March 19, 1929. J. NELSON 1,705,779

COMBINATION WASHING AND DRYING MACHINE

Filed July 3, 1924 3 Sheets-Sheet 1

Fig 2

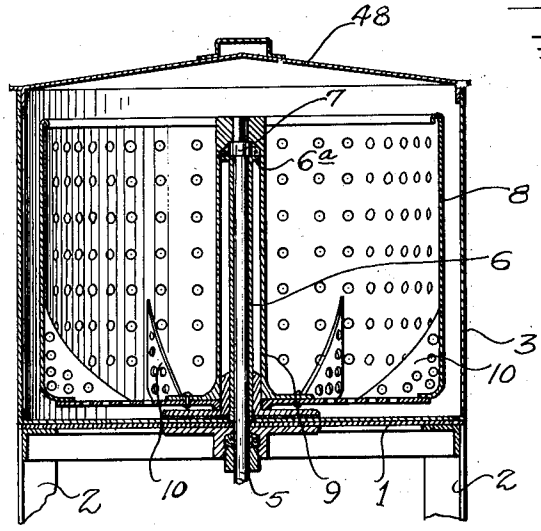


Fig 4

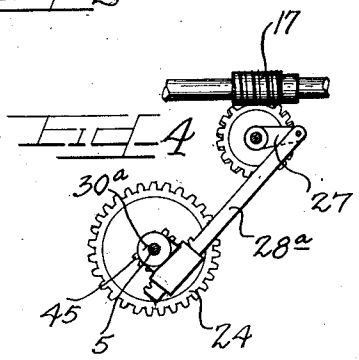


Fig 3

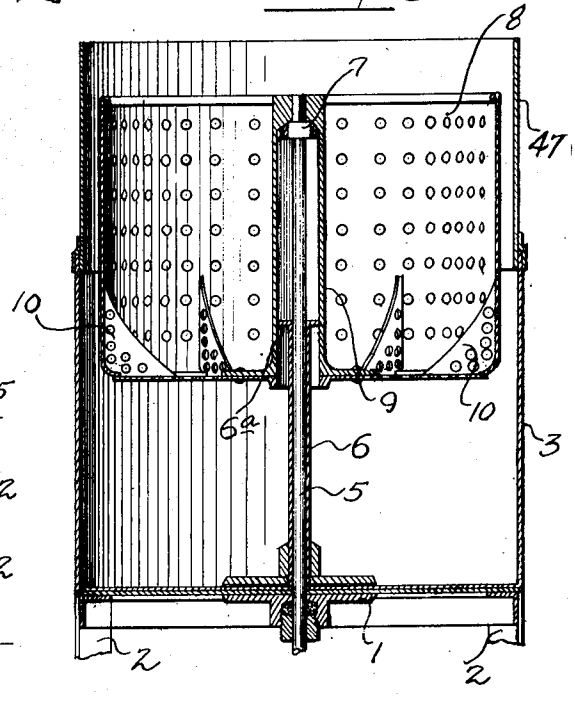
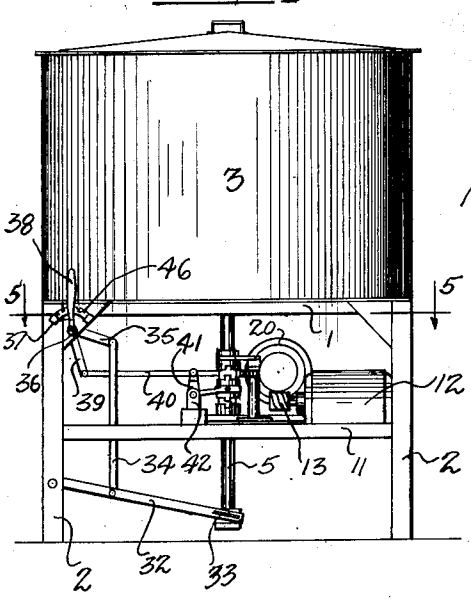


Fig 1



Inventor

John Nelson

Charles W. Hills

By Attys

March 19, 1929. J. NELSON 1,705,779

COMBINATION WASHING AND DRYING MACHINE

Filed July 3, 1924 3 Sheets-Sheet 2

Fig. 5

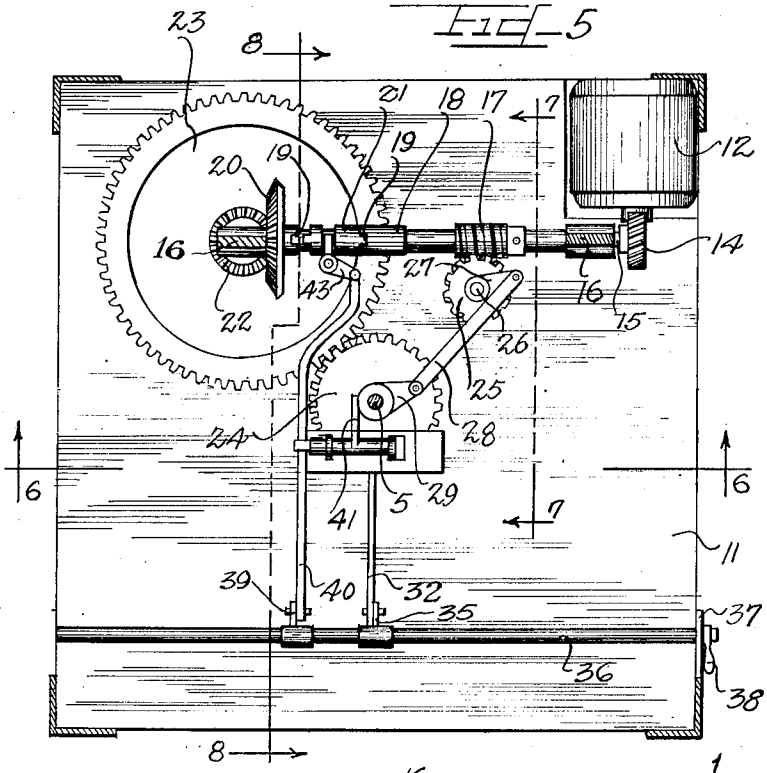
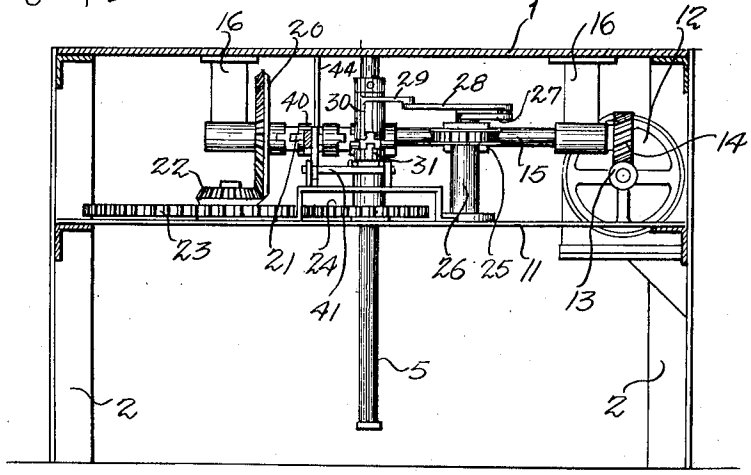


Fig. 6



Inventor

John Nelson

By Atty's

March 19, 1929. J. NELSON 1,705,779

COMBINATION WASHING AND DRYING MACHINE

Filed July 3, 1924 3 Sheets-Sheet 3

Fig. 7

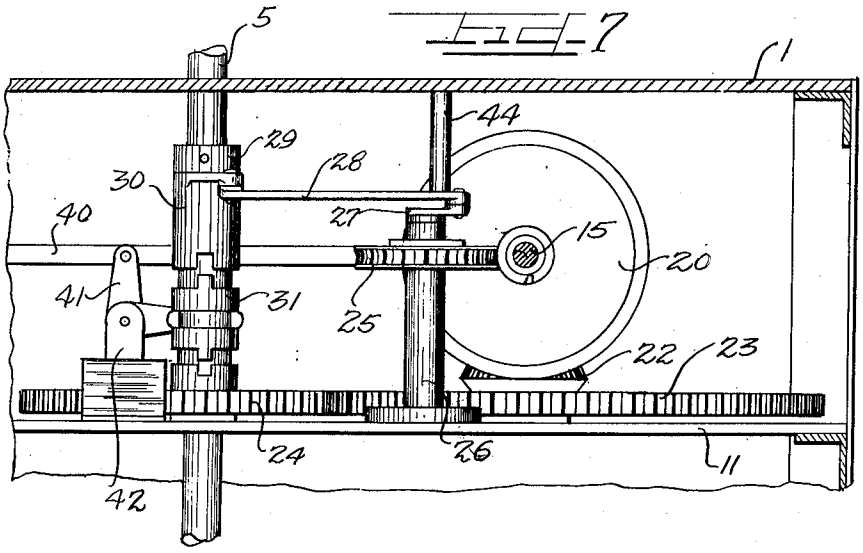
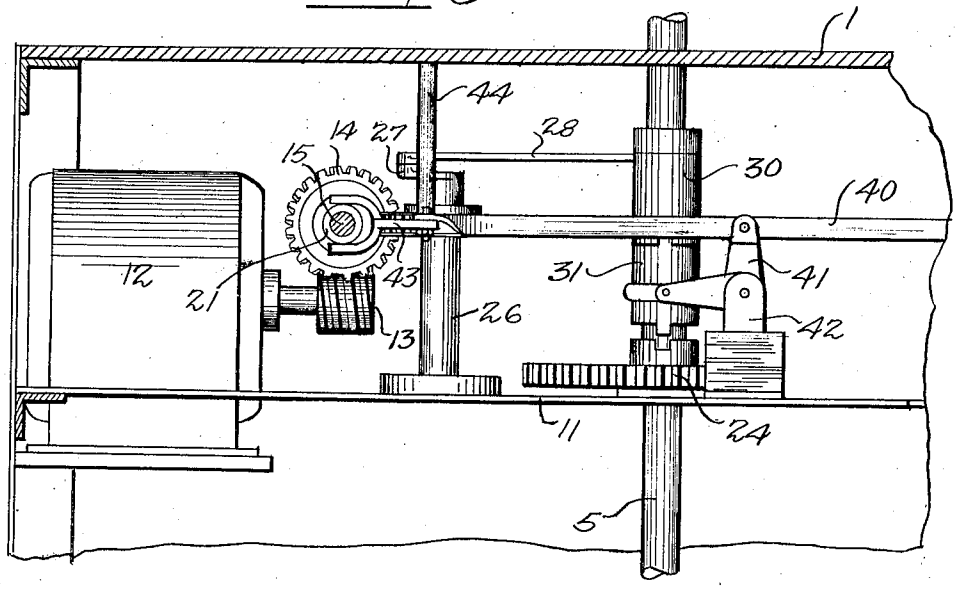


Fig. 8



Inventor

John Nelson

by Attys

Patented Mar. 19, 1929. 1,705,779

UNITED STATES PATENT OFFICE.

JOHN NELSON, OF NEWTON, IOWA, ASSIGNOR, BY MESNE ASSIGNMENTS, TO AUTOMATIC WASHER COMPANY, OF NEWTON, IOWA, A CORPORATION OF DELAWARE.

COMBINATION WASHING AND DRYING MACHINE.

Application filed July 3, 1924. Serial No. 723,857.

This invention relates to a combination washing and drying machine in which a perforated cylinder is oscillated for washing purposes and which may be elevated for constituting a centrifugal drier for drying purposes; the elevation of the cylinder severing the oscillating driving connection and establishing a continuous driving connection, and the cylinder being provided with perforated vanes for agitating the clothes and water.

The invention comprises the novel structure and combinations hereinafter described and more particularly pointed out and defined in the appended claims.

In the accompanying drawings which illustrate a preferred embodiment of this invention and in which similar reference numerals refer to similar features in the different views:

Figure 1 is an elevational view of the washing machine.

Figure 2 is an enlarged vertical sectional view through the tub and cylinder.

Figure 3 is a sectional view similar to Figure 2 with an extension added and the cylinder raised to drying position.

Figure 4 is a fragmentary elevational view of a modified form of driving mechanism.

Figure 5 is an enlarged sectional view upon the line 5—5 of Figure 1.

Figure 6 is an enlarged sectional view upon the line 6—6 of Figure 5.

Figure 7 is an enlarged sectional view taken upon the line 7—7 of Figure 5.

Figure 8 is an enlarged sectional view upon the line 8—8 of Figure 5.

As shown on the drawings:

Referring now to the drawings: there is shown a base support 1 comprising the supporting legs 2. A cylindrical wash tub 3 is positioned upon the base. A shaft 5 extends through the central part of the base and bottom of the tub and through a sleeve bearing 6 rising from the said bottom of the tub and provided with an upper annular flange 6ª. The upper end of the shaft 5 is of polygonal form with a collar 7 at the lower termination of said polygonal form. A perforated cylinder 8 is mounted within the tub, its walls being spaced from the walls of the tub. This perforated cylinder has a central or axial hub 9 which terminates in a bearing at its upper end which is provided with a polygonal bearing aperture for receiving the end of the shaft 5, the collar 7 forming a bearing abutment when the cylinder is elevated as will later more fully appear.

Upon the bottom of the perforated cylinder 8 are a plurality of spaced and perforated agitating vanes or plates 10. They extend across the lower corners of the cylinder and slope downwardly from the wall of the cylinder and they are slightly curved or scoop shaped for agitating the clothes in the cylinder and causing a circulation of the washing fluid.

The cylinder is adapted to be oscillated through arcs which should preferably not exceed 180° when clothes are being washed. However, when the cylinder is elevated as shown in Figure 3, it is adapted to be continuously rotated as will later appear. These two drives are automatic in their action; when one is established, the other is broken as will now be described.

Upon a suitable support 11 secured to the legs 2, there is positioned an electric motor 12, the shaft of which is provided with a worm 13, that meshes with a worm wheel 14 secured upon a shaft 15 suitably journalled in bearing brackets 16 depending from the base 1. A worm 17 having an elongated bearing hub or sleeve 18 (Figure 5) provided with clutch notches 19 is loosely mounted upon shaft 15 and upon the inner end of the shaft 15, there is loosely mounted a bevelled pinion 20 having a hub provided with similar clutch notches 19. A slidably splined clutch member 21 on the shaft 15 is provided with tongues upon its opposite ends for engagement with either the notches in the worm 17 or pinion 20 for alternatively engaging them to the shaft 15 for rotation therewith.

The pinion 20 meshes with a gear 22 secured concentrically of a large gear 23 journalled upon the support 11. The gear 23 meshes with a gear 24 loosely mounted upon the shaft 5. Consequently when the pinion 20 is clutched to the shaft 15 and gear 24 is clutched to its shaft, a continuous rotation is imparted to the shaft 5 and cylinder 8.

The worm 17 meshes with a worm gear 25 secured upon a shaft 26 extending upwardly from the support 11. A crank 27 is secured upon the upper end of the shaft 26 and is connected by a link 28 to a crank arm 29 integral with a clutch member 30 loosely mounted upon the shaft 5. The aforementioned gear 24 is likewise provided with an upward-

ly extending clutch hub, and a clutch member 31 is slidably splined upon the shaft 5 between the clutch member 30 and the clutch hub of gear 24 and is adapted for clutching either the member 30 or gear 24 to the shaft 5.

Mechanism has been provided for simultaneously elevating the cylinder 8 to drying position and shifting the clutch members 21 and 31 for disengaging the oscillating drive and effecting a continuous drive. In referring to Figure 1, it will be noted that a lever 32 pivoted at one end to a leg 2 has its other end connected by means of a slot and pin to a bearing collar 33 rotatably mounted upon the lower end of shaft 5. This lever is connected by a link 34 and an arm 35 to a rod 36 (Figure 5 journalled in suitable angle pieces 37 secured to the base 1 and legs. One end of this rod is provided with an operating handle 38. A second arm 39 is connected to the rod 36 and a link 40 is connected to the arm 39. The link 40' is connected intermediate its ends to one arm of a bell crank shipper lever 41 pivoted upon a bracket 42 extending from the support 11. The other arm of this shipper lever is in the form of a yoke engaging a suitable groove in the clutch member 31. The end of the link 40 is connected to one arm of a second bell crank shipper lever 43 pivoted upon a depending rod 44 from the base 1; the other arm of the bell crank lever 43 is in the form of a yoke which engages a suitable groove in the clutch member 21.

When the cylinder 8 is in its lowered position, the clutch 21 will be in engagement with the worm 17, and the clutch 31 will be in engagement with the member 30. Consequently the gears 20, 22, 23 and 24 will be idle or inoperative, so that if the motor is now started, only the worm 17 will rotate and through the link 28 will oscillate the shaft 5 and cylinder 8, the effective length of the crank 29 being greater than the crank 27. However, instead of using the crank 29, the link 28 may be made in the form of a rack bar 28^a as shown in Figure 4 for engagement with teeth 45 on the clutch member 30^a, a form well known in the art.

When the washing operation is completed and it is desired to elevate the cylinder 8, for drying purposes, the handle 38 is properly swung to raise the lever 32 for elevating the shaft 5 and cylinder 8 as shown in Figure 3. As the lever 32 is raised through the rotation of the rod 36, the lever 40 will be simultaneously actuated for shifting the clutch 21 out of engagement with the worm 17 and into engagement with the gear 20, and the clutch 31 out of engagement with the clutch member 30 and into engagement with the gear 24.

Consequently, the oscillating drive will be thrown out of action and the continuous drive through the gears will be brought into action.

In order to retain the cylinder in elevated position, a locking segment 46 may be secured adjacent the lever 38 which may be provided with a manually actuated pawl for engaging said segment as is well known in the art. When the cylinder 8 is in elevated or drying position, an extension cylinder 47 may be applied to the upper part of the tub by removing the cover 48 as shown in Figure 3, provided the tub is not deep enough in the first instance. From the foregoing it will be apparent that a novel form of combination washer and drier has been provided which may be readily connected from one to the other, the conversion of which automatically changing the drive from an oscillating one to a continuous rotary one. It will further be appreciated that the perforated cylinder with the lower vanes will cause an effective circulation of the washing fluid for cleansing the clothes.

I am aware that many changes may be made, and numerous details of construction may be varied through a wide range without departing from the principles of this invention, and I therefore do not purpose limiting the patent granted hereon, otherwise than necessitated by the prior art and the appended claims.

I claim as my invention:

1. In a washing machine of the class described, a receptacle, a perforated cylinder supported in said receptacle and adapted for vertical movement, a driven shaft, an oscillating drive between said shaft and cylinder, a continuous rotary drive between said shaft and cylinder, a clutch on the driven shaft and connectable with either the rotary drive or the oscillating drive and elevating mechanism for the cylinder having a connection with said clutch for automatically disconnecting the oscillating drive and connecting the continuous rotary drive during the elevating movement of said cylinder.

2. In a machine of the class described, a receptacle, a cylinder in said receptacle and supported for vertical movement, a pair of drives for the cylinder, clutches for controlling said drives, and means for elevating said cylinder and simultaneously shifting said clutches for disconnecting one drive and connecting the other.

3. In a machine of the class described, a receptacle, a cylinder supported therein for vertical movement, means for vertically shifting said cylinder from a lowered to an elevated position, a pair of drives for said cylinder, one for each position thereof, a shiftable clutch for each drive, and a connection between said means and each clutch for controlling said drives according to the position of the cylinder.

4. In a laundry machine, a casing, a perforated container in said casing, means including a shaft for raising and lowering said

container, a gear loose on said shaft, a clutch for engaging said gear and shaft, gearing for driving said gear, a power driven rotary element, an oscillatory driving mechanism between said element and shaft, clutch mechanism between said oscillating driving mechanism and gearing for connecting one and disconnecting the other and means for simultaneously operating said clutch and clutch mechanism.

5. In a laundry machine, a casing, a perforated container in said casing, a shaft secured centrally of said container, a power driven element, an oscillating driving mechanism between said element and shaft, a rotary gear on said shaft, a clutch for connecting and disconnecting said gear and shaft, gearing connecting said power driven element and gear, a clutch for disconnecting said oscillating mechanism and connecting said gearing with said power driven element, means for elevating said container, and connections from said means to said clutches for operating the same during the elevating movement of the container for disconnecting said oscillating driving mechanism and establishing a rotary drive through said gear.

In testimony whereof I have hereunto subscribed my name.

JOHN NELSON.