

June 17, 1930.

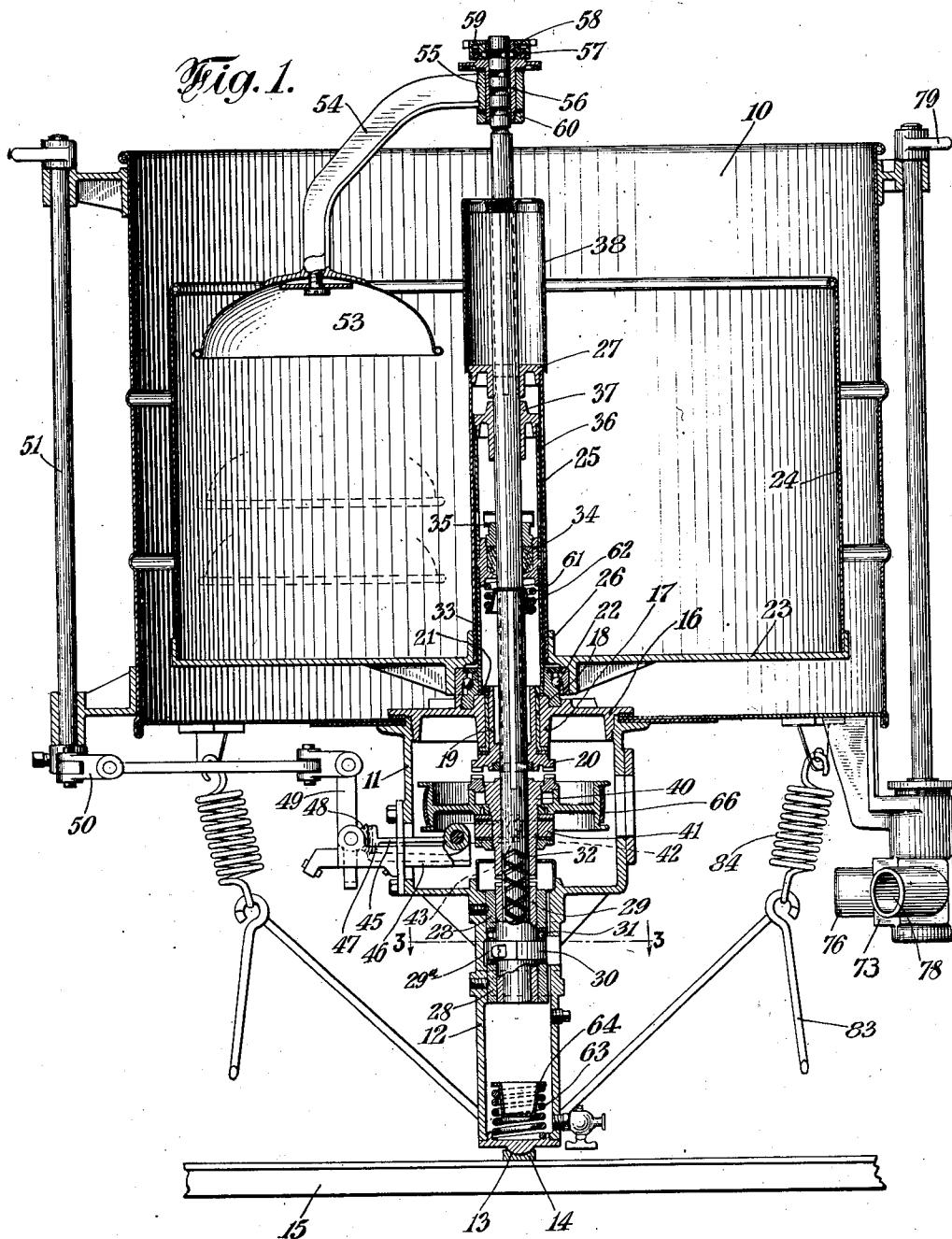
G. D. HAUSER

1,764,302

WASHING AND DRYING MACHINE

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4 Sheets-Sheet 1



Inventor
George D. Hauser
 By his Attorneys
Kenyon Kenyon

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G. D. HAUSER

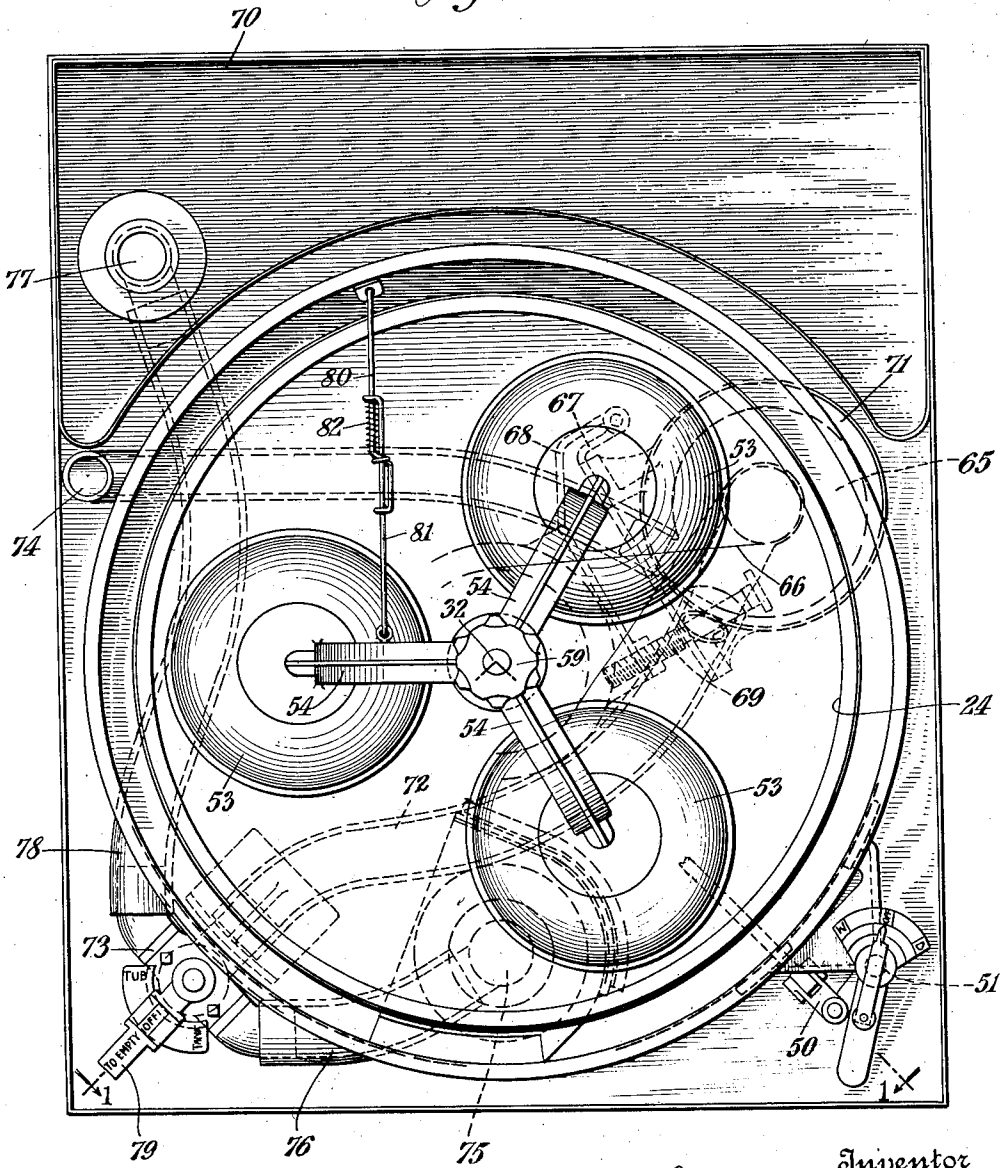
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Fig. 2.



Inventor
George D. Hauser
By His Attorneys
Kenyon Kenyon

June 17, 1930.

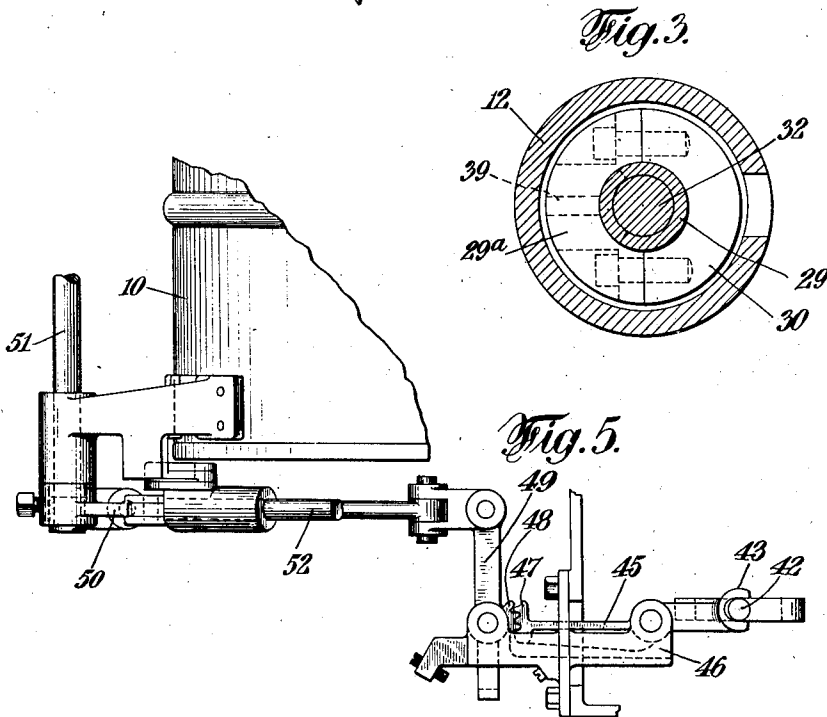
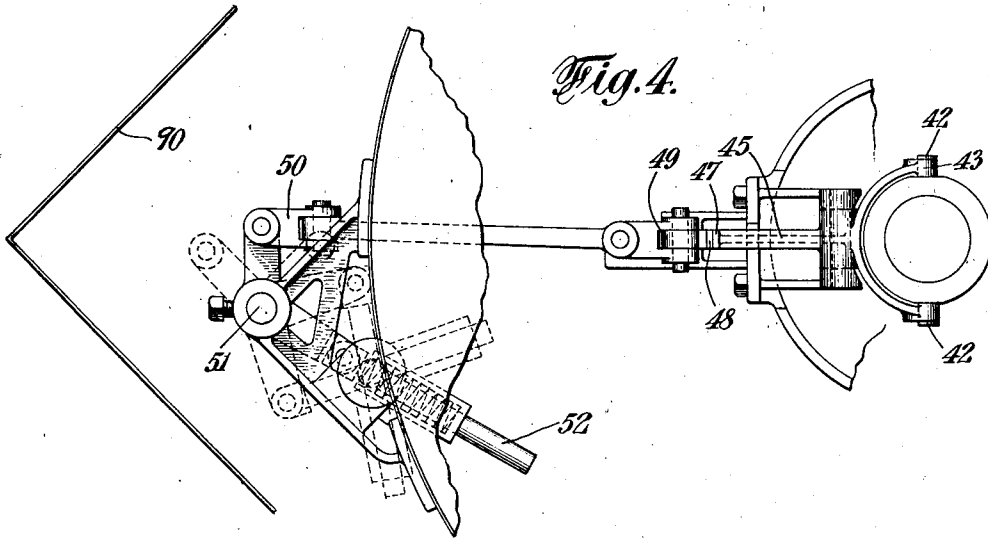
G. D. HAUSER

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Inventor
George D. Hauser
By His Attorneys
Kempson Kempson

June 17, 1930.

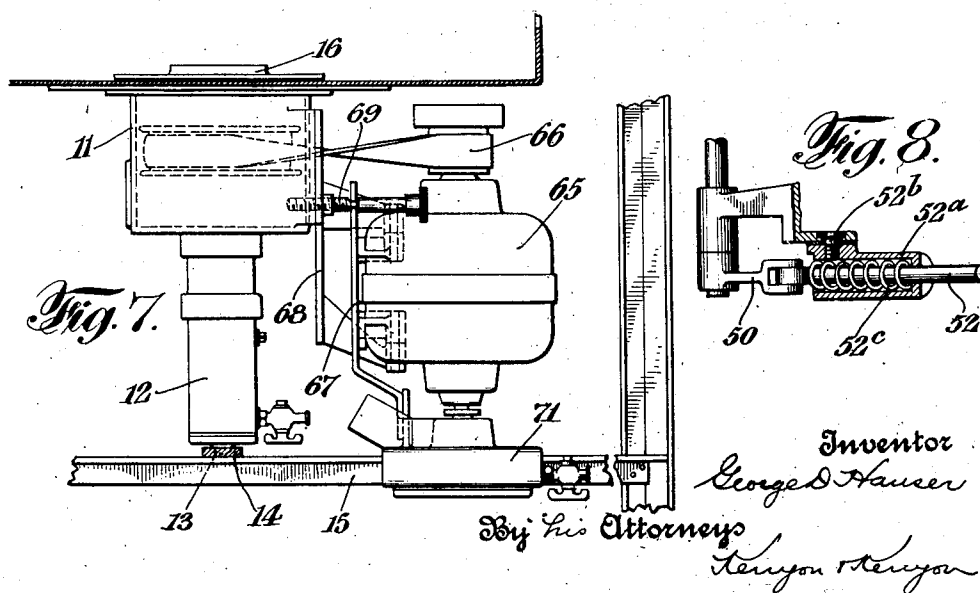
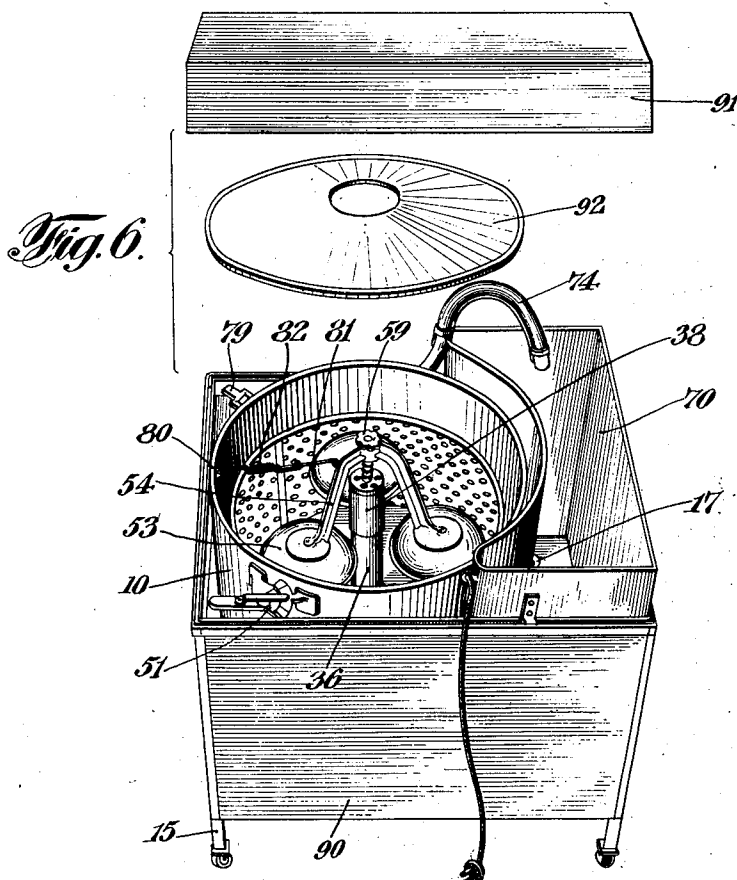
G. D. HAUSER

1,764,302

WASHING AND DRYING MACHINE

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UNITED STATES PATENT OFFICE

GEORGE D. HAUSER, OF UTICA, NEW YORK, ASSIGNOR TO UTICA PRODUCTS, INC., OF
UTICA, NEW YORK, A CORPORATION OF NEW YORK

WASHING AND DRYING MACHINE

Application filed January 6, 1928. Serial No. 244,805.

This invention relates to washing machines and more especially to that type of machine in which the clothes are washed by means of reciprocating pounders and are dried by rotation of a basket containing the clothes.

5 An object of this invention is a washing machine having provision for removing and storing the wash water while the basket is being rotated to dry clothes and returning the wash water from storage to the machine for further use. An additional object of the invention is improved means for causing relative movement of the pounders and clothes being washed so that the pounders engage 10 different portions of the batch of clothes at each reciprocation.

Other objects, novel features and advantages of this invention will be apparent from the following specification and accompanying drawing, wherein

20 Figure 1 is a vertical section through a washing machine embodying the invention;

Fig. 2 is a plan view;

25 Fig. 3 is a section on the line 3-3 of Fig. 1;

Fig. 4 is a plan view of the clutch-operating mechanism;

Fig. 5 is a side view thereof.

30 Fig. 6 is an exploded perspective view of the machine embodying the invention.

Fig. 7 is a fragmentary elevation showing the driving mechanism and Fig. 8 is a detailed view partially broken away.

35 The container 10 is supported from a hollow member 11 having a tubular portion 12 terminating in a semi-spherical projection 13 which seats in a socket in a post 14 forming a part of the frame 15. The member 11 is closed with a cap 16 which also clamps the 40 bottom of the container 10 to the member 11. The cap 16 is provided centrally thereof with a collar 17. A bearing sleeve 18 is mounted in the collar 17 and receives the hub of a clutch member 20 which is held in proper 45 position by means of a collar 21 threaded on the upper end thereof. The inner race member of a ball bearing 22 is seated in a groove in the cap 16 and the outer race thereof is seated in a recess formed on the under face 50 of the plate 23 which forms the bottom of the

basket 24. A tubular member 25 has one end threaded in the collar 26 and forms the inner wall of the basket 24. A hollow plug 27 closes the upper end of the tubular member 25. In the tubular portion 12 are mounted 55 bearing sleeves 28 in which is rotatably mounted a second clutch member 29, which has an enlarged portion 30 located between the adjacent ends of the sleeves 28. Between the enlarged portion 30 and the end of the upper sleeve is provided a thrust ball bearing 60 31. A plunger 32 is reciprocally mounted in the clutch members 29, 20, and plug 27 and is keyed to the clutch member 20 and plug 27 for rotation therewith. A sleeve 33 has one end threaded to the inner race member of the ball bearings 17 and is closed by hollow 65 plug 34 through which passes the plunger 32. This plug is provided with a recess which is filled with packing material held in place by a cap 35. A sleeve 36 similar to the sleeve 33 is threaded on the plug 34 and is closed by a hollow plug 37 which surrounds the plunger 32. A tubular shield 38 is threaded on the 70 plunger 32 and is of proper diameter to fit over the sleeve 25.

The enlarged portion of the clutch member 29 is provided with a removable section 29^a in which is rotatably mounted the stem of a key 39 which engages a double spiral groove 80 in the plunger 32. Rotation of the clutch member 29 causes reciprocation of the plunger 32. As this means of producing reciprocation of the plunger is not a part of this invention but is described in detail and claimed 85 in the patent to Xardell No. 1,581,904 of April 20th, it is not disclosed in detail in this application.

A third clutch member 40 is loosely mounted on the plunger 32 and is equipped with 90 teeth to engage the teeth either of the clutch member 20 or the clutch member 29 to cause rotation thereof. A collar 41 is provided on the clutch member 40 and is equipped with studs 42 which are received in the ends of a yoke 43 forming a part of the clutch-operating lever 45 pivotally mounted on a bracket 46 supported by the member 11. The other 95 end of the lever 45 forms a rack 47 which meshes with a gear segment 48 also mounted 100

on the bracket 46. A lever 49 is provided for operating the gear 48 and has one end linked to the end of an arm 50 mounted on the end of a shaft 51 rotatably supported by the container 10. The clutch member 40 is resiliently held in either of its two active positions by means of a plunger 52 slidably mounted in a casing 52^a which is pivotally supported by the stud 52^b. A coil spring 52^c surrounds the plunger 52 and has one end bearing against the end of the casing 52^a and the other end bearing against the enlarged head of the plunger which is pivotally connected to the arm 50.

When the clutch member 40 engages the clutch member 20, rotation of the clutch member 40 produces rotation of the basket 24 as the plunger 32 is caused to rotate and the basket is connected to the plunger through the plug 27 and sleeve 25. When the clutch member 40 engages the clutch member 29, rotation of the clutch member 40 caused reciprocation of the plunger 32. Due to the friction between the key 39 and the side walls of the groove in which it operates, the plunger 32 is caused to rotate slightly as well as reciprocate. This produces a slow rotation of the basket 24. A plurality of pounders 53 are carried by the plunger 32. Each pounder is attached to the end of an arm 54 terminating in a single hub 55. A sleeve 56 is adjustably mounted on the end of the plunger 32, the plunger being provided with a series of peripheral grooves. Balls 57 are mounted in slots at one end of the sleeve 56, and a follower 58 is provided for moving the balls radially to seat them in the aforementioned grooves. The follower 58 is held in operative position by the cap 59. The balls 57 both locate the sleeve and lock it to the plunger. The hub 55 surrounds the sleeve 56 and is held in position by the nut 60. The hub 55 is capable of rotation on the sleeve 56, but the friction between the two members is such that it requires a substantial pull to effect such rotation.

A helical spring 61 is interposed between the plug 34 and a collar 62 mounted on the plunger 32 and serves to cushion the upward movement of the plunger. In the bottom of the cylindrical portion 12, there is provided a helical spring 63 in the upward end of which is mounted a cup 64 which receives the end of the plunger 32 on its downward movement and cushions such movement. A supply of oil is maintained in the cylindrical portion 12 into which the end of the plunger 32 dips at each reciprocation and carries upwardly sufficient oil to lubricate the wearing parts.

A motor 65 is adjustably mounted on the housing 11 and is operatively connected to the clutch member 40 by means of a belt 66. A bracket 67 supporting the motor is hinged to a bracket 68 carried by the housing 10 and

an adjusting screw 69 permits adjustment of the motor.

A storage tank 70 is supported by the frame 15 and means are provided for transferring the wash water from the container 10 to the storage tank 70 and for returning it from the storage tank to the container. A pump 71 is mounted on the shaft of the motor 65 and has its inlet connected through a flexible tube 72 with the outlet of a three-way valve 73. The outlet of the pump is connected with a flexible conduit 74. In the bottom of the container 10, there is provided an outlet 75 which is connected by a conduit 76 with one of the inlets of the valve 73. The tank 70 is also provided in its bottom with an outlet 77 which is connected by means of a conduit 78 with the other inlet of the valve 73. Thus by properly operating the valve by means of the handle 79, either the container 10 or the storage tank 70 may be drained and the contents discharged through the conduit 74. This conduit may be so placed that the container discharges into the storage tank or into a drain. Also it may be so placed that water from the storage tank is returned to the container or is carried to a drain.

The position of the pounders relative to the plunger is changed at each reciprocation of the plunger. This is effected by means of an extensible member composed of a link 80 having one end hinged to the container 10 and a second link 81 having one end attached to an arm 54. The remaining ends of these links are bent to form loops which encircle the other link. A spring 82 is provided which tends to move the links 80 and 81 relative to each other to shorten the effective length of the extensible member. As previously mentioned, the pounders tend to rotate due to the fact that they are frictionally mounted on the plunger 32. The extensible member permits a certain amount of rotation and during this rotation the spring 82 is compressed. However, as the spring 82 is compressed, a point is reached at which the spring overcomes the friction between the hub and sleeve and the former is caused to rotate slightly with respect to the latter.

The rods 83 in conjunction with the springs 84 provide a resilient mounting for the container 10 so that the vibrations of the basket are not communicated to the frame 15. The means of attachment of the pounders to the plunger permits the ready detachment thereof when desired.

In the operation of this device, washing water is introduced into the container 10 in any suitable manner and the clothes to be washed are placed in the basket 24. The clutch-operating lever is moved to bring the clutch member 40 into engagement with the clutch member 29. Rotation of the clutch member 29 causes reciprocation of the plunger 32 through the medium of the key 39 in the man-

ner described in the patent to Xardell No. 1,581,904, dated April 20, 1926. By the reciprocation of the plunger, the pounders 53 are brought down into contact with the clothes and then lifted. Because of the friction between the key 39 and the plunger 32, the latter is caused to rotate slowly in the direction of movement of the clutch member. As the basket 24 is slidably keyed to the plunger 32, the basket rotates therewith. This rotary motion is slow but uniform. As the pounders 53 move downwardly, the link 81 moves on the link 80, thus compressing the spring 82. By the time that the pounder 53 has moved up out of contact with the clothes and above the surface of the wash water, the pull exerted by the spring 82 is sufficient to overcome the friction between the hub 55 and the sleeve 56 so that the former is rotated slightly relative to the latter to bring the pounders 33 back to their original positions. This operation is repeated upon each reciprocation of the plunger 32, so that the pounders 53 engage a different portion of the clothes upon each downward movement. After the washing operation is completed the clutch member 40 is moved to neutral position and pounders 53 are removed from the plunger 32. The valve handle 79 is then operated to connect the outlet of the container 10 to the inlet of the pump 71 and the flexible conduit 74 is arranged to discharge into the storage tank 70 and the wash water is transferred from the container 10 to the storage tank 70. The clothes are then rinsed in the usual manner after which the basket is rotated at a high speed to dry the clothes centrifugally. The basket is caused to rotate by moving the clutch member 40 by means of the member 51 to bring it into engagement with the clutch member 19. The water forced out of the clothes during the drying operation is removed from the container 10 through the valve 73, pump 71, and conduit 74, and may be discharged into a drain as it is not desirable to mix the cold rinse water with the heated wash water. When the clothes have been dried, the clutch member 40 is again moved into neutral position, the clothes are removed from the basket and the pounders again attached to the plunger. The wash water is now transferred from the storage tank 70 back to the container 10 by operating the valve control handle 79 to connect the outlet 77 of the storage tank 70 with the inlet of the pump 71 through conduit 78, valve 73 and conduit 72. The conduit 74 is at this time so directed that the discharge from the pump 71 is carried into the container 10. The storage tank 70 is disposed laterally of the container 10 and has one wall curved to fit around a portion of the container. The storage tank is of proper depth so that its capacity is sufficient to take care of the wash water ordinarily used in the container.

The container and storage tank may be enclosed in a casing 90 which is substantially rectangular in cross section and which, because of the compact arrangement of the container and storage tank, is sufficiently narrow to permit the machine readily to pass through the ordinary door. The compactness and simplicity of the machine permits it to be made of no higher height than the ordinary table and a removable flat cover 91 is provided so that the device may be used as a table when not being used as a washing machine. An annular cover 92 is provided for the container 10.

The above-described device permits the same wash water to be utilized in the washing of several batches of clothes without necessitating the removal of any batch of clothes from the basket until the batch has been rinsed and dried as well as washed. This results in a decided saving of time and labor for the operating of the machine as well as obviating the need of heating fresh wash water for each batch of clothes. Moreover, the amount of soap required is reduced due to the fact that the same water may be used several times.

I claim:

1. A washing machine comprising a container, a reciprocating and rotating plunger therein, a pounder frictionally mounted on said plunger, and a resilient member having one end fixed and the other end connected to said pounder.
2. A washing machine comprising a container, a plunger mounted therein for reciprocation and rotation, a pounder frictionally mounted on said plunger, and means for intermittently rotating said pounder relative to said plunger.
3. A washing machine comprising a container, a plunger mounted therein for reciprocation and rotation, a pounder frictionally mounted on said plunger, and resilient means for intermittently rotating said pounder relative to said plunger.
4. A washing machine comprising a container, a basket rotatably mounted therein, a plunger slidably attached to said basket, means for reciprocating and rotating said plunger, pounders frictionally mounted on said plunger, and means for intermittently rotating said pounder relative to said plunger.
5. A washing machine comprising a container, a basket rotatably mounted therein, a plunger slidably attached to said basket, means for reciprocating and rotating said plunger, pounders frictionally mounted on said plunger, and resilient means for intermittently rotating said pounder relative to said plunger.
6. A washing machine comprising a container, a basket rotatably mounted therein, a plunger slidably attached to said basket, means for reciprocating and rotating said

plunger, pounders frictionally mounted on said plunger, and a resilient member having one end fixed to said container and the other end connected to said pounder.

5 7. A washing machine comprising a container, a reciprocating and rotating plunger therein, a pounder frictionally mounted on said plunger, two slidably-connected links, one of said links having one end connected to said container and the other of said links having one end connected to said pounder, and a resilient member tending to draw said ends toward each other.

10 8. A washing machine comprising a container, a basket rotatably mounted therein, a plunger slidably attached to said basket, means for reciprocating and rotating said plunger, pounders frictionally mounted on said plunger, two slidably connected links, one of said links having one end connected to said container and the other having one end connected to said pounder, and a resilient member tending to draw said ends toward each other.

15 9. A washing machine comprising a container, a basket rotatably mounted therein, a plunger slidably keyed to said basket, means rotatable about said plunger for reciprocating the same, a pounder frictionally mounted on said plunger, and means for intermittently rotating said pounder relative to said plunger.

20 10. A washing machine comprising a container, a basket rotatably mounted therein, a plunger slidably keyed to said basket, means rotatable about said plunger for reciprocating the same, a pounder frictionally mounted on said plunger, and resilient means for intermittently rotating said pounder relative to said plunger.

25 11. A washing machine comprising a container, a basket rotatably mounted therein, a plunger slidably keyed to said basket, means rotatable about said plunger for reciprocating the same, a pounder frictionally mounted on said plunger, and a resilient member having one end attached to said container and the other end connected to said pounder.

30 12. A washing machine comprising a container, a basket rotatably mounted therein, a plunger slidably keyed to said basket, means rotatable about said plunger for reciprocating the same, a pounder frictionally mounted on said plunger, two slidably-connected links, one of said links having one end connected to said container and the other link having one end connected to said pounder, and a resilient member tending to draw said ends toward each other.

35 13. In a washing machine, a plunger, a hub, pounders carried by said hub, said plunger having a series of peripheral grooves and said hub having a series of radial apertures, clamping members movably mounted in said apertures, and means for moving said clamp-

ing members radially into one of said grooves to lock said hub to said plunger.

14. In a washing machine, a plunger, a hub, pounders carried by said hub, said plunger having a series of peripheral grooves and said hub having a series of radial apertures, clamping members movably mounted in said apertures, and means movable axially of said plunger for forcing said clamping members into one of said grooves to lock said hub to said plunger.

15. In a washing machine, a plunger, a hub, pounders carried by said hub, said plunger having a series of peripheral grooves, balls mounted in said apertures, and means for forcing said balls into one of said grooves to lock said hub to said plunger.

16. In a washing machine, a plunger, a hub, pounders carried by said hub, said plunger having a series of peripheral grooves, balls mounted in said apertures, and means movable axially of said plunger for forcing said balls into one of said grooves to lock said hub to said plunger.

17. In a washing machine, a container, a basket rotatably mounted therein, a plunger slidably keyed to said basket, rotatable means keyed to said plunger, a second means rotatable about said plunger, said plunger and second means being provided with coacting mechanism for effecting reciprocation of said plunger upon rotation of said second means, and driving means movable into engagement with either of said means.

18. In a washing machine, a container, a basket rotatably mounted therein, a plunger, means for rotating said basket, means rotatable about said plunger, said last named means and plunger being provided with mechanism for effecting reciprocation of the plunger upon rotation of said means, driving means and means for engaging and driving means with either of said other means.

19. In a washing machine, a container, a basket rotatably mounted therein, a plunger slidably keyed to said basket, rotatable means keyed to said plunger, a second means rotatable about said plunger, said second means and plunger being provided with mechanism for effecting reciprocation of said plunger upon rotation of said second means, driving means movable into engagement with either of said means, a pounder frictionally mounted on said plunger and means for intermittently rotating said pounder relative to said plunger.

20. In a washing machine, a container, a basket rotatably mounted therein, a plunger slidably keyed to said basket, rotatable means keyed to said plunger, a second means rotatable about said plunger, said second means and plunger being provided with mechanism for effecting reciprocation of said plunger upon rotation of said second means, driving means movable into engagement with either

of said means, a pounder frictionally mounted on said plunger and resilient means having one end attached to said container and another end connected to said pounder for intermittently rotating said pounder relative to said plunger.

21. In a washing machine, a container, a basket rotatably mounted therein, means for rotating said basket, means rotatable about said plunger, said last named means and plunger being provided with mechanism for effecting reciprocation of the plunger upon rotation of said means, driving means, means for engaging said driving means with either of said other means, a pounder frictionally mounted on said plunger and means for intermittently rotating said pounder relative to said plunger.

22. A washing machine, a container, a basket rotatably mounted therein, means for rotating said basket, means rotatable about said plunger, said last named means and plunger being provided with mechanism for effecting reciprocation of the plunger upon rotation of said means, driving means, means for engaging said driving means with either of said other means, a pounder frictionally mounted on said plunger and resilient means connected both to said container and to said pounder for intermittently rotating said pounder relative to said plunger.

23. A washing machine comprising a container, a basket rotatably mounted therein, a plunger slidably keyed to said basket, a clutch member slidably keyed to said plunger, a second clutch member rotatable about said plunger, coacting means on said plunger and second clutch member for effecting reciprocation of said plunger upon rotation of said clutch member, a third clutch member rotatably mounted on said plunger and movable into engagement with either of said other clutch members and driving means connected to said third clutch member.

24. A washing machine comprising a container, a basket rotatably mounted therein, a plunger slidably keyed to said basket, a clutch member slidably keyed to said plunger, a second clutch member rotatable about said plunger, coacting means on said plunger and second clutch member for effecting reciprocation of said plunger upon rotation of said clutch member, a third clutch member rotatably mounted on said plunger and movable into engagement with either of said other clutch members, driving means connected to said third clutch member, a pounder frictionally mounted on said plunger and means for intermittently rotating said pounder relative to said plunger.

25. A washing machine comprising a container, a basket rotatably mounted therein, a plunger slidably keyed to said basket, a clutch member slidably keyed to said plunger, a second clutch member rotatable about said

plunger, coacting means on said plunger and second clutch member for effecting reciprocation of said plunger upon rotation of said clutch member, a third clutch member rotatably mounted on said plunger and movable into engagement with either of said other clutch members, driving means connected to said third clutch member, a pounder frictionally mounted on said plunger, and resilient means connected both to said container and said pounder for intermittently rotating said pounder relative to said plunger.

In testimony whereof, I have signed my name to this specification.

GEORGE D. HAUSER.