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W. G. MORRISON.
STOP MOTION FOR SPINNING.

APPLICATION FILED SEPT. 2, 1896.

NO MODEL.

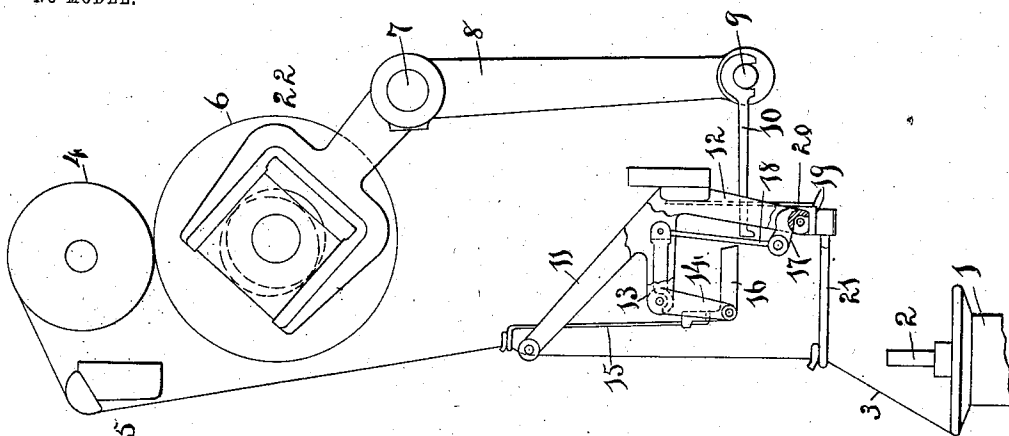


Fig. 1.

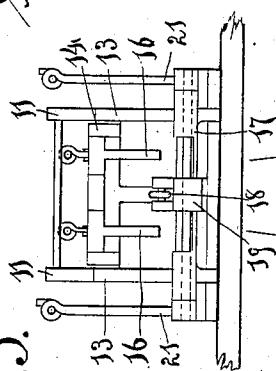


Fig. 2.

Fig. 3.



Fig. 4.

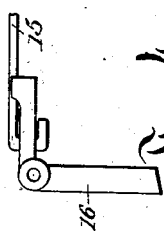


Fig. 5.

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STOP-MOTION FOR SPINNING.

SPECIFICATION forming part of Letters Patent No. 729,384, dated May 26, 1903.

Application filed September 2, 1896. Serial No. 604,637. (No model.)

To all whom it may concern:

Be it known that I, WALTER G. MORRISON, a citizen of the United States, and a resident of Willimantic, in the county of Windham and State of Connecticut, have invented certain new and useful Improvements in Stop-Motions for Spinning-Frames, of which the following is a full, clear, and exact description, whereby any one skilled in the art can make and use the same.

My invention relates to the class of devices used in spinning-frames for automatically stopping the winding operation when for any reason a strand or thread shall be broken; and the object of my invention is to provide a device of this class that shall be positive in operation, that will respond quickly upon the breaking of a thread, and that shall preserve an even tension upon the threads being wound, the device providing means whereby the supply of thread being wound is cut off rather than by the stopping of any of the running parts of the machinery.

Referring to the drawings, Figure 1 is a detail diagram view, in side elevation, of parts of a spinning-machine and showing the relative location of my improved stop-motion device. Fig. 2 is a detail diagram view, in front elevation, of parts of a spinning-machine, showing my improvement. Fig. 3 is a detail bottom view of the stop-motion device. Fig. 4 is a detail side view of the stop-motion device shown in position to stop the winding operation. Fig. 5 is a detail view showing in front and side elevation drop-wires and illustrating the method of securing them to the foot.

In the accompanying drawings the numeral 1 denotes supply-bobbins mounted on the blade of a spindle 2 and from which thread 3, as silk, is supplied to the bobbin 4, upon which it is wound, the thread passing through the thread-guide 5. This thread-guide is mounted on a reciprocating thread-guide rail in a manner well known to this class of machines, and further description is deemed unnecessary.

My improved device is especially applicable in the twisting and doubling of silk threads

at a single operation, it being necessary to preserve an equal tension upon each of the threads wound upon the bobbin 4, and my improved device is especially applicable on machines where the tension is obtained only by revolving the spindles at an extremely high rate of speed.

An eccentric 22 is borne on the shaft extending lengthwise of the machine, and a cylinder 6 is also secured to the shaft in operative relation to the bobbin 4, that receives motion therefrom by frictional contact. This eccentric is operatively connected to a bell-crank lever 8, mounted on a pivot 7, the opposite end of the lever bearing a stud 9, to which is connected a drag 10.

In spinning-machines in connection with which my device is readily adapted the spindles are arranged in groups placed close together, the threads from each spindle of a group being wound on a single bobbin. In devices used on spinning-machines of this class where the rotation of the receiving-bobbin ceases in the operation of the stop device a difficulty occurs from the fact that the loose ends of the light thread being wound float about in the currents of air caused by the revolutions of the spindles or like parts, and become entangled therein or adhere to other threads, causing the breaking of other strands of thread, and this will continue for a considerable distance along a spinning-frame before the operative has time to take up the loose ends or stop the machine. In my improved device I have overcome this difficulty by continuing the rotation of the receiving-bobbin thereby winding up all loose ends. In this operation, however, it has been found necessary to break the remaining strands that are wound into a single thread on a bobbin in order to prevent the winding of imperfect threads.

A frame consisting of upward-projecting side parts 11, downward-projecting side parts 12, and forward-projecting side parts 13 is mounted underneath the bobbin 4. A trip-lever 14 is pivoted between the forward-projecting side parts 13, and a drop-wire 15, appurtenant to each spindle in the group, is piv-

oted on said lever. Each drop-wire is secured to a foot 16, projecting therefrom at an angle preferably horizontally, the weight of this foot being sufficient to swing each of the drop-wires backward when not supported in an upright position. A rocking lever 17 is pivoted between the downward-projecting side parts 12 of the frame and is connected by a link 18 with the trip-lever 14. This rocking lever 17 is provided with cam-surfaces 19, each located at an angle with the other, and a spring 20, secured to the frame, bears against these cam-surfaces. Thread-engaging arms 21 project forward from the rocking lever in a position to engage the threads from the supply-bobbin, one of these arms being provided appurtenant to each spindle from which thread is being supplied. The spring 20 is provided for the purpose of causing the rocking lever 17 to operate with some force after a certain degree of movement has been imparted to the device by means of engagement of the drag 10 with a foot 16, the spring bearing with considerable force against one or the other flat cam-surfaces 19 and causing rotation of the parts under the impulse of the spring after the drag has ceased to operate thereon.

The operation of the device is as follows: The parts being in the relative position shown in Figs. 1, 2, and 3 of the drawings, with the thread 3 projecting upward through eyelets in the thread-engaging arms 21 and in engagement with the ends of the drop-wires 15, as the drag 10 is reciprocated by the eccentric 22 the drag escapes contact with the foot portion 16 of the drop-wire. When a thread breaks for any reason, the drop-wire is tipped backward by the weight of the foot 16 into the path of movement of the drag 10, the drop-wire engaging a fixed stop on the tension-lever. As the drag encounters the foot of the drop-wire the trip-lever is rocked on its pivot, and, through means of the connecting-link 18, throws the thread-engaging arms 21 on the rocking lever 17 downward and backward, which movement is accelerated as the spring 20 comes in contact with the next cam-surface on the rocking lever. This breaks the remaining thread or threads from the group of spindles, and the ends are immediately wound upon the bobbin 4 until such time as the operative shall take up the ends and start the machine in operation.

It is obvious that a single eccentric device may be used for operating a number of the stop-motion devices appurtenant to each group of spindles, the upper branch of the bell-crank lever in this instance being attached to the pivot 7 and arms extending downward therefrom appurtenant to each of the stop-motion devices. The drags may extend in both directions from the arm 8 to operate stop-motion devices on each side of the machine.

In Fig. 5 of the drawings I have shown an improved means of securing the drop-wire to the foot 16. In prior devices it has been the

custom to secure the drop-wire to the foot in the process of casting, but this necessitated the removal of the foot from the machine and the substitution of a new one. By my improved method of attachment the wire can be easily and quickly removed from the foot with the latter in place and a new one substituted at any time when needed. A groove 23 is formed lengthwise along the upright arm of the foot, into which the shank of the drop-wire 15 is inserted. The wire may be held in this groove by any desired means, the side parts of the groove preventing the wire from moving sidewise. In the preferred form of the device a hole 24 is made through the upright arm of the foot portion 16, the lower end of the wire inserted within this hole and then bent backward, resting against the back of the upright portion of the foot. The back-turned portion of the wire prevents it from being forced out of the groove and the side walls of the groove prevent any sidewise movement. This manner of attachment of the drop-wire provides an inexpensive means of attachment and one in which a wire may be readily removed and replaced by a new one.

I claim as my invention—

1. In combination in a spinning-frame, a plural number of spindles adapted to receive supply-bobbins, a drop-wire arranged to engage a thread from each of said bobbins, thread-engaging arms to engage each thread from a set of bobbins, each of said arms being mounted on a common swinging support, and means adapted to be connected with the drop-wires for swinging said support to simultaneously snap all the threads common to a set of bobbins.

2. In combination in a spinning-frame, a plural number of spindles adapted to receive supply-bobbins, drop-wires arranged to engage threads from said bobbins, thread-engaging arms to receive each thread from a set of bobbins, said arms being mounted on a common swinging support, and means set in operation by the drop-wire on failure of the thread for forcibly swinging said support to simultaneously break all of the threads.

3. In a spinning-frame, in combination with a number of spindles adapted to receive supply-bobbins, a drop-wire appurtenant to each of the threads, thread-engaging means appurtenant to each drop-wire, means for initially moving the thread-engaging means, and means for forcibly moving said means to snap all of the threads on the breaking of a single thread.

4. In combination, a base having a lengthwise groove, and an opening through the base depthwise of the groove, a drop-wire with its shank located in the groove, and with its end projecting through the opening and back-turned along the base.

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