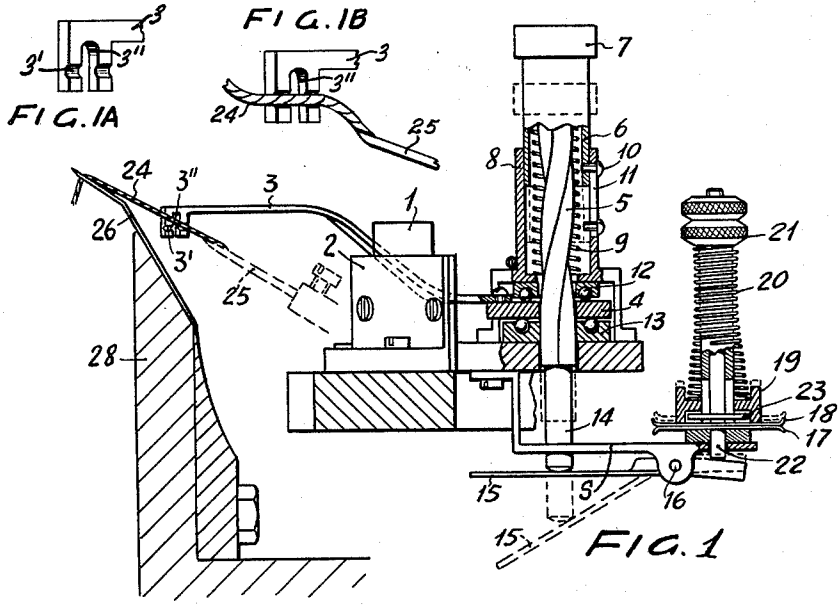
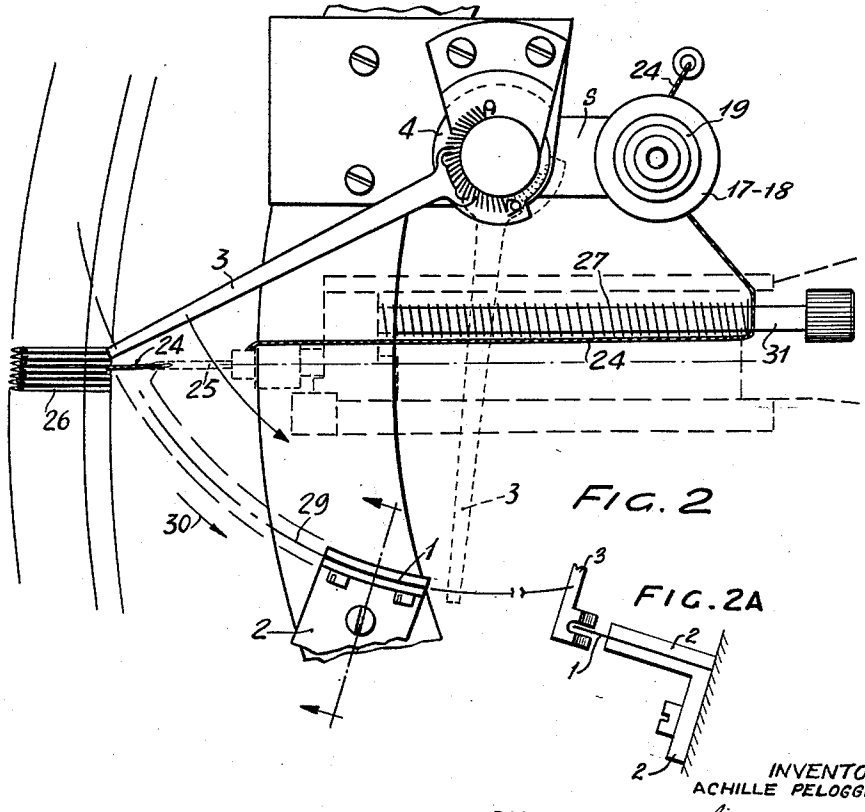
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THREAD-CUTTING DEVICE IN LINKING MACHINES

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# 3,081,722
# THREAD-CUTTING DEVICE IN LINKING MACHINES

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The present invention relates to a device for the cutting of the thread on linking machines, said operation having to be carried out from time to time by the operator.

At the present time, the cutting of the thread in the linking machine at the end of a certain operation is effected by the operator by means of scissors or by breaking the thread by hand; furthermore before cutting the thread, the operator is obliged to manually separate two thread-pressing elements which hold the thread therebetween.

The operator must also pull the thread beyond the eye of the needle before cutting it so that the thread does not escape from the needle at the resumption of the sewing process.

All these manual operations require a significant time to perform since the above mentioned operations on each machine have to be repeated a certain number of times during a working day.

The main object of the invention is to provide a device for the rapid cutting of the thread, said device also acting to automatically separate the thread-pressing elements.

The device of the invention comprises a stationary cutting blade and a rotating arm actuated by a control drive member and adapted to rotate after seizing the thread and thereby bringing said thread into contact with the cutting edge of said blade to cut the same.

Means are furthermore provided which are actuated by the same member that drives said arm to automatically release the pressure which keeps one of the two thread-pressing elements pressed on the other one.

To better illustrate the characteristics of the device according to the invention an embodiment of said device is going to be hereafter described with reference to the accompanying drawings wherein:

FIG. 1 diagrammatically shows a partially sectioned elevational view of the device and

FIG. 1A is a detail view of the thread seizing end of the rotating arm of FIG. 1 before said end contacts the thread.

FIG. 1B is a detail view similar to FIG. 1A but showing the thread seizing end in contact with the thread.

FIG. 2 the plan view of the same.

FIG. 2*a* is a detail view similar to FIG. 1A but showing the thread held on the end of the rotating arm as it approaches the cutting blade.

In the drawings: a blade 1 is supported by blade-support 2 fixed to the frame of the machine. An arm 3 is fixed at one end to a screw die piece 4 provided with a hole adapted to receive the long pitch screw of a shaft 5, adapted to rotate said screw die 4 when moved axially with respect to the screw die, this latter being mounted between the ball-crowns 12 and 13. Said shaft 5 is fixed at its upper end to a tubular element 6, the upper part or head of which is pressed down by the operator to operate the device as will be explained in more detail later. The free end of the arm 3 is shaped in form of a fork with a groove 3'' and a cross slot 3'.

Said tubular element 6 may slide within a tubular and stationary piece 8. A spring 9 is mounted in the inside of said two tubes 6 and 8, said spring urging the tube 6 upwardly.



Tube 8 includes a screw 10 which during the displacement of the tube 6 moves up and down in the window or slot 11 of the tube 8.

The lower end of the screw shaft 5 comprises a non-threaded stem 14 adapted to act on a lever 15. Said lever is pivoted on an axle 16, which is mounted on the machine frame by means of bracket S. FIGS. 1 and 2 clearly show the two thread-pressing discs 17 and 18, the axially displaceable piece 19 and the spring 20 which by acting on the stationary body 21 constantly presses said piece 19 on the thread pressing element 18. This last is therefore pressed on the element 17 and "clamps" the thread passing through the thread-pressing discs 17 and 18. An axially sliding bar 22 supports a pin 23 adapted to lift said piece 19. The drawing also discloses the needle 25 and the pointed elements 26 carried by the crown 28; when the cutting of the thread is effected the needle 25 is disposed in a position far apart from said pointed elements as shown in FIGS. 1 and 2.

By pressing on the head 7, acting as a knob, the tube 6 is forced downwardly against the action of the spring 9 which reacts between said tube and the bottom of the tube 8. The downward movement of tube 6 is stopped when the screw 10 reaches the lower end of the window or slot 11.

The shaft 5 moves downwardly with tube 6 so that the piece 4 and therewith the arm 3, by virtue of the long pitch thread of shaft 5 effects a rotation of a certain angle in the direction of the arrow 30 (FIG. 2) while, at the same time, the end of said arm containing the groove 3'' seizes the thread 24 in its position between the needle 25 and one pointed element 26, drags said thread for a certain distance corresponding to a circular sector 29, and brings it on and past the cutting edge of the blade 1. In such a way the thread is cut.

During the cutting, the sharp edge of the blade 1 passes within the groove 3'' at the end of the arm 3.

As mentioned above the lever 3, in its angular rotation, drags the thread 24 from the threaded end of the needle. Back of the needle 25, the thread 24 passes through a thread guide 31 positioned at the end of a compressable spring 27 (FIG. 2) and through the two elements 17 and 18 (FIG. 1) which press against the thread.

As previously mentioned each time that the thread of the prior art machines had to be cut with the scissors, the operator had to separate the two thread pressing elements 17 and 18 manually.

With the device of the present invention all of the required operations are taken care of by pressing the head 7; thus, when head 7 is pressed, the thread from the end of needle 25 is seized in slot 3' extended for a distance beyond the eye of the needle 25, at first against the action of spring 24 and then by the release of pressure devices 17—18 when the stem 14, acting through lever 15, bar 22 and pin 23 releases the pressure on said pressure member 18.

It is thus possible to obtain not only a considerable saving of time but also the advantage that once the cutting has been effected a certain length of thread (comprising the end where the cutting has been effected) protrudes out of the eye of the needle, the length of said protruding thread being such as to prevent the thread from escaping from the needle when the machine starts a new operation.

What I claim is:

1. In a linking machine of the type in which thread is fed to the sewing needle thereof through a thread tensioning means including a pair of elements which press against a thread passing therebetween, the improved cutting means comprising

a stationary blade mounted at a predetermined spaced distance from the needle of said machine,

a rotatable arm having means for contacting said thread at the outer end thereof which is adapted to move in an arcuate path from a position adjacent to but on the opposite side of said needle with respect to the blade to a position at and beyond the cutting edge of said blade,

means for mounting said arm for rotation,

said last-named means including means for rotating said arm in said arcuate path comprising a high pitch screw means and a die means which fits said high pitch screw means,

a first one of said screw means and die means forming the axis of rotation of said arm,

the second one of said screw means and die means being mounted on said machine to move axially with respect to the first one of said means,

spring means normally holding said rotatable arm in its position adjacent to said needle whereby pressing said second one of said screw means and die means operates the arm to move said thread beyond the eye of the needle up to the blade and to cut the thread at the blade.

2. In a linking machine of the type in which thread is fed to the sewing needle thereof through a thread tensioning means including a pair of elements which press against a thread passing therebetween, the improved cutting means comprising

a stationary blade mounted at a predetermined spaced distance from the needle of said machine,

a rotatable arm having means for contacting said thread at the outer end thereof which is adapted to move in an arcuate path from a position adjacent to but on the opposite side of said needle with respect to the blade to a position at and beyond the cutting edge of said blade,

means for mounting said arm for rotation,

said last-named means including means for rotating said arm in said arcuate path comprising a high pitch screw means and a die means which fits said high pitch screw means,

said arm being attached to said die means, the axis of which becomes the axis of rotation of said arm,

said screw means being mounted on said machine for axial movement with respect to said die means,

spring means normally holding said screw means and thereby the die means in the position wherein said arm is adjacent to said needle whereby axial movement of the screw means with respect to the die means rotates the arm to the blade means.

3. In a linking machine of the type in which thread is fed to the sewing needle thereof through a thread tensioning means including a pair of elements which press against a thread passing therebetween, the improved cutting means comprising



a stationary blade mounted at a predetermined spaced distance from the needle of said machine,

a rotatable arm having means for contacting said thread at the outer end thereof which is adapted to move in an arcuate path from a position adjacent to but on the opposite side of said needle with respect to the blade to a position at and beyond the cutting edge of said blade,

means for mounting said arm for rotation, said last-named means including means for rotating said arm in said arcuate path comprising a high pitch screw means and a die means which fits said high pitch screw means,

said arm being attached to said die means, the axis of which becomes the axis of rotation of said arm,

said screw means being mounted on said machine for axial movement with respect to said die means,

spring means normally holding said screw means and thereby the die means in the position wherein said arm is adjacent to said needle whereby axial movement of the screw means with respect to the die means rotates the arm to the blade means,

lever means adapted to disengage the pair of elements that press against the thread to hold the same therebetween,

an extension on said screw means adapted to operate said lever means to disengage said pair of elements when said screw means is operated against the action of said spring means to rotate said arm.

4. The device as claimed in claim 2 comprising

a pair of telescopic tubes surrounding said screw means,

said screw means being attached to the interior of one of said telescopic tubes and said spring means normally holding said telescopic tubes in open position.

5. The device as claimed in claim 3 comprising

a pair of telescopic tubes surrounding said screw means,

said screw means being attached to the interior of one of said telescopic tubes and said spring means normally holding said telescopic tubes in open position.

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