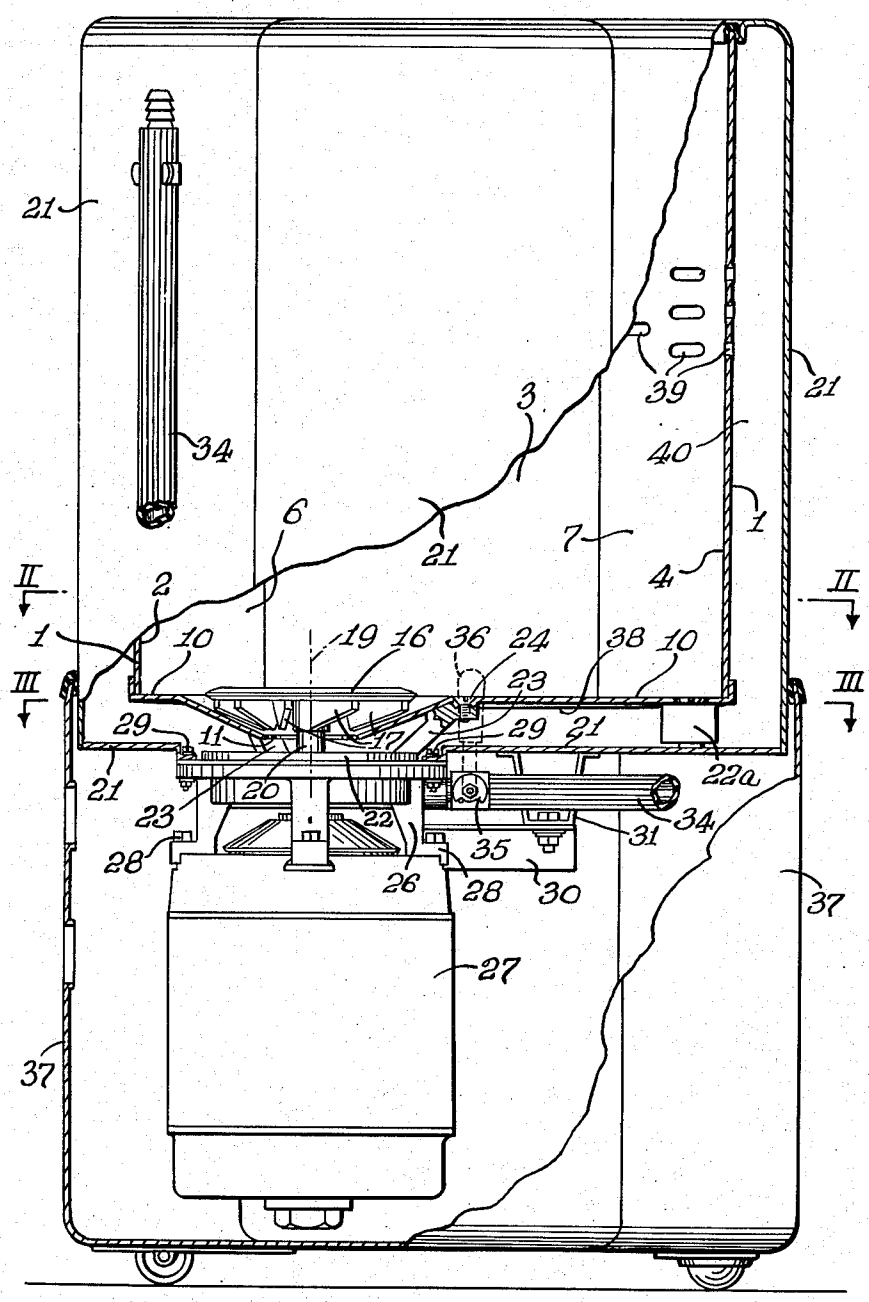
Nov. 24, 1953 W. BRETTER 2,660,045

WASHING MACHINE

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Fig 1.



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WASHING MACHINE

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Fig 2.

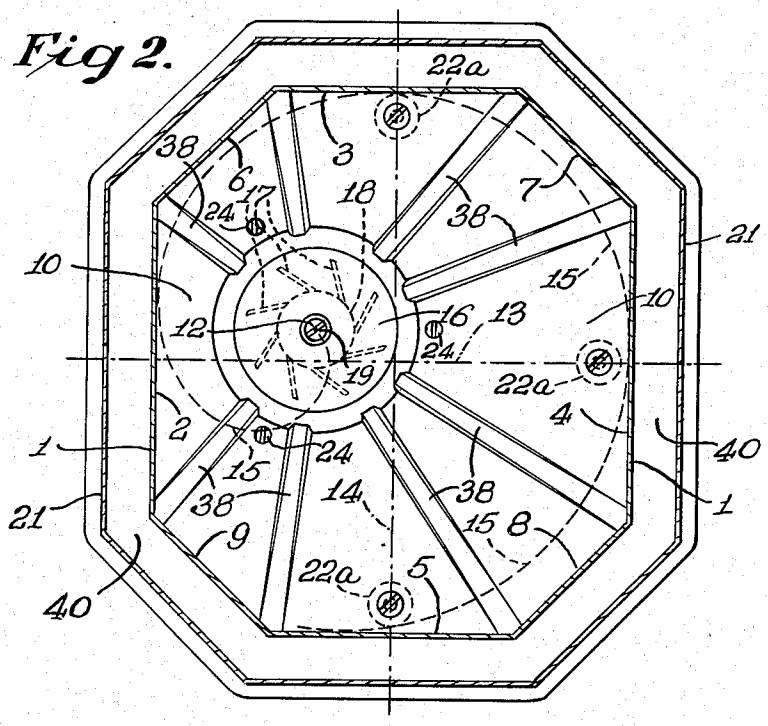
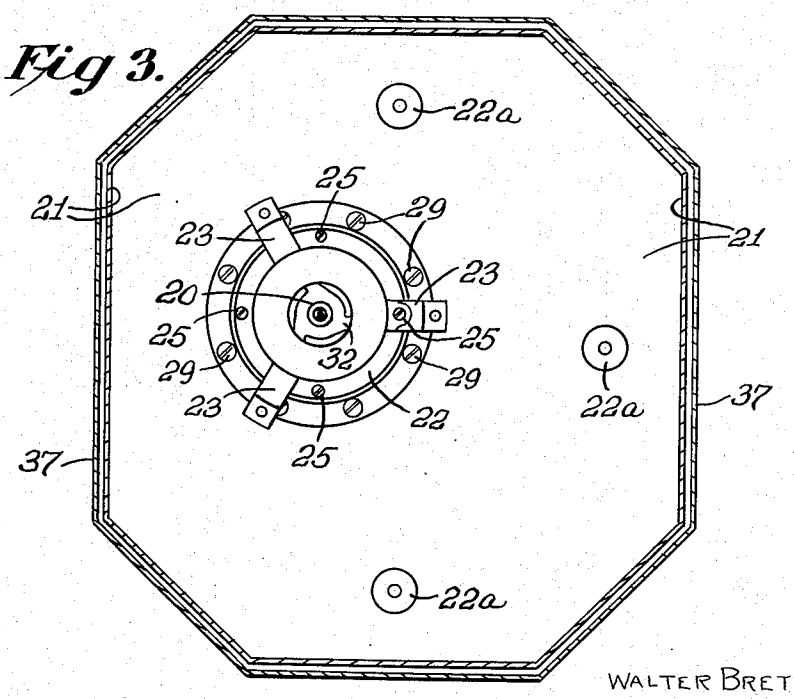


Fig 3.



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Fig 4.

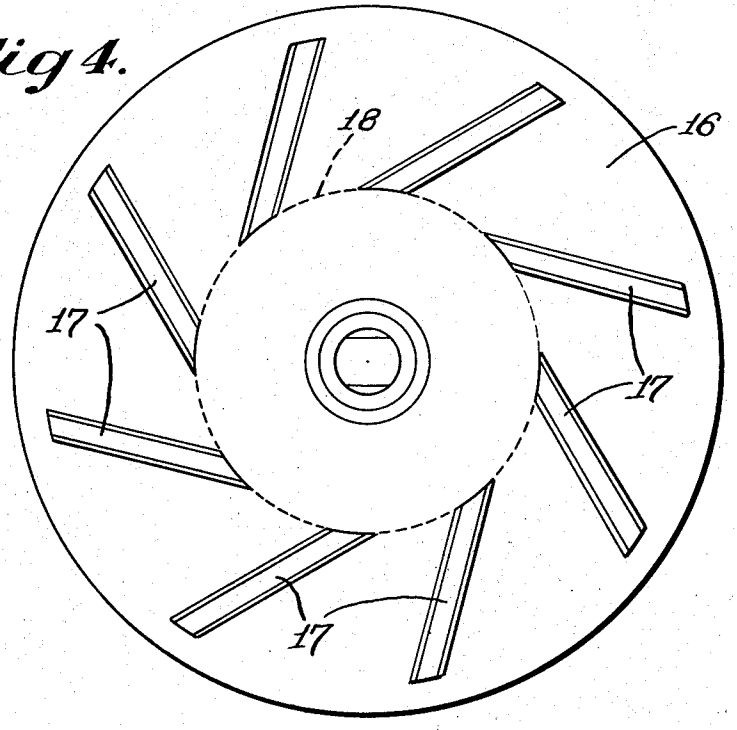
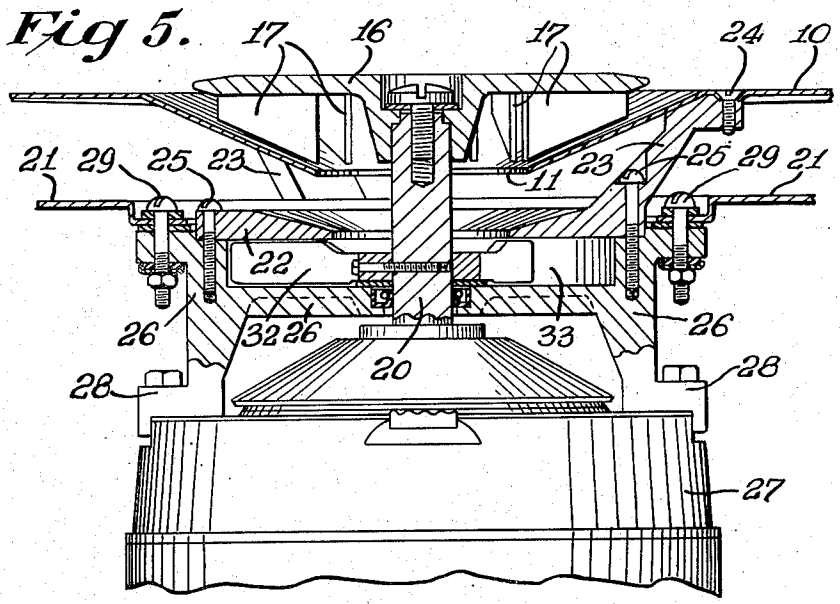


Fig 5.



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Patented Nov. 24, 1953

2,660,045

UNITED STATES PATENT OFFICE

2,660,045

WASHING MACHINE

Walter Bretter, Johannesburg, Transvaal, Union of South Africa

Application August 12, 1952, Serial No. 303,943

Claims priority, application Union of South Africa August 22, 1951

3 Claims. (Cl. 68—53)

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This invention relates to washing machines for textile fabrics and garments, and particularly to a machine of the type in which an agitator is rotatably mounted in a tank for containing the washing liquid and the articles to be washed, said agitator being driven by an electric motor or otherwise so that the washing liquid may be circulated and the articles thoroughly washed.

It has already been proposed to provide a clothes washing machine of this type in which the base of the tank is apertured around a point offset from both horizontal axes which intersect at right angles and pass through the middle of said bottom, in which the agitator fits closely and co-axially within the aperture, and in which the sides of the tank are arranged in relation to the aforesaid point so that they lie tangential to a continuous curve traced from and around said point and steadily increasing its distance from said point.

It has been found that with the machine described above, satisfactory results are only obtained if the washing load is relatively small in size and weight. If the washing load is increased even to a practical minimum, the articles are liable to become unduly damaged by the agitator, the upper surface of which is formed with vanes or ribs the crests of which are flush with the aforesaid upper surface, or alternatively with a plurality of depressions.

The present invention aims at overcoming this disadvantage.

In accordance with the invention, a washing machine comprises an inner tank for receiving washing liquid and the articles to be washed, said inner tank having the base thereof apertured around a point offset from both horizontal axes which intersect at right angles and pass through the centre of said bottom and having four sides arranged in relation to said point so that they lie tangential to a continuous curve traced from and around said point and steadily increasing its distance from said point; deflecting members interposed between adjacent sides of the inner tank; a centrifugal impeller fitting co-axially within the apertured portion of the base of the inner tank; a prime mover for imparting rotation to the impeller; an outer tank surrounding the inner tank and maintained in spaced relationship therefrom; port means in the wall of the inner tank through which washing liquid may pass to the space between the inner and outer tanks to be drawn axially into the impeller and discharged radially therefrom into the interior of the inner tank to provide a continuous circulation.

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Preferably, the impeller is mounted directly on the shaft of the prime mover. It has a smooth upper surface and is provided on its underside with a plurality of blades or vanes the inner ends of which are disposed around a pitch circle described about the axis, and the blades may decrease in depth as they advance towards the periphery. Preferably, the blades are inclined to the radii of the pitch circle, for example, at an angle of 60°.

For receiving the impeller, the base of the inner tank may be provided with an aperture which, in vertical section, is of inverted frustro-conical shape, the major diameter being greater than the overall diameter of the impeller, and the minor diameter less, and preferably corresponding to the pitch circle around which the inner ends of the impeller blades are disposed.

The space between the walls of the two tanks may communicate directly with the space between the bases of the tanks, such latter space in turn leading inwards to the underside of the impeller so that washing liquid may be drawn axially into the impeller into the gap between the impeller boss and the inner ends of the blades.

The invention will be further described with reference to the accompanying drawings in which:

Figure 1 is a part sectional elevation of a washing machine according to the invention.

Figure 2 is a cross-section on the line II—II in Figure 1.

Figure 3 is a cross-section on the line III—III in Figure 1.

Figure 4 is an inverted plan view of the impeller.

Fig. 5 is an enlarged detail, partly in section, of the impeller and surrounding parts.

Referring to the drawings, the machine comprises an inner tank 1 having four sides, 2, 3, 4 and 5 and deflecting members 6, 7, 8 and 9 interposed between said sides. The base 10 of the tank 1 is apertured at 11 around a point 12 offset from both horizontal axes 13 and 14 which intersect at right angles and pass through the middle of the base 10. The sides 2, 3, 4 and 5 are arranged in relation to the point 12 so that they lie tangential to a logarithmic spiral 15 evolved from the point 12.

The aperture 11 is of inverted frusto-conical shape, the major diameter being greater than the overall diameter of the impeller and the minor diameter less.

The impeller 16 is provided on its underside with eight blades 17 the inner ends of which are disposed about a pitch circle 18 described about the axis 19. The blades 17 are inclined to the radii of the pitch circle 18 at an angle of 60° and, as shown, they decrease in depth as they advance outwards towards the periphery. The impeller 16 is mounted on the motor shaft 20 with the blades 17 just clear of the surface of the aperture 11.

The outer tank 21 surrounds the inner tank 1 and is maintained in spaced relationship therefrom by means of a supporting member 22 having three upwardly-extending legs 23 to which the inner tank 1 is secured by screws 24, and by means of additional supports 22a. The supporting member 22 is attached by screws 25 to a casting 26 to which the driving motor 27 is bolted at 28. The outer tank 21 is bolted at 29 to the casting 26.

The outer tank 21 is supported on a stand 37 by means of inverted U-shaped brackets 31 welded to the base of the outer tank 21 and bolted on to a pair of angle iron brackets 30 provided on opposite sides of the interior of the stand 37.

A pump impeller 32 is mounted on the motor shaft 20 in the space 33 between the underside of the supporting member 22 and the casting 26, the inlet to said pump being axial through the supporting member 22. A discharge hose 34 communicates with the space 33 and is controlled by a valve 35 operated by a handle 36.

The walls of the inner tank 1 are apertured at 39 to permit the passage of washing liquid from the inner tank into the space 40 between the inner tank 1 and the outer tank 21. The base of the inner tank 1 is formed with sloping drain grooves 38 to ensure proper drainage of washing liquid from the interior of the tank after use. Such grooves 38 also serve to stiffen the base of the tank.

In use, the inner tank 1 is filled with washing liquid and the articles to be washed are placed therein. Liquid passes through the ports 39 into the space 40. The valve 35 is kept closed and the motor 27 started. Liquid is drawn axially into the impeller 16 and discharged into the inner tank 1. The impact of the discharging liquid upon the stationary liquid in the inner tank 1 causes circulation of the latter and eventually a vortex is formed in the centre of the inner tank. However, since the impeller 16 is mounted off-centre, adequate motion is imparted to the articles to be washed and:

(a) Since there is no suction from the delivery side in the inner tank, the articles are not forced on to the impeller.

(b) The only moving part which the articles can touch is the smooth upper surface of the impeller so that no untoward damage can occur.

(c) The force of the washing liquid discharged from the impeller will tend to keep the articles clear of the impeller.

The washing liquid passes through the ports 39 after most of its kinetic energy has been spent and the cycle is continued. When the washing operation is completed, the valve 35 is opened and the pump 32 empties the machine through the hose 34.

I claim:

1. A washing machine comprising an inner tank for receiving washing liquid and the articles to be washed, said inner tank having the base thereof apertured around a point offset from each of two horizontal axes which intersect at right angles and pass through the centre of said bottom and having four sides arranged in relation to said point so that they lie tangential to a continuous curve traced from and around said point and steadily increasing its distance from said point; deflecting members interposed between adjacent sides of the inner tank; a centrifugal impeller fitting co-axially within the apertured portion of the base of the inner tank; a prime mover for imparting rotation to the impeller; an outer tank surrounding the inner tank and maintained in spaced relationship therefrom; port means in the wall of the inner tank through which washing liquid may pass to the space between the inner and outer tanks to be drawn axially into the impeller and discharged radially therefrom into the interior of the inner tank to provide a continuous circulation.

2. A washing machine, according to claim 1, in which the impeller is provided on its underside with a plurality of vanes the inner ends of which are disposed around a pitch circle described about the axis, said vanes decreasing in depth as they advance towards the periphery, and in which, the aperture in the base of the inner tank within which the impeller is received is, in vertical section, of inverted frustro-conical shape, the major diameter being greater than the overall diameter of the impeller and the minor diameter less.

3. A washing machine, according to claim 2, in which the vanes are inclined to the radii of the pitch circle.

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