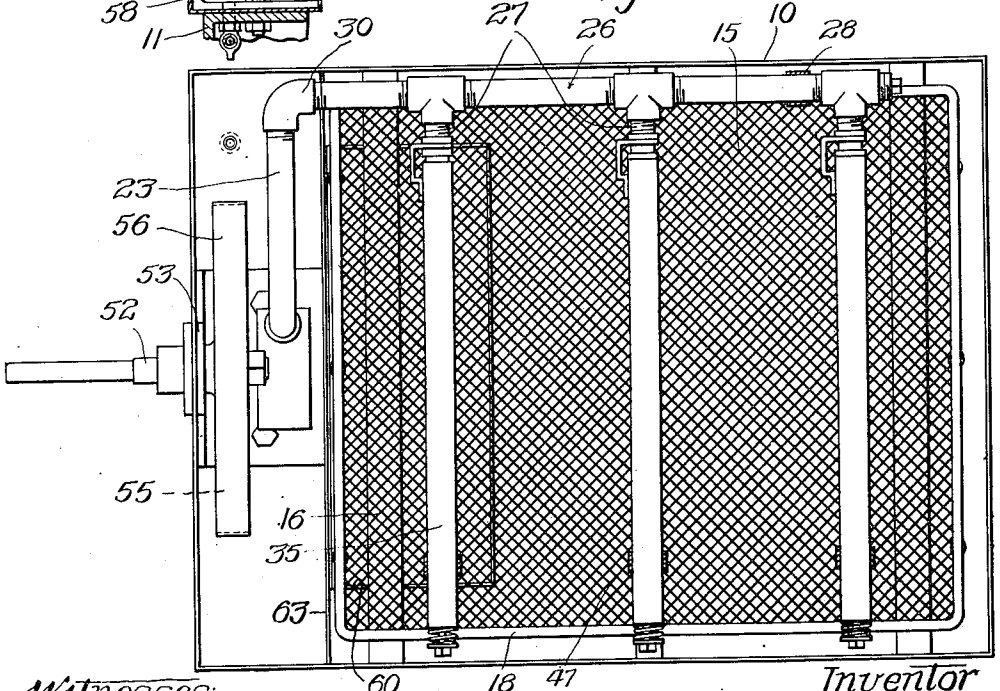


Fig. 3.



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UNITED STATES PATENT OFFICE.

JOHN THOMAS McGRATH, OF BLOOMINGTON, ILLINOIS.

DISH-WASHING MACHINE.

1,142,187. Specification of Letters Patent. Patented June 8, 1915.

Application filed June 19, 1914. Serial No. 846,085.

To all whom it may concern:

Be it known that I, JOHN THOMAS McGRATH, a citizen of the United States, and a resident of Bloomington, in the county of McLean and State of Illinois, have invented certain new and useful Improvements in Dish-Washing Machines, (Case B;) and I do hereby declare that the following is a full, clear, and exact description thereof, reference being had to the accompanying drawings, and to the characters of reference marked thereon, which form a part of this specification.

This invention relates to improvements in dish washing machines, and refers principally to that type of machines embracing a casing to receive and hold the wash water, a dish basket supported therein and one or more spray pipes for spraying the wash water upon and among the dishes supported in the basket, with suitable means for forcing the wash water into and through the spray pipes.

Among the objects of the invention is to provide a construction in dish washing machines of this character which, while adapted to hotel and restaurant uses, is also sufficiently simple and economical in construction to be adaptable to household uses.

A further object of the invention is to provide a novel means for directing the wash water to the receptacle which carries the dishes, so arranged that the water is dashed upon and among the dishes in the basket under considerable pressure, and also arranged to cut off the wash water from the spray pipe or pipes when the device is not in operation.

A further object of the invention is to provide a spray pipe arranged above the dish basket and supported on the hinged or swinging cover of the casing in such manner that the spray pipe may be swung upwardly away from the casing with the cover to permit the dish basket to be removed through the open top of the casing.

A still further object of the invention is to provide an improved means for separating from the wash water the particles removed from the dishes prior to the reintroduction of the wash water to the pump of the water circulating system.

Other objects of the invention are to improve and simplify machines of this general character, and the invention consists in the matters hereinafter set forth and more particularly pointed out in the appended claims.

In the drawings:—Figure 1 is a transverse vertical section of a dish washing machine embodying my invention. Fig. 2 is a longitudinal vertical section thereof. Fig. 3 is a plan view of the machine with the lid or cover removed. Fig. 4 is a fragmentary axial section illustrating the construction of the spray pipe and the valve for controlling the flow of water therefrom. Fig. 5 is a fragmentary plan view illustrating a stop carried by the valve sleeve to limit its movement.

As shown in the drawings, 10 designates the inclosing casing of the disk washing machine to receive and hold the wash water. Said casing, in the present embodiment of the invention, is made of oblong rectangular shape, and is supported at its front and rear ends on legs or standards 11, 11. The casing is provided with a swinging top or lid 12 that is hinged at one edge at 13 to one side wall of the casing, and is provided at its other edge with a locking latch 14 to lock the cover closed.

Arranged within the casing is a basket 15 to receive and hold the dishes to be washed. Said basket, as herein shown, is made of wire netting and is supported on horizontal girders 16, 16 extending transversely between the side walls of the casing and attached to said side walls in any suitable manner. The basket is open at its top, and the top edges of the side and end walls thereof may be strengthened by a binding strip 18. It is of oblong rectangular shape in plan to correspond with the shape of the casing. The basket is of such dimensions that it may be readily removed from the casing when the swinging lid or cover is raised.

The means for delivering the wash water to the basket 15 consist, as herein shown, of a centrifugal pump 20 that is mounted in a chamber or well 21 formed at one end of the casing 10 below the level of the bottom wall 22 of the casing and toward which chamber or well said bottom wall 22 is inclined to direct the water to the well. The intake of the pump is submerged in the water in said well. The eduction pipe 23 of the pump extends upwardly toward the top of the casing and is connected at its upper end with a header pipe 26 which is arranged parallel to one side wall of the casing near the top

thereof. Connected to said header pipe are a plurality of spray pipes 27, 27, disposed at right angles to the header, and arranged horizontally over the dish basket 15. The said header pipe 26 may be supported at its end remote from the pump eduction pipe 23 by a suitable hanger 28 suspended from the swinging lid. It is connected to the eduction pipe 23 through the medium of a rotative joint or union 30, whereby said spray pipes 27, which are supported on the lid, may be swung upwardly with the lid 12 about the axis of said rotative joint 30. The said spray pipes are provided with a plurality of relatively small discharge openings 31 at the lower sides thereof. The passage of water through the said discharge openings is controlled by a valve mechanism that is so arranged and constructed as to maintain the spray pipes closed until a predetermined pressure is induced therein from the pump 20, so that when the pipes are opened the discharge of water into the basket upon the dishes is effected with considerable pressure. The valve means herein shown to effect this result is made as follows: 35 designates a valve sleeve which surrounds and closely fits each spray pipe 27. The sleeve is closed at its outer end by an end wall 36. Extending loosely through an opening in said end wall is a bolt 37 that is screw-threaded or otherwise fixed to the end wall 38 of the spray pipe. Interposed between the end wall 36 of the valve sleeve and a head 39 of the bolt is a compression spring 40 which acts on the sleeve to hold the ports 41 thereof out of register with the spray apertures or ports 31 of the spray pipe. The said end wall 38 of the spray pipe is provided with one or more openings 42 which permit water to pass from said pipe into a pressure chamber 45 of the valve sleeve between the end walls of said sleeve and spray pipe.

The valved spray pipes are supported from the lid or cover 12 by means of hangers 47 suspended from the lid and engaging the outer ends of the spray pipes. In a construction where the hinges of the rotative joint between the header 26 and the eduction pipe 23 are not co-axial with the hinge of the cover 12, the said spray pipes with their valve sleeves may be movably supported in the hangers 47, or otherwise movably supported on the cover, so as to permit the cover to move relatively to the spray pipes when the cover is swung on its hinges. In order to lessen such relative movement of the cover to the spray pipes, I may hinge the cover to an overhanging ledge 50 of the side walls of the casing 10, so as to thereby bring the hinge axes of said parts closer together.

The centrifugal pump 20 is driven from a power shaft 52 that is rotatively mounted on a bearing 53 carried by a standard 54 that rises from the adjacent supporting leg frame and lies against the end wall of the casing. Said crank shaft is provided with a large wheel 55 which is connected by a belt 56 to a small belt wheel 57 attached to the shaft 58 of the centrifugal pump. The said operating shaft 52 may be rotated by hand or power mechanism and is herein shown as provided with a crank by which to rotate it.

In the operation of the machine the casing is charged with a body of heated water sufficient to immerse the pump 20. This water may be charged with soap, if desired. Thereafter the dishes are placed in the receptacle and the operating shaft 52 is rotated to operate the pump. Said pump acts to lift the water from the well 21 and force it into the spray pipes. When the pressure in the spray pipes is sufficient to overcome the strength of the springs 40, the valve sleeves are moved outwardly to bring the ports thereof into register with the spray openings 31 of the discharge pipes, whereupon water is forced with considerable pressure upon the dishes or other articles to be washed. The water continues to be discharged from the spray pipes as long as the valve operating pressure is maintained by the pump. When the operation of the pump ceases, the springs 40 act on the valve sleeves to return them to their closed positions. The said valves, arranged as described, constitute means to insure the discharge of the water upon the dishes at a predetermined pressure, and this pressure may be varied by adjustment of the bolt 37 which, being screw-threaded to the spray pipe, is capable of such adjustment.

In order to separate the larger particles, washed from the dishes from the water, after passing through the basket and before its reintroduction into the pump, I may provide at the bottom of the casing, near the pump well 21 thereof, a removable pan 60 which is seated in a transverse depression 61 at the foot of the inclination of the bottom wall. The side wall 62 of said pan 60 adjacent to the well is perforated. The well is separated from the casing at the bottom thereof by an upstanding plate 63 which extends at its upper edge slightly above the bottom of the dish basket. The said plate 63 is also perforated so as to permit the water which flows down the inclined bottom wall into the pan to pass into the well, while retaining the larger particles carried thereby in the pan. The said pan is removably supported in the casing and may be removed from time to time through the open top of the casing when the dish receptacle is removed. In this manner the wash water is kept clean so as to thereby render the operation of the machine sanitary.

In order to limit the opening and closing movements of the valve sleeves, I may provide said sleeves with stop arms 65 adapted,

in the normal closed position thereof, to engage and be held by shoulders 66 on the spray pipes, and adapted, in the open position thereof, to engage shoulders 67 on the spray pipes, said latter shoulders preventing overthrow of said valves to an extent to again close the spray pipes.

While I have described with some particularity the details of the illustrated embodiment of the invention, it will be understood that the invention is not intended to be limited to such details, except as such details are hereinafter specifically claimed, and as imposed by the prior art.

I claim as my invention:—

1. A dish washing machine comprising a receptacle for the wash water, a dish basket therein, a spray pipe for discharging water on the dishes in the basket, means to force the wash water through said pipe and onto the dishes, and valve means controlled by the pressure of wash water adapted to open upon a predetermined pressure in the spray pipe to deliver water on the dishes.

2. A dish washing machine comprising a receptacle for the wash water, a dish basket therein, a spray pipe for discharging water on the dishes in the basket, means to force the wash water through the spray pipe and onto the dishes, valve means controlled by the pressure of the wash water adapted to open upon a predetermined pressure in the spray pipe to deliver water on the dishes, and adjusting means to vary the pressure at which the water is discharged from said spray pipe.

3. A dish washing machine comprising a receptacle for the wash water, a dish basket therein, a spray pipe for discharging water on the dishes in the basket, means to force wash water through the spray pipe on the dishes, said pipe being provided with spray openings, a valve sleeve fitted thereover and movable thereon and provided with ports adapted by movement of the sleeve to be brought into register with the spray pipe discharge openings, and means controlled by the pressure of water within the spray pipe to shift said valve sleeve to its open position.

4. A dish washing machine comprising a receptacle for the wash water, a dish basket therein, a spray pipe for discharging water on the dishes in the basket, means to force wash water through the spray pipe on the dishes, said pipe being provided with spray openings, a valve sleeve fitted thereover and movable thereon and provided with ports adapted by movement of the sleeve to be brought into register with the spray pipe discharge openings, yielding means to normally hold the valve sleeve in its closed position, and means acted upon by the pressure within the spray pipe to move the valve sleeve to its open position.

5. A dish washing machine comprising a receptacle for the wash water, a dish basket therein, a spray pipe for discharging water on the dishes in the basket, means to force wash water through the spray pipe on the dishes, said pipe being provided with spray openings, a valve sleeve fitted thereover and movable endwise of the pipe and provided with a longitudinal series of ports adapted to register with said discharge openings, a spring acting to normally hold the valve sleeve in its closed position and means acted upon by pressure within the spray pipe to shift the valve sleeve to its open position against the action of said spring.

6. A dish washing machine comprising a receptacle for the wash water, a dish basket therein, a spray pipe for discharging water on the dishes in the basket, means to force wash water through the spray pipe on the dishes, said pipe being provided with a longitudinal series of spray openings, a valve sleeve fitted thereon and movable endwise of the pipe and provided with a longitudinal series of ports adapted to register with said discharge openings, a spring acting to normally hold the valve sleeve in its closed position, means acted upon by the pressure within the spray pipe to shift the valve sleeve endwise to its open position against the action of the spring, and stop means to limit the opening movement of the valve sleeve, and prevent overthrow thereof.

7. A dish washing machine comprising a receptacle for the wash water, a dish basket therein and means for spraying wash water on the dishes in the basket, comprising a spray pipe provided with a longitudinal series of spray openings and at one end with an end wall, a water lifting pump communicating with the other end of said spray pipe, a valve sleeve surrounding said spray pipe and movable endwise thereof and provided with ports to register with said spray openings, said valve sleeve being provided with a closed end wall between which and the end wall of the spray pipe is formed a pressure chamber, the end wall of the spray pipe being perforated to permit passage of water from the spray pipe to the pressure chamber and yielding means acting on the valve sleeve to normally hold said sleeve in its closed position.

8. A dish washing machine comprising a receptacle for the wash water, a dish basket therein and means for spraying wash water on the dishes in the basket, comprising a spray pipe provided with a longitudinal series of spray openings and at one end with an end wall, a water lifting pump communicating with the other end of said spray pipe, a valve sleeve surrounding said spray pipe and movable endwise thereof and provided with ports to register with said spray openings, said valve sleeve being provided with

a closed end wall between which and the end wall of the spray pipe is formed a pressure chamber, the end wall of the spray pipe being perforated to permit passage of water from the spray pipe to the pressure chamber, a headed bolt extending loosely through the end wall of said sleeve and connected to said spray pipe and a compression spring interposed between the head of said bolt and the end of said valve sleeve.

9. A dish washing machine comprising a receptacle for the wash water, a dish basket therein and means for spraying wash water on the dishes in the basket, comprising a spray pipe provided with a longitudinal series of spray openings and at one end with an end wall, a water lifting pump communicating with the other end of the spray pipe, a valve sleeve surrounding said spray pipe and movable endwise thereof and provided with ports to register with said spray openings, said valve sleeve being provided with a closed end wall between which and the end wall of the spray pipe is formed a pressure chamber, the end wall of the spray pipe being perforated to permit the passage of water from the spray pipe to the pressure chamber, and a stop carried by the valve sleeve to engage shoulders on the spray pipe to limit the opening and closing movements of said valve sleeve.

10. A dish washing machine provided with a spray pipe having a series of spray openings, and valve means for controlling the discharge of water from said spray pipe comprising a ported sleeve fitted over said spray pipe, yielding means acting on the sleeve to hold it in its closed position and means adapted to be acted upon by pressure within said pipe to shift said sleeve on the pipe against the action of said yielding means to open the spray openings.

11. A dish washing machine comprising a receptacle for wash water provided with a swinging lid, a dish basket therein, a spray pipe above the basket and supported on said lid, and a pump within the casing having an eduction pipe to which said spray pipe is connected by a rotative joint, whereby the spray pipe may be swung upwardly with the lid.

12. A dish washing machine comprising a receptacle for the wash water provided with a swinging lid, a dish basket therein, a spray pipe above the basket and supported on said lid, and a pump having an eduction pipe to which said spray pipe is connected by a rotative joint, whereby the spray pipe may be swung upwardly with the lid, said spray pipe being movably supported on said lid and the axes of the lid hinge and spray pipes being non-coaxial.

13. A dish washing machine comprising a receptacle for the wash water, provided with a swinging lid, a dish basket therein, and a water lifting pump with means to operate it and provided with an upwardly extending fixed eduction pipe, a horizontal header extending therefrom and arranged at an angle thereto beneath the hinged edge of the lid, and connected to the eduction pipe by a rotative joint, and spray pipes extending from said header over the basket and supported at their outer ends from said lid, whereby the spray pipes may be swung upwardly and downwardly with the lid.

14. A dish washing machine comprising a casing to receive the wash water, a dish basket therein, said casing being formed at one side to provide a well, the bottom wall of the casing inclining from the other side of the casing toward said well, a pump in the well, spraying means connected to the pump for discharging water upon the dishes in the basket, said inclined bottom wall being formed at the base thereof with a depression, a pan removably seated in said depression, and a separating screen between the pan and said well through which water is drained from the pan to the well.

15. A dish washing machine comprising a casing to receive the wash water, a dish basket therein, said casing being formed at one side to provide a well, the bottom wall of the casing inclining from the other side of the casing toward said well, a pump in the well, spraying means connected to the pump for discharging water upon the dishes in the basket, said inclined wall being formed at the base thereof with a depression, a pan removably seated in said depression, a plate dividing the well from the lower part of the casing and extending above the level of the pan, the said plate and adjacent wall of the pan being perforated, for the purpose set forth.

In testimony, that I claim the foregoing as my invention I affix my signature in the presence of two witnesses, this 1st day of June, A. D. 1914.

JOHN THOMAS McGRATH.

Witnesses:

F. J. BAESK,

N. McDERMOTT.