March 8, 1949. H. E. PAGE 2,463,801

CLOTHES WASHING MACHINE

Filed July 11, 1944 2 Sheets-Sheet 1

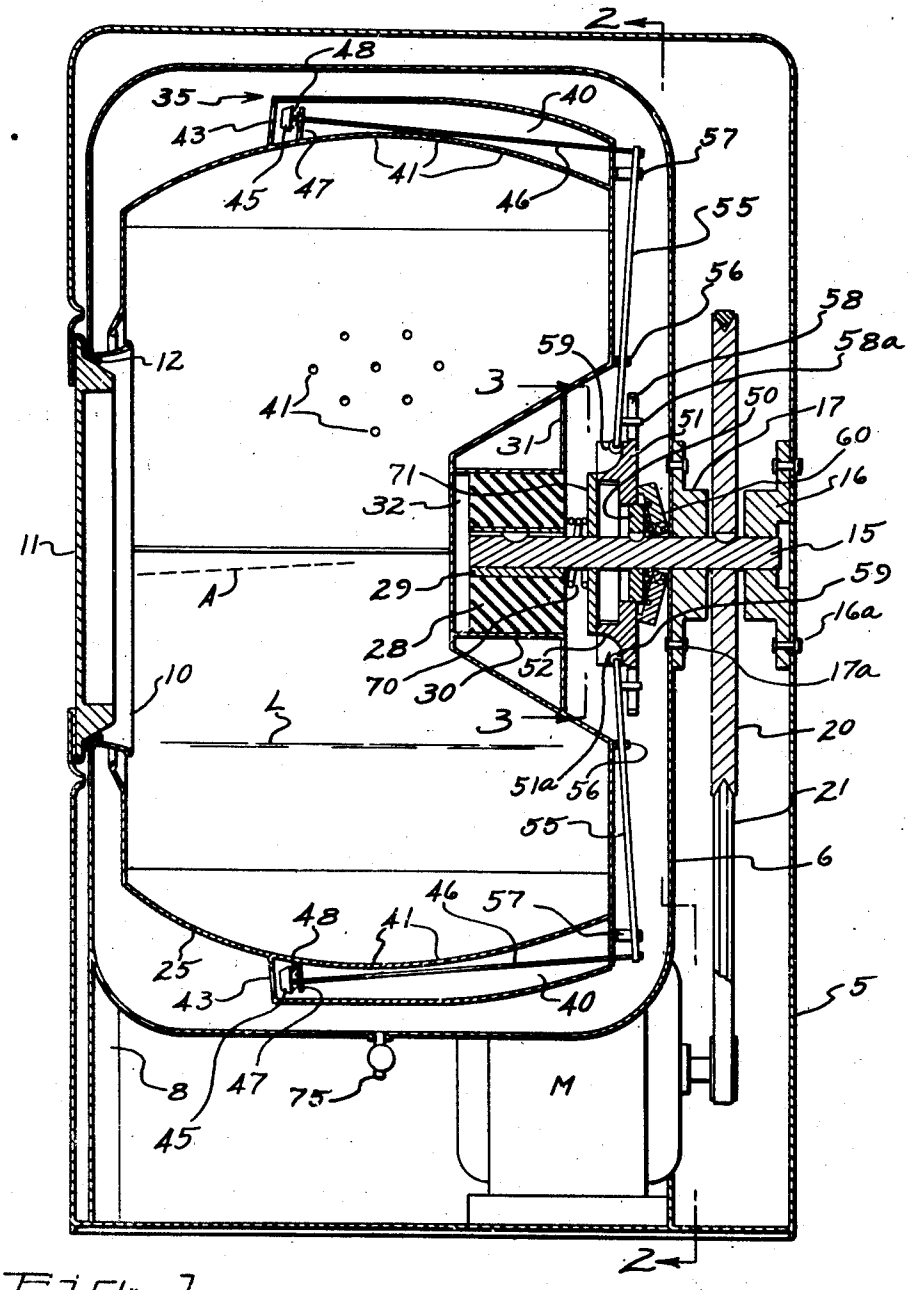


Fig. 1

INVENTOR.

Herbert E. Page

BY

Atty

March 8, 1949. H. E. PAGE 2,463,801

CLOTHES WASHING MACHINE

Filed July 11, 1944 2 Sheets-Sheet 2

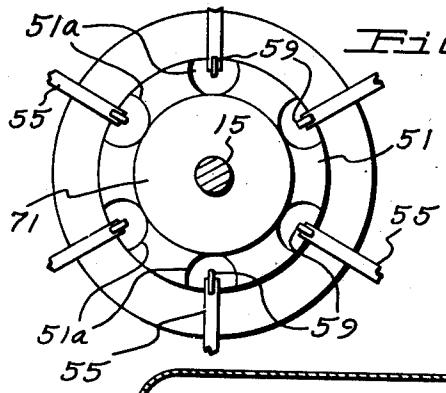


Fig. 3

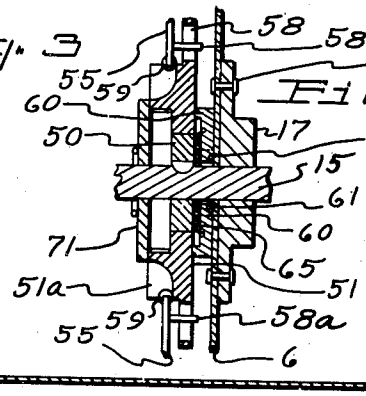


Fig. 4

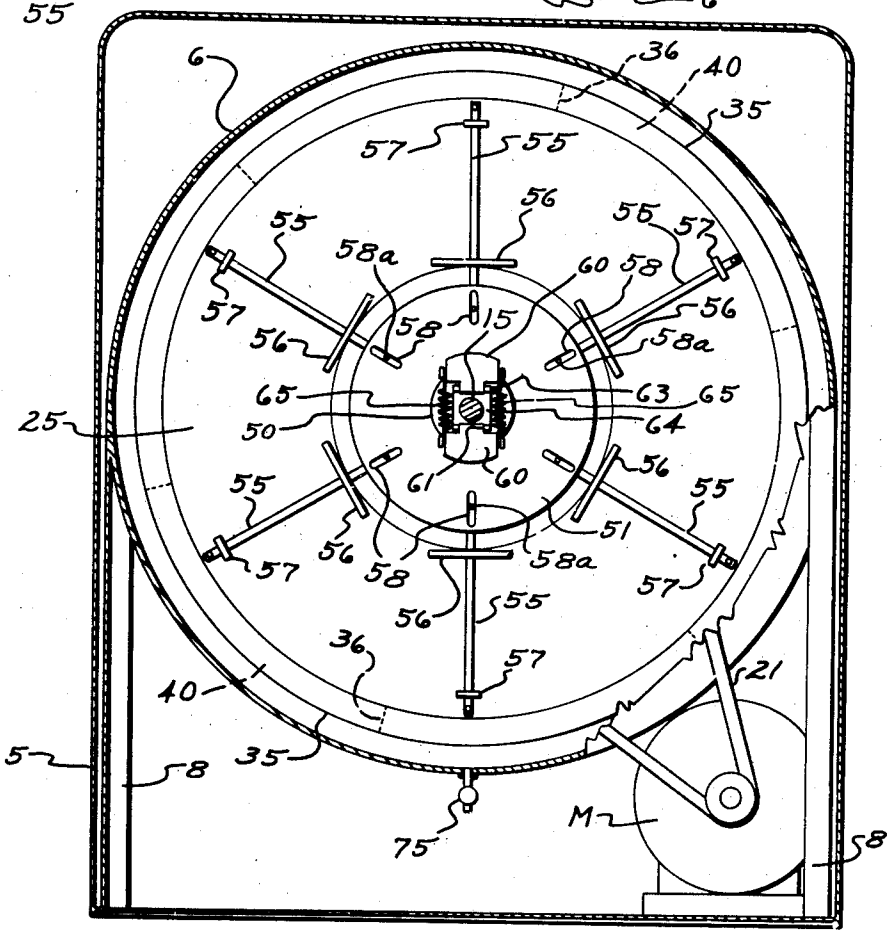


Fig. 2

INVENTOR.
Herbert E. Page
BY
Atty.

Patented Mar. 8, 1949

2,463,801

UNITED STATES PATENT OFFICE

2,463,801

CLOTHES-WASHING MACHINE

Herbert E. Page, Alhambra, Calif.

Application July 11, 1944, Serial No. 544,348

5 Claims. (Cl. 68—24)

1

This invention has to do with cleaning apparatus and in its more particular aspects relates to washing machines.

It is an object of my invention to provide a washing machine of the tumbler type which may be operable with a minimum of objectionable vibration; which incorporates means for automatically maintaining dynamic balance; which is extremely simple to operate; and which may be economically manufactured.

The invention possesses still further features of novelty and advantage and those will become obvious from the following detailed description of an embodiment which I have chosen for the purpose of explaining the invention. In connection with the following explanation I shall refer to the accompanying drawings, in which:

Fig. 1 is a medial vertical section;

Fig. 2 is a reduced section taken on line 2—2 of Fig. 1;

Fig. 3 is a fragmentary section taken on line 3—3 of Fig. 1; and

Fig. 4 is a fragmentary section of Fig. 1, but showing parts in a relatively different position.

In general, I carry out my invention by utilizing a wash basket which rotates about a horizontal axis in a drum or casing and having a resilient connection to the drive shaft. Disposed around the periphery of the basket I provide a plurality of symmetrically arranged liquid-collecting cups which have control valves operable to selectively release liquid therefrom in response to lateral movement of the basket relative to its axis of rotation under the burden of an unequally distributed wash load.

In the drawings the numeral 5 denotes a cabinet within which a drum 6 is horizontally mounted upon supporting legs 8, the drum having an inwardly flanged front opening 10 adapted to be closed by a door 11 carrying an annular sealing gasket 12.

A shaft 15 is journalled in bearings 16, 17, bearing 16 being secured by bolt 16*a* to the back wall of the cabinet and bearing 17 being secured to the back wall of the drum 6 by bolt 17*a*.

A drive pulley 20 is secured on the shaft between the bearings and is driven by a V-belt 21 from a motor M of conventional construction.

A circular wash basket 25 is secured on the left-hand end of the shaft 15 by means of resilient rubber hub 28 which carries a metal bushing 29 fitting on the shaft, the bushing being keyed on to the shaft. The hub member 28 is secured in a socket 30 provided by a wall member 31. The shaft 15 has a disc-like end member 32 which engages the left end face of the rubber hub member to prevent movement of the basket longitudinally of the shaft.

2

Disposed annularly of the basket there is an outer wall 35 divided by partition walls 36 into a plurality of liquid catching cups 40, which cups communicate with the interior of the basket through perforations 41 in the periphery of the basket.

In the front portion of the wall 35 of each of the cups 40 there is a discharge port 43 providing a seat for a valve 45. Each valve 45 is secured on the end of a stem 46, which stem slidably extends through a guide plate 47 carried by the basket, there being a compression spring 48 interposed between each guide plate 47 and each valve 45 to urge the valve seated. The valves are shown in open position in the drawings.

Keyed on to the drive shaft 15 there is a collar 50 on which is slidably carried a disc 51 having circumferentially spaced recesses 51*a* in its front or left-hand face, each of the recesses having a bottom wall providing a cam surface 52. Pivotally secured to the right-hand end of each of the valve stems 46 there is an actuating rod 55 which is fulcrumed in a bracket 56 carried by the back wall of the basket. Each of the rods 55 extends adjacent its upper end through a guide bracket 57 also carried by the back wall of the basket, and on the lower end of each of the rods 55 there is rotatably mounted a cam follower roller 59 in engagement with a cam surface 52. Radially disposed slots 58 are provided in the disc 51 adjacent its periphery and each of the rods 55 has a lateral arm 58*a*, said respective arms projecting into the respective slots as guides.

Inasmuch as during the washing cycle the basket 25 and drum 6 are filled with water to the approximately level L, as the basket rotates the cups 40 will tend to become filled with water through perforations 41, the water being normally retained in the cups during rotation by virtue of centrifugal action. Assuming all the cups to be thus filled with water and that a wash load is in the lower portion of the basket, the center of gravity will be such that the basket tends to rotate about an axis, such as denoted by the dotted line A, which is angular to the true axis, the true axis being the longitudinal axis of shaft 15. The resilient hub 28 permits this tilting of the axis of rotation without the drive shaft 15 being tilted. Unless corrected, such operation will set up vibrations and will cause uneven wear on the parts. I therefore provide novel means

for automatically restoring the dynamic balance of the machine, which includes means for selectively releasing water from the cups 40 to compensate for the unequal distribution of the wash load.

In the position of the parts shown in the drawing, the basket is shown on its true axis of rotation and at rest, all of the valves 45 being open so that all water is drained from the cups 40. This automatic opening of all the valves 45 is accomplished by the spring actuated weights 60 when the rotation of the basket is stopped, as will now be described.

A pair of oppositely disposed weights 60 are pivotally secured at their lower ends by pins 61 to ears 63 presented by a collar 64 secured on the shaft 15, so that the weights may be swung between the positions of Figs. 1 and 4. A pair of coil springs 65 normally urge the weights into the position of Fig. 1, causing the outer front edges of the weights to engage disc 51 and slide the disc to the left on the collar 50 to the position of Fig. 1. In this position the cam surfaces 52 of the disc engage the respective follower rollers 59 to actuate rods 55 into position opening all the valves 45. However, when the shaft 15 is rotated, the weights are swung by centrifugal action against the action of spring 65 to the position of Fig. 4, in which position the valves 45 are normally closed. The disc 51 is urged to the right by means of a coil spring 70 which bears at one end against the hub and bushing, and bears at its other end against a disc 71, which disc in turn bears against the front or left-hand face of disc 51. Spring 70 is not strong enough to slide disc 51 to the right until weights 60 are swung radially of the shaft by centrifugal action.

It will thus be observed that inasmuch as the follower rollers 59 are always in engagement with the respective cam surfaces 52, if the axis of rotation of the basket shifts from the true horizontal axis of rotation, one or more of the rods 55 will be actuated about the fulcrum 56 to open the valve or valves 45 with which it or they are operatively associated, thus releasing the water in the cup or cups 40 with which the actuated valve or valves are associated.

For the extraction cycle the water may be drained from drum 6 through a valve controlled outlet 75 and the basket 25 rotated to extract the moisture in the washed clothes within the drum by centrifugal action, some of the moisture thus extracted being caught in the cups 40 so that the weight equalizing means hereinbefore described may operate to maintain balance.

I claim:

1. Cleaning apparatus comprising a casing, a drive shaft journalled in the casing for rotation about a horizontal axis, drive means operatively connected with the shaft, a cylindrical basket, said basket presenting peripheral liquid-passing perforations, mounting means securing the basket axially on the shaft, said means including a resilient member interposed between the shaft and basket whereby to permit the longitudinal axis of the basket to tilt relative to the axis of rotation of the shaft in response to uneven weight distribution in the basket, means operatively associated with the basket to equalize the weight distribution imposed thereupon, said last-named means including liquid-collecting cups equidistantly disposed around the periphery of the basket in communication with the perforations, means responsive to tilting movement of the basket to selectively release liquid from the cups, and spring actuated means operable when the shaft is idle for simultaneously releasing liquid from all the cups.

2. Cleaning apparatus comprising a casing, a drive shaft journalled in the casing for rotation about a horizontal axis, drive means operatively connected with the shaft, a cylindrical basket, said basket presenting peripheral liquid-passing perforations, mounting means securing the basket axially on the shaft, said means including a resilient member interposed between the shaft and basket whereby to permit the longitudinal axis of the basket to tilt relative to the axis of rotation of the shaft in response to uneven weight distribution in the basket, means operatively associated with the basket to equalize the weight distribution imposed thereupon, said last-named means including liquid-collecting cups equidistantly disposed around the periphery of the basket in communication with the perforations, means responsive to tilting movement of the basket to selectively release liquid from the cups, spring actuated means operable when the shaft is idle for simultaneously releasing liquid from all the cups, and centrifugally operable means cooperating with the spring actuated means to render the latter inoperative during rotation of the shaft.

3. Cleaning apparatus comprising a casing, a drive shaft journalled in the casing for rotation about a horizontal axis, drive means operatively associated with the shaft, a cylindrical wash basket having an end wall, said basket presenting liquid-passing perforations, means resiliently securing the basket on the shaft in a manner to permit the longitudinal axis of the basket to tilt relative to the axis of rotation of the shaft in response to uneven weight distribution, a plurality of liquid-collecting cups disposed annularly around the periphery of the basket in communication with the perforations therein, each of the cups presenting a liquid-releasing opening, valve members controllably associated with said respective openings, a disc slidably mounted axially on the shaft to rotate therewith, actuating rods operatively connected at one end to the respective valve members, said rods having operative engagement at their other ends with the disc and being operable in response to tilting movement of the basket to selectively actuate the valves, and spring means carried by the shaft and operatively associated with the disc to slide the latter when the shaft is not being rotated and thereby simultaneously actuate all said valves.

4. Cleaning apparatus comprising a casing, a drive shaft journalled in the casing for rotation about a horizontal axis, drive means operatively associated with the shaft, a cylindrical wash basket having an end wall, said basket presenting liquid-passing perforations, means resiliently securing the basket on the shaft in a manner to permit the longitudinal axis of the basket to tilt relative to the axis of rotation of the shaft in response to uneven weight distribution, a plurality of liquid-collecting cups disposed annularly around the periphery of the basket in communication with the perforations therein, each of the cups presenting a liquid-releasing opening, valve members controllably associated with said respective openings, a disc slidably mounted axially on the shaft to rotate therewith, actuating rods operatively connected at one end to the respective valve members, said rods having operative engagement at their other ends with the disc and

being operable in response to tilting movement of the basket to selectively actuate the valves, spring actuated means cooperating with the disc for opening all the valves when the basket is idle and centrifugally operable means carried by the shaft and rendering the spring actuated means inoperative during rotation of the shaft.

5. Cleaning apparatus comprising a casing, a drive shaft journalled in the casing for rotation about a horizontal axis, drive means operatively associated with the shaft, a cylindrical wash basket having an end wall, said basket presenting liquid-passing perforations, means resiliently securing the basket on the shaft in a manner to permit the longitudinal axis of the basket to tilt relative to the axis of rotation of the shaft in response to uneven weight distribution, a plurality of liquid-collecting cups disposed annularly around the periphery of the basket in communication with the perforations therein, each of the cups presenting a liquid-releasing opening, valve members controllably associated with said respective openings, a disc slidably mounted axially on the shaft to rotate therewith, actuating rods operatively connected at one end to the respective valve members, said rods having operative engagement at their other ends with the disc and being operable in response to tilting movement

of the basket to selectively actuate the valves, a collar secured on the shaft adjacent the disc, a pair of opposite, laterally disposed weight members pivotally secured at one end to the collar for swinging movement relative thereto and being engageable at their outer ends against the disc in a manner to slide the latter when swung relatively to the collar and thereby to simultaneously actuate all said valves, said weight members being swingable in response to centrifugal action in position out of engagement with the disc during rotation of the shaft, and spring means normally urging said weight members into engagement with the disc, said spring means being operable when the shaft is not rotating to move the disc into valve-closing position.

HERBERT E. PAGE.

REFERENCES CITED

The following references are of record in the file of this patent:

UNITED STATES PATENTS

Number	Name	Date
1,489,758	Hanson	Apr. 8, 1924
1,772,863	Green	Aug. 12, 1930
2,224,241	Verdier	Dec. 10, 1940
2,230,345	Bradbury	Feb. 4, 1941