

Nov. 6, 1934.

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1,979,361

WASHING MACHINE

Filed June 20, 1930

2 Sheets-Sheet 1

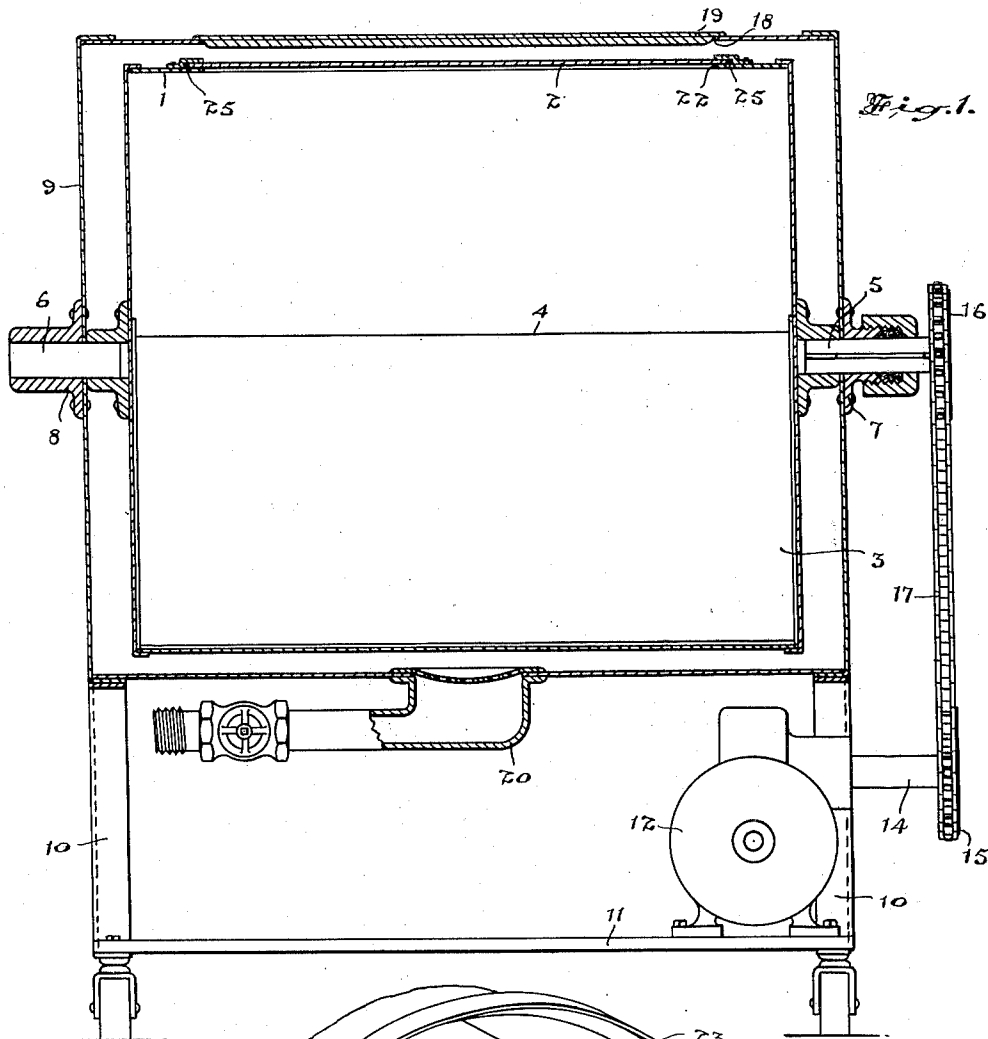
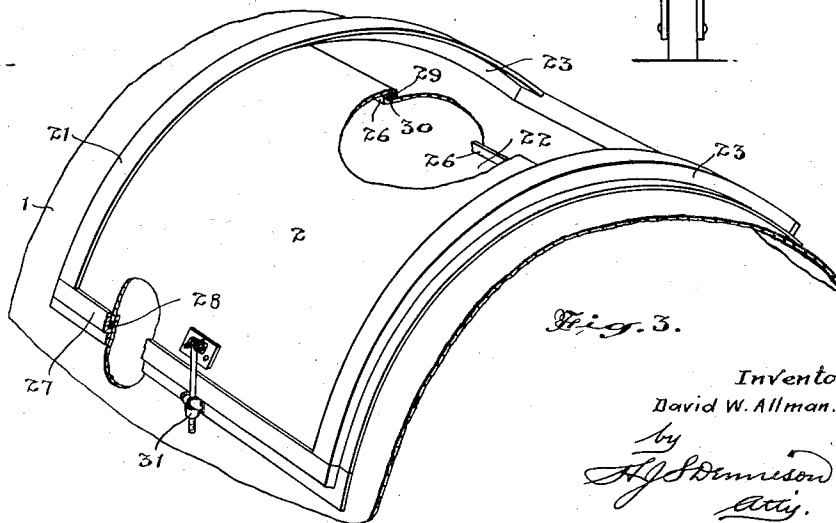


Fig. 3.

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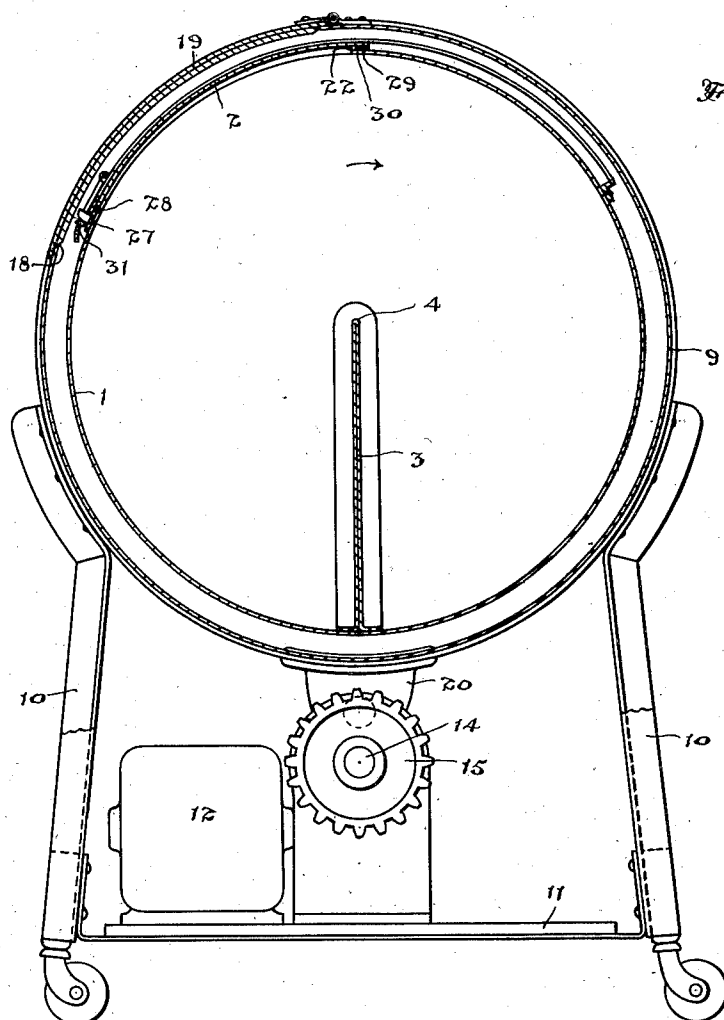
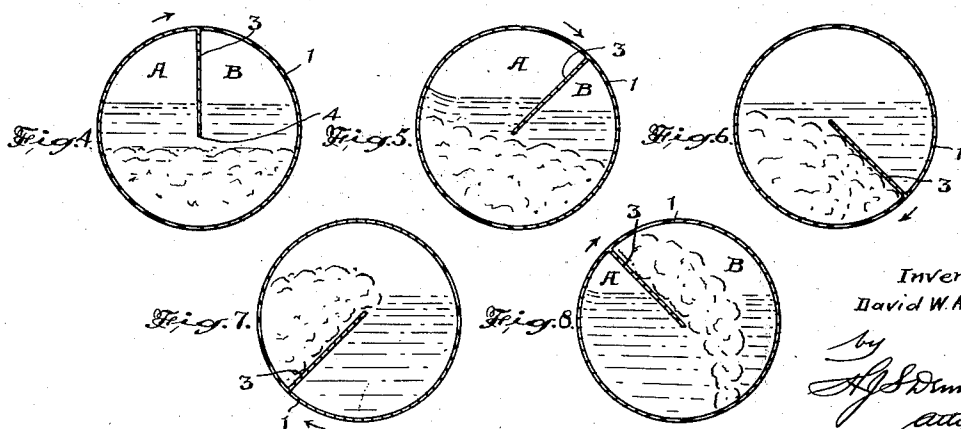


Fig. 2.



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UNITED STATES PATENT OFFICE

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WASHING MACHINE

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1 Claim. (Cl. 68—18)

The principal objects of this invention are to effect the cleansing of textile fabrics in a most thorough and scientific manner with the least possible wearing effect upon the fabrics, and to provide a device of extremely simple construction which will operate with the minimum of cost.

The principal feature of the invention consists in the novel construction of a rotating container whereby the washing water is thoroughly aerated and forced through the fabrics to be cleansed under the centrifugal pumping action of a vane rigidly mounted in the rotating element in which the fabrics and washing water are enclosed.

In the accompanying drawings, Figure 1 is a longitudinal sectional elevation of my improved washer.

Figure 2 is an end elevation and part transverse sectional view of the machine.

Figure 3 is an enlarged sectional perspective detail of the means for closing and sealing the rotating element, parts thereof being broken away.

Figures 4, 5, 6, 7 and 8 are diagrammatic views of the washing cylinder in transverse section showing the progressive centrifugal pumping action effected in the handling of the clothes.

A very great number of washing machines have been devised in which the clothes are subjected to either reciprocatory or oscillatory movements, either of the container in which the clothes are placed or of an element operating therein.

The present invention accomplishes the objective of cleansing the fabrics very rapidly with a purely rotative movement.

The principle of the device is illustrated very plainly in the diagrammatic Figures 4 to 8.

The cylindrical container 1 is provided with a suitable air-tight cover 2 and within the cylinder is arranged a longitudinal vane 3 which extends from end to end and is sealed at its ends and along one longitudinal side to the cylinder structure.

Water with suitable washing compounds is placed within the cylinder to a depth sufficient to seal the free edge 4 of the vane 3 which is preferably immersed several inches deep when the vane is at the top side of the cylinder as illustrated in Figure 4. The fabrics to be washed are placed within the cylinder, after which it is sealed.

The cylinder is then rotated upon its longitudinal axis.

It will be seen on reference to Figure 4 that there are two sealed air spaces A and B either side of the vane 3 above the water and as the

cylinder rotates, the air within the space B being imprisoned is compressed between the cylinder walls, the vane and the water and as the tendency of the water is to retain its level, a suction effect is created in the space A which tends to lift the surface of the water upwardly while the level of the water in the space B will be depressed.

This compressed air is forced downwardly as the cylinder continues to rotate and finally, is forced through the water and the fabrics around the free edge 4 of the vane. Its movement is assisted by the suction created in the chamber A.

This action will readily be understood to be that found in an ordinary centrifugal pump but as there is no outlet, the air is forced through the water and the fabrics.

As the vane continues to move downwardly as in Figure 6, after having discharged the air, it engages the clothes which otherwise would remain at the bottom of the cylinder and swinging around past the lower vertical position, the clothes are lifted by the vane as illustrated in Fig. 7, until the vane having passed the horizontal in its upward movement the clothes are spilled off back into the lower portion.

It will be seen that as the vane rises through the upper level of the water, the suction effect on the water in the space A commences to lift while the compression commences in the chamber B.

When the cylinder is rotated at a moderate rate of approximately 60 revolutions per minute, the compression of air and the suction effects in the chamber are such as to carry the water around within the cylinder in a highly aerated condition to substantially fill the cylinder, with the result that the cylinder rotates with practically no surge or off-balance movement.

The continual lifting and spilling of the clothes in the manner described in the aerated water which is being continually subjected to pressure and suction, forces the water through the fabrics in such a way as to loosen the dirt therefrom very rapidly and a very short period of operation is required to completely cleanse the fabrics.

The construction of the machine for operating the washing cylinder may be varied considerably, but the preferable form is herein shown.

The cylinder 1 is provided with trunnions 5 and 6 at either end which are mounted in suitable brackets 7 and 8 arranged in the end of a cylindrical casing 9 which forms an enclosure for the rotatable cylinder.

The cylindrical casing 9 is supported at the ends upon the legs 10 which are rigidly secured thereto and a platform or frame 11 extends be-

tween the legs 10 and supports an electric motor 12 and reducing gear 13 which operate the shaft 14 carrying a sprocket 15.

A sprocket 16 is mounted on the end of the 5 trunnion 5 and is driven by the chain 17.

The casing 9 is provided with an opening 18 in the top side which is closed by a hinged cover 19 of any suitable form. A drain pipe 20 leads from the bottom of the casing 9 to carry away the waste 10 water.

It is necessary to provide the inner washing cylinder with some form of an air tight cover. In the form shown a rectangular frame 21 is arranged to surround the opening 22. The side 15 flanges 23 of the frame extend inwardly and are formed of an arc slightly eccentric to the arc of the cylinder.

The cover 2 which is formed of an arched plate is slidably arranged between the flanges 23 and the body of the cylinder and a rubber gasket 25 20 is arranged around the flanged edges 26 of the opening 22.

When the cover is rotated to the closed position the eccentrically arranged flanges 23 draw 25 it down against the gasket 25 so as to form a water-tight joint. The front edge of the cover enters between the body of the cylinder and the cross flange 27 and engages a rubber packing 28 and the back edge 29 of the cover which is flanged 30 inwardly engages the packing 30.

A suitable latch fastener 31 is secured to the cover to hold it tightly in position when closed. In order to open the cover it is merely necessary to release the latch and slide the cover back and immediately it is moved it frees itself from the 80 gasket and slides freely in the eccentric flanges.

It will be readily understood that the construction of the device may be varied to a very considerable extent so long as the principal feature of the invention in the sealed rotating chamber with the rigid sealed vane therein is re- 85 tained.

What I claim as my invention is:

A washing machine of the type in which a cylinder is mounted for continuous rotation about a horizontal axis characterized in that said cylinder is provided on the interior with a single radially disposed imperforate partition sealed to the end walls and arcuate walls of the tub and having its free edge terminating substantially 90 axially of the tub for continuous sealing co-operation with a body of cleansing fluid of greater depth than the radial length of said partition, whereby said partition is adapted to cooperate 95 with the body of cleansing fluid in the tub raise the fabrics and compress the air above the fluid and force same through the raised fabrics and fluid during each revolution of the tub. 100

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