April 19, 1938. M. M. JACKSON 2,114,982

DRIVE MECHANISM FOR WASHING MACHINES

Filed Oct. 31, 1936 2 Sheets-Sheet 1

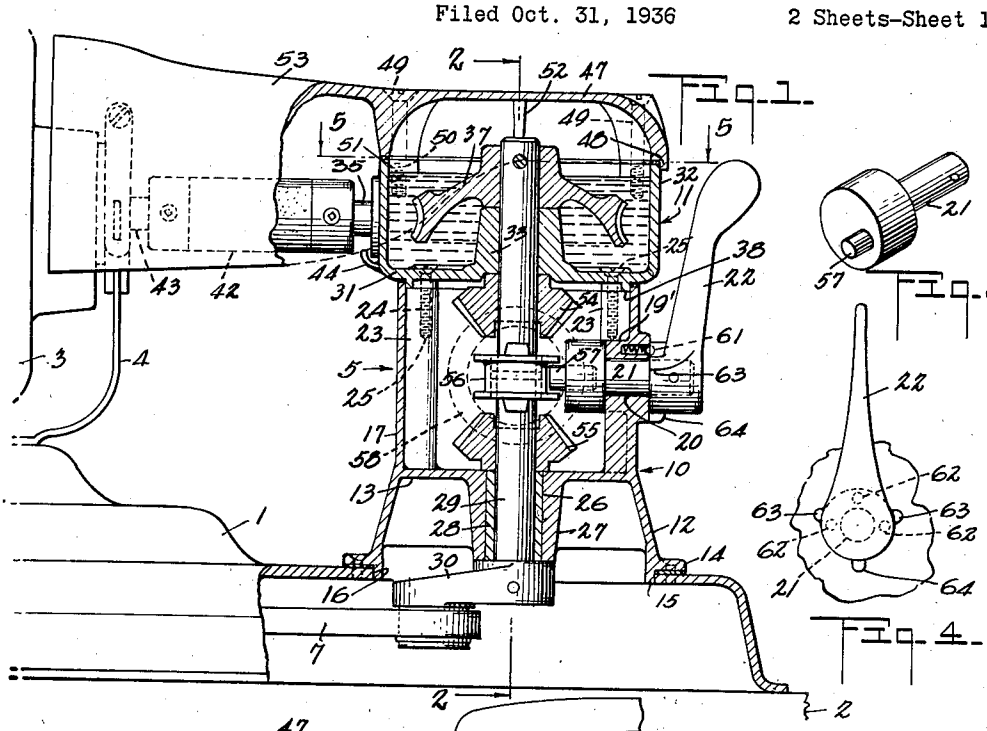

Fig. 1.

Fig. 3.

Fig. 4.

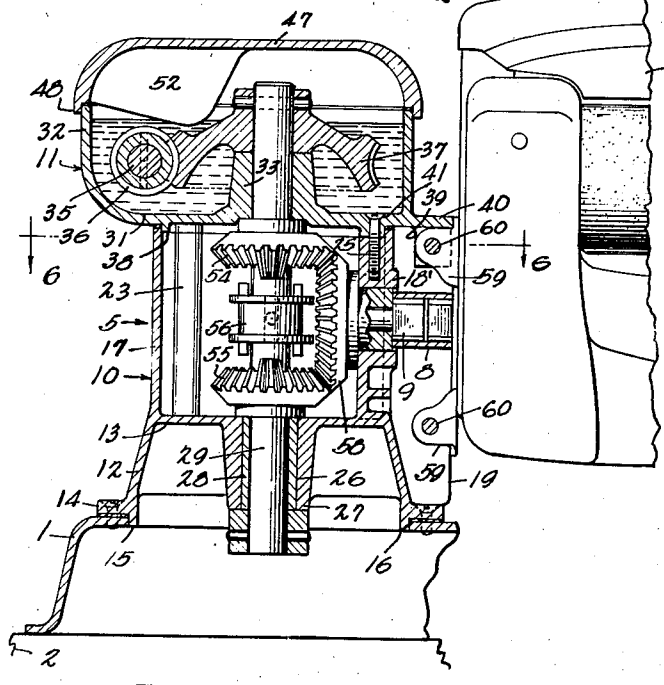

Fig. 2.

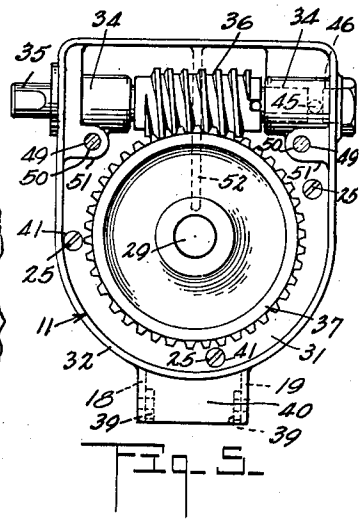

Fig. 5.

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FIG. 7.

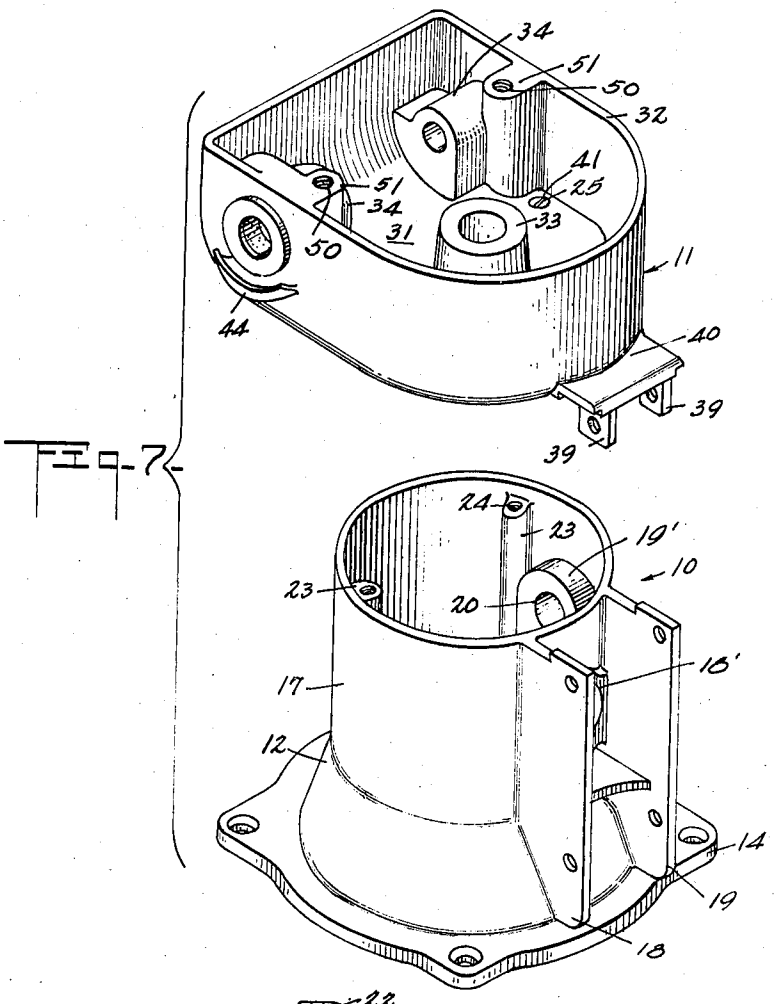
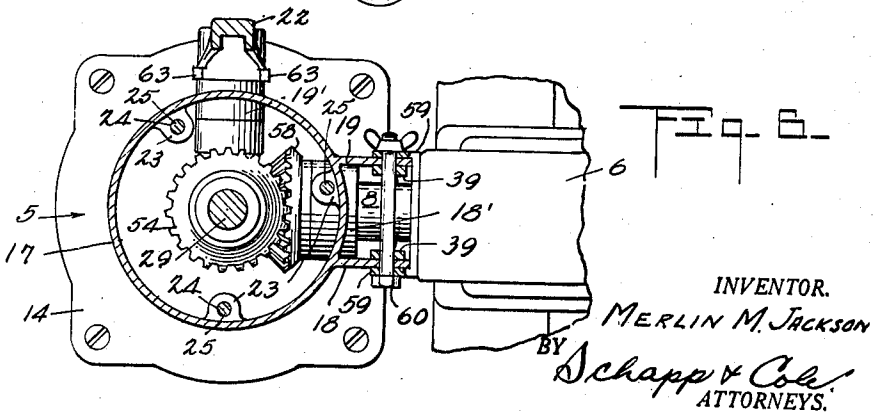


FIG. 8.



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UNITED STATES PATENT OFFICE

2,114,982

DRIVE MECHANISM FOR WASHING MACHINES

Merlin M. Jackson, San Jose, Calif., assignor to Little Giant Inc., Ltd., Oakland, Calif., a corporation of California

Application October 31, 1936, Serial No. 108,636

11 Claims. (Cl. 74—606)

The present invention relates to improvements in washing machines and has particular reference to a drive mechanism for a washing machine.

My invention is intended to be used in connection with that type of washing machine in which the operating mechanism is made as a separate unit to be mounted on the top of a tray or tub such as is usually provided in modern homes for laundering operations, as a built-in feature.

Since in washing machines of this type the motor and the drive mechanism are mounted above the tub or tray, it is essential that any leakage of oil or grease be prevented and it is the principal object of the present invention to provide a drive mechanism arranged in such a manner that leakage of the lubricant is carefully guarded against while at the same time ample lubricant may be provided for those portions of the mechanism needing it.

A further object of my invention is to provide certain structural improvements whereby the assembling of the drive mechanism is facilitated.

A further object of the invention is to provide a drive mechanism that is compact, well built, fits into the general design of the entire mechanism of the washing machine and is easily operated.

Further objects and advantages of my invention will appear as the specification proceeds.

The preferred form of my invention is illustrated in the accompanying drawings in which

Figure 1 shows a vertical section through my drive mechanism, certain adjacent portions of the entire washing machine assembly being shown in front elevation;

Figure 2 a vertical section taken along line 2—2 of Figure 1, with a portion of the wringer being shown in side elevation;

Figure 3 a perspective detail view of an eccentric for a clutch;

Figure 4 an end view of an operating means for the clutch;

Figure 5 a horizontal section taken along line 5—5 of Figure 1;

Figure 6 a horizontal section taken along line 6—6 of Figure 2; and

Figure 7 an exploded view, in perspective, of the main sections of the gear housing.

While I have shown only the preferred form of my invention I wish to have it understood that various changes and modifications may be made within the scope of the claims hereto attached without departing from the spirit of the invention.

The general assembly of my washing machine is indicated in part only and comprises a base 1, which is made to rest on the top of the tub 2 and is secured thereto in any suitable manner, a motor 3 secured to the base by means of a frame 4, a gear housing 5 secured to the base at a distance from the motor and a wringer 6 projecting from the housing at a right angle to the axis of the motor.

The agitator for the washing machine which is not shown in the drawings, projects from the base downward into the tub and is positioned slightly in front of the motor, the agitator being actuated by a connecting link 7 shown in Figure 1.

The wringer 6, which in itself does not form any part of this invention, is actuated, through a conventional coupling 8, by means of the shaft 9.

The present invention is directed principally to the drive mechanism by means of which motion is transmitted from the motor to the connecting rod 7 for driving the agitator and to the shaft 8 for operating the wringer, which latter must be free to turn in either direction and to be disconnected from the drive means.

The connecting link 7 is non-releasably connected to the drive mechanism and a suitable clutch mechanism is provided in the connection between the link and the agitator as is specifically described in my co-pending application, Ser. No. 108,635, filed October 31, 1936.

The drive mechanism is accommodated in the housing 5 which is made in two sections 10 and 11. The lower section 10 comprises a base 12, frusto-conical in shape and formed with a flat top 13, and an external flange 14 by means of which it is secured to the base 1 of the washing machine. A projecting downward flange 15 centers the housing relative to a corresponding perforation 16 in the base 1.

From the top 13 of the base 12 rises a cylindrical wall 17 which forms a chamber for one portion of the gear drive, the top 13 being the bottom of this chamber and being formed integral with the other parts.

The cylindrical wall of the lower section 10 has two spaced flanges 18 and 19 projecting outwardly therefrom, the flanges being arranged vertically and parallel to one another and extending substantially from the top of the wall to the base flange 14. Between the two flanges an embossment 18' is provided in the cylindrical wall and furnishes a bearing for the shaft 9 connected to the wringer.

A second embossment 19' arranged in the

cylindrical wall at a distance from the first embossment furnishes a second bearing 20 for the shaft 21 of the clutch manipulating handle 22. Three vertical ribs 23 running along the inside of the cylindrical wall serve to reinforce the latter and also provide, in their upper ends, threaded sockets 24 for the screws 25.

The bottom 13 of the section 10 has a central aperture 26 with a depending flange 27 which holds a bushing 28 serving as a bearing for the main vertical shaft 29 which latter is connected, through the arm 30, with the connecting link 7 leading to the agitator.

The upper section 11 of the housing is shown in plan in Figure 5 and comprises a flat bottom 31 and a wall 32 rising from the rim thereof and formed integral therewith. One portion is semi-cylindrical and the other portion is squared and made to merge with the cylindrical portion.

The bottom has a central embossment 33 rising therefrom and the embossment furnishes a bearing for the upper end of the vertical shaft 29. Two further bearings are provided in the embossment 34 in the squared section of the wall and support the horizontal shaft 35 which carries a worm gear 36 meshing with the gear 37 on the vertical shaft 29.

The upper section 11 rests on the lower section 10 and is alined therewith by means of an annular flange 38 projecting from the bottom and fitting in the cylindrical wall of the lower section. It is further positioned by means of two lips 39 projecting downwardly from a horizontal flange 40 which latter projects outwardly from the upper section 11 and overlies the flanges 18 and 19 of the lower section in such a manner that the lips 39 are inside the two flanges 18 and 19 and interlock therewith when the upper section is in the proper position with respect to the lower section. When this position has been obtained three perforations 41 in the bottom of the upper section register with the sockets 24 in the ribs 23 of the lower section and the two sections may be firmly drawn together by means of the screws 25.

The shaft 35 which carries the worm 36 is connected, through the flexible coupling 42, with the motor shaft 43 and where it leaves the wall of the upper section 11 a small catch basin 44 is provided to receive any grease or oil that might work past the bearing in the embossment 34. The far end of the shaft 35 rides against a ball bearing 45 confined between it and the screw 46.

The upper section 11 is surmounted by the cover 47 which has a flange 48 fitting over the upper edge of the section and which is secured in place by means of two screws 49 which pass through perforations in the cover into the threaded sockets 50 in vertical ribs 51 in the section 11. The cover has a baffle 52 suspended therefrom and this baffle overlies the worm 36 and serves to deflect the grease which has a tendency to be advanced by the screw action of the worm.

The cover 47 has a guard 53 projecting outwardly and this guard serves as a shield for the coupling 42 and the shafts connected thereby. It is shaped to cover the top and the sides of the coupling and its lines are such that they merge at one end into the general outline of the cover 47 and at the other end into the outline of the motor, although not connected to the latter.

The lower section of the housing accommodates a conventional transmission comprising two bevel gears 54 and 55 loose on the shaft 29, a clutch member 56 slidable on the shaft and an eccentric pin 57 on the shaft 21 for moving the clutch member from the neutral position shown into engagement with either of the bevel gears for transmitting motion to the large bevel gear 58 meshing with both and secured to the shaft 9 operating the wringer 6. The latter is suspended from the flanges 18 and 19 by means of ears 59 straddling the flanges and bolts 60 passing through registering perforations. The upper one of the bolts 60 also passes through the ears 39 by means of which the upper section 11 is positioned relative to the lower one.

The handle 22 is provided with suitable means, such as the spring-pressed ball 61 and recesses 62 for holding the same in any one of the three positions mentioned and two lugs 63 are provided to impinge upon a stationary stop 64 to form positive stops for the handle when it reaches the proper position for engagement of the clutch member with either of the bevel gears.

The manner of assembling the drive mechanism is as follows: The shaft 21 with its eccentric may first be inserted in its proper bearing in the lower section, with the upper section 11 removed, of course, and the large bevel gear 58 put in place.

Next the lower bevel gear 55 is placed on the bottom 13 in its proper place, the clutch 56 is manually held in approximate correct position, with the pin 57 in the groove of the clutch, and the shaft 29, from which both the arm 30 and the gear 37 have been removed, is lowered through the clutch, the lower bevel gear and the bushing 28.

During this operation the arm 30 may be connected to the bottom end of the shaft. Now the upper bevel gear may be applied. This finishes the assembly of the lower section 11.

Next the upper section is secured upon the lower section, the upper section being centered by the flange 38 and positioned by the lips 39 so that the holes in the bottom of the upper section register with the threaded sockets in the lower section whereupon the screws 25 may be applied for firmly securing the upper section in place.

The worm gear 37 may now be fastened to the vertical shaft and the worm assembly arranged by pushing the shaft 35 through the worm 36 held manually in the proper position. Placing the cover on top and fastening the same by means of bolts 49 completes the operation.

The upper section 11 which contains the rapidly revolving worm gear, is provided with a generous amount of lubricant. The latter does not enter the lower section 10 except in minute quantities passing along the central shaft, since the wall of the upper section is formed integral with the bottom thereof. The integral bottom of the lower section forms a second barrier to the lubricant and no lubricant whatever escapes downward from the lower section.

I claim:

1. In a drive mechanism for a washing machine, a gear housing comprising a lower section having an annular rim and a pair of vertical flanges projecting from the outer face thereof, an upper section having a bottom ring fitting within the annular rim for alining the two sections when one is placed on the other and a flange projecting outwardly from the upper section and having means interlocking with the flanges of the lower section for positioning one section with respect to the other.

2. In a drive mechanism for washing machines, a gear housing comprising a lower section having an annular rim and a pair of vertical flanges projecting from the outer face thereof, an upper

section having a bottom ring fitting within the annular rim for alining the two sections when one is placed on the other, a flange projecting outwardly from the upper section and having means interlocking with the flanges of the lower section for positioning one section with respect to the other and means for tightening the upper section upon the lower section.

3. In a device of the character described, a section for a gear housing comprising a base having a flat top a cylindrical wall rising from the base and formed integral therewith, a pair of vertical flanges projecting outwardly from the wall and an embossment in the wall between the flanges having a radial shaft bearing therein.

4. In a device of the character described, a section for a gear housing comprising a base having a flat top, a cylindrical wall rising from the base and formed integral therewith, a pair of vertical flanges projecting outwardly from the wall and an embossment in the wall between the flanges having a radial shaft bearing therein, with a second embossment in the wall having a radial shaft bearing at a right angle to the first bearing.

5. In combination, a base, a motor mounted thereon, a gear housing mounted on the base and having a shaft revolvable therein, a coupling between the motor shaft and the latter shaft, and a cover for the gear housing having a guard projecting therefrom for shielding the coupling, the guard being opened at the bottom to give access to the coupling and allowing the guard to be applied over the coupling from the top.

6. In a drive mechanism for a washing machine, a gear housing comprising a lower section having an annular rim and a pair of vertical flanges projecting from the outer face thereof, an upper section, means for alining the two sections when one is placed on the other, and a flange projecting outwardly from the upper section having means interlocking with the vertical flanges of the lower section for positioning the sections with respect to each other.

7. In a drive mechanism for a washing machine, a gear housing comprising a lower section having a pair of vertical flanges projecting therefrom, an upper section, means for alining the two sections when one is placed on the other, and a flange projecting from the upper section having means interlocking with the vertical flanges of the lower section for positioning the sections with respect to each other.

8. In a drive mechanism for a washing machine, a gear housing comprising a lower section having a pair of vertical flanges projecting from the outer face thereof, an upper section removably disposed on the lower section, means for securing the two sections together, a flange projecting outwardly from the upper section in overlying relation with the vertical flanges of the lower section and means for securing the upper section flange to the lower section flanges for positioning the sections with respect to each other.

9. In a drive mechanism for a washing machine, a gear housing comprising a lower section having a pair of vertical flanges projecting from the outer face thereof, an upper section removably disposed on the lower section, means for securing the two sections together, a flange projecting outwardly from the upper section in overlying relation with the vertical flanges of the lower section, lips extending downwardly from the upper section flange and into a position between the vertical flanges of the lower section for positioning the sections with respect to each other, and means for fastening the lips to the vertical flanges of the lower section.

10. In a drive mechanism for a washing machine, a gear housing comprising a lower section having a pair of vertical flanges projecting from the outer face thereof, an upper section removably disposed on the lower section, means for securing the two sections together, a flange projecting outwardly from the upper section in overlying relation with the vertical flanges of the lower section, the upper section flange and the lower section vertical flanges having stepped interfitting parts, and means for securing the upper section flange to the vertical flanges of the lower section.

11. In a device of the character described, a lower gear housing section having a pair of vertical flanges on the outer face thereof, an upper gear housing section removably disposed on the lower section, means for securing the two sections together, a flange projecting from the upper section having lips positioned between the vertical flanges of the lower section, a wringer having ears straddling the vertical flanges, fastening means extending through the vertical flanges and passing through the lips and ears, and driving means in one of the housing sections connected to the wringer.

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