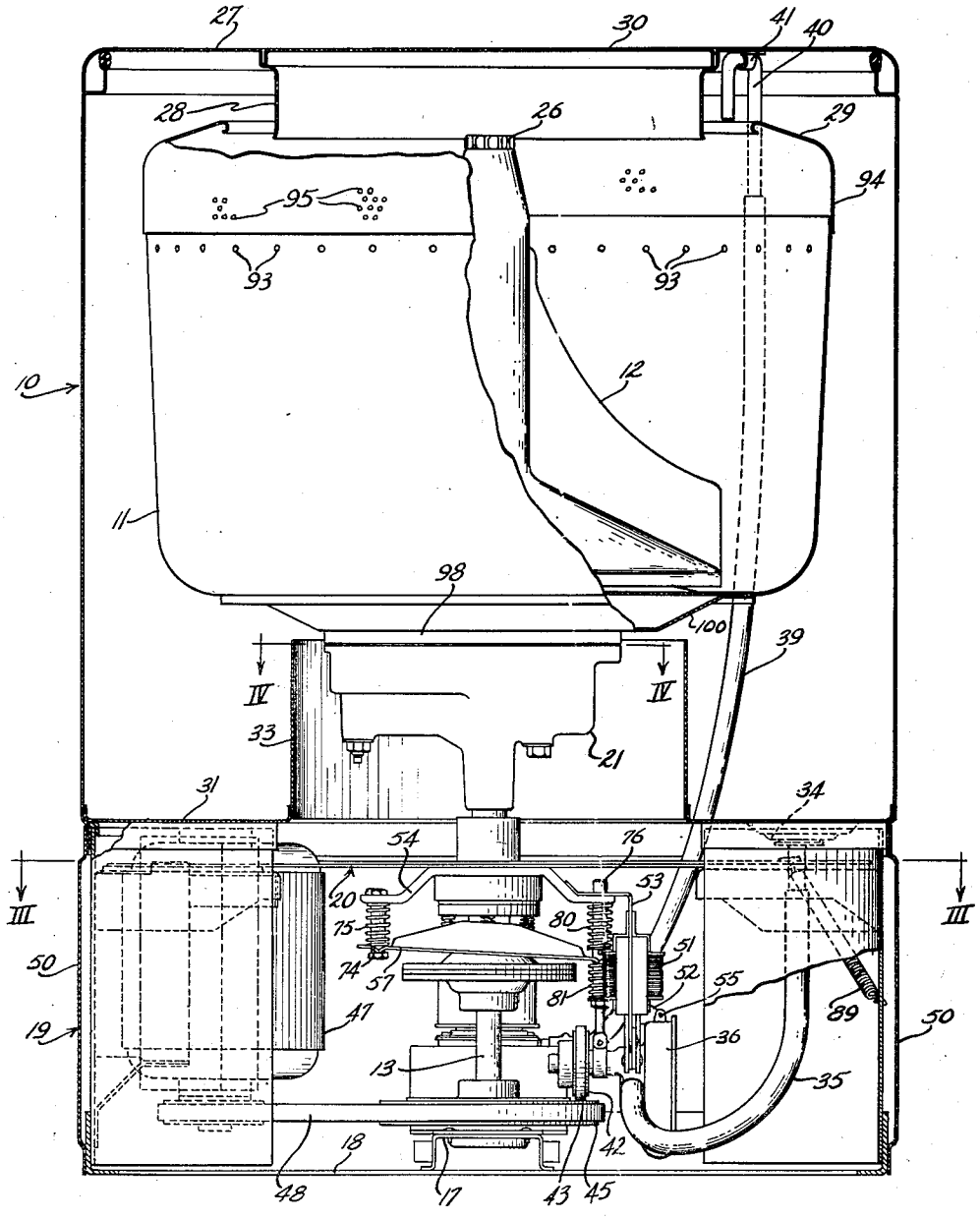
Feb. 10, 1953 D. A. JOHNSON 2,627,741

WASHING MACHINE PROVIDED WITH PLANETARY DRIVE MEANS

Filed July 21, 1949 6 Sheets-Sheet 1

Fig. 1



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WASHING MACHINE PROVIDED WITH PLANETARY DRIVE MEANS

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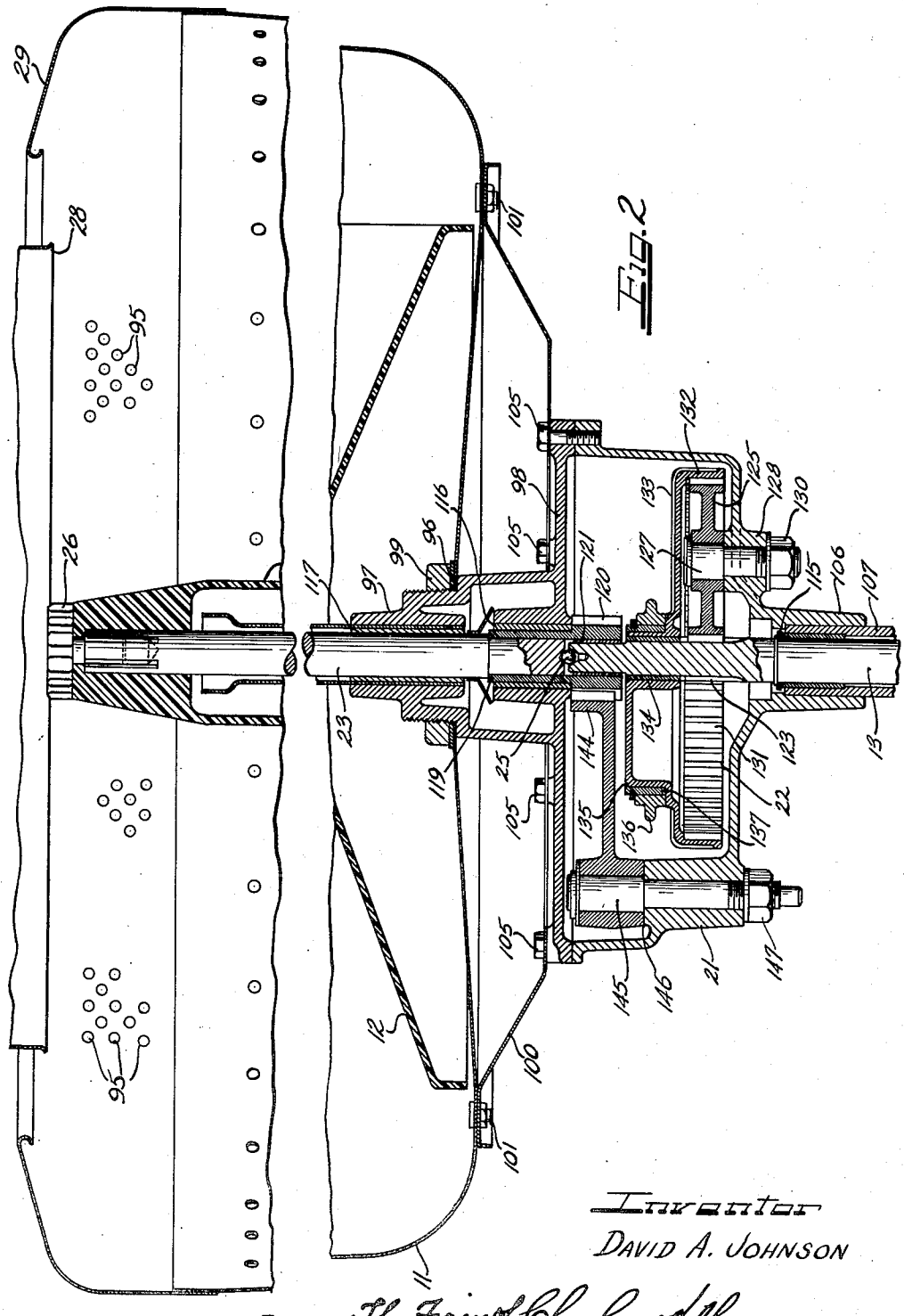


Fig. 2

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WASHING MACHINE PROVIDED WITH PLANETARY DRIVE MEANS

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Fig. 3

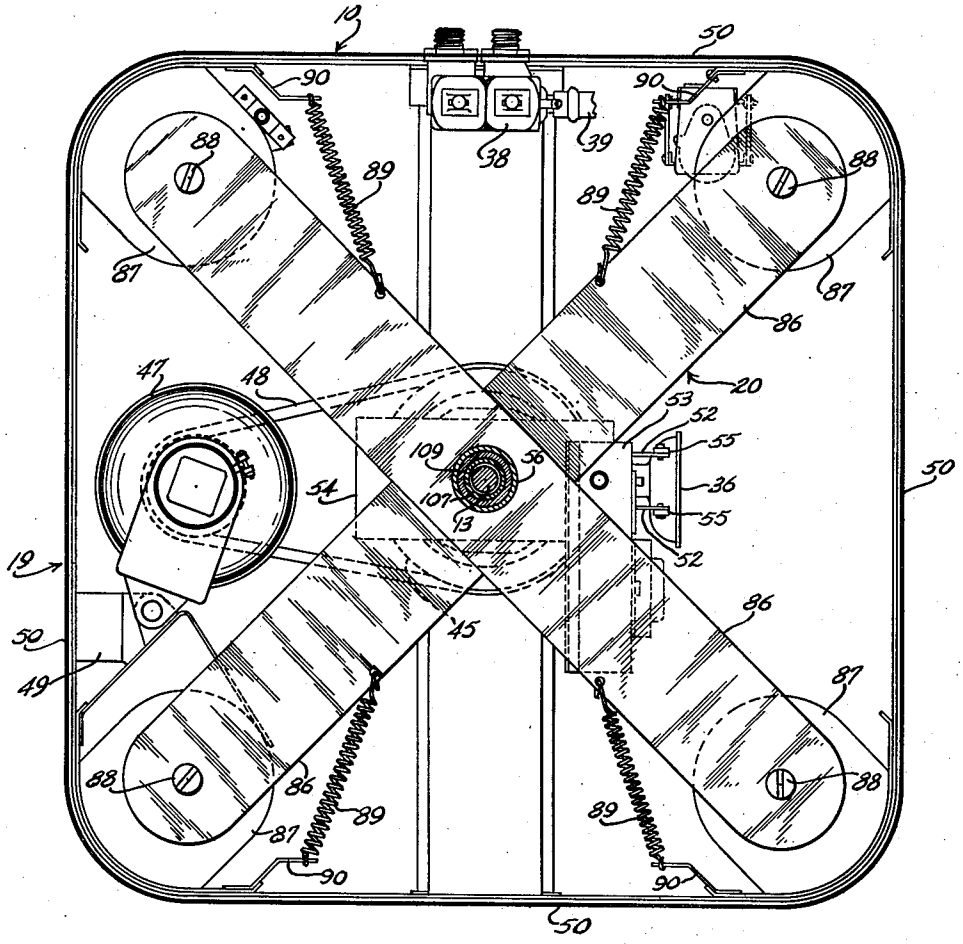
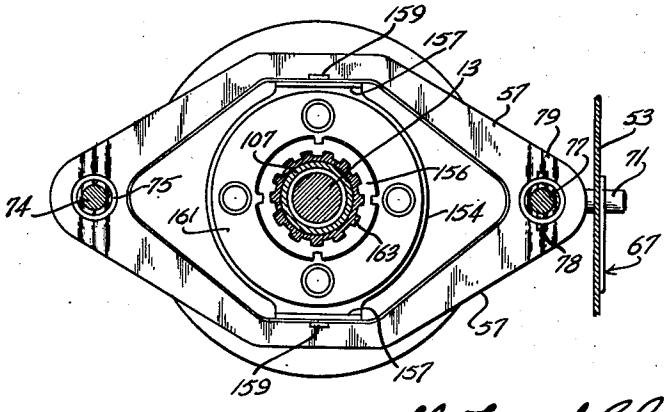


Fig. 7



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WASHING MACHINE PROVIDED WITH PLANETARY DRIVE MEANS

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Fig. 4

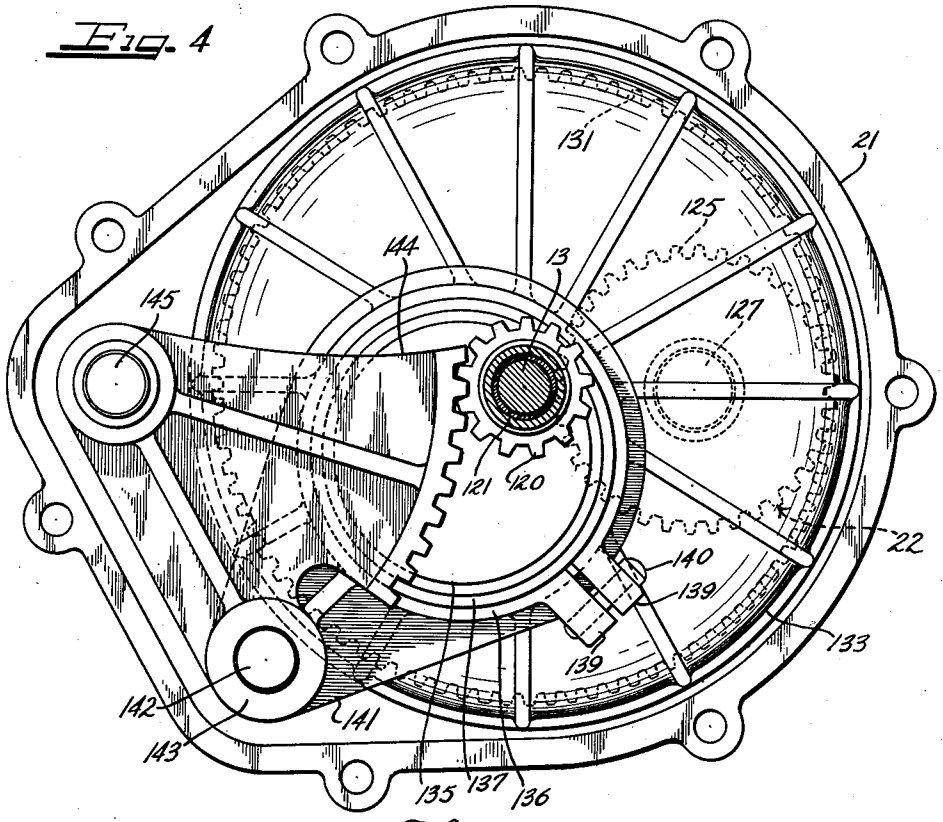
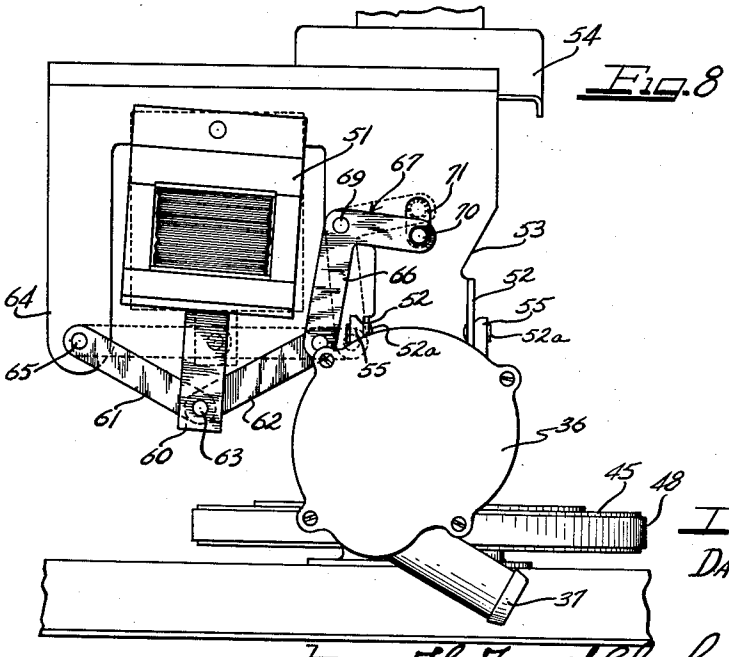


Fig. 8



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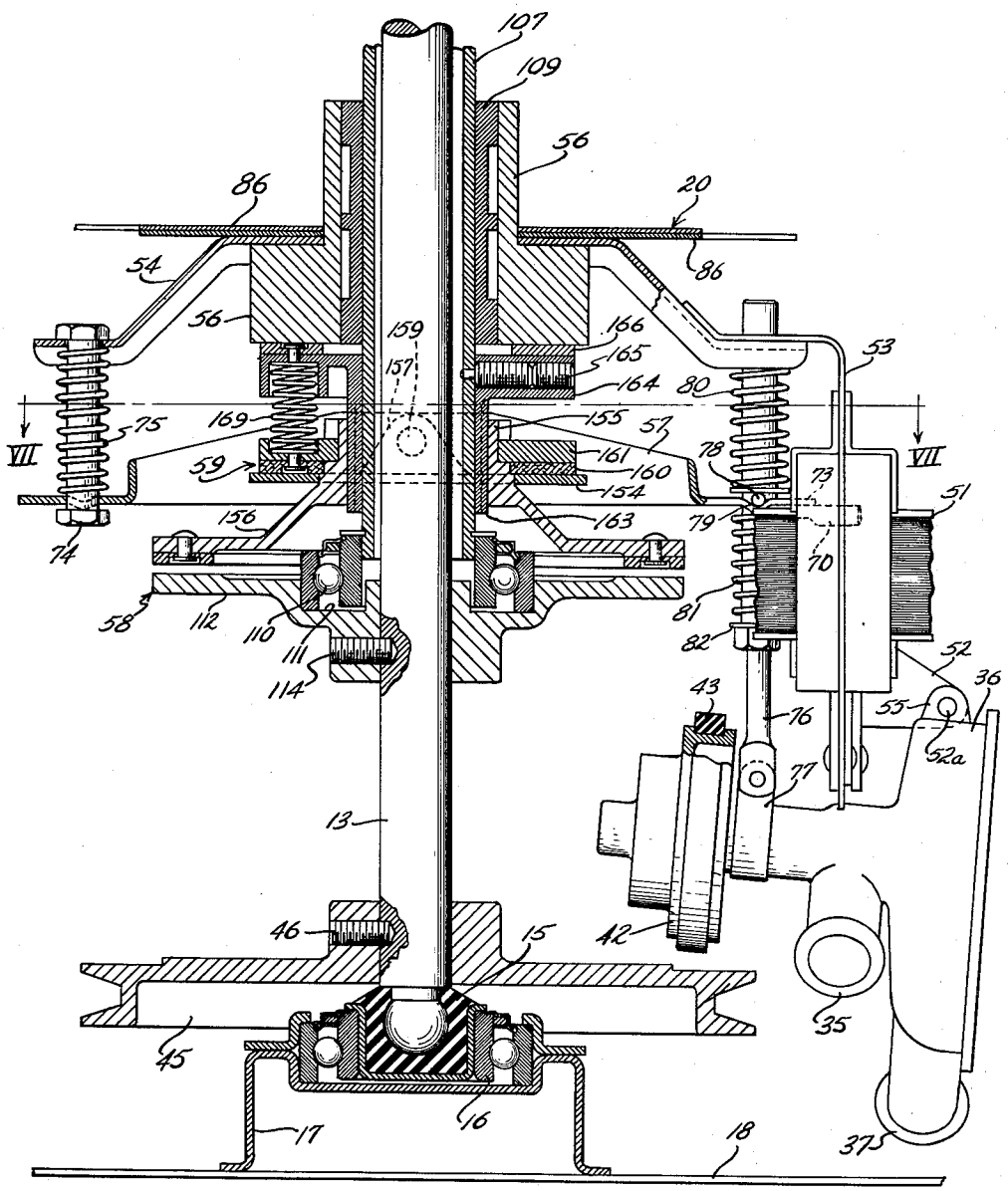
By The Firm of Charlesworth Attys.

Feb. 10, 1953 D. A. JOHNSON 2,627,741

WASHING MACHINE PROVIDED WITH PLANETARY DRIVE MEANS

Filed July 21, 1949 6 Sheets-Sheet 5

Fig. 5



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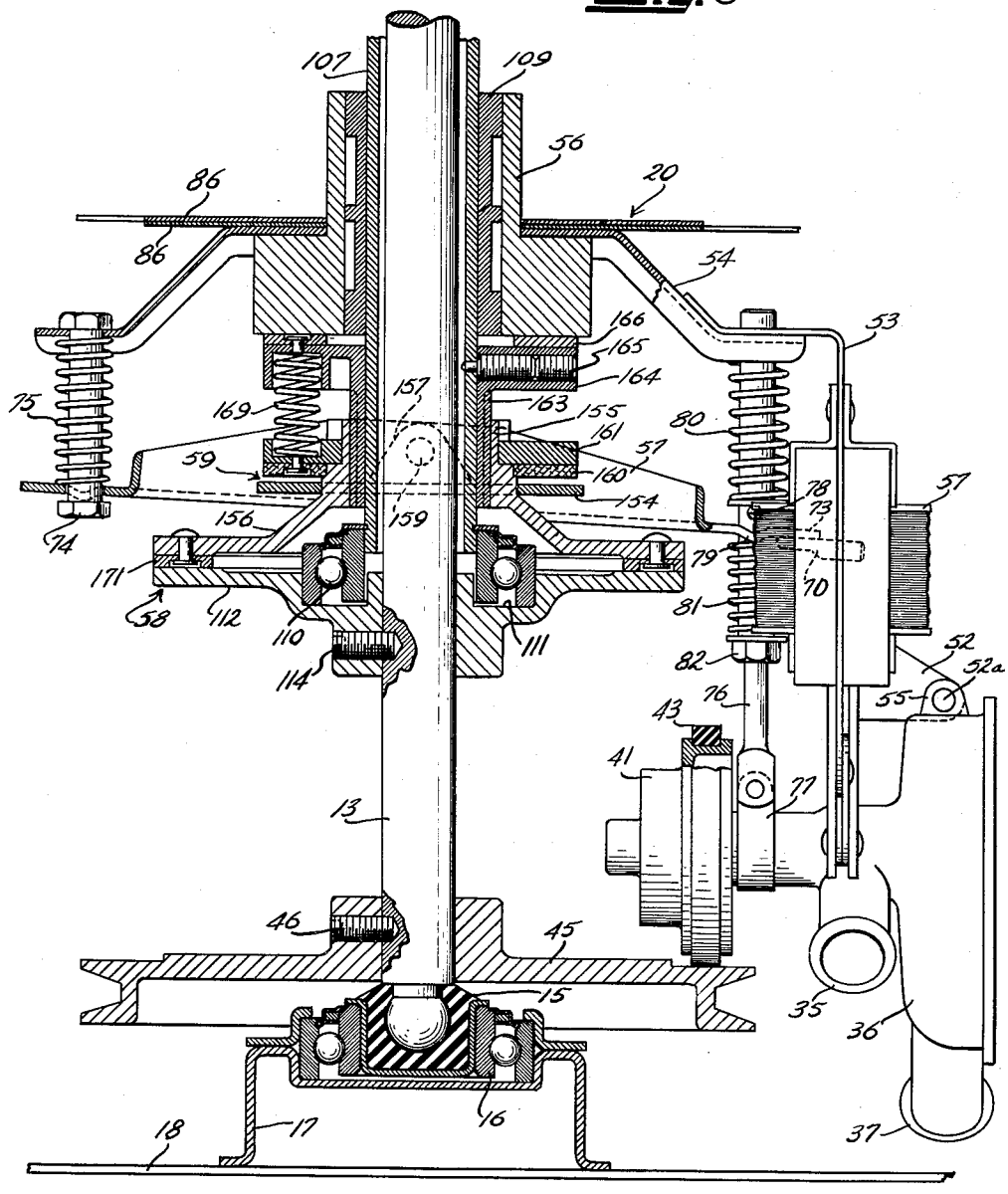
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WASHING MACHINE PROVIDED WITH PLANETARY DRIVE MEANS

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Fig. 6



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Patented Feb. 10, 1953

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UNITED STATES PATENT OFFICE

2,627,741

WASHING MACHINE PROVIDED WITH PLANETARY DRIVE MEANS

David A. Johnson, St. Joseph, Mich., assignor to Whirlpool Corporation, a corporation of New York

Application July 21, 1949, Serial No. 105,949

3 Claims. (Cl. 68—23)

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This invention relates to improvements in washing machines and more particularly relates to a simplified and improved form of automatic combination washing and extracting machine in which the washing cycle is followed by a spinning cycle, to extract liquid from the clothes.

A principal object of my invention is to provide a new and improved combination washing and extracting machine of more rugged and simpler construction than is found in the present machines of this type.

A more specific object of my invention is to provide a novel and simplified form of drive for oscillating the agitator or dasher of a washing machine, and for spinning the container for the clothes, to extract liquid therefrom, including a single rotatably driven shaft with coaxial drive connections therefrom to effect spinning of the clothes container or oscillation of the agitator.

A more specific object of my invention is to provide a novel form of combination washing and extracting machine having a simplified form of drive connection from a single vertical shaft, to effect the oscillating and spinning operations of the machine, the drive gearing of which is contained in a single housing connected to the clothes container and is so constructed and arranged as to eliminate all sliding gears and jaw clutches, and to utilize a single oppositely acting clutch and brake operable to effect the washing or extracting operations while the drive motor for the machine continues to rotate in one direction.

A still further object of my invention is to provide an improved washing machine having a simplified form of planetary geared reduction drive contained in a housing secured to a container for the clothes, to effect the oscillating operation during washing, the reaction member of which planetary geared reduction drive is formed by said housing, which housing is so constructed and arranged as to form a means for spinning the clothes container.

These and other objects of my invention will appear from time to time as the following specification proceeds and with reference to the accompanying drawings wherein:

Figure 1 is a transverse sectional view taken through the casing for the clothes container of a washing machine constructed in accordance with my invention, with certain parts of the clothes container broken away and shown in vertical section;

Figure 2 is an enlarged fragmentary transverse sectional view taken through the clothes

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container and housing for the oscillating drive mechanism for the machine;

Figure 3 is a sectional view taken substantially along line III—III of Figure 1; and illustrating certain details of the drive for the machine and the vibration dampener for the clothes container;

Figure 4 is a fragmentary horizontal sectional view taken substantially along line IV—IV of Figure 1;

Figure 5 is an enlarged detail transverse sectional view showing certain details of the support and mounting for the drive shaft of the machine and of the clutch and brake for connecting the parts of the machine in oscillating or rotating relation, with the clutch disengaged and the brake engaged, to effect the washing operation;

Figure 6 is a view somewhat similar to Figure 5 but showing the clutch engaged and the brake disengaged to effect the extracting operation;

Figure 7 is an enlarged detail fragmentary horizontal sectional view taken substantially along line VII—VII of Figure 5; and

Figure 8 is an enlarged detail end view showing the solenoid for controlling operation of the clutch and brake and for connecting the pump for removing liquid from the casing, in operative relation with respect to the drive shaft for the machine.

In Figure 1 of the drawings the machine is shown as including generally a cabinet **10** having a clothes container **11** therein, with an agitator or oscillating dasher **12** mounted within said clothes container, for effecting the washing operation while said clothes container is held from oscillating movement.

The clothes container **11** is herein shown as being mounted on the upper end of a vertical drive shaft **13** having a ball-shaped lower end **14**, encased in a resilient socket **15**, preferably made from rubber. Said socket is mounted in the inner race of a ball bearing **16**, mounted in a bearing support **17** mounted on and extending upwardly from a bottom **18** of a lower support or housing portion **19** of said casing. Said shaft extends upwardly from said bearing and is supported intermediate its ends in a vibration dampening support indicated generally by reference character **20**, as will hereinafter more clearly appear as this specification proceeds. Said shaft also extends upwardly within a housing **21** secured to and depending from the bottom of the clothes container **11**. Said housing forms the reaction member for planetary geared reduction mechanism **22**, contained therein and adapted to oscillatively drive the agitator or dasher **12**

through a vertical shaft 23 forming a continuation of the vertical shaft 13 and supported on the upper end thereof on a ball 25. The upper end of said shaft 23 has the agitator 12 mounted thereon and is of an irregular formation to oscillatively drive said agitator upon oscillation of said shaft. A hand screw 26 is provided to secure said agitator to said shaft.

The cabinet 10 has an upper inwardly extending annular top portion 27 having a collar 28 extending downwardly from the inner margins thereof within an inwardly extending annular flanged portion 29 of the clothes container 11, to form a means of access to said clothes container and to prevent the splashing or throwing of liquid from said container through the top of said casing. Said annular top portion of said casing is closed by a cover 30. Said casing also has an intermediate bottom 31, at the top of the lower support portion 19 thereof. Said intermediate bottom is herein shown as being of an annular formation with a liquid retaining collar 33 extending upwardly from the inner margins thereof and encircling the shaft 13 and housing 21. Said annular bottom 31 leads to a sump 34 having a flexible pipe or conduit 35 leading downwardly therefrom and connected to the suction end of a pump 36. Said pump is herein shown as being a well known form of centrifugal pump and is not herein shown nor described in detail, since it forms no part of my present invention. A similar flexible conduit (not shown) leads from a pressure outlet 37 of said pump to a drain, to discharge the liquid extracted from the clothes to waste. Said outlet may also be connected to a suitable storage tank for storing the liquid, if desired.

Liquid is supplied to the clothes container 12, by valves 38 and a flexible pipe 39 connected to a discharge pipe 40 secured to the bottom of the annular top portion 27 of the casing 10 by a hanger 41, and extending downwardly therefrom into the space between the inwardly extending flanged portion of the clothes container 11 and the collar 28.

The pump 36 is herein shown as having a drive wheel 42 secured to the end of its shaft (not shown). Said wheel has a friction rim 43 engageable with the top surface of a drive pulley 45 on the vertical shaft 13. Said drive pulley is secured to said vertical shaft 15 as by a set screw 46. Said pulley is rotatably driven by a motor 47 by means of a V belt 48. Said motor is herein shown as being pivotally mounted on a hanger 49 mounted on and extending inwardly from a side wall 50 of the lower support portion 19 of the casing 10. A suitable means of a well known form may be provided (not shown) to urge said motor in a direction away from the pulley 45, to maintain tension on the belt 48. When the friction rim 43 rests on the top surface of said drive pulley 45, the pump 36 will be driven from the motor 47 in an obvious manner.

A solenoid 51 is provided to control the washing and spinning operations of the machine and also to raise the friction rim 43 out of driving engagement with the pulley 45 during the washing operation. Said solenoid may be energized through suitable automatic timing mechanism in a manner well known to those skilled in the art and no part of my present invention so not herein shown or described.

As shown in Figures 5, 6 and 8, the pump 36 is pivotally suspended from ears 52, 52 extending outwardly from a depending portion 53 of a bracket 54, by means of pivotal pins 52a, 52a extending through said ears and through ears 55, 55 extending upwardly from the housing of said pump. Said solenoid is also pivotally suspended from said bracket, to one side of said depending portion 53, for movement about an axis perpendicular to the axis of pivotal movement of said pump. Said bracket encircles a flanged sleeve 56 and rests on the upper side of the flange thereof. Said sleeve encircles the drive shaft 13 and is suitably mounted in the vibration dampening mechanism 20. Said bracket depends from the flanged portion of said sleeve and also forms a support for a shifting yoke 57 for a friction clutch 58 and a brake 59, operable to control oscillation of the dasher 12 or spinning of the clothes container 11, as will hereinafter more clearly appear as this specification proceeds.

A plunger or core 60 of the solenoid 51 is pivotally connected at its lower end to a pair of toggle links 61 and 62, as by a pivotal pin 63 (see Figure 8). Said toggle link 61 is pivoted at its end opposite said pin 63, to an arm 64 depending from the bracket 54, as by a pivotal pin 65. The other of said toggle links is pivotally connected to the lower end of one lever arm 66 of a bell crank 67. Said bell crank is pivoted intermediate its ends to the depending portion 53 of the bracket 54 by a pivotal pin 68. The other lever arm of said bell crank has a pin 70 extending inwardly therefrom and extending through a slot 71 formed in said depending portion 53 of said bracket and extending vertically therealong. Said pin has engagement with a projecting end 73 of the shifting yoke 57, for pivotally moving said yoke upwardly about its point of connection to a depending bolt 74, forming a support for the end of said shifting yoke remote from said pin. Said bolt is mounted on and depends from the bracket 54. A compression spring 75 encircles said bolt and is interposed between the top of said shifting collar and the underside of said bracket, to yieldably hold said shifting yoke into engagement with the head of said bolt. A rod 76 is transversely pivoted adjacent its lower end to a strap 77, encircling the housing for the shaft of said pump, and extends vertically therefrom through the end of said shifting yoke adjacent the pin 70. Said rod is slidably mounted adjacent its upper end in the bracket 54. A pin 78 extends through said rod, intermediate its ends, and is adapted to be engaged by a depressed portion 79 of the shifting collar 57, upon vertical movement thereof. This will lift said rod and pump about the pins 52a, 52a against a compression spring 80 encircling said rod and interposed between the bottom of the bracket 54 and said pin. A compression spring 81 likewise encircles said rod and is interposed between the underside of said shifting collar and a nut and washer 82 threaded thereon to urge and yieldably hold said friction rim 43 in engagement with the upper face of said pulley 45 when said shifting collar is in the depressed position shown in Figure 6. It should here be noted with reference to Figure 6 that the nut and washer 82 may preload the compression spring 81 to enable the force of said spring to be added to the weight of said pump to yieldably engage said friction rim 43 with the upper face of pulley 45 when the shifting collar 57 is in a depressed position and that clearance is provided between the pin 78 and the shifting collar

57 when said shifting collar is in this position to assure that the full force of said spring and weight of said pump is taken on the upper face of said pulley 45 through said friction rim.

The vibration dampener 29 is of a form somewhat similar to that shown and described in application, Serial No. 784,109 filed November 5, 1947, now Patent No. 2,554,573, and is no part of my present invention, so it only need herein be pointed out that it includes generally two crossing tie plates 86, 86, herein shown as extending diagonally across the casing 10 and as having the flanged sleeve 56 extending therethrough and suitably supported thereby. The free ends of said tie plates rest on and are movably secured to brackets 87, 87 extending inwardly from the corners of said casing 10 by means of nuts and bolts 88, 88. Said arms have bearing engagement with friction plates (not shown), and clearance is provided between said bolts and the apertured portions of said arms through which said bolts extend, to allow for limited movement of said arms with respect to said brackets in all directions. Tension springs 89, 89 are connected between said arms and connecting members 90, 90, extending inwardly from the inside of the side walls 50, 50 of the support portion 19 of the casing 10 to yieldably restrain movement of said arms with respect to said brackets.

The clothes container 11 is herein shown as being circular in horizontal cross-section with an upright outwardly flaring side wall having liquid expelling apertures 93 adjacent the upper end thereof and having an upper cap portion 94 forming a continuation of said side wall and having the inwardly extending flanged portion 29 extending inwardly from the upper end thereof. Said upper cap portion 94 likewise has a plurality of liquid expelling apertures 95 opening therefrom beneath the flanged portion 29 thereof.

The bottom of the clothes container 11 is apertured at its center and is supported on a shouldered portion 96 of an upright hollow post 97 formed integrally with and extending upwardly from a cover 98 for the gear housing 21 (see Figure 2). A nut 99 threaded on said post is provided to secure said container to said post. Suitable packing may be interposed between said nut and the bottom of said clothes container, to prevent liquid from leaking from the bottom of said tub. An annular recessed or dish-shaped plate 100 is secured to the underside of the bottom of said clothes container as by machine screws 101 having nuts threaded thereon. Said machine screws may be recessed in said bottom and spot welded and soldered thereto, to prevent the leakage of liquid thereby, or suitable leakproof packing may be interposed between said annular plate and bottom to provide a leakproof joint therebetween. Said dish-shaped plate is secured at its lower inner portion to the top of the top cover 98 of the housing 21, as by cap screws 105, 105 securing said top cover to said housing.

The housing 21 has a depending hollow boss 106 mounted on the upper end of a sleeve 107. Said sleeve may be suitably secured to said boss as by keys or splines (not shown) to rotate said boss, the housing 21 and clothes container 11, upon rotation of said sleeve. Said sleeve encircles the drive shaft 13 and extends downwardly from said boss through and beneath a bearing member 109 mounted in the flanged sleeve 56 (see Figures 5 and 6). Said sleeve is journalled at its lower end in a ball bearing 110 mounted in a recessed portion 111 of a drive member 112 for the friction clutch 58. Said drive member is herein shown as being connected to the shaft 13 for rotation therewith, by means of a set screw 114. A bearing 115 herein shown as being a well known form of sleeve bearing is mounted in the upper end of said sleeve 107 and forms a bearing for the upper portion of the shaft 13 (see Figure 2).

The dasher shaft 23 is journaled in the cover 36 for the housing 21 and in the center post 97, on bearings 116 and 117, respectively and has a hub 119 of a pinion 120 secured thereto and depending therefrom. Said pinion 120 is herein shown as extending downwardly over the upper end of the drive shaft 13 and as being journaled thereon as by a bearing 121.

The oscillating drive from the shaft 13 to the aligned dasher shaft 23 includes gear teeth cut in the upper portion of said shaft 13 and forming a sun pinion 123 of the planetary gear reduction mechanism 22. Said sun pinion meshes with and drives a planetary gear 125 journaled on the upper end of a spindle 127 mounted in a boss 128 formed integrally with the bottom of the housing 21, and extending upwardly therefrom. A nut 130 threaded on the lower end of said spindle, is provided to secure said spindle to said housing. Said planetary gear 125 meshes with an internal gear 131, herein shown as being formed integrally with a depending flanged portion 132 of a casing 133 encircling the shaft 13 and journaled thereon on a bearing 134. The casing 133 has an upstanding eccentric 135 formed integrally therewith and having an eccentric strap 136 journaled thereon on a bearing 137. Said eccentric strap is herein shown as being split at one of its sides and as having two lugs 139, 139 extending outwardly from each side of the split portion thereof, through which extends a machine screw 140, which may be threaded in one of said lugs (see Figure 4). Said eccentric strap 136 has a portion 141 extending therefrom in one direction and having a spindle 142 secured thereto and projecting upwardly therefrom, and journaled at its upper end in a boss 143, herein shown as being formed integrally with a gear sector 144. Said gear sector is journaled on the upper end of a spindle 145, mounted in and extending upwardly from a boss 146, herein shown as being formed integrally with the housing 21. A nut 147, threaded on a lower end of said spindle 145 is provided to secure said spindle to said boss. The gear sector 144 meshes with the teeth of the pinion 120 to oscillate said pinion upon rotation of the shaft 13 and internal gear 131 upon holding the housing 21 from rotation.

The brake 59 is provided to hold the housing 21 from rotation when it is desired to oscillate the agitator or dasher 12, said housing then serving as the reaction member of the planetary geared reduction device 22 (see Figures 5 and 6). Said brake, as herein shown, includes an annular plate 154 held from rotation and extending around a hub 155 of a driven member 156 of the friction clutch 58. Said annular plate has ears 157, 157 extending upwardly from opposite sides thereof and transversely pivoted adjacent their upper ends to the shifting yoke 57, by pivotal pins 159, 159. The top surface of said plate is adapted to engage the bottom of an annular friction disk 160 secured to the bottom of an annular plate 161, splined on the hub of the driven mem-

ber 156 of the friction clutch 58. The driven member 156 of said friction clutch is splined on a sleeve 163 for slidable movement therealong. The upper portion of said sleeve is herein shown as having a flange 164, and said sleeve is secured to the sleeve 107 by means of a set screw 165 threaded in the flange 164 and engaging the sleeve 107. An annular bearing plate 166 is secured to the top surface of the flanged sleeve 163 and engages the bottom of the flange of the flanged sleeve 56. Compression springs 169, 169 are interposed between the underside of the flange 164 and the top of the plate 161 to urge said plate towards said annular plate 154 and to yield upon application of the brake.

It is obvious from the foregoing that when the yoke 56 is pivoted upwardly about its supporting connection on the depending bolt 74 upon energizing the solenoid 51 that the annular plate 154 will move upwardly into engagement with the friction disk 160. Said annular plate 154 being held from rotation by the yoke 57 will hold said friction disk 160 from rotation. This will also hold the flanged sleeve 163, sleeve 107 and housing 21 from rotation. Said housing 21 will then serve as the reaction member for the planetary reduction gearing 24, to effect oscillation of the dasher 12 through said planetary reduction gearing, eccentric strap 136 and gear sector 144 meshing with the pinion 120. At this time the clutch yoke 57 comes into engagement with the pin 78 on the rod 76, and lifts the friction rim 43 of the wheel 41 out of engagement with the top surface of the pulley 45, to stop operation of the pump 36.

When the solenoid 51 has been deenergized and the clutch yoke 57 is in the depressed position shown in Figure 6, a friction disk 171 on the bottom of the driven member 156 of the friction clutch 58 will come into engagement with the driving member 112 of said clutch. This will effect rotation of said driven member and the sleeve 107, rotatably driven by the sleeve 163 and set screw 165. It will also effect rotation of the housing 21 secured to said sleeve, and the clothes container 11 to spin said clothes container and extract liquid therefrom and from the clothes therein through the liquid discharge apertures 93, 93 and 95, 95. At the same time the friction rim 43 of the wheel 41 will come into engagement with the top surface of the drive pulley 45, to drive the pump 36 and discharge liquid from the sump 34 to waste, or to a suitable storage tank (not shown), where it is desired to store and reuse the liquid extracted from the clothes.

It may be seen from the foregoing that a novel form of combination washing and extracting machine of the automatic type has been provided having a far simpler drive than formerly, which enables oscillation of the dasher or spinning of the clothes container to be effected with a minimum number of gears and with no shifting of gears, and utilizes a simple form of friction clutch and brake connected to operate oppositely of each other, so that when the shifting means therefor is in one position the clutch is engaged to effect spinning of the clothes container, and when in another position the clutch is disengaged and the brake is engaged to effect oscillation of the dasher.

It may further be seen that this simplified form of drive to oscillate the dasher or spin the clothes container is obtained by a simple planetary geared reduction drive, the reaction member of which is formed by a housing therefor, secured to the bottom of the clothes container and held from rotation by a brake, to effect oscillation of the dasher, and that upon release of the brake, a clutch will be engaged, to rotate said housing and reaction member and spin the clothes container. It is also apparent that during the initiation of the spinning operation, the initial rotation of the reaction member of the planetary will slow down the oscillating motion of the dasher until the sleeve 107 and said reaction member and housing rotate at the speed of the shaft 13, at which time said planetary gear reduction mechanism and dasher will rotate as a unit with the reaction member and clothes container.

It may still further be seen that the drive shaft for the planetary may be continuously driven during the washing and extracting operations and that this shaft extends within the housing or reaction member for the planetary geared reduction mechanism and has the oscillating dasher shaft supported thereon for relative movement with respect thereto and extending upwardly therefrom, and oscillatively driven from said drive shaft through gearing contained wholly within said housing and effecting oscillation of the dasher merely by holding said housing from rotation.

While I have herein shown and described one form in which my invention may be embodied, it will be understood that various modifications and variations thereof may be effected without departing from the spirit and scope of the novel concepts thereof.

I claim as my invention:

1. Driving mechanism adapted for a combined washing and extracting machine having a cabinet having a clothes container journaled therein for rotation about a vertical axis and having an oscillating dasher therein, comprising a housing secured to and depending from said clothes container, a rotating drive shaft extending upwardly through the bottom of said housing and having a pinion thereon, a motor, means driven by said motor for driving said shaft, an oscillating drive shaft aligned with said first drive shaft and having said dasher supported thereon, bearing means between the adjacent ends of said shafts supporting one shaft on the other, a sleeve encircling said rotating drive shaft and secured to said housing, mechanical means for rotating said sleeve from said shaft to rotate said housing and said clothes container for extraction, brake means for holding said sleeve and housing from rotation, and means reacting against said housing when held from rotation to oscillatably drive said oscillating shaft and dasher for washing, comprising a pinion on said oscillating shaft extending downwardly within said housing and encircling said rotating drive shaft and disposed above said pinion on said rotating drive shaft, a casing rotatably journaled on said rotating drive shaft between said pinions, planetary gearing for rotatably driving said casing comprising an internal gear on said casing, a planetary gear journaled within said housing and meshing with said internal gear, and driven by said pinion on said rotating drive shaft, and oscillating drive mechanism connected between said casing and said pinion on said oscillating drive shaft for oscillatably driving said pinion and the dasher thereon, upon the holding of said housing from rotation.

2. Drive mechanism adapted for a combined washing and extracting machine having a cabinet, a clothes container mounted therein for rotation about a vertical axis and having an os-

cillating dasher therein, comprising a housing secured to and depending from said clothes container, a rotating drive shaft extending upwardly through the bottom of said housing and having a pinion thereon, a motor, means driven by said motor for continuously driving said rotating drive shaft, an oscillating drive shaft aligned with said first drive shaft and extending upwardly therefrom within said clothes container and having said dasher supported thereon, thrust bearing means between said shafts rotatably supporting one shaft on the other, a sleeve encircling said rotating drive shaft and secured to said housing, clutch means for rotatably driving said sleeve from said rotating drive shaft to rotate said housing and spin said clothes container for extraction, brake means for holding said sleeve and housing from rotation, and means for oscillatably driving said oscillating drive shaft and dasher from said rotating drive shaft upon application of said brake means, comprising a pinion on said oscillating drive shaft extending downwardly within said housing and encircling said rotating drive shaft and spaced above said pinion on said rotating drive shaft, a casing rotatably journaled on said rotating drive shaft between said pinions, planetary gearing for rotatably driving said casing from said pinion on said rotating drive shaft when said housing is held from rotation comprising a planetary gear journaled within said housing, an internal gear on said casing meshing with and driven from said planetary gear, an eccentric on said casing and an oscillating drive connection between said eccentric and said pinion on said oscillating drive shaft, for oscillatably driving said pinion, shaft and dasher upon the holding of said housing from rotation.

3. In a driving mechanism adapted for a combined washing and extracting machine having a cabinet, a clothes container journaled in said cabinet for rotation about a vertical axis and having an oscillating dasher therein, the improvements comprising a housing secured to and depending from said clothes container, a vertical rotating drive shaft extending upwardly through the bottom of said housing, a pinion on said rotating drive shaft within said housing, a motor, means driven by said motor for continuously driving said shaft, an oscillating drive shaft forming a continuation of said first drive shaft, a thrust bearing between said shafts and supporting one shaft on the other, said oscillating drive shaft having said dasher mounted thereon, a sleeve encircling said rotating drive shaft and secured to said housing, a clutch selectively operable to rotatably drive said sleeve from said rotating drive shaft to rotate said housing and said clothes container for extraction, a brake for holding said sleeve and housing from rotation, and means driven by said rotating drive shaft for oscillatably driving said oscillating drive shaft upon the application of said brake comprising a pinion on said oscillating drive shaft and encircling said rotating drive shaft and journaled thereon, a casing rotatably journaled on said rotating drive shaft between said pinions, and planetary gearing rotatably driving said casing from said rotating drive shaft comprising said pinion on said rotating drive shaft, a planetary gear rotatably supported within said housing and driven by said pinion, an internal gear within said casing and meshing with said planetary gear and rotatably driving said casing upon the holding of said housing from rotation, a rocking gear segment journaled within said housing and meshing with said pinion on said oscillating drive shaft, an eccentric on said casing, and an eccentric strap connecting said eccentric with said rocking gear segment for oscillatably driving said gear segment and dasher upon rotation of said casing and the holding of said housing from rotation.

DAVID A. JOHNSON.

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