N. L. LAWTON.

STOP MOTION FOR SPINNING MACHINES.

APPLICATION FILED APR. 26, 1921.

1,414,883. Patented May 2, 1922.

3 SHEETS—SHEET 1.

Fig. 1.

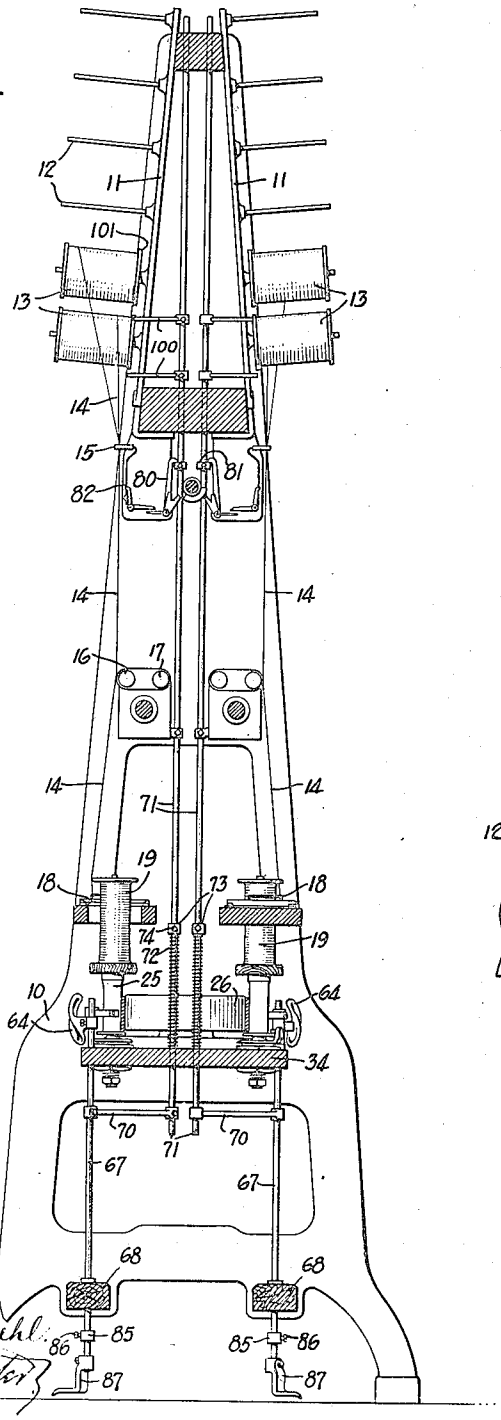
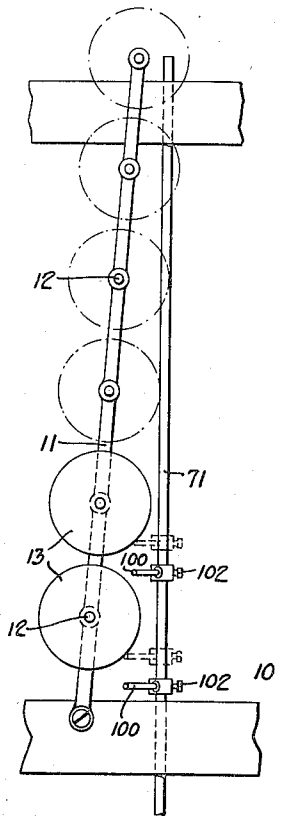


Fig. 2.



WITNESSES

Frederick Diehl

Geo. J. Hooster

INVENTOR

NATHAN L. LAWTON

BY Munn & Co

ATTORNEYS

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3 SHEETS—SHEET 2.

Fig.3.

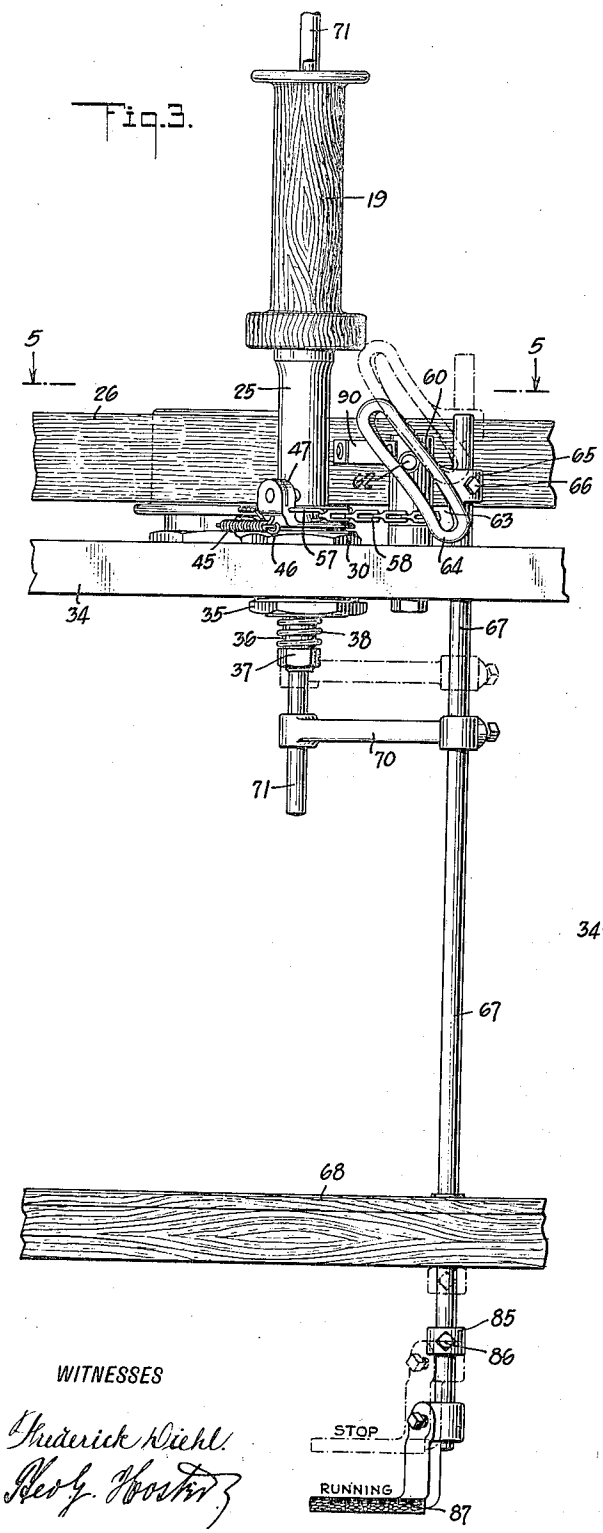
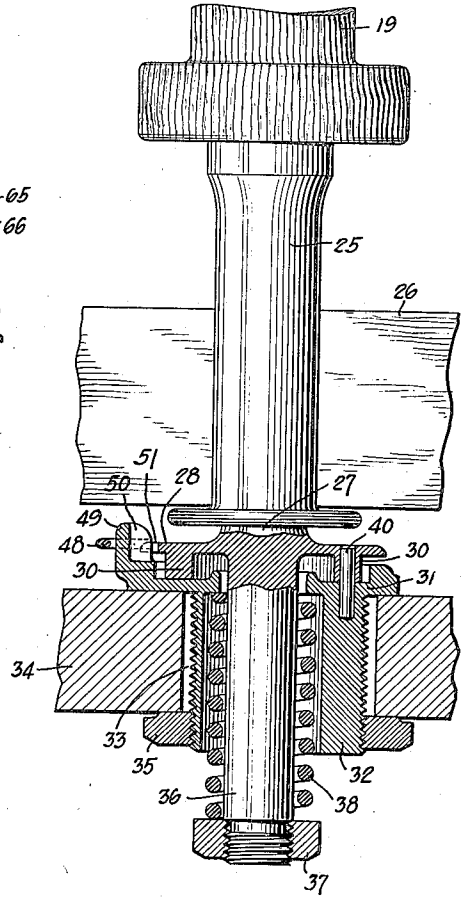


Fig.4.



WITNESSES

Frederick Kiehl.

Geo. G. Hoster.

INVENTOR

NATHAN L. LAWTON

BY Munn & Co

ATTORNEYS

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3 SHEETS—SHEET 3.

Fig. 5.

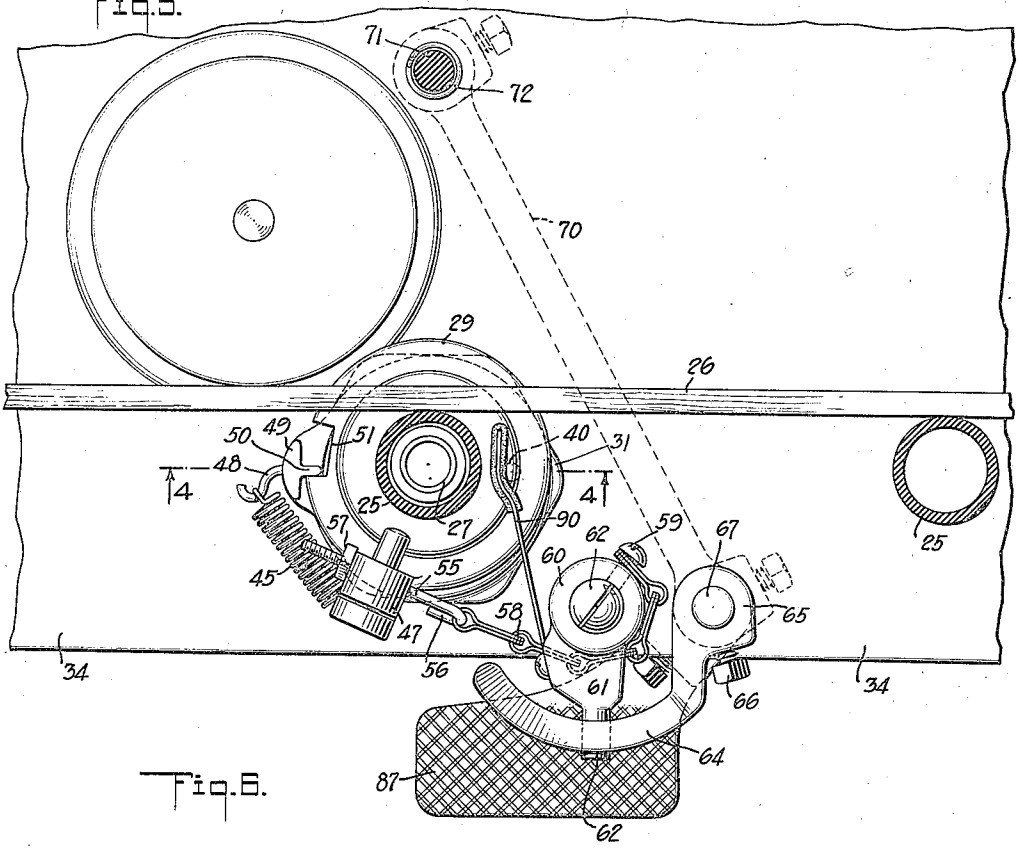
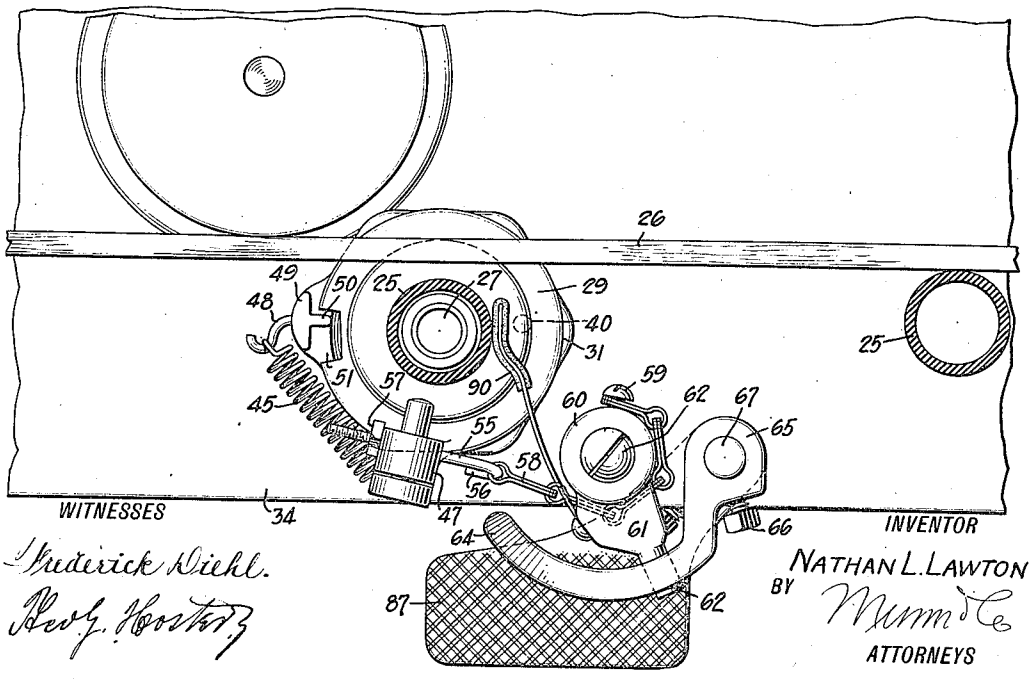


Fig. 6.



WITNESSES

Frederick Diehl.

Benj. Hoostetz

INVENTOR

NATHAN L. LAWTON

BY Munn & Co

ATTORNEYS

UNITED STATES PATENT OFFICE.

NATHAN L. LAWTON, OF DOVER, NEW JERSEY.

STOP MOTION FOR SPINNING MACHINES.

1,414,883. Specification of Letters Patent. Patented May 2, 1922.

Application filed April 26, 1921. Serial No. 464,544.

To all whom it may concern:

Be it known that I, NATHAN L. LAWTON, a citizen of the United States, and a resident of Dover, in the county of Morris and State of New Jersey, have invented a new and Improved Stop Motion for Spinning Machines, of which the following is a full, clear, and exact description.

The invention relates to textile spinning and its object is to provide a new and improved stop motion for spinning machines arranged to automatically stop the winding up spool from running in case the yarn breaks.

Another object is to relieve the driving belt for the spindles of undue wear incident to moving the belt out of engagement with the spindle, as heretofore practiced.

Another object is to stop the rotation of the unwinding spools in case the yarn breaks to prevent tangling of the loose ends of a broken yarn with the yarns of the adjacent spools.

With these and other objects in view, the invention consists of certain novel features of construction as hereinafter shown and described and then specifically pointed out in the claims.

A practical embodiment of the invention is represented in the accompanying drawings forming a part of this specification, in which similar characters of reference indicate corresponding parts in all the views.

Figure 1 is a cross section of a spinning machine provided with the improved stop motion;

Figure 2 is a front view of the stopping device for the unwinding spools;

Figure 3 is an enlarged front elevation of the stop motion as applied;

Figure 4 is an enlarged sectional front elevation of the same on the line 4—4 of Figure 5, parts being shown in elevation;

Figure 5 is a sectional plan view of the same on the line 5—5 of Figure 3 and with the parts in running position; and

Figure 6 is a similar view of the same with the parts in stop position.

The spinning machine is mounted on a suitably constructed main frame 10 on the upper portion of which are arranged the usual racks 11 disposed on opposite sides of the frame and each carrying pins 12 supporting sets of spools 13, and from each set of spools unwind a corresponding number of yarns 14 passing downward through eyes 15 and around driven feed rolls 16 and 17 to then pass through the traveler 18 and finally wind in spun condition on the winding up spool 19. Each spool 19 is removably mounted on the upper end of a spindle 25 normally in driving contact with an endless driven belt 26 to rotate the spindles on both sides of the machine at the same time and in unison. The construction so far described is that of an ordinary silk spinning machine as now generally used and hence further detail description of the general arrangement is not deemed necessary. Each spindle 25 is mounted on a supporting pin 27 provided with a flange 28 from which depends a rim 30 resting on a base 31 having a depending hub 32 extending through an opening 33 formed in the table 34 forming part of the main frame 10. A nut 35 screws on the hub 32 to securely and adjustably hold the base 31 in position on the table 34. From the flange 28 depends centrally a pin 36 extending eccentrically through the hub 32 and carrying at its lower end a nut 37 on which rests a spring 38 coiled on the pin 36 and abutting with its upper end against the under side of the base 31 to hold the rim 30 with the desired friction in engagement with the base 31. By extending the pin 36 eccentrically through the hub 32 the spindle 25 can be adjusted relative to the belt. The rim 30 is pivotally connected by a pivot pin 40 with the base 31 and this pivot pin 40 is parallel to the axis of the spindle 25 to allow of swinging the spindle 25 bodily into or out of engagement with the belt 26. Normally the spindle 25 is in driving engagement with the belt 26 by the action of a spring 45 attached at one end to a hook 46 secured to a lug 47 formed on the flange 28 of the rim 30, and the other end of the spring 45 is attached to a hook 48 projecting from a lug 49 forming part of the base 31. The lug 49 is provided with a tooth 50 projecting into a slot 51 formed in the flange 29 of the rim 30 to limit the bodily swinging movement of the rim 30 and consequently that of the spindle 25 carried thereby.

The lug 47 previously mentioned is engaged by the shank 55 of a hook 56, and on the said shank screws a nut 57 abutting against the lug 47. The hook 56 is connected with one end of a chain or other flexible connection 58 attached at its other end to a screw or similar device 59 fastened on the peripheral face of a hub 60 forming

part of a swing arm 61. The hub 60 of the swing arm 61 is mounted to turn on a stud 62 attached to the table 34. The swing arm 61 is provided at its outer end with a pin 62 projecting into a slot 63 of a cam 64 having a boss 65 secured by a set screw 66 to the upper ends of a rod 67 mounted to slide up and down in the table 34 and in a beam 68 forming part of the main frame 10.

Normally the pin 62 is in the upper portion of the slot 63 of the cam 64 (see Figure 3) with the spindle 25 in driving contact with the belt 26. Now in case the rod 67 is moved upward and with it the cam 64 then the latter by the action of its cam groove 63 and the pin 62 imparts a swinging motion to the swing arm 61 to cause the flexible connection 58 and its hook 56 to impart a swinging movement to the rim 30 and the spindle support 27 to move the spindle 25 out of engagement with the driving belt 26, thus stopping the spindle 25.

The rod 67 is provided with an arm 70 attached to the lower end of a rod 71 mounted to slide up and down in bearings arranged on the main frame 10, and the said rod 71 is pressed in an upward direction by a spring 72 coiled on the rod and resting at its lower end on top of the table 34 and abutting at its upper end against a collar 73 fastened by a set screw 74 to the rod 71. The spring 72 is normally under tension and the rod 71 is held in lowermost position by a hook 80 engaging a collar 81 attached to the rod 71. The hook 80 forms part of a tripping mechanism 82 of which the eye 15 forms a part, but as this tripping mechanism is of usual construction further description of the same is not deemed necessary, it being sufficient to state that in case a yarn 14 breaks the tripping mechanism 82 is actuated and its hook 80 is moved out of engagement with the collar 81 thus allowing the spring 72 to move the rod 71 upward. When this takes place the arm 70 connecting the rods 67 and 71 with each other causes an upward movement of the rod 67 to actuate the cam 64, as above explained. The upward movement of the rod 67 is limited by a stop collar 85 adjustably secured by a set screw 86 to the rod 67 below the beam 68. The lower end of the rod 67 is provided with a treadle 87 adapted to be engaged by the operator's foot to move the rod 67 and with it the rod 71 downward after the broken yarn has been repaired and it is desired to re-engage the spindle 25 with the belt 26.

From the foregoing it will be seen that normally the spindle 25 is in frictional contact with the driving belt 26 to rotate the spindle 25 and with it the spool 19 on which winds the yarn 14 after leaving the traveler 18. In case a yarn breaks intermediate the traveler 18 and the spool 13 then the releasing device 82 is actuated to release the corresponding rod 71 which by its spring 72 is moved upward and with it the rod 67. When this takes place the cam 64 is moved upward and by its engagement with the pin 62 imparts a swinging movement from the left to the right to swing the arm 61 whereby the latter exerts a pull on the flexible connection 58 and thereby swings the rim 30 of the spindle support 27 outward thus moving the spindle 25 out of engagement with the belt 26, as plainly shown in Figure 6. It is understood that in machines of this type it has been customary to move the belt 26 out of engagement with the spindle 25 by the use of an idler, but such arrangement produced undesirable wear on the belt and the idler. A brake 90 is attached to the swing arm 61 and is adapted to engage the spindle 25 at the time the latter swings out of engagement with the belt 26, as will be readily understood by reference to Figures 5 and 6.

In order to immediately stop the unwinding spools 13 from rotating after a yarn 14 breaks use is made of brake arms 100 attached to the rod 71 and normally extending in close proximity to the peripheral faces of the rear flanges 101 of the spools 13, as plainly shown in Figure 1. The brake arms 100 are adjustably secured by set screws 102 on the rod 71 and hence when the latter moves into uppermost position after being released as previously mentioned then the brake arms 100 move into engagement with the peripheral faces of the spools 13 to brake the same and thus stop the rotation incident to the pull exerted by the feed rolls 16 and 17 on the slot 14. It will be noticed that by this arrangement the broken end of a yarn dangling from a spool 13 is not liable to become entangled with an adjacent spool to the right or to the left of the spool having the broken yarn.

Having thus described my invention, I claim as new and desire to secure by Letters Patent:

1. In a spinning machine, a driven belt, a spindle, a spindle support having a pivot parallel to the axis of the spindle to allow the spindle support to swing bodily to move the spindle into and out of engagement with the said belt, a spring pressing the said spindle support to hold the spindle in contact with the said belt, a member mounted to turn on an axis parallel to the axis of the spindle, a connection connecting the said member with the said spindle support, a cam controlling the said member, and means controlled by the yarn to be wound on a spool held on the spindle and controlling the said cam to move the spindle out of engagement with the said belt on the breaking of the yarn.

2. In a spinning machine, a driven belt, a

spindle, a spindle support having a pivot parallel to the axis of the spindle to allow the spindle support to swing bodily to move the spindle into and out of engagement with the said belt, a spring pressing the said spindle support to hold the spindle in contact with the said belt, an arm having a hub mounted to turn on an axis parallel to the axis of the spindle, a flexible connection connecting the said hub with the said spindle, a cam engaging the said arm, a spring pressed rod mounted to slide and carrying the said cam, and a holding and releasing device for the said rod and controlled by the yarn to be wound on a spool held on the said spindle.

3. In a spinning machine a driven belt, a spindle, a spindle support having a pivot parallel to the axis of the spindle to allow the spindle support to swing bodily to move the spindle into and out of engagement with the said belt, a spring pressing the said spindle support to hold the spindle in contact with the said belt, a member mounted to turn on an axis parallel to the axis of the spindle, a connection connecting the said member with the said spindle support, a cam controlling the said member, means controlled by the yarn to be wound on a spool held on the spindle and controlling the said cam to move the spindle out of engagement with the said belt on the breaking of the yarn, and limiting means to limit the bodily swinging movement of the arm to the spindle support.

4. In a spinning machine, an unwinding spool, a spring-pressed rod having a fixed arm adapted to engage the said spool, and a holding and releasing device controlled by the yarn unwinding from the said spool and engaging the said rod to hold the latter normally in inactive position and to release the rod on the breaking of the yarn, said device comprising a pivoted L shaped arm having a catch engaging the rod, and a second L shaped arm having an eye through which the yarn passes, normally bearing against said first mentioned arm.

5. In a spinning machine, a spindle support adapted to carry a spindle for a spool for winding up the yarn, the spindle support having a rim, a base on which the said rim is mounted to turn, and a pivot pin parallel to the axis of the spindle and connecting the rim with the base to allow the spindle support to swing on the said pivot.

6. In a spinning machine, a spindle support adapted to carry a spindle for a spool for winding up the yarn, the spindle support having a rim, a base on which the said spindle rim is mounted to turn, a pivot pin parallel to the axis of the spindle and connecting the rim with the base to allow the spindle support to swing on the said pivot, and a spring interposed between the base and the spindle support to hold the rim in engagement with the base.

7. In a spinning machine, a spindle support adapted to carry a spindle for a spool for winding up the yarn, the spindle support having a rim, a base on which the said rim is mounted to turn, and a pivot pin parallel to the axis of the spindle and connecting the rim with the base to allow the spindle support to swing on the said pivot, the said rim having a notch and the said base having a lug projecting into the said notch to limit the bodily swinging movement of the said spindle support.

NATHAN L. LAWTON.