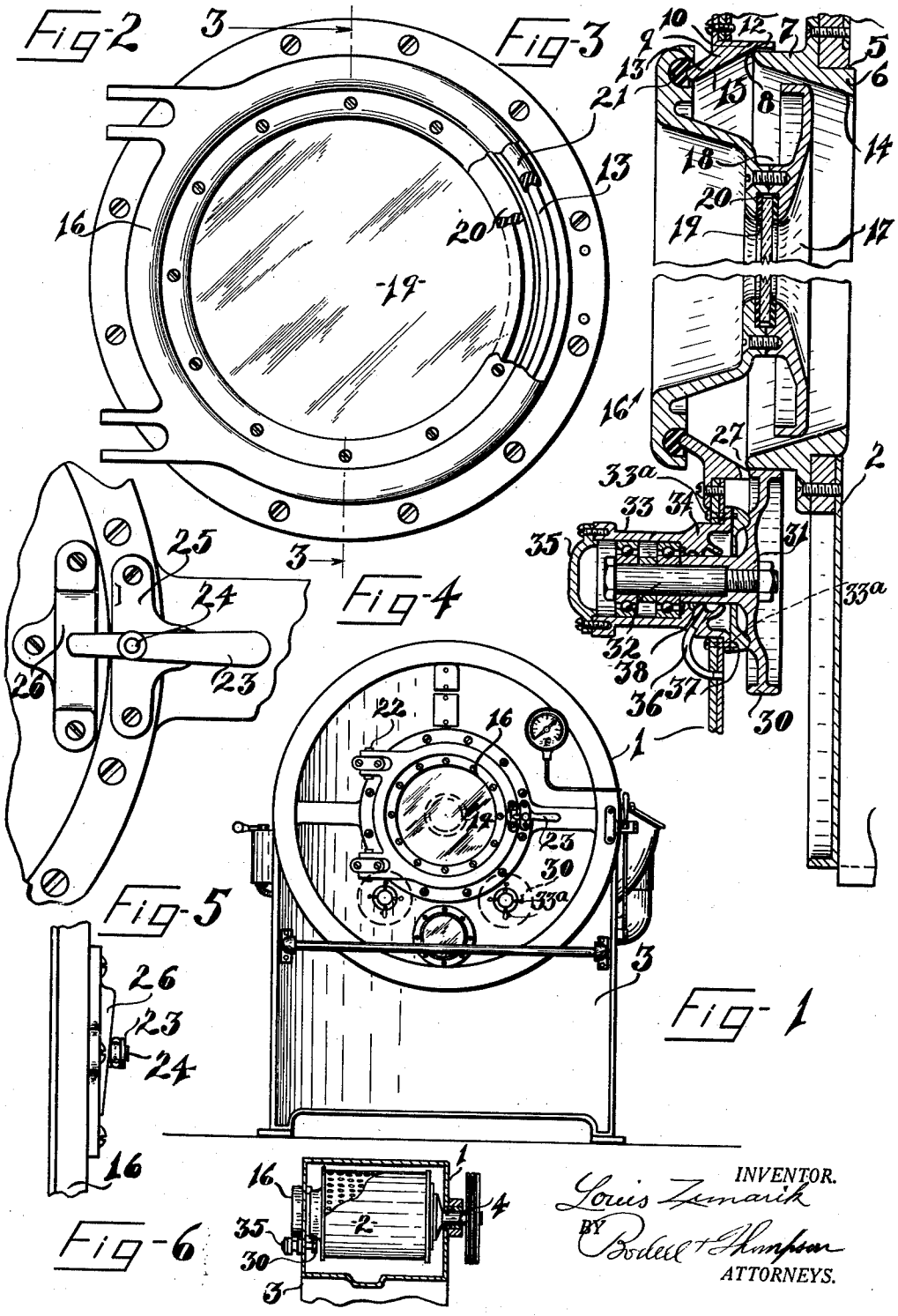
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LAUNDRY WASHING MACHINE

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LAUNDRY WASHING MACHINE

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8 Claims. (Cl. 68—18)

This invention relates to laundry washing and cleaning machines of the type having a perforated clothes receptacle, drum, or hydro-wheel, mounted in a stationary outer casing to move about a horizontally extending axis, and having a loading door at one end of the casing and drum arranged coaxially with the drum, and has for its object a door structure for closing both the door openings in the casing and in the drum, and having outer and inner portions for closing and sealing the door opening of the casing, and for closing the door opening of the drum.

It further has for its object an arrangement of what, for convenience may be called, door frames for the door openings whereby the frames lap, or telescope, providing a practically uninterrupted tubular loading and unloading passage from the outside of the casing to the interior of the drum. Also, a door structure in which the door is formed with a circumferential channel for receiving the liquid, or solvent, which finds its way past the inner portion of the door in the drum opening and a door frame structure which directs the liquid from the channel back into the casing.

It further has for its object, a door construction comprising inner and outer sections for a sash-like door or window frame for a central glass pane, through which the interior of the drum is visible, and an arrangement of the sections whereby a wide circumferential channel is provided which coacts with the door frames of the casing and drum openings to receive and direct back into the casing, liquid finding its way out through the drum opening when the door is closed.

It further has for its object, a bearing means for supporting the end of the drum that would otherwise be unsupported, or overhung, in machines in which the drum is supported and actuated from one end, and also a construction by which the bearing means coacts with the door frame of the drum.

In describing this invention, reference is had to the accompanying drawing in which like characters designate corresponding parts in all the views.

Figure 1 is an end elevation of a washing machine embodying my invention.

Figure 2 is an enlarged elevation, partly broken away, of the door.

Figure 3 is a sectional view on an enlarged scale on line 3—3, Figure 2.

Figures 4 and 5 are enlarged, fragmentary, detail views of the door lock.

Figure 6 is a diagrammatic view showing the general arrangement of the drum in the casing.

1 designates the stationary casing which is cylindrical in general form with its axis horizontal.

2 is the clothes container, hydro-wheel, or drum, mounted in the casing to move about a horizontally extending axis coaxial with, parallel to, or extending in the same general direction as the axis of the casing.

The casing 1 is mounted on a suitable base structure 3 which houses, or may house, mechanism, parts, etc., accessory to the machine. During washing operations, the drum oscillates or rotates about its axis a predetermined number of times in one direction and then, a predetermined number of times in the opposite direction, to tumble the clothes. During the washing operation, the casing 1 contains a washing fluid or solvent to a certain level, through which the clothes are sloshed during the movement of the drum. During other operations, as for instance an extracting operation the drum may be rotated in one direction only. The drum is supported from one end by a shaft 4 suitably journalled in the casing, to which shaft power is applied in any well known manner. Ordinarily, the other or outer end of the drum overhangs in the casing. The supporting of this otherwise overhung end, as will be hereinafter described, constitutes one of the features of the invention.

The door structure constitutes the principal feature of the invention, but also enters into the feature of supporting the otherwise overhanging end of the drum. The outer end or head of the drum, that is, the head remote from the shaft 4 is formed with an axial opening 5, the drum having an annular flange around the opening, extending beyond the end wall or head of the drum and constituting what for convenience may be called a door frame 6 which includes an annular flange 7 extending beyond the end of the drum towards the end wall of the casing.

The casing 1 is formed with an opening 8 alined with the opening 5, and the casing is also formed with a cylindrical or annular flange around the opening 8 which constitutes a door frame 9 having an inwardly extending annular flange 10. The flanges 10 and 7 telescope one within the other, and preferably, the flange 7 telescopes within the flange 10, as at 12. The door frame 9 is also formed with an outwardly extending annular flange 13 against which the door, to be described, closes and seats. The flanges 7 and 10 are formed with reversely arranged conical inner faces 14 and 15, the conical face 15 of the

flange 10 flaring outwardly toward the outer edge of the flange 7, and the conical face 14 of the flange 7 flaring outwardly toward the edge of the flange 10.

16 designates the door as a whole, this being formed with an outer portion which closes and seats against the casing or the flange 13 thereof, and an inner portion 17 for closing the opening in the drum, this being located within the conical face 14 of the flange 7, but out of frictional contact therewith. These inner and outer portions 16 and 17 define a circumferential groove 18, the open side of which is presented toward the conical faces 14 and 15. The inner and outer portions 16 and 17 constitute inner and outer sections of a sash-like frame for a glass window 19, these sections having formed between them a groove 20 for receiving the margin of the glass pane 19. The glass pane 19 is for the purpose of permitting the operator to watch a washing operation where the knowledge of the condition of the washing fluid, as to sudsing etc., is necessary. The outer section 16 is formed with a groove in which is located a ring of packing material which seats against the flange 13 and seals the door against the outlet of liquid to the outside of the casing 1.

The door is suitably hinged, as at 22, to the casing, and it is locked and pressed in its closed position by a lever 23 pivoted at 24 to the frame 9, or a face plate 25 secured thereto, this lever coacting with a wedge face 26 on the door and coacting with the lever to firmly clamp the door 16, or the packing 21 thereof, against the edge of the flange 13. When the door is closed, and the drum in operation, some fluid will pass the edge of the inner section 17, or find its way into the channel 18, and will run down to the lowermost portion of the channel where it drains, as at 27, into the casing for the reason that the flange 10 of the door frame 9 extends into the casing and overlaps the flange 7 of the door frame 6.

The outer end of the drum is supported by rollers or wheels 30, here shown as two, these wheels being located within the casing below a horizontal diameter of the drum, and supported from the end wall thereof and running on the periphery of the flange 7 of the door frame 6. As here shown, each wheel 30 is provided with a hub 31 mounted on a spindle 32 extending into a tubular housing 33 which extends through the wall of the casing 1 to the outside. The tubular housing 33 is in the form of a thimble having an annular peripheral flange 34 at its inner end which thrusts against the inner face of the wall of the casing 1, the thimble being placed in position by being inserted through the opening therefor, from the inside of the casing 1. The outer end of the casing is a removable cap 35. The casing 34 is provided with means tending to prevent fluid from feeding along the axles or shafts to the antifriction bearing, this means being here shown as annular recesses 38 in the casing around the axle 32 near the wheels 30, these recesses having drain ducts as 36. Also, an annular barrier 37 is arranged between the wheel 30 and the end wall of the casing 1 to deflect fluid passing from the channel 18 away from the bearings for the wheels 30. The thimble 33 is secured in position in any suitable manner as by screws 33a extending through the wall of the casing and outwardly extending flange at the inner end of the thimble 33 and into the annular barrier 37.

Certain fluids used in cleaning, as dry cleaning fluids, are corrosive and detrimental to bearings, and therefore, by this construction, the bearings for the wheels 30 are located so that the fluid is prevented from coming in contact with them. By this construction what would otherwise be the overhanging end of the drum is amply supported by rollers, the bearings of which are not subject to the solvent, or the action thereof, and also these bearings or rollers 30 coact with the periphery of the door frame 6 for the axial opening of the drum.

What I claim is:

1. In a laundry machine, the combination of an outer casing and an inner drum mounted in the casing to move about a horizontally extending axis, the drum having an axial door opening in one end, and the casing having a door opening alined therewith, a door for the latter opening closing and seating against the casing and including an inner non-rotatable portion extending into and approximately closing the drum opening, said door being formed with a peripheral channel and when closed receiving fluid passing said inner portion, and means for leading the fluid from the channel into the casing, in a radial direction outside of the drum opening.

2. In a laundry machine, the combination of an outer casing and an inner drum mounted in the casing to move about a horizontally extending axis, the drum having an axial opening in one end, and the casing having a door opening alined therewith, the casing and drum having tubular annular flanges around said opening, one flange telescoping with the other, a door for the opening in the casing closing and seating against the casing and having an inner portion extending into the flange of the drum to close the same and being out of contact therewith, said door being formed with a peripheral channel opening toward the inner faces of said flanges, the flange of the casing having means to return fluid passing the inner portion into the channel back into the casing.

3. In a laundry machine, the combination of an outer casing and an inner drum mounted in the casing to move about a horizontally extending axis, the drum having an axial opening in one end, and the casing having a door opening alined therewith, the casing and the drum having flanges around the openings, said flanges extending toward each other and constituting door frames, the flange of the drum telescoping into the flange of the casing, and a door closing the opening of the casing, the door having an inner portion extending into the flange of the drum and substantially closing the drum opening, the door also having a circumferential channel with its open side toward said flanges for receiving fluid passing the inner door portion, the flange of the casing having means to return the fluid in the channel to the interior of the casing.

4. In a laundry washing machine, the combination of an outer casing and an inner drum mounted in the casing to move about a horizontally extending axis, the drum having an axial opening in one end, and the casing having a door opening alined therewith, the casing and the drum having annular flanges around said openings, the flanges extending toward each other, said flanges having their inner faces reversely conical and the flange of the drum telescoping into that of the casing, the inner surface of the flange of the casing flaring outwardly toward the end of the drum, a door carried by the casing for substantially closing said openings, the door being provided with a circumferential chan-

nel, the open side of which is presented toward the conical faces of the flanges for receiving fluid passing the inner portion of the door into the channel, and the flange of the casing having means to return the fluid from the channel into the interior of the casing.

5. In a laundry machine, the combination of an outer casing, an inner drum mounted in the casing to move about a horizontally extending axis, the drum having an axial opening in one end, and the casing having a door opening alined therewith, a door for the latter opening comprising inner and outer sections, the outer section closing and sealing against the casing, and the inner section extending into the drum opening, said sections being formed with a window opening and with a groove between them for receiving the margin of a glass window pane, and means for clamping the sections together.

6. In a laundry machine, the combination of an outer casing, an inner drum mounted in the casing to move about a horizontally extending axis, the drum having an axial opening in one end, and the casing having a door opening alined therewith, a door for the latter opening comprising inner and outer sections, the outer section closing and sealing against the casing, and the inner section extending into the drum opening, said sections being formed with a window opening and with a groove between them for receiving the margin of a glass window pane, and means for clamping the sections together, the sections between which the glass window pane is clamped being provided with annular rim portions forming a peripheral channel for receiving the liquid passing the intersection, and means for leading the liquid from said channel into the casing.

7. In a laundry machine, the combination of an outer casing, and an inner drum mounted in the casing to move about a horizontally extending axis, means for rotatably supporting the drum at one end thereof, the drum having an axial opening at its other end, and the drum having an annular flange around said opening extending beyond the end wall of the drum, the peripheral surface of which serves as a bearing face, the casing having a door opening alined with the drum opening, a door carried by the casing for closing said openings, wheels located within the casing and coacting with said raceway to support the outer end of the drum, the wheels having axles extending to the outside of the drum and bearings on the outside of the drum in which the axles are journalled, means for preventing fluid from the casing from entering the bearing including a recess for receiving fluid working along the axle toward the bearings, and an outlet for draining such fluid away from the bearings.

8. In a laundry machine, the combination of an outer casing, and an inner drum mounted in the casing to move about a horizontally extending axis, means for rotatably supporting the drum at one end thereof, the drum having an axial opening at its other end, and the drum having an annular flange around said opening extending beyond the end wall of the drum, the peripheral surface of which serves as a raceway, the casing having a door opening alined with the drum opening, the casing having an annular flange around its opening extending into the casing toward and lapping the former flange, a door carried by the casing and closing against the casing and having an inner portion extending into the flange of the drum and out of frictional contact therewith, the door having a circumferential channel with its open side toward the inner faces of said flanges, wheels located within the casing and coacting with said raceway to support the outer end of the drum, the wheels having axles extending to the outside of the casing and bearings on the outside of the casing in which the axles are journalled, and means for preventing fluid from the casing from entering the bearings.

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