

May 29, 1951

J. W. CHAMBERLIN
RESILIENT MOUNTING FOR CLOTHES RECEIVING
CYLINDERS IN WASHING MACHINES

2,555,269

Filed Aug. 24, 1946

3 Sheets-Sheet 1

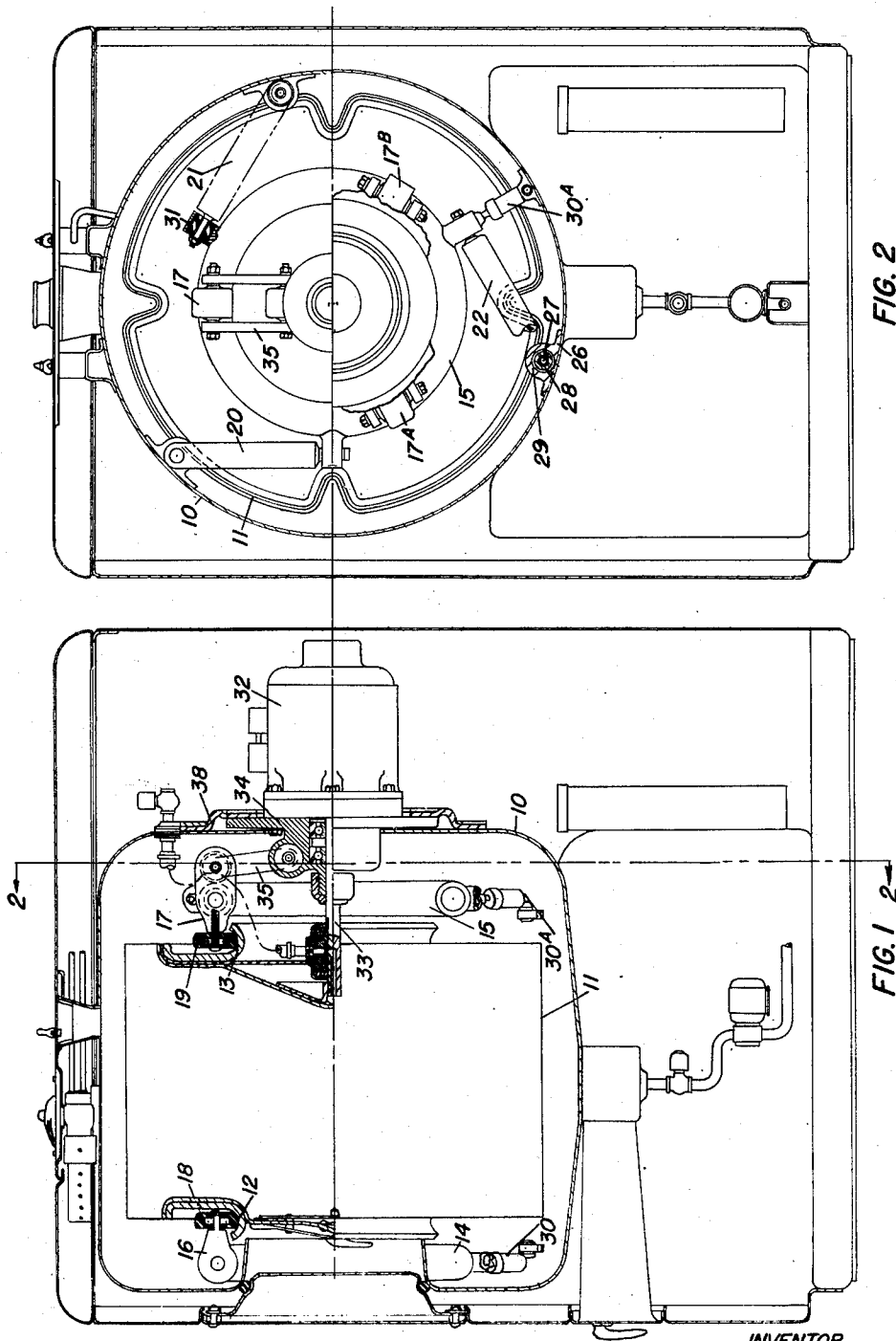


FIG. 2

FIG. 1

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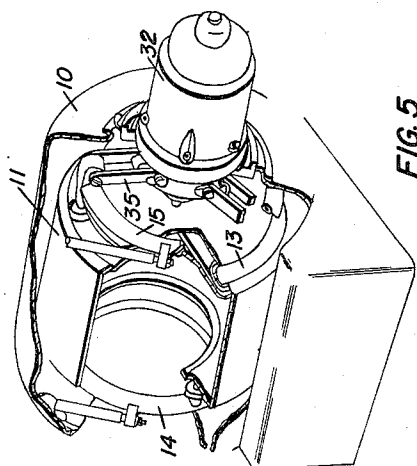


FIG. 5

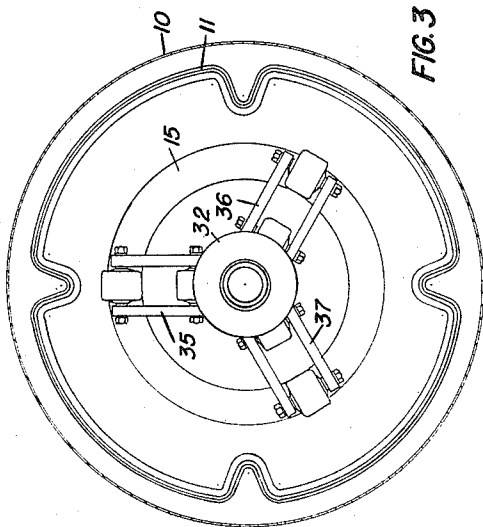


FIG. 3

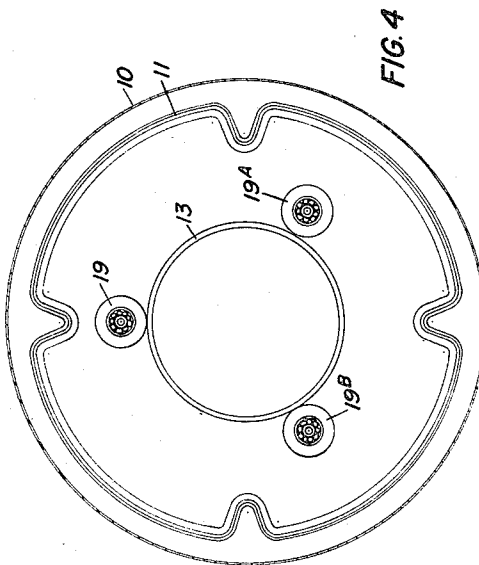


FIG. 4

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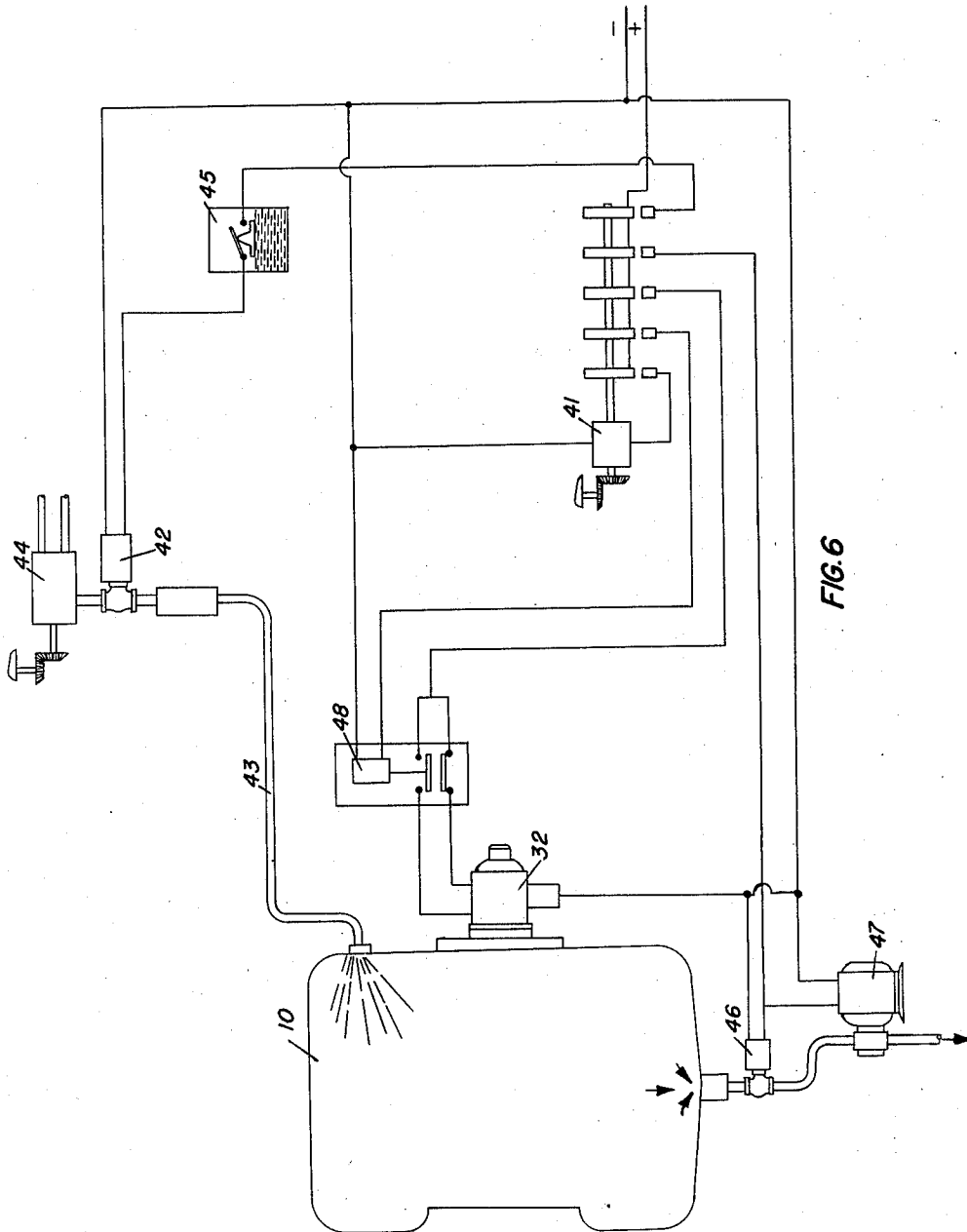


FIG. 6

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RESILIENT MOUNTING FOR CLOTHES
RECEIVING CYLINDERS IN WASHING
MACHINES

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5 Claims. (Cl. 68—140)

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This invention relates to washing machines of the combined washing and centrifugal extracting type.

It is a primary object of the present invention to provide a structure for automatic washing machines which will be capable of resiliently supporting a rotatable clothes cylinder such that the machine may be operated without special consideration for securing the machine to the floor and which will not set up objectionable vibrations with such use.

The above and other objects of the invention will appear more fully from the following more detailed description and by reference to the drawings forming a part hereof and wherein:

Figure 1 is a vertical cross section through the machine from the side showing the general arrangement of the drive and support mechanism.

Figure 2 is a rear view of the machine with the back panel removed and showing a section through the tub with views and partial sections of the cylinder and its support.

Figure 3 is a section showing the cylinder and the support for the two-speed drive motor.

Figure 4 is a section showing the location of the supporting rollers for the cylinder.

Figure 5 is a perspective view of the machine with parts broken away to show the support for the cylinder and the support for the drive motor.

Figure 6 is a diagrammatic view of the general arrangement and a wiring diagram for the control of the machine.

Referring to the drawings a tub 10 is designed to contain water for washing and is of such size as to surround a rotatable clothes cylinder 11 with its support structure. The rotatable cylinder 11 has annular shaped tracks 12 and 13 secured one in each end of the cylinder. Each of these tracks is concentric with the central axis of the cylinder and project outwardly from the ends of the cylinder. Adjacent each end of the cylinder is a circular shaped support member or ring, these ring support members 14 and 15 are preferably made up of tubing bent in circular form. Each of these rings 14 and 15 have three brackets attached thereto which extend toward the cylinder and over the tracks 12 and 13. One set of three of these brackets is provided for each end of the cylinder and in Figure 2 brackets 17, 17A and 17B for one end are shown, corresponding brackets are provided for the opposite end, one of these being shown at 16 in Figure 1. On each of the brackets there are rollers, Figure 4 showing rollers 19, 19A and 19B for the brackets on the ring 15 and corresponding rollers for the

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brackets on the ring 14 as indicated at 18 in Figure 1. Each of these rollers runs upon a track; track 12 for rollers supported from ring 14 and track 13 for rollers 19, 19A and 19B supported from ring 15. It is thus apparent that the clothes cylinder unit 11 is thus mounted for rotative movement relative to support rings 14 and 15 on the rollers as shown. For the purpose of supporting the rings, each of the rings 14 and 15, as shown in Figure 2, is resiliently secured to the wall of tub 10 by means of tangential struts 20, 21 and 22 for the support of the ring 15, while corresponding struts similarly positioned on the opposite end, serve as supports for the ring 14. Each of these struts as shown in Figure 2 has a rubber mounting such as 26 for connecting the end of the strut to the cylinder wall. This rubber mounting as shown at 26 is of the type which provides a center pivot 27 bonded to a rubber unit 28 which is in turn bonded in its outer fitting 29. This connection provides a so-called torsion mounting for the rubber so that the movement of the strut such as 22 about the axis of the pivot 26 is resiliently resisted by rubber in shear. It is thus apparent on inspection of the support unit as shown in Figure 2 that the three support struts on each end of the cylinder thus mounted will provide a resilient support for said cylinder in all directions in the plane of the struts. The opposite end of each of the struts is connected to its ring by a rubber mounting such as 31 as shown for the strut 21 in Figure 2. This mounting provides a resilient connection for the inner end of the strut and a similar rubber mounting is provided for each of the inner strut connections to its ring. A shock absorber 30 is mounted to act between ring 14 and the wall of tub 10 while shock absorber 30A is similarly mounted for ring 15.

For the purpose of rotating the cylinder 11 at two speeds, a low speed for washing and a high speed for extraction, an electric motor 32 is provided. This motor is of the so-called two speed type and may be of the general type shown in U. S. Patent Number 2,225,144. Such motor requires no transmission connections but is varied in its speed by electrical means. This motor has its output shaft connected directly to the shaft 33 of the cylinder 11. The motor 32 is supported on a bracket 34 which bracket is secured to the ring 15 by a plurality of pivoted connections 35, 36 and 37 thus securing the motor 32 to the ring 15. The bracket 34 is sealed to the wall of tub 10 by flexible connection 38 so that movement relative to the tub 10 is possible

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while maintaining a fluid tight connection to make the tub 10 capable of holding liquid.

As shown in Figure 6 the general arrangement of the machine is for automatic operation and a two-speed motor is provided. A timer unit 41 is provided which may be of the general type shown in U. S. Patent 2,180,948. Such timer has a plurality of cams as shown, each cam controlling a circuit which is closed for certain portion of the revolution of the cam as designed for the purpose of producing the desired cycle of operation including rotation of the motor 32 at a slow washing speed for a required time together with suitable connections to operate a water valve 42 to provide inlet of water through an inlet connection 43 from a water mixing valve 44. The level of the washing liquid in the tub is controlled by the float control switch mechanism 45. The water is drained at the required time by solenoid operated drain valve 46 connected to the bottom of the tub 10. If it is desired to provide a drain pump an auxiliary motor 47 may be provided which will drive a drain pump at the desired time.

A change from high speed to low speed of the motor 32 may be accomplished by a solenoid switch mechanism 48 or other suitable circuit changing device.

In operation clothes to be washed are inserted in cylinder 11 through the door in the front of the machine, the opening in the center portion of the cylinder providing access into the cylinder from the door. The motor 32 can then be actuated through a suitable cycle control timer such as 41 so that the motor will first be actuated at a washing speed and will rotate the cylinder at a desired speed for washing, the required amount of wash water being admitted to the tub 10 in accordance with usual practice in automatic washing machines of the type, for instance, as is disclosed in U. S. Patent Re. 22,375. Subsequent to the completion of a washing operation the cycle timer will control circuits to increase the speed of the motor 32 and provide high speed for rotation of the cylinder 11 for extracting washing liquid from the clothes. The structure shown for supporting the cylinder 11 is designed to absorb the forces set up by the out-of-balance load in the cylinder 11 and it is evident that the cylinder is free to rotate around its center of mass and will be resiliently resisted in such movement by the suspension provided. The forces which will be transmitted to the machine frame by out-of-balance load will therefore be reduced. The mounting of the two-speed motor in close proximity to the cylinder eliminates the necessity of drive pulleys and belts and the two-speed motor also eliminates the necessity for a transmission. The result is a compact design.

Although the invention has been described by reference to a specific structure it is intended that various modifications may be made within the scope of the following claims.

I claim:

1. In a washing machine of the type employing a horizontally disposed rotatable cylinder for washing and extracting operations, a tub, a cylinder in said tub, a circular track at each end of said cylinder, a circular support ring at each end of said cylinder approximately the same diameter as said track but spaced further from the end of said cylinder than said track, rollers supported by said ring and running on said track, struts extending tangentially from the circumference of said ring members for supporting said ring

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members and terminating at the wall of said tub surrounding said cylinder, a fastening for the end of each of said struts adjacent the inner surface of said tub comprising a rubber mounting for the end of each of said struts so disposed as to resist movement of said struts about said mounting by resistance of rubber in shear.

2. In a washing machine of the type employing a horizontally disposed rotatable cylinder for washing and extracting operations, a tub, a cylinder in said tub, a circular track at each end of said cylinder, a circular support ring at each end of said cylinder approximately the same diameter as said track but spaced further from the end of said cylinder than said track, rollers supported by said ring and running on said track, struts extending tangentially from the circumference of said ring members for supporting said ring members and terminating at the wall of said tub surrounding said cylinder, a fastening for the end of each of said struts adjacent the inner surface of said tub comprising a rubber mounting for the end of each of said struts so disposed as to resist movement of said struts about said mounting by resistance of rubber in shear, a drive motor, and means connecting said drive motor to one of said rings centrally thereof, and connections from said drive motor to rotate said cylinder.

3. In a combined washing and centrifugal extracting machine of the character described, a substantially circular tub wall, a horizontally positioned clothes containing cylinder mounted for rotation within said tub wall about a substantially horizontal axis, a pair of circular tracks mounted upon said cylinder concentric with the axis of said cylinder one adjacent each end of said cylinder, supporting members one adjacent the edge of each of said tracks, support rollers operating on said tracks and supported by said support members to support said cylinder for rotation on said circular tracks, and struts for supporting said support members, pivoted connections between the outer ends of said struts and said tub wall, and resilient connections between the inner ends of said support members and said struts.

4. In a combined washing and centrifugal extracting machine of the character described, a tub, a horizontally positioned clothes containing cylinder within said tub, means to support said cylinder for rotation comprising annular tracks secured to said cylinder positioned one at each end of said cylinder and at a diameter less than the outside diameter of said cylinder, support members positioned adjacent said tracks at each end of said cylinder, support rollers extending from said support members and positioned to operate in said tracks, struts for supporting said support members from said tub, and resilient connections between said support members, said struts and said tub.

5. In a combined washing machine and centrifugal extractor of the character described, a tub, a rotatable clothes containing cylinder mounted for rotation within said tub, a driving motor mounted with its output shaft on the axis of rotation of said cylinder and connected to rotate said clothes containing cylinder, a supporting member for said motor adjacent one end of said cylinder, means to support said cylinder comprising rollers also supported on said supporting member, a track on said cylinder contacted by said rollers for support of said cylinder during

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rotation, and resiliently mounted connections secured to said support member for suspending said supporting member from said tub whereby both said driving motor and said rotatable clothes containing cylinder are resiliently mounted.

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