Dec. 2, 1924. 1,517,285

O. F. FISCHEDICK ET AL

DRIVING MECHANISM FOR WASHING MACHINES

Filed June 27, 1921

Fig. 1.

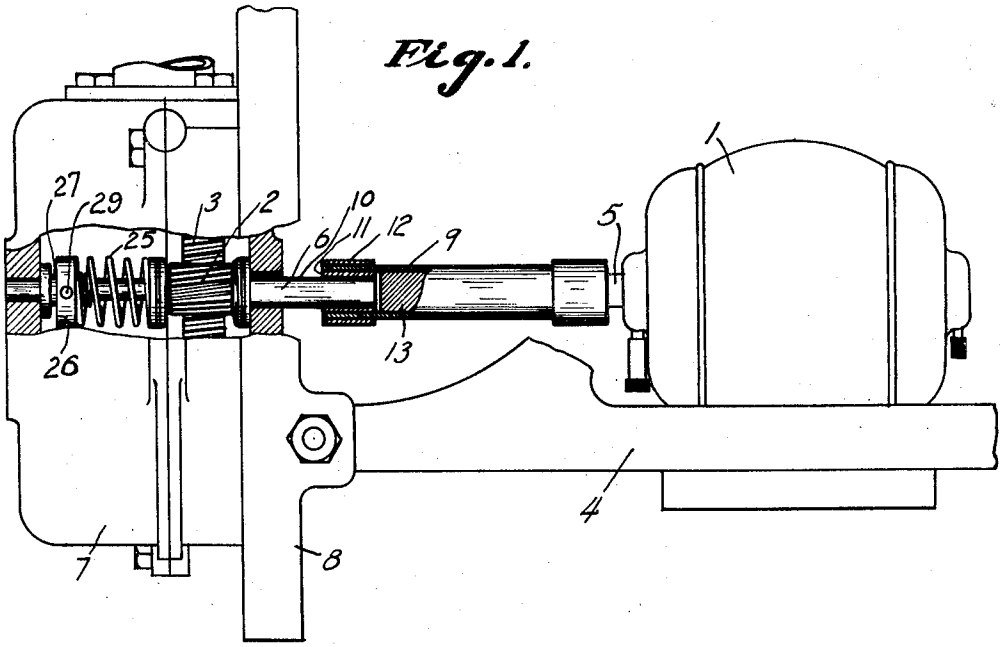


Fig. 2.

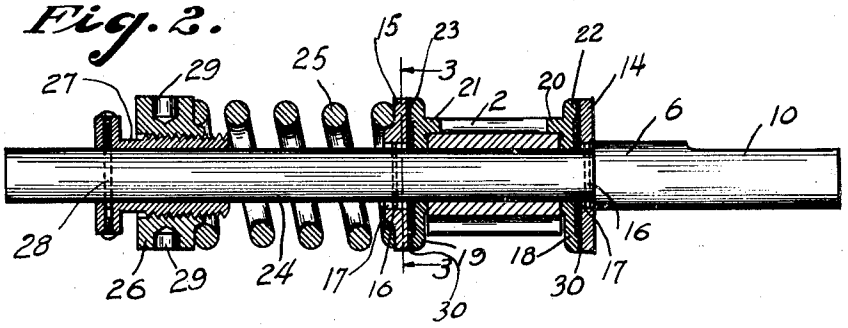
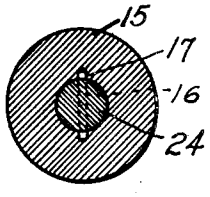


Fig. 3.



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UNITED STATES PATENT OFFICE.

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DRIVING MECHANISM FOR WASHING MACHINES.

Application filed June 27, 1921. Serial No. 480,535.

To all whom it may concern:

Be it known that we, OSCAR F. FISCHEDICK, and ALVIN W. KRAHN, citizens of the United States, residing at Milwaukee, county of Milwaukee, and State of Wisconsin, have invented new and useful Improvements in Driving Mechanism for Washing Machines, of which the following is a specification.

This invention relates to driving mechanism for washing machines, particularly of the oscillatory drum type.

This application is a continuation in part of our earlier co-pending application, Serial No. 347556, filed Dec. 26, 1919, for driving mechanism for washing machines.

Objects of this invention are to provide a driving mechanism which will protect both the motor and the mechanism from excessive strains; which will prevent the motor from becoming overloaded when the load is suddenly applied; which will prevent excessive strains due to the inertia of the revolving parts; and which will allow silent and smooth operation even tho loads of varying values may be placed upon the driving mechanism.

Further objects are to provide a driving mechanism for washing machines in which universal connection is provided in the driving mechanism closely adjacent the driving motor so that irregularities in alignment and vibrational disturbances are compensated for; in which a yielding twist is permitted in the driving mechanism; and whereby slight, sudden variations in the load are temporarily smoothed out by this resilient connection.

Further objects are to provide a driving mechanism in which a plurality of means are employed to prevent excessive strains being imposed upon such mechanism, so related to each other that a temporary, slight variation is taken up by one mechanism in such a manner that the torque progressively increases, and to associate with this device a second protective device whereby when the torque reaches a certain predetermined value one portion of the mechanism is allowed to slip with reference to the other portion thereof whereby excessive ultimate torque is not transmitted thru the mechanism, and whereby continual slipping and wearing of the parts for every slight variation in load is prevented.

An embodiment of the invention is shown in the accompanying drawings, in which:

Fig. 1 is an elevation partly in section of the driving mechanism forming the subject matter of this invention.

Fig. 2 is a sectional view of a portion of the mechanism shown in Fig. 1.

Fig. 3 is a section on the line 3—3 of Fig. 2.

This invention is particularly directed to driving mechanism for oscillatory washing machines and the drawing show a driving motor 1 operatively connected with a driving pinion 2 which is in mesh with the gear wheel 3 which latter forms a portion of the reduction gearing that transmits rotary motion to the crank or other device for oscillating the tub in the usual manner, such tub crank and other portions of the reduction mechanism being omitted for the sake of clearness.

The motor 1 may conveniently be mounted upon a transverse member 4 of the frame of the washing machine with its shaft 5 in alignment with the shaft 6 of the pinion 2. This pinion and the gear 3 are carried in a housing 7 which may be secured upon an upright portion 8 of the frame of the washing machine.

The shafts 5 and 6 are connected by means of a flexible tubing 9, such as rubber or similar material, and are each provided with a flattened side such as indicated at 10 for the shaft 6. A metal band 11 is fitted upon the ends of each of these shafts and the flexible tube 9 is slipped over such sleeve. An outer metal sleeve 12 is placed outside of the flexible tube and binds such tube tightly against the inner sleeve 11, thereby securely anchoring the ends of the flexible tube to the shafts 5 and 6. The central portion of the tube may be filled by a wooden core piece 13, if desired, so as to prevent collapsing of the tube under winding stresses.

The shaft 6 has loosely mounted thereon the driving pinion 2. This driving pinion bears at each end upon friction collars 18 and 19 which are provided with a plurality of inwardly projecting lugs 20 and 21 arranged to fit between the teeth of the

pinion and to thus lock the pinion to the collars 18 and 19. These collars are provided with annular outwardly extending ribs 22 and 23. These ribs bear against other friction collars 14 and 15 which are secured against rotation upon the shaft by means of pins 16 and cooperating recesses 17 formed in the collars. The collar 14 may bear against a shoulder formed at the point where the enlarged outer end of the shaft joins the reduced portion 24. The collar 14 is resiliently pressed towards the collar 15 by means of a relatively heavy spring 25 whose compression is adjusted by means of a nut 26 at its other end. This nut 26 threadably engages a sleeve 27 which is secured to the shaft by means of a pin 28. The nut 26 may conveniently be provided with radial holes 29 which are designed to be engaged by a spannel wrench so that it may be readily turned to secure the requisite compression of the spring 25. If desired, a fiber or other washer 30 may be provided between each of the collars 19 and 15 or 18 and 14, or such washer may be provided between only one pair of such collars.

It is to be noted that the collars 14 and 15 are secured against rotation upon the shaft while the collars 18 and 19 together with the driving pinion 2 are free to rotate upon the shaft except for the frictional engagement between the respective pairs of collars 14, 18 and 23, 15. It is found desirable to construct the collars 14 and 15 of machine steel and the collars 22 and 23 of bronze or brass, particularly so if the fiber washers 30 are not employed as a more uniform frictional engagement is secured by this means and as the rusting together of the adjacent pairs of collars is prevented.

It will be seen that a universal connection has been provided between the motor and the work and that such connection permits slight variations in axial alignment and slight variations due to relative displacements of the motor with reference to the axis of the driving pinion, such for example, as are caused by vibration. It will also be seen that the resilient tube 9 allows slight variations between the speed of the motor and speed of the shaft 6 for brief periods by the winding action of the tube. It will also be noted that the force required to twist the resilient tube gradually increases as the tube become more tightly twisted so that a gradually increasing torque is transmitted when these changes in speeds occur. When a torque of sufficiently high value to reach a predetermined standard has been attained, further twisting of the tube is relieved by the slipping of the pinion with reference to the shaft 6. This point at which slipping occurs, is determined of course by the compression of the adjustably held spring 25. It is therefore apparent that excessive slipping of the pinion with respect to the shaft 6 is prevented as this slipping does not occur for every slight variation in the load, particularly for small, temporary variations, as these variations are taken up by the twisting of the tube 9, thereby greatly lengthening the life of the mechanism and also promoting the smooth running thereof.

We claim:

1. Driving mechanism for devices subject to variable load, said mechanism including a drive shaft flattened at its end and shouldered intermediate its ends, a pinion loosely mounted upon the reduced portion of the drive shaft adjacent the shoulder, means rotatable with the drive shaft and adapted to communicate frictionally the torque of the shaft to the pinion, a threaded sleeve secured to the reduced portion of the drive shaft at a point remote from the shoulder, a nut threaded upon said sleeve, a spring confined between said nut and said means rotatable with the drive shaft.

2. Driving mechanism for a washing machine subject to varying power requirements, said driving mechanism comprising a driving shaft; a pinion loosely mounted thereon; a friction collar at each end of, and locked to, said pinion; a pair of collars positively connected with said shaft; and resilient means for causing said last mentioned collars to frictionally bind said first mentioned collars therebetween.

3. Driving mechanism for a washing machine subject to varying power requirements, said driving mechanism comprising a driving shaft; a pinion loosely mounted thereon; a friction collar at each end of, and locked to, said pinion; a pair of collars positively connected with said shaft; resilient means for causing said last mentioned collars to frictionally bind said first mentioned collars therebetween; and means for adjusting the stress of said resilient means.

4. A driving mechanism, for washing machines of the oscillatory type, comprising a driving shaft, a pair of friction collars operatively connected with said shaft, resilient means tending to press said collars towards each other, a pinion, a pair of collars having projecting lugs engaging between the teeth of said pinion and positioned at the outer ends of said pinion, said pinion and last mentioned collars being positioned between and frictionally coupled with said shaft by said first mentioned collars.

5. Driving mechanism for oscillatory washing machine comprising a driving shaft, a pinion loosely mounted thereon, a friction collar positioned at each end of said pinion and provided with inwardly projecting lugs arranged to engage between the teeth of said pinion to lock said collars and said pinion together, a second pair of friction

collars positioned outside of said first mentioned pair, a helical spring surrounding said shaft and tending to press said last mentioned collars toward each other, and a nut threadably carried upon said shaft and engaging the outer end of said spring whereby the frictional coupling of said pinion and shaft may be varied.

6. In a device of the character described, driving mechanism comprising a shaft, a pinion mounted coaxially thereof, a friction disc having lugs engaged with the said pinion, a second friction disc keyed to said shaft and a compression spring operatively productive of a degree of friction between said discs adapted under normal load to transmit motion between said shaft and said pinion.

7. In a driving mechanism, a driving member, a driven member subject to acceleration and deceleration relative to the driving member, and motion transmitting connections between said members including a pair of rotors in slip clutch connection, and a coupling composed of resilient material secured at its ends to members of said connections and having an intermediate portion of sufficient length and resilience to allow a relative turning movement of one member to the other, said coupling being adapted to yield to a material extent with less resistance than occasions the slippage of said clutch and the tension thereof increasing as the relative movement of the members it connects increases in degree.

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