Nov. 13, 1923. 1,473,820

H. J. LAROCHE ET AL

DEVICE FOR OPERATING THE SPINDLES OF SPINNING AND TWISTING MACHINES

Filed Jan. 18, 1923 2 Sheets-Sheet 1

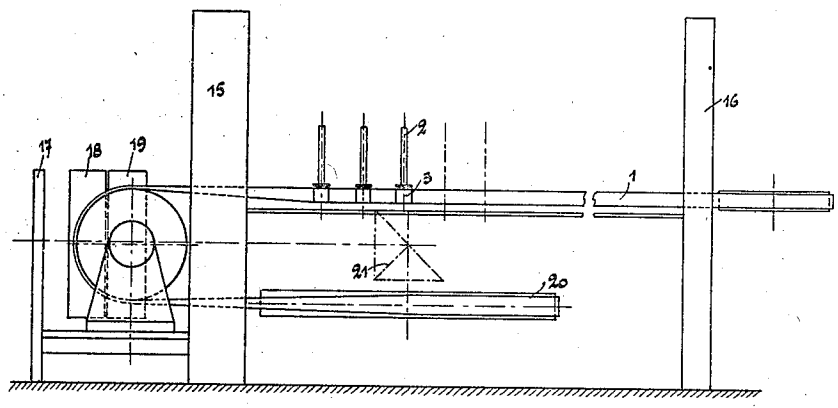



Fig. 1.

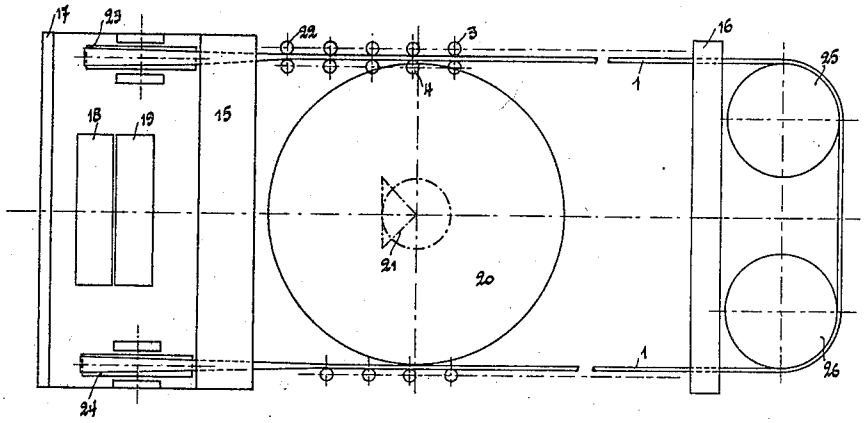



Fig. 2.

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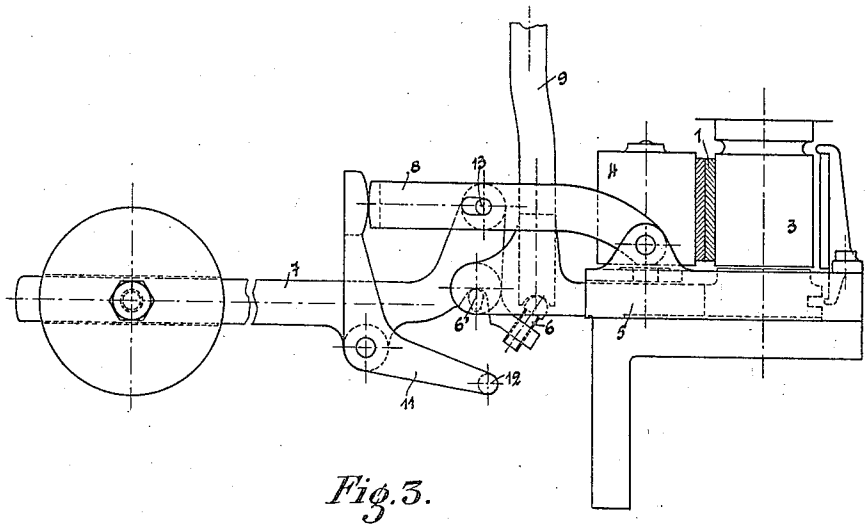



Fig. 3.

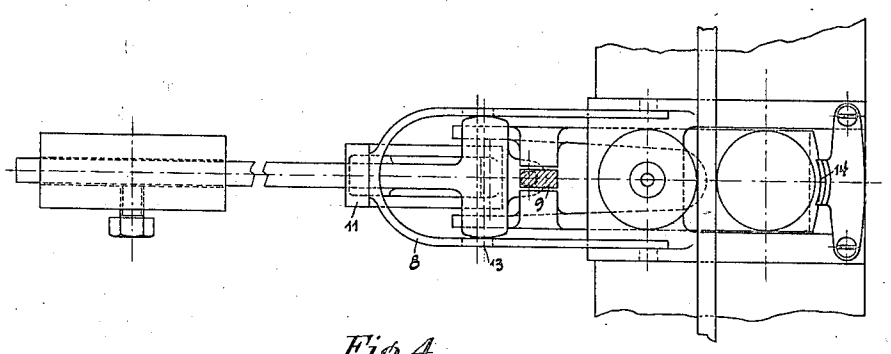



Fig. 4.

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# UNITED STATES PATENT OFFICE.

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## DEVICE FOR OPERATING THE SPINDLES OF SPINNING AND TWISTING MACHINES.

Application filed January 18, 1923. Serial No. 613,562.

*To all whom it may concern:*

Be it known that we, HENRI JEAN LAROCHE, engineer, and LOUIS MONTIGNY, engineer, respectively, a citizen of the French Republic, and a subject of the King of the Belgians, residing, respectively, at Paris, France, 16, Avenue de la Republique, and at Ghent, Belgium, 121 rue Neuve St. Pierre, have invented a certain Improved Device for Operating the Spindles of Spinning and Twisting Machines, of which the following is a specification.

The present invention relates to an improved device for operating the spindles of spinning and twisting machines, and more particularly has for its object to provide a device of the kind referred to which will make it possible to do away with the hemp ropes or the like operating each spindle separately by replacing them by a single element, e. g., a single belt, working under satisfactory conditions.

With this object in view the essential feature of the invention consists in operating by means of a single belt and through the medium of a suitable device, all the spindles of a bench or of one side of a bench of a spinning or twisting machine, and in the particular construction and arrangement of parts of the said device.

In order that the invention may be more readily understood one embodiment of same is, by way of example only, illustrated by the accompanying drawings wherein:

Figs. 1 and 2 are respectively an elevation and a plan showing the path of the single operating belt for a whole bench, that is to say for both sides of the bench.

Figs. 3 and 4 are respectively an elevation and a plan of the individual device provided for operating each spindle by means of the single endless belt.

Referring to Figs. 1 and 2, a ribbon 1 which may be constituted by an endless leather or other belt, travels in a vertical plane along each side of the bench at a speed corresponding to the peripheral speed of the usual spindle cylinders in an ordinary machine.

Each of the spindles 2 is at the base fitted with a friction roller 3, and to each friction roller 3, on the other side of the belt 1 (e. g., towards the inside of the bench) corresponds a vertical pressure roller 4 similar in shape and size to the roller 3 and which tends in a manner which will be described further on to keep the belt against the friction roller 3 when and as long as the spindle 2 requires to be rotated.

15 indicates the main frame of the machine and 16 the end frame, while 17 indicates the railings; 18 and 19 are respectively a fast and a loose pulley and 20 is the main driving pulley for the belt 1, this driving pulley being itself driven from the fast pulley 18 through the medium of mitre-gear 21. 23, 24, 25 and 26 are turn-back belt pulleys and a pair of suitable guide-rollers 22 is provided between the turn-back pulley 23 and the first spindle of the row of spindles on the corresponding side of the bench so as to keep the belt 1 in a vertical plane once it has passed the said pulley 23. The turn-back pulleys 23 and 24 are mounted on a movable carrier which is in any suitable known manner under a permanent pull which tends to cause said carrier to move away from the main pulley 20, for the purpose of tightening the belt and avoiding any slackness of same. The arrangement of the belt illustrated by Figs. 1 and 2 is of course given by way of example only and it is obvious that various other arrangements may be adopted without departing from the principles of the invention.

Referring to Figs. 3 and 4, the pressure rollers 4 are mounted each on a small carrier 5 which slidably rests on the upper face of the longitudinal members carrying the row of spindles.

The said carrier 5 is through the medium of a pair of connecting members 8 connected to a pin 13 carried by lugs provided on an arm of a rocking lever 7 extending at right angles to the line of travel of the belt 1 and of which the other arm carries a weight 10. A member 9 connected to a thread breaking device of known type normally bears at its lower end on a screw 6 carried by the end of the non-weighted arm of the lever 7, and by keeping this arm lowered against a stationary abutment 6′ causes the lever 7 to maintain through the medium of the connecting members 8 the carrier 5 in the position for which the pressure roller 4 is kept against the corresponding face of the belt 1. On the thread breaking device entering into action, the member 9 moves in an upward direction and allows the end 6 of the lever 7 to be raised by the weight 10, thus causing

the pressure roller 4 to be moved away from the belt 1 through the movement thus imparted to the carrier 5 by the connecting members 8. This same movement further causes an adjustable brake-block 14 to be simultaneously applied against the friction roller 3, thus causing the rotation of the spindle 2 to be stopped with rapidity and precision as soon as the member 9 is raised through the thread breaking device entering into action owing to the thread breaking. The said member 9 is connected to a thread breaking device such as that which exists in almost any bench of the kind referred to, which device imparts a slight upward movement to such member 9 when the thread breaks or snaps.

As the belt 1, however perfect, may offer slight variations in its thickness and as it may further become gradually thinner through wear the present invention further comprises means for automatically adjusting the action of the pressure roller 4. These means comprise a crank lever 11, carried by the rocking lever 7 and of which the lower end is provided with a weight 12 while its upper end, under the action of the said weight, is caused permanently to bear on the free ends of the connecting members 8 and to push same towards the belt. The hole in the connecting members 8 through which the pin 13 passes has a somewhat elongated shape, so as to allow a limited sliding movement of the said members in relation to said pin. When the member 9 is in its lower position, the lever 7 and its pin 13 are kept rigidly in position, but through being able to slide in relation to the pin 13 the connecting members 8 permanently push the pressure roller 4 against the belt owing to the fact that they are themselves pushed in the required direction by the lever 11 under the influence of the weight 12. The position of the pressure roller 4 therefore automatically adjusts itself according to the thickness of the belt, and the adjustment permitted by the length of the hole through which the pin 13 passes is sufficient to make allowance for any variations in the said thickness.

By this means the pressure of the roller 4 is kept absolutely constant, and the friction of the belt on the roller 3 is therefore necessarily constant also, so that the causes of variations in the speed of the spindle are reduced to a minimum.

When the lever 7 is enabled to move under the influence of its weight 10 owing to the member 9 being raised, the pin 13 first takes up the play allowed by the hole in the members 8 and then only causes the said members to withdraw the pressure roller 4 from the belt.

Owing to the present invention, it becomes unnecessary to operate each spindle by means of a hemp-rope, a method which has several drawbacks, such as among others: reduced length: about 2–2½ yards for a linear speed of about 12 yards, too small diameter of the spindle cylinders.

Considerable wear on the rope when starting and consequently large friction on the driving cylinders,

Irregularities in the said cylinders.

The well-known drawback resulting from the adjustment of the length of rope, and the irregularities in the operation resulting from the lack of fixity of the cylinders which are very difficult to maintain under satisfactory conditions.

In the present invention these drawbacks are completely avoided. Indeed, there is only a single endless belt which for a machine of normal size, has a length of about 22–28 yards for a linear speed of 12 yards, and which passes only on rollers of sufficient diameter (generally about 12 inches) and on a driving pulley also of large diameter (in most cases about 2 feet to 2′ 8″), so that a perfect contact is obtained. Besides, as the said ribbon or belt operates all the spindles and as the pressure thereof is exactly the same for each spindle, the number of revolutions of all the spindles is of much greater uniformity than when each spindle is operated by a separate rope of which the tension, the degree of wear, and the length vary from one spindle to the other.

On the other hand, when in an ordinary machine a rope is brought out of action, the said rope becomes stationary but the driving cylinder continues to rotate, so that considerable friction and wear on the rope are produced.

It may be mentioned that when a new bench is started, or when certain ropes are replaced, it is necessary to take care that only 6 to 10 spindles should be started at a time, in view of the abnormal tension to which these ropes are subjected. In a machine fitted according to the invention such precautions are obviously unnecessary, and the belt, being calculated according to the power required, works under most rational conditions.

It should be expressly understood that various modifications may be made to the details of the construction illustrated without departing from the spirit and scope of the invention as defined in the appended claim, and more particularly that the arrangement of the belt and the manner in which same is driven may be varied. For instance, instead of using a single endless belt for the spindles of both sides of a bench, a separate belt may be used for the spindles of each side.

We claim:

In a spinning and twisting machine, a

plurality of spindles arranged in a row and having a friction roller at their base, an endless belt arranged to travel in a vertical plane along the whole row of friction rollers of each bench of the machine, and means for driving said belt continuously at a suitable speed and keeping same under tension, in combination with a plurality of devices each comprising a carrier slidably supported on the spindle carrying member and fitted with a vertical roller facing the spindle friction roller on the opposite side of the belt; a weighted rocking lever having one arm provided with lugs carrying a pin; a pair of connecting members between aforesaid carrier and said pin, extending at right angles to the line of travel of the belt and capable of a limited movement in said direction in relation to such pin; means connected to a thread-breaking device of known type for causing the rocking-lever normally to apply the pressure roller against the belt through said connecting members; a weighted crank lever bearing on the ends of such connecting members opposed to the aforesaid carrier; and an adjustable brake mounted on said carrier and suitably positioned thereon to act on the aforesaid friction-roller of the spindle on the pressure roller being moved away from the belt through the aforesaid means permitting the rocking lever to impart the necessary movement to the carrier, through the connecting members, substantially as described.

In testimony whereof we signed hereunto our names.

HENRI JEAN LAROCHE.
LOUIS MONTIGNY.