

Aug. 28, 1934.

R. A. HITCHCOCK
WASHING AND DRYING MACHINE

1,971,979

Filed April 28, 1932 2 Sheets-Sheet 1

Fig. 1.

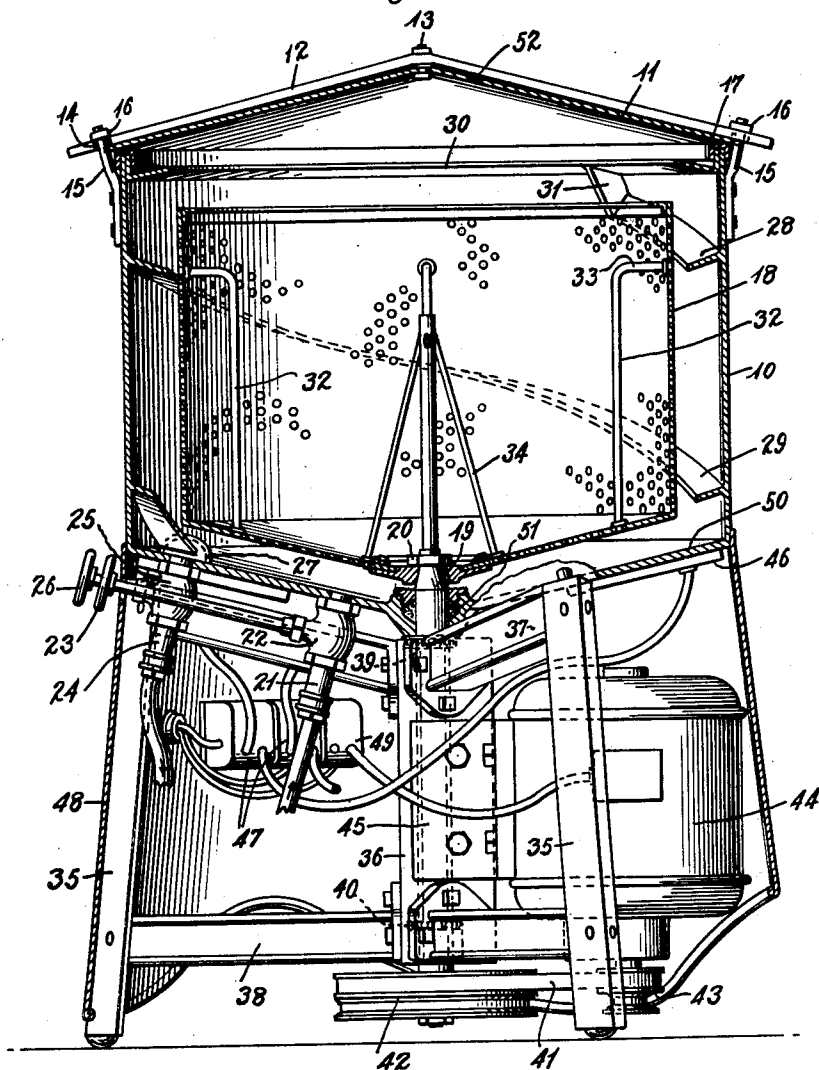
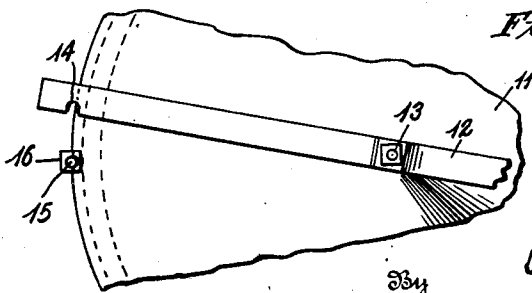


Fig. 2.



Inventor
Raymond A. Hitchcock

Brown & Phelps

Attorneys

UNITED STATES PATENT OFFICE

1,971,979

WASHING AND DRYING MACHINE

Raymond A. Hitchcock, Macon, Ga., assignor to
T. Baldwin Martin, trustee for T. Baldwin
Martin, William Thomas Williford, and Ray-
mond A. Hitchcock, all of Macon, Ga.

Application April 28, 1932, Serial No. 608,076

6 Claims. (Cl. 68—18)

The invention relates to washing machines and has as an object the provision of a machine adapted to both wash and dry fabrics with a minimum of handling by the attendant.

It is an object of the invention to provide a machine washing by centrifugal action, also removing fluid by the same action, and afterward drying the fabrics by hot air driven through the fabrics also by centrifugal action.

It is a further object of the invention to provide a machine into which fabrics to be cleaned may be inserted and which, after being set into operation, will clean, rinse, and dry the fabrics without being stopped.

It is a further object of the invention to improve upon the structures of machines of this character.

Further objects of the invention will appear from the following description when read in connection with the accompanying drawings showing an illustrative embodiment of the invention, and wherein:

Fig. 1 is a side elevation partly in section;

Fig. 2 is a detail plan view of a portion of the cover;

Fig. 3 is a plan view with the cover removed;

Fig. 4 is a bottom plan view; and

Fig. 5 is a detail central vertical section upon an enlarged scale, showing fragments of the basket, the vat bottom and the upper portion of the supporting frame.

As shown the device comprises a vat 10 having a cover 11 shown as clamped upon the vat by means of a bar 12 pivoted upon the cover at 13 and provided with notches 14 at its ends adapted to be swung into engagement with rods 15 provided with nuts 16 under which the bar may be sprung to retain the cover upon the vat. Desirably but not essentially a gasket is shown at 17 upon which the cover seats.

To subject the fabrics to centrifugal action of the fluid or air driven therethrough, there is shown a foraminous basket 18 rotatably mounted upon a vertical axis upon a central shaft 19. The basket is shown as seated upon the tapered upper end of the shaft, being desirably keyed thereto and clamped thereon by means of a nut 20.

To supply cleaning or rinsing fluid to the vat, there is shown a conduit 21 controlled by means of a valve 22, the valve stem being provided with a hand wheel 23. To remove fluid from the vat, there is shown a second conduit 24 also provided with a valve 25, its stem being provided with a hand wheel 26.

Since the fluid will be drawn off from the vat while the basket 18 is in rapid revolution, the opening of conduit 24 into the vat is shown as provided with a shield 27 opening in a direction counter to the revolution of the basket, which is to be revolved in the direction shown by the arrow in Fig. 3.

To feed fluid upwardly in the space between the basket and the wall of the vat, there is shown a pair of spiral ribs 28, 29 spiraling upwardly in the direction of rotation of the basket. The body of fluid in the bottom of the vat will be thrown into rapid revolution by friction with the basket and in its revolution will travel upwardly along the ribs 28, 29. To deflect fluid inwardly so as to fall within the basket upon reaching the upper ends of the spirals 28, 29, there is shown an annular rib 30 overlying the space between the basket and the vat and to assist in this inward deflection of the fluid there is also shown a member 31 at the junction between each spiral rib and the annular rib 30.

As a result of the structure shown, fluid thrown outwardly by centrifugal force through the fabrics will in part fall by gravity to the bottom of the vat to be set in rapid revolution thereby and to be carried upwardly by the ribs and will in part fall upon the ribs themselves where it will join the fluid traveling upwardly thereon until contacting with the member 31 and the rib 30 when it will be projected over the opening of the basket to fall into its interior and again be forced by centrifugal force through the fabrics.

To assist in the washing action by holding a portion of the fabrics away from the openings in the basket and to provide spaces into which fluid may fall, there are shown a plurality of bars 32 standing upwardly in the basket in spaced relation thereto, said bars being desirably braced in their position by being turned as at 33 at right angles and secured to the wall of the basket.

The center part of the basket obviously is subjected to the least centrifugal force and to hold the fabrics away from this non-active space as well as to provide for ingress of fluid into this space, there is shown a cage comprised of rods 34 secured to the bottom wall of the basket. The fluid falling into the space between the rods 32 and the wall of the basket will be struck by the fabric during its rapid revolution and will pass into or through the fabric in a direction tangential or concentric with the motion of the fabric and again be thrown outwardly by centrifugal force, thus increasing the frequency of passage of the fluid through the fabric.

To support the vat there is shown a framework comprising legs 35, a central member 36, and radial members 37, 38 desirably formed of cast aluminum structural shapes for purposes of rigidity.

The shaft 19 is shown as mounted upon ball bearings 39, 40 in the central member 36 and as driven by means of a belt 41 acting between a pulley 42 keyed upon the shaft 19 and a drive pulley 43 keyed upon the vertical shaft of a motor 44, which motor is shown as supported upon a bracket 45 carried by the central member 36.

As shown there are two driving and driven pulleys for the belt 41 of different sizes whereby a variation of speed of the basket 18 may be secured.

To dry fabrics which have been cleaned, rinsed, and the fluid extracted therefrom, during continuous revolution of the basket 18, means are provided to heat the air within the vat. As shown the heating means comprise electric heating elements 46 under control of switches 47 carried by the skirting 48 of the device and a switch 49 is also shown for control of the motor 44. Desirably the switching means are such as to provide different speeds of the motor and different degrees of heat in the heating elements.

The heating elements 46 may be first used to heat the cleaning fluid in the vat to a desired temperature and also to heat rinsing fluid if so desired. After the fabrics have been prepared for drying by having the fluid extracted therefrom, the heating elements may be used to heat the bottom wall 50 of the vat whereby to heat the air therein, which air is driven through the fabrics by centrifugal force and circulates from the space outside the basket over and into the center of the basket very much after the fashion of the circulation of the cleaning fluid therein. It is therefore unnecessary to stop the spinning of the basket after the fabrics have been placed therein during the cleaning, rinsing, fluid extraction, and drying operations.

In prior devices of this character of which I am aware wherein heating means have been provided to heat cleaning fluid in a vat, difficulties have arisen in holding the alignment of the drive shaft. These difficulties have resulted in attempts to drive the basket from above in some instances. To avoid this difficulty the present invention provides the central member 36 rigidly braced from the legs 35 by means of the structural shapes 37, the motor 44 being also supported from the same structural member 36 which carries the shaft 19.

The expansion of the bottom 50 of the vat which is shown as conical in form therefore merely results in a tendency to move vertically on the shaft 19 without affecting the alignment of the bearings of the shaft and the parallel relation thereto of the shaft of the motor 44. Moreover, by utilizing a belt drive any slight misalignment is not serious.

The packing gland 51 about the shaft 19 is desirably filled with asbestos and graphite material which will not be injured by the heat applied to the bottom 50.

An opening 52 is desirably provided in the cover 11 for escape of steam.

The device may be used with dry cleaning fluid in an obvious manner and the used fluid can be run off through conduit 24 and reclaimed for further use.

Since the fabric is not subjected to friction or any stress tending to pull it apart, no damage is done thereto by use of the apparatus.

The use of a belt drive and the elimination of any change-speed gearing or of any structure to change the elevation of the basket provides a very economical device for production.

Minor changes may be made in the physical embodiment of the invention within the scope of the appended claims without departing from the spirit thereof.

I claim:

1. A washing machine comprising, in combination: an upwardly opening vat; a foraminous basket rotatably mounted upon a vertical axis therein, with its wall in spaced relation to the wall of the vat and removable through the open top thereof; a rib carried by the wall of the vat, extending into said space and spiraling upwardly in the direction of rotation of the basket to a point adjacent the upper edge of the basket; obstructive means of substantially the same radial extent as said rib at the upper end of the rib to deflect fluid inwardly to fall into said basket; and means to rapidly revolve the basket.

2. A washing machine comprising, in combination; a vat; a foraminous basket rotatably mounted on a vertical axis therein, in spaced relation to the wall of the vat; means to rapidly revolve the basket; an annular rib carried by the wall of the vat overlying said space above the edge of the basket; a rib carried by the wall of the vat, extending into said space and spiraling upwardly in the direction of rotation of the basket; and obstructive means connecting the spiral and annular ribs to deflect fluid radially inward.

3. A washing machine comprising, in combination: a vat; a foraminous basket rotatably mounted on a vertical axis therein in spaced relation to the wall thereof; means to rapidly revolve the basket; means to propel fluid upwardly in said space and to deflect the same to fall into the basket; and a plurality of vertical rods rising from the floor of the basket to hold fabric out of contact with portions of the wall of the basket.

4. A washing machine comprising, in combination: a vat formed with a closed bottom; a basket rotatably mounted therein on a vertical axis; means to directly heat the bottom of the vat; a drive shaft for said basket projecting through a sealing gland in said bottom; a frame; a motor carried by said frame; means to drive said shaft by said motor; and spaced bearings for said shaft carried by said frame out of engagement with said bottom to prevent disturbance of the alignment of said bearings when the bottom is heated.

5. A washing machine comprising, in combination: a vat; a foraminous basket rotatably mounted therein upon a vertical shaft projecting through the bottom of the vat; a frame to support said vat comprising legs; and a central member supported by said legs, out of contact with the bottom of said vat; spaced bearings for said shaft mounted in said member; a motor supported on said member; means to drive said shaft by said motor; and means to directly heat the bottom of the vat.

6. A washing machine comprising, in combination: a frame; a vat having a liquid tight bottom downwardly sloping toward its center portion, supported on said frame with the central portion of said bottom out of contact with said frame; a basket movably mounted in said vat; a shaft journaled in said frame in bearings out of engagement with said bottom; projecting through the bottom of the vat and secured to said basket; means to drive said shaft; and means exterior of the vat to directly heat a wall thereof, whereby to heat the contents thereof.

RAYMOND A. HITCHCOCK.

CERTIFICATE OF CORRECTION.**Patent No. 1,971,979.****August 28, 1934.****RAYMOND A. HITCHCOCK.**

It is hereby certified that error appears in the printed specification of the above numbered patent requiring correction as follows: Page 2, line 139, claim 6, after "bottom" strike out the semicolon and insert a comma; and that the said Letters Patent should be read with this correction therein that the same may conform to the record of the case in the Patent Office.

Signed and sealed this 2nd day of October, A. D. 1934.

Leslie Frazer

(Seal)

Acting Commissioner of Patents.