

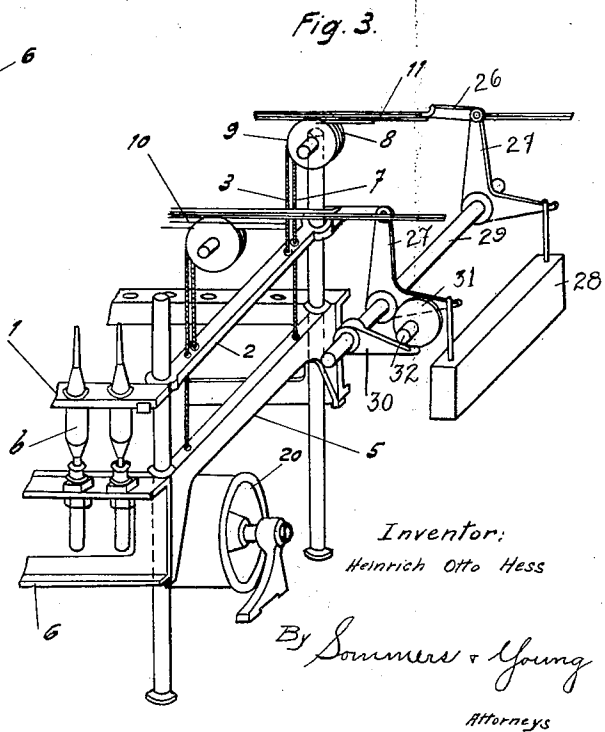
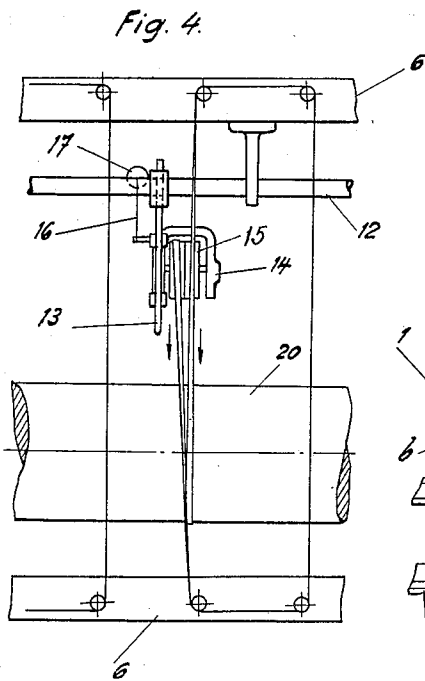
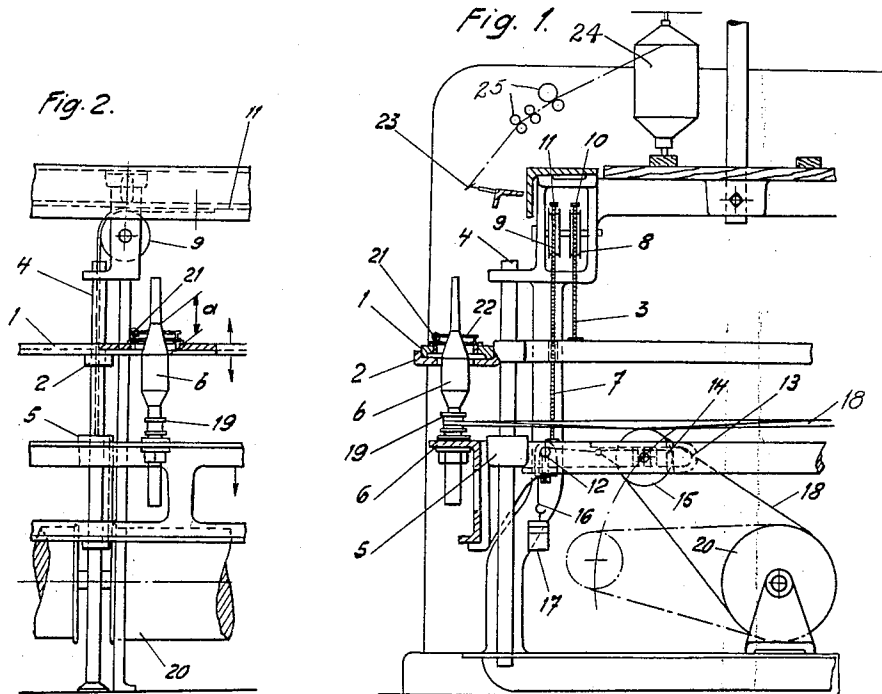
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RING SPINNING AND RING DOUBLING MACHINE HAVING A MOVABLE SPINDLE RAIL

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RING SPINNING AND RING DOUBLING MACHINE HAVING A MOVABLE SPINDLE RAIL

Application filed April 26, 1930, Serial No. 447,639, and in Switzerland May 10, 1929.

This invention relates to ring spinning and ring doubling machines, having a spindle rail and a ring rail which during the winding of the cops move in a vertical direction, and a stationary drum roller for driving the spindles. Thus, the vertical reciprocating motion of the ring rail determines the extent of the building movement for the cop winding operation and the continued downward motion of the spindle rail determines the length of the cop. In this manner a constant thread tension is obtained during the entire cop winding operation. With ring spinning and ring doubling frames of this type, heretofore, the vertical motion of the spindles was effected by taking advantage of the elasticity of the tape or cord drive respectively, but thereby, the uniformity of the tensioning of the driving means and, consequently, the rotation of the spindles is disturbed and the lift of the spindles restricted. With another machine of this type the driving drum is moved together with the spindle rail which arrangement, however, is disadvantageous due to the fact that the drum motion causes vibrations in the spindle rail and the spindles. It is known, to provide tightening rollers swingably arranged on a fixed shaft for the band or tape drive respectively for the spindles of ring spinning and ring doubling machines, and it is also known, for the purpose of varying the number of revolutions of the spindles, to shift guide pulleys associated with the band or tape drive respectively on driving cones of the spindles by means of an automatic control device, the said guide rollers being according to the size of the bobbin vertically adjusted relatively to the spindles.

According to the invention in a ring spinning and ring doubling frame of the aforesaid type, guiding and tightening pulleys are provided for the band or tape respectively for driving the spindles from the tin roller, the said pulleys moving in unison with the spindle rail, so as to maintain the same height relatively to the spindles, whilst in consequence of an automatic displacement of the guiding and tightening pulleys the required

length for the band or tape respectively is continuously equalized.

Thereby the point of engagement of the driving means on the spindles and the tensioning thereof remains the same at all times, so that together with a smooth and uniform running of the spindles a large lift and a correspondingly great length of the cops and a perfect working operation is obtainable.

In the accompanying drawing a constructional form of a machine according to the invention is shown by way of example only, wherein

Fig. 1 shows a front elevation of one half of the machine;

Fig. 2 is a partial side elevation thereof;

Fig. 3 illustrates, in a perspective view, schematically means for the actuation of the ring and spindle rails of one half of the machine, the other half of the machine situated to the right in this figure being omitted; and

Fig. 4 is a fragmentary top plan view of the tension roller and endless driving means.

Referring to the drawing, 1 designates ring rails resting on transverse supports 2 which in turn are suspended by means of chains 3 and guided on bars 4, so as to be secured from lateral displacement. The bars 4 serve also for guiding the supporting members 5 which are rigidly connected to the spindle rails 6 and hang on chains 7. The chains 3 and 7 are passed over rollers 8 and 9 respectively, mounted in the machine frame, and are attached to the flat rails 10 and 11 respectively. The supporting members 5 are moved by a shaft 12 which extends the full length of the machine and which carries stirrups 13 of tightening appliances for a band or a tape drive for the spindles. In the stirrups 13 a carriage 14 is slidably arranged in which the guiding and tightening pulleys 15 have their bearings. Weights 17 are hanging on short chains 16 suspended from the shaft 12, the said weights imparting the requisite tension to the driving tape 18. The guiding and tightening pulleys 15 are of double width, the engaging and the delivery side of the tape 18 being both placed on the same pulley. Alternatively, a twin roller may be provided.

The drive of the spindles 19 is derived from the stationary driving drum 20 by means of the bands or tapes 18 by conveniently combining four spindles each in a group, such a group including two spindles in each half of the machine, to be actuated from the same tape, passing from the driving drum 20 over the wharves of all the four spindles of the group and back to the said drum, in known manner, for the sake of clearness not shown in Fig. 3.

The operation of the machine is as follows:

The transverse supports 2 are moved up and down in regular intervals, and corresponding to the extent of the traversing movement required for the winding operation so that the ring rails 1 are constantly travelling through the stretch *a* (Fig. 2). This is effected by the aid of an auxiliary device comprising bell crank levers 27 to which the rails 10 are connected, by means of links 26 (see Fig. 3), which levers are fixed on a shaft 29 which is intermittently turned in the one or other direction by the intermediary of a crank arm 30, mounted on the said shaft, and an eccentric 31 mounted on a shaft 32 and cooperating with the crank arm 30 to rock the latter in regular intervals.

In order to maintain the bell crank levers 27 in equilibrium the ends of the other arms thereof are loaded by a counterweight 28. At the same time the rail 11 is slowly, but continuously shifted to the left in Fig. 2, whereby the supporting members 5 together with the spindle rails 6 are performing a correspondingly slow downward movement and, consequently, the length of the cops *b* is increased proportionately. The gradual downward movement of the spindle rail 6 is brought about by known means for building of the cop. Thereby it is attained that the winding of the different threads, running off supply bobbins 24 and subsequently passing a drawing arrangement 25 of known construction, onto the cops, relatively to the floor on which the machine is mounted, is effected at all times at the same level i. e. within the stretch *a*, with a view of obtaining a thread tension as constant as possible. The free length of the thread from the traveller 21, on the ring 22 to the thread guide 23', therefore, changes only for the extent *a* of the building movement for the winding operation. When the spindle rails 6 are lowered, the shaft carrying the guiding and tightening pulleys 15 is moved in unison therewith by means of the supporting members 5. At the end of this movement the pulleys 15 assume their lowermost positions, as shown in dot and dash lines in Fig. 1. The variation in the required length for the band or tape respectively for driving the spindles 19 caused by this downward movement of the pulleys 15 is equalized by the displacement of the said pulleys together with the

carriages 14 in the stirrups 13 by action of the weights 17, whereby, the guiding and tightening pulleys 15 maintain their height with respect to the spindle wharves. The spindle rails 6 perform a continuous downward movement which determines the length of the cops.

In consequence of the connection of the spindle rails on two opposite sides of the machine by means of common supporting members a congruent motion of the rows of spindles arranged on both sides of the machine is obtained.

I claim:

1. In a ring spinning and ring doubling machine of the type described, a stationary driving drum, endless driving means for actuating the spindles of the machine, pulleys for the said endless driving means for guiding and tightening the same, a vertically movable spindle rail carrying the said spindles, means for moving the said pulleys in unison with the said spindle rail, means for so automatically displacing the said pulleys relatively to the said driving drum, as to continuously equalize the required length for the said endless driving means, said means including a single individual movable tension roller, said roller being of double width whereby the end of the endless drive means, which runs on the drive drum as well as the end which runs off said drum is guided and tensioned.

2. In a ring spinning and ring doubling machine of the type described, a stationary driving drum, endless driving means for actuating the spindles of the machine, pulleys for the said endless driving means for guiding and tightening the same, a vertically movable spindle rail carrying the said spindles, means for moving the said pulleys in unison with the said spindle rail, and means for so automatically displacing the said pulleys relatively to the said driving drum, along a guide member, as to continuously equalize the required length for the said endless driving means, said means including a single individually movable tension roller.

3. In a ring spinning and ring doubling machine of the type described, a stationary driving drum, endless driving means for actuating the spindles of the machine, pulleys for the said endless driving means for guiding and tightening the same, the said pulleys having the double width of the said endless driving means for accommodating the engaging and delivery side thereof, a vertically movable spindle rail carrying the said spindles, means for moving the said pulleys in unison with the said spindle rail, means for so automatically displacing the said pulleys relatively to the said driving drum, as to continuously equalize the required length for the said endless driving means, said means including a single individually movable tension roller.

4. The combination with an endless drive

belt of spindles mounted on a spindle rail, a drive drum over which said endless belt passes, of a single individually movable tensioning roller over which said endless belt
5 extends, said tensioning roller being of double width whereby the end of the endless belt which runs on the drum as well as the end which runs off is guided and tensioned.

In testimony whereof I have signed my
10 name to this specification.

HEINRICH OTTO HESS.

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