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2,962,992

CONTROL FOR ELECTRIC SEWING MACHINES

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4 Claims. (Cl. 112-219)

This invention relates to sewing machines and more particularly to a control means designed to control the operation of the electric motor of a sewing machine, and the primary object of the present invention is to provide an improved device of this classification.

Another object of the invention is to provide a sewing machine control device adapted to deenergize the motor of a sewing machine an instant before the thread tension device releases the thread, thus preventing thread jamming because the control prevents operation of the sewing machine when tension is released from the thread.

With the above and other objects in view, as will hereinafter appear, the invention comprises the devices, combinations and arrangements of parts hereinafter set forth and illustrated in the accompanying drawings of a preferred embodiment of the invention, from which the several features of the invention and the advantages attained thereby, will be readily understood by those skilled in the art.

In the drawings:

Fig. 1 is a fragmentary end view of a sewing machine, portions being broken away or removed in order to show the present invention,

Fig. 2 is an enlarged sectional view taken substantially on the line 2-2 of Fig. 1,

Fig. 3 is a view similar to Fig. 1 except that parts are shown in different positions from which they are shown in Fig. 1,

Fig. 4 is a schematic electrical wiring diagram showing how the present control is connected, and

Fig. 5 is an exploded perspective view showing parts of the present invention.

Referring more specifically to the drawings, Fig. 1 illustrates a portion of a sewing machine 14 having a bed plate 16 from which rises a bracket arm standard (not shown) terminating in a bracket arm head 17 equipped with a conventional needle bar 18. The head 17 is also equipped with a presser bar 19 having a presser foot 21 positioned above the feed dog 22. In addition the head 17 carries a thread tension device 23 which may be similar to the thread tension device shown in expired United States Patent No. 1,167,823. The thread tension device 23 shown in the accompanying drawings includes a pair of tension disks 24 and 26 pressed together by a spring (not shown) and thereby adapted to grip a thread (not shown) in a known manner. The effective tension of the spring (not shown) on the disks 24 and 26 may be varied by turning an adjusting thumb nut 27 and the effect of the spring (not shown) on the disks 24 and 26 can be completely eliminated by endwise pressure upon a pin 28. A thread tension release lever 29 is pivotally mounted on the head 17 by means of a screw 31. One arm 32 of the lever 29 engages the pin 28 and the other arm 33 of the lever 29 is engaged by a projection 34 carried by a presser bar lifter 36 which is pivotally mounted on a screw 37. When the lifter 36 is manually raised from the solid line position 36' (Fig. 1) to the

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dash-dash line position 36'' (Fig. 1) the position of the tension release lever 29 is not affected. However, when the lifter 36 is raised from the position 36' (Fig. 1) to the dash-dash line position 36''' (Fig. 3) the projection 34 on the presser bar lifter 36 engages the arm 33 thereby turning the lever 29 clockwise. This moves the arm 32 against action of a spring 38 and moves the pin 28 lengthwise to separate the tension disk 26 from the disk 24. This releases any grip of the disks 24-26 on a thread (not shown) passing therebetween, and raises the presser foot 21 to the fully raised position 21'' shown in Fig. 3.

In addition to the foregoing, Figs. 1 through 5 disclose a small normally-closed electrical switch 46 having an operator 47 and a pair of electrical terminals 48 and 49. The operator 47 may be moved by a spring 51 formed integral with a bracket 52. The switch 46 and bracket 52 are secured within the head 17 by means of a pair of screws 53 and a block 54. The screws 53 pass through two holes in the head 17, through two aligned holes in the bracket 52, through two aligned holes in the switch 46 and are screwed into two threaded holes formed in the block 54.

The physical relationship between the switch 46, the operator 47, the spring 51 and a tip 56 on the end of the arm 33 are such that, when the lifter 36 is in the position 36' (Fig. 1) or in the position 36'' (Fig. 1), the tip 56 will not move the spring 51 to cause the operator 47 to open the normally closed switch 46. Under these conditions the electric motor 57 will be under the control of a foot or knee operated rheostat 58. The switch 46, the electric motor 57, and the rheostat 58 are part of a series of type electric circuit shown in Fig. 4 to comprise a source of electric power 61 which is connected by a conductor 62 to terminal 48. A conductor 63 connects terminal 49 to the motor 57 and a conductor 64 connects the motor 57 to the rheostat 58, and finally a conductor 66 connects the rheostat 58 to the source of power 61.

The physical relationships between the parts are such that when the lifter 36 is moved from position 36' (Fig. 1) to position 36''' (Fig. 3) the lever 29 is turned in a clockwise direction about screw 31. As this happens the tip 56 engages and raises the spring 51 which in turn engages and moves the operator 47. As soon as the operator 47 is moved, the switch 46 opens the electric circuit between terminals 48 and 49, thereby deenergizing and stopping the motor 57. Thereafter, as the lever 29 continues to turn, the arm 32 engages and moves the pin 28 endwise. This separates the disks 24-26 and releases tension on the sewing thread (not shown). Because the thread tension release lever 29 does not release the thread tension until the presser bar lifter 36 is fully lifted, and because the lever 29 does not open the switch 46 until just before the tension is released, the presser bar 19 and the presser foot 21 may be partly lifted to the position 21'' (Fig. 1) without deenergizing the motor 57. This permits turning the work being sewn without stopping the motor. Also, since the motor 57 is stopped an instant before the thread tensioning device 23 releases the thread (not shown), the said thread cannot become jammed.

Having thus set forth the nature of our invention, what we claim herein is:

1. A control device for a motor driven sewing machine, said control device comprising a normally closed electrical switch connected in series with the motor of the said sewing machine, a thread tension device for gripping the thread of said sewing machine, a first means for opening said normally closed electrical switch, a second means for releasing the grip of said thread tension device on said thread, and means for assuring that said first means will open the electrical switch before said second

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means releases the grip of said thread tension device on the thread of said sewing machine.

2. A control device for a motor driven sewing machine, said control device comprising a normally closed electrical switch connected in series with the motor of the said sewing machine, a thread tension device for gripping the thread of said sewing machine, a tip for opening said normally closed electrical switch, an arm for releasing the grip of said thread tension device on said thread, and means connecting said tip to said arm for assuring that said tip will open said electrical switch before said arm releases the grip of said thread tension device on the thread of said sewing machine.

3. A control device for a motor driven sewing machine, said control device comprising a normally closed electrical switch connected in series with the motor of the said sewing machine, a thread tension device for gripping the thread of said sewing machine, a thread tension release lever, a first arm on said lever for opening said normally closed electrical switch, a second arm on said lever for releasing the grip of said thread tension device on said thread, the physical relationship between said electrical switch, said thread tension device, and said thread tension release lever being such that the said parts open said normally closed electric switch an instant before said thread tension device releases the thread.

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4. In combination, a sewing machine, a bracket arm having a head, a presser bar mounted in said head, a presser bar lifter pivotally mounted on said head and adapted to raise said presser bar, a thread tension device mounted on said head, a thread tension release lever pivotally mounted on said head, a pair of arms forming part of said thread tension release lever, one of said arms being engaged by said presser bar lifter and the other of said arms releasing the tension of said thread tension device, a normally closed electrical switch mounted inside of said head, a tip formed on one arm of said release lever, the physical relationship between said electrical switch, said thread tension device, and said tip on said thread tension release lever being such that the said parts open said normally closed electrical switch an instant before said other arm releases the tension of said thread tension device.

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