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2,372,769

WASHING MACHINE

Original Filed March 18, 1939 3 Sheets-Sheet 1

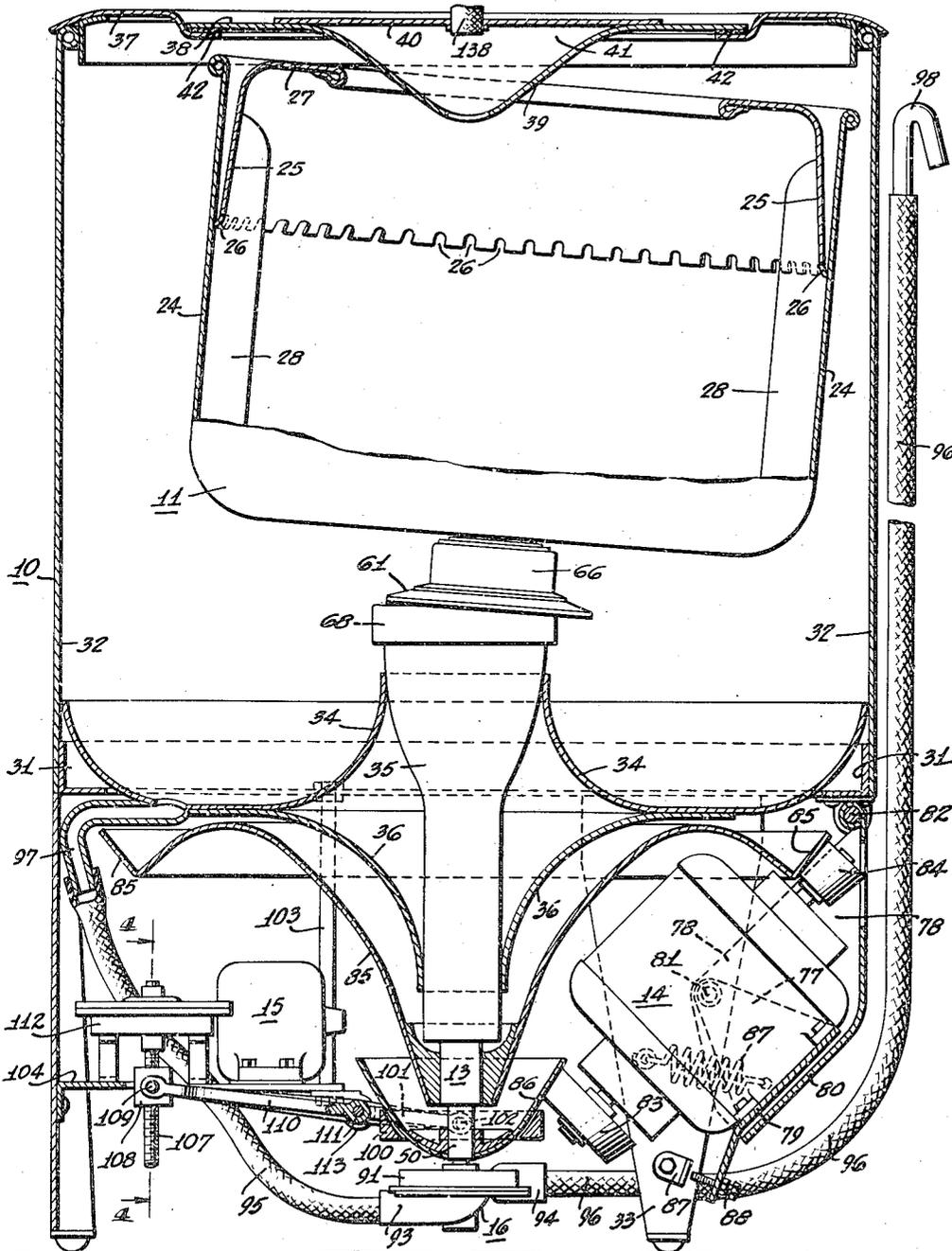


Fig. 1.

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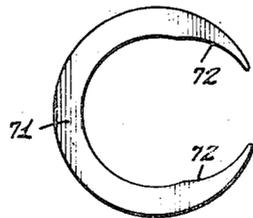
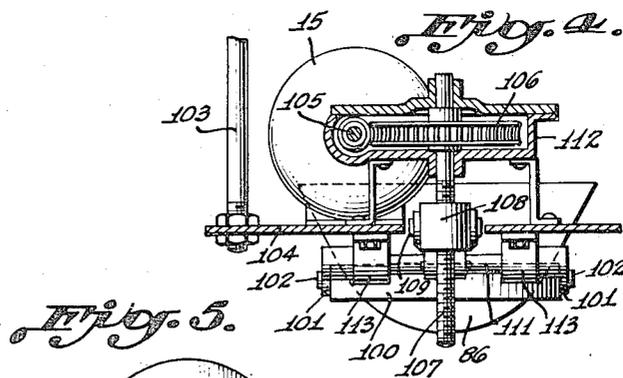
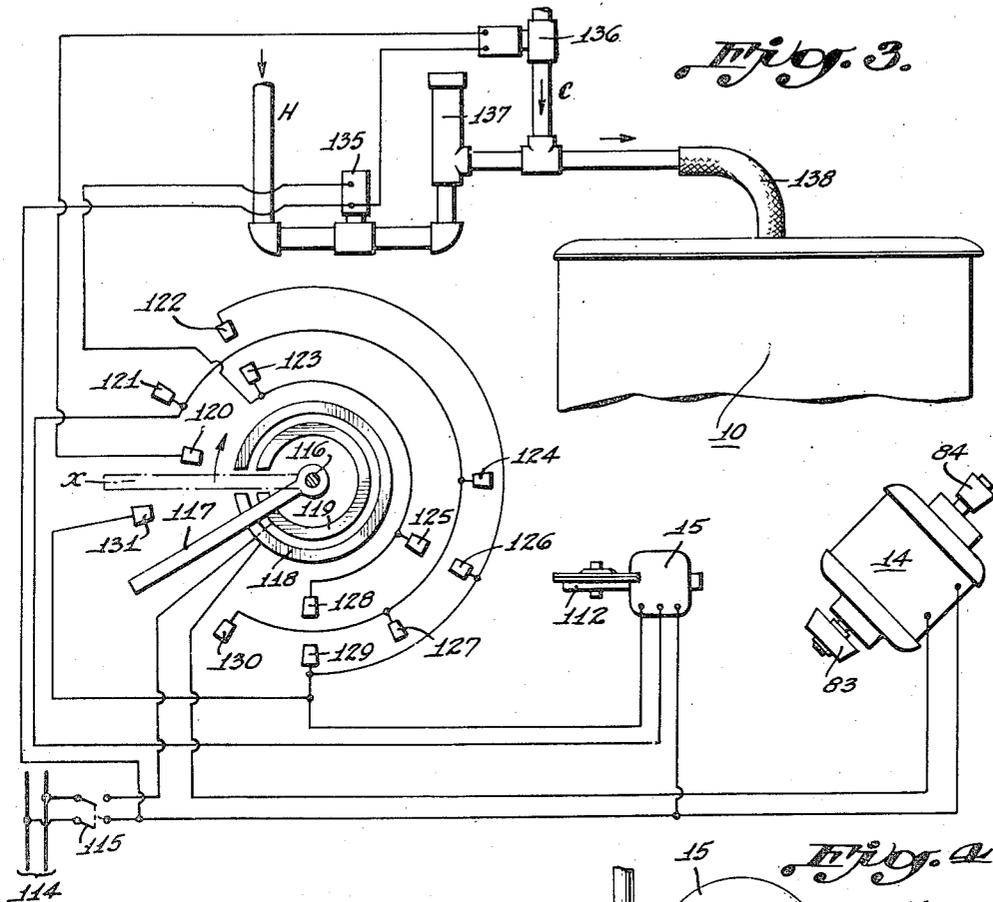
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# UNITED STATES PATENT OFFICE

2,372,769

## WASHING MACHINE

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Original application March 18, 1939, Serial No.  
262,652, now Patent No. 2,350,218, dated May  
30, 1944. Divided and this application April 11,  
1940, Serial No. 329,069

5 Claims. (Cl. 15—23)

The invention relates to washing machines having centrifugal separating apparatus for drying and is a division of my application Serial No. 262,652, filed March 18, 1939, which issued as Patent 2,350,218 on May 30, 1944.

According to a preferred form of the present invention, the laundry machine comprises an imperforate type clothes basket positioned within an outer tank with driving devices for impressing both a spinning motion and a gyrating motion on the basket. The driving devices may be suitably positioned under the tank and the basket may be supported in the tank by a suitable drive shaft or pedestal assembly comprising an outer tubular gyrating shaft and an inner spin shaft. The gyrating shaft may have a large friction gear secured thereto and the spin shaft a somewhat smaller friction gear. The driving devices may comprise a main electric drive motor having a friction gear on each end engaging the gyrating and spin shaft friction gears respectively.

The laundry machine according to the invention is particularly adapted for full automatic operation. A special shifting element may be provided for shifting between the washing and drying positions. This shifting element may comprise a brake ring which engages the spin shaft gear to move it up and down. During the washing operation, the brake ring may engage the spin shaft gear, holding it stationary and removed from its drive motor gear. For drying, the shift element may permit the spin shaft gear to engage its drive motor gear, the brake element entirely releasing the spin shaft gear during the drying operation. The gyrating shaft gear and its motor gear are in engagement continuously during both washing and drying operations.

The shift element may be operated by a suitable nut and screw mechanism driven by a small reversible electric control motor which operates to move the shift element first to its washing position and then to its drying position. Suitable contact and circuit devices may be provided for automatically operating and reversing the control motor.

According to a preferred form, the contact and circuit devices may comprise a stationary dial having a first series of contacts for controlling hot and cold water supply valves, a second series of contacts for controlling the control motor, and sector rings for controlling the main drive motor. Suitable clockwork is provided for driving a contact arm through a suitable clutch whereby the contact arm may be adjusted independent of the clockwork. This contact arm engages the vari-

ous contacts and sector rings for controlling entirely automatically the sequence of operations so that the clothes, when once placed in the basket, may be washed, rinsed and dried entirely automatically, each operation being timed without further attention from the operator after the clothes have been placed in the basket.

For performing the various operations on the clothes, a special imperforate basket may be provided having a clothes retaining ring for preventing water from being splashed out of the basket during washing and for preventing clothes from being discharged during drying. The tank may have a special cover cooperating with the basket, which cover has an upper wall and a depending wall spaced therefrom to deflect any liquid splashed above the basket back into the basket.

The tank bottom may be of special construction comprising a bottom wall having an annular trough-shaped member and a separate annular reinforcing member secured to the bottom of the annular wall, both these annular members being secured to a sleeve or pedestal which houses the drive shafts. The tank may be of relatively small capacity, being merely large enough to hold the basket without appreciable reservoir space since provision is made for pumping the water out of the tank bottom as soon as it is discharged from the basket during drying.

The invention also consists in certain new and original features of construction and combination of parts hereinafter set forth and claimed.

Although the novel features which are believed to be characteristic of this invention will be particularly pointed out in the claims appended hereto, the invention itself, as to its objects and advantages, and the manner in which it may be carried out, may be better understood by referring to the following description taken in connection with the accompanying drawings forming a part thereof, in which

Fig. 1 is a vertical elevation of the laundry machine with parts shown in section;

Fig. 2 is a vertical section through the main drive shaft assembly;

Fig. 3 is a diagram showing a completely automatic operation;

Fig. 4 is a section on the line 4—4 of Fig. 1; and

Fig. 5 is a detail of the gyrating ring used for the washing operation.

In the following description and in the claims, various details will be identified by specific names for convenience, but they are intended to be as

generic in their application as the art will permit.

Like reference characters denote like parts in the several figures of the drawings.

In the drawings accompanying and forming part of this specification, certain specific disclosure of the invention is made for purposes of explanation, but it will be understood that the details may be modified in various respects without departure from the broad aspects of the invention.

Referring now to the drawings and, more particularly, to Figs. 1 and 2, the laundry machine comprises, in general, an outer tank 10 enclosing an imperforate type clothes basket 11. The basket 11 is supported by a drive shaft assembly, including a spin shaft 12 and gyrating sleeve shaft 13. Main electric motor 14 drives both the spin shaft 12 and gyrating shaft 13, and control motor automatically shifts the machine back and forth between washing and drying operations. Pump 16 is for the purpose of emptying the tank into a sink or the like.

The basket 11 is made of suitable material, such as sheet metal and comprises a dished bottom 20 running into an upwardly and outwardly flaring side wall 24. The amount of flare will depend upon design but may be comparatively small, as illustrated. An annular ring 25 having apertures 26 is secured to side wall 24. Ring 25 has an intumed flange 27 for retaining the laundry during the washing and drying operations.

A plurality of baffles 23 are secured to the side wall 24 to assist in agitating the laundry during the washing operation. Two diametrically opposed baffles may be used, as shown, or any larger number. The basket 11 is supported by stub shaft 21 having a top plate 22. The bottom wall 20 of the spinner is secured between plate 22 and cooperating plate 23 by welding, brazing, or in any other suitable way.

Tank 10 is made up of a structural base ring 31 supporting an annular side wall 32 and in turn supported by legs 33, three legs being shown for purposes of illustration. The bottom of the tank is made up of an annular trough 34 secured to the sleeve or pedestal 35. An annular flared bracing member 36 is secured to sleeve 35 and to the bottom of trough 34, as indicated particularly in Fig. 1. The sheet metal members 32, 34, 35 and 36 may be secured together by welding or brazing, or in any other way well known in the art.

The cover for tank 10 comprises a flat ring 37 seated within the upper edge of the tank and having an annular seat 42. Seated on this seat is central lid 38 having a depending flared wall 39. Secured to the top of wall 39 is a flat wall 40. Walls 39 and 40 provide a chamber and act as baffles to prevent water from being thrown out of the machine during the washing operation. At the same time, walls 39 and 40 have aligned openings for feeding wash water through supply hose 138.

The drive shaft assembly comprises sleeve 35 which journals sleeve shaft 13, which in turn journals spin shaft 12. The sleeve or pedestal 35 carries a lower shoulder ring 44 providing a radial bearing for gyrating shaft 13 and a collar 45 is secured to shaft 13 to provide a vertical thrust bearing operating against ring 44.

The spin shaft 12 comprises a lower section 50 and upper section 51 connected by a universal joint 52, permitting the upper section 51 to spin

with the lower section 50 and also to execute a conical precessing movement about the center of universal joint 52, as will be explained more in detail hereinafter. Ring 53 is secured to gyrating sleeve 13 and supports bearing sleeve 54 for journalling lower section 50. Bearing washers 55 act between ring 53 and the shoulder on universal joint 52 to take the vertical thrust of spin shaft 12.

The upper section 51 has a sleeve 56 fixedly secured thereto, this sleeve being splined to receive a complementary splined end 57 of basket stub shaft 21. Spring 58 acts between a recess in upper section 51 and the bottom of stub shaft 21 for a purpose hereinafter described.

To overcome precession, the gyrating shaft 13 applies an accelerating force to the precessing basket shaft made up of shafts 51 and 21 above universal joint 52. To impart this accelerating force, friction rings 60 are secured to the upper edge of gyrating shaft 13. Friction rings 60 cooperate with a spherical cup or plate 61 which is secured to sleeve 62, which in turn supports bearing bushing 63 journalled on sleeve 56. The bushing 63 is flared at both ends for a purpose hereinafter described. The spherical friction surfaces on cup 61 and friction rings 60 are laid out about the center of universal joint 52 when in its lower or drying position, indicated in Fig. 2.

For transferring weight from the basket 11 to the spherical cup 61, a sleeve 64 is provided, journalled on cup 61 by bearing ring 65. A shield 66 is secured to cup 61 and carries a felt washer 67 bearing against ring 64 for the purpose of retaining lubricant within the shield 66 and for preventing water from getting into the bearing mechanism. Shield 68 is secured to gyrating sleeve 13 to prevent water getting into the drive shaft assembly.

In the position shown in Fig. 2, the parts are in their drying position and the drying operation has just begun. Spin shaft 12 rotates at a centrifugally extracting speed and at the same time gyrating shaft 13 rotates in the same direction at a slower speed. The friction members 60 and 61 carry the basket shaft 21, 51 journalled in bearing 63 in a conical path.

For washing, a gyrating ring 71 is secured to gyrating shaft 13. Ring 71, shown in detail in Fig. 5, has an off-center recess 72 adapted to receive a ring or bushing 73 tapered to seat easily within recess 72. Spin shaft 12 is raised in a manner hereinafter described to cause ring 73 to seat in recess 72. Ring 73 is journalled radially by bearing 76 and axially between collars 74 and 75 fixed on shaft 56.

For driving the machine, an electric motor 14 is bolted to saddle 79. Saddle 79 has side ears 77 pivoted at 81 to side walls 78 of hanger 80. Hanger 80 is suspended from pivot 82 secured to base ring 31.

The shaft of electric motor 14 carries bevel friction gears 83 and 84, engaging respectively gears 86 and 85 on lower section 50 and gyrating shaft 13. Spring 87 acts between the adjacent leg 33 and an ear 77 of saddle 79 to yieldably urge friction gears 83 and 84 into engagement with friction gears 86 and 85. A stop 89 is secured to a leg 33 and an adjustable screw 88 is secured to saddle 79 to limit the upward movement of gear 83 when it is disengaged from gear 86 for the purpose hereinafter described.

Referring to Fig. 2, the pump 16 comprises a casing 91 having an impeller 92 pinned to lower section 50. The casing 91 is journalled on shaft

50 and has inlet 93 and outlet 94. Flexible hose 95 connects inlet 93 with a drain tube 97 connected to the tank bottom (Fig. 1). Flexible hose 96 connects discharge outlet 94 with a gooseneck 98 adapted to be hung over the edge of a sink, as will be understood by those skilled in the art. The water flows in the direction of the arrows and the flexible hose 95 resists the torque on casing 91 caused by the pumping action.

The position of the parts shown in Figs. 1 and 2 is the drying position at the beginning of the drying operation. To shift from drying position to washing position, the spin shaft 12 is elevated, this disengaging drive gears 83 and 86 and engaging gyrating bushing 73 with the recess in gyrating ring 71.

The shifting mechanism is as follows: A brake collar 100 engages gear 86 to elevate spin shaft 12, to disengage gears 83 and 86 and to stop the spin of shaft 12. The brake collar has trunnions 102 supported between arms 101. The raising and lowering of arms 101 is done by control motor 15 which is supported on plate 104 (Figs. 1 and 4).

Plate 104 is supported by the hangers 103 and by the adjacent leg 33 of the machine. Plate 104 also supports a worm gear reduction unit 112 made up of a worm 105 on the drive shaft of motor 15, which meshes worm wheel 106 on screw shaft 107. Screw shaft 107 engages nut 108 having trunnions 109 connected to the forked end of arm 110 which is secured to pivot shaft 111. Pivot shaft 111 is supported by hangers 113 from the bottom of plate 104 and carries the arms 101.

It will be apparent from Fig. 1 that when current is supplied to control motor 15, it will rotate screw shaft 107, causing nut 108 to move downwardly, which in turn imparts upward movement to brake collar 100 which shifts the machine from the drying to the washing position in the manner described above. Reversal of the control motor 15 will bring the parts back to the position shown in Fig. 1.

The above described machine is especially adaptable for full automatic operation. With such operation, it is only necessary for the operator to place the clothes in the basket and make certain settings and thereafter all washing, rinsing and drying is done entirely automatically, each operation being timed, and no further attention from the operator is necessary until it is time to remove the clothes from the basket for hanging out to dry or for ironing.

Referring now to Fig. 3, a circuit arrangement is shown for controlling the automatic operation. The arrangement comprises a dial having a clock shaft 116 which may be the minute shaft of any suitable clock mechanism, either electric or spring driven. Secured to minute shaft 116 is a contact arm 117 which may be secured to shaft 116 by any ordinary friction clutch commonly used in clocks, whereby the contact arm 117 may be rotated by the operator independent of the clock mechanism. Arranged in the path of the contact arm are sector rings 118, 119 and contacts 120-131.

The several sector rings and contacts are connected to a source of power 114 which may be any ordinary A. C. or D. C. household power line, which power is controlled by a switch 115. Connected in circuit is the main drive motor 14 of the machine and the control motor 15. Also connected in circuit is a solenoid operated water valve 135 connected in a hot water supply line H and a second solenoid operated water valve 136

connected in a cold water supply line C. Connected in the hot water line H is a soap box 137 in which may be placed soap chips or soap powder which is carried into the machine by the flow of hot water. Pipes H and C are connected to hose 138 which passes through the cover of tank 10.

It will be understood that, if desired, the solenoid valves 135 and 136, soap container 137, contact dial and control switch 115 may be suitably built into the machine.

#### Operation

The drying operation will first be described since the machine is shown in position at the beginning of this operation. The nut 108 has just reached its uppermost position on screw shaft 107 and the brake ring 100 has just permitted friction gear 86 to engage motor friction gear 83 and has just released gear 86 from braking action. Gyrating shaft 13 is already moving at washing speed and spin shaft 12 is beginning to rotate at drying speed. In explaining this operation, it will be first assumed that the clothes and everything spinning with the basket 11 are perfectly balanced with respect to the basket axis. In actual practice this condition will rarely or seldom occur and the basket will spin about a theoretical center of mass spaced from the geometrical basket axis, but the correcting action is substantially the same in both cases.

The basket 11 partakes of two movements, (1) a spinning movement about its own axis, and (2) a gyrating movement about the center of universal joint 52, the basket axis describing a conical surface. Friction rings 60 carry friction cup 61 in a circular path, the basket shaft 21 spinning within cup 61 by means of bearings 63 and 65.

It will thus be seen that the gyro-stabilizer including gyrating shaft 13 exerts a force on the basket 11 tangential to its conical precessional movement. The direction of rotation of gyrating shaft 13 is the same as the direction of spin shaft 12 and gyrating shaft 13 impresses an accelerating force on the precessional movement of the basket. The tangential accelerating force causes the basket to move in a direction at right angles to the force or toward true vertical position, the friction surfaces 60 and 61 permitting the basket 11 to take a true central position in which the vertical axis of drive shaft section 50 coincides with the basket axis, assuming the clothes are evenly distributed and everything secured to and partaking of the same movement as the basket 11 is perfectly balanced about the basket axis.

In case the clothes are not evenly distributed, the gyro-stabilizer will center the entire whirling mass about the theoretical center of mass which will differ slightly from the axis of the spinner basket and shaft 21. In this case, there will be a slight circular motion of the spherical cup or disc 61 on ring 60, but the correcting force acting toward true vertical due to the correcting action of gyrating shaft 13 will nevertheless continue to exist.

After the basket 11 has been spun at centrifugally extracting speed a sufficient length of time to expel the water from the clothes, the automatic control operates control motor 15 in such direction as to drive nut 108 downwardly on screw shaft 107. This causes brake ring 100 to engage spin gear 86, disengaging it from drive gear 83 and arresting the spinning movement of spin shaft 12. Further downward movement of nut

108 elevates spin shaft 12, raising the universal joint 52 off thrust bearing 55, compressing spring 58 and moving sleeve shaft 56 and gyrating ring 73 upwardly to engage in the socket 72 of gyrating ring 71, the tapered surface of these members facilitating seating of these parts.

It will be noted that the basket 11 partakes of no upward movement, but that the basket shaft 21 telescopes down within sleeve shaft 56, compressing spring 58. Friction members 60 and 61 maintain contact, the flaring ends of bearing bushing 63 accommodating the upward shift of universal joint 52 which places it slightly off center with respect to the center of curvature of the spherical surface of friction members 60, 61.

This is the washing position. The gyrating shaft 13 carrying gyrating ring 71 positively moves ring 73 in a circular path, but the basket shaft 21 partakes of no rotation about its own axis because spring 58 provides sufficient contact pressure between gear 86 and brake ring 100 to hold these members in non-slipping relation during washing.

Thus the basket 11 with its measured contents of water and clothes is gyrated about the center of universal joint 52 in elevated position, the agitator blades 28 helping to tumble the clothes, opening them up and exposing all parts to the washing action of the water. The ring 25 and flange 27 on the basket prevent the water from sloshing out during washing, the baffles 39 and 40 on the tank cover directing any water which might spout upwardly back into the basket and preventing this water from discharging out of the machine.

After the clothes are washed for a sufficient length of time, the control motor 15 drives the nut 108 upwardly to the position shown in Fig. 1, this movement disengaging gyrating rings 71 and 73, engaging the universal joint 52 with thrust bearing 55, engaging spin gear 86 with motor gear 83 and disengaging the brake ring 100 from the spin gear 86. The frictional surfaces of gears 83 and 86 permit the necessary slipping to drive spin shaft 12 up to centrifugally discharging speed. Here again spring 58 helps supply the necessary downward pressure to spin gear 86. Most of the weight of basket 11 and contents during drying is borne by spherical friction members 60 and 61.

The automatic control functions as follows: Assume the contact arm 117 is resting off all contacts in position X from a previous run and the switch 115 is open. The machine is in the washing position. The clothes will be placed in the basket and the soap container 137 will be filled. It is only necessary then to close power switch 115 and to start the minute driving hour shaft 116.

Engagement of arm 117 with contact button 120 operates cold water solenoid 136 to deliver a measured amount of cold water into basket 11. The moving arm 117 contacts sector rings 118, 119, thereby starting the one-quarter horse power main driving motor 14. The machine being in the washing position, the clothes are then given a pre-rinse in cold water of, say, five minutes until the contact arm 117 hits button 121. This causes control motor 15 to shift the brake ring 100 to the drying position. The machine now spins the water out of the clothes for, say, five minutes until arm 117 reaches buttons 122, 123.

It will be understood that the time that arm 117 remains in contact with any of the buttons

120-131 depends upon the width of the buttons, with any given width of arm. The widths of the various buttons may, therefore, be selected to allot the proper times to carry out the functions controlled by the widths of these contacts. For example, contact button 120, operating cold water solenoid 136, may cause cold water to flow for one and one-half minutes, assuming the water supply is adjusted to four gallons per minute and the capacity of the basket is six gallons. The width of button 121 may be selected to operate control motor 15 just a little longer than is necessary to drive nut 108 from its lower to its upper position.

Upon contacting button 122, the control motor 15 will be reversed, thereby returning the machine to washing position. At the same time, contact with button 123 opens hot water valve 135, causing hot water to pass through the soap box 137 and fill the basket with a predetermined amount of hot water and soap. The machine will now wash for a predetermined time, say, ten to twenty minutes, until contact arm 117 engages button 124 which again shifts the machine to the drying position.

The machine will dry for a predetermined time, say, five minutes, until contact arm 117 contacts button 126 which causes the machine to shift to washing position. Contact with button 125 opens hot water valve 135 to give the clothes a hot rinse.

The hot rinsing will take place for, say, five minutes, until contact arm 117 touches button 127 which shifts the machine to drying position, after which the machine may dry for, say, five minutes. The drying operation continues until contact arm 117 touches button 129 which shifts the machine to washing position. Contact with button 128 again opens hot water valve 135 which fills the basket with hot water for a second hot rinse.

This hot rinse may continue for, say, five minutes, until contact arm 117 hits button 130 which shifts the machine to the drying position. This drying operation will continue for, say, ten or fifteen minutes, if it is desired to spin the clothes dry enough for ironing, or until contact arm 117 engages button 131 which shifts the machine to washing position, or ready for the next batch of clothes. As the arm 117 passes off of sector rings 118, 119 to position X, main drive motor 14 stops and, if desired, the clockwork may also have been set to stop automatically.

The machine is now at rest and in the starting position. The clothes have been spun dry and may be removed from the machine by the operator. The new batch of clothes may be placed in the basket; the soap box 137 filled again, and the automatic control set to operate upon this batch of laundry in the same manner as above described.

Thus, it will be seen that a combined washing and drying machine is provided that is simple in construction and operation. Both spin and gyrating shafts are located below the basket to permit easy access to the top of the basket. Since the basket spills no water during washing, a minimum amount of water is consumed. A suitable water level in the basket for washing will be about even with the holes 26.

This type of machine also lends itself admirably for full automatic operation, as both washing and drying operations may be carried on with the clothes in the same container. No water circulation is required since water is prevented from sloshing out of the basket during washing and the tank 10 may be made of minimum capacity since

it does not have to store water. The pump 16 runs only during the drying operation when water is being expelled from the basket. The guard ring 25 effectively prevents the discharge of clothes during washing and drying and the large number of holes 26 permit the water to be expelled during drying.

The washing action is achieved by the gyrating shaft rotating at the same speed as is used for correction purposes during the drying operation. A positive gyrating drive is achieved for the washing operation.

The machine may be almost completely made of pressed metal parts and impregnated oilless bearings may be used. Due to the absence of toothed gears, the machine will be noiseless in operation and due to the perfect gyro-balancing obtained, the tank and frame will stand at substantially complete rest when the machine is either spinning or washing.

The frictional engagement between cup 61 and rings 60 is established by the weight of the spinner basket, clothes and water, and suitable guards are provided for preventing water from getting into the bearings and for preventing grease from getting onto the friction surfaces.

The two-part cover for the tank is convenient, as it is only necessary to remove the center lid 38 for inserting clothes into the basket and removing them from the basket. The ring 37 normally stays in place and acts as a guard to prevent water discharged from the basket 11 during drying from splattering out of the tank 10. The guard ring 37 is completely removable from the tank for cleaning purposes and to permit the spinner basket to be removed. This member may be easily lifted out of the machine, the splined basket shaft 21 lifting out the sleeve shaft 56 and being easily replaceable therein.

Various modifications of the invention will be apparent to those skilled in the art. For example, if automatic operation is not desired, the control motor 15, reduction gears 112 and nut and screw bolt assembly 108, 109 may be eliminated and a simple pedal placed on the end of arm 110 with suitable catch mechanism for shifting between washing and drying positions. Also, the baffles 39 and 40 in the tank cover forming concentric chamber 41 may be conveniently used as a soap chamber.

Also, if desired, provision may be made for reversing the main drive motor 14 during some of the operations, for example, during the rinsing operation in the event trouble is encountered from clothes becoming tangled in the basket due to continuous rotation of the basket in one direction.

Also, if it is desired to gyrate the basket at high speeds during the washing operation, a counterweight may be applied to offset any tendency of the machine to lurch around during washing. The counterweight would be applied either to gyrating shaft 13 or its guard ring 68, or to the upper side of the rim of friction wheel 85, the counterweight always being placed diametrically opposite to the eccentric opening 72 of gyrating ring 71. It would be practical to use a counterweight equivalent to about half load, since I have found machines of considerable capacity will wash without objectionable vibration to the tank without any counterweight at all.

Also, if desired, the spinner basket may be provided with vertically extending corrugations all around the sides and may be provided with circular corrugations on the bottom to serve as a wash-

board effect on the moving clothes during the washing operation.

The above mentioned copending parent application, now Patent 2,350,218, contains claims to the feature of stabilizing the basket by the use of a hollow shaft surrounding the spin shaft to apply a stabilizing movement to the basket assembly and also contains claims to the manner of driving the friction gears on the spin shaft and gyrating shaft by friction gears mounted on opposite ends of the driving motor.

Reference is also made to copending application, Serial No. 379,238, filed February 17, 1941, as a division of the above-mentioned parent case, and which contains claims to the mechanism for shifting between the washing and drying positions and to the electrical controls and contacts for determining the sequence of events of washing, rinsing, drying, etc.

While certain novel features of the invention have been disclosed and are pointed out in the annexed claims, it will be understood that various omissions, substitutions and changes may be made by those skilled in the art without departing from the spirit of the invention.

What is claimed is:

1. In a combined washing and centrifugal drying machine, a clothes basket, a tank surrounding said basket, supporting devices for said tank and basket, said supporting devices including a universal pivot device under said basket, said basket being of the imperforate type comprising a bottom wall and an annular substantially vertical side wall, a ring comprising an annular side wall disposed within said basket, said ring having a perforated lower edge and engaging said side wall near the middle part thereof, said ring converging inwardly and upwardly and merging into an inwardly extending flange, a shaft connecting said basket and said universal pivot device, a drive shaft driving said pivot device, means for spinning said drive shaft for centrifugal extraction, means for imparting a motion to said basket shaft laterally of its axis for washing.

2. In a laundry machine, a tank, a cover on said tank having a depending annular wall, a laundry basket within said tank sufficiently imperforate to hold liquid for washing purposes, a universal pivot device under said basket and supporting said basket, means for imparting a motion to said basket shaft laterally of its axis to agitate said basket and its contents for washing, means for spinning said basket about its own axis for drying, said basket having an annular side wall and an imperforate inwardly extending annular top wall forming an opening into which said cover wall projects, said cover wall and basket top wall constituting baffles to deflect liquid splashed during washing back into the basket.

3. In a laundry machine, a tank, a cover comprising a ring seated on the top edge of the tank, said cover also comprising a central lid seated on said ring, said lid having an upper wall and a depending dish-shaped lower wall spaced therefrom, said lid walls having aligned openings, a laundry basket within said tank sufficiently imperforate to hold liquid for washing purposes, a universal pivot device under said basket and supporting said basket, means for gyrating said basket about said universal pivot device to agitate said basket and its contents for washing, means for spinning said basket about its own axis for drying, said basket hav-

ing an annular side wall and an imperforate inwardly extending annular top wall forming an opening into which said dish-shaped lower wall projects, said lid walls and basket top wall constituting baffles to deflect liquid splashed during washing back into the basket.

4. In a washing machine, a basket sufficiently imperforate to hold both laundry and laundry liquid for washing, a universal pivot device under the basket, a shaft connecting said universal pivot device and basket, means for imparting a motion to said basket shaft laterally of its axis for washing, means for spinning said basket about its own axis for drying, said basket having a bottom wall, an upstanding annular side wall, said basket having discharge openings to pass liquid during drying, a guard wall secured to said side wall externally thereof and extending above said discharge openings for returning to the basket any liquid passing out of said discharge openings during washing, the top of said side wall having an inwardly extending annular imperforate top wall forming a restricted top opening to provide access to the interior of the basket.

5. In a washing machine, a basket sufficiently

imperforate to hold both laundry and laundry liquid for washing, a universal pivot device under the basket, a shaft connecting said universal pivot device and basket, means for gyrating said basket about said universal pivot device for washing, means for spinning said basket about its own axis for drying, said basket having a bottom wall, an upstanding inner annular conical side wall converging inwardly and upwardly and having discharge openings at its maximum diameter well below the top of the basket, said basket having an outer annular side wall disposed outwardly of said inner side wall, and connected thereto below said openings, an inwardly extending annular top wall connected to the top of said inner side wall and forming a restricted opening to provide access to the interior of the basket, all of said walls being imperforate except for said discharge openings, whereby to prevent liquid being splashed out of the basket during the washing operation and to prevent clothes from being discharged from the basket during the drying operation.

JAY GRANT DE REMER.