THREAD HOLDING DEVICE FOR USE ON SPINNING MACHINES

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1. Claim. (Cl. 57—53)

This invention relates in general to spinning machines, and, in particular, to a new and useful device for maintaining the first few turns or coils of thread on a spindle during the operation immediately after removal of a fully wound spindle.

In a spinning machine, when a fully wound spindle is removed upwardly from its spindle by hand, the thread supplied to the spindle remains joined to the removed spindle during the formation of a few turns of thread on the empty spindle, which turns must be held on the spindle by the tightly drawn thread coming from the removed spindle. At this moment, the empty spindle must be placed on the spindle by hand and the thread turns must be wedged between the spindle and the spool so that the thread between the completed spool and the spindle about to be formed can be torn. In those machines where the removal and replacement of spools is effected automatically by means of the so-called "spool changers" the thread between the full spindle and the spindle must be cut before a new spindle can be placed on. Because the turns of the thread on the spindle are no longer retained under tension, there is a tendency for the threads to move downwardly on the spindle due to their weight so that a separate operation is necessary to join the thread end with an empty spool which is newly inserted on the spindle. The second problem is to maintain the joining of the thread end with the new empty spool automatically. For this it is necessary to maintain the thread end or the turns of the thread on the spindle until the thread ends and turns are clamped by a newly inserted spool.

In accordance with the invention, there is provided means for directing an air current against the turns on the empty spindle in the manner such that the turns are maintained in position on the spindle as they are newly formed initially. Preferably the air current is directed from below and obliquely against the probable fall of the thread turns, that is the small weight of the thread turns is equalized by the air current or air pressure acting on the spindle. By providing a pneumatic retaining means for the newly-formed threads on the spindle, it is possible to place a new spool on the spindle after removal of a full spool without having any apparatus in the way to hinder the operation. The invention is advantageously embodied on a spinning machine having a spool changing carriage, which is movable relative to a spinning bench or bank of spindles. In such a construction, means such as blower or compressor hose is mounted on the carriage and arranged to direct an air current against the spindles having spools which are being changed in order to maintain the first few turns of thread on the spindles after the thread has been severed from the finished spools. The construction is such that two or three successive spindles in a row may be controlled with the air current simultaneously. In addition, it is possible to control the desired direction of the air current by the particular arrangement of an air directing channel arranged in the spool changing carriage and connected to the blower. In some instances, it is preferable to connect the carriage with a compressed air line, which is arranged thereon in a position for directing air outwardly from the carriage toward the spindles at an angle to insure the maintenance of the turns on spools which are being wound.

A further advantage of the device is that the air pressure directed against the spool changing and spindle operating mechanism will insure that such mechanism is maintained free of dust and dirt. Accordingly, it is an object of this invention to provide an improved spinning machine construction with means for facilitating the retention of initial windings of thread on a spindle and the formation of threads on a spool which is about to be wound.

A further object of the invention is to provide means for directing air against a spindle for the purpose of maintaining the threads which are being newly formed on the spindle in the position they assume as they are formed immediately after the thread has been cut from a previously wound spool which has just been removed from the spool.

A further object of the invention is to provide a spinning machine with means for insuring proper thread formation on a spindle which is simple in design, rugged in construction and economical to manufacture.

The various features of novelty which characterize the invention are pointed out with particularity in the claims annexed to and forming a part of this specification. For a better understanding of the invention, its operative advantages and specific objects attained by its use, reference should be had to the accompanying drawings and descriptive matter in which there is illustrated and described a preferred embodiment of the invention.

In the drawings:

FIG. 1 is a partial side elevational and partial sectional view of a spool changing carriage of a spinning machine indicating a fully wound spool which has been removed from the spindle and moved upwardly;

FIG. 2 is section taken on the section line 2—2 of FIG. 1; and

FIG. 3 is somewhat similar to FIG. 1, but taken from the opposite end of the machine.

Referring to the drawings, in particular, the invention comprises a spinning machine including a spool changing carriage 1 along side of which there is arranged a spool changing carriage 2 which is displaceable in a known manner, and preferably continuously. A guide rail 3 (FIG. 3) defines a trackway for rollers 4 which are rotatively carried by the carriage 2 to permit movement thereof on the rail.

As partly indicated at FIG. 1, within the carriage 2 there are mechanisms and controls for devices generally designated 20. By a device (not shown) the thread is indicated just after being cut at a location below the spool 5. The loose thread end is indicated 8. The thread 10 is being supplied from above by the thread guide 9 and a few turns of the thread indicated 11 have already been applied around the spool. In the embodiment of the invention illustrated the carriage 2 includes a lower compartment or chamber 2a in which there is provided an electric motor driven blower 12 which takes air in from the exterior of the carriage 2 and discharges it into the chamber 2a. A wall 2 at the top of the chamber 2a has an opening 13 which is covered by a guide channel or air directing dust 14, which extends either entirely or at least in its last section obliquely from below and upwardly; air is directed upwardly at an angle, as indicated in FIG. 1, by the issued air current 15. The outlet opening, or aperture 15a, for the air current lies in the back wall of the carriage 2 and preferably is of such a length that, for example, three spindles are hit simultaneously by the air current (see FIG. 2).
The blower 12 may run continuously or be connected by the carriage control (not shown), which actuates the blower during the removal of a fully wound spool 5. After the thread has been cut, the thread turns 11 present on the spindle 7 are retained by the air current 15 or prevented from sliding off the spindle 7. By means of the device 20, with associated controls (not shown) an empty spool 16 (FIG. 3) is now placed on the spindle 7 and then the thread turns 11 are clamped between the spool 16 and the spindle 7.

By means of the air current 15, which is directed obliquely forward and upwardly in the direction of the movement of the carriage which is indicated by the arrow in FIG. 3, provision is made that the thread is retained on the spindle during the entire time from the removal of a wound spool to the placing on of an empty spool.

While a specific embodiment of the invention has been shown and described in detail to illustrate the application of the inventive principles, it will be understood that the invention may be embodied otherwise without departing from such principles.

What is claimed is:

For use on a spinning machine comprising a spindle bench having a plurality of rotatable spindles mounted thereon, a carriage arranged alongside said bench and movable relative to said bench, said carriage having means on said carriage for removing a fully wound spool from a spindle on said spindle bench, means for directing an air stream against at least one of the spindles in a direction for maintaining newly wound thread thereon in position prior to the insertion of a new spool on the spindle, said last-mentioned means comprising means defining an interior compartment in said carriage, a blower mounted in said compartment and arranged to direct air therein for pressurizing said compartment, and means defining a discharge channel extending from said compartment and terminating in an opening disposed for directing a stream of air against at least one spindle in a direction obliquely upwardly for retaining the threads formed thereon in position so that they will not fall down under the influence of gravity.