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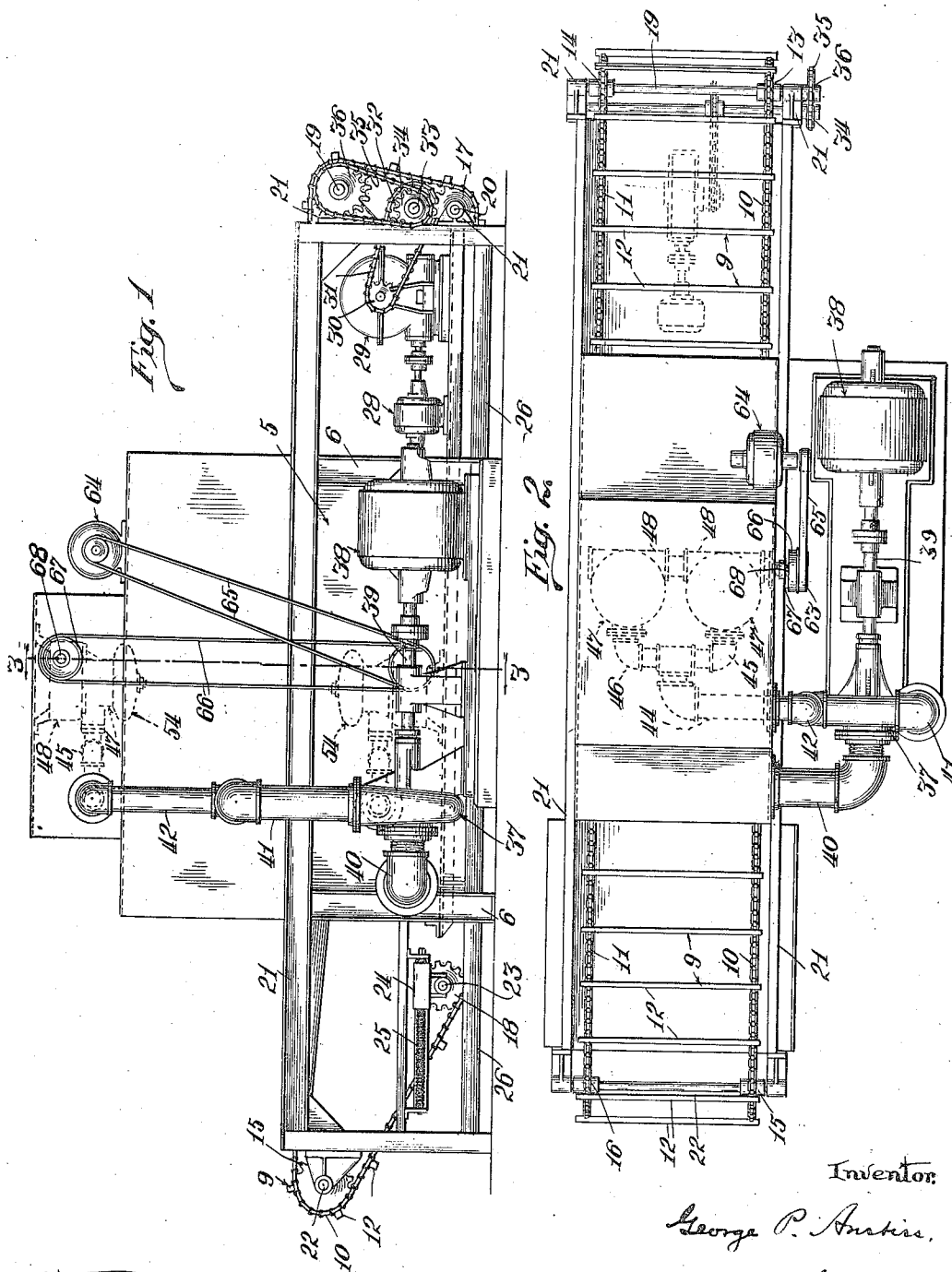
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G. P. ANSTISS

WASHING MACHINE

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Witness
Milton Lenoir

Inventor
George P. Anstiss.
Adams Jackson.
Attorneys

UNITED STATES PATENT OFFICE.

GEORGE P. ANSTISS, OF OAK PARK, ILLINOIS, ASSIGNOR TO G. S. BLAKESLEE & CO., OF
CICERO, ILLINOIS, A CORPORATION OF ILLINOIS.

WASHING MACHINE.

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My invention relates to washing machines of the type in which the articles to be washed, which may be castings or other metal parts, such as automobile fenders, running boards, &c., or dishes, are moved through the machine, and between the points of their admission and discharge are washed by throwing the water, usually containing a cleansing agent in solution, forcibly against them. In some machines of this type the articles to be washed are continuously in motion while the washing is being done, and in others they are stationary at that time, and my present invention contemplates washing articles handled in either way, although I have chosen to show it embodied in a machine in which the articles are moved continuously during the washing operation. The improvements which form the subject-matter of this application have to do principally with the means for throwing the wash water against the articles so that all parts thereof will be thoroughly cleansed during the transit of the articles from the inlet to the outlet end of the machine. The nature of my invention will appear from the following description of the embodiment thereof illustrated in the accompanying drawings in connection with the claims hereinafter made.

In the drawings,—

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

Fig. 2 is a plan view thereof;

Fig. 3 is a vertical cross-section, enlarged, on line 3—3 of Fig. 1; and

Fig. 4 is an enlarged central vertical section of one of the devices for throwing the water.

The machine illustrated comprises a box-like structure preferably of sheet metal, the lower portion of which is in the form of a tank 5 adapted to contain wash water, or where rinsing also is done rinsing water, in which case two tanks are provided suitably separated so that the wash water does not contaminate the rinsing water. An arrangement for this purpose is shown in the pending application of George S. Blakeslee Serial No. 243,673, filed July 6, 1918. The tank 5 is supported above the floor in any suitable way, as by legs 6, to provide space below it for the return flight of the endless conveyor hereinafter described. Above the tank portion of the machine and extending longitudinally at opposite sides thereof are

rails 7, 8, preferably in the form of angle iron, which are adapted to form tracks to support and guide the upper flight of an endless conveyor 9 on which the articles to be washed rest while they move through the machine. In the construction illustrated this conveyor comprises side chains 10, 11 connected by cross strips 12 set on edge and spaced a distance apart, as best shown in Fig. 2. The chains 10, 11 run over upper sprocket wheels 13, 14 at the outlet end of the machine and sprocket wheels 15, 16 at the inlet end thereof, and under sprocket wheels 17 at the outlet end of the machine and sprocket wheels 18 adjacent to the inlet end of the machine, as shown in Fig. 1. The sprocket wheels 13, 14 are carried by a shaft 19, and the sprocket wheels 17 by a shaft 20, both of which are suitably journaled in brackets secured to a frame-work 21 which projects at the opposite ends of the machine, as shown in Fig. 1. The sprocket wheels 15, 16 are in like manner carried by a shaft 22 secured at the opposite end of said frame-work, and the sprocket wheels 18 are carried by a shaft 23 which is mounted in adjustable brackets 24 movable longitudinally of said framework on adjusting screws 25, as shown in Fig. 1. By this arrangement the sprocket wheels 18 serve as belt tighteners and are used to regulate the tension of the conveyor. Below the tank 5 angle iron tracks 26, 27 are provided at opposite sides of the machine for supporting the lower flight of the conveyor during its return movement, as best shown in Fig. 3.

The conveyor is driven so that it travels over the tank 5 by any suitable means, such as a motor 28 and reduction gearing that is shown enclosed in a casing 29, a shaft of such gearing having thereon a sprocket wheel 30 connected by a chain 31 to a sprocket wheel 32 carried by a shaft 33, which also carries a sprocket wheel 34 connected by a chain 35 to a sprocket wheel 36 mounted on the shaft 19, as best shown in Figs. 1 and 2. By this construction the motor 28 operates to drive the shaft 19 and thereby operate the conveyor. While I prefer to employ the means described for this purpose it will be understood that any other suitable devices may be employed.

The means for throwing water upon the articles to be washed comprises a pump 37, preferably of the centrifugal type, and

driven by a motor 38 disposed at one side of the machine, as shown in Figs. 1 and 2, the armature shaft of the motor being directly connected to the pump by a shaft 39. The intake side of the pump is connected to the lower portion of the tank 5 by a pipe 40 while the discharge side thereof is connected by a pipe 41 with a vertical header 42, the ends of which are provided with horizontally-disposed pipes 43, 44 which extend transversely of the machine respectively under and over the path of the articles to be washed, as best shown in Fig. 3. The inner ends of these pipes are connected by pipes 45, 46 with castings 47, four of which are preferably provided, two below the conveyor 9 and two in an inverted position in the upper portion of the washing compartment, as best shown in Fig. 3. The number of these castings may be varied to suit different conditions, but ordinarily the arrangement shown will give very satisfactory results. The construction of these castings is best shown in Fig. 4, from which it will be seen that there is a hollow base portion 48 supported on legs 49, an intermediate portion 50 resting on and bolted to the base portion 48 and provided with a central bearing member 51, and an inlet passage 52 formed in a laterally-disposed arm 53 adapted to be connected with one of the branch pipes 45, 46. The passage 52 opens upwardly at the upper end of the intermediate member 50 into a hollow rotatable head 54 preferably somewhat of a mushroom shape. This head, which is provided with a number of perforations in its outer and lateral surfaces is provided with a circular opening at its under side adapted to receive the upper end of the intermediate member 50 and fit fairly closely thereon but not closely enough to interfere with the free rotation of said head. The head is provided at its center with a vertically-disposed hub 55 by means of which it is fitted upon and keyed to the upper end of a shaft or spindle 56 journaled in the bearing member 51 and having its lower end fitted in a bearing 57 in the bottom of the base member 48, as best shown in Fig. 4. Mounted upon the lower portion of the spindle 56 and non-rotatably connected therewith, preferably by a pin 58, is a worm wheel 59, and preferably ball bearings 60 are provided between the under side of said worm wheel and the base member 48 to take the downward thrust. The worm wheel 59 meshes with a worm 61 carried by a shaft 62 which projects into the base member 48, and at its outer end carries a double pulley 63, as best shown in Fig. 2. The pulley 63 is driven from a motor 64 by a belt 65, and it is also connected by a belt 66 with a pulley 67 mounted on a shaft 68 similar to the shaft 62 disposed at the upper side of the machine in connection with the overhead

water throwing means. The motor 64 is preferably mounted on top of the machine, as best shown in Fig. 1.

From the foregoing description it will be understood that when the pump 37 is in operation water will be drawn from the tank 5 and be supplied under considerable pressure to the water throwing devices above and below the path of the articles to be washed. The water will enter each of said water throwing devices through the passage 52 thereof and be delivered to its head 54 in a direction parallel with the axis of the head, so that the water will impinge directly against the head, and will be discharged through the perforations 69 therein. Meanwhile, the heads 54 will be rotated by the operation of the motor 64, which operates to rotate the spindles 56 through the worm 61 and worm gear 59. Consequently, the water discharged through the perforations 69 will be discharged forcibly in a multiplicity of directions, and, therefore, will be directed against all parts of the articles being washed. This feature of positively rotating the head or heads 54 while the water is being discharged through them is a very important part of my invention, since it insures the violent application of the water to all parts of the articles without the loss of force which is experienced in machines which make use of the reactionary force of the discharged water to effect rotation of a spraying device, as in such machines a considerable part of the force of the water is absorbed in effecting the rotation of the head, and in machines of the type under consideration the force with which the water is applied to the articles vitally affects the success of the washing operation. By rotating the head or heads while washing is being done the water is properly distributed so that the articles are thoroughly washed all over instead of along certain lines only as would be the case if the heads did not rotate. The improvements described, therefore, make practicable the use of pressure heads of the spray or jet type for washing articles which heretofore could be successfully washed only by machines of the paddle wheel type. The construction by which the revolving heads are rotated comparatively slowly provides for directing relatively solid streams of water against the articles for securing maximum impacting energy of the wash water against them, since the velocity of the water and its impacting energy are not impaired as would be the case if the revolving heads were rotated at fairly high speed, which would tend to nebulize the water and destroy the directional characteristic of the nozzle openings in said heads. It will be understood, of course, that the wash water falls back into the tank and may be used over and over again, and that it is

heated in any suitable way, as by steam pipes such as are commonly used in washing machines.

While my invention may best be embodied in a washing machine in which the articles to be washed are moved through a washing compartment, I wish it to be understood that it may also be applied to machines in which the articles to be washed are not carried through the machine, but remain in a stationary position while being washed. So far as I am aware, I am the first in the art to devise a washing machine in which the water used for washing purposes is forcibly projected against the articles to be washed by means of a rotating distributing head through which the water is forced, and which is caused to rotate by power driven means apart from or independent of the pressure of the water supplied to and distributed by such head. The claims hereinafter made are therefore to be construed accordingly.

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

1. In a washing machine, the combination with a washing compartment having means therein for supporting the articles to be washed, of water distributing members arranged oppositely to each other, respectively above and below said supporting means,

each of said distributing members comprising a stationary base having a water passage therein, a rotating head revolubly supported by said base and communicating with said water passage, said head having perforations for the discharge of water therefrom, and means mounted on the base operable to rotate said head, and means for supplying water to the water passages of said distributing members.

2. A water distributing device comprising a hollow base, an intermediate member mounted on and secured to said base, said intermediate member having a water passage therein, a shaft journaled in said intermediate member, a perforated head mounted on and rotating with said shaft, said head communicating with said water passage, and means in the base for rotating said shaft.

3. A water distributing device comprising a hollow base, an intermediate member mounted on and secured to said base, said intermediate member having a water passage therein, a shaft journaled in said intermediate member and in said base, a perforated head mounted on and rotating with said shaft, said head communicating with said water passage, and a worm and worm wheel in said base for rotating said shaft.

GEORGE P. ANSTISS.