Jan. 3, 1933. R. GILBERT 1,892,833

POWER UNIT

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FIG. 1.

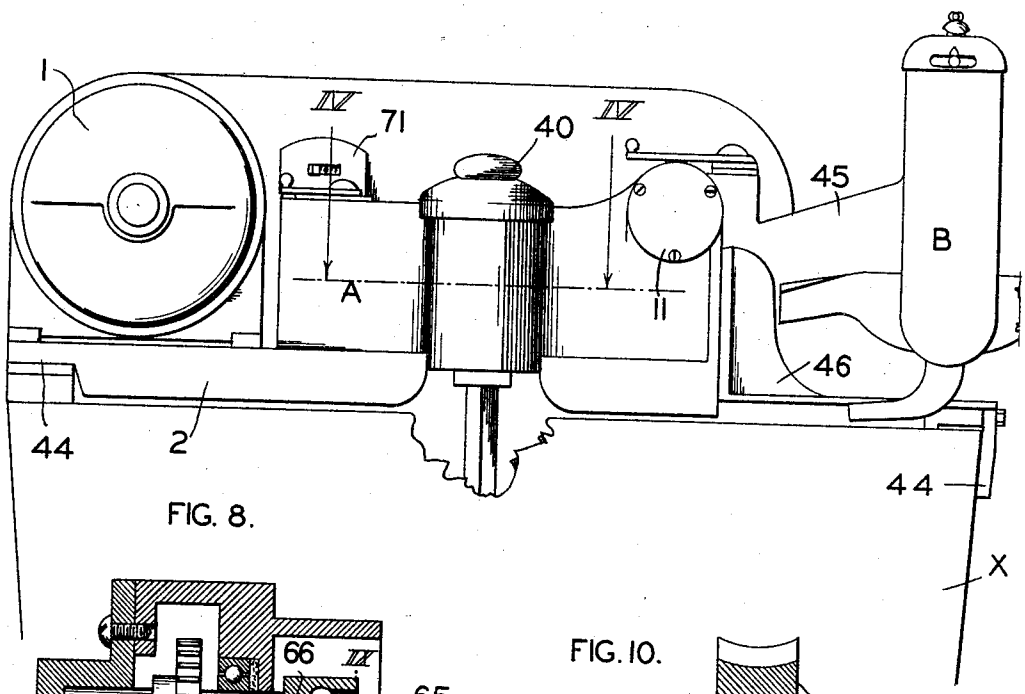


FIG. 8.

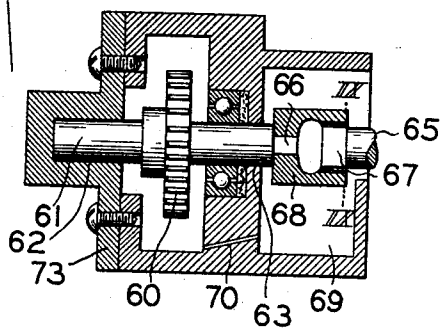


FIG. 9.

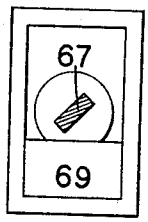
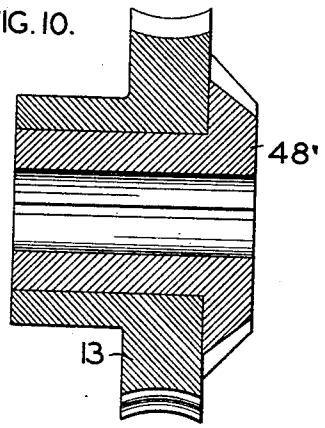


FIG. 10.



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FIG. 3.

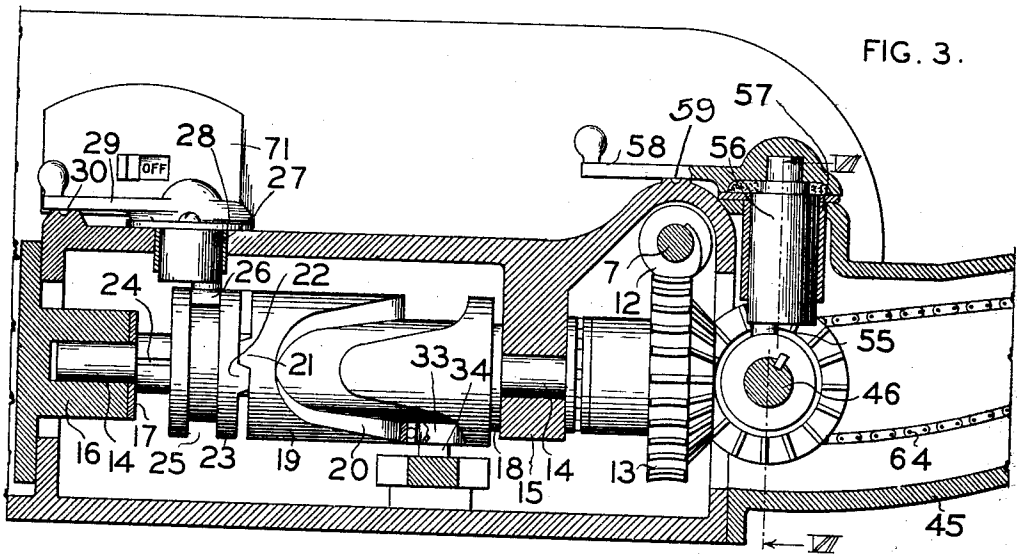


FIG. 2.

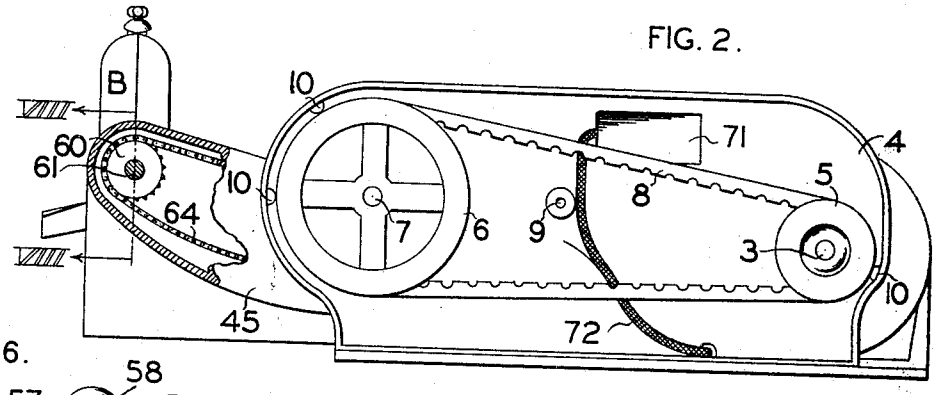
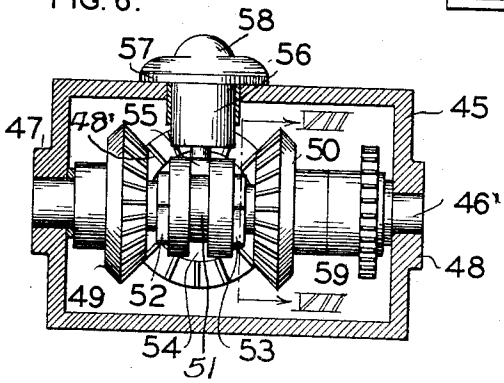


FIG. 6.



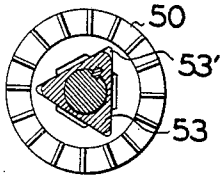


FIG. 7.

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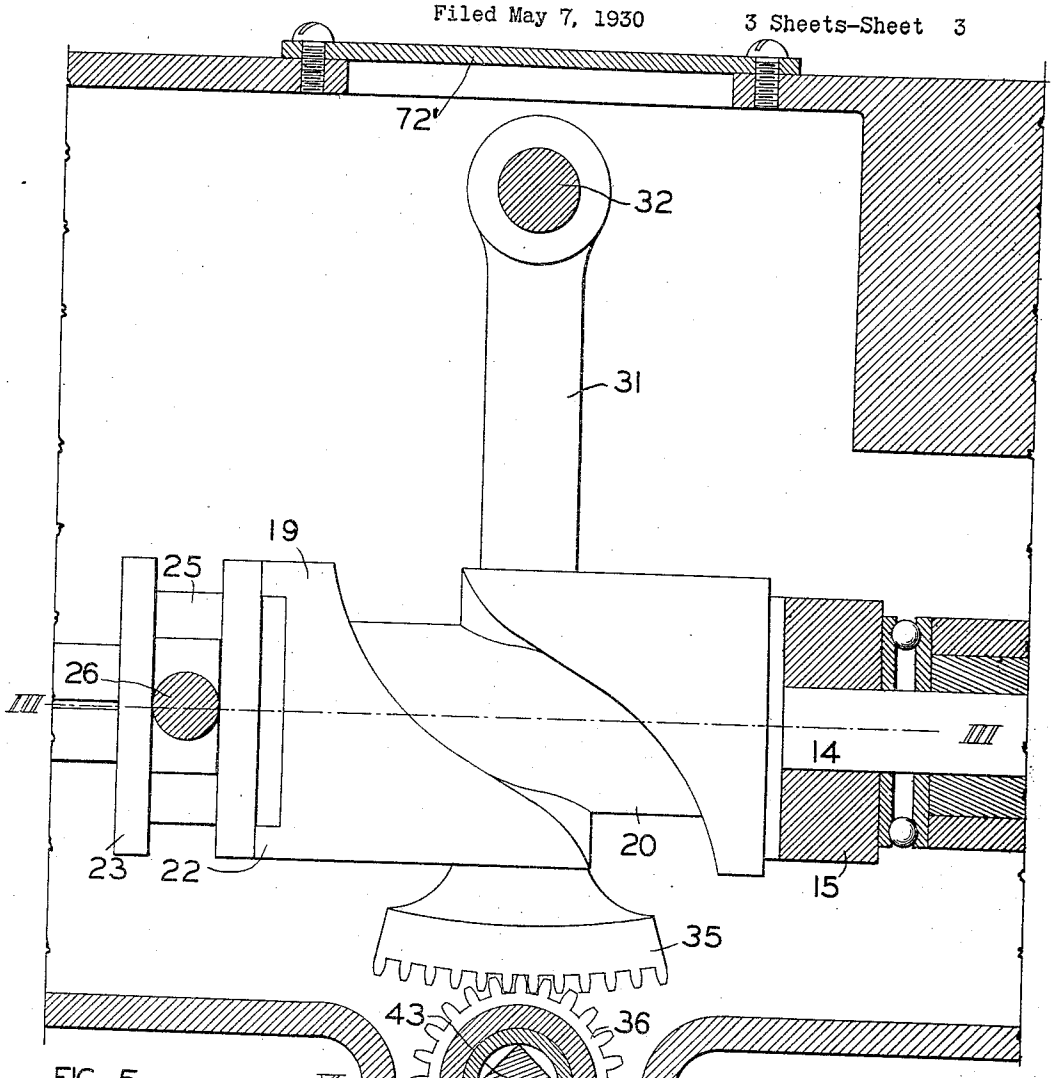
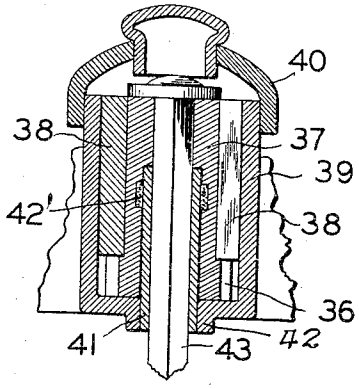


FIG. 5.

FIG. 4.



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Patented Jan. 3, 1933 1,892,833

UNITED STATES PATENT OFFICE

REGINALD GILBERT, OF SAN FRANCISCO, CALIFORNIA

POWER UNIT

Application filed May 7, 1930. Serial No. 450,577.

This invention relates to improvements in power units and more particularly to motive means for washing and wringing machines.

The principal object is to provide a portable power unit which may be readily attached to and detached from wash tubs, laundry trays and other conventional laundry installations.

Another object is to enclose all working parts in lubricant, so far as practicable.

A further object is to simplify the operation and guard the moving parts for the protection of the operator.

Other objects and advantages will appear as the description progresses.

In this specification and the accompanying drawings the invention is disclosed in its preferred form. But it is to be understood that it is not limited to this form because it may be embodied in other forms. It is also to be understood that in and by the claims following the description it is desired to cover the invention in whatsoever form it may be embodied.

In the three sheets of drawings:

Fig. 1 is a front elevation of the invention installed on a laundry tray.

Fig. 2 is a rear view of the same, detached from the tray.

Fig. 3 is an enlarged detail of the cam shaft housing and assembled mechanism therein; the housing is in vertical section taken on the line III—III, Fig. 4.

Fig. 4 is a greatly enlarged detail view of the same, in horizontal section taken on the line IV—IV, Fig. 1.

Fig. 5 is a detail in vertical section of the bearing for the oscillating shaft, taken on the line V—V, Fig. 4.

Fig. 6 is a detail of the reverse gear for the wringer drive, partially in vertical section on the line VI—VI, Fig. 3.

Fig. 7 is a detail end view of the reverse clutch collar of the same partly in cross section on the line VII—VII, Fig. 6.

Fig. 8 is a detail of the sprocket drive and universal joint for the wringer, partly in vertical section on the line VIII—VIII, Fig. 2.

Fig. 9 is an end view of the said universal joint, partially in cross section on the line IX—IX, Fig. 8.

Fig. 10 is an enlarged detail in vertical section, of the combined worm and bevel gear of the countershaft drive.

In detail the construction illustrated in the drawings, referring to Figs. 1, 2, comprises the enclosing housing designated A as all inclusive. The housing is preferably an integral die casting of aluminum or other alloy of proper strength.

The various mechanisms are inserted into the housing through openings closed by oil and moisture tight covers. It is important in laundry machinery that no oil escape from the machine to stain the laundry, and equally important that no water or soapy solutions enter the working parts and emulsify the lubricant to the detriment of the working parts.

The prime mover in the present instance is the electric or other form of motor 1, fixed to the base 2 of the housing. The shaft 3 of the motor extends into the belt guard 4, fixed to the base 2. The grooved drive pulley 5 is fixed on the motor shaft 3. The driven pulley 6 is fixed on the countershaft 7 in alinement with the pulley 5.

Power is transmitted from the motor to this countershaft by the V type belt 8. This type of drive is preferred because of its silence, flexibility and lack of vibration. The belt guard 4 has a sheet metal cover, not shown, held in position by a screw engaging the lug 9 and fitting closely within the housing 4 against the stop lugs 10—10.

The countershaft 7 is mounted in suitable bearings in the housing 1, and in the cap 11, fixed thereto. The gear worm 12 is fixed on the countershaft 7, intermediate these bearings and enmeshed with the worm gear 13 keyed on the end of the cam shaft 14.

This cam shaft is mounted in the bearing 15 in the housing and in the cap 16, fixed to the housing. The ends of this shaft are turned down to form shoulders abutting the ends of the bearings 15—16. The thrust plates 17—18 are interposed to take the end thrust wear.

The cam 19 is revoluble on the shaft 14, and has the peripheral slot 20 formed therein.

The clutch teeth 21 are formed on the end of the cam and adapted to engage similar teeth 22, on the slidable clutch collar 23 splined on the shaft 14 at 24. This clutch has the concentric groove 25 therein.

The cam is clutched and declutched by the stud 26 engaging the groove 25 and mounted eccentrically on the spindle 27 in the cap 28 fixed in the housing and operated by the exposed crank handle 29.

Swinging the handle 29 slides the collar 23 on the spline 24 to drive or declutch the cam 19, respectively. The handle has the tit 30 thereon, engaging a recess or socket in the top of the housing to hold the handle in adjusted position. The collar 23 being driven by the shaft 14 through the spline 24 will revolve the cam when the teeth 21—22 are engaged.

The rack segment arm 31 is pivoted at 32 on the base 2 of the housing and extends under the cam. The stud 33 extending upward from this arm has an antifriction roller 34 thereon engaging the cam slot 20. The rotation of the cam 19 causes the reciprocal oscillation of the arm 31, see Figs. 3, 4.

The arm 31 has the segmental rack 35 thereon, enmeshed with the pinion 36, see Figs. 4, 5. This pinion has an upwardly extended hub 37, mounted within a split bushing 38, contracted within the semi-cylindrical bore of the turret 39 extending from the side of the housing. This turret has a complete concentric neck at the top portion to encircle the bushing 38. The friction cover 40 covers the top of the turret to retain the lubricant within the housing.

To prevent the lubricant from seeping downward past the pinion 36, the concentric tube 41 is forced into the neck 42 in the bottom of the turret and extends upward within the hub 37 of the pinion. To arrest the capillary rise of the lubricant this hub is provided with an internal groove into which the annular felt gasket 42′ may be forced. The tube 41 extends above the oil level in the housing.

The upper end of the hub 37 has a square hole broached therein to engage the upper end of the square vertical dasher shaft 43. This shaft is intended to extend down into the laundry tray X and have mounted thereon a dasher of any suitable type, not shown, to agitate the laundry or other contents of the vessel within which it operates.

The housing A may be fixed to the edge of the tray in any suitable manner, such as the clamps 44.

Laundry trays and other vessels to which this machine may be attached vary so in structure, that several types of clamping or permanent attaching means will be adopted by those skilled in the art, to meet these various conditions.

A wringer operating means is combined with the power unit as an attachment to the housing A and geared to the cam shaft. This comprises the hollow neck 45 and the bracket 46 bolted to the housing A, see Figs. 1, 2, 3.

The transverse shaft 46′ is mounted in suitable bearings 47—48 in the opposite sides of the neck 45, see Fig. 6. The conventional three-bevel-gear reverse gearing is mounted in this neck 45. The main driving bevel gear 48′ is formed integral with the worm gear 13, or it may be combined therewith as shown in Fig. 10, in which the hub of the bevel gear 48′ is forced into the hub of the gear 13 and becomes a part thereof.

The intermediate right and left bevel gears 49, 50 are free on the shaft 46′, and both are enmeshed on opposite sides of the gear 48′, consequently revolve in opposite directions. The sliding collar 51 is splined on the shaft 46 and drives the same.

The opposite ends 52, 53 of this collar are polygonal, in this instance triangular, to engage similarly shaped sockets 53′ in the sides of the bevel gears 49, 50, see Fig. 7. The central groove 54 is provided in the collar to engage the stud 55 eccentrically formed on the spindle 56. This spindle is pivoted in the cap 57 fixed in the top of the housing. This spindle is operated by the lever handle 58, having the tit 59 engaging a recess in the housing to hold the handle in adjusted position.

Since the bevel gears 49, 50 revolve freely in opposite directions on the shaft 46′ and the collar 51 is splined on this shaft, the shaft will be driven in the direction of the gear 49 or 50 engaged by the collar, as selected by the handle 58. In the neutral position shown in Fig. 6 the shaft is not revolved in either direction.

The hub of the sprocket 59 is fixed upon and revolves with the shaft 46′. A similar sprocket 60 is fixed on the shaft 61 mounted in bearings 62, 63 in the walls of the neck 45. The sprocket chain 64 transmits the power of the motor 1 to the wringer B, which may be of any conventional type suitable for the purpose, or any other mechanism desired.

It is advisable to interpose a universal or compensating joint such as shown in Fig. 8 between the sprocket shaft 61 and the shaft 65 of the wringer. The ends of the shafts 61 and 65 are flattened as at 66 and 67 to engage in the intermediate block 68 having transverse slots in the ends thereof to engage the ends 66, 67 respectively, to allow for any disalinement of the shafts 61, 65. Any lubricant dropping from the joint 68 accumulates in the trough 69, and drains through the bypass 70 into the neck 45, thence back into the housing A.

The electric switch 71 is attached to the housing in any accessible location, through which an electric circuit is wired to the motor 1 through the cable 72, see Figs. 2, 3.

This invention operates substantially as follows:

The switch 71 is thrown to the "on" position which energizes the motor to drive the cam shaft 14. After the motor attains operating speed the handle 29 is thrown into the position shown in Fig. 3. This clutches the cam 19 and operates the washer mechanism within the tray X. When the washing operation is complete the cam is declutched by reversing the handle 29.

The handle 58 is then swung to drive the wringer mechanism in the desired direction for wringing the laundered garments, in the usual manner. The wringer is generally located between two trays. By reversing the wringer, by reversing the handle 58, the garments can be passed through the wringer in either direction, from one tray to the other.

The washing and wringing units may be operated at the same time or separately by manipulating the clutch controls 29 and 58.

The various openings, recesses and chambers are cored in the housing A, the base 2 acting as an integral pan to retain lubricating oil or grease, which will be distributed throughout the interior of the housing A and the neck 45 by the rotating parts therein contacting the lubricant, which will find its way into the bearings and between contacting operating surfaces, except the belt drive in the guard 4. The external openings necessary in assembling the internal parts, are closed by gasketed or tight covers attached to the housing, such as the covers 72′, 73, 57, 28, 16, etc.

This power unit has been described in its particular application to laundry or washing machine purposes. But it is obvious that mechanisms, other than the washing dasher and the wringer, may be operated by the power available at the shafts 43 and 61, without departing from the spirit of this invention.

Having thus described this invention what I claim and desire to secure by Letters Patent is:

1. A power unit comprising an enclosing housing; a motor driven reduction gear mounted within said housing; a revolving shaft driven by said reduction gear; an oscillatory shaft projecting through said casing; a segment driven by said revolving shaft and adapted to impel said oscillatory shaft; a bevel gear mounted on said revolving shaft; a shaft transverse to said revolving shaft; right and left bevel gears rotatably mounted on said transverse shaft; a sprocket fixed to said transverse shaft; a clutch collar splined to said transverse shaft; a spindle journaled in said housing; a stud eccentrically mounted on said spindle and adapted to slide said clutch collar to selectively engage either of said left and right bevel gears.

2. A power unit comprising an enclosing housing; a reduction gear mounted within said housing; a cam shaft adapted to be driven by said reduction gear; a cam on said cam shaft; an oscillating shaft projecting from said housing and adapted to be driven by said cam; a bevel gear mounted on said cam shaft; a transverse shaft; left and right bevel gears rotatably mounted on said transverse shaft and enmeshed with said bevel gear on the cam shaft; a clutch splined to said transverse shaft and adapted to selectively engage either the left or right bevel gears; a sprocket and chain drive from said transverse shaft to a secondary shaft; an operating shaft in flexible driving association with said secondary shaft; a reservoir adapted to receive seepage of oil from the secondary shaft and having a bypass draining into said main housing.

In testimony whereof I have hereunto set my hand this 2nd day of May, 1930.

REGINALD GILBERT.