March 2, 1948. E. A. WHEELER 2,437,179

PERIPHERAL DRAIN MEANS FOR LAUNDRY MACHINES

Filed March 18, 1947 2 Sheets-Sheet 1

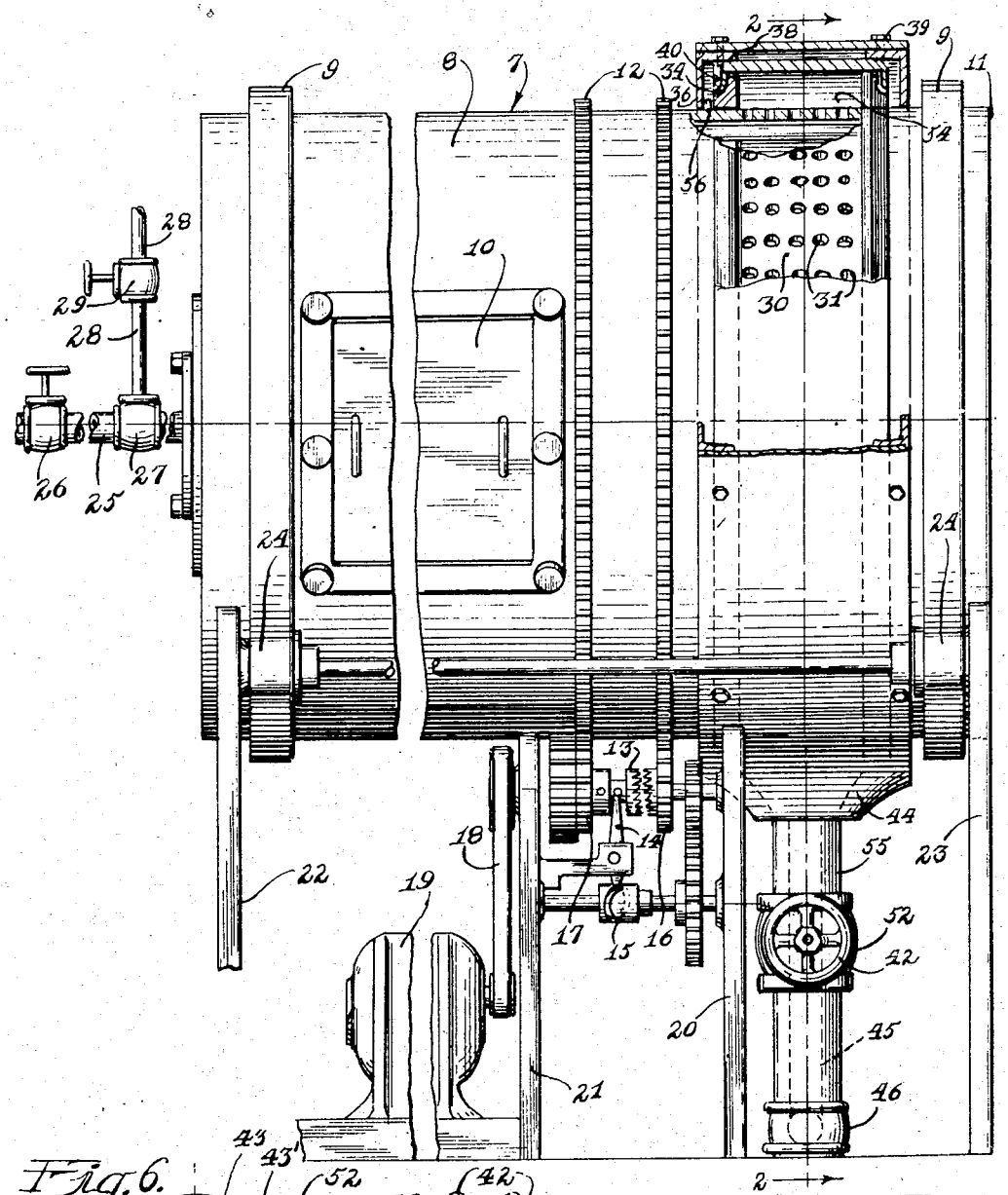


Fig. 1.

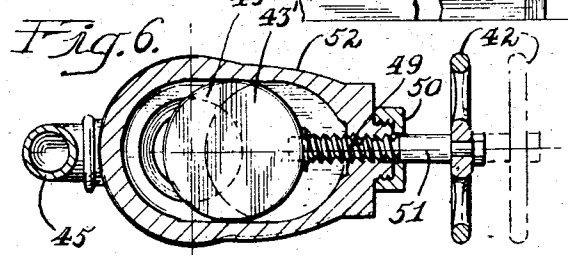


Fig. 6.

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PERIPHERAL DRAIN MEANS FOR LAUNDRY MACHINES

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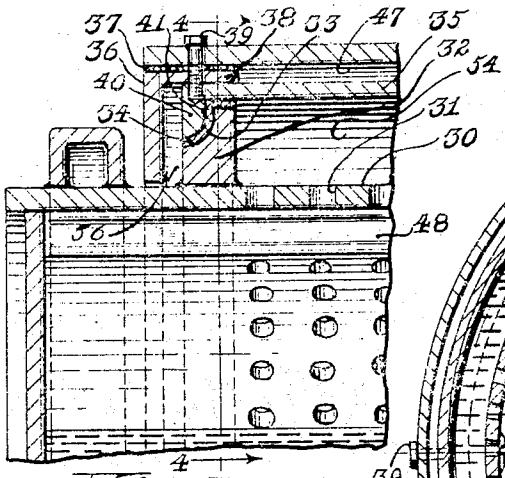


Fig. 3.

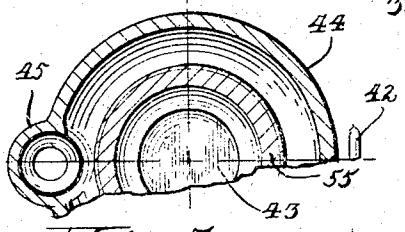


Fig. 5.

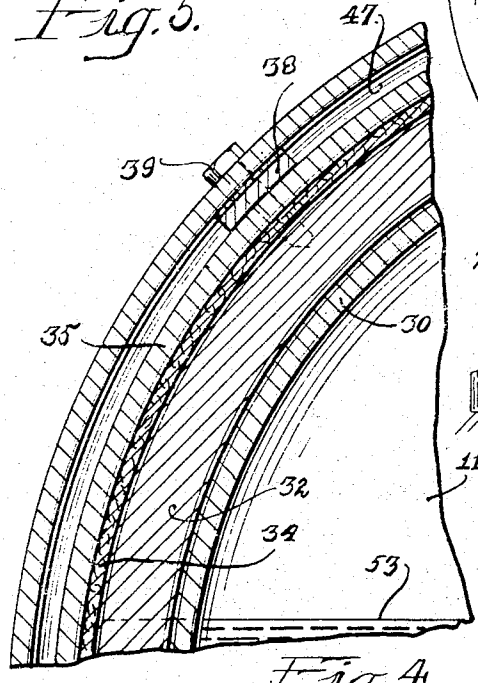


Fig. 4.

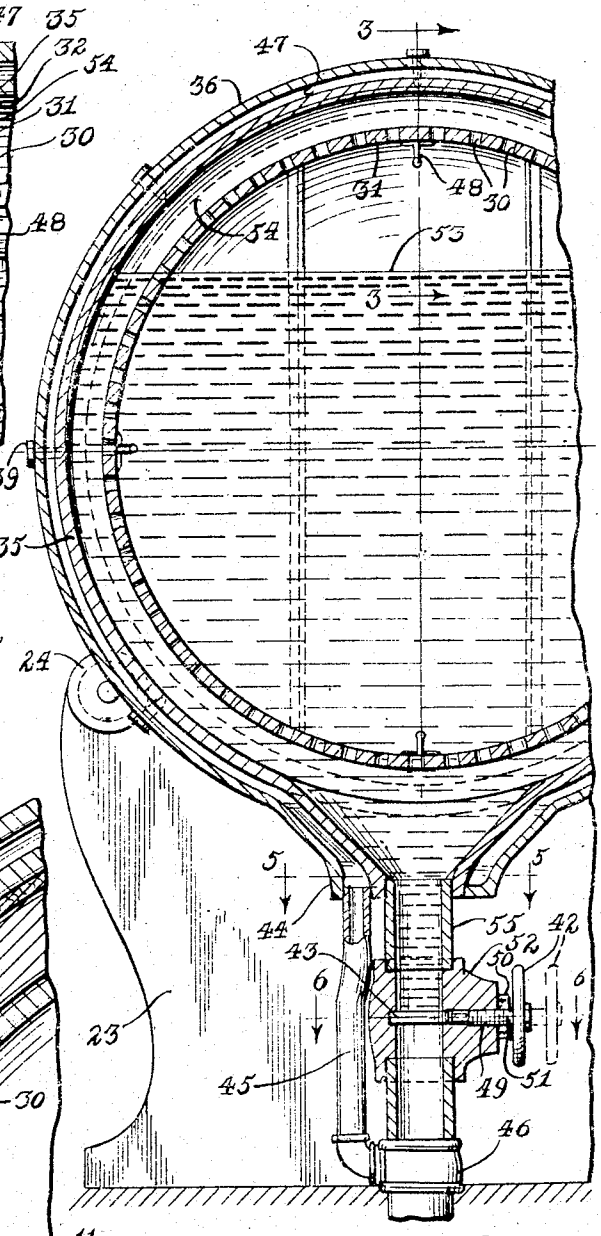


Fig. 2.

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UNITED STATES PATENT OFFICE

2,437,179

PERIPHERAL DRAIN MEANS FOR LAUNDRY MACHINES

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Application March 18, 1947, Serial No. 735,324

6 Claims. (Cl. 68—144)

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My invention relates to improvements in laundry machinery especially with respect to draining therefrom liquids that are used for laundering and rinsing operations, and related to my copending patent application designated Serial Number 679,805, filed June 27, 1946.

An important object of my invention is to provide in a laundry machine, what I term a peripheral drain means in a shell-less type of machine, that is, where a single drum is used.

Another object of my invention is to provide peripheral drain means on the rotating shell or drum of the laundry machine, which is equipped with a series of perforations communicating with an annularly confined drain area, in turn connected to a drain duct controlled by suitable gate valve means.

A still further object of my invention is to provide peripheral drain means equipped with splash seal means so as to assure the proper draining of the liquids; the said splash seal means being provided with an auxiliary drain communicating with the main drain means of the laundry machine.

A further object of my invention is to provide peripheral drain means consisting of a perforated peripheral portion on a rotating laundry machine drum, the same being equipped with end walled sections forming a seal with an annularly constructed and formed mating element or means, the same being stationary and secured to the splash seal or guard means, to be maintained in stationary position against the mating walls formed on the said peripheral portion outside of the confines of the said perforated peripheral section.

A further object of my invention is to provide valve control means associated with the said peripheral drain means, which will permit the same to be maintained closed for washing operations, or partly open for washing and rinsing operations, or open for draining purposes when the laundering operation is considered complete.

A still further object of my invention is to provide a shell-less type of laundry machine provided with peripheral drain means, and which may be rotated a number of times in clockwise and counter-clockwise directions intermittently so as to effectively and efficiently wash or launder soiled material deposited therein.

Other objects and advantages inherent in my invention will become apparent from an examination of the accompanying drawings, more clearly described in the ensuing description, in which

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like symbols are used to designate like parts, and in which:

Fig. 1 represents a front view of my laundry machine.

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

Fig. 3 is a fragmentary and enlarged cross-sectional view taken substantially on the line 3—3 of Fig. 2.

Fig. 4 is a fragmentary sectional view taken substantially on the line 4—4 of Fig. 3.

Fig. 5 is a cross-sectional view taken substantially on the line 5—5 of Fig. 2.

Fig. 6 is a sectional view of the valve used in connection with the drain duct and is taken as a section along the line 6—6 of Fig. 2.

Referring to the various views, my invention is generally designated 7 and consists of a rotating drum 8 which is geared to rotate by virtue of the annular gear structure 12 in mesh with direct rotational gearing 16, and the reverse gearing 17, through the medium of a dual clutch 13, shifted by a fork 14, engaged by the cam 15, the clutch being alternately engaged to drive the drum through one of the gears 12 in a clockwise direction, and in a contra-clockwise direction through the other gear 12. The gearing and cam mechanism for operating the drum is supported on the framework 20 and 21.

The drum is supported preferably by means of annularly formed projections 9 on the exterior surface of the drum 8 which rest in cradle-like fashion on a number of flanged rollers 24, supported on the base consisting of frames 22 and 23. The prime mover 19 through the belt 18 furnishes motivation in one direction and, by virtue of the aforesaid duplex clutch means 13, the drum movements are effectuated in clockwise and counter-clockwise directions.

A door 10 is provided and is removably attached to the drum 8 so that clothes may be deposited therein or removed therefrom.

One end of the drum is closed as at 11; the other end also being closed with the exception that suitable communicating and connecting flanges are provided in order to permit the attachment of the feed line 25 to which are secured the control valve 26 connected to some source of liquid supply, a T 27 being provided in the pipe line 25 for connecting the pipe line 28 with its valve control 29 through which steam under pressure is fed into the machine, quite common practice in laundry equipment.

Water and steam in proper admixture according to the manipulation and settings of the valves

26 and 29 are fed into the machine after the clothes have been deposited therein. The machine being equipped to rotate the drum 8 in clockwise and counter-clockwise directions, by virtue of the ribs 48, prevents the clothes deposited therein from moving in the same path or number of revolutions as the drum, the said ribs interrupt the movement of the clothes therein, and thus cause the said clothes to be continually shifted about within the drum independently of the rotational movements imparted thereto, in order to more effectively launder the textile materials deposited in the laundry machine. The liquid level is preferably maintained as indicated at 53 so as to permit the laundering and washing to be efficiently performed.

The drum 8 is provided with a peripheral section thereof 30, having a multiplicity of holes 31, through which holes the draining of the said liquid 53 is effectuated when the laundering operation has been completed. On each side of the peripherally perforated portion 31 are walls 32 secured to the drum 8 so as to provide an area 54 confined between the stationary enclosure 35, having a depending lip 40, which is arcuately formed as indicated at 41, in order to mate with the arcuate formation 33 on the walls 32. Suitable sealing or packing material 34 is interposed between the said arcuate portions and the outer peripheral portions of the walls 32 so that, when the drum is rotatably operative, no liquid will escape from the confines 54. The cylindrical section 35 is held in place by a splash guard structure 36 of cylindrical formation, secured to an annularly formed structure 38, in turn secured to the cylindrical section 36 and to the section 35 by means of cap screws 39. The packing 37, or other similar material, may be used to effectively seal the joints between the section 36 and the annularly formed section 38.

Thus, a space 47 is provided about the outer peripheral portion of the seal element 35 and the interior of the splash guard 36, communicating with the confines 56. The guard element 36 terminates in a suitable outlet 44 to which is secured an auxiliary drain 45, connected through suitable elbow means, to the main drain 46 which may be positioned in the floor of the laundry establishment so as to drain out, through proper sewage connections, the liquids from the laundry equipment. The annular section 35, which is stationary, also terminates in a reduced outlet at the bottom 55 to which is connected the valve body 52, having a gate 43 therein, and a manipulating hand-wheel 42 secured to a threaded stud 51 operating in the threaded portion 49 of the valve body 52 and secured by the gland nut 50 to prevent leakage.

In Fig. 6, I show the gate of the valve in two positions; at 43, in partly open position for rinsing operations and, in dotted lines as shown at 43', the gate is open in order to permit draining at a rapid rate, at a time when it may be desired to refill the machine with a fresh supply of liquid washing solution.

The operation of the machine is simple. When the valves 29 and 26 are open, the drain valve 52 is closed, thus the machine is charged with a suitable quantity of liquid 53 and steam under pressure for laundry operation. The drum is subjected to a number of clockwise and counter-clockwise revolutions intermittently.

When the laundry operation is deemed complete, the liquid 53 is drained out through the valve 52. Then, the valves 26 and 29, or the valve 26 may be left open in order to permit draining and rinsing simultaneously, the valve 52 being in partly open position so as to make available a rinsing operation at a slow rate. If rinsing at a rapid rate is desired, the valve 52 may be completely opened and the water allowed to circulate through rapidly, which is fed originally through the open valve 26.

While the laundering operation is being performed, the valve 52 is in a closed position as shown by the full lines of the hand-wheel 42 in Fig. 2; thus, no liquid will escape but the liquid 53 will be confined above the valve 52 to the level area indicated in Fig. 2.

The advantage in using a construction of this type is that it eliminates an outer shell, a single drum only being needed, and the draining of the liquid from the rotating drum is done substantially adjacent one of its ends so as to more effectively drain through the foreign elements which have been dislodged from the materials being laundered, thus more effectively draining through any such residue as abrasives, metal filings, and such other materials which have become lodged in the interstices of the textile material permitting the same to be cleaned thoroughly. The materials usually cleaned in laundry equipment of this type are of the heavy duty variety, such as overalls, wash cloths, rags, and such other textile materials which become heavily encumbered with substances that should be removed for sanitary reasons as well as for efficient laundering.

I wish to stress that, in providing a peripheral drain structure of the type herein indicated, I find it essential to incorporate suitable seal means and, for added and auxiliary protection, I provide a splash guard to retain any slight amount of liquid that may escape the seal means provided, the machine being operable suitably by virtue of a peripheral drain structure embodied in a single shell or drum machine working in concert with a suitable drain valve mechanism.

Although I have indicated the general construction of a laundry machine of this type, it may be stated that mechanical equivalents of the said structure may be resorted to without departing from the spirit and scope of the invention herein illustrated suggestively. The means for driving the drum may be altered to any equivalent mechanical means. However, the important feature of the machine is the peripheral drain means located substantially near one end of the machine in order to more effectively drain the same as distinguished from draining through what is known as a dual shell type of machine wherein the draining is performed throughout the entire peripheral length and surface of the inner shell wherein the clothes are deposited, thus causing the clothes to act as a strainer and prevent the dislodgment of the foreign particles of matter which should be removed therefrom. With this type of construction, the tendency of the clothes is to act as filters and partial drains preventing carrying off of the material which had first been dislodged and floated into the washing liquid; draining through the materials is thus minimized when but a small peripheral section of one single drum is confined to draining the machine.

It is thought that the advantages resulting from my improved construction can be readily understood from the foregoing description, taken in connection with the accompanying drawings, and it should be noted that various changes may be made in the details of construction without departing from the general scope and spirit of my

invention, providing they are within the scope of the subjoined or appended claims.

Having thus disclosed and revealed my invention, what I claim as new, and desire to secure by Letters Patent, is:

1. In a laundry machine of the character described, drum means rotatably confined and provided with perforated peripherally cylindrical drain means embracing a comparatively small peripheral portion adjacent one end of the said drum means, annular walls secured to the said drum means on each side of the said cylindrical drain means, stationary drain means sealably confining the said annular walls, splash guard means encasing the said stationary drain means and supporting the same, the said stationary drain means terminating in a downwardly depending outlet, and valve means secured to the said outlet.

2. In a laundry machine of the character described, drum means rotatably confined and provided with perforated peripherally cylindrical drain means embracing a comparatively small peripheral portion adjacent one end of the said drum means, annular walls secured to the said drum means on each side of the said cylindrical drain means, stationary drain means sealably confining the said annular walls, splash guard means encasing the said stationary drain means and supporting the same, the said stationary drain means terminating in a downwardly depending outlet, and valve means secured to the said outlet, the said splash guard means terminating in a downwardly depending outlet.

3. In a laundry machine of the character described, drum means rotatably confined and provided with perforated peripherally cylindrical drain means embracing a comparatively small peripheral portion adjacent one end of the said drum means, annular walls secured to the said drum means on each side of the said cylindrical drain means, stationary drain means sealably confining the said annular walls, splash guard means encasing the said stationary drain means and supporting the same, the said stationary drain means terminating in a downwardly depending outlet, and valve means secured to the said outlet, the said splash guard means terminating in a downwardly depending outlet, the said second-mentioned depending outlet being connected to the said first-mentioned depending outlet at a point below the said valve means.

4. In a laundry machine of the character described, drum means rotatably confined and provided with perforated peripherally cylindrical drain means embracing a comparatively small peripheral portion adjacent one end of the said drum means, annular walls secured to the said drum means on each side of the said cylindrical drain means, stationary drain means sealably confining the said annular walls, splash guard means encasing the said stationary drain means and supporting the same, the said stationary drain means terminating in a downwardly depending outlet, and valve means secured to the said outlet, the said annular walls having undercut portions of arcuate cross-sectional configuration circumferentially thereabout, the said stationary drain means being provided with downwardly depending walls having circumferential undercut portions of mating configuration with the said first-mentioned undercut portions, and gasket means interposed between the said undercut portions.

5. In a laundry machine of the character described, drum means rotatably confined and provided with perforated peripherally cylindrical drain means embracing a comparatively small peripheral portion adjacent one end of the said drum means, annular walls secured to the said drum means on each side of the said cylindrical drain means, stationary drain means sealably confining the said annular walls, splash guard means encasing the said stationary drain means and supporting the same, the said stationary drain means terminating in a downwardly depending outlet, and valve means secured to the said outlet, the said splash guard means terminating in a downwardly depending outlet, the said annular walls having undercut portions of arcuate cross-sectional configuration circumferentially thereabout, the said stationary drain means being provided with downwardly depending walls having circumferential undercut portions of mating configuration with the said first-mentioned undercut portions, and gasket means interposed between the said undercut portions.

6. In a laundry machine of the character described, drum means rotatably confined and provided with perforated peripherally cylindrical drain means embracing a comparatively small peripheral portion adjacent one end of the said drum means, annular walls secured to the said drum means on each side of the said cylindrical drain means, stationary drain means sealably confining the said annular walls, splash guard means encasing the said stationary drain means and supporting the same, the said stationary drain means terminating in a downwardly depending outlet, and valve means secured to the said outlet, the said splash guard means terminating in a downwardly depending outlet, the said second-mentioned depending outlet being connected to the said first-mentioned depending outlet at a point below the said valve means, the said annular walls having undercut portions of arcuate cross-sectional configuration circumferentially thereabout, the said stationary drain means being provided with downwardly depending walls having circumferential undercut portions of mating configuration with the said first-mentioned undercut portions, and gasket means interposed between the said undercut portions.

EDWARD A. WHEELER.