July 18, 1933. C. R. WENGER 1,918,945

AGITATOR FOR WASHING MACHINES

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Fig. 1.

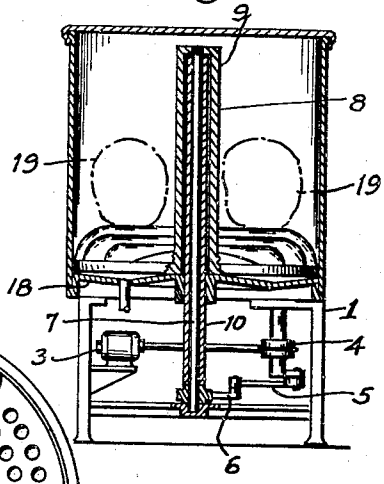


Fig. 6.

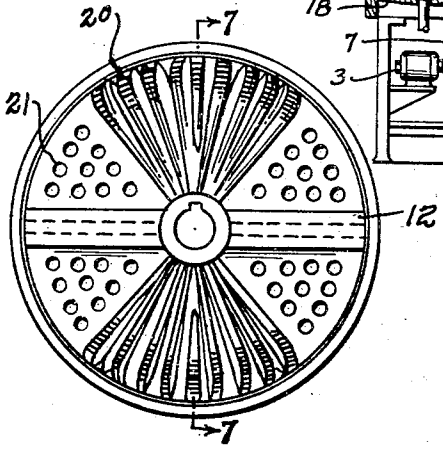
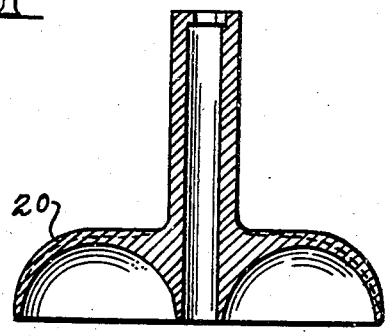


Fig. 7.



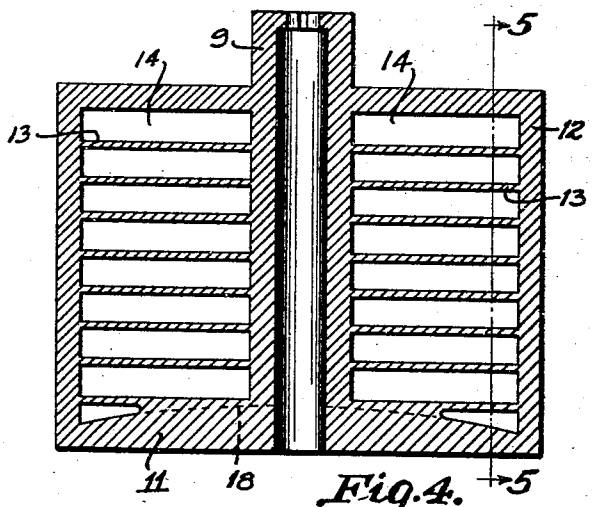


Fig. 4.

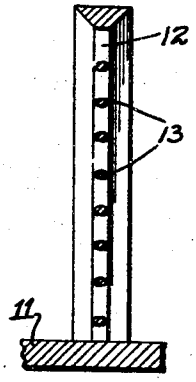


Fig. 5.

Fig. 8.



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Fig. 3.

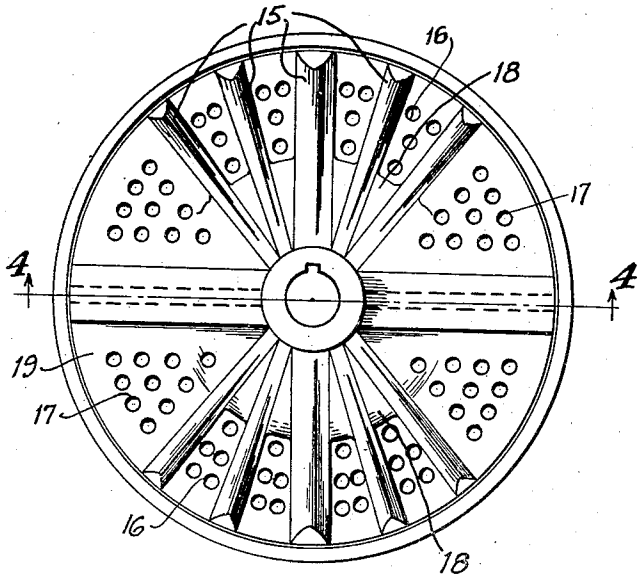
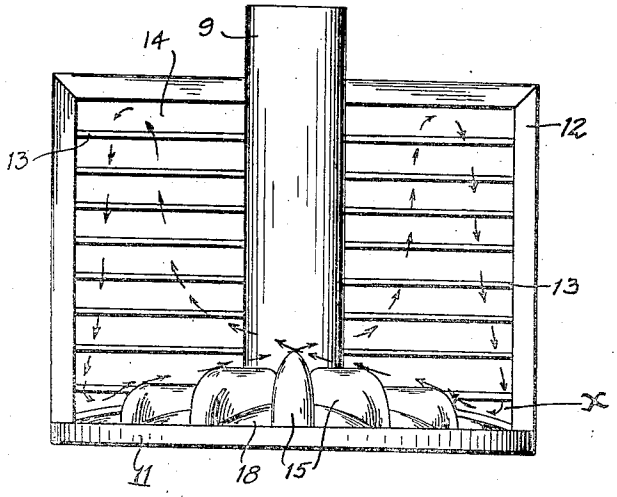


Fig. 2.



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UNITED STATES PATENT OFFICE

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AGITATOR FOR WASHING MACHINES

Application filed December 8, 1931. Serial No. 579,766.

This invention relates to washing machines of the oscillating agitator type.

It has for one of its objects the provision of an agitator having a vertical diametrical partition so constructed as to oppose but little resistance to the inertia of the water in the tub, whereby the body of water, in the main, remains stationary, the clothes being propelled through the water in reversing directions by the vertical partition.

Another object of the invention is to provide an agitator describing a path in its oscillation, substantially the full width of the interior of the tub so that no part of the clothes can escape the oscillatory effect of the agitator.

Still another object of the invention is the provision of an agitator which conducts the clothes through a new and peculiar movement in which the contents is subjected to wash board action both in a substantially horizontally and vertical plane, the clothes being turned meanwhile through its frictional contact with the surfaces of the agitator so that all parts thereof are subjected to the wash board action, the path of movement of the clothes including a region in which they are subjected to suction through the recession of some of the supporting water due to change in the direction of movement of the vertical partition, the suction producing a partial interchange of the water throughout the mass of the clothes.

A further object of the invention is the provision of an agitator, the structure of which reduces to a minimum the entangling of the contents of the tub, protecting the fabrics from being torn and making it easier to remove the contents from the tub at the conclusion of the washing period.

Other objects of the invention will appear as the following description of a preferred and practical embodiment thereof proceeds.

In the drawings which accompany and form a part of the following specification and in which the same characters of reference have been employed throughout the several views to designate identical parts:

Figure 1 is a vertical section through a washing machine embodying the principles of the present invention;

Figure 2 is a side elevation of the agitator;

Figure 3 is a plan view of the agitator;

Figure 4 is a diametrical vertical section through the agitator;

Figure 5 is a vertical section taken along the line 5—5 of Figure 4;

Figure 6 is a plan view of a modified form of agitator;

Figure 7 is a vertical section taken along the line 7—7 of Figure 6; and

Figure 8 is a cross section taken through one of the slats or bars 13 shown in Figures 4 and 5.

Referring now in detail to the several figures, and first adverting to the general assemblage shown in Fig. 1, the standard 1 and tub 2 may be of conventional type, a motor 3 being supported beneath the tub and driving through suitable gearing 4, a pitman 5 which coacts with a crank 6 on a shaft 7, to impart oscillatory movement to a dolly or agitator which in general is designated by the reference character 8. The agitator follows the customary construction insofar as it is provided with an upstanding sleeve 9 rising to a height above the level of water in the tub and being carried or otherwise suitably connected to the shaft 7, by which connection the oscillatory movement of the shaft is imparted to the dolly. The shaft 7 as is customary, is housed within a tube 10 which extends within the sleeve 9 to a height above the said water level.

So much of the structure as has been described up to this point is conventional. The present invention concerns itself with the dolly which as shown in Figures 1, 2 and 3, comprises a circular base or disk 11 of such diameter as to occupy the full cross section of the tub. A vertical diametrical partition 12 rises from the base 11 being integral with or secured to the sleeve 9. Said partition is preferably the same width as the diameter of the base 11, that is to say, in its motion it sweeps the full width of the tub leaving no room by which articles of clothing can escape from one side of the

partition to the other, or become entangled on the ends of the partition.

The partition is preferably formed of lattice construction as shown, that is, it is provided with a plurality of horizontally arranged slats 13 leaving openings 14 therebetween. The slats are merely illustrative of any suitable form of grid which may be provided for permitting the oscillation of the partition 12 with minimum disturbance to the body of water and at the same time preventing articles from the bundles of clothes on opposite sides of the partition from escaping through to the other side, and are preferably of stream line cross section so as to cut the water with minimum disturbance of the water.

The base or disk 11 is provided on both sides of the partition 12 with riffles 15 progressively increasing in height, those of least height being adjacent the partition 12 and those of greatest height being perpendicular to said partition.

The base or disk 11 between said riffles is convex or dome-shaped, sloping slightly downward toward drainage openings 16 and 17 clearly shown in Figure 3. These openings communicate with the annular trough-shaped bottom 18 of the tub.

In operation, a suitably sized bundle of clothes which may be represented by the broken lines indicated at 19 in Figure 1, is inserted on each side of the partition 12, the tub having been previously filled to the proper depth with water. Assuming that a bundle of clothes is resting upon the bottom of the agitator at the point indicated at x in Figure 3, and that the agitator is moving in a counter-clockwise direction, the inertia of the water and of the bundle of clothes will cause the riffles to slide beneath the clothes, the bundle of clothes rising as upon an inclined plane, its motion relative to the riffles being indicated by the arrows in Figure 2. When the bundle of clothes reaches the highest of the riffles 15, it is moving diagonally upward and comes in contact with the left hand grid of the partition 12 at an intermediate point. In its movement over the riffles it was subjected to wash board action by said riffles and now that it comes into contact with the grid of the partition 12 it is deflected vertically upward against the slats or bars of said partition being subjected to a further washboard action. Just as the bundle of clothes reaches the point represented at the top of the trajectory of arrows on the left hand side of Figure 2, the agitator reverses its direction. The drawing back of the partition 12 necessarily creates a partial vacuum by displacement of some of the water causing the bundle of clothes to fall abruptly vertically into the void thus created, the clothes descending into the depression or well 19 formed between the base of the partition and the first adjacent riffle. During this descending movement suction induced by said partial vacuum draws the water through the mass of the bundle. No sooner has the bundle of clothes reached the bottom of said well than it is engaged by the riffles on the left hand side, with reference to Figure 2, the clothes being elevated on an inclined plane and projected in an oblique direction against the grid on the right hand side of the partition. In sliding over the riffles and over the bars or slats of the partition 12 a certain degree of rotation is imparted to the bundle so that all sides of it are subjected to the wash board action.

The sediment gravitates down the inclined bottom 18 of the agitator, being assisted by centrifugal force and flows through the drainage openings 16 and 17 into the trough in the bottom of the tub.

By the above described construction, a movement of the clothes through the water and a rubbing effect thereupon by the elements of the agitator is produced, which closely simulates hand washing and cleans the clothes more thoroughly and in less time than has been accomplished heretofore.

Figures 6 and 7 disclose a slightly modified form of the invention in which the agitator may be formed of pressed metal having the riffles stamped upwardly from dome-shaped elevations 20 formed on opposite sides of the partition 12. In view of the shape of the elevations, the riffles may all be of the same height and yet give the same movement to the clothes as is indicated by the arrows in Figure 2. The wells between the groups of riffles and the partition may be stamped with a plurality of drain apertures 21.

While I have in the above description disclosed what I believe to be a preferred and practical embodiment of the invention, it is to be understood that the details of construction as shown and described are merely by way of example and not to be construed as limiting the scope of the invention as claimed.

What I claim is:

1. Washing machine comprising in combination, a tub and an oscillating agitator, the latter including a vertical diametrically disposed partition dividing the tub into two compartments, and a bottom having radial ridges of different heights to provide an undulating contour on each side of said partition adapted when the agitator oscillates to under-run a bundle of clothes encountered adjacent the receding side of said partition, and to direct them inclinedly upward against the approaching side of said partition.

2. Washing machine comprising in combination, a tub, and an oscillating agitator,

the latter including a vertical partition arranged diametrically, the width of said partition being substantially equal to the inside diameter of the tub, said agitator including also a bottom having inclined means of undulating contour, adapted when the agitator oscillates to under-run a bundle of clothes encountered adjacent the receding side of said partition, and to direct them inclinedly upward against the approaching side of said partition.

3. Washing machine comprising in combination a tub and an oscillating agitator, the latter including a vertical partition, arranged diametrically, the width of said partition being substantially equal to the inside diameter of the tub, said agitator including a circular bottom substantially coextensive with the bottom of the tub, and having inclined means of undulating contour symmetrically arranged on each side of the partition, adapted when the agitator oscillates to under-run a bundle of clothes encountered adjacent the receding side of said partition and to direct them inclinedly upward against the approaching side of said partition.

4. Washing machine comprising in combination a tub and an oscillating agitator, the latter including a vertical partition arranged diametrically, and being formed with spaced horizontally disposed ribs and including a bottom having radial means of undulating contour symmetrical on each side of a plane perpendicularly bisecting the partition, adapted when the agitator oscillates to under-run a bundle of clothes encountered adjacent the receding side of said partition and to direct them inclinedly upward against the ribs of the approaching side of said partition.

5. Washing machine comprising in combination a tub, and an oscillating agitator, the latter including a vertical partition arranged diametrically and having transverse ribs with open spaces between said ribs, said agitator including a bottom having radial ribs of a height progressively increasing from said partition to a plane perpendicular to said partition, and adapted when the agitator oscillates to under-run a bundle of clothes encountered adjacent the receding side of said partition and to direct them inclinedly upward against the ribs of the approaching side of said partition.

6. Washing machine as claimed in claim 5, the agitator including the partition and the bottom being of a diameter substantially equal to that of the tub, and the ribs of the partition of streamline cross section to minimize water resistance.

7. Washing machine as claimed in claim 5, the radial ribs adjacent the partition being spaced from the partition to form wells the bottoms of said wells provided with through passages, whereby the bundle of clothes after its upward flight against said partition, abruptly descends into said wells through the displacement of some water occasioned by reversal in the direction of oscillation of said agitator.

CLEMENT R. WENGER.