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UNLOADING MEANS FOR ROTATABLE CONTAINERS

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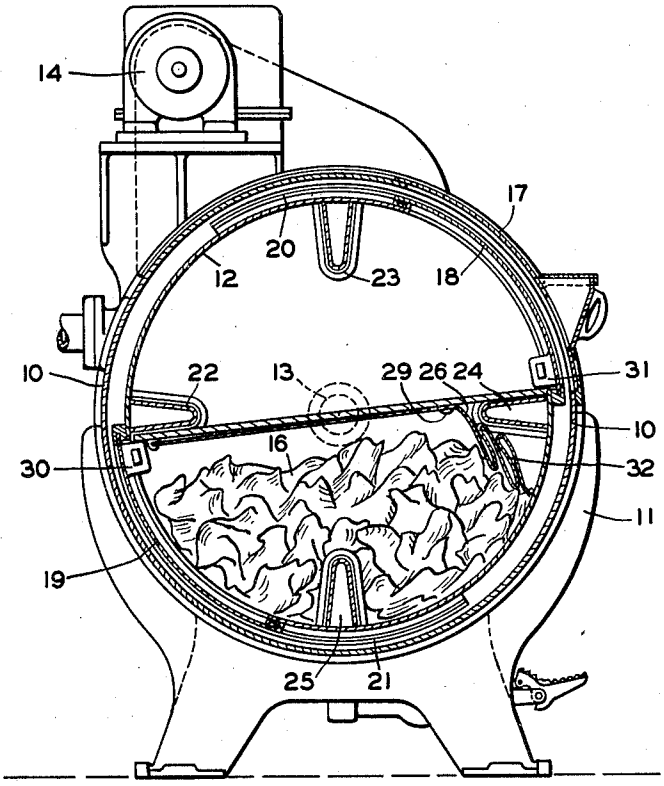


FIG-1

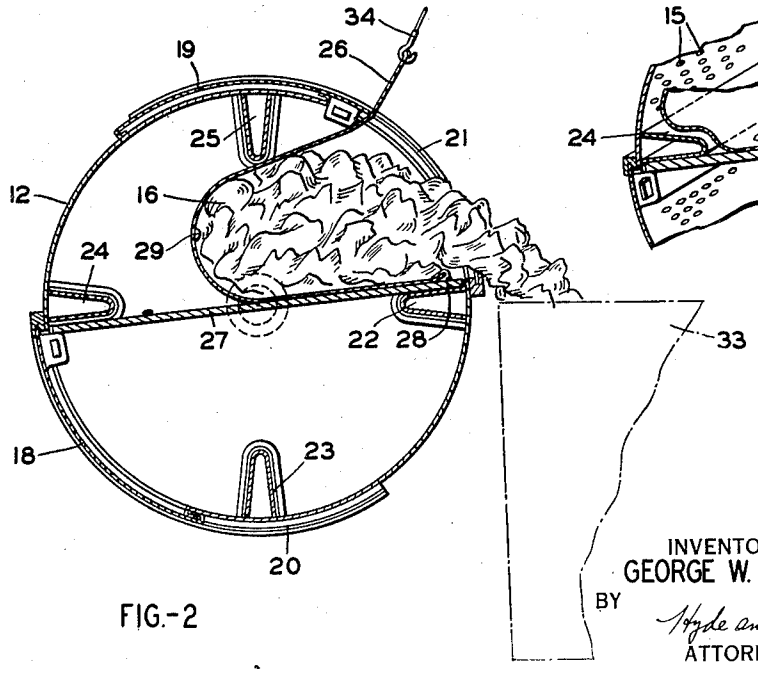


FIG.-2

FIG.-3

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UNLOADING MEANS FOR ROTATABLE CONTAINERS

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4 Claims. (Cl. 68—210)

The invention relates to an unloading means for laundry machinery. It particularly relates to unloading means for machines of the type wherein articles are washed, cleaned, tumbled, dried, or otherwise processed in a rotatable container.

Although for simplicity and convenience the invention will be illustrated and described as applied to a washing machine wherein a foraminous, goods-containing cylinder rotates within a stationary, liquid-containing casing, it will be apparent that it is also applicable to the so-called tubless type washer wherein a single container, usually cylindrical, performs both the function of the rotatable, inner, goods-containing cylinder and the outer, stationary liquid-containing shell of the conventional type of washer.

Withdrawal of the load from machines of this type presents problems involving more than mere inconvenience. The loading and unloading door is usually at or above the axis of rotation of the cylinder, and necessarily above the level of the detergent or cleaning fluid, and the load when wet is materially heavier than at the time of its insertion in the machine. While in this condition the work is sometimes torn or otherwise damaged during removal by reason of being dragged upwardly and outwardly across projections in the vicinity of the unloading doors.

It is an object of the invention to provide improved unloading means which may be readily inserted in the machine when the washing or cleaning operation is finished, and whereby the goods may be rapidly, safely, and efficiently removed in accordance with the novel method now to be described.

Other objects and advantages will be apparent from a study of the following description in conjunction with the attached drawing which is intended to be illustrative merely, and not limiting.

Fig. 1 is a sectional end elevation of a washing machine showing the unloading means applied thereto.

Fig. 2 shows, in section, the rotatable cylinder of Fig. 1, the unloading operation being partially completed.

Fig. 3 is a view, in perspective, of a fragmentary portion of the cylinder and unloading means.

The drawing illustrates a conventional washing machine comprising a stationary casing 10 carried by a supporting frame 11. A goods-containing cylinder 12 rotates on a longitudinal axis in bearings 13 supported by the frame 11 or casing 10 in the usual manner. Cylinder 12 is driven through suitable intermediate power transmission means from motor 14, and means for starting, stopping, and inching, being conventional, is not herein shown. Means, also not shown, is provided for introducing and discharging detergent, water, cleaning fluids, and supplies to casing 10 from whence they have access, through apertures 15 in the cylinder 12, to the work 16. The casing is provided with a door opening, sealed by a sliding door 17 when the machine is in operation, the lower horizontal sill of the door opening being in the vicinity of the horizontal plane of the axis of rotation of the cylinder.

The cylinder 12 is provided, in the present embodiment, with two diametrically opposed door openings which can be sealed by closing sliding doors 18 and 19. Said sliding doors travel, respectively, in grooved runways 20 and 21 along the cylindrical peripheral edges of the corresponding door openings. The casing doorway and the two cylinder doorways are preferably horizontally coextensive with each other and with the axial length of the work containing chamber of the cylinder, and either cylinder door may be brought into registry with the casing door and maintained in alinement as desired, for instance during loading and unloading. The cylinder is provided with ribs 22, 23, 24, and 25 extending radially inwardly for the purpose of agitating the load during cylinder rotation. Ribs 22 and 24 are conveniently positioned to serve an additional purpose as will appear.

When the washing or cleaning operation is completed, the cylinder is stopped with one of its doors in registry with the casing door, for instance in the position shown in Fig. 1, and casing door 17 and cylinder door 18 are successively slid upwardly to fully open position.

For the unloading operation I have provided a flexible curtain 26, which in the embodiment shown is permanently attached to a rigid carrying frame or shelf 27 along one edge 28 thereof, and disposed to be removably attached, as by snap fasteners 29, to points on said carrying frame remote from said line of fixed attachment. While shown herein as a shelf, member 27 could obviously be a lattice or framework or other supporting structure capable of temporarily supporting the wet work, as will appear. This shelf is of slightly smaller dimensions than those of an axial plane through the cylinder as defined by the interior dimensions thereof, so that the shelf is capable of being inserted through the full-sized casing and cylinder doors,

and, when placed in the cylinder, the shelf forms a partition dividing the cylinder into two substantially equal sized semicylindrical chambers. When inserted as aforesaid, from right to left in Fig. 1, the leading edge of the shelf, that is to say the one most remote from the operator, is placed in a recess between rib 22 and lock box or casing 30 of sliding door 19. The trailing edge of the shelf, being the one nearest the operator, is allowed to rest on rib 24, and the shelf may then be securely held in place by lowering cylinder door 18 until its lock box 31 bears against the upper portion of the shelf edge. While being inserted, the flexible curtain 26 is on the lower side of the shelf, being fixedly attached to the shelf along the edge 23 as aforesaid, and being removably attached for instance at points 29.

The flexible curtain is approximately equal in width to the width of the shelf in the direction of the cylinder axis, but is considerably longer than the shelf in a direction at right angles thereto, so that when inserting the shelf the operator folds in a substantial overlap 32 under rib 24, as shown in Fig. 1. The cylinder door is now closed, and the shelf, the curtain, and the work being disposed in the positions shown in Fig. 1, with the curtain on that face of the shelf which presents the curtain to the work, the cylinder is turned in either direction through one-half rotation or until it reaches the angular position shown in Fig. 2. In this position the work has been lifted and deposited upon the shelf and is held by gravity on top of curtain 26 which, by reason of the rotation, is now supported on top of shelf 27. The operator now opens door 19, reaches over the work, grasps the free edge of the overlapped portion 32 of curtain 26, and draws it outwardly, rolling the work out therewith into container 33. The snap fasteners 29 permit ready separation of curtain 26 from shelf 27. If the load is a heavy one the curtain may be removed by power means, linked to hook 34 as in Fig. 2, and the curtain edge may be provided with a reinforced edge and an aperture or other convenient means for attaching the hook thereto.

After the load is discharged the shelf and attached curtain are removed and the machine is ready for the next load. The unloading means, comprising shelf and curtain as aforesaid, are only inserted after the washing operation is completed and the embodiment described requires no special internal construction for support, other than the conventional pre-existing ribs and lock boxes, but of course in any construction where such ribs and lock boxes are not used, or are inconveniently positioned, suitable means can readily be added for supporting the shelf edges.

In the accompanying claims I have used the term "frame" to designate any shelf, latticework, grating, or other suitable partition member, foraminous or otherwise, whereby the flexible curtain may be carried into, and maintained in, supported work-receiving position.

What I claim is:

1. A washing machine having a rotatable cylinder, said cylinder including a work-containing chamber and said chamber having wall portions provided with substantially diametrically opposed door openings, said door openings being substantially coextensive in length with the length of the chamber, and unloading means comprising a rigid frame removably positioned in said chamber substantially in a plane including the rotational axis of said cylinder and of an area closely approximating that of said plane, as bounded by said chamber confines, and a flexible unloading curtain superposed upon said frame and removably attached thereto at spaced points, whereby, on rotation of said cylinder, said work is deposited on said curtain and is thereafter removable from said chamber by manipulation of said curtain.

2. A washing machine having a stationary casing, a member rotatably mounted within said casing and including a work containing chamber, said casing having a front wall portion provided with a door opening, said chamber having oppositely disposed wall portions provided with door openings capable of being brought selectively into registry with said casing door by rotation of said rotatable member, and unloading means for said chamber comprising a rigid frame removably positioned in said chamber, a flexible work removing curtain carried by said frame in superposed relationship, and removably attached to said frame to temporarily maintain said relationship, whereby, on rotation of said rotatable member, said work is deposited on said curtain and is thereafter removable from said chamber by manipulation of said curtain through said door opening.

3. A washing machine having a rotatable cylinder, said cylinder including a work-containing chamber, and said chamber having a wall provided with a door opening substantially coextensive in length with the length of the chamber, and unloading means comprising a rigid frame removably positioned in said chamber substantially in a plane including the rotational axis of said cylinder, and of a length and width closely approximating the dimensions of said plane, as bounded by said chamber confines, and a flexible unloading curtain fixedly attached to said frame in the neighborhood of one edge thereof and removably attached to said frame at a point remote from said edge, whereby, on rotation of said cylinder, said work is deposited on said curtain and is thereafter removable from said chamber by separation of said curtain from said frame at said point of removable attachment and manipulation of said curtain from said chamber.

4. A washing machine having a rotatable cylinder including a work-containing chamber having wall portions provided with substantially diametrically opposed door openings extending subtsantially the full length of the chamber, and work unloading means for said cylinder, comprising a rigid rectangular frame removably insertible into said cylinder to a position where its plane includes the axis of rotation of the cylinder and its longitudinal edges are adjacent that edge of each door opening which is lowermost when the opening is in the work discharge position, and a flexible unloading curtain connected to said frame along one of its edges and removably attached thereto at points near to the opposite edge, whereby, upon rotation of said cylinder with the frame therein and the curtain lying on that side of the frame presented to the work, the work may be lifted and deposited upon the curtain and then unloaded from the chamber by manipulation of said curtain.

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