July 5, 1932. I. R. ROWE 1,866,322

SPINNING AND TWISTING MACHINE

Filed Oct. 30, 1930 2 Sheets-Sheet 1

Fig. 1.

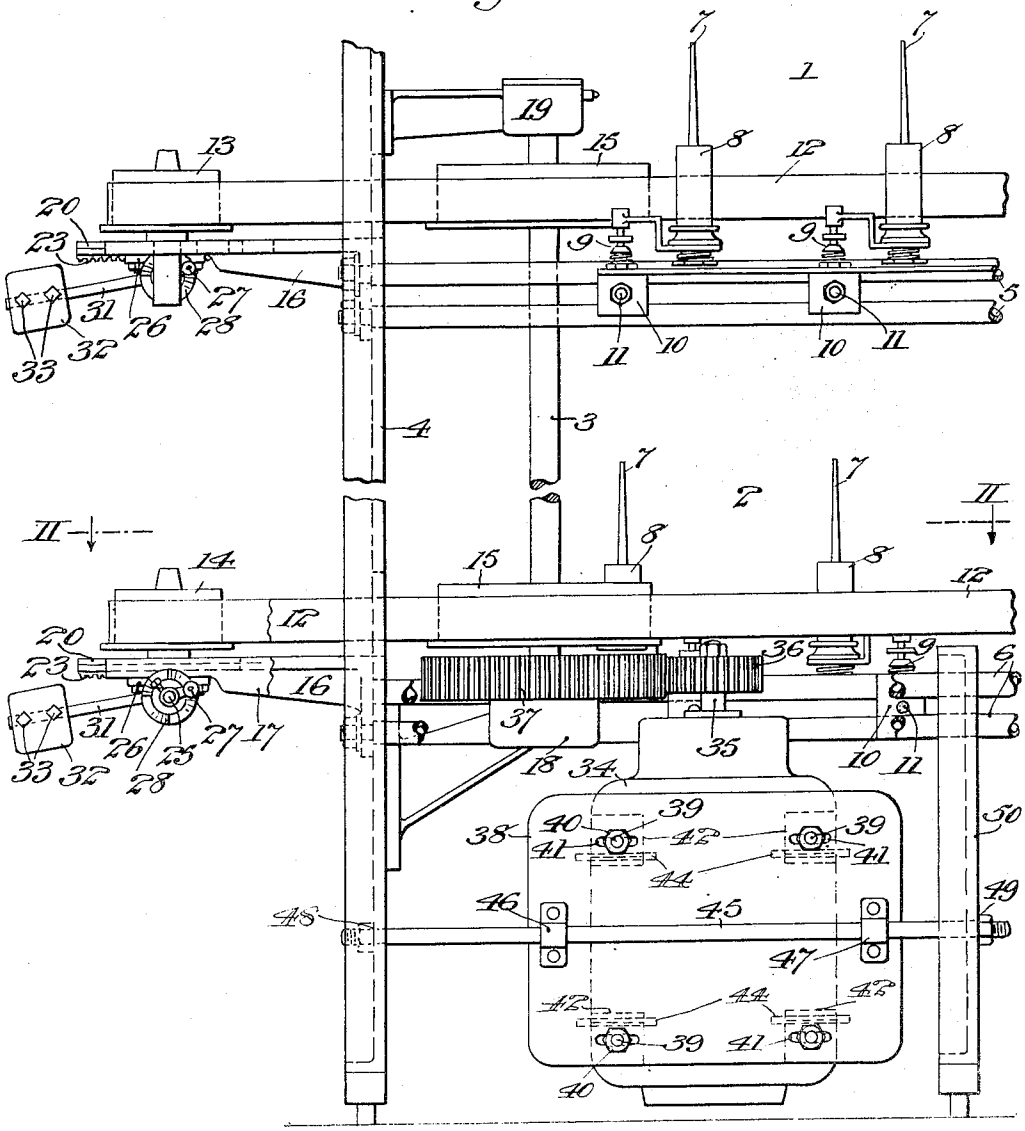
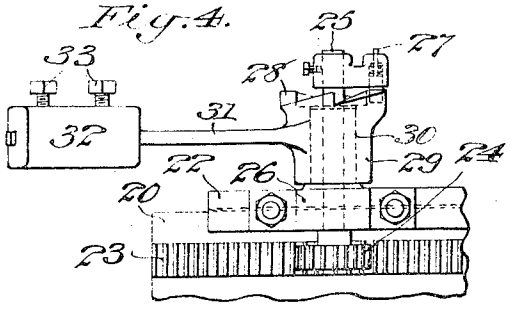


Fig. 4.



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Fig. 2.

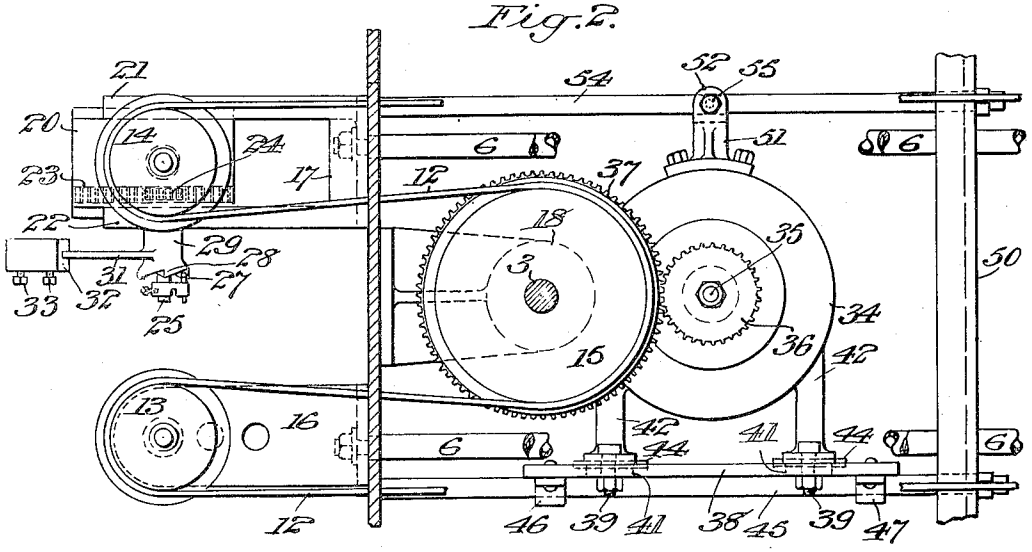
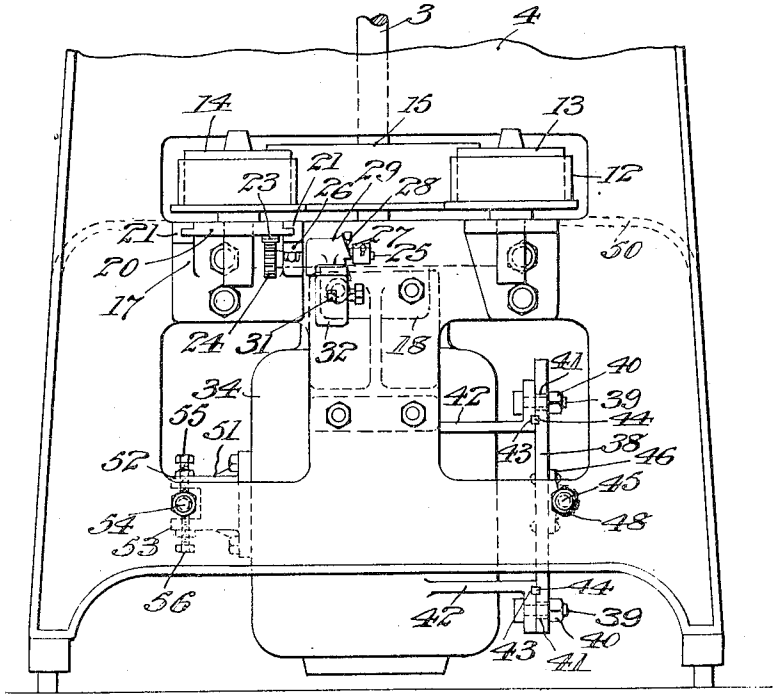


Fig. 3.



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UNITED STATES PATENT OFFICE

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SPINNING AND TWISTING MACHINE

Application filed October 30, 1930. Serial No. 492,152.

This invention relates to improvements in spinning and twisting machines and more particularly to the driving mechanism for the endless belts which actuate the spindles or other devices.

One of the objects of the invention is to provide means for changing the surface speed of the driving belts without effecting the position of the driven and idler pulleys.

Another object is to provide a mechanism for adjusting the motor and its driving means with respect to the main driving pulley of the belt.

Another object is to provide means for automatically maintaining a predetermined tension on the driving belt without effecting the position of the belt with respect to the spindles actuated thereby.

Another object is to provide a driving mechanism, the arrangement of which is such as to readily and easily remove or replace the driving belts, when desired.

Another object is to provide certain improvements in the form, construction and arrangement of the several parts whereby the above named and other objects may effectively be attained.

A practical embodiment of my invention is represented in the accompanying drawings, in which

Fig. 1 represents a detail side elevation, partly in section, of the driving end of a spinning and twisting machine, having two decks of spindles superposed in the frame, and my improved driving mechanism applied thereto;

Fig. 2 represents a horizontal section taken in the plane of the line II—II of Fig. 1, looking in the direction of the arrows;

Fig. 3. represents a detail end elevation of the lower portion of the machine; and

Fig. 4 represents a detail inverted plan view, on an enlarged scale, of one of the idler take up pulleys and its automatic tension mechanism.

The portion of the spinning and twisting machine shown in the drawings illustrates the driving ends of two decks of spindles denoted generally by 1, 2, each deck being provided with a separate tension means and a single driven shaft 3 common to both decks.

The end frame 4 has secured thereto upper and lower pairs of rods or pipes 5, 6, respectively, which rods are disposed on opposite sides of the frame and extend throughout the length of the machine. It is to be understood that a similar end frame serves to support the opposite end of the several rods.

The spindles of each deck are denoted by 7, and each spindle comprises a whirl 8 mounted in a bearing 9 carried by a suport 10 secured to a pair of rods by a bolt 11.

Each deck of spindles is actuated by an endless belt 12 which is guided around an idler pulley 13, an idler take up pulley 14 and a drive pulley 15. The idler pulley 13 is mounted in a bracket 16 fixed to the end frame 4, while the idler pulley 14 is movably mounted in a bracket 17 also carried by the frame. The drive pulley 15 is fixed to the vertical shaft 3, which is stepped in a lower bearing 18 and an upper bearing 19, both of which bearings are secured to the end frame 4.

The idler take up pulley 14 is mounted to move in the bracket 17 by means of a plate 20 mounted to slide in guide rails 21, 22 of the bracket 17, which plate is moved horizontally in the guide rails by means of a rack 23 fixed on the underside of the plate 20 and a pinion 24 carried by a shaft 25, which is journaled in a bracket 26 secured to and depending from the guide rail 22. The end of the shaft 25 has secured thereto a spring actuated pawl 27 arranged to coact with ratchet teeth 28 on the face of a member 29 mounted to rock on a hub 30 of the bracket 26. The coaction of the ratchet teeth on the member 29 with the pawl on the shaft 25 adjustably locks the shaft 25 to the member 29. The member 29 is also provided with an arm 31 adapted to receive a weight 32 adjustably secured thereon by means of set screws 33. Thus it will be seen that the weighted arm 31 tends to rock the member 29 in its bracket 26 so that the ratchet teeth 28 will exert pressure on the pawl 27, which, in turn, rotates the shaft 25 and its pinion 24 while the pinion transmits its motion to the rack 23 on the plate 20. By the outward movement of the plate 20, the pulley 14,

which is carried thereby, will serve to maintain a frictional contact with the belt, while the weighted arm 31 through its ratchet and pawl connection with the shaft 25, pinion 24, and rack 23, tends to automatically hold a predetermined tension on the belt.

Motion is imparted to the vertical shaft 3 by means of a motor 34 having its driving shaft 35 provided with a gear 36 removably mounted thereon, which gear 36 meshes with a gear 37 fixed on the shaft 3.

The motor 34 is secured at one side to a plate 38 by means of bolts 39 and nuts 40, and has a slidable adjustment thereon by means of elongated slots 41 through which the bolts 39 pass. As a means for guiding the motor 34 on the plate, legs 42 on the motor are provided with grooves 43, each of which is arranged to receive a key 44 carried by the plate 38. This plate 38 is mounted on a rod 45 by means of straps 46, 47, one end of which rod is bolted at 48 to the frame 4, while the other end is locked at 49 in an upright 50 located within the frame of the machine. The motor is further provided with a lug 51 having ears 52, 53, which are arranged to straddle a rod 54 bolted between the frame 4 and the upright 50. Adjusting screws 55, 56 are threaded in the ears 52, 53 and arranged to impinge upon the rod 54 so as to provide a means by which the motor 34 with its drive shaft 35 and gear 36 may be readily moved to properly aline the gear 36 with the gear 37 on the shaft 3.

The surface speed of the belt 12 may be readily changed by removing the gear 36 from its shaft 35 and substituting therefor a gear of larger or smaller diameter. This is accomplished by loosening the nuts 40 on the bolts 39, so that the bolts are free to slide in the slots 41 in the plate 38 and the legs 42 with their grooves 43 capable of being slid on the keys 44. This movement of the motor disengages the gear 36 with the gear 37. When the gear 36 has been removed from the motor shaft and replaced by another gear of larger or smaller diameter, the motor and its legs may again be slid on the keys 44 until the replaced gear and the gear 37 are enmeshed, after which the nuts 40 are tightened on the bolts 39 and the motor locked to the plate 38.

From the foregoing it will be seen that a constant tension is applied to the belt 12, and the same tension maintained at all speeds. Furthermore, by changing the gears to increase or diminish the surface speed of the belt, the tension and position of the driven and idler pulleys are maintained.

It is also evident from the construction and arrangement of the mechanism that the driving belts may be removed or replaced when desired, without disengaging the driving gears, so that the same surface speed may be maintained for any belt applied thereto.

It is obvious that various changes may be resorted to in the form, construction and arrangement of the several parts without departing from the spirit and scope of my invention; and hence, I do not intend to be limited to the details herein shown and described except as they may be included in the claims.

What I claim is:

1. The combination with a spinning and twisting machine having an end frame, a plurality of rows of spindles, a spindle driving belt and guide pulleys therefor, of a belt driving pulley disposed within said end frame, at least one idler take up pulley for the belt, a motor mounted within the end frame beneath the spindles, and interchangeable driving means interposed between the motor and driving pulley.

2. The combination with a spinning and twisting machine having an end frame, a plurality of rows of spindles, a spindle driving belt and guide pulleys therefor, of a shaft mounted within said end frame, a belt driving pulley on said shaft, at least one idler take up pulley for the belt, a motor mounted within the end frame beneath the spindles, and interchangeable driving means interposed between the motor and shaft for actuating the shaft.

3. The combination with a spinning and twisting machine having an end frame, a plurality of rows of spindles, a spindle driving belt and guide pulleys therefor, of a shaft mounted within said end frame, a belt driving pulley on said shaft, at least one idler take up pulley for the belt, an auxiliary frame spaced from the end frame, a motor carried by said auxiliary frame beneath the spindles, and interchangeable driving means interposed between the motor and shaft for actuating the shaft.

4. The combination with a spinning and twisting machine having an end frame, a plurality of rows of spindles, a spindle driving belt and guide pulleys therefor, of a shaft mounted within said end frame, a belt driving pulley on said shaft, at least one idler take up pulley for the belt, an auxiliary frame secured within the end frame and spaced therefrom, a motor fixed between said auxiliary and end frames beneath the spindles, and interchangeable driving means interposed between the motor and shaft for actuating the shaft.

5. The combination with a spinning and twisting machine having an end frame, a plurality of rows of spindles, a spindle driving belt and guide pulleys therefor, of a shaft mounted within said end frame, a belt driving pulley on said shaft, at least one idler take up pulley for the belt, an auxiliary frame spaced from the end frame, a motor carried by said auxiliary frame and adjustable lengthwise of the machine, and inter-

changeable driving means interposed between the motor and shaft for actuating the shaft.

6. The combination with a spinning and twisting machine having an end frame, a plurality of rows of spindles, a spindle driving belt and guide pulleys therefor, of a shaft mounted within said end frame, a belt driving pulley on said shaft, at least one idler take up pulley for the belt, an auxiliary frame secured within the end frame and spaced therefrom, a motor fixed between said auxiliary and end frames beneath the spindles and adjustable lengthwise of the machine, and interchangeable driving means interposed between the motor and shaft for actuating the shaft.

7. The combination with a spinning and twisting machine having an end frame, of at least one deck of spindles arranged in rows on opposite sides, each deck comprising a driving belt, guide pulleys therefor, a belt driving pulley, and at least one take up pulley for the belt, a vertically disposed shaft mounted between the rows of spindles within said end frame and carrying the driving pulley of each deck of spindles, an auxiliary frame secured within the end frame and spaced therefrom, a motor fixed between said auxiliary and end frames beneath the spindles, and interchangeable driving means interposed between the motor and shaft for actuating said shaft.

8. The combination with a spinning and twisting machine having an end frame, of at least one deck of spindles arranged in rows on opposite sides, each deck comprising a driving belt, guide pulleys therefor, a belt driving pulley, and at least one take up pulley for the belt, a vertically disposed shaft mounted between the rows of spindles within said end frame and carrying the driving pulley of each deck of spindles, an auxiliary frame secured within the end frame and spaced therefrom, a motor carried by said auxiliary frame and adjustable lengthwise of the machine, and interchangeable driving means interposed between the motor and shaft for actuating said shaft.

9. The combination with a spinning and twisting machine having an end frame, of at least one deck of spindles arranged in rows on opposite sides, each deck comprising a driving belt, guide pulleys therefor, a belt driving pulley, and at least one take up pulley for the belt, a vertically disposed shaft mounted between the rows of spindles within said end frame and carrying the driving pulley of each deck of spindles, an auxiliary frame secured within the end frame and spaced therefrom, a motor fixed between said auxiliary and end frames beneath the spindles, and adjustable lengthwise of the machine, and interchangeable driving means interposed between the motor and shaft for actuating said shaft.

10. The combination with a spinning and twisting machine having an end frame, a plurality of rows of spindles, a spindle driving belt and guide pulleys therefor, of a shaft mounted within said end frame, a belt driving pulley on said shaft, at least one idler take up pulley for the belt, an auxiliary frame secured within the end frame and spaced therefrom, a plate carried by said auxiliary and end frames, a motor fixed to said plate, and interchangeable driving means interposed between the motor and shaft for actuating the shaft.

11. The combination with a spinning and twisting machine having an end frame, a plurality of rows of spindles, a spindle driving belt and guide pulleys therefor, of a shaft mounted within said end frame, a belt driving pulley on said shaft, at least one idler take up pulley for the belt, an auxiliary frame secured within the end frame and spaced therefrom, a vertically disposed plate carried by said auxiliary and end frames, a motor fixed to said plate, and interchangeable driving means interposed between the motor and shaft for actuating the shaft.

12. The combination with a spinning and twisting machine having an end frame, a plurality of rows of spindles, a spindle driving belt and guide pulleys therefor, of a shaft mounted within said end frame, a belt driving pulley on said shaft, at least one idler take up pulley for the belt, an auxiliary frame secured within the end frame and spaced therefrom, a plate carried by said auxiliary and end frames, a motor fixed to said plate and adjustable lengthwise on the plate, and interchangeable driving means interposed between the motor and shaft for actuating the shaft.

13. The combination with a spinning and twisting machine having an end frame, a plurality of rows of spindles, a spindle driving belt and guide pulleys therefor, of a shaft mounted within said end frame, a belt driving pulley on said shaft, at least one idler take up pulley for the belt, and auxiliary frame secured within the end frame and spaced therefrom, a vertically disposed plate carried by said auxiliary and end frames, a motor fixed to said plate and adjustable lengthwise on the plate, and interchangeable driving means interposed between the motor and shaft for actuating the shaft.

In testimony, that I claim the foregoing as my invention, I have signed my name this 28th day of October, 1930.

IRVING R. ROWE.

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CERTIFICATE OF CORRECTION.

Patent No. 1,866,322. July 5, 1932.

IRVING R. ROWE.

It is hereby certified that error appears in the printed specification of the above numbered patent requiring correction as follows: Page 2, line 84, claim 1, after "pulley" insert the words for actuating said driving pulley; page 3, line 112, claim 13, for "and" read an; and that the said Letters Patent should be read with these corrections therein that the same may conform to the record of the case in the Patent Office.

Signed and sealed this 11th day of October, A. D. 1932.

M. J. Moore,
Acting Commissioner of Patents.

(Seal)