

Feb. 19, 1935.

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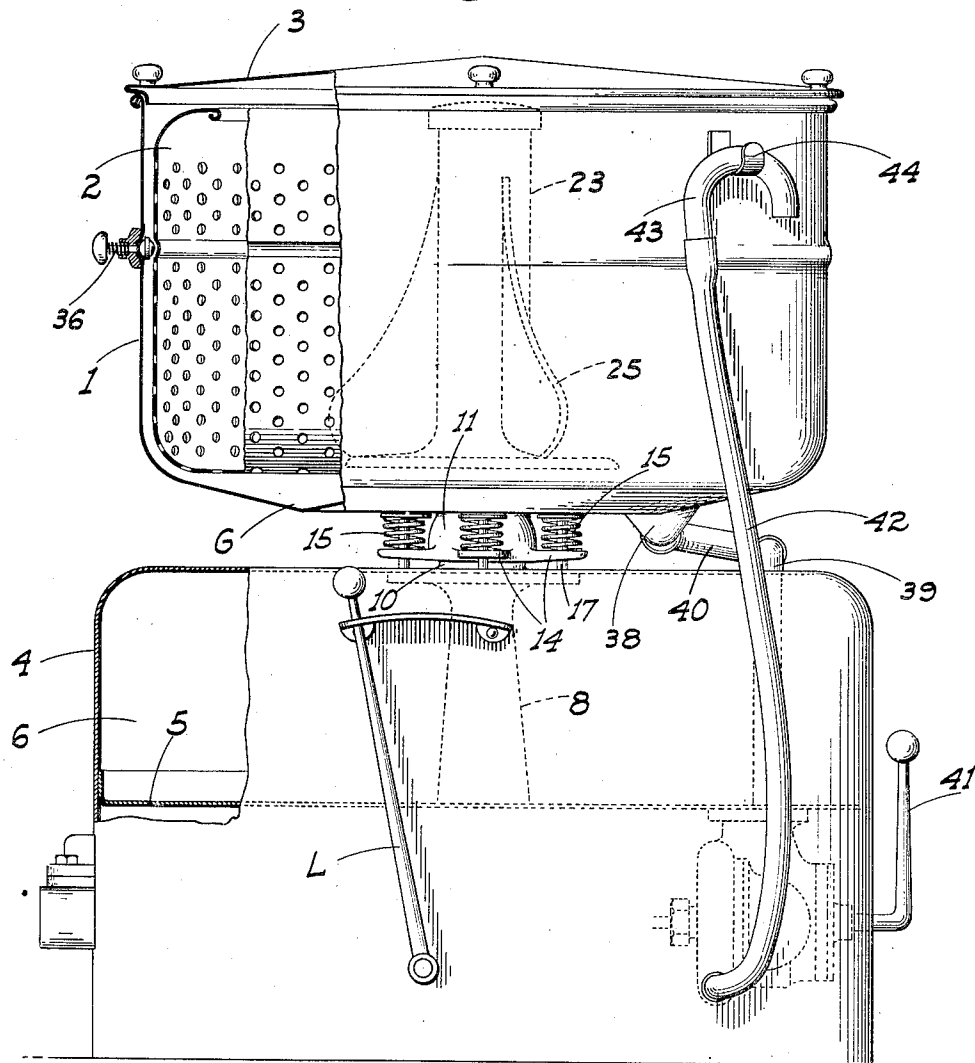
1,991,793

WASHING MACHINE

Filed Aug. 4, 1931

2 Sheets-Sheet 1

Fig. 1



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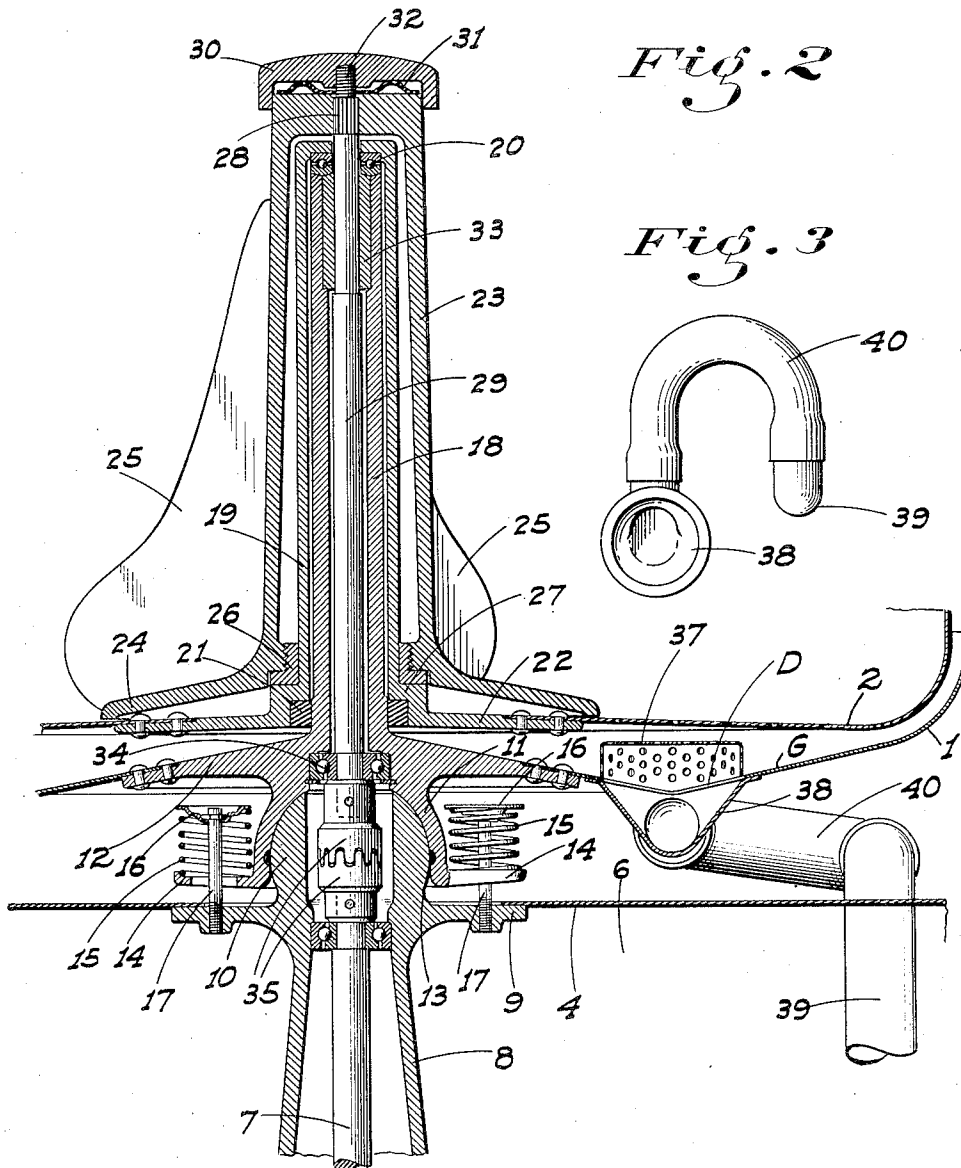
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2 Sheets-Sheet 2



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WASHING MACHINE

Paul Cureton, Vallejo, Calif.

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9 Claims. (Cl. 68-15)

This invention relates to domestic washing machines of the centrifugal or rotary type, and particularly to the mounting and operating of the clothes containing basket and adjacent parts.

5 The principal object of my invention is to provide a mounting and operating structure for the basket and agitator having only a single drive shaft, and a supporting means for the structure as a whole arranged so that if the basket be unequally loaded while in the spinning motion, the oscillation thus induced is so dampened that a minimum of vibration is transmitted to the floor. I have also mounted the basket and adjacent parts in connection with the shaft in such a manner that they may be easily dismounted without the use of any tools, when necessary for inspection, cleaning or other purposes.

Another object of my invention is to provide a machine of this character in which the parts are so arranged that the clothes or other fabrics may be washed in hot water, rinsed in cold water and drained without losing the hot suds and without being handled or removed from the basket from the time they are first placed therein for washing, until they are finally removed to be hung on the line.

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 elevation of a complete washing machine, partly broken out.

Fig. 2 is an enlarged section showing the mounting of the parts of the machine which form the essential features of this invention.

Fig. 3 is a top plan view of the flexible water-outlet conduit.

Referring now more particularly to the characters of reference on the drawings, the machine comprises upper and lower units separated from but connected with each other. The upper unit includes an exterior cylindrical casing 1 in which a cylindrical foraminous basket 2 is turnably mounted with a clearance fit. A removable lid 3 is normally disposed on top of the casing and encloses the basket. The lower unit includes a casing 4 to rest on the floor, and divided by a horizontal partition 5 into upper and lower compartments, the upper one 6 of which forms a water storage vessel having a capacity at least equal to that of the basket. The lower compartment contains the operating machinery and the water circulating pump and control valve arrangement—

features which of themselves do not form any part of the present invention.

The drive shaft 7 which projects upwardly from the lower compartment axially of the upper unit is enclosed and journaled in a tubular housing 8. This housing projects through the water vessel and is provided adjacent its upper end with an annular flange 9 which is secured to the top of the casing 4. The upper end of the housing above the casing 4 and between said casing and the bottom of the casing 1 is formed as a ball 10. The exterior surface of this ball is machined and is engaged by a socket member 11 formed at the top with a surrounding flange 12 which engages and supports the bottom of the casing 1. An oil retaining gasket 13 is preferably recessed in the socket to engage the ball and maintain the contacting surfaces lubricated. Ears 14 project radially from the base of the socket, said ears forming seats for the lower end of the compression springs 15. The upper ends of these springs are engaged by cups 16 to which studs 17 are secured. These studs project through the springs and ears and are secured in the flange 9.

Preferably formed with and projecting upwardly from the flange 12 is a tubular stem 18 projecting upwardly to adjacent the top of the basket. Superimposed on the stem is a sleeve 19 extending a short distance above the same. At its upper end the sleeve is supported from the stem and held in centralized relation therewith by a combination annular and thrust bearing 20; and at its lower end has a bushing 21 turnably engaging the stem at its base. The sleeve is provided with a base flange 22 to which the bottom of the basket 2 is secured.

Surrounding and enclosing the sleeve is the substantially cylindrical hub 23 of the agitator. Thus hub is formed with an outwardly projecting flange 24 at the base and has a number of radial agitating ribs 25 projecting outwardly therefrom. At its base the hub is provided with a bushing 26 which bears against the sleeve and also rides on a shoulder 27 formed with the flange 22. At its upper end above the sleeve the hub has removable driving engagement with the splined end 28 of a driven shaft 29.

A cap 30 having a spring washer 31 therein is removably secured on a stud 32 formed on top of the shaft 29. A yieldable pressure is thus exerted against the hub and this causes the bushing 26 to have yieldable and adjustable driving contact with the shoulders of the basket flange.

The shaft 29 is journaled adjacent its upper end in a bearing bushing 33 seated in the upper

end of the stem 18, and adjacent its lower end in an annular bearing 34 mounted in the stem just above the socket 11. The shaft is shouldered in this bearing so that it can have no downward movement.

The shafts 7 and 29 are aligned with each other and at their adjacent ends are provided with the cooperating elements 35 of a universal joint which are normally slightly separated, the central point of which joint is disposed at the axis of the ball and socket unit. This joint is of a type in which the two cooperating elements are separable by endwise movement, so that the assembly or dismounting of the parts inside the restricted area of the tubular ball offers no problem.

By reason of this construction it will be seen that the weight of the outer casing 1, the basket 2 and the agitator are all carried by the ball, and the driven shaft 29 only supports its own weight from annular roll 34 which is also carried by the ball. This removes vertical strains from the ball and the universal joints and permits of a more compact lighter construction and easier action of the same than would otherwise be the case. Also the tensionally controlled ball and socket mounting of the stem 18 permits a limited universal tilting movement of said stem and the parts supported in connection therewith. The springs 15 and the holding studs not only hold the socket in place on the ball and prevent rotation of the same, but prevent undue ease of tilting movement of the basket and provide a universally tensionally controlled cushioned resistance to such movement. As a result vibration from the reciprocation of the agitator or oscillation from the movement induced by spinning is practically eliminated at this joint as well as most of the noise usually associated with a rigid bearing construction.

When the agitator is used as such during washing operations the cap 30 is slacked off somewhat, which leaves the basket relatively stationary or non-driven. When spinning the basket or wringing the fabrics therein the cap is turned down snug and the basket or agitator turn as one. I have found that at times the momentum of the basket will cause the same to turn for some time even after the clutch is disengaged and the agitator has ceased to turn, the frictional engagement between the basket and agitator not being sufficient to stop the basket when loaded. I may therefore mount a radially disposed spring-retracted plunger 36 in one side of the casing 1.

On the inner end the plunger carries a frictional lining to yieldably engage the adjacent wall of the basket, and on its outer end is provided with a knob or similar element whereby the plunger may be pressed in. In this manner a brake is provided so that rotation of the basket may be quickly halted.

By removing the cap 30 the agitator may be removed by itself or the basket and agitator may be removed as a unit. This permits of ready cleaning of these parts and also of the casing 1.

Proper operation of the agitator for its different uses, that is reciprocation for washing, or continuous rotation for wringing, is controlled by manipulation of the lever L which is disposed in a convenient location on the outside of the casing 4. This lever controls the driving of the shaft 7 from the operating motor by the mechanism in the lower chamber below the storage vessel 6, and which mechanism of itself forms no part of my invention as previously stated.

The bottom of the casing 1 slopes down from

the center and from its outer periphery to form a depression or gutter G all around. At a certain point in its length this gutter is provided with an opening D. This is covered by a removable perforated strainer cap 37 and communicates with a drain hopper 38 depending from and secured against the bottom of the casing. A drain pipe 39 projects upwardly from the manually operable valve of the pump (not shown) through the top of the casing 4 to a termination to one side of the hopper. The hopper and the upper end of the drain pipe are connected by a flexible hose 40 of U-shape form and disposed in a horizontal plane, so as to offer no interference with the oscillating movement of the casing 1 about the ball.

During the washing or rinsing operations the water carried in the basket and the casing 1 also fills the outlet conduit down to the pump valve, whose operation is controlled by a suitable lever or handle 41 and during wringing operations or when discharging rinse water conduit is open through valve to pump and the water being drained or extracted is discharged to drains through a hose 42 connected to the pump discharge. This hose is preferably provided with a U-shaped nozzle 43 on its upper end, adapted to hang on the rim of a sink or on casing 1 so as to discharge into the basket as when returning hot suds. When not in use the nozzle may be hung on a hook 44 or the like secured on the outside of the casing.

By proper manipulation of the valve and with the operation of the pump the hot suds water may be drained by gravity and transferred to the tank 6, or the cold rinse water may be allowed to discharge through pump into a sink or the like through the hose 42. Or the hot suds water may be returned by the pump to the basket from the tank 6 through the hose 42 when the latter is hung so as to discharge into the basket. This valve and circulating system however represents a separate invention.

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 vertical tubular member having an outwardly projecting flange adjacent its lower end, a water retaining receptacle the bottom of which is secured on the flange, a vertically tubular ball and socket joint structure associated with and supporting said member below the flange, a sleeve turnable on said member above and supported by the member, a foraminous basket supported by and secured to said sleeve adjacent its lower end, an agitator in the basket removably centered on the sleeve, means for clamping the agitator and basket together, a driven shaft journaled in and projecting upwardly in said tubular member and having driving engagement at its upper end with the upper end of the agitator, and a drive shaft projecting upwardly into the joint structure from below and flexibly connected to the lower end

of the driven shaft inside and in the axial plane of the joint.

2. In a washing machine, a vertical tubular member having an outwardly projecting flange adjacent its lower end, a water retaining receptacle the bottom of which is secured on the flange, a vertically tubular ball and socket joint structure associated with and supporting said member below the flange, a sleeve turnable on said member above and supported by the member, a flange projecting outwardly from the sleeve at its lower end, a foraminous basket supportedly and secured to said sleeve flange, an agitator unit removably centered on and overhanging the sleeve, a driven shaft journaled and projecting upwardly in said tubular member and extending into the top of the agitator in driving relation therewith, a member on the sleeve on which the base of the agitator rests, a cap over the top of the agitator adjustably mounted on the upper end of the shaft to clamp the base of the agitator against the member, and a drive shaft projecting upwardly into the joint structure from below and flexibly connected to the lower end of the driven shaft inside and in the axial plane of the joint.

3. In a washing machine, a vertical tubular member having an outwardly projecting flange adjacent its lower end, a water retaining receptacle the bottom of which is secured on the flange, a ball and socket joint structure associated with and supporting said member below the flange, a sleeve turnable on said member above and supported by the member, a foraminous basket fixed on said sleeve, an agitator centered on and clamped in connection with the sleeve to rotate therewith, and means within said tubular member and connected to the agitator to drive the same irrespective of any limited universal oscillating of the receptacle and parts associated therewith.

4. In a washing machine, a fixed vertical member, a ball element on the upper end thereof, a socket member engaging the element, a water retaining receptacle supported by the socket, a basket in the receptacle, means mounting the basket for oscillating movement with the receptacle, and means to rotate the basket without interfering with the oscillation thereof.

5. In a washing machine, a rotary clothes basket, a tubular universal joint structure sup-

porting the basket for free rotative and universal oscillating movement, a driven shaft mounted in axial alinement with the axis of oscillation and operatively connected to the basket, a drive shaft below the driven shaft, the adjacent ends of the shafts being disposed within the joint structure, and a universal joint between the shafts disposed axially of the said joint structure.

6. In a washing machine, a rotary clothes basket, means including a vertically tubular ball and socket joint supporting the basket for free rotation and universal oscillating movement, a normally vertical driven shaft disposed axially of the basket and projecting into the joint, means connecting said shaft in driving relation with the basket, a bearing supporting said shaft against downward movement, a vertical drive shaft below the driven shaft projecting upwardly into the joint structure, and a flexible disengageable coupling structure between the adjacent ends of the shafts disposed axially of the joint.

7. In a washing machine, a rotary clothes basket, a tubular universal joint structure supporting the basket for free rotative and universal oscillating movement, a driven shaft mounted in axial alinement with the axis of oscillation and operatively connected to the basket, a drive shaft below the driven shaft, the adjacent ends of the shafts being disposed within the joint structure, and means flexibly and disengageably connecting the adjacent ends of the shafts in driving relationship.

8. In a washing machine, a rotary clothes basket, a fixed support for the basket, a vertical ball and socket joint connection between the basket and support, vertically alined pairs of ears projecting radially from the ball and socket, and springs to draw said pairs of ears toward each other.

9. In a washing machine, a rotary clothes basket, a fixed support for the basket, a vertical ball and socket joint connection between the basket and support, vertically alined pairs of ears projecting radially from the ball and socket, members secured to one set of ears and projecting through the other set, compression springs about said members seated on the other set of ears, and caps on the outer ends of the members engaging the adjacent ends of the springs.

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