

Nov. 10, 1931.

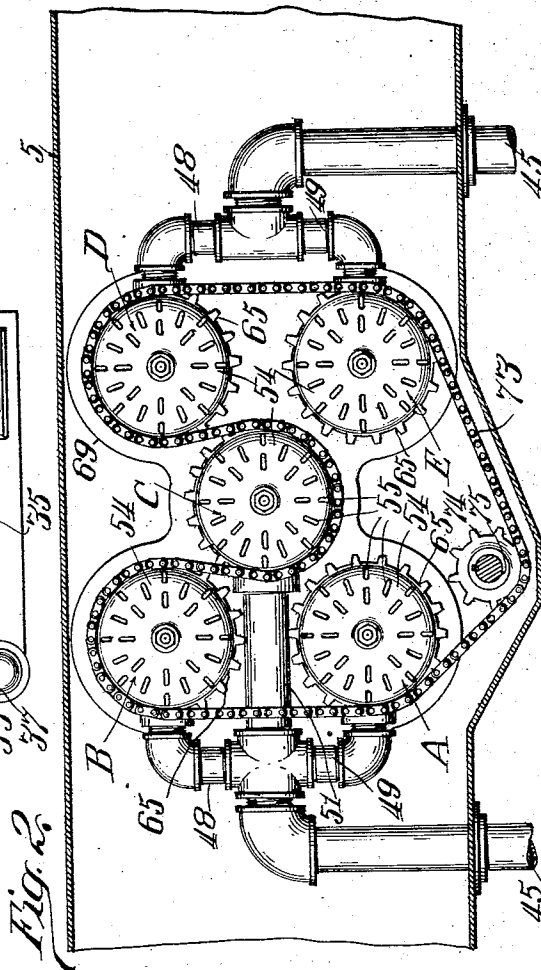
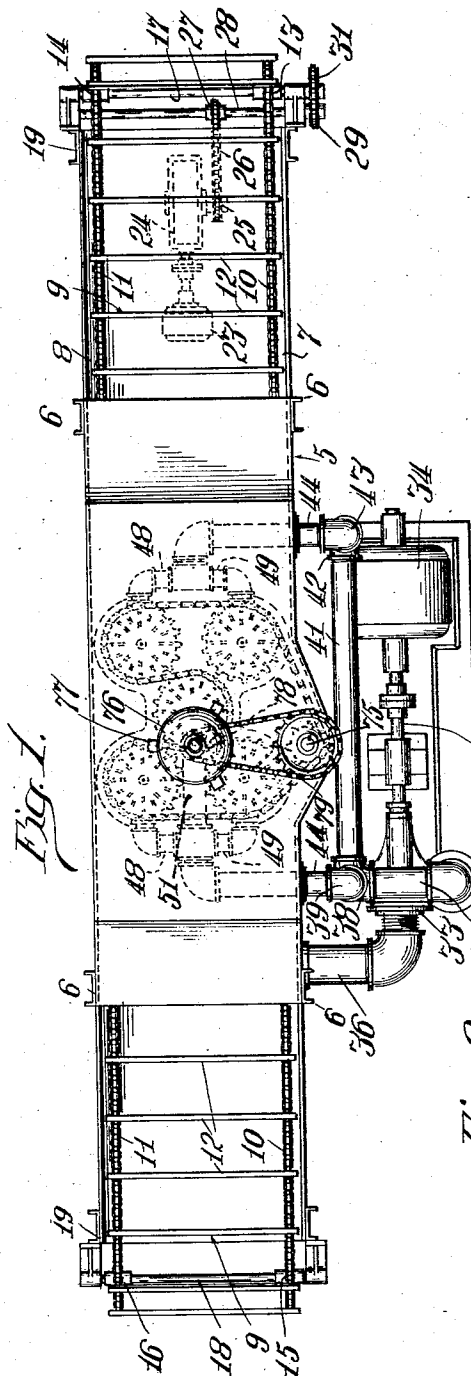
G. P. ANSTISS

1,831,223

WASHING MACHINE

Filed March 19, 1928

2 Sheets-Sheet 1



Witness
Milton Lenoir

Inventor.
George P. Anstiss,
By Brown, Jackson, Rostoker & Simmons.
Attorneys

Nov. 10, 1931.

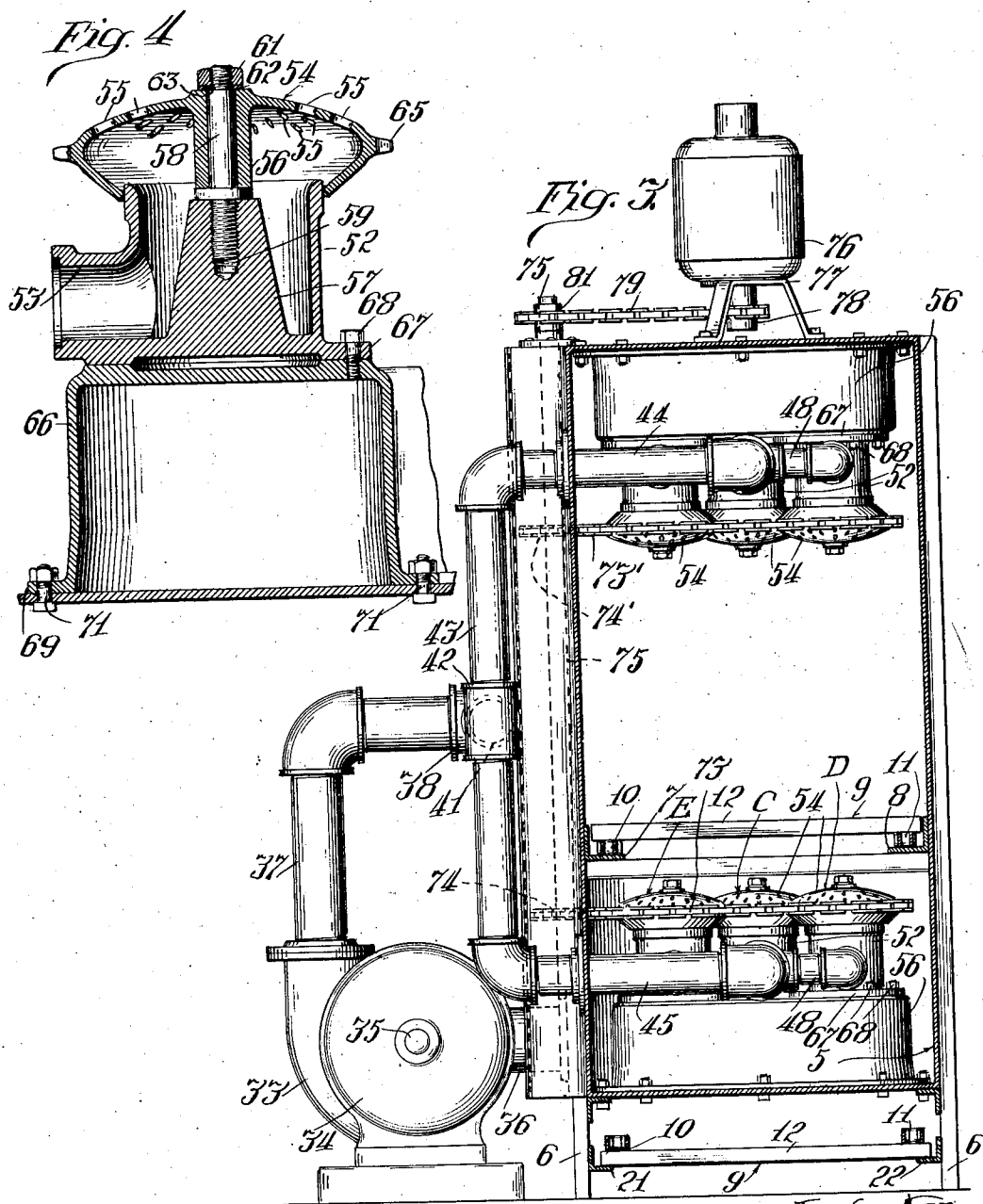
G. P. ANSTISS

1,831,223

WASHING MACHINE

Filed March 19, 1928

2 Sheets-Sheet 2



Inventor

George P. Anstiss.

By Brown, Jackson, Boettcher & Drimmer.

Attorneys.

Witness
Hilton Lenoir

UNITED STATES PATENT OFFICE

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

WASHING MACHINE

Application filed March 19, 1928. Serial No. 282,790.

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, etc., or which may be dishes or other like articles, 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.

In my prior application Serial No. 671,738, filed October 30, 1923, now Patent No. 1,677,320, granted July 17, 1928, I have disclosed a washing machine of the above general description wherein the wash water is thrown against the articles from rotating heads having spray apertures therein through which the water issues in high velocity streams. The rotation of the heads causes the streams of water to be moved to all different points of the articles, whereby the water is projected against the entire outer surfaces and into the curves, angles and crevices of the articles, for the more efficient washing thereof. In this prior application, the several heads are each rotated through a worm gear unit which is housed in the base portion of the head and which transmits positive rotation to the head at a definite speed. I have found that this practice of transmitting a power drive to the head is by far more efficient than utilizing the reactive forces of the streams of water to rotate the head, since the latter practice tends to diminish the impinging velocity of the streams against the articles to be washed. The present invention improves upon my prior construction by providing improved means for driving the rotating heads, such driving means being in the nature of a sprocket chain or endless band which passes from one to the other of the heads of the series and has driving engagement therewith. Such manner of driving the heads is simpler and much less expensive than the construction shown in my prior application. Moreover, it permits of the use of a considerable number of heads grouped together in a cluster for projecting a greater volume of water over a larger area, the driving chain being passed in series from one head to the other in the cluster and avoiding the objectionable interference between driving shafts and the expense of the driving connections between said shafts and the source of power. The nature of my invention, and other objects and advantages thereof, will appear from the following description of a preferred embodiment.

In the accompanying drawings illustrating such embodiment:

Fig. 1 is a plan view of the improved washing machine.

Fig. 2 is a horizontal sectional view through the machine, illustrating the lower cluster of heads in plan.

Fig. 3 is a vertical sectional view taken transversely through the machine, and

Fig. 4 is an enlarged axial sectional view of one of the rotating heads.

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 is also 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 prior patent of George S. Blakeslee No. 1,520,111, granted December 23rd, 1924. 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 por-

tion of the machine and extending longitudinally at opposite sides thereof are rails 7, 8 (Fig. 3) 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. 1. The chains 10, 11 run over upper sprocket wheels 13, 14 at the outlet end of the machine and over sprocket wheels 15, 16 at the inlet end thereof. The sprocket wheels 13, 14 are carried by a shaft 17, and the sprocket wheels 15, 16 by a shaft 18, both of which are suitably journaled in brackets secured to the framework 19 which projects at the opposite ends of the machine, as shown in Fig. 1. It will be understood that the conveyor chains after passing over the sprocket wheels 13, 14 extend downwardly to a lower pair of sprocket wheels (not shown) which are disposed below the upper sprocket wheels 13, 14, so that the return flight of the conveyor is in proximity to the base of the machine. This return flight is thence guided upwardly to the sprocket wheels 15, 16 at the other end of the machine by passing under another pair of sprocket wheels (not shown) adjacent to the latter end of the machine, this latter pair of sprocket wheels being adjustable so that they may serve to tighten or loosen the chains. As shown in Fig. 3, angle iron tracks 21, 22 are provided at opposite sides of the machine, below the tank 5, for supporting the return flight of the conveyor. The latter is driven so that it travels over the tank 5 by any suitable means, such as a motor 23 and reduction gearing that is shown enclosed in a casing 24, a shaft of such gearing having mounted thereon a sprocket wheel 25 connected by a chain 26 to a sprocket wheel 27 mounted on a transversely extending shaft 28 at the outlet end of the machine. A sprocket wheel on the shaft 28 drives the chain 29 which passes over a sprocket wheel 31 which is mounted on the outer end of the shaft 17. By this construction the motor 23 operates to drive the shaft 17 and thereby to operate the conveyor. The specific details of the sprocket wheels over which the conveyor chains pass, and of the mechanism for driving the conveyor, are fully illustrated in my copending application, Serial No. 671,738.

The means for throwing water upon the articles to be washed comprises a pump 33, preferably of the centrifugal type, disposed at one side of the machine and driven by a motor 34, as shown in Fig. 1, the armature shaft of the motor being directly connected to the pump by a shaft 35. The intake side of the pump is connected to the lower por-

tion of the tank 5 by a pipe 36, while the discharge side thereof is connected by a pipe 37 with one port of a four-way coupling 38. The upper and lower ports of the coupling 38 are connected with the upper and lower sections of a vertical header 39. The lateral port of the coupling 38 is connected through a horizontal pipe 41 with a T-coupling 42 which connects with the upper and lower sections of another vertical header 43. Fig. 3 illustrates the vertical header 43, and it will be seen that the upper and lower ends thereof connect with horizontally disposed pipes 44, 45 which extend transversely of the machine under and over the path of the articles to be washed. The upper and lower ends of the other header 39 connect with a similar pair of pipes which are also disposed above and below the upper flight of the conveyor. The inner ends of the pipes 44, 45 which communicate with the header 43 are connected through branch pipes 48, 49 (Fig. 1) with suitable castings on which the rotating heads are mounted. It will be understood that the lower pipe 45 is connected through a duplicate pair of branch pipes 48, 49 with castings disposed below the carrying flight of the conveyor. The pipes extending inwardly from the upper ends of the other header 39, corresponding to the pipes 44, 45 of the header 43, also connect through branch pipes 48, 49 with similar castings on which rotating heads are mounted. A third branch pipe 51 also extends inwardly from each of the latter pipes for establishing connection with a centrally disposed casting in each cluster. The above described arrangement of branch pipes 48, 48-49, 49 and 51 is employed when each cluster consists of five rotating heads, but it will be understood that such arrangement of branch pipes may be suitably modified when a greater or lesser number of heads is employed.

Referring to Fig. 4, each rotatable head unit comprises a base casting 52, the hollow interior of which communicates with a laterally disposed inlet passage 53 adapted to be connected to one of the aforesaid branch pipes. The passage 53 communicates upwardly through the open upper end of the base casting 52 with the interior of a hollow rotatable head 54, preferably somewhat of a mushroom shape. This head, which is provided with a number of perforations 55 in its upper surface, is provided with a circular opening at its under side adapted to receive the upper end of the base casting 52 and to 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 downwardly extending hub 56 which rests upon the upper end of a conical support or bearing standard 57 rising within the casting 52. A pivot stud 58 passes down-

wardly through an axial opening in the hub 56 and screws into a tapped opening 59 in the upper end of the supporting member 57. The upper end of the screw stud 58 is reduced and threaded for receiving a nut 61 for preventing upward displacement of the rotatable head 54, a washer 62 being preferably interposed between the nut and the top of the rotatable head. The shoulder 63 formed by reducing and threading the upper end of the stud 58 serves as a stop for limiting the extent to which the nut 61 and washer 62 can be screwed downwardly, whereby the nut will not bind the rotatable head 54 and restrict its rotation. The rotatable head is formed or provided with a suitable annular driving surface with which the endless driving member is adapted to engage in passing from one rotatable head to another. This annular driving surface is illustrated as being in the form of a series of sprocket teeth 65 for receiving the links of a sprocket chain. Preferably such driving surface or sprocket teeth project outwardly from that portion of the rotating head which is of largest diameter, although it will be apparent that the driving surface might be formed on an annular skirt depending from the head and encircling the upper portion of the base casting 52. The base castings 52 of each of the rotating heads in the group are mounted on any suitable supporting frame, preferably in the form of a hollow casting 66 as shown in Fig. 4. Each base casting 52 is provided with an attaching flange 67 which is secured by screws 68 to the hollow base 66. The latter also has attaching flanges 69 which are secured by bolts 71 to one of the walls of the tank 5.

Fig. 2 illustrates the heads which are disposed below the upper plate of the conveyor, and it will be noted from this figure that a plurality of these heads are closely grouped in a cluster for obtaining a concentrated discharge of water against the articles to be washed. In the construction shown, five of such heads are employed, designated A, B, C, D and E, with the head C disposed centrally with respect to the other heads, although it will be obvious that a greater or lesser number of heads may be employed, and that these heads may be grouped in other arrangements. A driving chain 73 is trained around the toothed driving surfaces of the several heads, being looped inwardly around the central head C in passing from the head B to the head D. Such chain is driven from a sprocket pinion 74 which is mounted on a vertically extending shaft 75 disposed at the front or side of the machine. It will be noted from Fig. 2 that the adjacent wall of the tank 5 is bulged outwardly so as to accommodate the shaft 75 and sprocket pinion 74.

The rotating heads which are disposed above the upper flight of the conveyor are

preferably grouped in the same relation as is illustrated in Fig. 2. Referring to Fig. 3, these upper heads are also driven by a sprocket chain 73' which passes around a sprocket pinion 74' also mounted on the vertical shaft 75. This shaft has any suitable bearing support in the tank 5, and has its upper end projecting from the top wall of the tank for establishing connection with the source of power. Preferably this source of power consists of a small electric motor 76 supported in vertical relation on a tripod base 77 carried by the top wall of the tank. A sprocket pinion 78 on the armature shaft of the motor drives a chain 79 which passes over a sprocket wheel 81 on the upper end of the shaft 75.

From the foregoing description it will be understood that when the pump 33 is in operation water will be drawn from the tank 5 and be supplied under considerable pressure to the water-throwing heads above and below the path of the articles to be washed. The water will enter each of said water throwing heads through the passage 53 thereof and be delivered to the 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 apertures 55 therein. Meanwhile, the heads 54 will be rotated by the operation of the motor 76, which operates to drive the chains 73, 73' through the vertical shaft 75. Consequently, the water discharged through the apertures 55 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 heads 54 while the water is being discharged through them is an 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 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.

It will be seen that by employing the chains 73, 73' to drive the rotating heads a very simple and inexpensive driving arrangement is obtained. As previously remarked, such form of drive also permits the several heads to be grouped closely together in any desired arrangement without complicating the establishment of a drive to each of the heads. Moreover, if it is desirable to

reverse the direction of rotation of some of the heads or to leave one of the heads standing inert, such can be readily accomplished by merely changing the path of the drive chain. For example, by extending the chain around the inner sides of the two heads A and E the rotation of these heads can be reversed, and by shortening the chain and having it pass directly from the head B to the head D the central head C will stand idle. The wash water sprayed against the chain from the oppositely disposed heads serves as a lubricating medium for the chains. It will be understood 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.

I claim:

1. A water distributing device comprising a stationary base having a water passage therein, a rotating head supported by said base and communicating with said water passage, said head having a spraying element containing perforations for the discharge of water therefrom, and an annular driving surface on said element formed integral therewith and as a part thereof and around which a flexible driving member is adapted to be passed for rotating said head.

2. A water distributing device comprising a stationary base having a water passage therein, a rotating head supported by said base and communicating with said water passage, said head having perforations for the discharge of water therefrom, a stationary supporting member within said base, a bearing stud screwed into said supporting member and extending axially of said head, a bearing hub formed internally in said head and rotatably mounted on said stud, the end of said hub bearing against said stationary supporting member, said stud extending outwardly beyond said hub and having a reduced threaded end forming an annular shoulder, a nut screwing over said threaded end and preventing displacement of said head from said bearing stud, and sprocket teeth projecting radially from the peripheral portion of said head for receiving a driving chain.

3. The combination of a plurality of water spraying units each comprising a stationary base having a water passage therein, and a rotary head supported by said base and communicating with said water passage, said heads having perforations for discharge of water therefrom, an annular driving surface integral with each head, a single driving means directly engaging each of said driving surfaces, and means for moving said driving means to rotate said heads in different directions at the same speed.

4. The combination of a plurality of water spraying units each comprising a stationary base having a water passage therein, and a

rotary head supported by said base and communicating with said water passage, said heads having perforations for discharge of water therefrom, sprocket teeth projecting radially from the peripheries of said heads, and an endless sprocket chain engaging the teeth of each of said heads to rotate the heads.

5. A water distributing device comprising a hollow cylindrical base, a conical member projecting concentrically inside of said base, a cast spraying head comprising a hub, a sprocket wheel having a web sloping to said hub, and a flange extending to the edge of said cylindrical base, water ejecting orifices in said web, and means for mounting said hub rotatably upon said conical member.

6. A water spraying unit comprising five spraying heads disposed in a plane with one of the heads spaced equidistant from each of the other four, an annular set of sprocket teeth on each head, a shaft intersecting the plane of said heads, a sprocket wheel on said shaft, and a chain disposed in said plane and encircling said sprocket wheel and engaging the teeth of each of said heads, said chain when moved by said wheel revolving said four heads in one direction and said one head in the opposite direction.

7. A water distributing device comprising a stationary base having a water passage therein, a rotary head supported by said base and communicating with said water passage, said head being an ellipsoid and containing perforations for the discharge of water therefrom, and sprocket teeth projecting from the periphery of said head substantially in the plane of its major axis for receiving a driving chain to rotate the head.

8. The combination of a plurality of water spraying units each comprising a stationary base having a water passage therein, and an ellipsoidal head pivotally supported by said base for rotation about its minor axis and communicating with said water passage, said head having perforations for discharge of water therefrom, sprocket teeth projecting radially from said head in the plane of its major axis, and a single driving means engaging the sprocket teeth of each head for rotating the heads at the same speed.

In witness whereof, I hereunto subscribe my name this 15th day of March, 1928.

GEORGE P. ANSTISS.