

Oct. 29, 1935.

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2,019,089

COMBINED WASHING AND DRYING MACHINE

Filed Dec. 11, 1930

3 Sheets-Sheet 2

FIG. 4

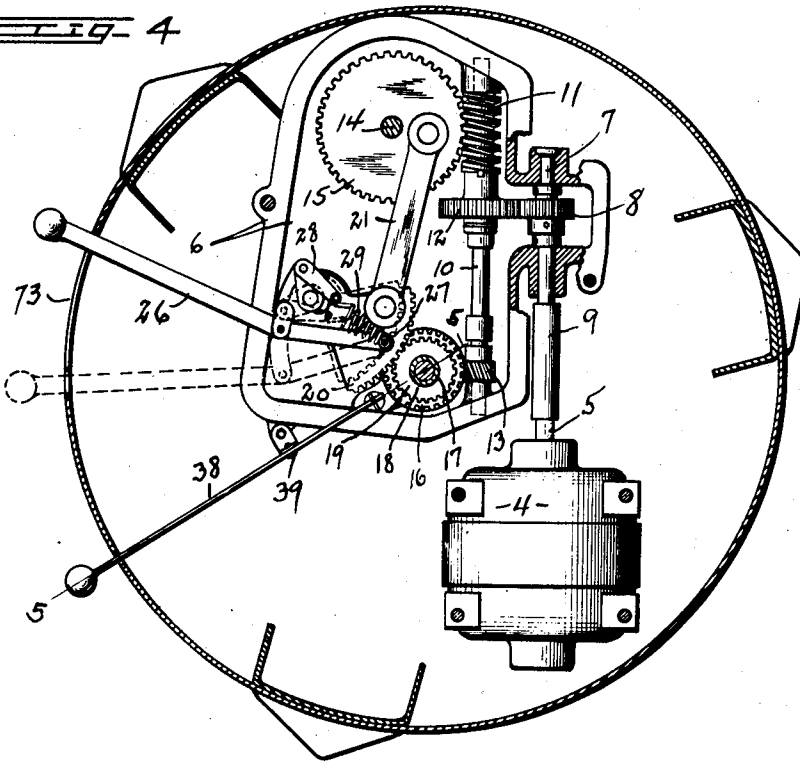


FIG. 5

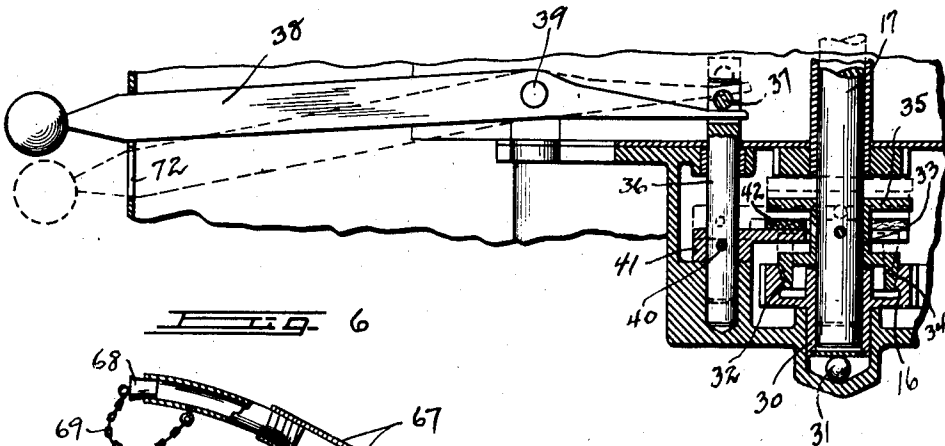
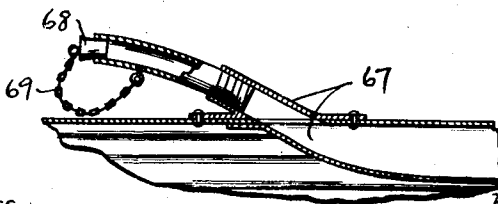


FIG. 6



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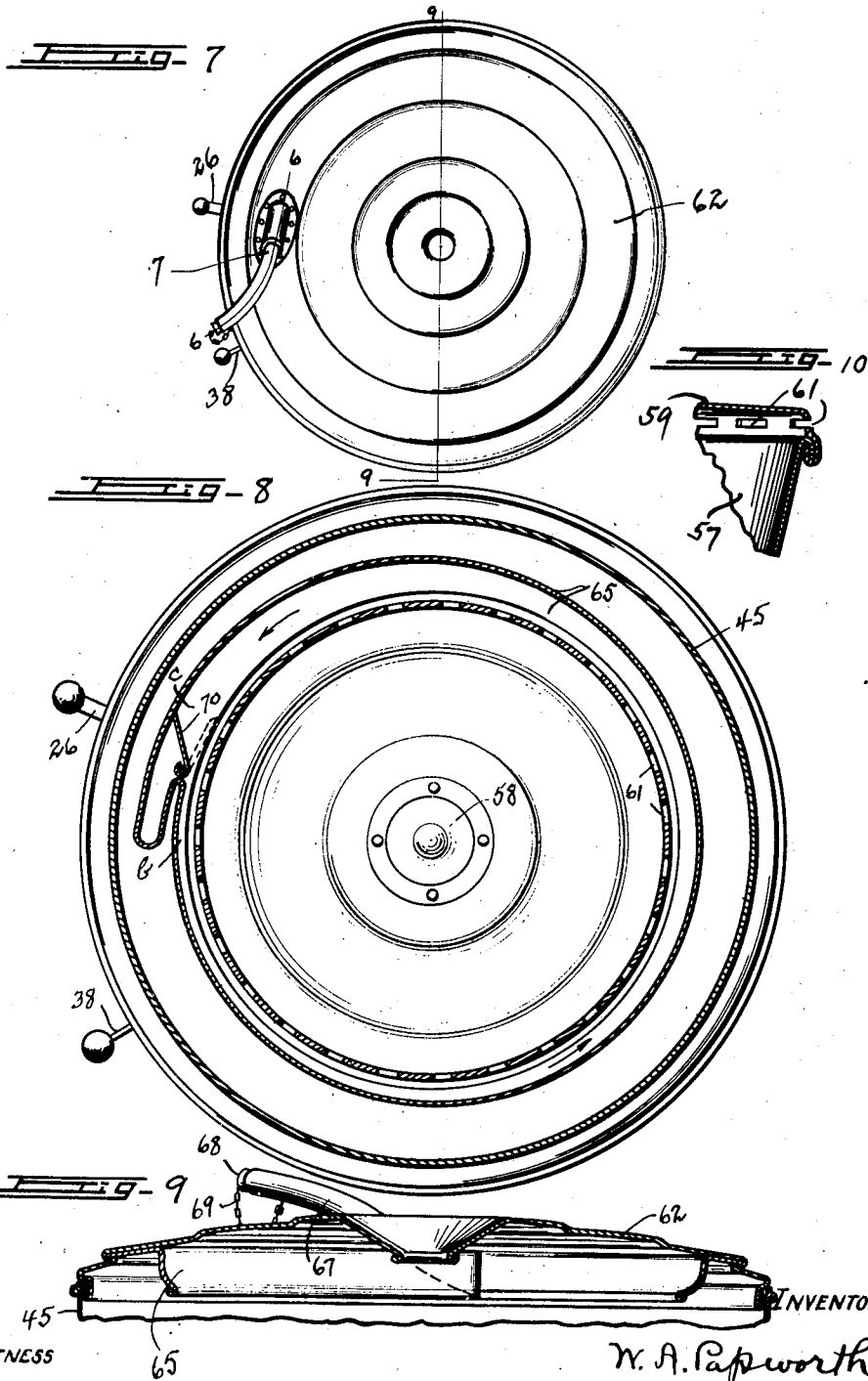
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COMBINED WASHING AND DRYING
MACHINE

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2 Claims. (Cl. 210—75)

This invention relates to a new and improved combined washing and drying machine.

The main object of my invention is to provide a washing machine, the one here being shown of a dolly type, and a centrifugal drier which may be together operated in a single tub or container or separately if preferred, and may be driven from the same source of power.

Another object of my invention is to provide a new and improved means for disposing of the fluid extracted from the clothes outside of the tub or returning the same to the tub, if desired.

Another object is to provide a device in which the directing and controlling means for the liquid extracted from the clothes will be incorporated in the cover for the machine and be removable therewith.

Other objects and advantages relate to the size, shape and arrangement of parts all as will more fully appear from the following description taken in connection with the accompanying drawings in which:—

Figure 1 is a top plan view of my device.

Figure 2 is a section on line 2—2 of Figure 1.

Figure 3 is a plan view of a portion of the dolly operating mechanism.

Figure 4 is a section on line 4—4 of Figure 2.

Figure 5 is a section on line 5—5 of Figure 4.

Figure 6 is a section on line 6—6 of Figure 7.

Figure 7 is a top plan view of my device showing it as made in a different shape.

Figure 8 is a section on line 8—8 of Figure 2 showing the device circular in form.

Figure 9 is a section on line 9—9 of Figure 7.

Figure 10 is a section, partially broken away, through the upper edge of the centrifugal basket and its cover.

It will be understood that other types of washing mechanism other than that shown here may be used in my device, but for the purpose of explaining the same, I have here shown a washing mechanism of the dolly type.

My device comprises a main frame 1 having a centrally disposed internally threaded depending boss 2.

Frame 1 is supported on a plurality, in this case shown as three, of legs 3.

On the undersurface of frame 1 is secured a motor 4 having an armature shaft 5. A gear housing 6 is also secured to the undersurface of frame 1.

Journalled in one side of casing 6 is a shaft 7 having secured thereto a gear 8. Shaft 7 extends outwardly from casing 6 and is connected to armature shaft 5 by a coupling 9.

A second shaft 10 is also journalled in casing 6 in parallel relation to shaft 7 and carries on one end a worm 11. Shaft 10 also carries a gear 12 in mesh with gear 8.

On the end of shaft 10 opposite to that on

which is carried the worm 11 is secured a spiral gear 13.

A shaft 14 is journalled in casing 6 with its axis normal to the axis of shaft 10. A worm gear 15 is secured to shaft 14 and is in mesh with worm 11.

A gear 16 is loosely mounted on the lower end of a vertically extending shaft 17 and is in mesh with gear 13. Shaft 17 is positioned in a vertically extending tubular member 18. Tubular member 18 has secured thereto a gear 19.

For the purpose of operating the dolly hereinafter to be described, I provide a segmental gear 20, Figures 3 and 4. A link 21 has one end pivotally mounted on segmental gear 20 and has the other end pivotally and eccentrically mounted on gear 15 so that the rotation of gear 15 will cause the reciprocation of segmental gear 20.

The rear end of segmental gear 20 is pivotally mounted on a circular cam member 22 which, in turn, is secured to a shaft 23, shaft 23 being eccentric to the axis of member 22 and being journalled in casing 6. A crank arm 24 is secured to shaft 23.

Pivotally mounted on the outer end of crank arm 24 is a link 25 which has its other end pivotally mounted on a lever 26. The inner end of lever 26 is pivotally mounted on a pivot pin 27 secured to casing 6.

On the upper surface of the outer end of crank arm 24 is pivotally mounted a link 28. On the inner end of link 28 is secured one end of a spiral spring 29, the other end of spring 29 being secured to pivot pin 27.

Spring 29 normally tends to rotate cam 22 to a position where segmental gear 20 will be in mesh with gear 19 so that the reciprocal movement of segmental gear 20 will be transmitted to gear 19 and tubular shaft 18.

When it is desired to move segmental gear 20 out of mesh with gear 19 so that the latter will come to rest, lever 26 is moved about the pivot 27 and through link 25 and crank arm 24 will move cam member 22 about the pivot 23, which will carry with it segmental gear 20 taking the same out of mesh with gear 19.

A means hereinafter to be described is provided to hold lever 26 in a position where segmental gear 20 will be out of mesh with gear 19. When lever 26 is released spring 29 will cause segmental gear 20 to be carried into mesh with gear 19.

Referring to Figure 5, gear 16 is journalled in the bottom of casing 6 and has a depending hub 30 in engagement with a thrust ball 31. The upper face of gear 16 carries a female clutch facing 32.

A member 33 is pinned to shaft 17 and carries a depending male clutch member 34 adapted to co-act with clutch member 32 on gear 16. The upper end of member 33 carries a circular flange 35.

When the shaft 17 is in the lowered position, clutch member 34 will engage clutch member 32 and the rotary movement of gear 16 will be transmitted to shaft 17.

- 5 For the purpose of de-clutching members 32 and 33 so that shaft 17 may come to rest, I provide in casing 6 and slidable vertically therein a stub shaft 36.

10 Shaft 36 carries on its upper end a transverse pin 37 which is in engagement with one end of a lever 38, which is pivotally mounted in casing 6 as by a pivot pin 39.

The downward movement of the outer end of lever 38 will cause the upward movement of the 15 inner end of lever 38 carrying with it shaft 36.

Adjacent the lower end of shaft 36 is secured, as by a pin 40, a jawed member 41 which encircles member 33 and is adapted to contact with the undersurface of flange 35.

20 The upper face of member 41 carries a brake lining 42. When the outer end of lever 38 is depressed, shaft 36 will be carried upwardly and will carry member 41 into contact with flange 35 and the further downward movement of the 25 outer end of lever 38 will cause member 33 to be moved upwardly carrying shaft 17 with it and moving clutch member 34 out of engagement with clutch member 32, brake lining 42 aiding to rapidly stop rotation of shaft 17.

30 A protecting covering 43 having a depending skirt 44 is positioned on main frame 1. A tub or vat 45 is positioned on the upper surface of member 43, a gasket 46 of leather or other appropriate material being interposed between vat 45 and 35 member 43 at the outer edges of the same.

A tubular shaft 47 having an annular flange 48 adjacent its lower end and having a depending 40 externally threaded portion 49 extends upwardly into vat 45 and has its lower end threaded into boss 2 on member 1, a gasket 50 being interposed between the under face of flange 48 and bottom of vat 45, and a second gasket 51 being interposed 45 between the under surface of vat 45 and the upper surface of member 43, so that there may be no possibility of leakage of liquid from vat 45 where member 47 passes through the bottom thereof.

50 Tubular member 18 and shaft 17 pass upwardly through member 47, member 18 terminating a short distance above the upper end of member 47 and shaft 17 extending upwardly beyond the upper end of member 18, the upwardly extending 55 end of shaft 17 being splined, as shown at a.

A conventionally shaped dolly of the multiple-blade type is positioned on member 47 and has an internal flange 53 adjacent its upper end which 60 contacts with the upper end of member 47.

On the lower end of dolly 52 is secured a tubular guide piece 54 in rotary contact with a guide flange 60 55 on member 47.

The upper end of dolly 52 is keyed to member 18, as by a key 56, so that reciprocatory motion of member 18 will be transmitted to dolly 52. A 65 set screw 56' is also provided in dolly 52 to hold it from axial movement.

70 A circular extractor basket 57 has secured in the central portion of its bottom, an upwardly extending tubular member 58 adapted to be slidably, but not rotatably mounted on the splined end a of shaft 17 so that rotary movement of shaft 17 will be transmitted to basket 57, basket 57 being readily removable from shaft 17 when desired.

75 Basket 57 has an imperforate bottom and an upwardly extending and outwardly flaring imperforate side wall.

On the upper edge of basket 57 is secured, as by rolling, a cover 59 having a central aperture 60 and having a plurality of circumferentially spaced slots or apertures 61, see Figure 10.

A cover 62 has a centrally disposed depending 5 portion 63 in the shape of an inverted truncated cone which provides a central aperture in registration with the aperture 60 in basket 57.

A rubber gasket 64 is provided on the periphery of cover 62 and is adapted to register with the 10 rolled edge 66 of the upper end of the vat 45. Adjacent the outer edge of cover 62 and in spaced relation to the upper end of basket 57 is secured a circular trough 65.

15 The lower edge of trough 65 is positioned slightly below the apertures 61 in basket 57 so that liquid expelled through apertures 61 will be deposited in trough 65.

As perhaps may best be seen from Figure 8, the 20 lower edge of the trough 65 extends circumferentially of the basket in substantially an evenly spaced relation thereto while the upwardly and outwardly extending side of the trough, starting from the discharge orifice 67, defines a spiral of 25 gradually increasing diameter so as to gradually extend to a greater distance from the basket as it approaches the discharge orifice 67 to provide a trough of gradually increasing capacity.

This construction is of advantage because of the fact that the closer the side of the trough is 30 to the basket the greater will be the effect of centrifugal force on the liquid thrown into the trough and in consequence the greater will be the initial speed at which the liquid will move around the trough.

35 The trough being made narrowest at the point where it leaves the discharge orifice the greatest initial speed will be imparted to that liquid which has the farthest to travel to reach the discharge orifice. As the trough approaches the discharge 40 orifice its outer edge is spaced a gradually increasing distance from the basket to accommodate the accumulating liquid, the speed of travel of the liquid being gradually reduced as the distance to be traveled by it becomes less. The relation of parts is such that the liquid will be expelled from the discharge orifice with considerable 45 force.

The small end of the trough is indicated at b and the large end at c, Figure 8.

50 The large end c of the trough 65 is in communication with an upwardly and outwardly extending discharge orifice 67. During certain operations of my device, it is desirable that the orifice 67 be closed so that liquid extracted from 55 the clothes in the basket 57 will be returned to the vat 45.

I have here shown two ways by which this result may be accomplished. Perhaps the simplest way is to provide a cork 68 which may be 60 used to close the open end of discharge orifice 67, a chain 69 being preferably provided on cork 68 so that same may not be lost.

65 After the clothes have been subjected to the washing operation for the proper length of time, the lever 26 is moved laterally in a slot 73 in member 43 to carry segmental gear 20 out of mesh with gear 19 so that dolly 52 will come to rest.

70 Slot 73 has an offset portion at one end in which the end of lever 26 may be positioned to hold it in the retracted position.

The clothes are then removed from the bottom of the vat 45 and placed in the basket 57 and a new batch of clothes to be washed is placed in vat

45, the cover 62 is placed in position on vat 45 and levers 26 and 38 are released and allowed to return to the normal operating position.

Basket 57 having an upwardly and outwardly flaring wall, the liquid which will be thrown outwardly from the clothes in basket 57 by centrifugal force, will contact with the wall of basket 57 and move upwardly to and through the apertures 61. Such liquid will be thrown laterally with considerable force and it will also be thrown in the direction of rotation of basket 57. The liquid thus extracted from the clothes will be thrown into the trough 65 and will flow circumferentially of such trough.

The liquid thus extracted from the clothes being the washing solution, it is preferable that the same be returned to the vat 45 and to accomplish this result, the discharge orifice 67 is closed by the cork 68 or if the device incorporates the valve 70, such valve is moved to a position to close discharge orifice 67.

As may best be seen from Figures 2 and 9, the trough 65 is spaced from the basket 57 and it is also of such a shape that it will not retain inert liquid. Therefore, when the discharge orifice 67 is closed, the liquid extracted from the clothes will drain from trough 65 back into vat 45.

After the washing water has been extracted from the clothes in basket 57, the orifice 67 is opened and rinsing water is introduced through the apertures in cover 62, and the top of basket 57.

After this rinsing water is extracted from the clothes by centrifugal force, it will be thrown into trough 65 and will move circumferentially thereof to and through discharge orifice 67 and it will be deposited in any convenient receptacle.

To facilitate this operation, a hose may, if desired, be attached to the discharge end of orifice 67.

As another method of closing orifice 67, I have shown on Figure 8 a pivoted gate valve 70 which may be manipulated by a handle 71 to be moved to a position to close orifice 67 or to open the same.

Although I have not here shown a lead to connect the motor to a source of potential, it will be understood that such a lead is provided.

Operation

When it is desired to use my device, the cover 62 is removed and the basket 57 is also removed from shaft 17.

Water and soap or other washing fluid is then placed in vat 45 up to a level beneath the upper end of dolly 52. The clothes to be washed are then placed in the vat. The basket 57 may then be replaced, if desired, or it may be left outside of the vat until the completion of the washing of the first batch of clothes. Cover 62 is placed in position.

The motor is then started with the lever 26 in position to permit the meshing of segmental gear 29 with gear 19 so that oscillating motion will be transmitted to dolly 52. Lever 38 is moved to the position to cause the de-clutching of members 33 and 16 so that shaft 17 will be at rest.

Lever 38 extends outwardly through a slot 72 in member 43, slot 72 having an offset portion at its lower end so that when the outer end of lever 38 is depressed, it may be swung laterally into the offset portion of slot 72 to hold it in the down position.

Since the amount of water in trough 65 will

gradually increase in the direction of rotation of basket 57, the trough 65, as heretofore explained, has a spiral outer wall and gradually becomes larger and of greater capacity as it approaches the discharge orifice 67. Such an arrangement facilitates very greatly the operation of the device and also provides against the possibility of any of the rinsing or blueing water escaping from the trough 65 back into the vat 45 before it reaches the discharge orifice 67 which would be the case if more liquid were discharged into the trough 65 than could be carried by such trough.

After the rinsing operation, blueing water may be introduced into the basket 57 and after it has been extracted from the clothes, it may be returned to the blueing receptacle in readiness for further use.

After the clothes in basket 57 have been blueed they are removed from such basket. The second batch of clothes may then be transferred from vat 45 to basket 57, a new batch introduced into vat 45 and the rinsing and blueing operation performed for the second batch, while the new batch is being washed. These operations may be performed as often as is desired.

Although I have not shown one it will be understood that a drain is provided by means of which the vat 45 may be emptied after the washing operation is finished.

I have here shown vats 45 of two different shapes but it will be understood that the shape of the vat 45 is immaterial inasmuch as the trough 65 is carried on the cover 62 so that it may be of the proper shape irrespective of the shape of the vat proper.

It will also be understood that various changes and modifications may be made in the various parts of my device without departing from the spirit of my invention, for although I have shown a specific structure and form and relation of parts as an exemplification of an embodiment of my invention, I do not desire to restrict myself to the exact size, shape or arrangement of parts as various changes may be made within the scope of the appended claims.

I claim:

1. In a combined washing and drying machine having a vat in which clothes are washed, in combination, a centrifugal drying vat mounted in the washing vat and adapted to be rotated at high speed, a cover for said washing vat extending substantially completely over the drying vat, a trough having a discharge outlet, said trough depending from the cover, encircling the drying vat, and having its lower edge lying beneath the point of discharge of the liquid from said drying vat, the liquid as it issues from said extractor being confined between the trough and the lower side of said cover whereby it is prevented from being sprayed about the room in which the machine is operating.

2. In a combined washing and drying machine having a vat in which clothes are washed, a centrifugal drying vat mounted in the washing vat and adapted to be rotated at high speed, a cover for the washing vat enclosing the drying vat completely within the confines of the washing vat, and a trough secured to the underside of said cover and depending therefrom so that its lower edge lies below the point of fluid discharge from said drying vat.

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