Aug. 2, 1932. L. H. HORNER 1,869,692

SPINDLE DRIVE FOR SPINNING OR TWISTING MACHINES

Filed May 1, 1931 2 Sheets-Sheet 1

Fig. 1.

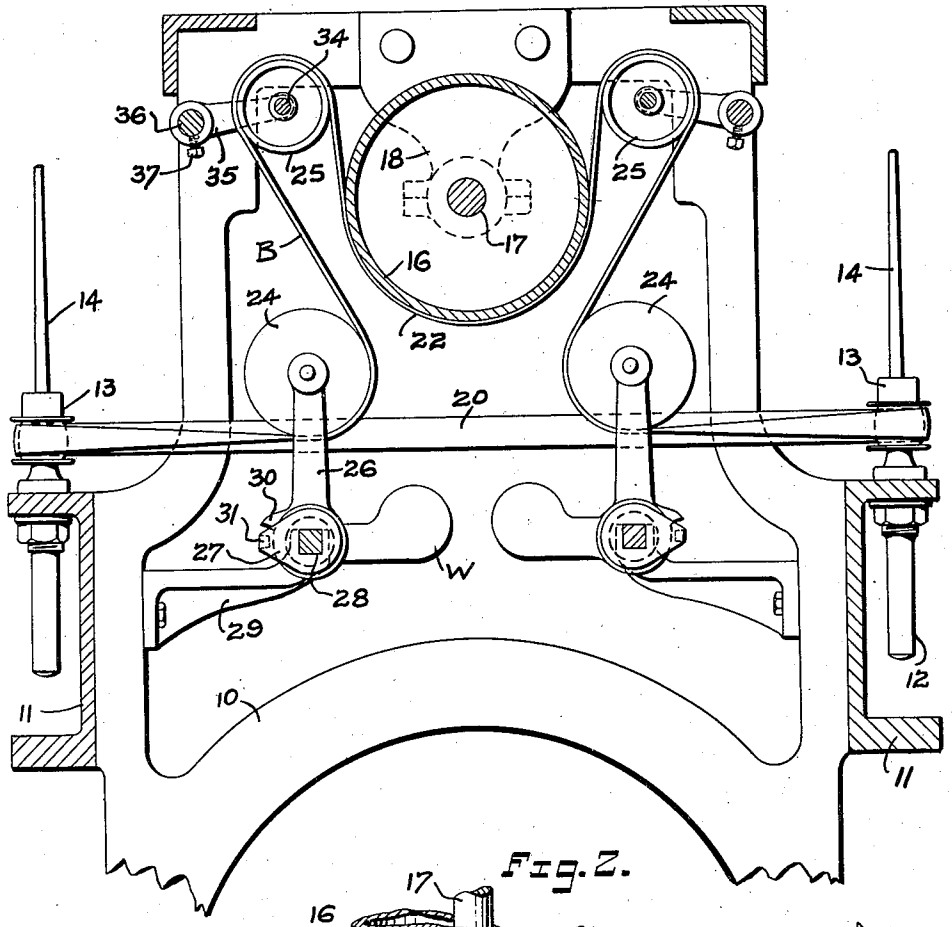
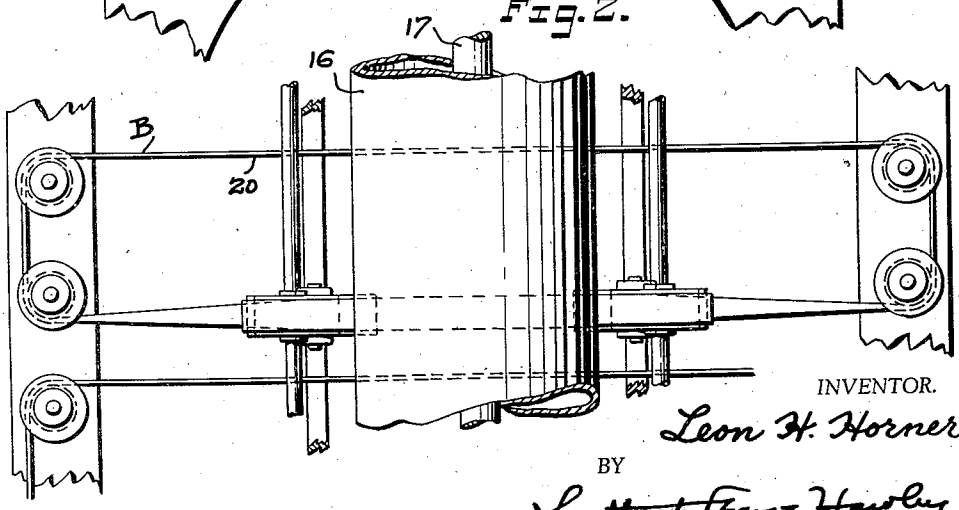


Fig. 2.



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Fig. 3.

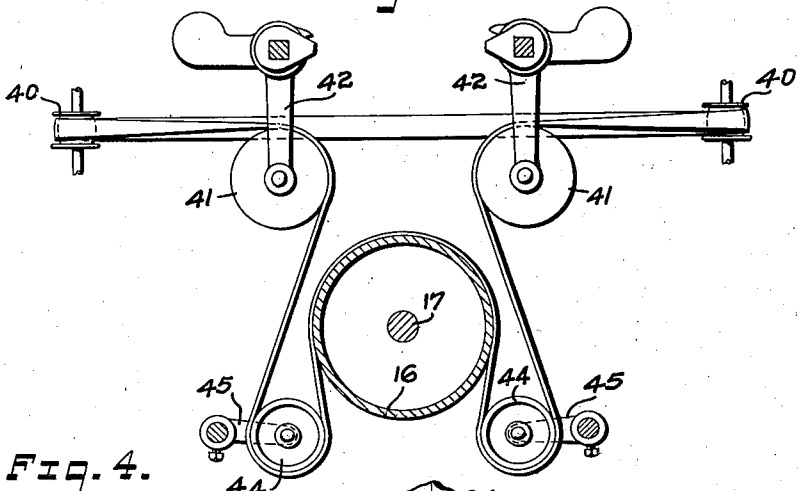


Fig. 4.

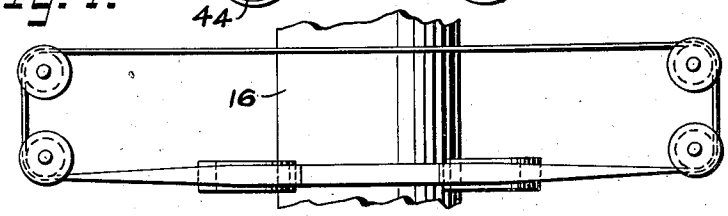


Fig. 5.

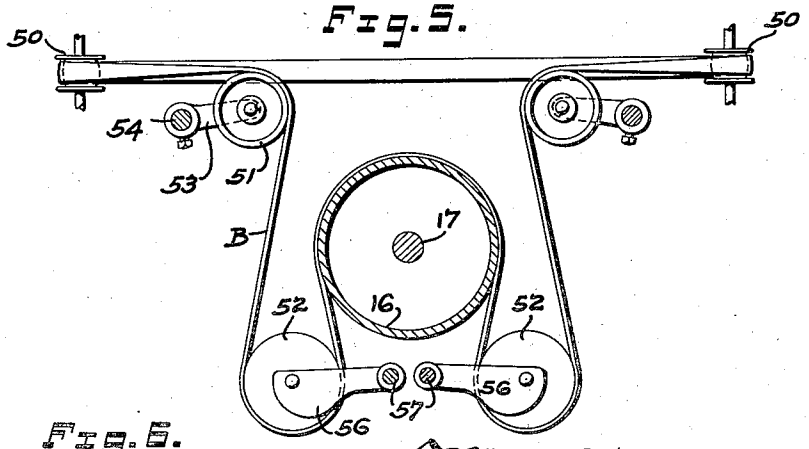
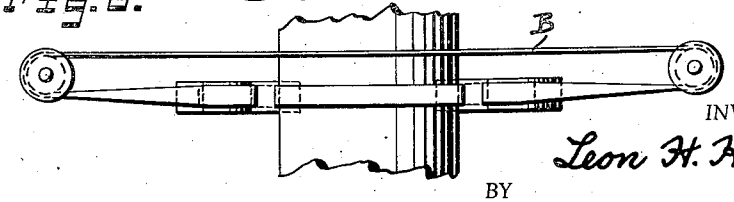


Fig. 6.



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UNITED STATES PATENT OFFICE

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SPINDLE DRIVE FOR SPINNING OR TWISTING MACHINES

Application filed May 1, 1931. Serial No. 534,317.

This invention relates to spinning and twisting machines in which the spindles are arranged in rows on each side of a driving cylinder or drum, and in which a single band or tape is utilized to drive one or more spindles at each side of the machine.

It is the general object of my invention to provide an improved spindle drive so designed that a continuous band or tape may be used, both runs of which will be disposed on the same side of the cylinder, so that a continuous one-piece band may be applied or removed without passing the band over the end of the cylinder or cylinder shaft.

A further object of my invention is to provide a spindle drive in which the arc of contact between the cylinder and band is substantially one half of the circumference of the cylinder. I also provide improved means for guiding and tensioning the band, together with means for adjusting the same to meet operating conditions.

My invention further relates to arrangements and combinations of parts which will be hereinafter described and more particularly pointed out in the appended claims.

Three forms of the invention are shown in the drawings, in which

Fig. 1 is a sectional end elevation of portions of a spinning or twisting frame embodying one form of my invention;

Fig. 2 is a partial plan view of the parts shown in Fig. 1;

Fig. 3 is a sectional end elevation showing a second form of my improved spindle drive;

Fig. 4 is a plan view thereof;

Fig. 5 is a sectional end elevation of a third form of my invention, and

Fig. 6 is a plan view of the construction shown in Fig. 5.

Referring to Figs. 1 and 2 I have shown portions of a twisting or spinning frame comprising an end frame 10, spindle rails 11 disposed at each side of the machine, and spindles 12 secured in the rails 11 and having driving pulleys or whirls 13 secured on the blades 14 thereof. A driving cylinder or drum 16 is secured on a driving shaft 17, which is rotatably mounted in suitable bearings 18 and is driven from any convenient source of power. The parts thus far described are of the usual commercial construction.

As shown in Figs. 1 and 2, I provide a band B for each two spindles at each side of the machine, each band thus driving four spindles and rotating all of the spindles at the same speed and in the same direction. The band B extends in a straight run, as indicated at 20, directly across the frame from one of the spindles on one side to a correspondingly positioned spindle on the other side, this straight run being substantially below the cylinder 16 and out of contact therewith.

The upper run 22 of the band B extends from the second spindle on each side around a lower guide pulley 24 and over an upper guide pulley 25, and then under the driving cylinder 16 and in driving contact therewith.

Each lower drive pulley 24 is mounted on an arm 26, pivoted on a hub or bearing member 27, which in turn is supported on a square shaft 28 held in fixed brackets 29. A weight W is formed integral with the arm 26 and tends to swing the guide pulley 24 in a direction to tension the band B. A lug 30 on the arm 26 engages a stop or abutment 31 on a projecting portion of the hub or bearing member 27 and thus limits swinging movement of each pulley 24 toward the adjacent spindle 12.

It will be noted that the lower guide pulleys 24 engage the band B substantially in the plane of the straight run thereof, or in the plane of the whirls 13.

The upper guide pulleys 25 are rotatably mounted on studs 34 in the ends of arms 35, adjustably secured to cross rods 36 by set screws 37. The arms 35 may be adjusted around the rods 36 in accordance with the

length of the band B and may be secured in adjusted position by the set screws 37.

It will be noted that the pulleys 25 are on the opposite side of the axis of the shaft 17 from the pulleys 24 and from the straight run of the belt, and that they are so positioned that the band B engages the driving cylinder 16 for substantially half of the circumference of the cylinder, thus having a very effective driving contact therewith.

The band B is preferably woven as a continuous piece of fabric and without any joint or seam. This construction of the band is rendered possible from the fact that both runs of the band are below the cylinder 16 and from the fact that the guide pulleys 24 and 25 are each mounted on separate supporting arms and are entirely open at one side, so that a band may be readily placed thereon.

It will also be noted that the drive is symmetrical as to both sides of the machine, so that the direction of rotation of the cylinder 16 may be reversed and the spindles may be driven in either direction under identical driving conditions and at the same speed.

The fact that the straight run 20 of the band B is below and beyond the periphery of the cylinder 16 permits me to use a cylinder made in long sections, instead of necessitating the use of separate driving pulleys on the shaft 17, as has been necessary in certain previous driving constructions.

In Figs. 3 and 4 I have shown a slightly modified construction in which the spindle whirls 40 are substantially above the plane of the cylinder 16. In this case the movable guide pulleys 41 are mounted on depending arms 42 above the cylinder 16 and the fixed guide pulleys 44 are mounted on arms 45 below the cylinder 16.

This construction is substantially an inversion of the construction shown in Fig. 1 and the operation and advantages thereof are substantially identical.

In Figs. 5 and 6 I have shown a construction in which the spindle whirls 50 are above the plane of the cylinder 16, as in Fig. 3, but in which the fixed guide pulleys 51 and movable guide pulleys 52 are somewhat differently arranged. The fixed guide pulleys 51 in Fig. 5 are mounted on arms 53 secured to the cross rods 54 above the plane of the cylinder 16, so that the pulleys 51 engage the band B substantially in the plane of the straight upper run thereof. The movable pulleys 52 are mounted on arms 56 pivoted on cross rods 57 and having substantial counterweight portions formed integral therewith. The parts are so disposed that the weight of each pulley 52 is effective to tension the band B, in addition to the weight of its supporting arm 56.

In Fig. 5 I have shown a single spindle only at each side of the machine and driven by each band B, while in Figs. 2 and 4 I have shown two spindles at each side of the machine for each band B.

It will be understood that the construction shown in Figs. 1 and 2 or 3 and 4 may be used with two spindles only, and that the construction shown in Figs. 5 and 6 may be used with four spindles, all without change except in the length of the band B.

Having described three forms of my improved spindle drive, it will be seen that each form possesses the advantage of extensive driving contact with the cylinder 16 and also of symmetrical construction rendering the drive completely reversible. Also in each case the continuous one-piece band may be applied or removed without any difficulty and without passing the band over the end of the cylinder.

Having thus described my invention and the advantages thereof, I do not wish to be limited to the details herein disclosed otherwise than as set forth in the claims, but what I claim is:—

1. In a spinning or twisting machine, a driving cylinder, a plurality of spindles arranged in a row at each side of said cylinder, an endless band partially encircling a spindle in each row and having both runs thereof disposed at one and the same side of said cylinder and beyond the periphery thereof, one run of said band having driving contact with substantially one-half of the circumference of said cylinder.

2. In a spinning or twisting machine, a driving cylinder, a plurality of spindles arranged in a row at each side of said cylinder, an endless band partially encircling a spindle in each row and having both runs thereof disposed at one and the same side of said cylinder, said band having a straight run connecting said spindles and disposed beyond the periphery of said cylinder and having a second run providing driving contact with substantially one-half of the circumference of said cylinder, a set of guide pulleys for said band comprising a pair of pulleys, one fixed and one movable, interposed in the driving run of said band between the cylinder and the spindles at each side of said cylinder, and means to actuate each movable pulley to tension the band.

3. The combination in a spindle drive as set forth in claim 2, in which one guide pulley in each pair engages the band substantially in the plane of the straight run of the band, and the other guide pulley of each pair engages the band beyond the axis of the cylinder, with respect to said straight band.

4. The combination in a spindle drive as set forth in claim 2, in which said latter means comprises a separate counterweight for each movable guide pulley.

5. The combination in a spindle drive as set forth in claim 2, in which the fixed pulleys

are mounted on supporting arms which are each angularly adjustable about a fixed axis, and in which means is provided to hold said arms in angularly adjusted position.

6. The combination in a spindle drive as set forth in claim 2, in which the movable pulleys engage the band substantially in the plane of the straight run, and the fixed pulleys are mounted in loops of the band and beyond the axis of the driving cylinder with respect to said straight run.

In testimony whereof I have hereunto affixed my signature.

LEON H. HORNER.