

Sept. 5, 1939.

P. CURETON

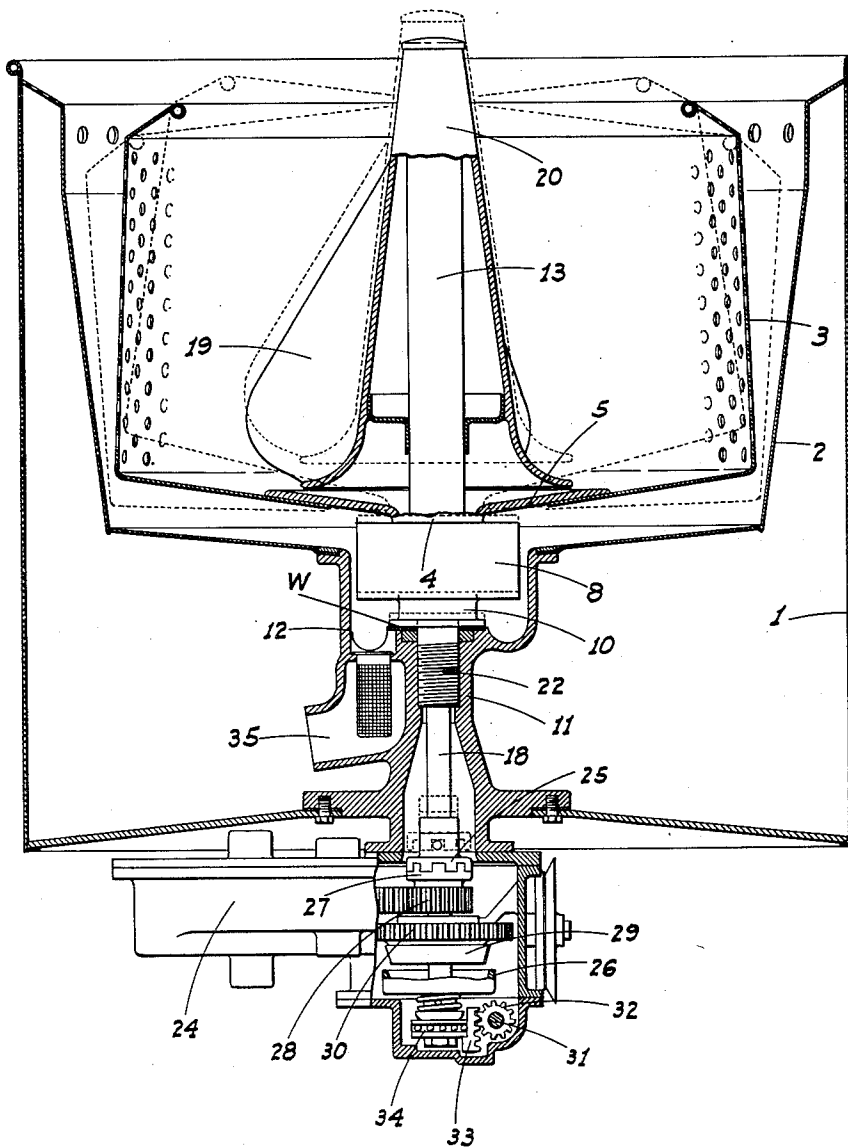
2,171,845

WASHING MACHINE

Filed Dec. 1, 1936

2 Sheets-Sheet 1

Fig. 1



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Fig. 2

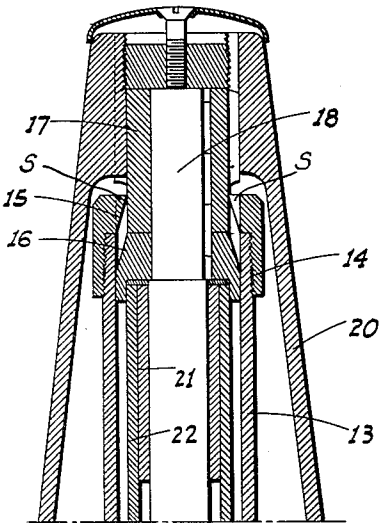


Fig. 3

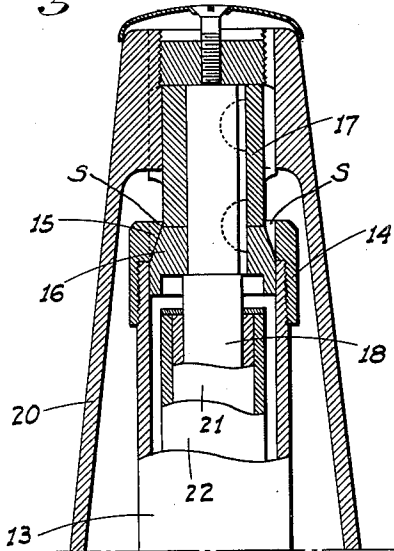
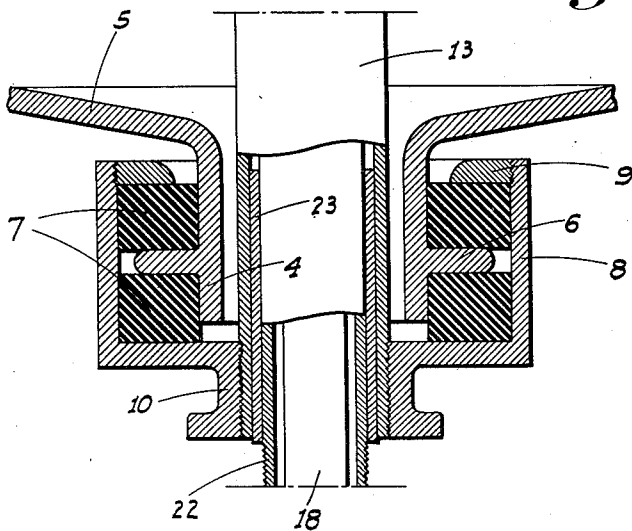


Fig. 4



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2,171,845

WASHING MACHINE

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4 Claims. (Cl. 210—71)

This invention relates to domestic washing machines of the centrifugal or rotary type and particularly to the mounting and operation of the clothes basket and agitator, being in this respect an improvement over my United States Patent No. 1,991,793, dated February 19, 1935.

In the previous device, the mounting of the basket for the desired yieldable vibratory or oscillating movement when spinning during the centrifugal water draining operation was obtained by breaking the drive shaft and placing a flexible or universal joint therein; a similar joint being also necessary between the basket and its support. This, however, was a relatively expensive construction and one subject to considerable wear. Also, in this previous joint structure, the dampening or shock absorbing effect was not uniform.

The principal object of my present invention is to avoid this expensive construction while retaining the advantages thereof, by providing an unbroken, rigid drive shaft, but a yieldable mounting for the basket, in which the dampening movement is uniform, and a selectively controlled connection between the shaft and basket so that the latter can be oscillated in a vibratory manner when being rapidly rotated or spun during the water draining operation.

These objects I accomplish by means of such structure and relative arrangement of parts as will fully appear by a perusal of the following specification and claims.

In the drawings similar characters of reference indicate corresponding parts in the several views:

Fig. 1 is a side view, mainly in section, of the essential features of a washing machine constructed according to my invention.

Fig. 2 is an enlarged sectional view of the upper end of the drive shaft and adjacent parts showing the shaft in its lowered agitator oscillating position.

Fig. 3 is a similar view showing the shaft in a raised basket rotating position.

Fig. 4 is a fragmentary section showing the basket supporting and driving cup and adjacent parts.

Referring now more particularly to the characters of reference on the drawings, the machine comprises a stationary outer casing 1 of suitable form, provided with an inner cylindrical and relatively short container 2 depending from the top of the casing. Turnable in the container is a cylindrical foraminous clothes basket 3 sufficiently smaller than the container to allow for a cer-

tain freedom of oscillating or vibratory movement of the basket out of its normal axial position.

The basket at the bottom is provided with a central depending tubular hub 4 having an outwardly projecting annular flange 5 at the top which supports and is secured to the bottom of the basket. The hub intermediate its ends, but closer to the bottom than to the top, is formed with an outwardly projecting annular flange 6 which is disposed between a pair of thick, resilient rubber washers 7, which closely surround the hub. These washers fit closely in the cup 8, which has a ring nut 9 inside at the top to bear down on the upper washer to prevent undesired upward displacement of the same, and thus compressing and maintaining the washers in clamped, driving engagement with the flange 6 and with the cup.

The cup at the bottom is provided with a depending skirt 10 which at times rests on a fiber washer W seated on top of a tubular boss 11. This boss is formed as part of a housing 12 which extends above the boss about the cup and supports the bottom of the container 2, and which also depends below the boss and is supported from the bottom of the casing 1.

Secured in the skirt 10 is an upwardly projecting sleeve 13, which at its upper end (adjacent the top of the basket) is provided with a cap 14 having an upwardly converging tapered bore 15 above and overhanging the bore of the sleeve, as shown in Figs. 2 and 3, and forming a clutch element. A cooperating clutch element 16 is provided at the bottom of a sleeve 17 which is keyed on the upper end of a drive shaft 18, the element 16 being closely slidable within the sleeve 13. A winged agitator 19 of conventional form has a tubular axial portion 20 surrounding the sleeve 13 and having splined driving connection with the shaft sleeve 17.

It may here be noted that the bore 15 is cut with splines S to match those of the sleeve 17. This is to facilitate removal of the basket for cleaning without the aid of tools, and for assembling operations.

The shaft 18 just below the element 16 slides and turns in a bearing bushing 21 which is mounted in another sleeve 22. This sleeve projects through the sleeve 13 in clearance relation thereto to a termination below the same, being secured at its lower end in the boss 11. Above the boss a bearing bushing 23 is disposed between the sleeves 22 and 13. The shaft 18 extends below the sleeve 22 and the housing 12 and terminates

in a gear box 24 depending and supported from the bottom of said housing.

The shaft 18 during a clothes washing operation is disposed so that the clutch element 16 is clear of the element 15, so that while the agitator is oscillated, no rotation will be imparted to the sleeve 13, and hence the cup 8 to which the sleeve 13 is secured will not be rotated. At this time, the cup skirt 10 is resting on washer W which acts as a friction element to prevent undue freedom of rotation of the cup, and hence the basket. If the shaft is raised until the elements 15 and 16 engage each other, the cup 8 will be brought into driving relation with the shaft and will be rotated with said shaft. This raising of the shaft is carried out until the element 15 is also lifted somewhat. This of course lifts sleeve 13 and the cup 8, as well as the basket. The cup skirt is thus raised from frictional engagement with the washer W so that freedom of rotation of the cup and basket is unrestricted. At the same time, the movement of the shaft is changed from an oscillating to a continuous rotary motion.

This may be accomplished by any suitable means, but I preferably employ the following structure.

Fixed on the shaft within the gear box is a clutch element 25 and another clutch element 26 below the same. The clutch element 25, when the shaft is in its lowered position, engages a cooperating clutch element 27 turnable on the shaft and secured as a unit with an oscillating pinion 28. The clutch element 26 is then below and clear of a cooperating clutch element 29 turnable on the shaft and secured as a unit with a rotating gear 30.

When the shaft is in its lowered position, therefore, the shaft and agitator will be oscillated and the basket will be stationary. When the shaft is raised, however, the clutch elements 25 and 27 become disengaged and subsequently the elements 26 and 29 become engaged. This causes the shaft to be rotated and both the agitator and basket to be simultaneously rotated. It is to be noted that the engagement of clutch elements 15 and 16 is designed to take place before clutch elements 26 and 29 take place, so as to both insure the desired lifting of the cup skirt 10 off washer W, as previously explained, and also to insure overcoming of the inertia of the agitator and basket. Between these two limits of movement of the shaft there is of course a neutral position when the shaft is not driven in any manner.

The shaft is selectively moved to and maintained in any desired position by a hand controlled shaft 31 mounted in and projecting from the housing 24 at right angles to the shaft 18. This shaft carries a pinion 32, which engages a vertical rack 33 supported from the casing of a ball bearing 34 which is turnable but axially immovable on the lower end of shaft 18.

When the basket is rotated by motion transmitted to the hub 4 from the cup 8, the resilient or yieldable washers 7 allow of a certain amount of vibratory or oscillating movement of the basket from its normal position, as indicated by dotted lines in Fig. 1. The vibration otherwise transmitted to the machine as a whole and to the floor

if the basket is unevenly loaded during the spinning motion, is damped and absorbed without strain being placed on any part. When the basket is thus oscillated, the bottom is tilted upwardly to one side or the other somewhat. Inasmuch as the agitator is also lifted with the shaft 18, however, the bottom of the agitator is held clear from the tilted bottom of the basket, even if the bottom of the agitator is normally close to the bottom of the basket, as is desirable.

It is to be noted that the control of the circulation of water from the container 2 through its drain outlet 35 into the tank or casing 1 and vice versa, is shown in my Patent No. 1,991,793, and forms no part of the present invention. The casing 1 may also be supported from the floor as shown in the previous device, or in any other suitable manner.

From the foregoing description it will be readily seen that I have produced such a device as substantially fulfills the objects of the invention as set forth herein.

While this specification sets forth in detail the present and preferred construction of the device, still in practice such deviations from such detail may be resorted to as do not form a departure from the spirit of the invention, as defined by the appended claims.

Having thus described my invention, what I claim as new and useful and desire to secure by Letters Patent is:

1. In a washing machine, a rotary clothes basket, a cup mounted for rotary movement disposed below and axially of the basket, a hub depending from the basket into the cup, an annular flange projecting outwardly from the hub within the cup, and resilient rubber washers in the cup about the hub on opposite sides of and frictionally engaging the flange and cup in driving relationship and drive means applied to the cup.

2. In a washing machine, a rotary clothes basket, a cup mounted for rotary movement disposed below and axially of the basket, a hub depending from the basket into the cup, universally yieldable drive connection means between the hub and cup and providing a support of the hub in the cup, and a support on which the cup normally rests.

3. A structure as in claim 2, in which said support is arranged to provide a yieldable frictional resistance to the rotation of the cup.

4. In a washing machine, a rotary clothes basket, a cup mounted for rotary movement disposed below and axially of the basket, a hub depending from the basket into the cup, universally yieldable drive connection means between the hub and cup and providing a support for the hub in the cup, a support on which the cup normally rests arranged to then provide a yieldable frictional resistance to the rotation of the cup, a longitudinally movable drive shaft projecting upwardly through the cup and hub, and means between the cup and shaft to place the latter in driving connection with the cup upon an upward movement of the shaft a predetermined amount and to also lift the cup from the support to allow of unrestrained rotation of the cup and basket.

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