Oct. 2, 1923. 1,469,207

G. S. BLAKESLEE

WASHING MACHINE

Filed Aug. 16, 1920 3 Sheets-Sheet 1

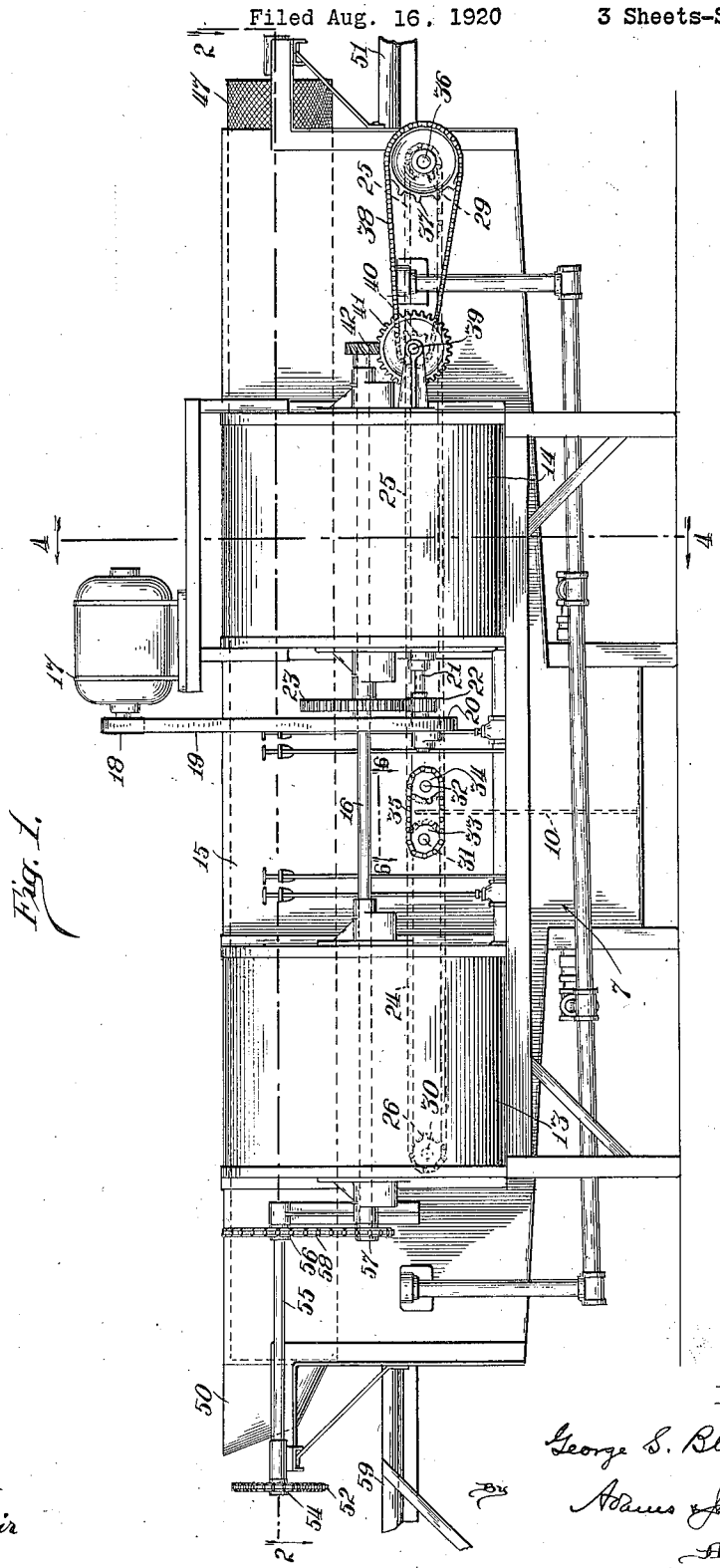


Fig. 1.

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Filed Aug. 16, 1920 3 Sheets-Sheet 2

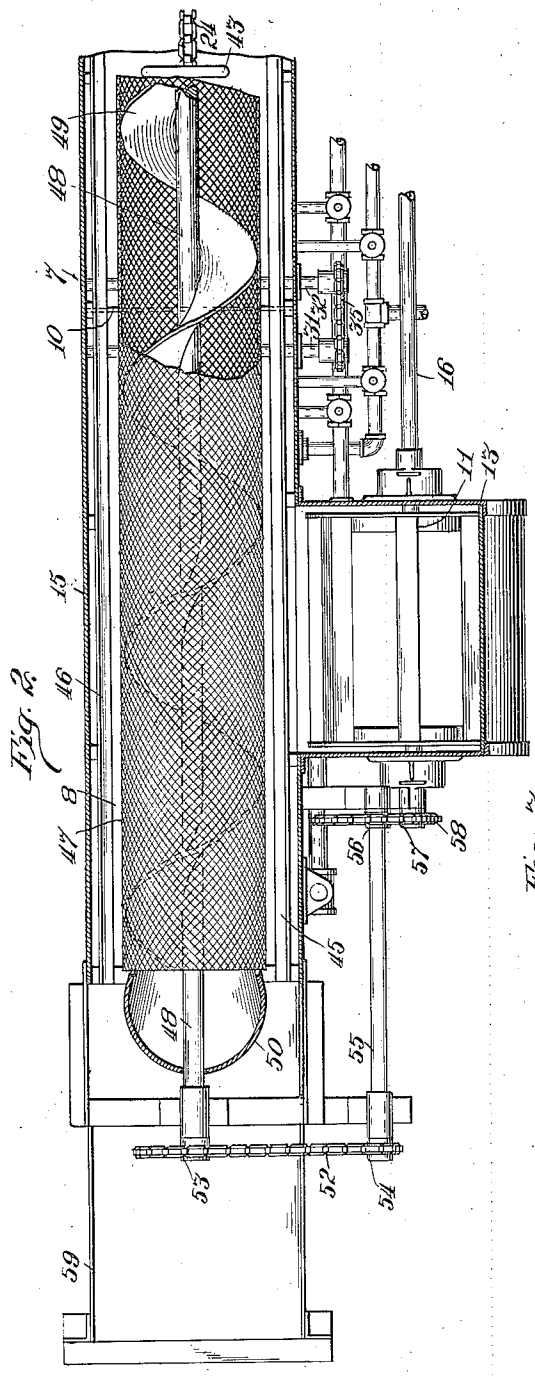


Fig. 2.

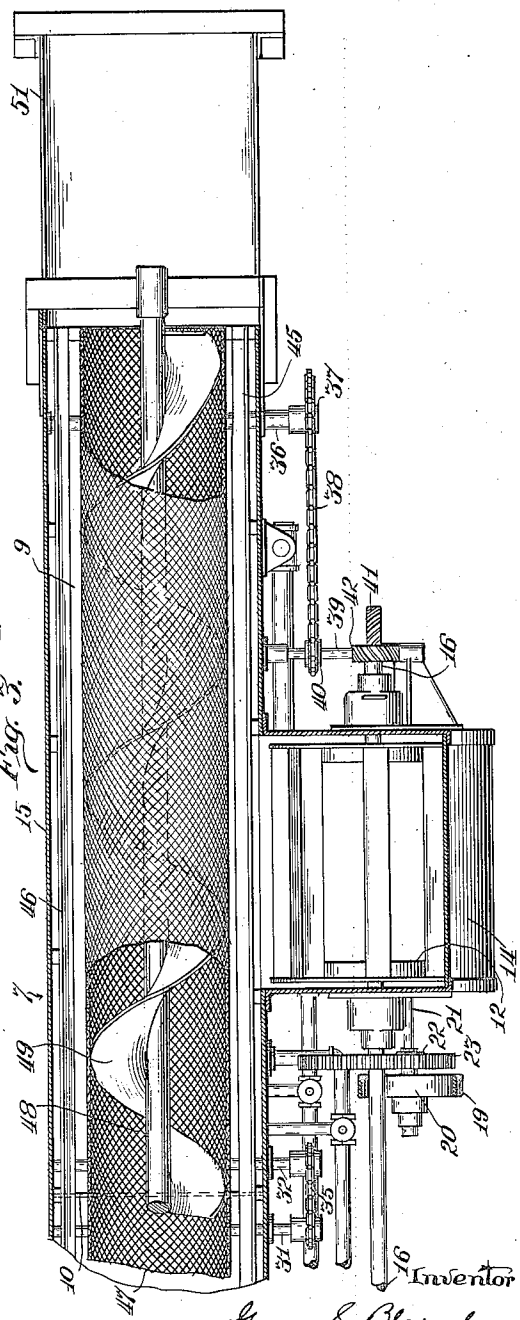


Fig. 3.

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Fig. 5.

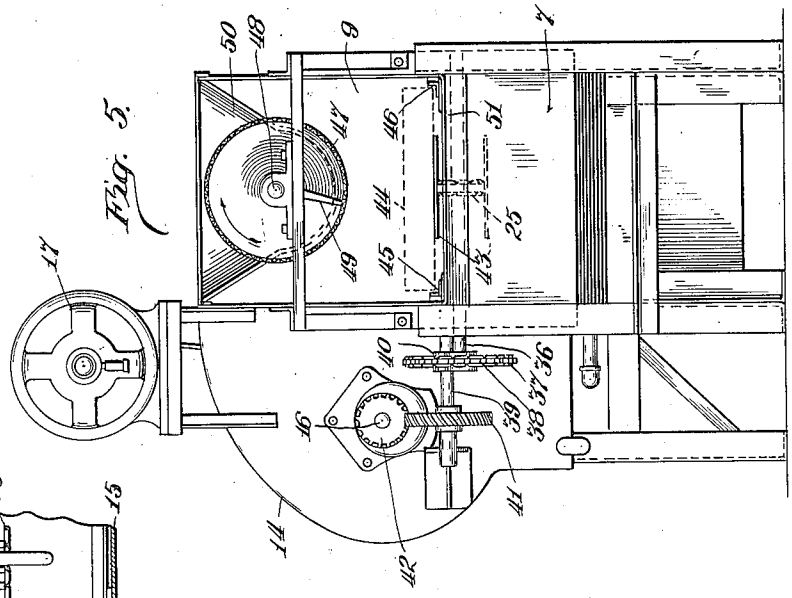


Fig. 6.

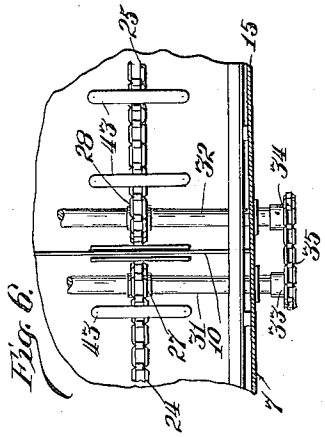
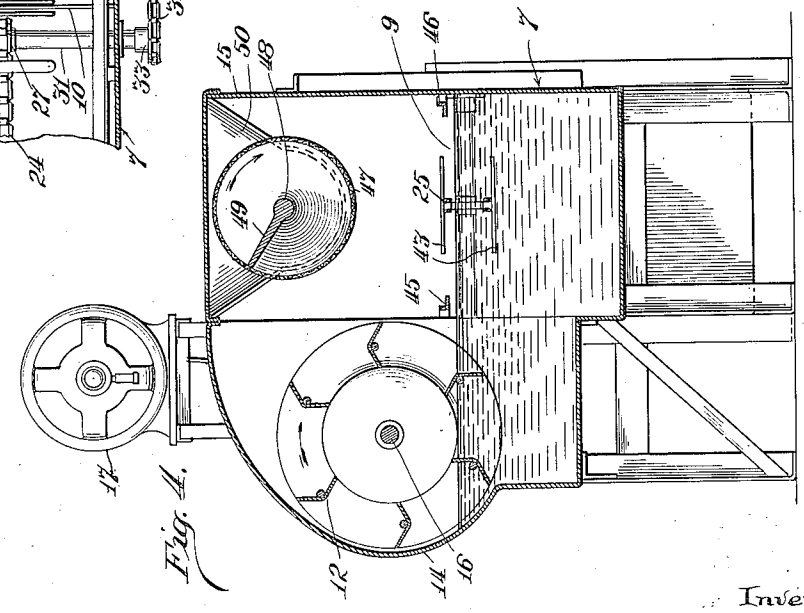


Fig. 4.



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UNITED STATES PATENT OFFICE.

GEORGE S. BLAKESLEE, OF OAK PARK, ILLINOIS.

WASHING MACHINE.

Application filed August 16, 1920. Serial No. 403,759.

To all whom it may concern:

Be it known that I, GEORGE S. BLAKESLEE, a citizen of the United States, and a resident of Oak Park, in the county of Cook and State of Illinois, have invented certain new and useful Improvements in Washing Machines, of which the following is a specification, reference being had to the accompanying drawings.

My invention relates to washing machines, and particularly to machines intended for washing metal parts, such as castings. Such parts vary greatly in size and weight, and are of a great variety of shapes, many of them being quite irregular, so that it is a difficult matter to provide a machine which will operate with certainty to handle such articles without damaging them, while at the same time they are effectively cleansed. Economy of space is also an important consideration, and it is highly desirable that a washing machine of this character be so constructed as to have great capacity for the space which it occupies. To provide a washing machine which will meet the above mentioned requirements is the object of my present invention. I accomplish this object as illustrated in the accompanying drawings and as hereinafter described. What I believe to be new is set forth in the claims.

In the accompanying drawings,—

Fig. 1 is a side elevation of my improved machine;

Fig. 2 is a partial horizontal section thereof, showing that half of the machine adjacent to the inlet end thereof;

Fig. 3 is a similar view showing the discharge end portion of the machine, both Figures 2 and 3 being taken substantially on line 2—2 of Fig. 1;

Fig. 4 is a vertical section on line 4—4 of Fig. 1;

Fig. 5 is an end view of the discharge end of the machine; and

Fig. 6 is a detail, being a partial horizontal section on line 6—6 of Fig. 1.

My improved machine comprises an elongated tank, which in the best embodiment thereof is divided transversely midway of its length to form compartments for washing and rinsing water; paddle wheels disposed laterally with reference to said tank and operating respectively in the washing and rinsing compartments to throw water therefrom upon the articles to be washed; endless conveyors operating over the water in the washing and rinsing compartments, the conveyor in the washing compartment being arranged to deliver the articles carried thereby to the conveyor in the rinsing compartment; and a rotary reticulated cylindrical member extending longitudinally over the tank above said conveyors, in the best embodiment of said invention said cylindrical member being arranged to operate also as a conveyor for conducting comparatively small articles through the machine while they are subjected to the action of the washing and rinsing water. In order that such cylindrical member may operate as a conveyor, it is provided with a spiral core extending longitudinally through it so that as said member rotates the articles contained in it will be advanced therethrough and discharged at the outlet end of the machine. All these operating parts are connected for operation by a single motor, and the usual piping is provided for supplying hot water to the washing and rinsing compartments, and for drawing off the water therefrom when desired.

Referring to the drawings,—7 indicates the tank as a whole, 8 the washing compartment, 9 the rinsing compartment, and 10 the partition which separates the tank into said two compartments. 11 indicates the paddle wheel associated with the washing compartment, and 12 the paddle wheel associated with the rinsing compartment. These paddle wheels are mounted in lateral extensions 13, 14 of a housing 15, which encloses the operating parts of the machine, and which is an extension of the tank proper. The two paddle wheels have their axes alined and are mounted on a common shaft 16, as shown in Figs. 1, 2 and 3, so that they rotate in unison. Said shaft is driven by an electric motor 17, preferably mounted on a platform above one of the paddle wheel housings, as shown in Fig. 1. The armature shaft of said motor carries a pulley 18 which is connected by a belt 19 with a pulley 20 mounted on a countershaft 21, as best shown in Figs. 1 and 3. This countershaft carries a spur pinion 22 which meshes with a gear 23 mounted on the shaft 16, as just shown in Fig. 1. As best shown in Fig. 4, the lower portions of the paddle wheels 11, 12 dip

into the water in the lateral extensions of the tank 7 and the blades of said paddle wheels are arranged so that when said wheels rotate in the direction indicated by the arrow in Fig. 4 they take up the water and throw it laterally into the upper portion of the washing and rinsing compartments.

24, 25 indicate endless conveyors mounted respectively in the washing and rinsing compartments, and arranged to conduct articles to be washed in the same direction over the water in said compartments. These conveyors are in the form of endless chains which operate over sprocket wheels, the conveyor 24 being supported and actuated by sprocket wheels 26, 27, and the conveyor 25 by sprocket wheels 28, 29, as shown in Fig. 1. The sprocket wheel 26 is mounted on a transverse shaft 30 suitably mounted near the inlet end of the washing compartment, and the sprocket wheels 27 and 28 are mounted respectively upon transverse shafts 31, 32 mounted in the housing at opposite sides near the upper end portion of the partition 10, as best shown in Fig. 1, from which it will be seen that said partition extends up between the shafts 31, 32 and terminates below the level of the upper loops of the two conveyors 24, 25. The shafts 31, 32 project outside of the housing at one end, as shown in Fig. 6, and their projecting ends are provided with sprocket wheels 33, 34, respectively, which are connected by a link belt 35, as best shown in Figs. 1 and 6. Thus the two conveyors operate in unison and their upper or operating surfaces move in the same direction. The sprocket wheel 29, which is located near the discharge end of the machine, is mounted on a transverse shaft 36 which also extends out through the casing and carries a sprocket wheel 37 over which travels a link belt 38 connecting the shaft 36 with a shaft 39 having a sprocket wheel 40, as best shown in Fig. 3. The shaft 39 also carries a worm wheel 41 with which meshes a worm or spiral gear 42 mounted upon an end portion of the paddle wheel shaft 16, as best shown in Figs. 1 and 3. By this construction the two conveyors 24, 25 are driven from the motor 17 through the paddle wheel shaft.

The construction of the conveyors 24, 25 is best shown in Figs. 4, 5 and 6, from which it will be seen that each of said conveyors comprises flat transverse bars 43 secured intermediately of their length to the conveyor chains so that they are horizontally disposed and spaced a distance apart. These conveyors are designed to accommodate baskets or trays 44 in which the articles to be washed are placed, said baskets being preferably slightly less in width than the width of the main portion of the tank 7, as indicated by dotted lines in Fig. 5, and they are long enough to rest on two or more of the cross-bars 43. In the normal operation of the machine the baskets are supported entirely by the cross-bars 43, but to provide against accidental tipping of the baskets, due to unbalanced loading or other cause, longitudinally-extending rails 45, 46 are provided at opposite sides of the tank, preferably above the water level therein, as shown in Figs. 5 and 6, said rails being preferably in the form of angle irons. They are so located that they are not engaged by a basket 44 when the latter occupies a horizontal position, but should the basket tip its lower margin will strike the adjacent rail and will be prevented from tipping further.

It will be apparent that a basket deposited upon the conveyor 24 at the inlet end of the machine will be carried along by said conveyor and automatically transferred at the center of the machine to the conveyor 25, which will conduct it to the outlet end of the machine, and that as the basket passes through the machine its contents will be subjected to the action of the water thrown by the paddle wheels.

In order to more effectively distribute the washing and rinsing water thrown by the paddle wheels and direct it more forcibly against the articles carried by the conveyors 24, 25, as well as to economize space and provide additional capacity without increasing the floor space occupied by the machine, I provide the rotating reticulated member hereinbefore referred to, which as clearly shown in the drawings is in the form of a cylinder 47 which extends longitudinally of the machine over the washing and rinsing compartments and over the conveyors 24, 25. This cylinder may be either wire mesh or any other suitable openwork construction which will permit water to pass therethrough and will at the same time serve as a conveyor for comparatively small articles. In the construction shown, said cylinder is provided with a central longitudinally-extending shaft 48 around which winds a spiral blade 49, as best shown in Figs. 2 and 3. If desired the shaft and blade may be made integral with each other, as shown in Fig. 4. The shaft 48 and blade 49 are fixedly connected with the cylinder 47 so that they rotate in unison. The ends of the cylinder 47 are both open, and at the inlet end thereof a hopper or funnel 50 is provided through which the articles to be washed are introduced. At the outlet end of the machine a table 51 is provided to receive not only the baskets delivered by the conveyor 25, but also the articles delivered from the cylinder 47.

The cylinder 47 is rotated through the shaft 48 by means of a link belt 52 which runs over sprocket wheels 53, 54. The sprocket wheel 53 is mounted on one end portion of the shaft 48, as shown in Fig. 2,

and the sprocket wheel 54 is mounted upon a shaft 55 which is driven from the paddle wheel shaft 16 through sprocket wheels 56, 57 and a link belt 58, the sprocket wheel 57 being mounted on the paddle wheel shaft 16, as best shown in Figs. 1 and 2. By this construction all the operating parts are driven from the motor 17. 59 indicates a loading table at the inlet end of the machine, as best shown in Figs. 1 and 2. 60, 61 indicate overflow pipes for controlling the level of the water in the washing and rinsing compartments.

It will be seen from an inspection of Fig. 4 that the lower portion of the cylinder 47 is opposite the upper portions of the paddle wheels 11, 12 and overlies the conveyors 24, 25, and as indicated by the arrow in Fig. 5 the lower portion of said cylinder moves in the opposite direction to that of the water thrown by said paddle wheels. When the machine is in operation, therefore, the water thrown by the paddle wheels will strike the lower portion of said cylinder while the same is moving in the opposite direction, thus increasing the force of the impact of the water not only upon the surface of said cylinder but also upon the articles contained therein. A part of the water will pass into the cylinder and will thoroughly scour the contents thereof, after which it will fall upon the articles carried by the conveyors 24, 25. Part of the water will also be deflected by the cylinder and distributed downwardly over the article carried by said conveyors. The result is that the articles carried by said conveyors, as well as those contained within the cylinder 47, will be thoroughly scoured without waste of either water or time. Furthermore as the cylinder 47 occupies space which has heretofore been wasted, the capacity of the machine is very largely increased without increasing the floor space which it occupies. My improved machine, therefore, is peculiarly suitable for use in factories where the available space is limited and where a machine of large capacity is required.

So far as I am aware I am the first in the art to provide a washing machine of the type described having a rotary member arranged to cooperate with the paddle wheel or wheels to direct the water upon articles traveling thereunder; or one in which such rotary member is in the form of a reticulated cylinder which operates also as a conveyor to conduct articles to be washed through the machine. I also believe myself to be the first to provide a washing machine of the character described with a plurality of conveyors arranged in different horizontal planes. These features are, therefore, claimed generically. In other respects also my invention is not limited to the specific construction shown and described except in so far as the same is particularly claimed.

What I claim as my invention and desire to secure by Letters Patent, is—

1. A washing machine comprising a tank, a conveyor extending thereover for conducting articles to be washed over the water therein, a paddle wheel at one side of said conveyor and operating to throw water from said tank upon the articles carried thereby, and a rotary member extending longitudinally over said conveyor in the path of and serving to deflect water thrown by said paddle wheel.

2. A washing machine comprising a tank, a conveyor extending thereover for conducting articles to be washed over the water therein, a paddle wheel at one side of said conveyor and operating to throw water from said tank upon the articles carried thereby, and a rotary reticulated cylinder extending longitudinally over said conveyor in the path of the water thrown by said paddle wheel.

3. A washing machine comprising a tank, a conveyor extending thereover for conducting articles to be washed over the water therein, a paddle wheel at one side of said conveyor and operating to throw water from said tank upon the articles carried thereby, and a rotary cylindrical conveyor extending longitudinally over said conveyor in the path of the water thrown by said paddle wheel.

4. A washing machine comprising a tank, a plurality of conveyors extending longitudinally thereover in different horizontal planes for conducting articles to be washed over said tank, means for moving each of said conveyors continuously in one direction and means for throwing water from said tank upon the articles carried by said conveyor.

5. A washing machine comprising a tank, a plurality of conveyors extending longitudinally thereover in different horizontal planes for conducting articles to be washed over said tank, one of said conveyors being a reticulated rotary cylinder and means disposed laterally with reference to said conveyors for throwing water from said tank against the articles to be washed.

6. A washing machine comprising a tank, a plurality of conveyors disposed one above another and extending over said tank for conducting articles to be washed thereover, one of said conveyors being a reticulated rotary cylinder, and means for throwing water from said tank simultaneously upon the articles carried by said conveyors.

7. A washing machine comprising a tank, a conveyor extending thereover for conducting articles to be washed over the water therein, a paddle wheel at one side of said

conveyor and operating to throw water from said tank upon the articles carried thereby, a rotary member extending longitudinally over said conveyor in the path of and serving to deflect water thrown by said paddle wheel, a motor, and driving mechanism for rotating said paddle wheel and said rotary member in the same direction from said motor.

8. A washing machine comprising a tank, a conveyor extending thereover for conducting articles to be washed over the water therein, a paddle wheel at one side of said conveyor and operating to throw water from said tank upon the articles carried thereby, a rotary reticulated cylindrical member extending longitudinally over said conveyor in the path of the water thrown by said paddle wheel, a motor, and driving connections for rotating said paddle wheel and rotary member in the same direction from said motor.

9. A washing machine comprising a tank, a paddle wheel at one side thereof for throwing water from said tank upon the articles to be washed, a reticulated rotary cylindrical conveyor for the articles to be washed, arranged parallel with the axis of said paddle wheel, the lower portion of the conveyor being opposite the upper portion of the paddle wheel, and means for rotating said conveyor and paddle wheel in the same direction.

10. A washing machine comprising a tank, a conveyor extending over said tank, said conveyor comprising an endless chain and spaced transverse bars carried by said conveyor for supporting trays containing the articles to be washed, the outer end portions of said bars being unsupported, means for throwing water from said tank upon the articles carried by said trays, and means for driving said conveyor.

11. A washing machine comprising a tank, a conveyor extending over said tank, said conveyor comprising an endless chain and spaced transverse bars carried by said chain for supporting trays containing the articles to be washed, the outer end portions of said bars being unsupported, guard rails at the sides of said tank below the level of said transverse bars for preventing excessive tipping of said trays, means for throwing water from said tank upon the articles carried by said trays, and means for driving said conveyor.

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