

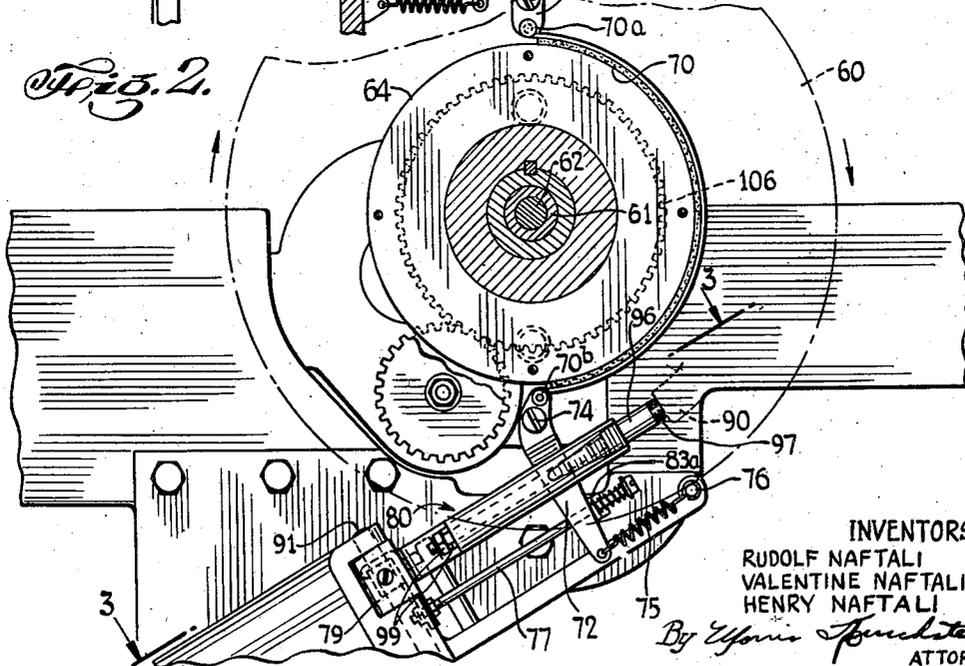
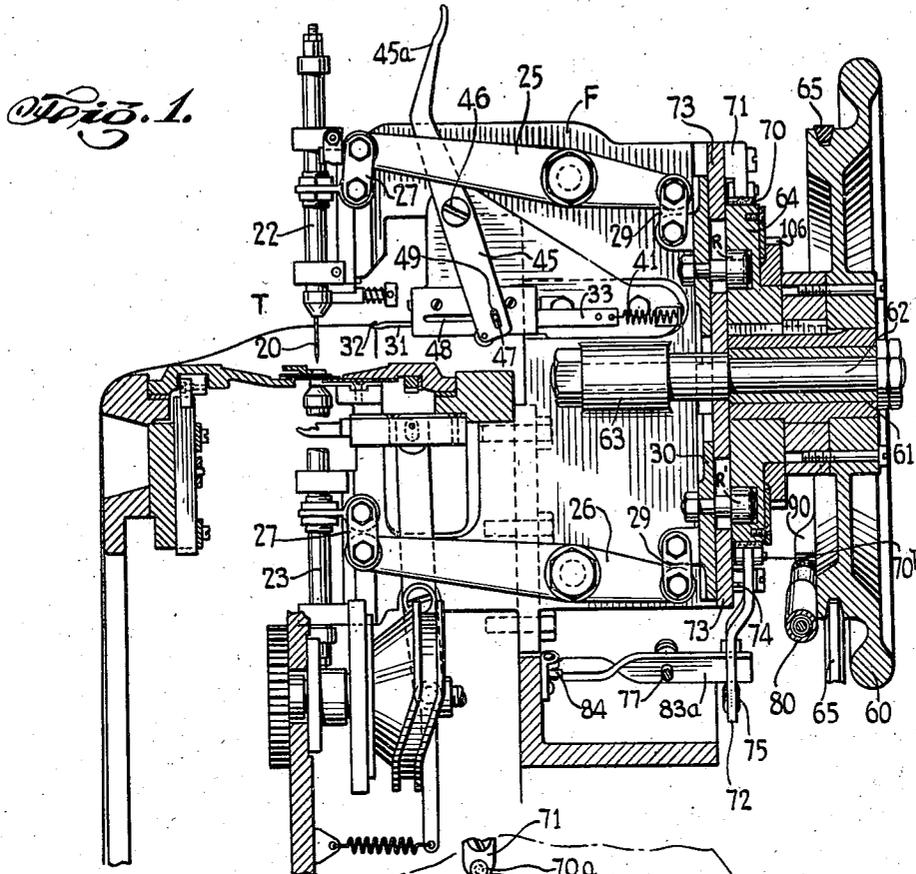
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TIE STITCHING MACHINE

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TIE STITCHING MACHINE

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11 Claims. (Cl. 112—219)

Our invention relates to sewing machines. More particularly, our invention is concerned with improvements to that type of sewing machines employed for stitching neckties, such for example as disclosed in our Patent No. Re. 19,653, dated July 23, 1935, in which there is employed a double pointed needle having its eye located between the points, the opposite ends of which, during the operation of the machine, are alternately grasped by the jaws of a pair of opposed needle bars arranged in alignment.

One object of our invention is to provide a sewing machine of the character described having improved means for automatically stopping the operation of the machine after the complete stitching of each tie, so that the eye of the needle will always be in proper alignment for threading.

Other objects of this invention will in part be obvious and in part hereinafter pointed out.

Certain features shown and described but not claimed in this application are shown, described and claimed in our copending application, Serial No. 130,252, filed March 11, 1937, for Tie Stitching machines, of which the present application is a division, and our copending application, Serial No. 289,523, filed August 11, 1939.

The invention accordingly consists in the features of construction, combinations of elements, and arrangement of parts which will be exemplified in the construction hereinafter described, and of which the scope of application will be indicated in the following claims.

In the accompanying drawings, in which is shown one of the various possible embodiments of this invention,

Fig. 1 is a side elevational view, partly sectional, of a tie stitching machine constructed in accordance with our invention;

Fig. 2 is an end view, partly sectional, of that portion of the apparatus shown in Fig. 1, illustrating our novel means for automatically stopping the operation of the machine after the stitching of a tie;

Fig. 3 is a cross-sectional view taken substantially on the line 3—3 of Fig. 2;

Fig. 4 is an enlarged cross-sectional view taken substantially on the line 4—4 of Fig. 3; and

Fig. 5 is a schematic wiring diagram illustrating the operation of our invention.

Referring now in detail to the drawings, we have disclosed an apparatus embodying our invention, such apparatus being of the type disclosed in our Patent No. Re. 19,653 and copending application Serial No. 32,148, filed July 19, 1935.

Referring more particularly to Fig. 1 of the drawings, we have disclosed a sewing machine of the class above referred to, in which there is employed a double pointed needle 20 having its eye located between the points, and which is caused to be alternately grasped by upper and lower needle bars 22 and 23, respectively, after piercing the fabrics of a necktie to effectively sew a line of stitching therethrough. A pair of pivotally mounted rocker arms 25 and 26 connected to the needle bars 22 and 23 by links 27, and to a cam actuated plate 30 by means of links 29, cause synchronous oscillation of the said upper and lower needle bars to alternately clutch the needle 20 in the manner described in said Patent No. Re. 19,653 and copending application Serial No. 32,148.

In the operation of sewing machines of the character herein described for stitching neckties, where a separate thread of suitable length is employed for stitching each necktie, it is necessary to rethread the needle after the completion of the stitching of each necktie. Since in actual manufacturing practice a great many neckties are stitched on a single machine in one day, it is highly desirable that the threading of the needle after each tie has been stitched be accomplished with a minimum expenditure of time and with great accuracy, lest the needle be broken in the threading operation.

By our invention we have provided novel means arranged so that when the sewing machine has completed the stitching of a tie and the said machine is thereupon automatically stopped, the eye of the needle will be in proper alignment with respect to the threader 31. The mechanism for automatically causing the machine to stop so that the eye of the needle 20 will be in such proper alignment will now be described in detail.

In the drawings, there is shown a fly wheel 60 fixed to a collar 61 for rotation therewith, said collar 61 being freely rotatably mounted on a fixed shaft 62 held in a bracket 63 fixed to the frame F of the sewing machine, in the manner shown and described in our said copending application Serial No. 32,148. Also mounted on the collar 61 for rotation therewith is an annular cam 64, designed to actuate the rocker arms 25 and 26, as described in our said copending application. Suitable means are provided for driving said wheel 60 and cam 64, such as for example a belt 65 connected to a motor pulley which is driven by a motor, not here shown, but which is shown in our said copending application.

By our invention we have devised a construc-

tion whereby, when the current is turned on from a source of supply, the means for operating the machine is held normally ineffective until a hand switch is thrown, which automatically renders the machine operating means effective for a predetermined period of time, such as for example the complete stitching of a tie, after which the said hand switch is automatically opened to break the circuit to again render the machine operating means ineffective. We have provided means for causing the machine to be stopped as above described, so that the eye of the needle will be in proper alignment for threading. The mechanism for carrying out the above will now be described.

Mounted on the outer rim of the cam 64 is a flat brake band 70 adapted to be normally held in frictional engagement with a portion of the said cam by having one end 70a of said band pivotally attached to a suitably positioned fixed support 71 and the other end 70b of said band being pivotally attached to a rocker arm 72. The rocker arm 72 is pivotally mounted on a wall 73 of the frame F by means of a fixed pivot 74, and is designed to normally hold the band 70 in frictional engagement with the annular cam 64 to prevent rotation thereof, by means of a spring 75 having one end thereof attached to the free end of the rocker arm, and the other end thereof being fixed to a pin 76 on the wall 73.

To render the brake band 70 ineffective against the action of the spring 75, there is provided a rod 77 attached at one end to an armature 78 by means of a link 79 (see Fig. 3), forming a part of a pivotally mounted member 80, soon to be described. The rod 77 is pivoted to the link 79 at 81, while the link 79 is in turn pivotally connected to the armature 78 at 82. The other end of the rod 77 is adapted to pass through an aperture in a member 83 pivoted to the wall 73 at 84, said member having an extended portion 83a which is adapted to contact the rocker arm 72. The rod 77 is provided with an enlarged head 85 adapted to hold a spring 86 in confinement between said head 85 and the portion 83a. The spring 86 is designed to slightly offset the action of the spring 75 and at the same time to prevent too rapid action of the brake band 70. For releasing the brake band from its effective position, as shown in Fig. 2 of the drawings, there is provided a solenoid 87, mounted on the wall 73 and which when energized by closing a hand switch, in a manner to be more fully described, will attract its armature 78 to carry with it the rod 77 which, in turn, acts upon the rocker arm 72 to swing said rocker arm about the pivot 74 against the action of the spring 75. The brake band 70 is thus released to permit rotation of the cam 64 which, in turn, causes synchronous oscillation of the needle bars 22 and 23, as described.

When, after the complete stitching of a tie, the solenoid 87 becomes (automatically by the opening of the hand switch) deenergized, the spring 75 will restore the rocker arm 72 to its normal position, such as shown in Fig. 2, to effectively cause the band 70 to frictionally engage the cam 64. To insure that the upper needle bar 22 will receive the needle 20 and that the said needle bar 22 will stop in a position whereby the eye of the needle will be in proper alignment with the threader 31, there is provided on the inner flat surface of the wheel 60 a lug 90 which is adapted to abut against a specially designed abutment member 80, normally disposed in the path of movement of said lug 90, as clearly shown

in Figs. 2 and 3. The member 80 is pivoted to the wall 73 at 91, and is integral with the link 79, which in turn is pivotally connected to the armature 78, as above described.

When the abutment member 80 is in the normal position as shown, it serves as an aid to the frictional action of the band 70 to prevent rotation of the cam 64. However, when the solenoid 87 is energized to attract its armature 78, it is seen that at the same time that the brake band 70 is released, as hereinbefore described, the abutment member 80 will be swung out of the path of the lug 90 to permit rotation of the wheel 60 and cam 64.

The tension of the brake band 70 is such that when the solenoid 87 is deenergized to automatically cause braking action of the band 70, the cam 64 will still rotate at a very low speed until the lug 90 on the wheel 60 strikes the abutment member 80 to cause the sewing machine to come to a dead stop. The lug 90 is so disposed that when the machine is thus caused to stop, as above described, the eye of the needle will be in proper alignment to be pierced by the hook 32. To minimize the shock of the meeting of the abutment member 80 with the lug 90, the said member 80 is provided with a longitudinal opening 95 (see Fig. 4) in the end thereof, into which there is slidably received a rod 96 having a rounded end portion 97, which is adapted to strike the lug 90 and which may be constructed of suitable resilient material. A spring 98 housed within the opening 95 is adapted to resiliently resist the inward sliding movement of the rod 96 and thus absorb the shock when the end 97 strikes the lug 90. A pair of nuts 99 threaded on a reduced portion 100 of rod 96 and disposed as shown is attached to the rod portion 96 and serves as a means for adjusting the tension of the spring 98.

To limit the pivotal movement of the abutment member 80 toward the path of the revolution of the lug 90, we have provided a stop member 80a on the wall 73 (see Fig. 3) designed to cooperate with an adjustable set screw 80b on the link 79.

In Fig. 5 of the drawings, we have shown a wiring diagram illustrating the automatic action of the starting and stopping mechanism above described, and in which a switch S controlling current from a source of supply is shown in open position to break the circuit of current from said source of supply. When the switch S is closed to complete the circuit from the source of supply, the motor M for driving the wheel 60 and cam 64 is not yet energized due to the open hand switch H, which separates the contacts 101 and 101a due to the action of the spring 102, and thus renders the circuit to the motor M ineffective. The brake band 70 is, therefore, held in frictional engagement with the cam 64, due to the action of the spring 75, and because of the abutment member 80, which is shown diagrammatically as disposed in the path of the lug 90. Also, there is shown the traveling work platform 103, adapted to be driven through a chain of gears 104, 105, 106, the said gear 106 being mounted on the same collar 61 as the cam 64 and wheel 60.

When it is desired to operate the machine for stitching a tie, the hand switch H is moved to the dotted line position H', which closes the contacts 101 and 101a against the action of the spring 102, to complete the circuit through the solenoid 87 to energize the same, which then attracts its armature 78 and releases the brake band 70 against the action of the spring 75 in the

manner hereinbefore described. At the same time, the abutment member 80 is swung out of the path of the lug 90. The motor M, having been also simultaneously set in operation by the closing of the switch H, drives the wheel 60 and cam 64 through the belt 65 to oscillate the needle bars 22 and 23. The traveling work platform 103 is also simultaneously caused to travel by means of the gears 106, 105 and 104, in the direction of the arrow, and the machine proceeds in its operation of stitching a tie.

After the work platform, carrying the assembled tie fabrics, has traveled a distance sufficient to complete the stitching of a tie, the pin 107 will strike the contact arm 101a to automatically open the contacts 101 and 101a moving the switch H against the action of the spring 102. When contacts 101 and 101a have been opened, the circuit from the source of current supply to the motor M is immediately broken, and the solenoid 87 simultaneously becomes deenergized, to cause braking action of the band 70 on the cam 64, and the pivotal swinging of the abutment member 80 directly in the path of the lug 90. The wheel 60 and cam 64 will rotate slowly due to the frictional action of the brake band 70 until the lug 90 strikes the member 80, to bring the machine to a dead stop.

It will thus be seen that there is provided a device in which the several objects of this invention are achieved, and which is well adapted to meet the conditions of practical use.

As various possible embodiments might be made of the above invention, and as various changes might be made in the embodiments above set forth, it is to be understood that all matter herein set forth or shown in the accompanying drawings is to be interpreted as illustrative and not in a limiting sense.

Having thus described our invention, we claim as new and desire to secure by Letters Patent:

1. In a sewing machine, the combination of alternately operating upper and lower needle bars, a double pointed needle having an eye located between the points, means for alternately connecting the needle with each needle bar, means for threading the needle, said last named means comprising a hook adapted to pass through the eye of the needle, a traveling work carrying platform, means to move said platform transversely of the longitudinal axis of said needle, means for driving said sewing machine to cause reciprocal movement of said needle bars, switching means for rendering said last named means ineffective, said switching means being disposed in the path of travel of said platform and so positioned as to be actuated by said platform at the end of its working travel, and means for causing said needle bars to come to rest at a predetermined position when said driving means is rendered ineffective, said predetermined position being such that the said needle will be connected to the upper needle bar.

2. In a sewing machine, the combination of alternately operating upper and lower needle bars, a double pointed needle having an eye located between the points, means for alternately connecting the needle with each needle bar, means for threading the needle, said last named means comprising a hook adapted to pass through the eye of the needle, a traveling work carrying platform, means to move said platform transversely of the longitudinal axis of said needle, means for driving said sewing machine to cause reciprocal movement of said needle bars,

switching means for rendering said last named means ineffective, said switching means being disposed in the path of travel of said platform and so positioned as to be actuated by said platform at the end of its working travel, and means for causing said needle bars to come to rest at a predetermined position when said driving means is rendered ineffective, said predetermined position being such that the said needle will be connected to the upper needle bar, and such that the eye of the needle and the hook of the threading means will be in registered alignment for threading.

3. In a sewing machine, the combination of alternately operating upper and lower needle bars, a double pointed needle having an eye located between the points, means for alternately connecting the needle with each needle bar, means for threading the needle, said last named means comprising a hook adapted to pass through the eye of the needle, a traveling work carrying platform, means to move said platform transversely of the longitudinal axis of said needle, means for driving said sewing machine to cause reciprocal movement of said needle bars, switching means for rendering said last named means ineffective, said switching means being disposed in the path of travel of said platform and so positioned as to be actuated by said platform at the end of its working travel, and means for causing said needle bars to come to rest at a predetermined position when said driving means is rendered ineffective, said predetermined position being such that the said needle will be connected to the upper needle bar, said last named means comprising braking means, means to actuate said braking means when said driving means is rendered ineffective, and positive stopping means which is prepared for operation when said braking means is actuated.

4. In a sewing machine, the combination of alternately operating upper and lower needle bars, a double pointed needle having an eye located between the points, means for alternately connecting the needle with each needle bar, means for threading the needle, said last named means comprising a hook adapted to pass through the eye of the needle, a traveling work carrying platform, means to move said platform transversely of the longitudinal axis of said needle, means for driving said sewing machine to cause reciprocal movement of said needle bars, switching means for rendering said last named means ineffective, said switching means being disposed in the path of travel of said platform and so positioned as to be actuated by said platform at the end of its working travel, and means for causing said needle bars to come to rest at a predetermined position when said driving means is rendered ineffective, said predetermined position being such that the said needle will be connected to the upper needle bar, said last named means comprising a brake, a solenoid, said solenoid and said brake being so constructed and arranged that when said solenoid is energized said brake is rendered ineffective, means to de-energize said solenoid when said driving means is rendered ineffective, and positive stopping means which is prepared for operation when said solenoid is de-energized.

5. In a sewing machine, the combination of alternately operating upper and lower needle bars, a double pointed needle having an eye located between the points, means for alternately connecting the needle with each needle bar,

means for threading the needle, said last named means comprising a hook adapted to pass through the eye of the needle, a traveling work carrying platform, means to move said platform transversely of the longitudinal axis of said needle, means for driving said sewing machine to cause reciprocal movement of said needle bars, switching means for rendering said last named means ineffective, said switching means being disposed in the path of travel of said platform and so positioned as to be actuated by said platform at the end of its working travel, and means for causing said needle bars to come to rest at a predetermined position when said driving means is rendered ineffective, said predetermined position being such that the said needle will be connected to the upper needle bar, said last named means comprising a brake, a solenoid for controlling said brake, means to operate said solenoid so as to apply said brake when said driving means is rendered ineffective, and positive stopping means which is prepared for operation when said driving means is rendered ineffective.

6. In a sewing machine of the character described, the combination of a needle bar, means comprising a rotatably mounted wheel for causing reciprocable movement of said needle bar, a projection on said wheel, a traveling work carrying platform, means for moving said platform, means for driving said wheel, switching means for rendering said last named means ineffective, said switching means being disposed in the path of travel of said platform and so positioned as to be actuated by said platform at the end of its working travel, and means for causing said needle bar to come to rest at a constant predetermined position when said driving means has been rendered ineffective, said last named means comprising a stop and means to position said stop in the path of travel of the extension on said wheel.

7. In a sewing machine of the character described, the combination of a needle bar, means comprising a rotatably mounted wheel for causing reciprocable movement of said needle bar, a projection on said wheel, a traveling work carrying platform, means for moving said platform, means for driving said wheel, switching means for rendering said last named means ineffective, said switching means being disposed in the path of travel of said platform and so positioned as to be actuated by said platform at the end of its working travel, and means for causing said needle bar to come to rest at a constant predetermined position when said driving means has been rendered ineffective, said last named means comprising braking means, means for actuating said braking means when said wheel driving means has been rendered ineffective, a stop, and means for positioning said stop in the path of travel of the extension on said wheel.

8. In a sewing machine of the character described, the combination of alternately operating upper and lower needle bars, a double pointed needle having an eye located between the points, means for alternately actuating the needle with each needle bar, means for threading the needle, said last named means comprising a hook adapted to pass through the eye of the needle, a traveling work carrying platform, means to move said platform transversely of the longitudinal axis of said needle, and an electric motor for driving said sewing machine to cause reciprocable movement of said needle bars, a source of current supply for said electric motor, electrical connec-

tions between said motor and said source of current supply, a switch in said electrical connections, said switch being disposed in the path of travel of said platform and so positioned as to be opened by said platform at the end of its working travel, a solenoid electrically connected to said motor, a brake controlled by said solenoid, said brake being effective to slow down said machine when said switch is opened by said platform, and means for causing said needle bar to come to rest at a predetermined position when said switch is opened, said predetermined position being such that said needle will be connected to the upper needle bar, said last named means comprising positive stopping means which is prepared for operation when said switch is opened.

9. In a sewing machine of the character described, the combination of alternately operating upper and lower needle bars, a double pointed needle having an eye located between the points, means for alternately actuating the needle with each needle bar, means for threading the needle, said last named means comprising a hook adapted to pass through the eye of the needle, a traveling work carrying platform, means to move said platform transversely of the longitudinal axis of said needle, means comprising a rotatably mounted wheel for causing reciprocable movement of said needle bars, said wheel having an extension, an electric motor for driving said wheel, a source of current supply for said electric motor, electrical connections between said motor and said source of current supply, a switch in said electrical connections, said switch being disposed in the path of travel of said platform and so positioned as to be opened by said platform at the end of its working travel, a solenoid electrically connected to said motor, a brake controlled by said solenoid, said brake being effective to slow down said machine when said switch is opened by said platform, and means causing said needle bar to come to rest at a predetermined position when said switch is opened, said predetermined position being such that said needle will be connected to the upper needle bar, said last named means comprising a stop and means to position said stop in the path of travel of the extension on said wheel.

10. In a sewing machine of the character described, the combination of alternately operating upper and lower needle bars, a double pointed needle having an eye located between the points, means for alternately actuating the needle with each needle bar, means for threading the needle, said last named means comprising a hook adapted to pass through the eye of the needle, a traveling work carrying platform, means to move said platform transversely of the longitudinal axis of said needle, means comprising a rotatably mounted wheel for causing reciprocable movement of said needle bars, said wheel having an extension, an electric motor for driving said wheel, a source of current supply for said electric motor, electrical connections between said motor and said source of current supply, a switch in said electrical connections, said switch being disposed in the path of travel of said platform and so positioned as to be opened by said platform at the end of its working travel, a solenoid electrically connected to said motor, a brake controlled by said solenoid, said brake being effective to slow down said machine when said switch is opened by said platform, and means for causing said needle bar to come to rest at a predetermined position when said switch is

opened, said predetermined position being such that said needle will be connected to the upper needle bar, said last named means comprising a stop and means actuated by said solenoid to position said stop in the path of travel of the extension on said wheel.

11. In a sewing machine of the character described, the combination of alternately operating upper and lower needle bars, a double pointed needle having an eye located between the points, means for alternately actuating the needle with each needle bar, means for threading the needle, said last named means comprising a hook adapted to pass through the eye of the needle, a traveling work carrying platform, means to move said platform transversely of the longitudinal axis of said needle, and an electric motor for driving said sewing machine to cause reciprocable movement of said needle bars, a source of current supply for said electric motor, electrical connections between said motor and said source of current supply, a switch in said electrical con-

nections, said switch being disposed in the path of travel of said platform and so positioned as to be opened by said platform at the end of its working travel, a solenoid electrically connected to said motor, a brake controlled by said solenoid, a brake operating link, said link being actuated by said solenoid, said brake being operated through said link and by said solenoid to slow down said machine when said switch is opened by said platform, and means for causing said needle bar to come to rest at a predetermined position when said switch is opened, said predetermined position being such that said needle will be connected to the upper needle bar, said last named means comprising a stop actuated by said link for positioning in the path of travel of the extension on said wheel when the switch is opened

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