July 16, 1929. F. R. STEELSMITH 1,720,975

WASHING MACHINE AGITATOR

Filed July 12, 1928

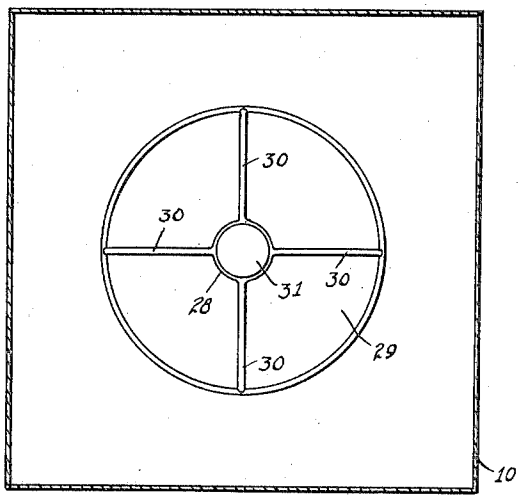


Fig. 2.

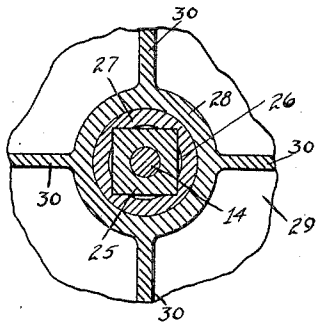


Fig. 3.

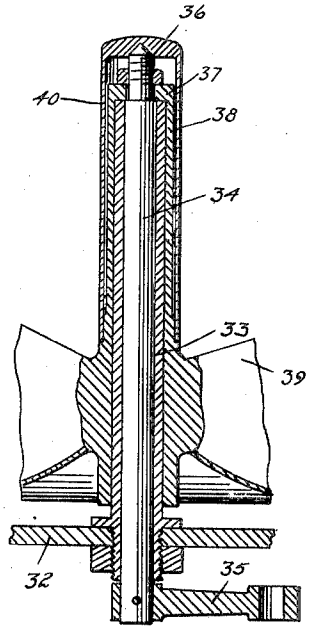


Fig. 4.

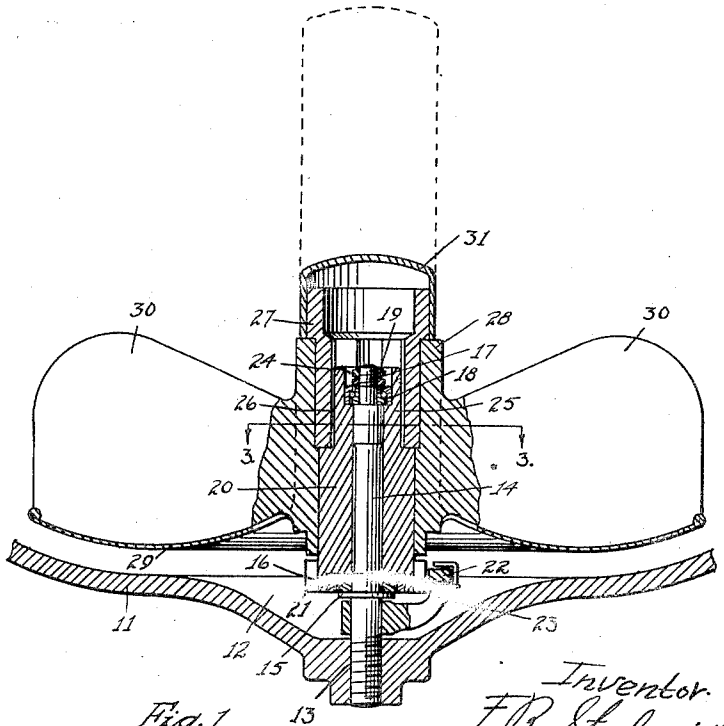


Fig. 1.

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UNITED STATES PATENT OFFICE.

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WASHING-MACHINE AGITATOR.

Application filed July 12, 1928. Serial No. 292,082.

This invention relates to improvements in agitators for washing machines of that type mounted in the bottom of the tub and having a vertical hub and radial agitator blades, and which is adapted to oscillate about a vertical axis.

Considerable difficulty has been experienced with the clothes being washed gathering on the top portion of the agitator, or if the hub extends a considerable distance above the dolly, trouble is experienced in the clothes wrapping around the upwardly projecting end, which causes them to be supported in such a manner that they will not be properly washed, the wrapping of the clothes about the hub often causes a large amount of tangling and knotting, which is very undesirable, especially when wringing the clothes.

Difficulty has also been experienced with that type of agitators mounted on a rigid upright pivot post and employing a rack and pinion for imparting oscillatory movement to the agitator, in that each time a reverse movement is imparted to the agitator, the agitator has a tendency to move longitudinally of the post, causing a knocking noise which is undesirable.

It is, therefore, the object of my invention to provide in an agitator of the type above described improved means whereby the tangling and knotting of the clothes will be eliminated, and which is adapted to be used in connection with various types of agitators without materiorly interfering with the fundamental construction and arrangement of the same.

A further object is to provide in an agitator of the type having a rigid upright pivotal post improved means for preventing longitudinal movement of the agitator relative to said post to reduce undesirable knocking as reverse movement is imparted to the agitator.

A further object is to provide in that type of agitator having a rigidly supported pivot post, and a permanently mounted actuating member supported on said post, improved means for detachably mounting the agitator with said actuating means.

My invention consists in the construction, arrangement and combination of the various parts of the device, whereby the objects contemplated are attained, as hereinafter more fully set forth, pointed out in my claims, and illustrated in the accompanying drawings, in which:

Figure 1 is a vertical sectional view of one type of an agitator showing the manner in which my improved means is applied thereto.

Figure 2 is a plan view of same.

Figure 3 is a detail sectional view taken on the line 3—3 of Figure 1.

Figure 4 is a vertical sectional view showing the manner in which my improved device is applied to another type of agitator.

The numeral 10 indicates a washing machine tub having a bottom 11, the central portion of said bottom being provided with a recess 12. The bottom of said recess has a screw threaded opening 13, in which is mounted an upright pivot post 14, rigidly supported in said bottom. The post is provided with a flange 15 slightly above the bottom 11, on which is mounted a ball bearing 16. The upper end of the post 14 has a contracted screw threaded portion 17 on which is mounted a ball bearing 18 secured in position by means of suitable lock nuts 19.

Mounted on the movable collars of the ball bearings 16 and 18 is a sleeve 20, the lower end of which is provided with gear teeth 21 to form a pinion, which is actuated by means of a reciprocating rack bar 22 in the usual manner. Said rack bar is slidably mounted in a pivot guide yoke 23.

The upper end of the sleeve 20 is provided with a recess 24 for receiving the ball bearings 18 and the lock nuts 19.

The upper end of said sleeve 20 is also provided with a square portion 25 designed to enter a square opening 26 in a bushing 27. Said bushing 27 is rigidly mounted in the hub 28 of the agitator 29. Said agitator is provided with the usual upright radial blades 30. The upper end of the bushing 27 is enlarged and rests above the upper end of the hub 28. The diameter of said bushing is slightly less than the diameter of the hub and the outer face of said bushing is finished.

A cylindrical shield or cap 31 is rotatively mounted on the upwardly projecting end of said bushing. Said shield may be of any desired length. The diameter of the shield is substantially the same as the outside diameter of the hub 28.

By this arrangement it will be seen that the tendency of the clothes to wrap about the hub portion of the agitator is greatly reduced, due to the fact that the moment adhesion takes place between the clothes and the revolvable shield, the agitator hub is permitted to rotate within the shield to thereby prevent a large per cent of the wrapping effect. There is some tendency toward wrapping, however,

due to the friction between the shield and the member on which it is mounted, which will cause a slight tendency toward wrapping or winding of the clothes about said shield. If this wrapping takes place, the clothes are quickly released by the thrashing or agitating effect of the blades 30.

On account of the inertia action of the clothes and the shield, it will be seen that the agitator will move in advance of the clothes wound on said shield, which has a tendency to loosen and unwind the clothes from the shield.

In Figure 4 I have illustrated a slightly modified form in which the bottom of the tub is indicated by the numeral 32, and which is provided with an upright sleeve 33, the lower end of which projects through the bottom of the tub, while the upper end of the sleeve is of such height as to project above the normal water line.

An oscillatory shaft 34 is mounted in said sleeve, the lower end of which is provided with a rock arm 35, while the upper end has a contracted screw threaded portion 36, in which is mounted one end 37 of a downwardly projecting sleeve 38, which surrounds the sleeve 33 and is designed to support the agitator 39 in its lower end. The winding and wrapping effect of this type of agitator is very pronounced, the clothes wrapping about the sleeve 38. This wrapping is easily overcome by providing a shield 40, the upper end of which is pivotally mounted on the upper end of the member 36, and the lower end rotatively mounted on the shoulder 37 on the sleeve 38. The operation of this form of the device is the same as that above described.

By mounting the sleeve 20 on suitable ball bearings and rigidly securing the same in place by means of the lock nuts 19, I have provided means whereby any longitudinal movement of the sleeve 20 relative to the post 14 is eliminated. The nuts 19 provide means for taking up any end wear that may develope.

Thus it will be seen that I have provided an improved washing machine agitator of that type adapted to oscillate about a vertical axis and to be mounted in the bottom end of the tub, whereby undesirable noise caused by the reversing of the agitator is eliminated, and whereby the undesirable feature of the clothes wrapping about the agitator hub is entirely eliminated.

I claim as my invention:

1. A washing machine agitator comprising an upright hub adapted to oscillate about a vertical axis having upright radial blades at its lower end, and a shield rotatively supported upon, relative to and covering the upper end of said hub.

2. A washing machine agitator comprising an upright hub adapted to oscillate about a vertical axis, and having upright radial blades at its lower end, a cylindrical shield supported upon and covering the upper end of said hub, the side surface of said shield being substantially common with the outside surface of said hub, said shield being rotatively mounted relative to said hub and agitator blades.

3. In combination, a support, a vertical pivot member, an agitator rotatively mounted on said pivot member, said agitator comprising a hub having a fixed and radial upright blade, the upper end of said hub having a slightly contracted portion, and a cylindrical shield rotatively mounted on and relative to said contracted portion and about a common axis with said agitator.

4. In combination, a support, a vertical pivot member, an agitator rotatively mounted on said pivot member, said agitator comprising a hub having a fixed and radial upright blade, the upper end of said hub having a slightly contracted portion, a cylindrical shield rotatively mounted on and relative to said contracted portion and about a common axis with said agitator, and means for imparting a rotary oscillatory movement to said agitator.

5. In combination, a support, a vertical pivot member, an agitator rotatively mounted on said pivot member, said agitator comprising a hub having a fixed and radial upright blade, the upper end of said hub having a slightly contracted portion, a cylindrical shield rotatively mounted on and relative to said contracted portion and about a common axis with said agitator, and adjustable bearing members carried by said upright pivot for preventing longitudinal movement of said agitator relative to said pivot member.

6. In combination, a support, a fixed upright pivot member, a sleeve rotatively mounted on said pivot member, adjustable means for retaining said sleeve against longitudinal movement relative to said pivot, the upper end of the side surface of said sleeve being square, an agitator having a square opening for fitting the square portion of said sleeve, a shield rotatively supported upon, relative to and covering the upper end of the hub of said agitator, and means for imparting rotary reciprocating movement to said sleeve.

Des Moines, Iowa, July 7, 1928.

FRANK R. STEELSMITH.