

UNITED STATES PATENT OFFICE.

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WASHING-MACHINE.

SPECIFICATION forming part of Letters Patent No. 721,929, dated March 3, 1903.

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To all whom it may concern:

Be it known that I, FREDERICK H. WIARD, a citizen of the United States, residing at East Avon, in the county of Livingston and State of New York, have invented new and useful Improvements in Washing-Machines, of which the following is a specification.

This invention relates to that class of washing-machines which comprise an oscillating tub provided in its bottom with ribs or corrugations forming a lower rubber and an upper oscillating rubber arranged above the lower rubber and carried by a support which extends upwardly through the bottom of the tub as distinguished from machines in which the upper rubber is suspended from a cross-bar extending across the top of the tub.

The object of my invention is to produce a machine of this type in which the two rubbers are simultaneously oscillated in opposite directions and which shall at the same time be strong, compact, and inexpensive in construction.

In the accompanying drawings, consisting of two sheets, Figure 1 is a sectional side elevation of my improved washing-machine. Fig. 2 is a horizontal section thereof in line 2 2, Fig. 1, looking upward. Fig. 3 is a fragmentary vertical section of the machine on an enlarged scale. Figs. 4, 5, and 6 are transverse sections in lines 4 4, 5 5, and 6 6, Fig. 3, respectively.

Like letters of reference refer to like parts in the several figures.

The stationary base or supporting frame of the machine preferably consists of a metallic head or crown plate A, provided on its under side with a number of sockets *a*, preferably four, and a corresponding number of legs A', having their upper ends secured in said sockets. These legs are tied together below the plate A by a brace or bridgetree A².

B is the oscillating tub, which is provided in its bottom with ribs *b*, forming the lower rubber.

C is an upright cylindrical rock-shaft which turns in bearings *c c'*, formed centrally in the plate A and the bridgetree A² and which passes loosely through an opening in the bottom of the tub. The latter is preferably supported on ball-bearings, which comprise an

inverted annular cup *d*, arranged on the under side of the tub, a collar *d'*, arranged below said cup, and a row of balls *d*², interposed between said cup and the upper side of said collar, as shown in Fig. 3. The collar *d'* rests upon the hub of a horizontal gear-segment E, which is secured to the rock-shaft C, and this segment is in turn supported by a ball-bearing, which consists, preferably, of an inverted cup *e*, arranged on the under side of said gear-segment, a collar *e'*, resting upon the bearing *c*, and a row of balls *e*², interposed between said cup and the upper side of said collar. The bearing-cups *d e* and the collars *d' e'* are arranged loosely on the rock-shaft C, and the upper cup *d* is caused to turn with the tub by a stud *d*³, arranged on the under side of the tub and entering a recess in said cup, or by other suitable means. The lower cup *e* and the upper collar *d'* are caused to turn with the gear-segment E by similar studs *e*³, while the lower bearing-collar *e'* is held against turning by a stud *e*⁴, which enters a recess in the bearing *c*. The tub is provided at its upper edge with a handle *f* for oscillating it.

G is a horizontal rock-lever arranged below the tub and mounted upon a vertical pivot *g*, which projects from the upper side of the plate A. This lever is provided at its inner end with a gear-segment *g'*, which meshes with the gear-segment E of the shaft C, and the outer arm of the lever passes loosely through an opening *h*, formed in a depending bracket H, which is secured to the lower edge of the tub, so that upon oscillating the tub the shaft C is rocked or oscillated in the opposite direction from the tub through the medium of the rock-lever G and the gear-segments E and *g'*.

I is the upper rubber, which coöperates with the lower rubber *b*, carried by the tub. This rubber consists of a disk which is provided on its under side with rubber ribs *i* and which is adapted to turn with the rock-shaft C, so that the upper and lower rubbers are oscillated in opposite directions.

J is a cross-head arranged above the upper rubber and provided with a central opening, through which the rock-shaft C passes loosely, and K represents vertical tie rods or bolts

which connect the upper rubber with said cross-head. The upper ends of these rods pass through the ends of the cross-head J, and their lower ends are secured in perforated horizontal lugs *l*, secured to the upper side of the upper rubber and overhanging the edge of an opening *l'*, which is formed centrally in the rubber.

m represents spacing tubes or sleeves which surround the tie-rods K between the lugs *l* and the under side of the cross-head J.

N is a second cross-head, arranged below the cross-head J and secured to the rock-shaft C, so as to oscillate therewith. This oscillating cross-head is provided in its ends with notches or recesses *n*, in which the spacing-tubes *m* of the upper rubber engage, as shown in Figs. 3 and 5. By this construction said tubes are interlocked with the cross-head N, compelling the same and the upper rubber I to oscillate therewith, while at the same time allowing said tubes to slide vertically in the recesses of said cross-head to permit the upper rubber to be raised for placing the clothes in the tub. The upper cross-head J, the tie-rods K, and the spacing-tubes *m* together form a rigid and inexpensive supporting-frame for the upper rubber I.

o is an upright tube or sleeve extending upwardly from the bottom of the tub B and surrounding the rock-shaft C, forming a housing therefor. This tube is secured at its lower end to the tub-bottom in any suitable manner to form a water-tight joint, and its upper end is seated loosely in a socket *o'*, formed in the under side of the said cross-head N, so that the tube is free to oscillate with the tub independently of said cross-head.

p is a cover for the tub, which rests upon suitable ledges *p'* and which is provided with a central opening for the passage of the rock-shaft C and the upright supporting-frame of the upper rubber I.

The central opening *l'* of the upper rubber is of sufficient size to admit the oscillating cross-head N, and the recesses *n* of this cross-head are of the proper size to permit the passage of the lugs *l* through the same, so that the upper rubber can be passed over the central shaft C and the tube *o* or removed therefrom.

In using the machine the cover *p* and the upper rubber I are removed from the tub, and after placing the clothes in the same said rubber and the cover are replaced. The tub is then oscillated by grasping its handle *f*, the movement of the tub being transmitted to the upper rubber I by the rock-lever G, the gear-segments E and *g'*, and the rock-shaft C in such manner as to oscillate the two rubbers in opposite directions, as hereinbefore described. This action of the rubbers is produced by simple means and without the necessity of extending a cross bar or yoke across the top of the tub.

I claim as my invention—

1. The combination with a stationary frame, and an oscillating tub supported thereon and provided in its bottom with a rubber, of an upright rock-shaft journaled in the stationary frame and extending upwardly through the bottom of the tub, an upper rubber connected with said rock-shaft to turn therewith, a horizontal rock-lever arranged below said tub and connected with the tub to oscillate therewith, and means connecting said rock-lever and rock-shaft whereby the shaft is rocked in an opposite direction to that of the tub, substantially as set forth.

2. The combination with a stationary frame, and an oscillating tub supported thereon and provided in its bottom with a rubber and at its upper portion with an operating-handle, of an upright rock-shaft journaled in the stationary frame and extending upwardly through the bottom of the tub and provided below the tub with a gear-segment, an upper rubber connected with said rock-shaft to turn therewith, a horizontal rock-lever pivoted upon said stationary frame and provided at its inner end with a gear-segment which meshes with the gear-segment of said rock-shaft, and a connection between the outer portion of said lever and said tub whereby the lever is rocked, substantially as set forth.

3. The combination with a stationary frame, and an oscillating tub provided in its bottom with a rubber, of an upright rock-shaft journaled in said frame and extending upwardly through the bottom of the tub, a gear-segment secured to said shaft between the tub and said stationary frame, a ball-bearing between said segment and said stationary frame, and a ball-bearing between said gear-segment and said tub, whereby said segment constitutes a part of the supporting-bearing for said tub and shaft, and a horizontal rock-lever provided with a gear-segment which meshes with the gear-segment on said rock-shaft, substantially as set forth.

4. The combination with a stationary frame, and an oscillating tub having a rubber in its bottom, of an upright rock-shaft journaled in said frame and extending upwardly through the bottom of the tub, means for oscillating said tub and rock-shaft in opposite directions, a cross-head fixed to said rock-shaft above the tub-bottom, an upper rubber provided on opposite sides of said shaft with vertical rods or members which interlock with said cross-head, and an upper cross-head which connects said rods above the first-named cross-head and which is guided on said shaft, substantially as set forth.

5. The combination with the stationary frame and an oscillating tub having a rubber in its bottom, of an upright rock-shaft supported in said frame and extending upwardly through the bottom of the tub and provided above the tub-bottom with a cross-head having notches or recesses, an upper

rubber provided with a central opening for the passage of said shaft and at opposite sides of said opening with horizontal lugs which extend inwardly beyond the edge of the opening, upright rods arranged on opposite sides of said shaft and secured at their lower ends to said lugs and engaging in the recesses of said cross-head, a second cross-head connecting said rods above the first-named cross-head, the opening of said upper rubber being of sufficient size to admit the cross-head of said shaft, and actuating-gearing which connects said shaft with said tub, substantially as set forth.

15 6. The combination with the stationary frame and an oscillating tub having a rubber in its bottom, of an upright rock-shaft journaled in said frame and extending upwardly through the bottom of the tub, a cross-

head secured to the upper portion of said shaft and provided with notches or recesses, actuating-gearing connecting said shaft with the tub, an upper rubber provided on opposite sides of said shaft with upwardly-extending rods which engage in the recesses of said cross-head, an upper cross-head connecting said rods above said recessed cross-head and guided on said shaft, and a tube or sleeve surrounding said shaft between the bottom of the tub and said recessed cross-head and secured at its lower end to the tub-bottom, substantially as set forth.

Witness my hand this 24th day of May, 1902.

FREDERICK H. WIARD.

Witnesses:

ROBT. H. WIARD,
LORENZO WILBUR.