

Jan. 20, 1959

G. D. CONLEE
DRIVE MECHANISM

2,869,698

Filed Aug. 26, 1955

3 Sheets-Sheet 1

Fig. 1.

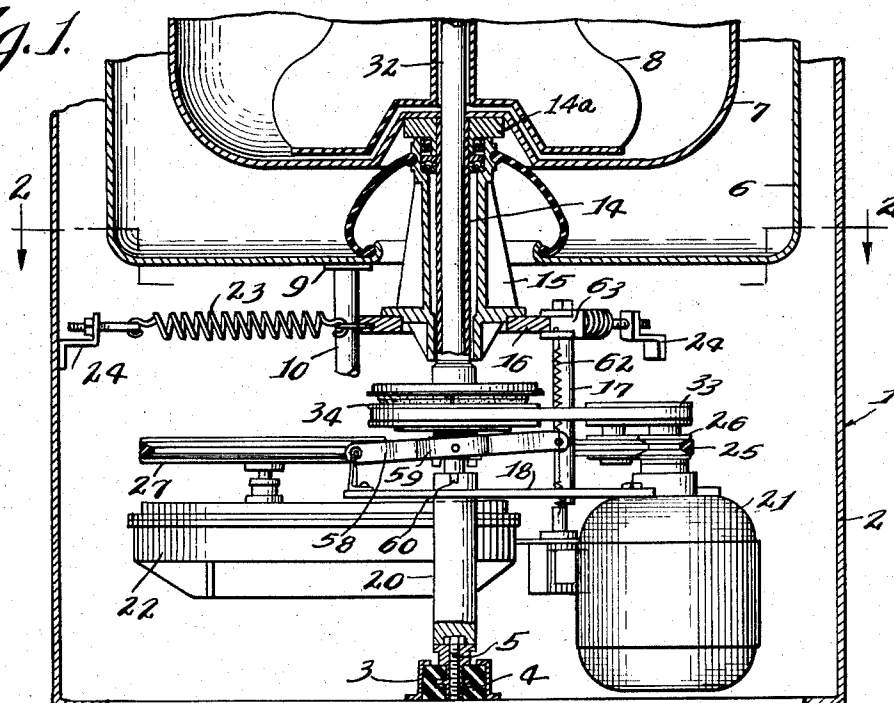
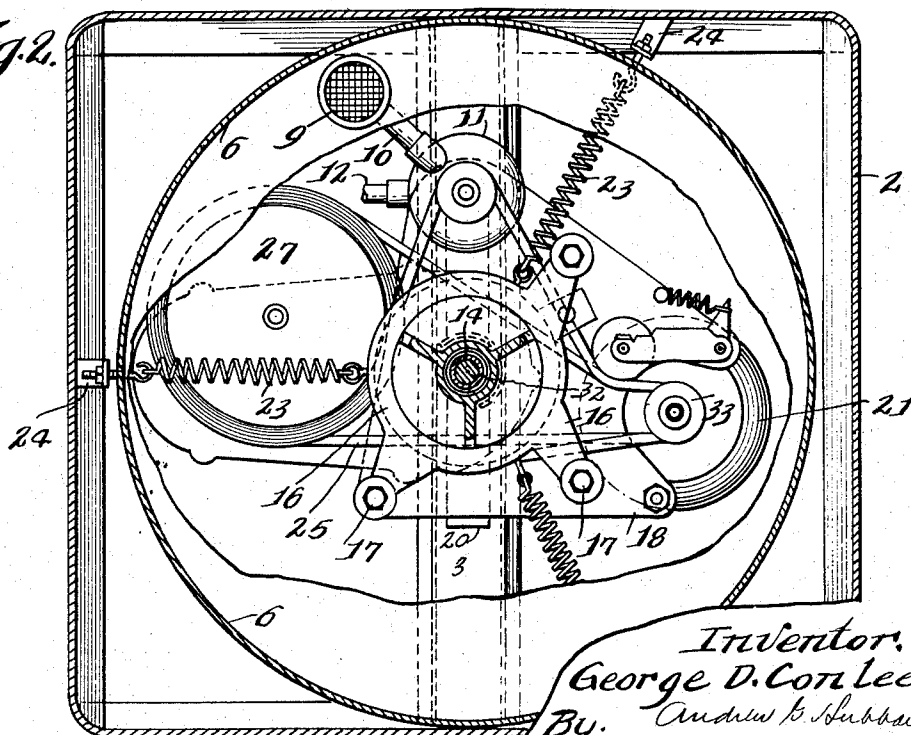


Fig. 2.



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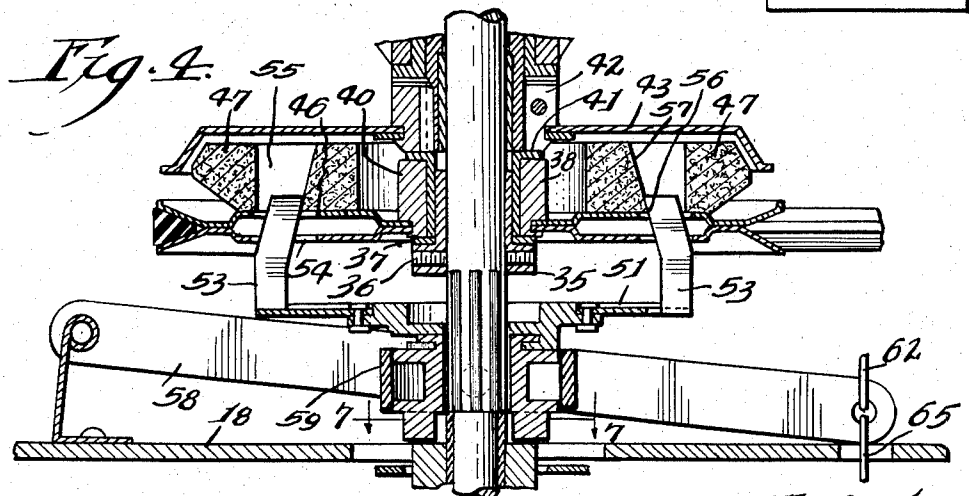
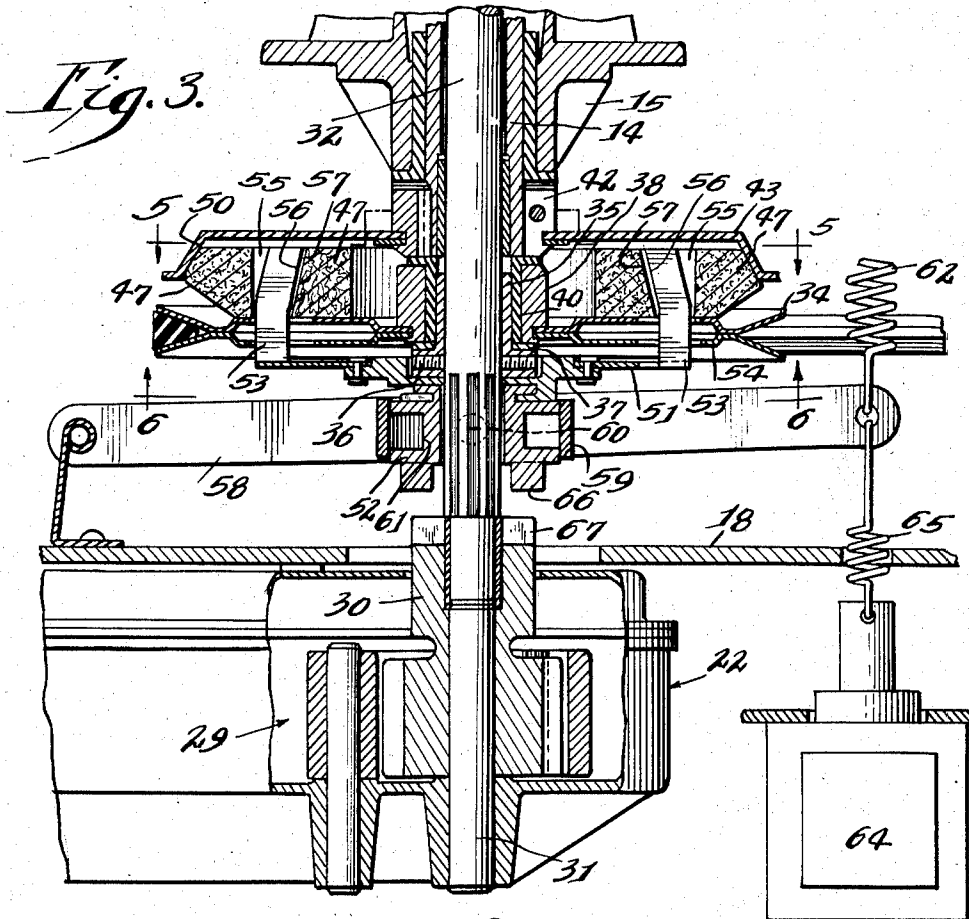
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3 Sheets-Sheet 2



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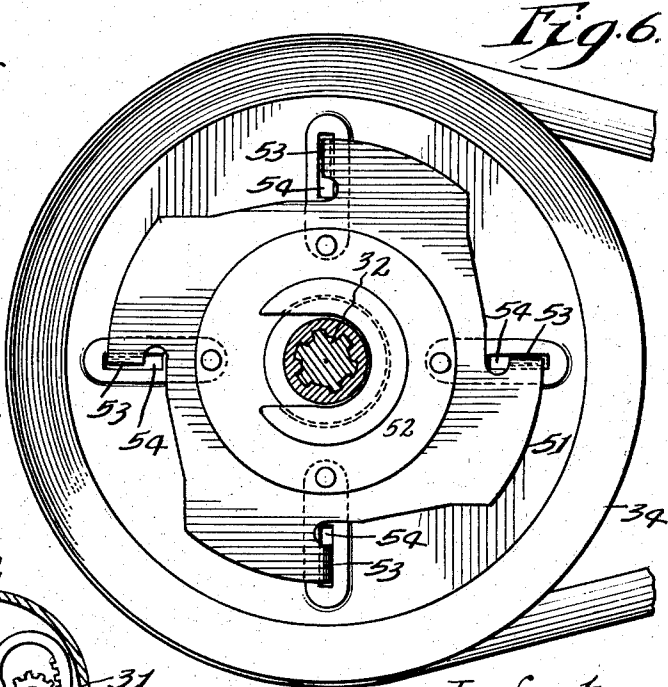
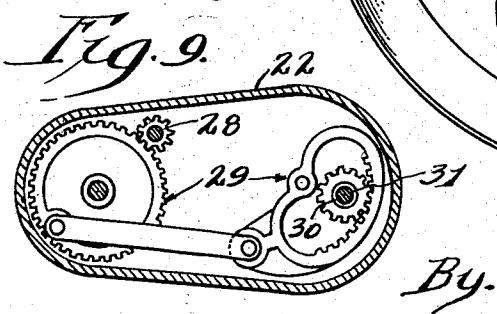
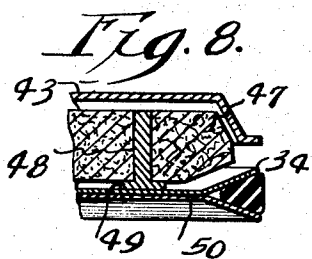
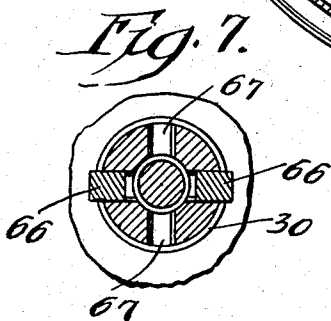
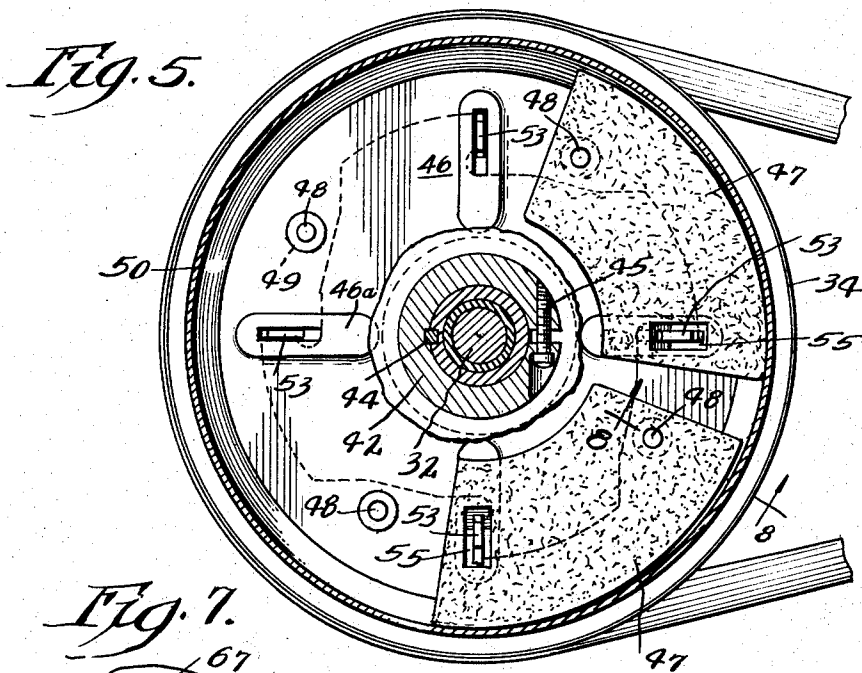
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3 Sheets-Sheet 3



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2,869,698

DRIVE MECHANISM

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Application August 26, 1955, Serial No. 530,803

10 Claims. (Cl. 192—48)

This invention relates to drive mechanism, and, in particular, to a drive mechanism in which a pair of shafts may be selectively driven by means including a clutch control mechanism which is common to a centrifugal clutch and a second clutch and arranged to hold the centrifugal clutch out of operation while the second clutch is engaged.

The invention may advantageously provide centrifugal or slip-clutching means for driving one of the shafts, and jaw type or other positive engagement clutch means for driving the second of the shafts. Such a construction is useful, for example, in certain popular types of domestic clothes washing machines in which the clothes are washed and then centrifugally damp-dried in a single tub. During a washing or rinsing operation, the tub is stationary and an agitator is operated therein to cause proper water action and clothes turnover; during the centrifuging action, the agitator is disengaged for idle rotation as the tub rotates. It frequently occurs that at the beginning of the centrifuging operation, the clothes within the tub are eccentrically arranged relative to the spin axis. The resulting unbalance of the tub imposes a substantial load on the motor as it accelerates the tub from a standing start to the final centrifuging speed, as is well known in the art. Consequently, although simple jaw clutches are adequate for the agitator shaft, fluid couplings and centrifugal clutches have been widely used in the centrifuging drive mechanisms in order to apply the water-extraction load to the motor in more gradual fashion.

In highly price-competitive apparatus, such as domestic laundry machines of the time-cycle controlled type, it is economically necessary to reduce manufacturing costs by simplification of the drive mechanism. A single drive motor for driving the agitator transmission and for driving the tub at centrifuging speed has been accepted as a basic means for cost reduction. In view of the fact that the agitator must be disconnected from the motive power during the centrifuging operation and vice versa, it is apparent that the single motor must operate through independent clutching means for the agitator and spin shafts. In some present forms of washing machine drive mechanisms, a solenoid or other clutch-operating device is provided for each clutch so that the clutches may be selectively operated at the proper point in the automatic time cycle. Individual clutch actuators are costly. It has also been proposed to utilize a single direction responsive clutch in combination with a reversible motor, but in order to engage one of the drive mechanisms to the exclusion of the other, it is necessary to stop and reverse the drive motor.

It is therefore an object of the present invention to provide a centrifugal clutch and a second clutch for respectively driving the spin shaft and the agitator shaft of a washing machine and to associate with the respective clutches a common control mechanism which automatically and positively locks the centrifugal clutch out of operation as the second clutch is engaged and releases

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the centrifugal clutch for operation as the second clutch is disengaged.

It is another object of the invention to provide a drive mechanism embodying a centrifugal clutch and a jaw clutch in which the centrifugal clutch may be positively disengaged and the jaw clutch engaged without stopping the common drive motor.

It is a further object of the invention to provide an improved centrifugal clutch having clutch release devices in permanent engagement with the clutch elements and therefore ready for immediate operation.

In a presently preferred embodiment of the invention as applied to a clothes washing machine, a common clutch control mechanism is disposed between a centrifugal clutch element arranged to drive a tubular spin shaft and a jaw clutch element arranged to connect the agitator shaft. The agitator shaft is disposed within the tubular spin shaft for independent rotation relative thereto. A drive sheave for the spin shaft is mounted axially spaced from the centrifugal clutch element, concentric to the agitator and spin shafts and is freely rotatable relative thereto. The surface of the sheave facing the centrifugal clutch element pivotally carries a plurality of friction shoes arranged within the adjacent peripheral wall of the clutch element, for frictional driving engagement therewith. The clutch control mechanism is mounted in axial spaced relation to the drive sheave for axial movement on the drive sheave mounting shaft. Said clutch control mechanism has cam members extending through the drive sheave into operative relation with the friction shoes carried thereby. The clutch control mechanism is in continuous mechanical association with a jaw clutch member splined to the agitator shaft, and is in free rotational relationship to said shaft. Lever means is provided to move the clutch control mechanism and its associated jaw clutch member axially on the agitator shaft. When this assembly is moved in a direction to engage the jaw clutch, the cam members of the control mechanism engage and move the centrifugal clutch friction members out of operative relationship with the centrifugal clutch element, whereupon the drive sheave rotates idly and the spin shaft is positively disconnected from power during the operation of the agitator. When the control mechanism is moved in reverse direction to disengage the jaw clutch, the cam members release the friction shoes for centrifugal movement into driving engagement with the spin shaft clutch member.

Other features and advantages of the invention will be apparent from the following detailed description of a presently preferred embodiment, read in connection with the accompanying drawings in which:

Fig. 1 is a fragmentary side sectional elevation of a clothes washing machine embodying the present invention;

Fig. 2 is a fragmentary plan section taken on lines 2—2 of Fig. 1;

Fig. 3 is a fragmentary side sectional elevation showing a portion of the agitator shaft and the agitator shaft drive mechanism, a portion of the tubular spin shaft mechanism, and the clutch mechanism embodying the present invention; said clutch mechanism is shown in engaged position to drive the spin shaft;

Fig. 4 is a fragmentary side elevation showing the operation of the clutch control mechanism into a position in which the jaw clutch is engaged and the centrifugal spin shaft clutch is positively disengaged;

Fig. 5 is a fragmentary plan section taken on lines 5—5 of Fig. 3;

Fig. 6 is a bottom plan view of the clutch control mechanism taken on lines 6—6 of Fig. 3;

Fig. 7 is a fragmentary plan section of the jaw clutch elements in engagement, taken on lines 7—7 of Fig. 4;

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Fig. 8 is a fragmentary sectional elevation taken through one of the centrifugal clutch drive shoes at the point of pivotal mounting thereof; and

Fig. 9 is a partial plan section of the agitator shaft transmission.

Referring first to Fig. 1, a washing machine 1 comprises an outer casing 2 having a suitable base or supporting structure including the inverted channel 3, which, as shown in Fig. 2, extends from one side to the other of the frame 2 and at its mid point has a resilient block 4 which receives a mounting stud 5, the web of said channel being suitably apertured to freely accommodate the stud 5.

The washing machine further includes a water collector 6 mounted by any suitable means (not shown) within the housing 2 so as to be permanently secured therein. Said water collector accommodates the washing tub 7 within which is located an agitator 8, which, as is well known in the art, is arranged to be oscillated so as to set up a movement of the wash water (not shown) within the tub, whereupon the articles to be laundered are tumbled and moved about in the wash liquid.

At the termination of any of the water-using operations of the washing machine, such as washing or rinsing, the tub 7 is rotated at relatively high speed, whereupon by centrifugal action the water content of the tub spills over the rim of the tub into the water collector 6. At the base of said collector, a screened inlet 9 communicates by way of a connection 10 with a pump 11 (see Fig. 2) from which the accumulated liquid passes through the discharge tube 12 to a convenient plumbing drain (not shown).

The tub 7 is rotatably supported by means of a tubular shaft 14 mounted on suitable bearings within a support sleeve 15 in turn carried on a structural plate 16. Typically, tub 7 can be fixed to a support flange 14a, which in turn is secured to shaft 14. As shown in Fig. 2, the plate 16 is supported, as by the posts 17, on a main carriage plate 18. Said plate 18, in turn, is secured to a suitable U-shaped framework 20. The nexus of the U-shaped framework 20 is secured in its central region to the stud 5 as shown in Fig. 1. The plate 18 carries the drive motor 21 and the agitator transmission 22. In view of the fact that the entire mechanism is supported on a single resilient bearing support at the stud 5 for conical movement about said stud, a suitable plurality of tension springs 23 are arranged in a fashion extending between the plate 16 and brackets 24 affixed to the main housing structure, to maintain the mechanism in a normally vertical position. A belt 25 extends between motor drive sheave 26 and a sheave 27 carried above the casing of the agitator transmission 22, whereby the agitator main drive shaft 28 (Fig. 9) is arranged to be rotated. Through the gearing 29 illustrated in Fig. 9, such rotation is translated into an oscillation of a jaw clutch element 30 which is rotatably supported on a fixed stub shaft 31, as best appears in Fig. 3. Agitator transmissions of this type are very well known in the art and form no part of the present invention.

Concentrically arranged with respect to stub shaft 31 and advantageously journaled within the jaw clutch element 30 is an agitator shaft 32 which rotatably extends through the tubular spin shaft 14. Shaft 32 may be supported within shaft 14 by suitable sleeve or roller bearings, as well known in the art. The upper end of said shaft 32 fixedly carries the agitator 8, and it will therefore be obvious that by means of suitable clutching devices, the motor 21 can be made to oscillate the shaft 32 and its thereon mounted agitator. A second sheave 33 fixed on the shaft of motor 21 is belt connected to a sheave 34 which is journaled for idle rotation on the shaft 32. A suitable method of mounting sheave 34, for example, may include a collar 35 fixed to the shaft 32 as by set screws or equivalent 36; a bottom flange of

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said collar 35 supports a thrust bearing 37 which in turn carries the hub 38 of sheave 34 and an intermediate sleeve bearing 40. An upper flange 41 of said sleeve bearing provides a bearing support for the hub 42 of the centrifugal clutch element 43. Said hub 42 is affixed to the lower end of the tubular spin shaft 14 as by a key 44 and set screw 45 (see Fig. 5) or equivalent means. Therefore, although the clutch element 43 is rotatable relative to the sheave 34, it is fixed to the spin shaft 15 and comprises the driving element of said spin shaft.

As best shown in Fig. 5, the sheave 34 has an upper surface 46 which slidably carries a plurality, for example, four, friction clutch elements or shoes 47. These may be of molded friction material. Each of said shoes is pivoted to said sheave 34 by a stub shaft 48 having a base 49 secured to a web portion 50 of sheave 34. To accommodate the thickness of head portions 49 of the stub shafts, the surface 46 of sheave 34 is formed with embossed portions 46a having flat top surfaces which slidably support the clutch shoes 47 at the same level above the surface 46, as are the tops of the stud shaft heads 49. The point of pivotal attachment is near one end of each shoe, whereupon rotation of sheave 34 by means of the motor 21 will cause the shoes 47 to swing outward about their pivots 48 and engage with the peripheral wall 50 of the clutch element 43. Although said wall 50 may be vertical so as to comprise a cylindrical surface engaged by the vertical walls of the shoes 46, operational advantages result from sloping the wall 50, as shown in Fig. 3, whereby the clutch element 43 comprises a relatively shallow frusto-conical cup overlying the clutch shoes 47. Obviously, the radially outermost wall of each of the clutch shoes 47 will have a matching slope so as to make full area contact with the wall 50. It will be obvious that so long as the shoes 47 are free to engage the wall 50 as the sheave 34 is rotated by the motor 21, the torque of the motor will be transmitted to the clutch element 43, and thence to the shaft 14, in proportion to the centrifugal forces acting on the shoes. If the motor is laboring because of the weight or disposition of clothes in the tub 7, the reduced speed of the motor will correspondingly reduce the force of engagement of the shoes 47 with the wall 50, whereupon the shoes will slip somewhat and permit the tub gradually to come up to final speed.

The clutch control mechanism, which is effective to release the clutch shoes 47 for engagement with wall 50, or positively to withdraw and hold the shoes inoperative, is best shown in Figs. 3 through 6. The mechanism comprises a control member which may advantageously be a stamped metal plate 51 freely rotatably carried by a shifting sleeve 52. Sleeve 52 is mounted on shaft 32 for axial movement thereon and is designed to rotate said shaft, as later explained. A conventional spline relationship between sleeve 52 and shaft 32 may be employed. Plate 51, the underside of which is shown in Fig. 6, has four arms 53 which pass freely through slots 54 in sheave 34 and enter slots 55 in the respective shoes 47. Each arm 53 terminates in a cam face 56 which is in operative association with a cam face 57 in the slot 55.

When the plate 51 and its associated arms 53 are in raised position, as shown in Fig. 3, the arms 53 and the cam faces 56 thereof are completely out of contact with the shoes 47, whereupon the shoes are free to rotate into engagement with the wall 50 as the sheave 34 is rotated. It will be understood that the slots 55 are considerably wider than the arms 53 (see Fig. 5) to permit the shoes 47 to rotate on the pins 48 without conflict with the arms 53. It will be understood also that the radial length of slots 54 is appreciably greater than the radial width of the arms 53 to provide for the necessary additional outward movement of the shoes 47 as their driving surfaces wear.

As shown in Fig. 4, when the plate 51 is moved down-

wardly relative to sheave 34, the camming surfaces 56 of arms 53 engage the surfaces 57 of the shoes 47 and positively withdraw the shoes from the wall 50 of the clutch element 43. This action of course completely disconnects the clutch element 43 from the motor and rotation of the spin shaft 14 will be interrupted.

The slope of the respective cam surfaces 56 and 57 is such that the exertion of relatively small downward force on plate 51 is multiplied into sufficient effort to withdraw the shoes from the wall 50 regardless of the speed of rotation of the sheave 34.

The shifting of plate 51 relative to sheave 34 is advantageously accomplished by a lever 58 pivotally supported on plate 18, as shown in Fig. 3, and having a yoke 59 surrounding the collar 52. Said yoke is preferably fitted with diametrically opposed rollers 60 which ride in a groove 61 formed in said collar. To the free end of lever 58 is affixed a spring 62, anchored to a bracket 63 extending from plate 16, as shown in Fig. 1; said spring 62 biases lever 58 into counterclockwise rotation, whereupon the plate 51 normally occupies its Fig. 3 position, freeing the shoes 47 for engagement with the wall 50. Operation of lever 58 in the opposite direction may in an automatically controlled washing machine be accomplished by a solenoid 64 suitably fixed to the motor 21 or other structure which is fixed to the plate 18. The armature of the solenoid is attached to lever 58 by the usual take-up spring 65. Energization of solenoid 64 by any conventional switch means draws the lever 58 down into the Fig. 4 position, in which the cam surfaces 56 and 57 cooperate to withdraw the clutch shoes from surface 50, as previously noted.

As shown in Figs. 3 and 4, sleeve 52 is made a principal component of the clutch for driving shaft 32 from the agitator drive gearing 29. Said sleeve 52 is therefore provided with teeth 66 for engagement within the jaws 67 of clutch element 30. During the downward movement of sleeve 52, the cam plate 51 acts to disengage the shoes 47 from the wall 50 before the teeth 66 enter the jaws 67, whereupon the agitator shaft 14 is disconnected from power before the agitator load is imposed on the motor.

It is obvious therefore that with a clutch constructed according to the invention, a single continuously operating motor may be used selectively to drive either of two loads; one load is positively disconnected from the motor before the other is placed thereon; and with respect to one of the loads at least, the motor assumes the load in gradual fashion.

While there has been described what is at present considered to be the preferred embodiment of the invention, it will be understood that various modifications may be made therein, and it is intended to cover in the appended claims all such modifications as fall within the true spirit and scope of the invention.

I claim:

1. A clutch, comprising a driven element, a shaft concentric with said driven element, a driving element rotatably mounted on said shaft in axially spaced relation with said driven element, a plurality of drive shoes carried by said driving element, each of said drive shoes having friction surfaces for frictional driving engagement with said driven element, means for pivotally mounting each of said drive shoes to said driving element for swinging movement into driving contact with said driven element upon rotation of said driving element whereby to transmit torque from said driving element to said driven element, a control member mounted on said shaft externally of said driving and driven elements, means for moving said control member axially on said shaft, each of said drive shoes having wall means defining an open structure in which one of the wall means thereof constitutes a camming surface, and means on said control member extending into each open structure in spaced relation to the walls thereof whereby to permit the free

swinging movement of said drive shoes, each said control member means having a member engageable with its associated drive shoe camming surface to urge the respective drive shoes out of engagement with said driven element wall upon axial movement of said control member camming means in one direction relative to said driving element, and disengaging from said camming surface upon axial movement in the opposite direction to release said drum shoes for swinging movement into driving position.

2. A clutch, comprising a cup-like driven element, a shaft concentric with said driven element, a driving element rotatably mounted on said shaft in fixed spaced relation with said driven element, a plurality of arcuate drive shoes carried by said driving element, each of said drive shoes having friction surfaces for frictional driving engagement with a peripheral wall of said driven element, pivot means extending from said driving element at one end of each shoe to pivotally attach the same to said driving element for swinging movement into driving contact with said wall upon rotation of said driving element whereby to transmit torque from said driving element to said driven element, a control member rotatably mounted on said shaft externally of said driving element, means for moving said control member axially on said shaft, each of said drive shoes having wall means defining an opening therethrough of which one of the walls thereof constitutes a camming surface in radial relationship to said shaft, and means on said control member extending into each of said openings in spaced relation to the walls thereof whereby to permit the free swinging movement of the said drive shoes, each of said control member means having wall means engageable with the associated drive shoe camming surface to urge said drive shoes out of engagement with said driven element wall upon axial movement of said control member camming means in one direction relative to said driving element, and disengaging from said camming surface upon axial movement in the opposite direction to release said drive shoes for swinging movement into driving position.

3. A clutch, comprising a cup-like driven element, means for securing said driven element to a tubular shaft, a shaft concentric therewith and disposed thereon for rotation relative thereto, a drive sheave rotatably mounted on said second-named shaft in axially spaced relation with said driven element, a plurality of arcuate drive shoes carried by said drive sheave within said driven element, each of said drive shoes having friction surfaces for frictional driving engagement with an adjacent wall of said driven element, means for pivotally mounting each said drive shoe adjacent an end thereof for pivotal movement about an axis, whereby upon rotation of said drive sheave said shoes will swing by centrifugal action into engagement with said wall, each said shoe having wall means defining a passage extending radially therethrough at the end remote from the pivotal mounting means, one of said wall means providing a cam face extending upwardly and angularly toward the axis of said driving member, a control member rotatably mounted on said shaft for movement axially of said drive shoes, said control member having cam elements individual to each said drive shoe passage, said cam elements being of substantially less width than the passage so as to be in spaced relation to the side walls thereof, each said cam element having a camming surface adjacent said cam face and engageable therewith to rotate said drive shoes out of engagement with said driven element wall upon axial movement of said control element in one direction, and means for axially moving said control element in said one direction and in the reverse direction, in which latter direction said cam elements will release said shoes for driving engagement.

4. A clutch, comprising a driven element fixed to a shaft to be rotated, said driven element including a hub

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portion and a peripheral wall radially outward thereof, a drive sheave carried by said shaft for rotation thereon, a plurality of drive shoes carried by said drive sheave within said peripheral wall, each of said shoes being pivoted to said drive sheave near an end of said shoes, whereby upon rotation of said drive sheave said shoes will by centrifugal action swing outward into driving engagement with said peripheral wall, each said drive shoe being formed with a radially extending slot defining an axially extending angular cam face, a control member axially movable on said shaft in operative association with said drive sheave, said control member having rigid members passing slidably through said drive sheave for rotation therewith, a plate-like cam element integral with said rigid members and extending axially from said control member through said drive shoe slots, each said cam element being of substantially less width than the associated slot, and each said cam element being effective when said control member is moved axially in one direction to engage the associated cam faces to urge the said drive shoes into rotation away from said peripheral wall and when the control member is moved axially in the other direction to release said cam shoes to permit the respective drive shoes to move into said driving engagement, and means for moving said control member in the desired direction.

5. In a drive mechanism, a first shaft to be rotated, a second shaft to be rotated, said shafts being concentric, a driven clutch element secured to said first shaft, a driving clutch element rotatably carried on said second shaft in fixed axially spaced relation to said driven clutch element, a plurality of arcuate drive shoes carried by said driving element each of said drive shoes having a friction surface for frictional driving engagement with said driven element, means for pivotally mounting each said drive shoe for swinging movement into engagement with said driven element upon rotation of said driving element, a third shaft concentric with and below said second-named shaft, means for rotating said third shaft, clutch means between said second and third shafts and including a member axially slidable relative to said second shaft for transmitting rotation of said third shaft to said second shaft upon movement of said slidable member in the direction of said third shaft, a control member in continuous freely rotatable engagement with said last-named clutch means, camming means on each of said drive shoes, camming means extending from said control member into operative association with said drive shoe camming means, the respective camming means being such that upon movement of said last-named clutch means and its associated control member toward said third shaft said drive shoes are urged into rotation away from engagement with said driven member to interrupt the driving engagement of said drive shoes therewith, while the said clutch means between said second and third shafts is actuated to drivingly connect said shafts, and means for axially moving said last-named clutch means and associated control member in a desired direction.

6. In a drive mechanism, a first shaft to be rotated, a second shaft to be rotated, said shafts being concentric, a driven clutch element secured to said first shaft, said driven clutch element being of dish formation and having a peripheral wall a drive sheave rotatably carried on said second shaft in fixed axially spaced relation to said driven clutch element, a plurality of arcuate drive shoes carried by said drive sheave, each of said drive shoes having a friction surface for frictional driving engagement with the peripheral wall of said driven element, means for pivotally mounting each said drive shoe adjacent an end thereof for movement about an axis parallel to said shafts whereby upon rotation of said drive sheave said shoes will drivingly engage said peripheral wall, a third shaft coaxial with and below said first-named shafts, means for rotating said third shaft, clutch

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means between said second and third shafts and including an axially slidable member on said second shaft for transmitting rotation of said third shaft to said second shaft upon movement of said slidable member in the direction of said third shaft, a control member rotatably disposed on said axially slidable clutch member, camming means on each of said drive shoes, camming means extending from said control member through said drive sheave into operative association with said drive shoe camming means, the respective camming means being such that upon movement of said last-named clutch means and its associated control member toward said third shaft, said drive shoes are urged into rotation away from said driven member wall to interrupt the driving engagement of the drive shoes therewith, while the said clutch means between said second and third shafts is actuated to drivingly connect said shafts, and lever means for effecting such movement of said last-named clutch means.

7. A drive mechanism according to claim 6, in which said lever means is spring biased to releasably position said last named clutch means at one of its extremes of axial movement.

8. A drive mechanism, comprising first and second shafts arranged for selective rotation, said shafts being concentric, a drive sheave carried by one of said shafts for independent rotation thereon, said drive sheave having a substantially flat central or web portion, a driven clutch element secured to the other of said shafts in axially spaced relation to said drive sheave, said driven clutch element having a peripheral wall disposed radially outward of said drive sheave web portion, a plurality of drive shoes carried by said drive sheave on the said web portion thereof within said peripheral wall, means for pivotally mounting each said drive shoe adjacent an end thereof for rotation into driving engagement with said peripheral wall upon rotation of said drive sheave, a third shaft concentric with and axially spaced from said drive-sheave carrying shaft, means for rotating said third shaft, clutch means disposed between said last-named shafts and axially movable relative thereto, said clutch means being non-rotatably secured to said second shaft for effecting a driving connection between said second and third shafts upon movement in one direction relative to said third shaft and interrupting said connection upon movement in the opposite direction, a control member carried by said clutch means in operative association with said drive sheave for rotation therewith relative to said clutch means, rigid arm members on said control member extending into operative association with said drive blocks, means on said arm members engaging with said drive blocks upon movement of said clutch means and thereon-carried control member in the direction effecting the said driving connection with said third shaft to rotate said drive blocks out of engagement with said driven clutch, lever means for effecting desired axial movement of said clutch means and control member, and means for actuating said lever means.

9. In combination, a first shaft, a second shaft concentric therewith for rotation independently thereof, a third shaft concentric with said second shaft and axially spaced therefrom, a drive sheave carried by said second shaft, a driven clutch member fixed to said first shaft, centrifugally actuated clutch means carried by said drive sheave for driving engagement with said driven clutch member upon rotation of said drive sheave, a positive engagement clutch member in continuous driving relationship with said second shaft, a cooperating positive engagement clutch member in continuous driving relationship to said third shaft, means for moving said first-named positive engagement clutch member into or out of clutching relationship with said cooperating clutch member, and means carried by said first-named positive engagement clutch member to engage said centrifugally actuated clutch means and establish the same in inoperative position upon

movement of said clutch member into said clutching relationship with said cooperating clutch member.

10. In combination, a first shaft having a driven clutch element fixed thereon, a second shaft having a centrifugally actuated clutching means thereon for driving engagement with said clutch element upon rotation of said centrifugally actuated clutching means, means for rotating said clutching means, a third shaft concentric with said second shaft, a first clutch member on said second shaft, a second clutch member on said third shaft, means for moving one of said clutch members axially relative to the other to connect or disconnect the respective clutch members, and means carried by said movable clutch member to engage said centrifugally actuated clutch means to operate

the same out of clutching relation with the said driven clutch element upon axial movement of said movable clutch member into one of its operative relationships with respect to the other clutch member.

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