

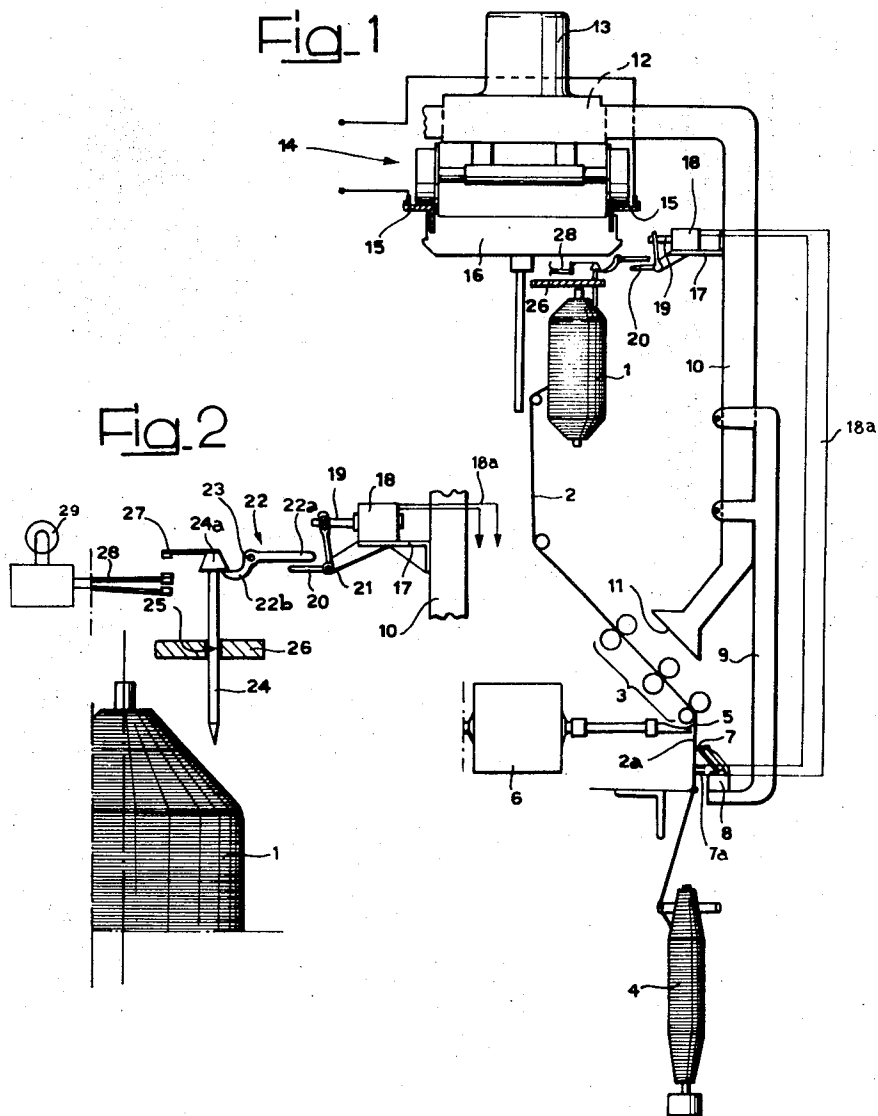
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DEVICE FOR REDUCING YARN WASTAGE IN A TEXTILE MACHINE

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DEVICE FOR REDUCING YARN WASTAGE IN A TEXTILE MACHINE

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2 Claims

ABSTRACT OF THE DISCLOSURE

A textile machine such as a spinning frame has a yarn break detector which, upon detecting a broken yarn, causes an electrical actuator to operate so as to break the yarn ahead of a yarn-drawing region, thereby reducing wastage of the yarn upon breakage.

This invention relates to devices for reducing yarn wastage in textile machines, such, for example, as spinning frames and twisting frames.

It is known to provide in such machines means for automatically detecting and signalling breakage of yarn. For example, one such known yarn breakage detector means, disclosed in British Patent 942,791 to Electronics (Bradford) Limited, comprises a feeler mounted for pivotal movement on an arm which is reciprocable along the working front of the machine. The feeler rests normally against the yarn being processed and is caused to move angularly by its own weight upon encountering a break in any one of the yarns it traverses, such angular movement causing, through an associated electrical circuit, operation of a signalling device and also arrest of the movement of the supporting arm. The feeler is somewhat wider than the gap between adjacent yarns and so does not move out of its normal position when passing from one yarn to another along the machine unless one of the yarns is broken. A similar system is disclosed in the applicants' Italian Patent 688,154.

Textile machines of the abovementioned type are commonly provided with suction means adapted to remove the yarn ends or waste fibres. Should breakage of a yarn occur at the region to which suction is applied, the broken end is drawn into the suction means and is caused to unwind from the supply spool, leading to a high percentage of waste in the time lapsing between the breakage of the yarn and the stopping of the respective yarn supply spool by the machine attendant.

Yarn waste may also be caused by the continued drawing of yarn through the drawing unit with which textile machines are equipped, when a yarn breakage occurs past the said unit.

In some prior art devices these disadvantages have been mitigated by providing means ahead of the drawing region below the supply spool to cause breakage of the thread in response to detection by a feeling mechanism of a break below the drawing region. The prior devices have relied upon severing means or clamping means acting on the thread, and have tended to be somewhat complex.

An object of the present invention is to provide a simple device which acts positively to prevent the drawbacks mentioned above. The essence of the invention is the provision of means to immobilize the supply spool upon detection of a breakage, thereby positively preventing the unwinding of further yarn in all circumstances.

The invention will be more clearly understood from the following description, given by way of example only, with reference to the accompanying drawings, wherein:

FIG. 1 is a diagrammatic side elevational view of a de-

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vice according to one embodiment of the invention in connection with a spinning frame, and

FIG. 2 is a diagrammatic side view on an enlarged scale of a detail of the device of FIG. 1.

Referring to FIG. 1, part of a spinning frame is shown diagrammatically. A yarn 2 which unwinds from a supply spool 1 travels through a drawing region 3 and is wound on completion of the process on a winding spool 4.

A fixed suction opening 5 is provided behind a region 2a of the yarn between the drawing region 3 and the winding spool 4. The opening 5 communicates with a manifold 6 leading to a suction source for the machine (not shown).

A feeler 7 is associated with the region 2a of the yarn and is a part of the means for automatic detection and signalling of yarn breakage. The feeler 7 is pivotally mounted on a support 8 carried by an arm 9 which in the embodiment shown is secured to a suction conduit 10. The conduit 10 is connected to a suction fan 12 and is provided with suction nozzles 11 in the vicinity of the drawing region 3. The suction fan 12, which is driven by an electric motor 13, is mounted on a carriage 14 which is movable longitudinally on horizontal guides 15 carried by a top frame 16 of the spinning frame so that the suction conduit 10 and arm 9 can effect reciprocating movement along the front of the spinning frame.

Reciprocating movement of the carriage 14 along the guides 15 causes the feeler 7 to scan horizontally along the front of the frame, bearing on successive yarns being worked in the frame. The feeler of the type known from the above-mentioned British Patent 942,791 in that it traverses all the yarns spun on the machine and is wider than the gap between successive yarns.

When the feeler 7 encounters a broken end it rotates under its own weight about its axis and completes an electrical circuit which stops the carriage 14 and operates a signalling device (not shown). Being wider than the gap between successive yarns, it is not actuated in passing from one yarn to the next when both yarns are intact.

If a yarn 2 breaks ahead the drawing region 3, the drawing rollers at the drawing region 3 are unable to draw yarn from the supply spool and the supply spool 1 stops rotating under the action of the drawing rollers.

If, however, the yarn 2 breaks in the region 2a past the drawing region 3, the drawing rollers in the latter region continue to rotate and unwind the yarn 2 from the supply spool 1; the broken end of the yarn is removed through the suction opening 5.

In order to avoid or minimise yarn waste upon such breakage, the yarn 2 should be stopped ahead the drawing region 3, and the rollers in the drawing region 3 should be prevented from drawing further yarn from the supply spool 1. This is effected according to the invention by causing breakage of the yarn 2 ahead of the drawing region 3 by means to be described.

In the illustrated embodiment, the rotation of the supply spool 1 is stopped by means of an electromagnetic device actuated by the feeler 7 (described hereinafter in more detail) and as a result the yarn 2 snaps between the spool 1 and the drawing region 3.

A strap 17 is secured to the suction conduit 10 and supports an electromagnet 18 having a movable armature 19 which acts on a bell crank lever 20 centrally fulcrumed at a pivot 21 (FIG. 2). The bell crank lever 20 is juxtaposed to an arm 22a of a latch device constituted by a further bell crank lever 22 which is centrally fulcrumed at a pivot 23.

The lever 22 has a hook-shaped arm 22b adapted to engage a lock member 24 slidably mounted in a seating 25 in a fixed support 26. The lock member 24 comprises a vertical pin which carries at its upper end an enlarged

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head 24a beneath which the hook-shaped arm 22b of the lever 22 is normally engaged.

The electromagnet 18 is connected in a control circuit 18a, shown diagrammatically with switch contacts 7a associated with the feeler 7, so that when the feeler 7 moves angularly upon encountering a broken yarn, this circuit is completed to energise the electromagnet 18. When the electromagnet 18 is energised in this way by movement of the feeler 7, its armature 19 moves to the right (as viewed in FIG. 2), rocking the bell crank lever 20 in a clockwise sense about its pivot 21. The lever 20 engages the arm 22a, rocking the further bell crank lever 22 in an anticlockwise sense, and thereby releasing the lock member 24. The lock member 24 then falls under its own weight and penetrates into the turns of the supply spool 1 to halt the rotation of the rollers in the drawing region 3 then causes the yarn ahead of this region to snap.

The enlarged head 24a of the lock member 24 carries an extension 27 which is adapted to close a switch 28 when the lock member 24 falls into engagement with the spool 1. Closure of the switch 28 in turn energises a warning lamp 29 or other device facilitating detection of the broken yarn by the attendant.

The device according to the invention may be mounted in some other convenient manner on a textile machine in the absence of suction means or a reciprocable carriage 14, in which case the device would be provided with its own operating and guiding means.

It will be understood that constructional details of the embodiments herein described and illustrated may be varied widely without departing from the scope of the invention as defined in the appended claims.

We claim:

1. In a textile machine of the kind having a yarn-drawing region and a device for reducing yarn wastage com-

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prising yarn breaking means located ahead of the yarn-drawing region, an electrical control circuit controlling operation of the yarn-breaking means and a break detector located beyond the yarn-drawing region operatively included in said control circuit and effective to cause operation of the yarn breaking means ahead of the yarn-drawing region in response to a break in the yarn detected by the break detector, the improvement that said yarn breaking means comprise a lock member movable in engagement with the yarn supply spool to halt rotation thereof, a latch device which normally holds the lock member clear of the supply spool, and an electro-magnet operatively associated with said break detector and effective to release the latch device upon detection of a break in the yarn by the break detector, thereby releasing the lock member to stop rotation of the supply spool and break the yarn ahead of the drawing region.

2. Device as claimed in claim 1, wherein the lock member moves vertically under its own weight when released by the latch device.

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