Aug. 12, 1947. J. P. JORGENSON 2,425,618

GARMENT UNLOADING DEVICE

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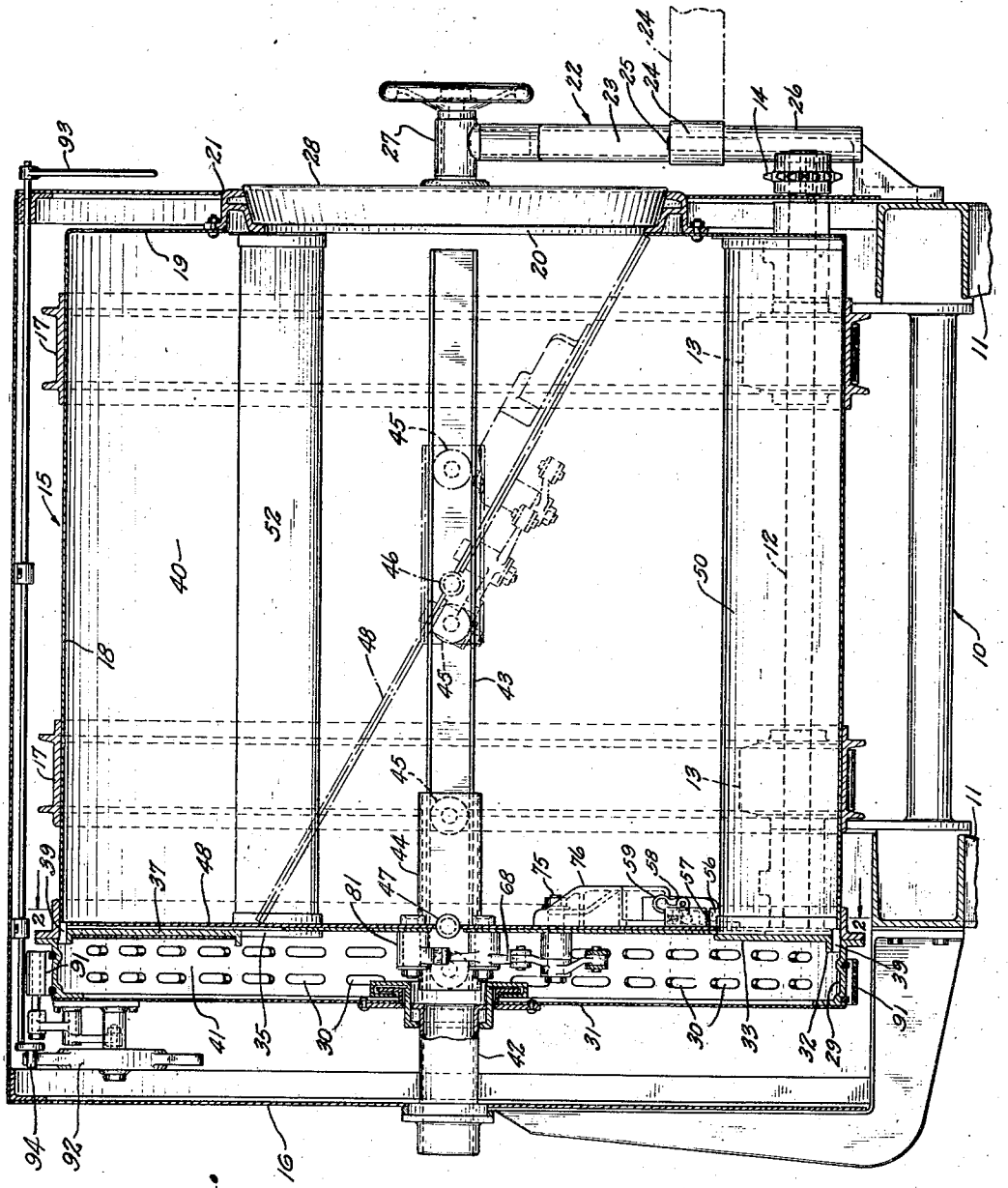


Fig. 1.

INVENTOR.
John P. Jorgenson
BY
Morsell & Morsell
ATTORNEYS.

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Fig. 3.

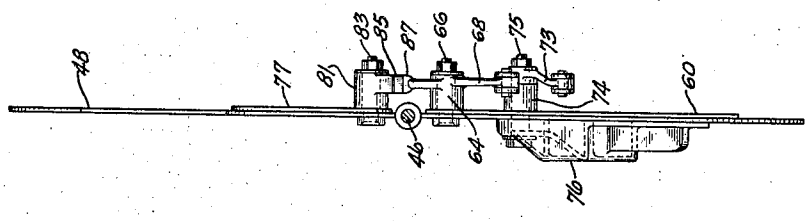
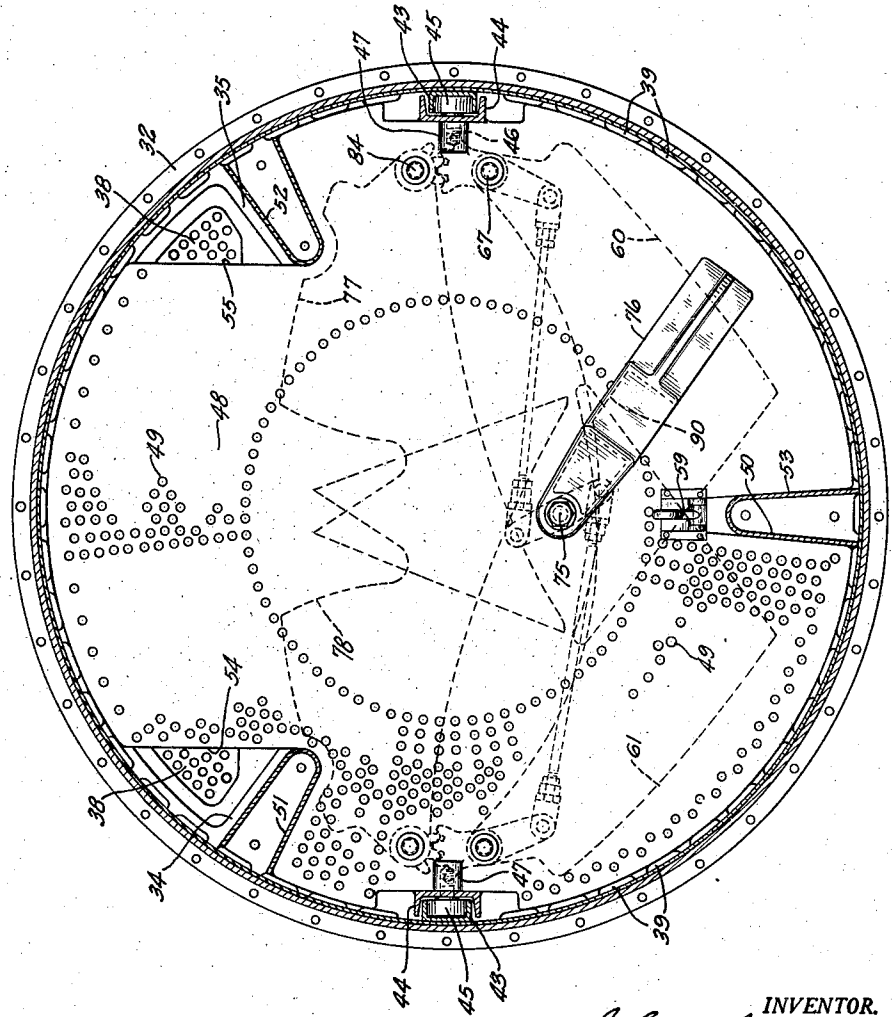


Fig. 2.



INVENTOR.

John P. Jorgenson

BY

Mosell & Mosell

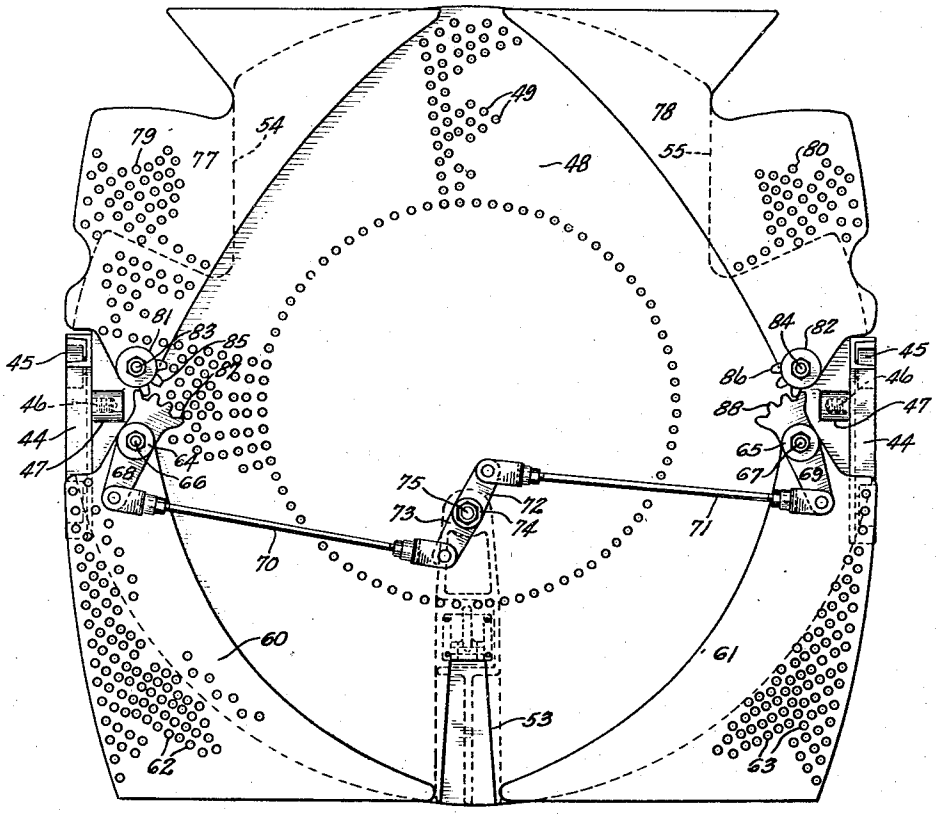
ATTORNEYS.

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GARMENT UNLOADING DEVICE

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Fig. 4.



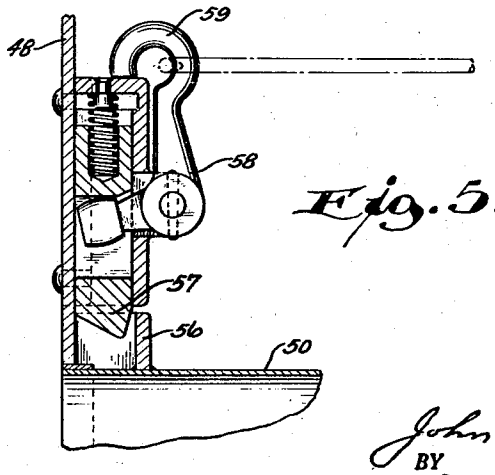


Fig. 5.

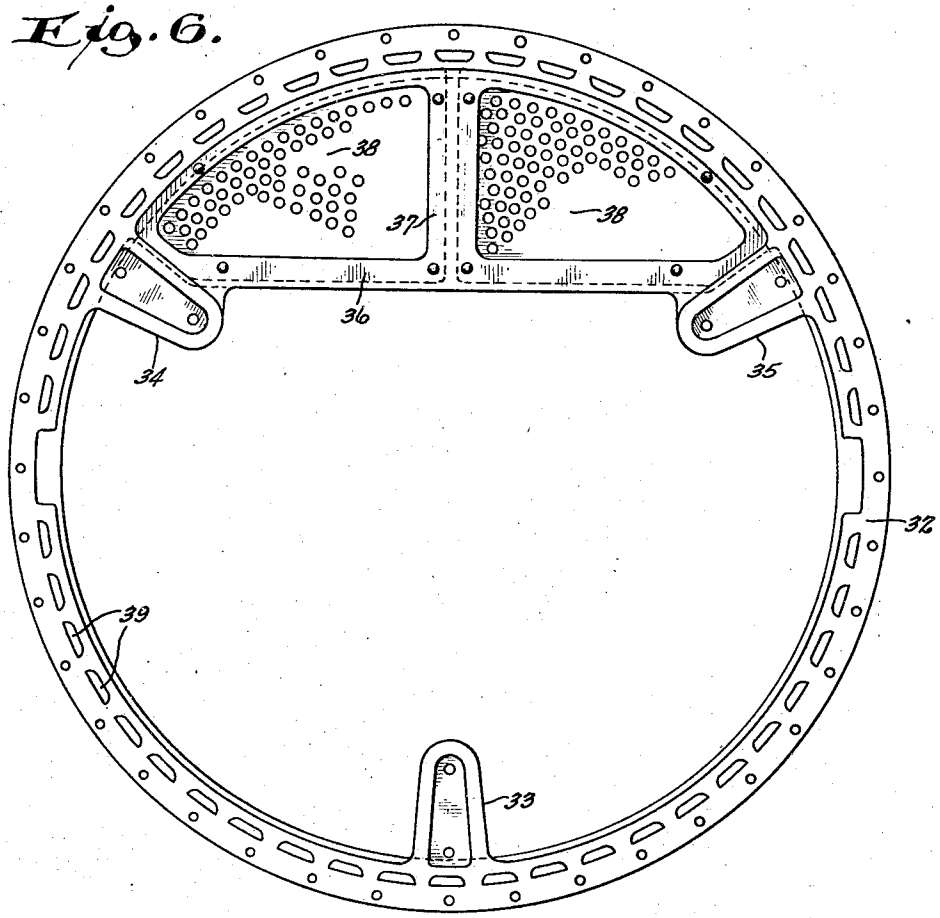
INVENTOR.
John P. Jorgenson
BY
Morsell & Morsell
ATTORNEYS.

Aug. 12, 1947. J. P. JORGENSON 2,425,618

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Fig. 6.



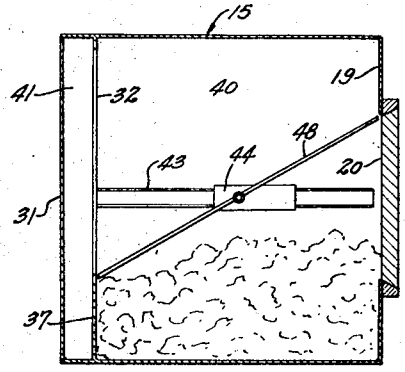


Fig. 7.

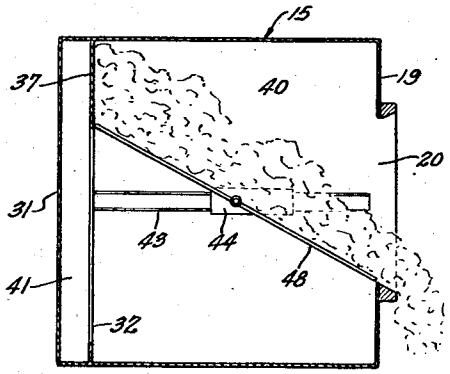


Fig. 8.

INVENTOR.
John P. Jorgenson
BY
Mosell & Mosell
ATTORNEYS

Patented Aug. 12, 1947 2,425,618

UNITED STATES PATENT OFFICE

2,425,618

GARMENT UNLOADING DEVICE

John P. Jorgenson, Wilmette, Ill., assignor to Kling Bros. Engineering Works, Chicago, Ill., a corporation of Illinois

Application May 6, 1944, Serial No. 534,442

11 Claims. (Cl. 68—210)

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This invention relates to improvements in garment unloading devices, and more particularly to unloading devices adapted for use in washing machines or the like.

In commercial laundries and dry-cleaning establishments the removal of garments from the drum of a washing machine or other clothes handling cylinder is a difficult and time-consuming task. If a large size washing machine is filled to capacity there may be as much as nine hundred pounds of wet garments to be removed. This usually involves about twenty minutes of hard manual work. In addition it is particularly inconvenient and difficult to get at the last batch of garments.

It is, therefore, a general object of the present invention to provide in a cylinder having an end door, means for facilitating the removal of garments therefrom.

A further, more specific object of the invention is to provide in a device of the class described, means forming an unloading chute which is movable from an inactive position parallel to one of the end walls of the cylinder to an angular position for guiding garments out of the cylinder door.

A still further object of the invention is to provide means for readily altering the effective outline shape of the unloading chute after it has been moved to unloading position so that no corner spaces will be present between edge portions of the chute and wall portions of the cylinder.

A further object of the invention is to provide a device as above described wherein the chute, when in inactive position for unloading purposes, forms an apertured partition for separating the main washing chamber from an auxiliary liquid discharge chamber, there being means for releasably locking the chute in partition-forming position.

A further object of the invention is to provide in a device of the class described and including a garment containing cylinder with longitudinally extending garment lifting ribs therein, means whereby the chute may be moved from inactive position to unloading position without interference from said ribs, and means whereby the chute member will fit properly with relation to said ribs in either of the two positions of the chute.

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

In the accompanying drawings, 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 longitudinal vertical sectional view through a washing machine showing the improved unloading device incorporated therein, the dot-and-dash lines indicating the unloading position of the chute;

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Fig. 2 is a sectional view taken on line 2—2 of Fig. 1 showing the chute member in inactive or partition-forming position;

Fig. 3 is an edge view of the chute member alone;

Fig. 4 is a view looking at the lower side of the unloading chute when the chute is in unloading position with the wings extended;

Fig. 5 is a fragmentary detail view illustrating the lock for releasably maintaining the chute in partition-forming position;

Fig. 6 is an elevational view of the partition backing ring;

Fig. 7 is a partially diagrammatic view showing the position of the washing cylinder and garments therein when the chute is first pulled out to angular position; and

Fig. 8 is a partially diagrammatic view showing the final discharge position of the chute after the cylinder has been rotated 180° from the position of Fig. 7.

Referring more particularly to the drawings, the numeral 10 designates a suitable supporting frame mounted on legs 11. The frame has suitably journaled therein spaced shafts 12. Each shaft has rigidly connected thereto rollers 13. Each shaft may have a rigid sprocket wheel 14 thereon, and the sprocket wheels may be connected by an endless chain, or in any other suitable manner, so that both of the shafts 12 are rotated when one of the shafts is driven from an outside source. The above described construction forms no part of the novel subject matter of the present application and is more completely illustrated in application Serial No. 479,559, filed March 18, 1943.

A washing cylinder or drum 15, which is located within a fixed outer casing 16, is positioned for rotation on a horizontal axis. The drum is equipped with external peripheral tracks 17 and is supported for rotation on the rollers 13 in the manner fully described in the above referred to pending application. The rollers engage within the tracks 17, as shown in Fig. 1, and cause rotation of the drum. Any other means may, of course, be utilized for causing such rotation.

The peripheral wall portion 18 of the cylinder or drum is preferably imperforate and the front end wall 19 is provided with a loading and discharge opening 20. The opening 20 in the front end of the drum is in registration with an opening 21 in the front wall of the casing 16.

An L-shaped door supporting arm 22 comprises an upright portion 23 and a horizontal portion 24. The end of the horizontal portion is pivotally connected by a pivot pin 25 with a

support 26 on the frame. At the upper end of the upright portion 23 of the L-shaped arm 22 is a horizontal bearing 27 within which a stud projecting from the door 28 is rotatable. The arrangement is such that when the door 28 is in the closed position of Fig. 1 it may rotate with the washing cylinder. When the cylinder is not rotating and when it is desired to load or unload garments, the door 28 may be unlocked, and the horizontal portion 24 of the L-shaped arm 22 may be swung to the dot-and-dash line position of Fig. 1 to move the upright portion 23 and the door to a laterally disposed position. This affords complete access to the openings 20 and 21.

At the inner or opposite end of the drum is an annular casting 29 which is formed with liquid openings 30. A solid sheet 31 is suitably secured to the inner edges of the casting 29 to close the end of the cylinder. Secured within the annular casting 29 near the opposite edge thereof is a ring 32 having three radially extending projections 33, 34 and 35 projecting inwardly therefrom, (see Fig. 6). A strip of metal 36 connects the radial projections 34 and 35 and an additional strip 37 extends from the center of the strip 36 toward the periphery of the ring to provide two segmental openings which are closed by perforated plates 38. The ring 32 adjacent the peripheral wall of the cylinder is also provided with openings 39 which provide for communication between the main washing chamber 40 (see Fig. 1) and the auxiliary chamber 41.

Steam, water, and other washing fluids, from an outside source, may be directed into the auxiliary chamber 41 through an axially disposed tubular conduit 42. The conduit 42 extends into an opening in the end wall 31 and there is a suitable rotary joint which permits rotation of the cylinder around the conduit 42.

Extending longitudinally of the cylinder, and secured to opposite interior portions of the cylinder wall 18, are inwardly facing channels forming tracks 43. Cooperable with each of the tracks 43 is a carriage 44 equipped with rollers or wheels 45. These rollers are guided by and roll within the flanges of the track channels 43 so that the carriages are movable longitudinally of the tracks from the full line position of Fig. 1 to the dot-and-dash line position therein. Projecting inwardly from each carriage is a stud 46 and each stud enters a socket 47 in an edge of a chute member 48 (see Fig. 2). The arrangement is such that the chute member 48 may pivot on the studs 46.

The chute member is apertured throughout a major portion of its area, as at 49, so that when it is in the full line position of Fig. 1 it forms an apertured partition separating the main washing chamber 40 from the auxiliary chamber 41. Thus washing fluid can readily flow through the openings 49 of the partition and through the openings 39 of the partition backing ring 32 shown in Fig. 6 when the member 48 is in the full line position of Fig. 1.

Connected at one end to the radial projections 33, 34 and 35 of the partition backing ring 32 and at their opposite ends to the front end of the cylinder are garment lifting ribs 50, 51 and 52. These ribs are positioned against the inner surface of the peripheral wall 18 of the cylinder and project radially inwardly therefrom.

When the chute and partition forming member 48 is in the upright full line position of Fig. 1, it bears against the partition backing ring 32. The partition and chute forming member 48 is formed with an edge recess 53 so that it will properly fit around the projecting rib 50 and with edge recesses 54 and 55 for reception of the ribs 51 and 52. The recesses 54 and 55 are relatively wide and V-shaped and are much larger than the cross-section of the ribs 51 and 52 for a reason to be hereinafter explained. This, however, does not leave open spaces when the member 48 is in the position of Fig. 2 because this portion of the partition is backed up by the perforated plates 38 of the partition backing ring 32.

Referring to Figs. 1 and 5, the inner end of the garment lifting rib 50 is formed with a projecting lug 56 which is adapted to be engaged by a latch 57 when the member 48 is in the full line position of Fig. 1 to lock said member in partition forming position. The latch is carried by the member 48 and is adapted to be operated by a bell crank lever 58 having an exposed hook 59. When the door of the washing cylinder is open, the hook 59 may be readily pulled to latch opening position by the use of an instrument such as a window pole inserted through the door opening of the washing cylinder. A further pull on the pole, after the latch is released, will cause movement of the member 48 from the full line position of Fig. 1 to the dot-and-dash position therein, wherein it is capable of serving as an unloading chute, as will hereinafter be explained. A movement from the full line position of Fig. 1 to the dot-and-dash line position therein is, of course, accompanied by movement of the carriages 44 on the tracks 43 and by pivotal movement of the partition member 48 on the trunnions 46.

When the partition and chute forming member is in the full line partition forming position of Fig. 1, its outline is circular, except for the rib recesses 53, 54 and 55, to fit the circular cross section of the washing cylinder. When this member is moved to the dot-and-dash line position of Fig. 1, however, the circular shape does not fill the corners. If the member 48 were moved to a completely horizontal position, it would have to be rectangular in shape to fit the cylinder. However, it is only moved partially toward the horizontal position, as shown by the dot-and-dash lines of Fig. 1, and, therefore, its outline, in order to fit the washing cylinder, must be something between a circle and a rectangle. If spaces were left at the four corners of the chute, when in the dot-and-dash line position, garments would catch in these spaces and there would be difficulties in connection with use of the member as an unloading chute.

In order to overcome the above-mentioned difficulty, novel means is provided for altering the effective outline shape of the member 48 after it is moved to unloading position. Referring to Fig. 4, there are wings 60 and 61 which are apertured, as at 62 and 63. These wings are formed with integral projecting pivot bearings 64 and 65 through which pivot pins 66 and 67 extend in such a manner that the wings are pivotally movable against the lower side of the chute member when the latter is in the unloading position. Arms 68 and 69, which are integral with the pivot bearings 64 and 65, are pivotally connected at their ends to the outer ends of links 70 and 71. The inner ends of the links 70 and 71 are pivotally connected to the ends of arms 72 and 73. The latter project rigidly from a hub member 74 through which a

pivot pin 75 extends, the hub member being keyed to the pin 75. The pin 75 projects rotatably through the other side of the chute 48 and on this other side an operating handle 76 (see Fig. 3) is keyed to the pin 75. Other wings 77 and 78 are apertured as at 79 and 80 and have pivot bearing members projecting from one side thereof, as at 81 and 82. Pins 83 and 84 extending from the chute through the bearings 81 and 82 permit pivotal movement of the wings 77 and 78. The bearing members 81 and 82 have gear segments 85 and 86 integral therewith and these segments are adapted to mesh with segments 87 and 88, connected to the bearing members 64 and 65 of the wings 60 and 61.

As a result of the above described arrangement when the handle member 76 is in the position of Fig. 2, then the wings are all in a withdrawn position as indicated by the dotted lines. It is to be noted that when the wings are withdrawn they are clear of the rib recesses 53, 54 and 55. When the partition and chute forming member 48 is swung to the unloading position shown by dotted lines in Fig. 1, then the wings may be moved from the withdrawn position of Fig. 2 to the operative position of Fig. 4 by moving the handle from the position of Fig. 2 to the position of Fig. 4. This movement of the handle causes simultaneous spreading of all four wings. It is to be noted that the wings 77 and 78 are notched, as at 89. This permits the garment lifting ribs 51 and 52 to intersect these wings, by way of the notches 89, as is clear from Fig. 1. The wing operating handle 76 is formed with a laterally opening pocket 90 which is positioned to accommodate the latching mechanism 58 and associated parts when the handle is in the position of Fig. 4. Due to the novel wing construction the effective outline shape of the partition forming chute member may be quickly altered from the circular shape of Fig. 2 to the shape of Fig. 4, and it is to be noted that the shape of Fig. 4 will perfectly fit the contours of the interior of the cylinder when the member 48 is in the angular chute forming position shown by dotted lines in Fig. 1.

Cooperable with the exterior of the perforated annular wall 29 of the auxiliary chamber 41 is a band valve 91 provided with operating mechanism 92 which is under the control of a hand lever 93. This mechanism is fully described in pending application Serial No. 479,559, filed March 18, 1943. The arrangement is such that when the operating lever 93 is in one position that a trip member 94 at the opposite end is disposed in such position as to trip the valve operating mechanism 92 and cause expanding movement of the band valve 91 so that spent liquid can be discharged from the auxiliary chamber 41 and from the main washing chamber 40 through the openings 30 in the auxiliary chamber which are controlled by the band valve. When the hand lever 93 is in a reversed position, then the band valve will be closed.

Operation

In use of the device, and with the band valve in a position to close the apertures 30, the drum is first filled with water and the other cleansing materials through the supply conduit 42. This liquid first enters the auxiliary chamber 41 and then passes through the openings 49 in the partition member 48 and through the openings 39 into the main chamber 40. The garments to be cleaned have, of course, been previously placed in the drum through the opening 20, and the door 28 has been closed. The partition and chute forming member 48 is in the full line vertical position of Fig. 1 and is locked in said position by engagement of the latch 57 with the rib lug 56. Upon rotation of the shafts 12 and rollers 13 the drum will be rotated at a desired speed for washing. After the washing action has taken place for a desired period and it is desired to remove the washing liquid from the drum, the hand lever 93 is turned to the position of Fig. 1 to bring the trip member 94 into the position illustrated. As the drum rotates, one of the projecting arms of the valve band actuating mechanism 92 will engage the trip member 94 causing the band valve to be moved to the open position shown in Fig. 1. The spent liquid can now pass from the main washing chamber 40 into the auxiliary chamber 41, through the openings in the partition 48 and through the openings 39, and can then escape from the peripheral openings 30 of the auxiliary chamber. This liquid passes into a suitable trough or drain pan from which it is directed to a point of discharge.

In order to remove the wet garments from the washing cylinder it has heretofore been necessary to reach manually into the opening 20 and withdraw wet heavy garments. In a large machine this takes a substantial length of time and there are also the difficulties of getting access to the last garments or articles in the cylinder. With the present invention, however, after the washing operation has been completed and with the door in open position, and with the latch mechanism 58 in an uppermost position, the latch is unlocked and the partition is swung out to the position shown in Fig. 7, the garments being below the partition as indicated in said figure. The latch may be readily released by using a pole similar to a window pole and by then pulling with the pole to cause movement of the carriage 44 and swinging of the partition to the position of Fig. 7. The partition must be swung out to the position of Fig. 7 while the cylinder is in the position of this figure, as otherwise the garments would be trapped on the wrong side of the chute. When the chute has been suitably disposed in proper angular position, then the handle 76 on the chute is moved from the position of Fig. 2 to the position of Fig. 4 to cause spreading of the wings to the position of the latter figure. This alters the effective outline of the member 48 so that it conforms with the shape of the cylinder when the partition and chute forming member is in the angular position. After the parts are in the position of Fig. 7 then the cylinder is rotated 180° to bring it to the position of Fig. 8 which is also the same position indicated by dot-and-dash lines in Fig. 1. The garments can now all be discharged through the door opening 20 in a few minutes time because the member 48 serves as an inclined chute so that the operation is aided by gravity. The wings and wing operating levers are all on the lower side of the chute and, therefore, do not interfere with the discharge of the garments. The operating handle 76 is on the top side but it is in the straight position of Fig. 4 and is so formed that garments do not readily catch thereon. The space at the inner end of the main chamber 40 above the rear edge of the chute 48 is closed by the apertured plates 38 (Fig. 6). These plates prevent the garments from entering the auxiliary chamber when the cylinder is being rotated from the position of Fig. 7 to the position of Fig. 8 just before unloading. The garments will, therefore, slide out on both sides of the handle 76 and over

the top of the handle. After the garments have all been discharged, the wing operating handle 76 is moved back to the position of Fig. 2 to withdraw the wings. This then permits pushing of the member 48 back into the vertical partition forming position. While so moved, the latch will automatically engage to maintain the partition in vertical position until such time as the latch is subsequently released.

While the device is particularly useful in connection with washing machines, where the discharge of the heavy wet garments presents a substantial problem, nevertheless the novel unloading chute structure is useful in any garment handling cylinder having an end door.

Various changes and modifications may be made without departing from the spirit of the invention and all of such changes are contemplated as may come within the scope of the claims.

What I claim is:

1. In a garment handling apparatus, a cylinder disposed for rotation on a horizontal axis and having an opening in its front end wall for the reception and discharge of garments, a plate within said cylinder mounted for movement from a first position near and parallel to the rear end wall of the cylinder to a second position where it forms an inclined plane leading to said front end wall opening to facilitate the unloading of garments, said plate being substantially circular in outline when in said first position to fit the interior contour of the cylinder, and means for altering the effective outline shape of said plate when the latter is in said second position to substantially fit the interior contour of the cylinder in said new position.

2. In a garment handling apparatus, a cylinder disposed for rotation on a horizontal axis and having an opening in its front end wall for the reception and discharge of garments, a plate within said cylinder mounted for movement from a first position near and parallel to the rear end wall of the cylinder to a second position where it forms an inclined plane leading to said front end wall opening to facilitate the unloading of garments, said plate being substantially circular in outline when in said first position to fit the interior contour of the cylinder, and wings swingable from a position within the outline of the plate to a spread position to alter the effective outline shape of said plate when the latter is in unloading position so that the plate and wings substantially fit the interior contour of the cylinder in said new position.

3. In a garment handling apparatus, a cylinder disposed for rotation on a horizontal axis and having an opening in its front end wall for the reception and discharge of garments, a plate within said cylinder mounted for movement from a first position near and parallel to the rear end wall of the cylinder to a second position where it forms an inclined plane leading to said front end wall opening to facilitate the unloading of garments, said plate being substantially circular in outline when in said first position to fit the interior contour of the cylinder, and corner wings swingable from positions within the outline of the plate to a spread position to alter the effective outline shape of said plate when the latter is in unloading position so that the plate and wings substantially fit the interior contour of the cylinder in said unloading position, and a common means for spreading said wings simultaneously.

4. In a garment handling apparatus, a cylinder disposed for rotation on a horizontal axis and having an opening in its front end wall for the reception and discharge of garments, a plate within said cylinder mounted for movement from a first position near and parallel to the rear end wall of the cylinder to a second position where it forms an inclined plane leading to said front end wall opening to facilitate the unloading of garments, said plate being substantially circular in outline when in said first position to fit the interior contour of the cylinder, and corner wings swingable from positions within the outline of the plate to a spread position to alter the effective outline shape of said plate when the latter is in unloading position so that the plate and wings substantially fit the interior contour of the cylinder in said unloading position, and common means including an operating handle accessible from the cylinder opening when the plate is in unloading position for spreading said wings simultaneously.

5. In a garment handling apparatus, a cylinder disposed for rotation on a horizontal axis and having an opening in its front end wall, said cylinder also having longitudinally extending garment lifting ribs therein positioned adjacent the peripheral wall, a plate within said cylinder mounted for movement from a first position near and parallel to the rear end wall of the cylinder to a second position wherein it forms an inclined plane leading to said front end wall opening to facilitate the unloading of garments, said plate being substantially circular in outline when in said first position to fit the interior contour of the cylinder and the edges of the plate being notched to accommodate the garment lifting ribs, said notches being shaped to permit movement of the plate, and wings swingable from positions within the outline of the plate to spread positions to alter the effective outline shape of said plate when the latter is in unloading position so that said plate and wings substantially fit the interior contour of the cylinder when the plate is in unloading position, some of said wings being notched to accommodate certain of the garment lifting ribs.

6. In a garment handling apparatus, a cylinder disposed for rotation on a horizontal axis and having an opening in its front end wall for the reception and discharge of garments, a plate within said cylinder mounted for movement from a first position near and parallel to the rear end wall of the cylinder to a second position where it forms an inclined plane leading to said front end wall opening to facilitate the unloading of garments, said plate being substantially circular in outline when in said first position to fit the interior contour of the cylinder, a backing ring against which said plate is positioned when the plate is in said first position, means carried by said ring and disposed parallel to the end walls of the cylinder to fill the space between the rear edge of the unloading plate and the periphery of the cylinder when the plate is in unloading position, and means for altering the effective outline shape of said unloading plate when the latter is in unloading position.

7. In a garment handling apparatus, a cylinder disposed for rotation on a horizontal axis and having an opening in its front end wall for the reception and unloading of garments, oppositely disposed longitudinally extending guiding tracks connected to the inner surface of the peripheral wall of the cylinder, carriages mounted for

movement along said tracks, and a plate positioned between and pivoted to said carriages whereby the plate is movable from a first position near and parallel to the rear end wall of the cylinder to a second position wherein it forms an inclined plane leading to said front end wall opening to facilitate the unloading of garments.

8. In a garment handling apparatus, a cylinder disposed for rotation on a horizontal axis and having an opening in its front end wall for the reception and unloading of garments, oppositely disposed longitudinally extending guiding tracks connected to the inner surface of the peripheral wall of the cylinder, carriages mounted for movement along said tracks, a plate positioned between and pivoted to said carriages whereby the plate is movable from a first position near and parallel to the rear end wall of the cylinder to a second position wherein it forms an inclined plane leading to said front end wall opening to facilitate the unloading of garments, said plate being substantially circular in outline when in said first position to fit the interior contour of the cylinder, and means for altering the effective outline shape of said plate when the latter is in said second position to substantially fit the interior contour of the cylinder when the plate is in said new position.

9. In a washing machine, a cylinder disposed for rotation on a horizontal axis and having an opening in the front end wall for the reception and unloading of garments, said cylinder having a main washing chamber and having an auxiliary chamber adjacent the rear end wall, a perforated plate within said cylinder mounted for longitudinal sliding movement and for pivotal movement from a first position near and parallel to the rear end wall of the cylinder, wherein it forms a partition between the main and auxiliary chambers, to a second position wherein it forms an inclined plane leading to said front end wall opening to facilitate the unloading of garments.

10. In a washing machine, a cylinder disposed for rotation on a horizontal axis and having an opening in the front end wall for the reception and unloading of garments, said cylinder having a main washing chamber and having an auxiliary chamber adjacent the rear end wall, a perforated plate within said cylinder mounted for longitudinal sliding movement and for pivotal movement from a first position near and parallel to the rear end wall of the cylinder, wherein it forms

a partition between the main and auxiliary chambers, to a second position wherein it forms an inclined plane leading to said front end wall opening to facilitate the unloading of garments, said plate being substantially circular in outline when in said first position to fit the interior contour of the cylinder, and means for altering the effective outline shape of said plate when the latter is in said second position to substantially fit the interior contour of the cylinder when the plate is in said new position.

11. In a washing machine, a cylinder disposed for rotation on a horizontal axis and having an opening in the front end wall for the reception and unloading of garments, said cylinder having a main washing chamber and having an auxiliary chamber adjacent the rear end wall, a perforated plate within said cylinder mounted for movement from a first position near and parallel to the rear end wall of the cylinder, wherein it forms a partition between the main and auxiliary chambers, to a second position wherein it forms an inclined plane leading to said front end wall opening to facilitate the unloading of garments, said plate being substantially circular in outline when in said first position to fit the interior contour of the cylinder, wings swingable from positions from within the outline of the plate to spread positions to alter the effective outline shape of the plate when the latter is in unloading position so that the plate and wings substantially fit the interior contour of the cylinder, and a common means including linked connections for spreading said wings simultaneously, said wings and linked connections being accommodated in said auxiliary chamber when the plate is in partition forming position.

JOHN P. JORGENSON.

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