

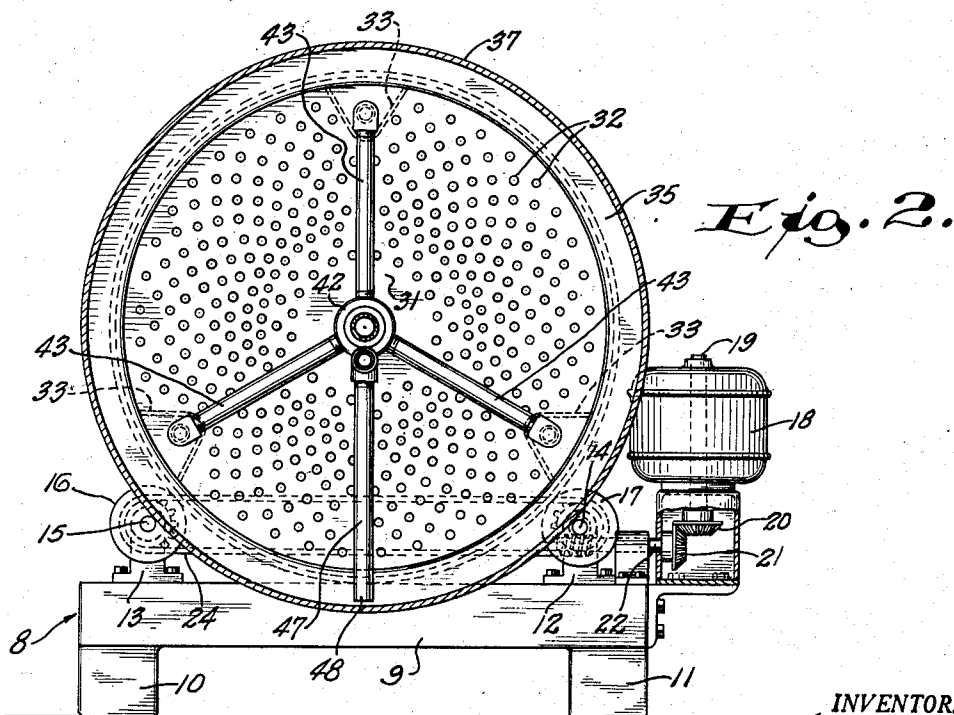
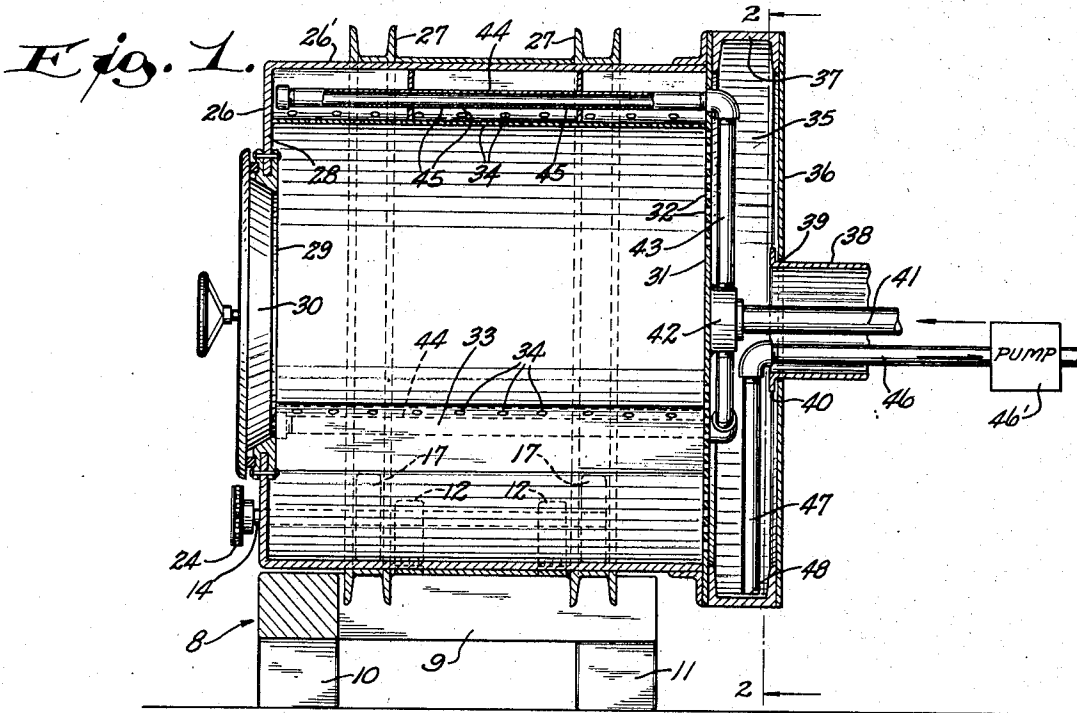
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WASHING MACHINE

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# UNITED STATES PATENT OFFICE

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## WASHING MACHINE

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2 Claims. (Cl. 68—144)

This invention relates to improvements in washing machines suitable for use in either laundry or dry-cleaning operations.

Heretofore, in washing machines, it has been common practice to utilize a cylindrical drum having an apertured periphery which is rotatable in a water containing outer shell. With this type of construction the water flows into and out of the apertures in the periphery of the cylinder during rotation of the latter to effect a cleansing action.

It is a general object of the present invention to provide an improved construction wherein there is no outer shell containing water, and wherein a washing cylinder, rotatable on a horizontal axis and having a peripheral wall which is imperforate throughout the major portion of the axial length of the cylinder, contains both the water and the garments to be cleaned, there being means on the inner side of the peripheral wall of the cylinder for agitating and lifting the water to splash the same upon the garments as the cylinder rotates, with all the water confined in said cylinder.

A further object of the invention is to provide improved means for effectively introducing water or dry-cleaning fluid into the interior of the cylinder and for discharging the spent liquid.

A more specific object of the invention is to provide a washer as above described, having an imperforate peripheral wall, wherein there is an auxiliary discharge chamber at one end of the drum separated from the main washing chamber by a perforated wall, there being hollow perforated garment lifting ribs in the main washing chamber terminating at one end at said perforated wall, and there being means housed in said auxiliary chamber for conducting water or cleaning fluid directly into said hollow ribs so that the liquid is ultimately discharged radially inwardly from said hollow perforated ribs and onto the garments within the washing chamber.

A still further object of the invention is to provide a washer as above described wherein the water or cleaning fluid is first introduced axially into the auxiliary chamber and then through radial conduits located in said auxiliary chamber to the garment lifting ribs.

A further object of the invention is to provide an improved washer as above described wherein there is means located in the auxiliary chamber for removing spent liquid which has circulated from the washing chamber, through the perforated wall, and into said auxiliary discharge chamber.

With the above and other objects in view the invention consists of the improved washing machine, and all its parts and combinations as set forth in the claims and all equivalents thereof.

In the accompanying drawing, illustrating one complete embodiment of the preferred form of the invention, in which the same reference numerals designate the same parts in all of the views:

Fig. 1 is a vertical section taken axially of the drum and illustrating the improved washing machine; and

Fig. 2 is a sectional view taken on the line 2—2 of Fig. 1.

Referring more particularly to the drawing, the numeral 8 designates a suitable supporting frame having base members 9 and supporting legs 10 and 11. Suitably supported on the base are upstanding bearing members 12 on one side and 13 on the other side. A shaft 14 is journaled in the bearing members 12, and a shaft 15 is journaled in the bearing members 13. The shaft 15 has rigidly mounted thereon drum supporting rollers 16, and similar rollers 17 are rigidly mounted on the shaft 14.

Any suitable arrangement may be utilized for causing rotation of the drum on the rollers 16 and 17. As one method of accomplishing this function, there is an electric motor 18, or other prime mover, having its drive shaft 19 provided with a bevel gear 21 on a horizontal shaft 22. The horizontal shaft 22 is adapted to drive through a worm and wormwheel connection, the shaft 14. The forward end of the shaft 14 is equipped with a rigidly mounted sprocket wheel which is connected by an endless chain 24 with a sprocket wheel mounted rigidly on the forward end of the other shaft 15. Thus, operation of the motor 18, in a desired direction, causes simultaneous rotation of the two sets of drum supporting rollers 16 and 17. If desired, any well-known mechanism may be employed to cause the drum to oscillate rather than rotate continually in the same direction.

The washing cylinder or drum 26 is mounted for rotation on a horizontal axis. This drum is equipped with external peripheral tracks 27 and is supported for rotation on the rollers 16 and 17. The rollers engage within the tracks, as shown in Fig. 1, to cause rotation or other movement of the drum.

The peripheral wall portion 26' of the drum is imperforate, and the front end wall 28 is provided with a loading opening 29 which is normally closed by a door 30. At the opposite or

inner end of the drum is a wall 31 formed with perforations 32 therein. These perforations preferably cover the entire wall except for the center portion thereof. Supported on the inner surface of the peripheral wall portion 26' and extending between the end wall 28 and the perforated wall 31 are a plurality of hollow ribs 33. These ribs are adapted to lift water or other liquid in the lower portion of the cylinder, as the cylinder rotates, and splash said liquid back on the garments. The ribs also keep the liquid in an agitated condition and serve to keep the garments in motion. The ribs are also formed with perforations 34 for a purpose to be hereinafter explained.

The openings 32 in the perforated wall 31 communicate with an auxiliary discharge chamber 35 and said discharge chamber has an imperforate end wall 36 which is spaced from the perforated wall 31. The auxiliary discharge chamber also has a peripheral wall portion 37.

A sleeve 38, which is suitably supported against rotation, extends axially into an opening 39 in the end wall 36. The sleeve 38 may be provided with an annular flange 40 within the auxiliary discharge chamber 35. Any suitable sealing means may be utilized to prevent loss of liquid through the opening 39 around the sleeve 38. Extending axially to the sleeve 38 is a supply conduit 41 for fresh water, soap, steam, or dry-cleaning fluid. The inner end of the supply conduit 41 extends into a hollow hub member 42. The hub member 42 is secured to the perforated wall 31 and is rotatable with the drum and around the inner end of the supply conduit 41. A suitable seal may be provided at this rotating joint. Conduits 43, housed within the auxiliary chamber 35, extend radially outwardly from the hub member 42. These conduits 43 may discharge directly into the ends of the hollow garment lifting ribs 33. However, it is preferred to have the conduit portions 43 connect with other conduits 44 which extend longitudinally within the hollow garment lifting ribs 33. The conduit portions 44 are provided with liquid discharge openings 45.

A discharge conduit 46, which extends longitudinally through the sleeve 38, communicates with a suction pipe 47 which extends radially within the discharge chamber 35. The lower end 48 of the pipe 47 is open and positioned near the periphery of the chamber 35. The pipe 46 may connect with a suitable suction pump 46' so that spent liquid may be removed from the discharge chamber 35. This used liquid may, if desired, be reconditioned in any well-known manner and recirculated.

During use of the improved washer, the garments to be cleaned are first positioned within the washing chamber and the door 30 is closed. Next, the motor 18 is started to cause rotation or other movement of the drum 26. Hot water and soap, or a suitable dry-cleaning fluid is directed through the inlet pipe 41 under pressure. From the pipe 41 the cleaning liquid flows radially outwardly through all of the conduits 43 at the same time. The liquid then enters the longitudinal conduit portions 44 and is discharged into the interior of the hollow perforated ribs 33. After these ribs have been filled with liquid, the liquid is forcibly discharged from the openings 34 in the ribs toward the center of the drum. The multiplicity of small streams of liquid, extending throughout the length of the washing chamber, will act effectively on the garments within the

drum as the garments are being agitated by the rotation of the drum and by the action of the garment lifting ribs. After the drum has been filled to a desired level with the washing liquid, some of the spent liquid will continually flow into the auxiliary discharge chamber 35. It is possible to operate the machine so that fresh liquid is continually admitted while spent liquid is continually withdrawn by the suction pipe 47. It is also possible to shut off the supply of fresh liquid and to shut off the suction pump and permit the washer to operate for a desired period before the used liquid is withdrawn.

By having the radial conduits 43 located within the auxiliary discharge chamber 35 and by having the longitudinal conduit portions 44 located within the hollow ribs, these conduits will in no way interfere with the garments and will not come in contact therewith. The construction is inexpensive to manufacture because of the simple method of introducing the washing liquid and of withdrawing the spent liquid and because no outer shell is necessary.

Various changes and modifications may be made within the spirit of the invention and all of such changes are contemplated as may come within the scope of the claims.

What we claim is:

1. A washing machine comprising a drum having a wall at one end provided with a garment-loading opening, spaced parallel walls at the opposite end of the drum defining an auxiliary chamber therebetween, the inner wall of said auxiliary chamber having liquid perforations communicating with the interior of the drum proper, means engageable with the periphery of the drum supporting the same for rotation on a horizontal axis, a non-rotatable sleeve extending axially into the auxiliary chamber at one end of the drum around which the drum is rotatable, a fluid inlet pipe extending axially in said sleeve and into said auxiliary chamber, means in the auxiliary chamber close to one wall thereof rotatable with the drum for conducting fluid from said inlet pipe to points of discharge in the drum proper which are spaced radially outwardly from the axis of the drum, a discharge pipe eccentrically positioned in said sleeve and having an end projecting into the auxiliary chamber, a branch pipe rigidly connected to said end and projecting in a radial direction in said auxiliary chamber close to the opposite wall from the wall which is adjacent said means for conducting fluid from the inlet pipe and having an open end located near the bottom of the chamber, and a pump connected to said discharge pipe.

2. A washing machine comprising a drum having a wall at one end provided with a garment-loading opening, spaced parallel walls at the opposite end of the drum defining an auxiliary chamber therebetween, the inner wall of said auxiliary chamber having liquid perforations communicating with the interior of the drum proper, means engageable with the periphery of the drum supporting the same for rotation on a horizontal axis, a non-rotatable sleeve extending axially into the auxiliary chamber at one end of the drum around which the drum is rotatable, a fluid inlet pipe extending axially in said sleeve and into said auxiliary chamber, a hub member located centrally within said auxiliary chamber and rotatable with the drum and forming a fluid header which rotates around said fluid inlet pipe and into which said pipe discharges, means close to one wall of the auxiliary chamber and extend-

big radially outwardly from said hub member for conducting fluid to points of discharge in the drum proper which are spaced radially outwardly from the axis of the drum, a discharge pipe eccentrically positioned in said sleeve and having an end projecting into the auxiliary chamber, a branch pipe rigidly connected to said end and projecting in a radial direction in

said auxiliary chamber close to the opposite wall from the wall which is adjacent the first-mentioned radially extending means and having an open end located near the bottom of the chamber, and a pump connected to said discharge pipe.

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