July 10, 1923. 1,461,354

T. INAKI

WASHING MACHINE

Filed Sept. 25, 1919

Fig. 1.

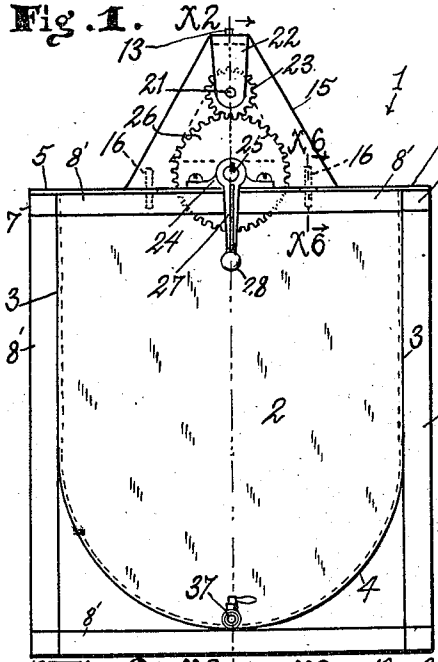


Fig. 3.

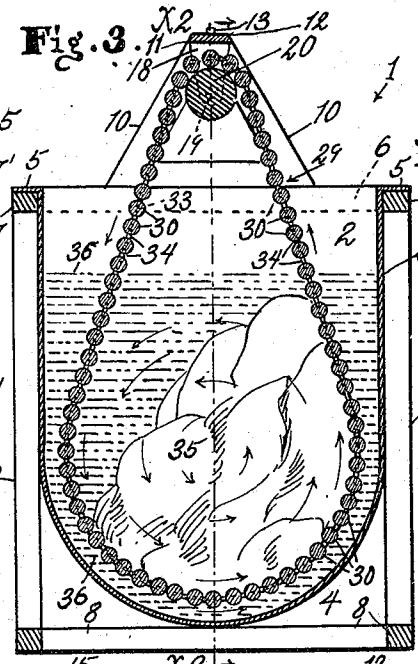


Fig. 5.

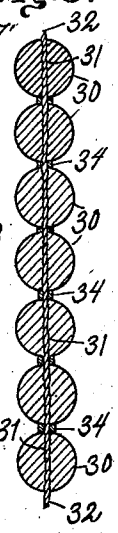


Fig. 2.

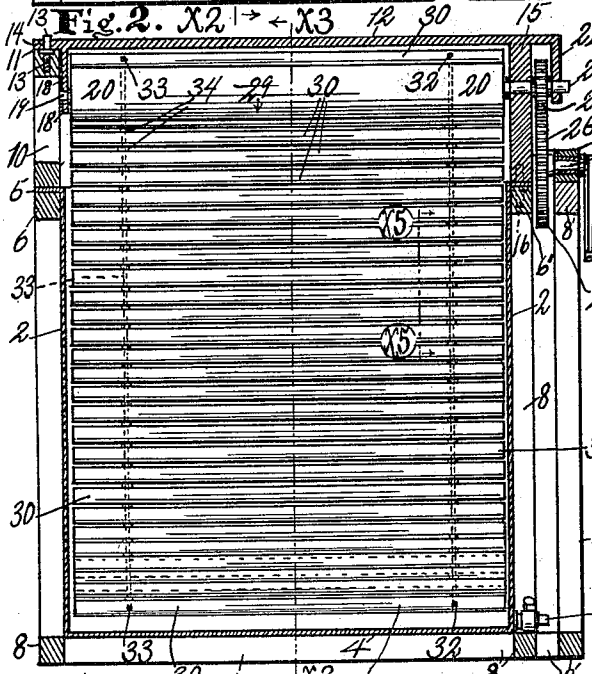


Fig. 4.

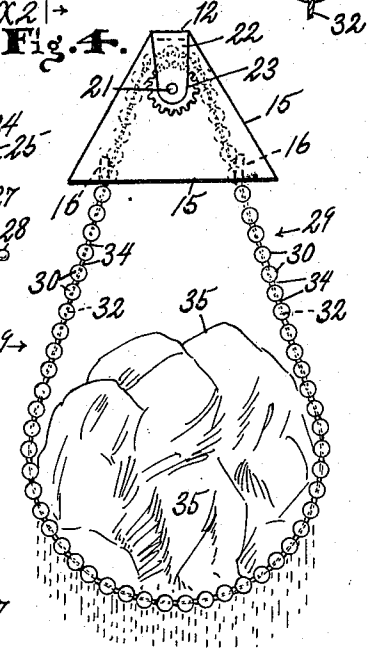
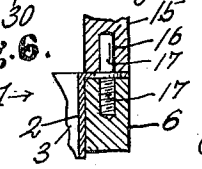


Fig. 6.



Witness:
W. M. Gentle

Inventor.
Toyojiro Inaki.
by James R. Townsend
his atty.

Patented July 10, 1923. 1,461,354

UNITED STATES PATENT OFFICE.

TOYOJIRO INAKI, OF FRESNO, CALIFORNIA.

WASHING MACHINE.

Application filed September 25, 1919. Serial No. 326,415.

To all whom it may concern:

Be it known that I, TOYOJIRO INAKI, a subject of the Emperor of Japan, residing at Fresno, in the county of Fresno and State of California, have invented a new and useful Washing Machine, of which the following is a specification.

This invention relates to washing machines having means for revolving the material to be cleansed in a washing fluid; and the invention may be said to consist in the provision of the novel features and in the novel construction, combination and arrangements of parts as will appear hereinafter.

An object of this invention is to provide means whereby the soiled clothes may be washed, elevated to a position to drain after they have been washed, and after they have been drained, secured and to do this with maximum ease and with minimum manual manipulation.

Another object is to provide a washing machine of the character indicated, that will not injure the material but which can be operated to greatly agitate the clothes in the washing fluid and thereby expeditiously clean them.

I accomplish the former objects by an endless apron arrangement removably attached to a tub frame as will hereinafter more fully appear.

A feature of the invention appears in novel means for attaching and detaching the apron support from the tub frame; the connecting and disconnecting of parts being accomplished by lifting the apron support upward from the receptacle thereby eliminating the usual tedious work of unfastening screws and bolts.

Another feature of invention is shown in the unique construction and operation of the apron driving means.

Other objects, advantages and features of invention may appear from the accompanying drawings, the subjoined detailed description and the appended claims.

The accompanying drawings illustrate the invention.

Figure 1 is an end elevation of the washing machine.

Fig. 2 is an axial sectional elevation through the washing machine on line x^2, Figs. 1 and 3.

Fig. 3 is a central sectional elevation on line x^3, Fig. 2; the tub being charged with washing fluid and the apron with clothes. Curved arrows indicate movement of the apron and clothes when the crank is turned in one direction.

Fig. 4 is an end elevation of the apron and support removed from the tub, the clothes being shown in process of draining.

Fig. 5 is an enlarged section through a portion of the apron on line x^5, Fig. 2.

Fig. 6 is an enlarged sectional elevation on line x^6, Fig. 1; showing in detail, one of the retaining pins for the apron support.

The tub 1 is formed with end plates 2 to which a plate bent to form the sides 3 and bottom 4 of the tub is connected by any well known means, and a portion of the top ends of these plates are bent outwardly at right angle to the vertical sides and ends to form the flange 5 that is adapted to rest on the top bars 6, 6′ and 7, 7′ of a rectangular frame 8 that is formed to receive and support the tub 1 which may be formed of sheet metal or any other suitable material.

To one of the top bars 6 there is secured by any well known means a triangular standard 10 which has its top portion 11 flattened to form a seat for the end of the head bar 12.

In the flattened portion 11 of the standard 10 there is secured a pin screw 13, the upper end or pin of which is positioned to pass through an opening 14 in the head bar 12. See Fig. 2.

Near the other end of the bar 12 and integrally connected thereto is a triangular plate constituting a standard 15, which has in its bottom, sockets 16 that are adapted to register with the tops of the screw pins 17 the screws of which are screwed in the frame bar 6′ that is oppositely located relative to the frame 6′. By the foregoing construction of parts it can readily be seen that the bar 12 and also associated parts can be readily placed, removed and replaced on the upper ends of the screw pins 13 and 17.

Near one end of the plate 12 there is a downward extension or hanger 18 that has therein an opening for the bearing pin 19 in one end of the roller 20. In the other end of the roller 20 there is secured a bearing pin 21 that extends through the standard plate 15 and downward extension or hanger 22 of the bar 12: and between the standard 15 and hanger 22 there is a small pinion 23 secured to the bearing pin 21.

To one end of the rectangular frame 8 there is secured an extension 8′ to the top part of which is attached the bearing block

24 in which there is mounted the shaft 25. To one end of this shaft there is secured a gear 26 that is positioned for its teeth to mesh with the teeth of the pinion 23 when the bar 12 and associated parts are in position on the pins 13 and 17.

To the other end of the shaft 25 there is secured the crank 27 by which the gear 26 is rotated to drive the pinion 23; or to facilitate turning of the crank its outer end is provided with the handle 28.

Suspended from the roller 20 is a flexible apron 29 that is formed of a plurality of rounded wooden rods 30. These rods 30 have openings 31 near each end thereof that are spaced equidistant apart so that when the rods are placed together the openings therethrough will register.

Through these openings are threaded the endless cables 32 and 33 and also threaded on these cables between each of the rods 31 are the beads 34 that space the rods apart; and this arrangement and connection of parts forms the endless flexible apron 29 that hangs loosely from the roller 20. Also the spacing between the rods can be accomplished by knots in the cables in a well known manner.

The clothes or other material 35 to be cleansed is placed inside the apron 29 and the bar 12 and associated parts positioned as heretofore described: which position will submerge the material inside the apron in the washing fluid 36 and connect the teeth of the pinion 23 with the gear 26 so that when the crank 27 is rotated in either direction it will move the material in the washing fluid.

When the crank 27 is revolved to the left the material in the apron will be rolled as indicated therein. The material has a tendency to cling and climb upward on the apron until it is displaced by gravity after which it tumbles downward in the fluid with a floundering effect which tends to agitate the fluid in the tub and such agitation of the fluid greatly facilitates the cleansing of the material.

Also by rapidly reversing the movement of the crank 27, a corresponding reverse movement of the material is effected which alternation of movements causes a cleansing impact of the material with the washing fluid. The moving material and apron cause the fluid to flow through the material.

This impact of material against the fluid and the flow of the fluid through the material cause the fluid to quickly and efficiently cleanse the material.

After the material is cleansed the bar 12 can be lifted bodily by any suitable means, to a position where the apron is above the fluid level where it may be held until the fluid is drained from the material back into the tub.

The bar 12 and associated hangers can be lifted either by hand in the case of small machines or in large machines by any well known elevating device. Elevating apparatus are old and well known consequently no specific device is shown.

In operation the material 35 to be cleansed is placed inside the apron 29 and the tub suitably filled with washing fluid 36 as shown; after which the bar 12 is positioned over the tub as described which submerges the lower end of the apron 29 and the material therein in the fluid 36; after which power is applied to the shaft 25 to rotate the gear 26 to drive the pinion 23, and its associated parts as heretofore described.

A drain cock 37 is provided in the bottom of the tub for removing the washing fluid.

Although I have shown a crank connected with the shaft 25 I do not wish to be limited to that means of applying power thereto, as the crank can be replaced by a common pulley or gear and driven by any well known intermittent or reversible rotary driving mechanism. Also I have described the apron as formed of spaced rods and endless cables but this contrivance also can be made in various ways to perform the same function, such as a perforated belt or chains carrying spaced bars suspended in the same way as the preferred form of apron that I have employed, consequently I reserve all right to such modifications and changes as do not depart from the scope and spirit of the invention.

I claim:

1. A washing machine comprising a receptacle for washing fluid; a frame supporting said receptacle; a standard secured to said frame and having a pin secured to its top; another standard removably mounted on said frame and provided with sockets on its lower edge; pins on the frame adapted to cooperate with said sockets to hold the other standard in position on the frame; a head bar connected to said other standard and having an opening at one end adapted to cooperate with the pin in the top of the standard secured to said frame; a hanger secured to said head bar; a roller positioned above said receptacle and journalled in said hanger and said other standard; an endless apron supported by said roller; and means for revolving said roller and apron for the purpose set forth.

2. A washing machine comprising a receptacle for washing fluid; a frame supporting said receptacle; a standard secured to said frame and having a pin secured to its top; pins on said frame; another standard removably mounted on said frame and provided with sockets on its lower edges adapted to cooperate with the pins on said frame to hold said other standard in posi-

tion on said frame; a head bar secured to said other standard having an opening adapted to cooperate with the pin in the top of the standard secured to the frame; a hanger secured to said head bar; a roller journalled in said removable standard and hanger; an endless apron supported by said roller; a pinion on the end of the roller; a gear mounted on the frame and adapted to contact with and rotate said pinion when the roller is in position; and means for actuating said gear.

3. A washing machine comprising a receptacle for washing fluid; a frame supporting said receptacle; a standard secured to said frame; another standard removably mounted on said frame and provided with sockets on its lower edges; a head bar connected to said other standard one end of which is provided with an opening and adapted to rest on said first mentioned standard; hangers secured to said head bar; a roller journalled in said hangers and said other standard; an endless apron supported by said roller; a pinion on the end of said roller between one of said hangers and said other standard; a gear mounted on the frame and adapted to contact with and rotate said pinion, means for actuating said gear; and means adapted to cooperate with said sockets and the opening in said head bar to hold said other standard and head bar in position on the frame.

In testimony whereof, I have hereunto set my hand at Fresno, California, this 17th day of September, 1919.

TOYOJIRO INAKI.

Witness:
JAMES R. TOWNSEND.