June 28, 1927. 1,634,238

C. G. SINCLAIR

WASHING MACHINE

Filed Aug. 2, 1924 2 Sheets-Sheet 1

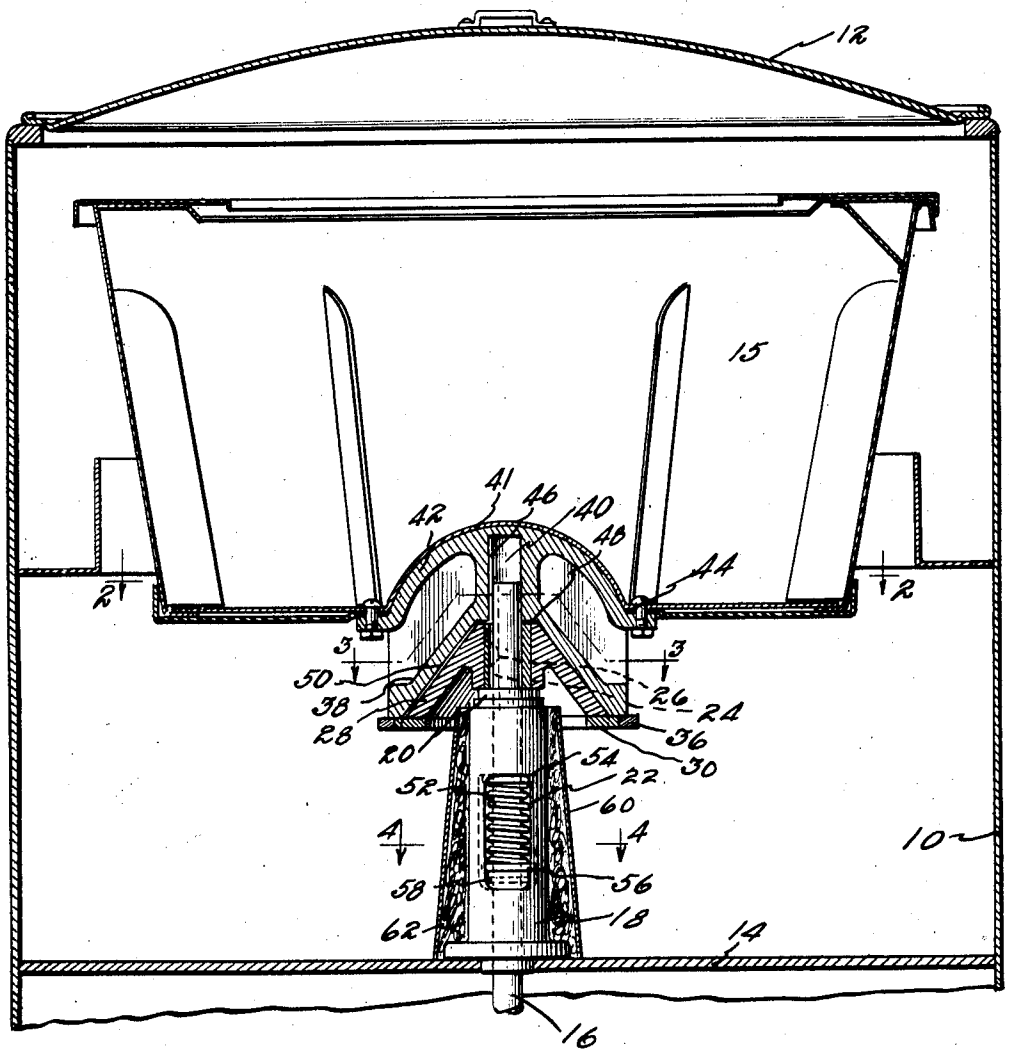


Fig. 1

INVENTOR.
Cyril G. Sinclair

BY Parker & Burton

ATTORNEY.

June 28, 1927. 1,634,238

C. G. SINCLAIR

WASHING MACHINE

Filed Aug. 2, 1924 2 Sheets-Sheet 2

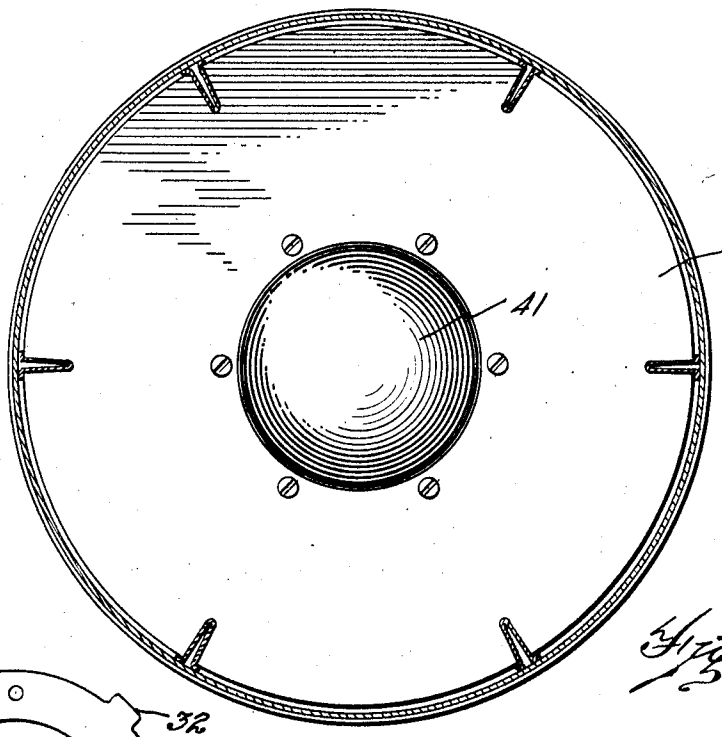


Fig. 2.

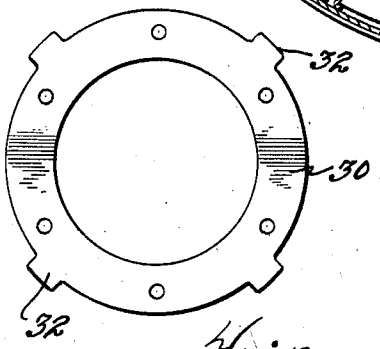


Fig. 5.

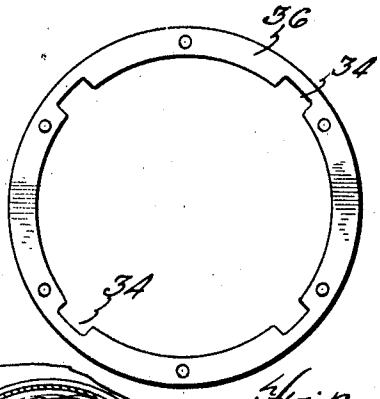


Fig. 6.

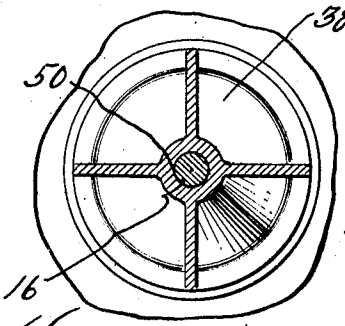


Fig. 3.

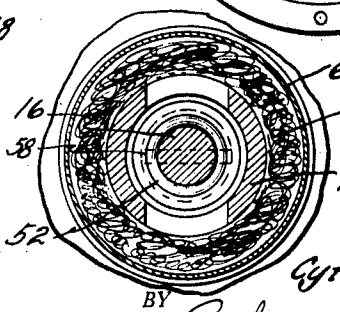


Fig. 4.

INVENTOR.

Cyril G. Sinclair

BY

Parker & Burton

ATTORNEY.

Patented June 28, 1927. 1,634,238

UNITED STATES PATENT OFFICE.

CYRIL G. SINCLAIR, OF TORONTO, ONTARIO, CANADA, ASSIGNOR, BY MESNE ASSIGNMENTS, TO RELIANCE STORAGE AND WAREHOUSE COMPANY, OF DETROIT, MICHIGAN, A CORPORATION OF MICHIGAN.

WASHING MACHINE.

Application filed August 2, 1924. Serial No. 729,679.

My invention relates to improvements in washing machines and particularly to that type of machine illustrated in my co-pending application Serial No. 715,102, filed May 22, 1924.

An object is to provide a machine of that character with improved driving mechanism and particularly with improved clutch mechanism for engaging a rotatable tub with the driving shaft, and to an improved tub structure.

The particular improvements and details of construction are defined in the claims and will more fully appear in the following specification and accompanying drawings.

In the drawings,—

Figure 1 is a fragmentary vertical cross-sectional view through my improved washing machine.

Fig. 2 is a horizontal sectional view taken on line 2—2 of Fig. 1.

Fig. 3 is a horizontal sectional view taken on line 3—3 of Fig. 1.

Fig. 4 is a horizontal sectional view taken on line 4—4 of Fig. 1.

Fig. 5 is a plan view of the male clutch collar.

Fig. 6 is a plan view of the female clutch collar.

In the drawings, let 10 indicate the vat of a washing machine having a removable cover 12 and a bottom 14. 15 indicates a rotatable washing tub supported interiorly of the vat for continuous rotation or oscillatory rotation.

In my co-pending application above identified I provide a rotatable driving shaft adapted to be continuously rotated or rotatably oscillated. This shaft is longitudinally movable to be engaged by the driving mechanism for continuous rotation or rotatable oscillation as therein described. In the present application the driving shaft is indicated as 16. The driving mechanism whereby the shaft is rotatably oscillated or continuously rotated is not shown as it does not form any part of this invention. Shaft 16 is longitudinally movable and extends upwardly vertically through the bottom of the vat 14. Interiorly of the vat surrounding the shaft is a tubular standard 18. A suitable bearing 20 is disposed on the upper end of said standard. The standard is cut away as at 22 to permit access to the shaft and for a purpose hereinafter more fully set forth. The shaft 16 extends upwardly beyond the bearing 20 and for a portion of its length is longitudinally slotted as at 24 to receive a key 26 carried by a cone collar clutch 28. This collar is supported on the bearing 20 and by means of the key is engaged with the shaft to rotate therewith while permitting movement of the shaft longitudinally therethrough. The collar carries a ring male clutch member 30 provided with clutch portions 32 which are adapted to engage in recesses 34 of a female clutch ring 36 which is carried by the cone clutch member 38. This cone clutch member 38 forms a part of the tub 15 and seats over the clutch collar 28 and is furthermore recessed as at 40 to receive the end of the driving shaft 16.

The bottom of the tub is formed with an unbroken axial concavity 41 within which is disposed a crown portion 42 of the cone clutch 38 secured to the bottom of such tub by suitable means such as bolts 44. The cone clutch is cut away to lighten the same, as will appear in the drawing. Due to the fastening of the cone clutch 38 in an unbroken axial concavity in the bottom of the tub there is no danger of leakage through the bottom of the tub at such point.

The recess 40 in the cone clutch 38 is provided with an air groove 46 and the interior of the cone clutch 38 is so formed that a space 48 will exist between the top of the clutch collar 28 and the bottom of the cooperating concavity of the clutch member 38 which communicates with the air groove 46, and the inner surface of the clutch member 48 is provided with a groove 50 so that an air space is provided to the interior of the concavity 40.

I provide a spring 52 which surrounds the shaft 16 interiorly of the standard 18 and one end bears against a shoulder 54 of the standard and the other end against a collar 56 secured to the shaft 18 by pin 58 so that the tendency of this spring is to hold the shaft 16 yieldingly downwardly. The standard 18 is surrounded by a casing 60 and suitable packing 62 is provided between the casing and the standard.

In the operation of my machine when the tub is lowered so that the cone clutch 38

mounted within the unbroken axial concavity 41 in the bottom of the tub is lowered onto the clutch collar 28 driven by the shaft 16 the female ring clutch member 36 engages the male ring clutch member 30 of the collar so the tub is driven by the shaft. Longitudinal movement of the shaft is provided for in that the recess 40 in the clutch member 38 is of such a depth as to permit such movement within the limits required. The shaft is held downwardly by the spring 52 so that its normal position will be its lowermost one.

What I claim is:

1. In a washing machine, a vat, a rotatable driving shaft extending upwardly through the bottom of the vat, a housing extending upwardly from the bottom of the vat about the shaft and provided with a bearing at its upper end, a cone clutch supported on said bearing coupled with the shaft to rotate therewith while permitting longitudinal movement of the shaft therethrough, a spring encircling the shaft within the housing bearing at one end against a part of the shaft and at the opposite end against a fixed part of the housing to exert a yielding pressure upon the shaft endwise thereof, and a tub provided with a co-operating cone clutch member adapted to seat on the first named clutch member to support the tub thereon for rotation by the shaft.

2. In a washing machine, a vat, a driving shaft extending upwardly through the bottom of the vat, a tubular housing extending upwardly from the bottom of the vat about the shaft and provided with a bearing at its upper end, said housing cut away on one side to expose a portion of the shaft, a cone clutch member removably seated upon the bearing at the top of the housing coupled with the shaft to rotate therewith while permitting longitudinal movement of the shaft therethrough, a tub having an axial concavity in its bottom, a second clutch member having a crown portion secured within said concavity, and a cone clutch portion adapted to seat upon the first named cone clutch member to support the tube thereon for rotation thereby, and a spring encircling the shaft within the housing opposite the cut-out of the housing, said spring bearing at one end against a part of the shaft and at the opposite end against a fixed part of the housing to exert a yielding pressure upon the shaft endwise thereof.

In testimony whereof, I sign this specification.

CYRIL G. SINCLAIR.