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S. J. BOUGHTON

WASHING AND DRYING MACHINE

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2 Sheets-Sheet 1

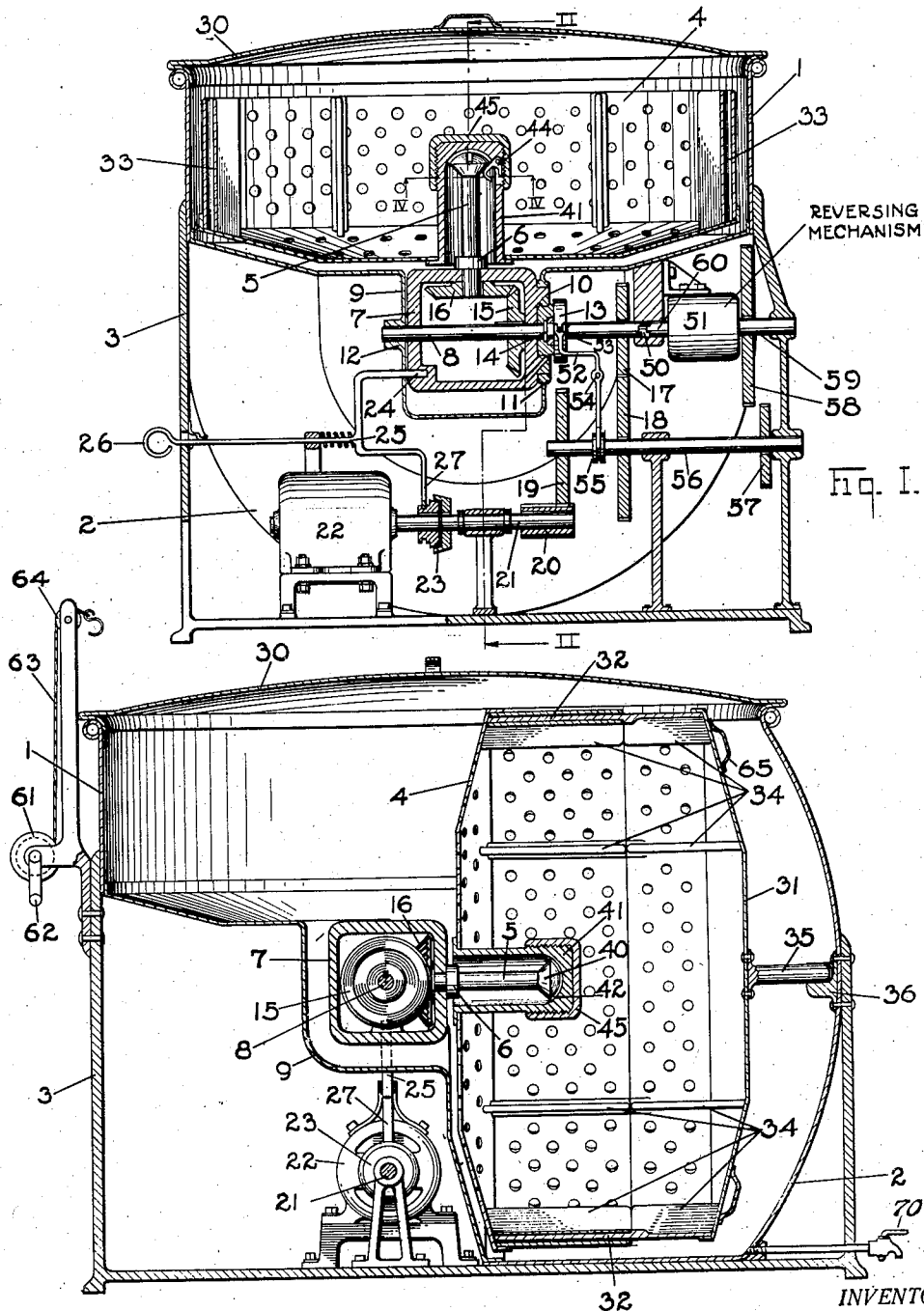


Fig. I.

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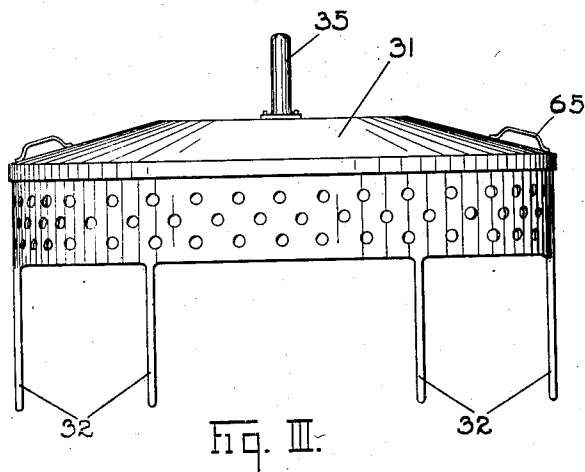
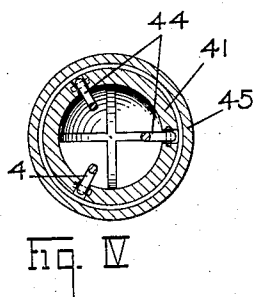
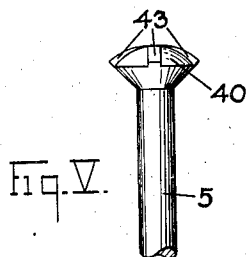
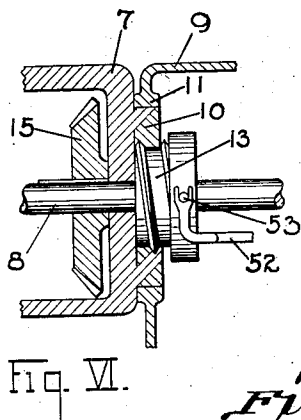
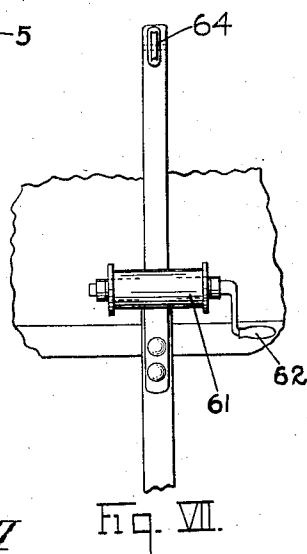
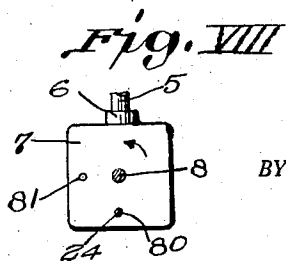
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WASHING AND DRYING MACHINE

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2 Sheets-Sheet 2



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WASHING AND DRYING MACHINE.

Application filed October 21, 1920. Serial No. 418,570.

This invention relates to combination washing and wringing machines, its general object being to provide a machine in which the clothes may be washed and wrung by centrifugal force without removing the clothes from the container, by swinging the container to different positions.

Another object is to provide a machine which has a stationary outer casing which encloses the container in both its washing and wringing positions, thus preventing the splashing of water outside the machine at all times.

Another object is to provide a mechanism for swinging and driving the container which is disposed entirely on the under side of the stationary casing so that it will not interfere with the operator.

Other objects are: To provide a common means for supporting and rotating the container when in the wringing position; to provide a common means for operating the container in both its washing and wringing position; to provide a bevel gear for operating the container in both washing and wringing positions and which remains meshed with its driving gear when the container is swung to different positions; to provide a container with telescopic sections so that more space may be provided for the clothes during the washing operation.

Other objects and those relating to economies of manufacture and simplicity and lightness of construction will appear later as I proceed with a detailed description of that particular embodiment of my invention which for the purposes of illustration I have shown in the accompanying drawings, in which

Figure I is a vertical section through the center of the clothes container when the same is in the wringing position.

Figure II is a vertical section on line 2—2 of Figure I but showing the container in the washing position.

Figure III is an elevation of the detachable upper part of the container.

Figure IV is a section on line 4—4 of Figure I, the shaft being removed.

Figure V shows on an enlarged scale the clutch end of the drive shaft.

Figure VI shows on an enlarged scale a detail shown in Figure I.

Figure VII shows on an enlarged scale

the windlass for raising the container to its wringing position.

Figure VIII shows the detail of the locking means for the container.

Similar reference characters refer to similar parts throughout the several views.

1 represents the stationary outer casing of the machine which is constructed to completely enclose the clothes container in both its washing and wringing positions as shown in Figures I and II. The lower portion 2 of the casing is filled with water to the desired level dependent upon the amount of clothes to be washed and preferably has a drain cock at its lowest point for draining purposes. The entire outer casing is preferably made of sheet metal and rigidly supported upon a frame structure 3. The clothes container 4 is cylindrical in shape and is made of some pervious material such as perforated sheet metal and is supported at its center when in the wringing position by the vertical shaft 5. The shaft 5 is supported at its lower end by a collar 6 bearing upon the hollow member 7 which is pivotally supported upon the central part 9 of the stationary outer casing. One end of hollow member 7 has an internally threaded member 10 welded to it as shown in Figure VI, the outer cylindrical surface of member 10 having a bearing 11 on the part 9. The other end of member 7 is supported by the shaft 8 which has a bearing 12 on the part 9. Fitting within member 10 is the externally threaded nut 13 with wide pitched threads fitting those of the member 10. Shaft 8 runs through the center of nut 13 and has a collar 14 fitting within a groove in nut 13 so that shaft 8 partakes of any lateral movement of nut 13. The bevel gear 15 is splined upon shaft 8 to allow lateral movement of the shaft, and intermeshes with bevel gear 16 which is keyed upon the shaft 5. Gear 16 also has a bearing upon member 7 to hold shaft 5 in place during the washing operation.

During the wringing operation shaft 8 is driven through the train of gears 17, 18, 19, and 20 as clearly shown in Figure I. Shaft 21 to which gear 20 is keyed is driven by the electric motor 22 through the clutch 23. The hollow member 7 is held in its wringing position by the catch 24 extending through the stationary part 9 into a hole

in member 7. Catch 24 is rigidly attached to member 25 and is operated by the handle 26 extending to a convenient point outside the machine. Clutch 23 is operated by a
 5 fork 27 which is also rigidly attached to member 25. Thus it is seen that clutch 23 is disengaged whenever the catch 24 is withdrawn, so that it will be impossible to tip the clothes container 4 from one position
 10 to the other while it is connected to the power source 22. However, by withdrawing handle 26 only a short distance clutch 23 may be disengaged without releasing the catch 24.

15 In starting the washing operation the machine parts will be in the position shown in Figure I. The cover 30 is removed and the articles to be washed put into the container 4. The cooperating and telescoping closure
 20 31 of the container is now inserted to its position. This member 31 forms an extension to the cylindrical part of the container and also provides one end portion to hold the clothes from falling out during the
 25 washing operation. The member 31 is rigidly attached to the container 4 by the extensions 32 (see Figure III) which fit snugly into recesses 33 (see Figure I) provided therefor. The inner surface of both the con-
 30 tainer and cooperating closure member are provided with longitudinally extending vanes or "lifters" 34, which serve to carry up the clothes from the bottom and drop them again through the water and suds.
 35 The recesses 33 are preferably formed where the vanes 34 are attached to the cylindrical portion, as shown in Figures I and II. The portion 31 being firmly in position, catch 24 is withdrawn by handle 26 and the clothes
 40 container tipped over to the washing position. A trunnion 35 rigidly secured to portion 31 falls into the stationary bearing 36 and thus the outer end of the container is supported during the washing operation.
 45 The inner end is supported by its attachment to shaft 5 in such a manner as to allow for a slight disalignment in order to obtain exact balance of the cage when rotated at high speed for drying. This is accomplished
 50 by providing a ball and socket connection between shaft 5 and the container. Shaft 5 has the ball 40 and the center piece 41 of the container 4 has the socket 42 which has a slightly greater radius than ball 40 and
 55 therefore allows a slight rocking of the container upon the ball 40. The projections 43 on the ball 40 however, fit into corresponding grooves in the socket 42 which are deep enough to permit the above described rock-
 60 ing motion but yet not disengage the clutch connection. The ball 40 is held up into the socket by the three pivoted catches 44 (see Figures I and IV). These pivoted catches drop down by gravity when the cap 45 is
 65 withdrawn and thus allow the ball to be

inserted. The cap 45 is then screwed on and presses against one arm of each of the pivoted catches 44, thus holding them up against the conical bottom of ball 44. The
 above described structure permits a slight
 70 rocking motion of the clothes container but gives a rotary driving connection at all times. When the container is tipped over to the washing position the hollow member
 75 7 together with member 10 is revolved about 90 degrees. The internal threads of member 10 engaging the external threads of nut 13 cause the nut 13 to be shifted bodily to the
 right as viewed in Figure I. On account of
 80 the collar 14 the entire shaft 8 is shifted to the right also, thus bringing clutch 50 into engagement, and causing driving connection between shaft 8 and the stub shaft 60 of the
 reversing mechanism 51. The nut 13 is pre-
 85 vented from rotating by the yoke lever 52 which engages two diametrically opposed pins 53 on the nut 13. The yoke lever 52 is pivoted on the stationary pin 54 and its
 opposite end is forked and engages a collar
 90 55 keyed to the shaft 56. Therefore when the nut 13 is shifted to the right the lever 52 shifts the shaft 56 to the left together with the gears 18, 19, and 57 keyed thereto. This
 motion will disengage gear 18, shift gear 19
 95 along the long gear 20 without disengagement, and engage gear 57 with the gear 58, which is keyed to the driving shaft 59 of the reversing mechanism 51. The details
 of this reversing mechanism are not shown
 100 as the same are well known to those skilled in the mechanical arts and it is not thought necessary to illustrate any particular type here. Its operation is such that when shaft
 59 is rotated continuously in one direction
 105 the shaft 60 is first rotated several revolutions in one direction and then the same number in the opposite direction, etc. Therefore after shaft 56 is shifted to the
 left by the shifting of shaft 8 to the right
 110 the motor 22 is geared up through gears 20, 19, 57, 58, reversing mechanism 51, clutch 50, gears 15 and 16 to the clothes container 4. The motor 22 is now connected by the en-
 gagement of clutch 23 when the catch 24
 115 registers with a hole 81 in member 7 which corresponds to the washing position. Elec-
 tric connections for the motor being made, the container will now be rotated several
 120 revolutions in one direction and then several revolutions in the other, this operation being continued as long as may be required to clean the clothes. To stop this operation
 the handle 26 is pulled out, thus disengaging
 125 clutch 23. The container may now be turned up to the wringing position. To aid in thus raising the container a small windlass 61
 operated by the hand crank 62 may be provided, the cable 63 passing over a guide
 130 pulley 64 and hooked or fastened onto some portion of the container, such as one of the

handles 65. The top member 31 may now be removed and the container 4 revolved at a high speed through the gears 18 and 17, the reversing mechanism 51 being now disconnected. Only a few minutes will be required to wring the clothes when they may be removed and the operation repeated with another batch of clothes.

By my invention it is not necessary to drain off the water in order to wring the clothes with the same container in which they were washed. Moreover the entire operating mechanism is simpler and lighter than those heretofore used.

While I have described in more or less detail one embodiment of my invention I do not wish or intend to be limited thereto as it is obvious to those skilled in the art that the same is capable of many variations without departing from the scope of the invention as defined by the appended claims.

What I claim is:

1. In a combined centrifugal wringer and cylinder washer, a cylinder formed of two parts, and a pair of axially aligned pivotal mountings, one on each part, said parts being disconnectible, whereby one only may be utilized for wringing.

2. In a combination washing machine and centrifugal wringer, a clothes container rotatably supported upon a vertical axis in the wringing position and rotatably supported upon a horizontal axis in the washing position, and a cover for said container removably attached thereto, and provided with a trunnion forming part of the horizontal axis support.

3. In a combination washing machine and centrifugal wringer, a clothes container having an axial pivotal mounting, the axis of said container being approximately vertical in the wringing position and approximately horizontal in the washing position, and a cover for said container removably attached thereto, and provided with a trunnion forming part of the horizontal axis support.

4. In a machine of the class described, a driving shaft having an enlarged head, a clothes container provided with a cylindrical bearing member having a closed end adapted to receive said head, said cylindrical member having a retaining finger pivoted therein adapted to engage behind said head to lock the parts in operative position, and a threaded cap for said cylindrical member adapted to engage said finger to hold it in operative position.

5. In a machine of the class described, a vertical driving shaft terminating at its upper end in a substantially ball ended head, a clothes container supported upon said shaft with its base below said head, said container having a socket resting upon said ball ended head, clutch elements between said ball and socket adapted to provide positive drive

from said shaft to said container but capable of permitting slight rocking movement in the ball and socket joint and means for detachably locking the clutch elements together.

6. In a combined washing and drying machine, a container rotatably supported upon a vertical axis in drying position and upon a horizontal axis in washing position, trunnions upon which said container is mounted to swing from one position to the other, and means for driving said container in both positions, said means including a clutch, a lock for holding said container in either of its two operative positions, and lock releasing means so arranged as to be incapable of operation until said clutch is disengaged.

7. In a combined washing and drying machine, a container rotatably supported upon a vertical axis in drying position and upon a horizontal axis in washing position, trunnions upon which said container is mounted to swing from one position to the other, means for driving said container in both positions, said means including a clutch, a lock for holding said container in either of its two operative positions, and a lock releasing means and a clutch shifter so arranged that the clutch may be disengaged without releasing the lock but that the lock may not be released without disengaging the clutch.

8. In a combined washing and drying machine, a container rotatably supported upon a vertical axis in drying position and upon a horizontal axis in washing position, trunnions upon which said container is mounted to swing from one position to the other, means for driving said container in both positions, said means including a clutch, a lock for holding said container in either of its two operative positions, a lock releasing means, a clutch shifter and a single operating handle connected to the lock releasing means and clutch shifter, said handle having three positions—one in which both the lock and clutch are engaged, one in which the lock alone is engaged, and one in which both lock and clutch are disengaged.

9. In a washing and wringing machine, in combination, a clothes container having a driving gear attached thereto centered upon the axis of said container, a power shaft for operating said driving gear with the axis of the container in a horizontal position for washing and in a vertical position for wringing, the gear connections between the driving gear and the power shaft being continuous.

10. In a combined washing and drying machine, the combination of a support, a container mounted upon said support and movable to horizontal or vertical position, a connection between the support and con-

tainer above the base of the container when in upright position, said connection being sufficiently loose to permit automatic centering of the container when rapidly revolved and means for steadying said container when in horizontal position.

11. In a combined washing and drying machine, the combination of a support movable to approximately vertical and horizontal positions, a container mounted on

and movable with said support there being a loose driving connection between the container and support positioned above the base of the container when in upright position and means for steadying said container on its loose connection with the support when in horizontal position.

In testimony whereof, I affix my signature.

SOLON J. BOUGHTON.