May 7, 1940. T. W. KAESTNER 2,200,175

OPERATING MECHANISM FOR WASHING MACHINE ASSEMBLIES

Filed June 3, 1937 2 Sheets-Sheet 1

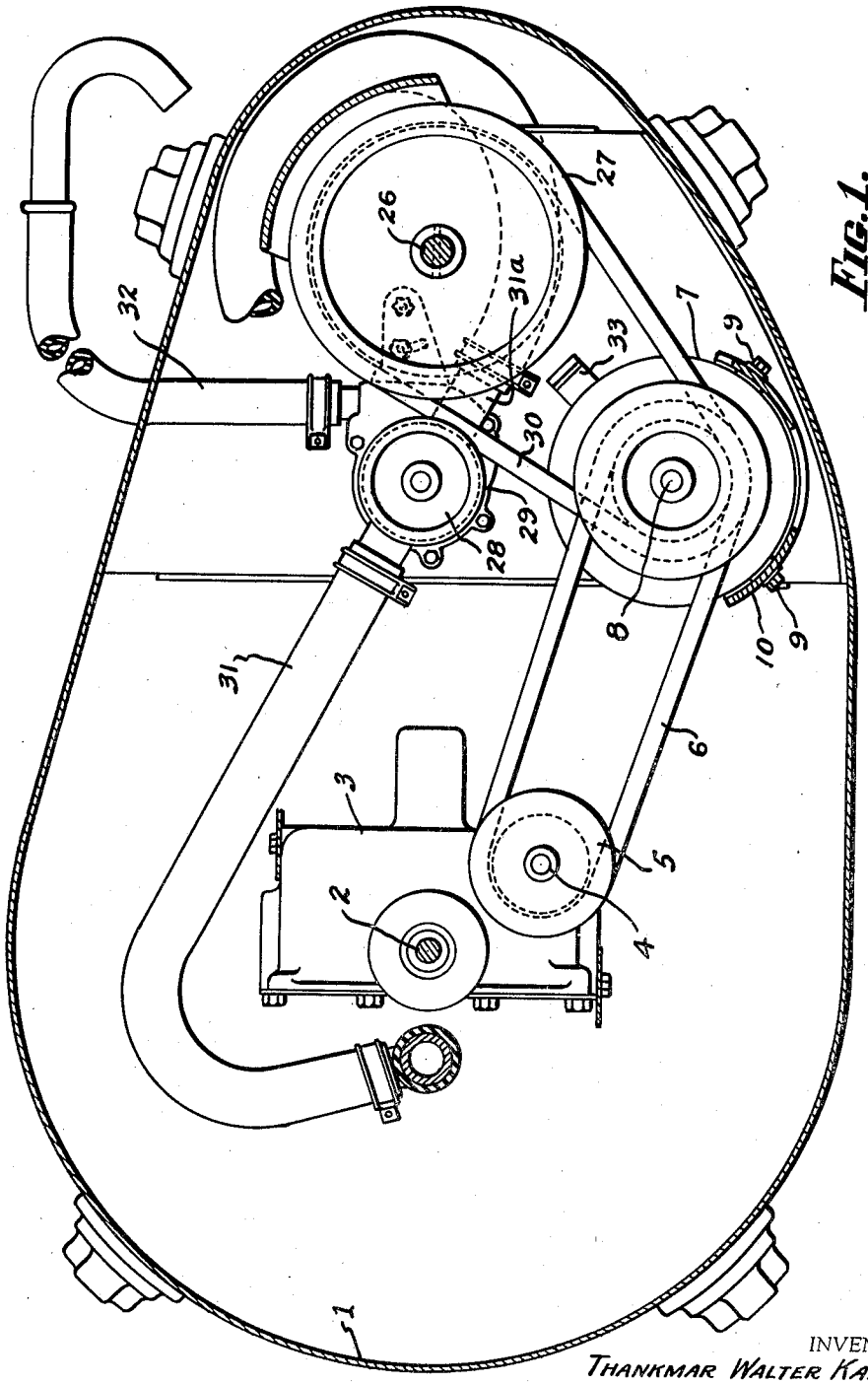


Fig. 1.

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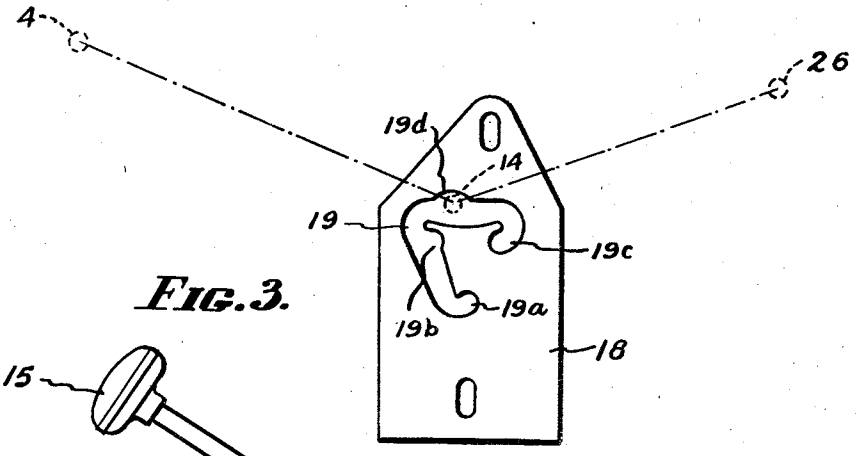


FIG. 3.

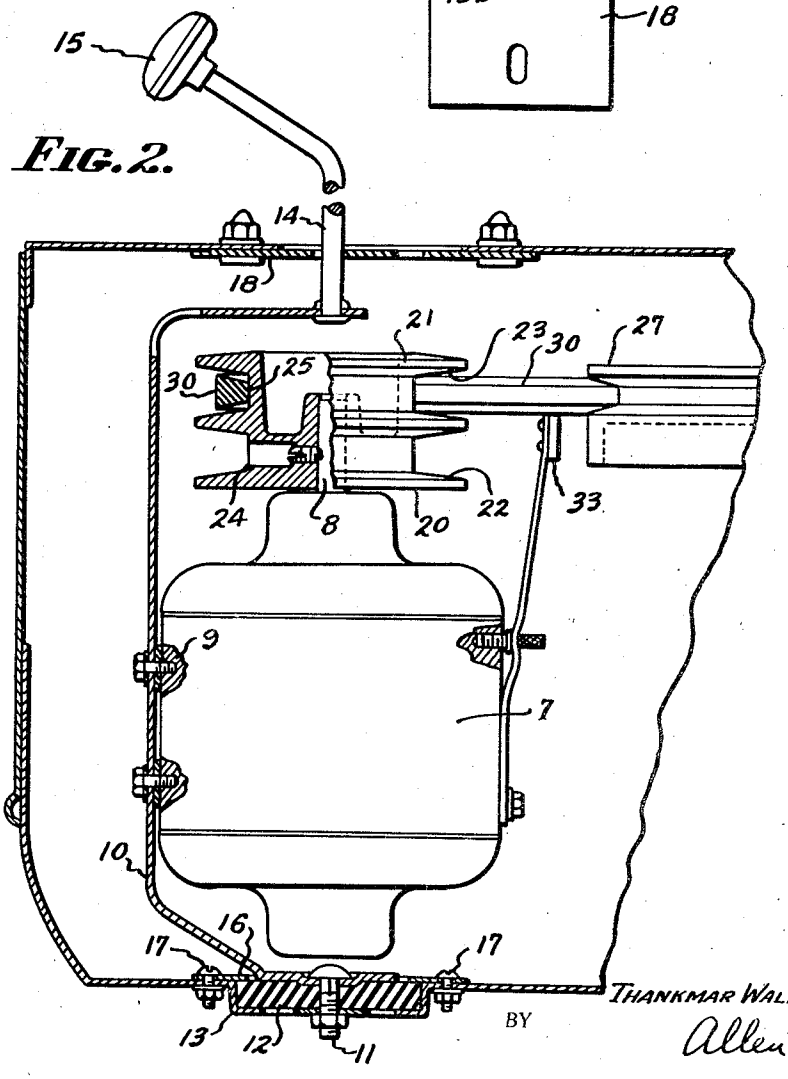


FIG. 2.

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UNITED STATES PATENT OFFICE

2,200,175

OPERATING MECHANISM FOR WASHING MACHINE ASSEMBLIES

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Application June 3, 1937, Serial No. 146,257

1 Claim. (Cl. 192—11)

My invention relates to operating mechanism for washing machine assemblies comprising a washing machine and a centrifugal dryer which are mounted on a support so that the washing machine and dryer provide a washing machine unit.

In such a combination it is my object to provide a unitary motor drive with flexible members such as belts, extending from the driving arrangement, usually an electric motor, wherein means is provided without any clutch to alternately drive the washing machine and the dryer either separately or together.

As far as I am advised the use of a single motor or power unit for driving either the tub of the washing machine or a dolly therein and at the same time to drive a centrifugal dryer is old and well known. Such driving mechanisms have, as far as I am advised, ordinarily included two clutches, either a single clutch by which either washing machine element could be actuated, or a compound selective clutch by which either of the elements could be operated selectively.

Broadly, it is the object of my invention to eliminate the use of a clutch in such washing machine combinations and to thereby greatly reduce the cost ordinarily required for clutches and at the same time to provide means for selectively operating either the washing machine unit or the dryer unit, or both.

It is my object to accomplish the aforenoted purpose by mounting the electric motor so that the position of the motor itself may be shifted to release one or more driven belts, by which selective operation of the washing machine unit or the dryer may be effected.

Another object of my invention is to provide a driving mechanism which, because of its construction and method of operation, permits a certain slippage during the time that the spinner basket or dryer is getting up to full revolution speed thereby avoiding overloading of the motor at the time the dryer is first started in operation.

A further object in connection with the operating mechanism for a washing machine assembly is the provision of one motor, two driving pulleys on the motor shaft, two driven pulleys one on each of the units to be operated, and an arrangement by which the driven pulleys can be selectively engaged by manipulation of the position to which the driving pulleys on the motor shaft is adjusted.

Broadly, it is my object in a drive to provide a motor having driving pulleys on the motor shaft of enlarged U-shaped construction, wherein the inner surface of the driving belt wil engage the hubs at the bottom of the V's on the driving pulleys, the V-sides of the belt will engage the inwardly tapering walls of the driven pulleys, and the outer surface of the V-belts may be used for driving a flat friction pulley such as is frequently utilized in such combinations for actuating a water pump.

The above objects and other specific objects to which reference will be further made, I accomplish by that certain combination and arrangement of parts of which I have illustrated a preferred embodiment.

Referring to the drawings,

Figure 1 is a plan view of the complete assembly.

Fig. 2 is a sectional view of the motor and mounting, one of the driving belts not being shown in this detailed view.

Fig. 3 is a plan view of a slotted plate by which the driving motor is retained in adjusted position.

Referring first to Figure 1, the casing enclosing the complete unit is shown at 1. The shaft for actuating the dolly on the washing machine is shown at 2. The power transmitted from the power unit or electric motor is transmitted through the gear case which is generally indicated at 3. The driving shaft 4 for the gear case unit rotates in one direction, but due to the arrangement of gears the rotary movement at a high speed of the shaft 4 is transmitted at a much reduced speed and transformed into an oscillatory movement of the shaft 2. The accomplishment of this change of speed and the transforming of a constant speed in a given direction to an oscillatory movement at a reduced speed forms no part of this application and since the general principle is old, no further details of the construction of the gear case is thought to be required.

The shaft 4 is provided with a V-shaped pulley 5 which is engaged by the sides of a V-belt 6.

The V-belt 6 is driven by a pulley mounted on the motor shaft which will be best understood by reference to the sectional view in Fig. 2.

In Fig. 2 the electric motor is indicated at 7 having a rotor drive shaft 8. The housing of the motor is mounted with bolts 9 on a bracket 10. The bracket 10 is secured by means of a bolt 11 to a resilient or rubber block 12.

The block 12 is held in position in a frame 13 which ordinarily forms part of the frame 1. The bracket 10 has a bar 14 fixed at its upper end

with a knob 15 for moving the bar to various desired positions.

By moving the knob 15, the frame or bracket 10 may be pivoted back and forth because of the resilience of the block 12. The block 12 is held in position in the frame 13 by means of plates 16, 16 secured to the frame 13 by bolts 17. At the top of the frame 13 there is adjustably mounted a plate 18, best shown in Fig. 3. The plate has a slot 19 with convex enlargements 19a, 19b, 19c and 19d in which the rod 14 seats at different positions of adjustment. The adjustment of the rod 14 to various positions in the slot 19 provides a simple way of tensioning the belts as required.

The motor shaft 8 has two pulleys 20, 21 mounted on it, which pulleys may be a single compound pulley if desired. The pulleys have peripheral U-grooves 22, 23 in them. The outwardly tapering walls of the V-grooves are spaced sufficiently far apart so that the V-sides of the V-shaped driving belts do not frictionally engage them.

The frictional driving of the V-belts from the motor pulleys 20, 21 is by contact with the faces of the pulley hubs 24, 25 at the bases of the U-grooves.

In the combination illustrated the pulley 20 drives the washing machine unit through the gear case 3 and the pulley 21 drives the centrifugal dryer. The spinner shaft is shown at 26 and a V-grooved pulley 27 is mounted on the spinner shaft.

The V-grooves of the pulleys 27 and 5 are such as to engage the V-driving belts in a normal manner so that the drive is accomplished by the frictional engagement of the sides of the V-belts.

A rotary pump 28 is indicated in Figure 1 which has a flat driving pulley 29 which is engaged by the outer surface of the V-belt 30, which drives the spinner shaft pulley 27. Since the V-belt 30 will only be tensioned when the spinner shaft is to be actuated, the pump 28 can only be run conjointly with the spinner. This arrangement however, only applies in the particular combination illustrated and it will be well within the scope of my invention to assemble the pump in a different position.

The pump has two suction lines illustrated at 31 and 31a and a delivery line at 32. The particular function of the pump however is similar in many respects to the pumps in old and well known assemblies so no specific reference will be made to the cycle of washing operations where the function of the pump becomes of importance.

Referring to Fig. 2 it will be observed that a brake shoe 33 is adjustably mounted on the motor 7. The utility of this construction is that when the motor is shifted so that the belt 30 becomes slack the brake shoe 33 bears against the spinner pulley 27 and causes the spinner or dryer basket to slow down rapidly.

When the motor is shifted to slacken either the V-belt 30 or the V-belt 6 the belt lies without frictional engagement with the sides of the driving pulleys and the pulleys turn freely with the belts lying idle against the sides of the inwardly tapering grooves. I have found that there is no difficulty with heating up, due to friction of the belts when they are not being driven.

The rubber block 12 at the bottom of the bracket acts as a universal joint permitting free pivoting of the motor bracket to the various positions of adjustment of the rod 14 within the slot 19. It wil be obvious that movement of the motor shaft in arcs toward and away from the axes of the spinner shaft pulley and the washing machine dolly driving pulley will tension and loosen the driving belts for the respective washing machine units.

A particular feature of my combination is the tendency of the V-belts to slip when the motor pulleys are shifted to driving position. With a motor shaft operation at 1800 R. P. M. for example, were such a speed to be applied directly to the spinner basket it would cause a tremendous strain on the electric motor. Since, however, the belts slip, at first, freely and then gradually less and less, the strain on the motor is applied gradually.

Thus the overload switch cut outs and various arrangements for gradually building up the load on the motor when the spinner basket is attaining its full speed of revolution are rendered unnecessary.

While the mechanical drive illustrated is particularly adapted for use with two driven elements like a washing machine dolly and a spinner basket, it may be utilized in any mechanism where there is an equivalent problem of alternately and selectively driving members from a single motor ordinarily operating at a fixed speed.

Referring to Figure 3 the following positions of selective driving of the washer and spinner basket will result when the shifter rod 14 is in various positions. At 19a both spinner and washer will be actuated. At 19b the spinner only will be actuated. At 19c the washer only will be actuated and at 19d the transmission will be in a neutral position with both the spinner and washer at rest.

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

A new mechanical movement for obviating a clutch mechanism between a rotating driving member and more than one rotatable driven member comprising V-grooved pulleys on the driven members, V-belts for engaging the V-grooved pulleys in a normal manner, and U-grooved pulleys on the rotating driving member of abnormal size whereby the inner surface of the belts only frictionally engage the hubs at the bases of the last noted U-grooved pulleys, and means for axially shifting said last noted U-grooved pulleys for selectively tensioning the V-belts to drive the normally engaged V-grooved driven pulleys and braking means for at least one of the driven pulleys operatively connected with said means for axially shifting said last noted U-groved pulleys.

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