June 10, 1924. 1,497,180

C. D. MAXWELL

WASHING MACHINE

Filed Dec. 18, 1919 3 Sheets-Sheet 1

Fig. 1.

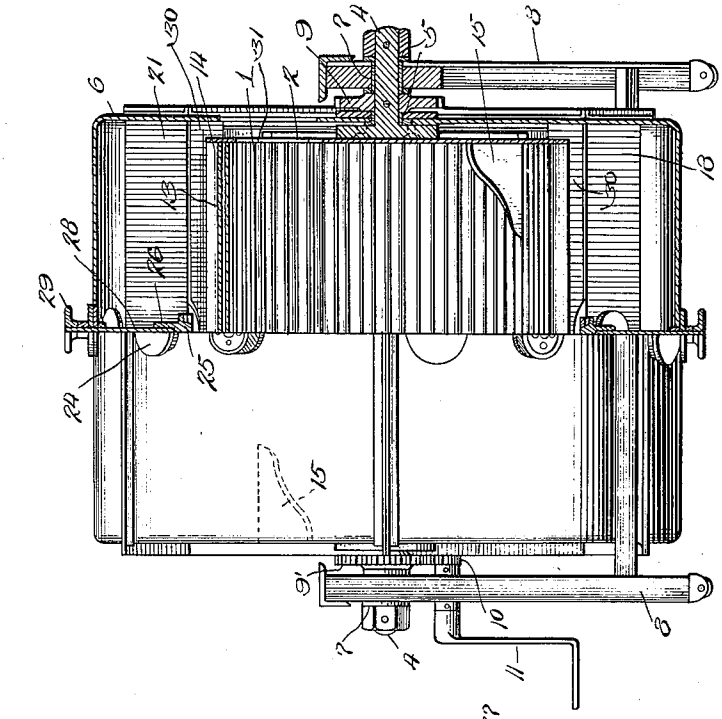
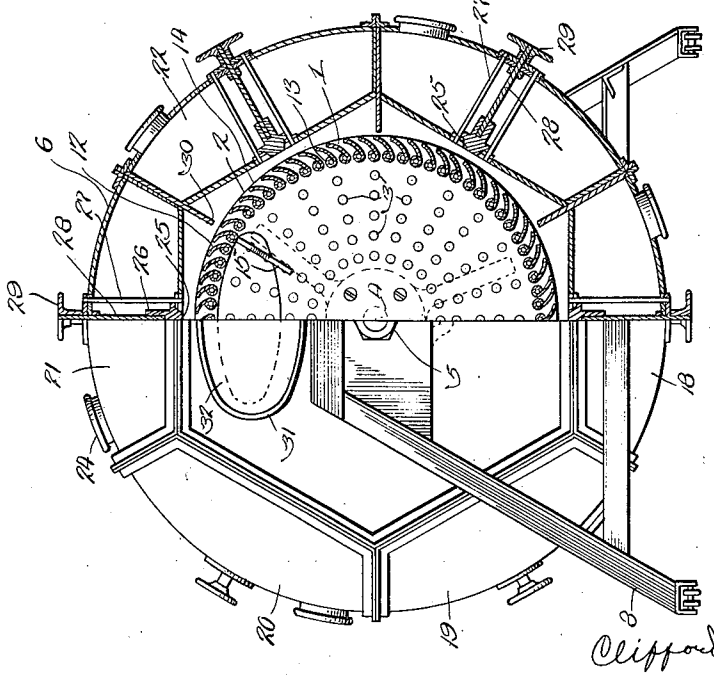


Fig. 2.



Inventor:
Clifford D. Maxwell
Attorney.
C. Dudley Stevens.

June 10, 1924. 1,497,180

C. D. MAXWELL

WASHING MACHINE

Filed Dec. 18, 1919 3 Sheets-Sheet 2

Fig. 3.

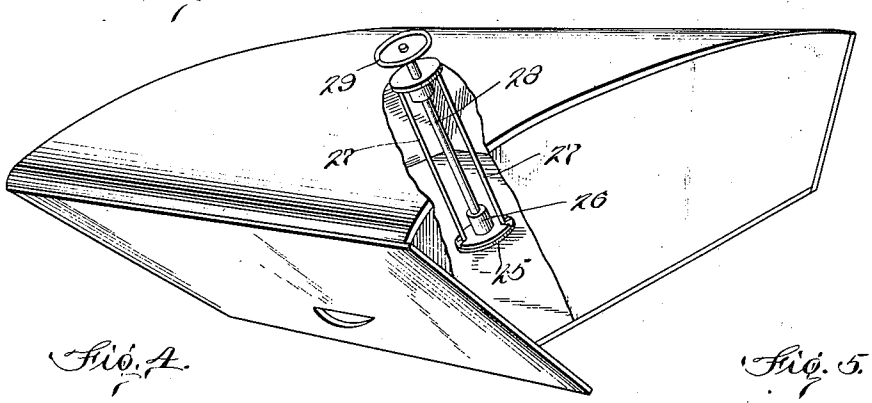


Fig. 4.

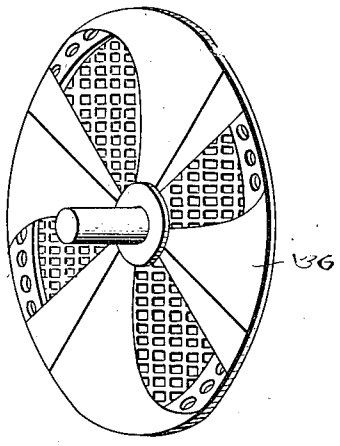


Fig. 5.

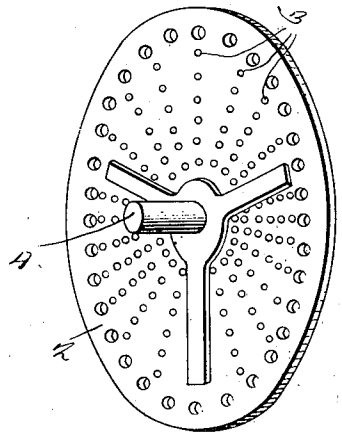
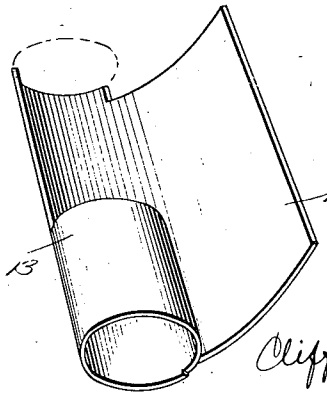


Fig. 6.



Inventor:
Clifford D. Maxwell
Attorney.
C. Hindley Stevens.

June 10, 1924. 1,497,180

C. D. MAXWELL

WASHING MACHINE

Filed Dec. 18, 1919 3 Sheets-Sheet 3

Fig. 7

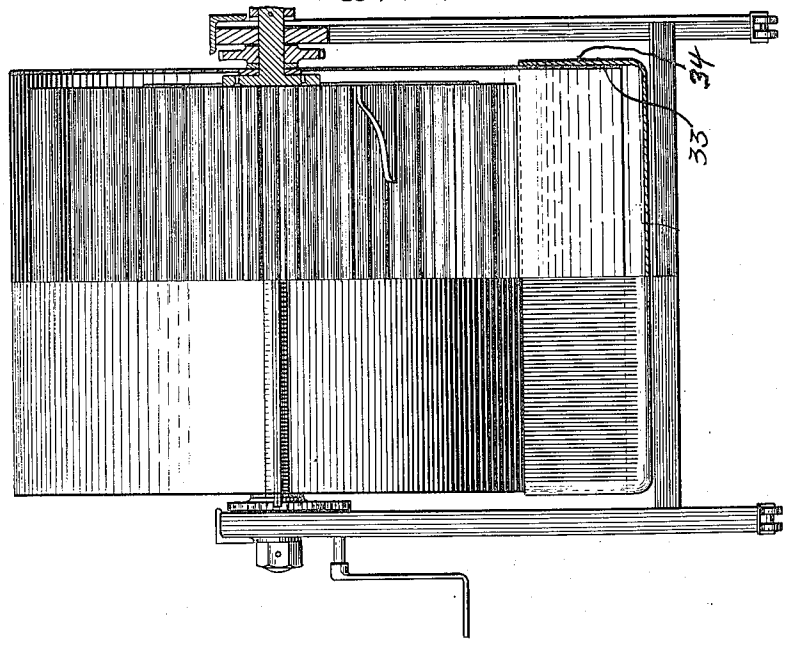
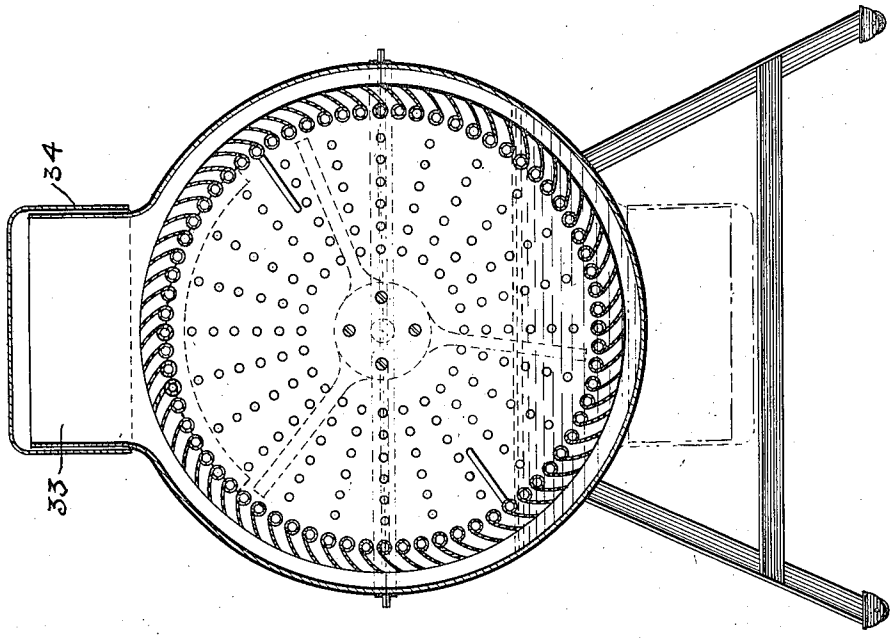


Fig. 8



Inventor
Clifford D. Maxwell
By C. Bradley Pheasey.
Attorney

Patented June 10, 1924. 1,497,180

UNITED STATES PATENT OFFICE.

CLIFFORD D. MAXWELL, OF WASHINGTON, DISTRICT OF COLUMBIA.

WASHING MACHINE.

Application filed December 18, 1919. Serial No. 345,767.

To all whom it may concern:

Be it known that I, CLIFFORD D. MAXWELL, a citizen of the United States, residing at Washington, District of Columbia, have invented new and useful Improvements in Washing Machines, of which the following is a specification.

This invention relates to washing machines of the rotary cylinder type, designed to accomplish with a single structure the manifold operations incidental to the process of washing clothes and other articles.

One object of this invention is to produce a washing machine of the character specified, combining in a unitary structure means by which soiled articles may be subjected to a process of wringing, bluing, starching and drying.

Another object is to provide a washing machine having facilities for producing a thorough agitation of the articles being cleansed while at the same time maintaining a continuous circulation of soapy water through them.

Another object is to provide a washing machine wherein the clothes are held in a loose condition in order to allow the water free access to every article, thus effecting a complete removal of the dirt.

Another object is to provide a washing machine arranged to permit complete draining of the washing water from the clothes containing cylinder and the successive introduction of a series of cleansing waters, each cleansing water being fully withdrawn prior to the admission of that following.

Another object is to provide a washing machine embodying a circular series of compartments, each compartment having a valve-controlled orifice communicating with the clothes container and functioning as reservoirs for the respective washing, cleansing, bluing and starching fluids, to be used as occasion requires.

Another object is to provide a washing machine of simple, durable construction specially adapted to domestic laundry purposes, and capable of handling, without injury, the most delicate fabrics.

With these and other objects in view, my invention consists in certain novel details of construction, combination and arrangement of parts to be hereinafter more particularly set forth and claimed.

Referring more particularly to the accompanying drawings in which corresponding parts are indicated by similar reference characters:

Figure 1, is an end elevation of the machine, with a portion broken away and partly in section.

Figure 2, is a side elevation of the machine partly in section and with a portion of the side removed.

Figure 3, is a perspective view of one of the compartments, a portion being broken away exposing the valve construction shown in elevation.

Figures 4 and 5, are detailed perspective views of modified forms of headers which may be used with the clothes container.

Figure 6, is a detail perspective view of one of the tubes with its blade-like termination which constitute the body portion of the clothes container.

Figure 7, is an end elevation of a modified form of washing machine with a portion broken away and partly in section.

Figure 8, is a transverse vertical section partly in elevation and showing the lower most position of the reservoir in dotted outline.

Briefly this invention consists of an inner rotatively mounted cylindrical clothes container having apertured heads; a body portion formed of a series of tubular members having arcuate fan-like terminations functioning when washing as water elevating and distributing means and when drying as blast producers; a rotary cylindrical housing enclosing the container, and embodying a plurality of compartments which communicate with the clothes container through valve controlled orifices, and serving as reservoirs for the different solutions required to remove the dirt from soiled articles, such as a soapy washing water, a series of cleansing waters, a bluing and a starching solution, any of which may be allowed to flow into active relation with respect to the clothes container and then withdrawn as occasion requires.

In the illustrated embodiment characterizing one form of this invention there is

shown an inner clothes container 1, having heads 2, apertured as at 3, and provided with concentrically mounted outwardly projecting spindles 4, which extend through bearing openings 5 in the outer housing 6 and into bearings 7 in supporting standards 8. One of the spindles 4 carries a gear 9 adapted to mesh with the driving pinion of a motor, (not shown). A gear 9′ on the housing meshes with a pinion 10 on the end of bell-crank 11, the latter being suitably journalled in the adjacent standard 8.

Mounting the container and its housing in this manner enables either to be rotated as required, that is to say, the inner container during the washing operation may be rapidly rotated by the motor geared to it, while the outer housing may be revolved on the spindles of the clothes container by the crank and gear mechanism to properly dispose the requisite compartment in discharging position.

Coming now to the specific construction of the clothes container, (see Figures 1 and 2), this element consists of apertured heads 2 and a cylindrical body 12 formed of a circular series of tubes 13 having curved terminations 14 interposed between the heads 2. These tubes 13 present in effect a corrugated rubbing surface devoid of angular portions which would prove injurious to delicate fabrics. The curved terminations 14 function either as propellers to carry the water upwardly and distribute it between the tubes to the clothing within the container or as fan blades to produce a strong current of air through the container for drying purposes.

Tumbler plates 15 are mounted on the respective heads and project inwardly toward the center of the container to engage the clothes and assist in their agitation.

Referring to the outer housing 6, (see Figure 2), this member is formed with a plurality of segmental compartments 18, 19, 20, 21, 22 and 23 each having a suitable filling opening closed with a cap 24 and a valve opening 25 centrally formed in its floor, said opening being closed by a valve 26 operating between parallel guides 27. The stem 28 of valve 26 projects to the exterior of the compartment and is provided with a thumb piece 29 by which the valve may be raised or lowered.

Baffle plates 30 suitably apertured to permit proper drainage are arranged at the extremities of each compartment and project inwardly towards the interior of the outer housing to prevent the water from racing or swirling around the container as the latter is revolved during operation of the machine.

The side walls of the outer housing 6, as well as the heads of the container, are formed with elliptical openings 31 to permit introduction of the material to be washed. A cover 32 closes the opening 31 in the outer housing 6 as shown in Figure 2 of the drawings.

In the modification illustrated in Figures 7 and 8, the outer housing has a single compartment in the nature of a neck 33, having a cap 34, the cap constituting a receptacle. When the clothes are being wrung or dried, the outer housing is revolved to place receptacle 35 in the position shown in dotted lines, Figure 8, whereupon the water emptying into said receptacle is removed from contact with the container. During the washing operation, receptacle 35 is in the topmost or discharging position as shown in full lines, same figure. With exception of the preceding distinctions this form of machine is the same as that hereinbefore described and for this reason further discussion with respect to it is deemed unnecessary.

The container heads 2 of either form of machine may be designed as shown in Figure 5, or with the fan 36 as disclosed in Figure 4. In this latter construction the curvature of the fan blades is such that the air or water is drawn in one end of the container and discharged through the other, thus producing an extremely strong air or water circulation for washing or drying purposes.

Having described the structural details of this invention, its operation is as follows: Assuming the clothes container to be charged with soiled articles of clothing, compartment 18, filled with a soapy washing water, compartments, 19, 20 and 21 with a series of rinsing waters, and compartments 22 and 23 with bluing and starching solutions respectively, to begin the operation of washing, compartment 18 with the soapy washing solution is brought to topmost position, its valve opened, and its contents permitted to flow into the interior of outer housing 6 to the level shown in dotted lines Figure 2.

Inner container is now rapidly rotated by the motor and gear mechanism previously mentioned whereupon the articles within are subjected to a thorough scrubbing, being caused to pass rapidly over the tubular surface of the container, the soapy water in the meantime, continually circulating longitudinally and transversally through the apertured heads and between the tubes of the container.

After the clothes have been washed for a period sufficient to remove all dirt, the housing is again revolved to dispose compartment 18 in the lowermost position, its valve opened and the soapy water allowed to return to the compartment from which it was emptied.

The washing operation being completed,

the next step is to properly rinse the clothes with clean water, consequently compartments 19, 20 and 21 are each in turn brought to a topmost position, emptied of their contents and then after the container has been suitably rotated, positioned so that the water may be returned to the compartment from which it was emptied. Treating the clothes to this series of rinsing waters effectively removes all soapy or dirty water which may have remained after washing and conditions them for the next step of wringing.

The process of wringing is incidental to the operation of washing and rinsing, since obviously if all water is removed from contact with the container, and the latter rapidly revolved, centrifugal action will cause the water to be thrown from the clothes as they revolve with the container, this together with the twisting effect of the tumblers which are positioned in staggered relations on the container heads for this purpose will serve to effectively remove all surplus water.

Bluing and starching of the clothes is accomplished in the same manner as in the washing operation, that is to say, the compartment containing the bluing solution is brought to topmost position, its contents discharged, the container rotated sufficiently to blue the clothes within after which the solution is returned to its compartment.

This operation is repeated for starching. The clothes are now ready to be dried for ironing, which is accomplished in this wise; as all water is removed from contact with the container, rapid rotation of the latter produces a strong circulation of air through the clothing, since the fan-like terminations 14 which function during washing, to distribute the water between the tubes of the container now serve as fan blades to create, in conjunction with the fan-blades which may be positioned on the inner surface of the container head, (Figure 4), a strong air blast capable of rapidly drying out the clothes.

The operation of the modification shown in Figures 7 and 8, is the same as that above described with this exception, instead of a plurality of compartments this machine has but a single receptacle which must be repeatedly filled with the different solutions employed. This construction dispenses with the valve arrangement described in connection with the other form of machine. To remove the water in contact with the clothes container it is only necessary to position the neck with its cap in its lowermost position whereupon the water flows into the receptacle 35, formed by said neck and cap from which it may be removed and replaced by other solutions as required.

From the above it is obvious, I have designed a washing machine which is compact, simple in construction and inexpensive to produce.

Although in the foregoing, certain elements have been mentioned as best adapted to perform the functions allotted to them, nevertheless it is to be understood that various minor changes with respect to details of construction may be resorted to within the scope of the appended claims without departing from or sacrificing any of the principles of this invention.

Having described my invention, what I claim as new is:—

1. In a washing machine, the combination with a rotary housing provided with a plurality of reservoirs, each reservoir having a charging and discharging position; of a cylindrical container rotatable within the housing and means in connection with the container for producing a circulation of air or liquid through it.

2. In a washing machine, the combination with a rotary housing provided with a circular series of reservoirs, each reservoir having a charging and discharging position, and means in connection with the container for producing a circulation of air or liquid through it.

3. In a washing machine, the combination with a rotary housing provided with a circular series of reservoirs, each reservoir having a valve controlled orifice and a charging and discharging position; of a cylindrical container rotatable within the housing and means in connection with the container for producing a circulation of air or liquid through it.

4. A washing machine, comprising a movable housing equipped with a series of reservoirs, each having charging and discharging positions, a container rotatably positioned within the housing, and means in connection with the container for producing a circulation of air or liquid through it.

5. A washing machine, comprising a movable housing equipped with a circular series of reservoirs, each having charging and discharging positions, a container rotatably positioned within the housing, and means in connection with the container for producing a circulation of air or liquid through it.

6. A washing machine, comprising a movable housing equipped with a series of reservoirs, each having a valve controlled orifice and charging and discharging positions, a container rotatably positioned within the housing, and means in connection with the container for producing a circulation of air or liquid through it.

7. A washing machine, comprising a movable housing equipped with a circular series of reservoirs, each having a valve controlled orifice, and a charging and discharging position, a container rotatably positioned within

the housing, and means in connection with the container for producing a circulation of air or liquid through it.

8. A washing machine comprising a movable housing equipped with a reservoir having charging and discharging positions, a container rotatably positioned within the housing and means in connection with the container for producing a circulation of air or liquid through it.

CLIFFORD D. MAXWELL.

Witnesses:
W. H. FRANKLAND,
H. H. KALUPY.