May 15, 1923.

1,455,387

H. Z. COBB

STOP FOR SEWING MACHINES

Filed April 29, 1920

2 Sheets-Sheet 1

Fig. 4.

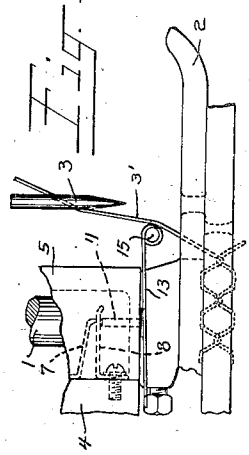


Fig. 3.

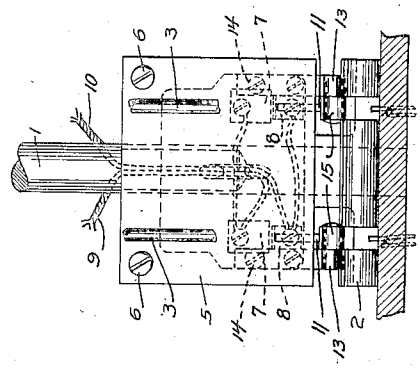


Fig. 1.

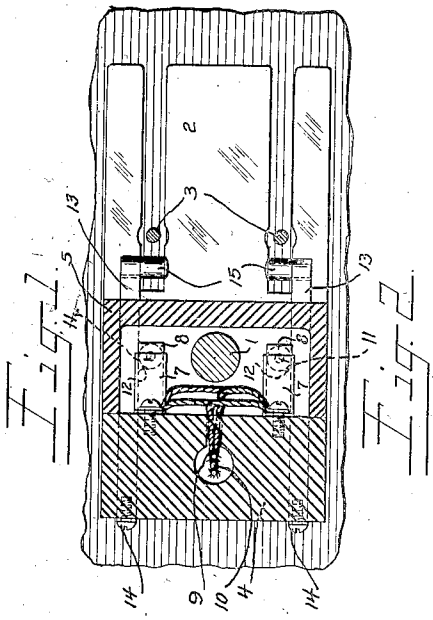
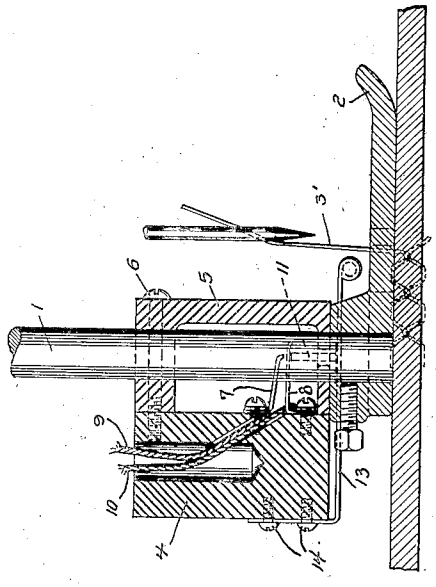


Fig. 2.



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Fig. 5.

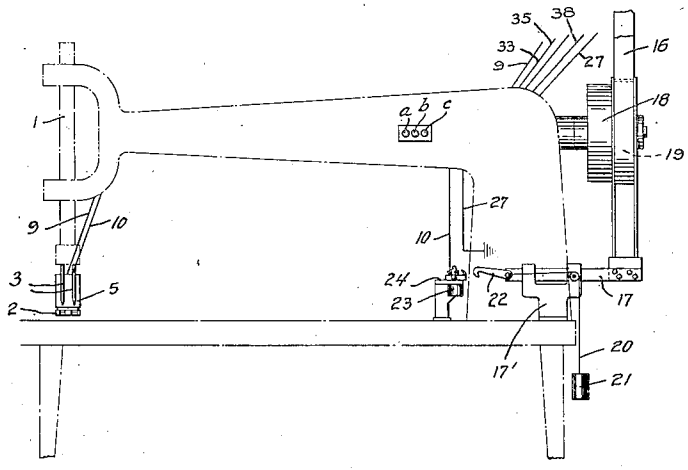
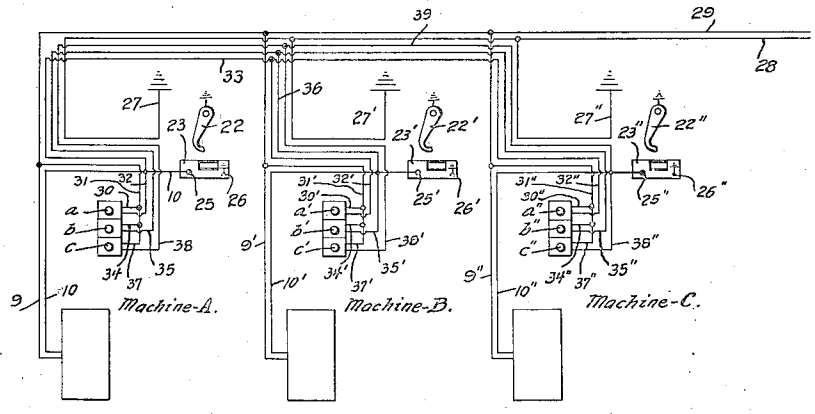


Fig. 6.



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Patented May 15, 1923. 1,455,387

UNITED STATES PATENT OFFICE.

HENRY Z. COBB, OF NEW YORK, N. Y., ASSIGNOR TO NEW YORK BELTING AND PACKING COMPANY, A CORPORATION OF NEW YORK.

STOP FOR SEWING MACHINES.

Application filed April 29, 1920. Serial No. 377,512.

To all whom it may concern:

Be it known that I, HENRY Z. COBB, a citizen of the United States, residing at New York, county and State of New York, have invented a new and useful Stop for Sewing Machines, of which the following is a full, clear, and exact description.

This invention relates to a stop for sewing machines.

In operating a sewing machine, particularly in handling heavy materials, there is a liability of the needle becoming bent, in which case it may fail to concatenate its thread. When using a lock stitch machine this failure may also be caused by the exhaustion or breaking of the bobbin thread. Hence, it is desirable, and more particularly so in the case of plural needle machines, to provide an efficient means for quickly stopping the machine if for any reason the needle should fail to concatenate its thread.

In the sewing of belting it is particularly desirable to have the machines equipped with a device of this character for the following reasons: When sewing belting it is customary to use a series of plural needle machines, arranged in stepped relation, so that by passing the belting through the successive machines a large number of longitudinal seams may be simultaneously stitched on the belting. By this expedient the belting may in a single operation be stitched across its entire width in the case of a narrow size, and the number of times the belting is required to be passed through the machines is reduced in the case of the wider sizes. If for any reason the needle in any machine should fail to concatenate its thread the remaining needles, of course, will continue to stitch until the operative discovers the defect and stops the machines. It is then necessary to pull the belting back through the machine or machines, to the point where the needle failed to concatenate the thread, and after correcting the defect again begin the stitching. This involves a double stitching by all the remaining needles in the series of machines, which is objectionable in the finished belting. In addition, female operatives are largely used for this work and as the belting is quite heavy, the operation of pulling the belting back is a laborious one, requiring considerable strength.

It is an object of my invention to provide a simple and efficient means for stopping a sewing machine upon failure of the thread to be concatenated.

Another object is to provide an improved means actuated by the thread for stopping the machine upon failure of the thread to be concatenated.

A further object is to provide electrical means directly actuated by the thread leading from the work for stopping the machine upon such failure.

A still further object is to provide an improved means for stopping the machine operable upon breakage or exhaustion of the bobbin thread, or bending of the needle.

A still further object is to lessen the number of operatives required to attend a series of sewing machines.

A still further object is to provide means whereby, when any one of a series of machines is automatically stopped by failure of its thread to be concatenated, the remaining machines may be quickly stopped by the operative from any one of them.

For a complete disclosure of the invention, reference is had to the accompanying specification and claims.

In the drawings, Fig. 1 is a horizontal section showing my automatic stop attached to the presser bar of a sewing machine, and

Fig. 2 is a vertical section through the stop on the line of the presser bar.

Fig. 3 is a front elevation of the stop.

Fig. 4 is a side elevation showing the actuation of the stop by the needle thread upon failure of the latter to be concatenated.

Fig. 5 is a side elevation of a sewing machine showing the manner in which my stop is used to actuate a belt shifter.

Fig. 6 is a wiring diagram of my invention as applied in a series of three machines.

Referring to the drawings, the numeral 1 represents the presser bar of a sewing machine to which the presser foot 2 may be attached in any of the known ways. In the present disclosure the stop is applied to a two-needle machine, the numeral 3 designating the needles thereof. Attached to the presser bar is a hollow casing formed of

vulcanite or other insulating material, the rear half 4 of which is secured to the forward half, 5, by screws 6. Mounted in the casing in alignment with each needle is a circuit closing device comprising a pair of superposed contact members 7 and 8, which are secured as shown by screws to the rear half 4. As the circuit closing devices are alike in all details, a description of but one of them will be given.

Attached to the respective contact members 7 and 8 are wires 9 and 10 leading from the casing. Below the contact member 8 is a vertically movable pin 11 adapted upon upward movement to move the contact member 8 against the member 7. This pin rests upon a lateral extension 12 carried by a flat spring 13 secured to the rear portion 4 of the casing by screws 14. At the forward end of the spring 13 a small roller 15 is mounted which projects laterally in alignment with a needle thread. If the machine is provided with more than one needle a pair of contact members and co-acting parts are provided for each needle, and the respective contact members are connected to the wires 9 and 10 as shown in Fig. 3.

In the present instance the machine is shown as driven by a belt 16, which latter may be shifted by a belt shifter 17 to either the fast pulley 18 or the loose pulley 19. The belt shifter 17 is slidably mounted in a bracket 17′ on the frame of the machine, and by means of a cord 20 connected to the belt shifter and carrying a weight 21, the belt shifter is normally moved to position the belt on the loose pulley 19. When it is desired to operate the machine the belt shifter is pushed over against the action of the weight 21 to position the belt 16 on the fast pulley 18 and thereby drive the machine, and to hold the belt shifter in this position an electric latch device is provided. The specific latch device used is immaterial, and in the present instance an ordinary form of electrically operated door latch is used. This comprises a hooked latch member 22 pivotally mounted on the belt shifter 17, and a complementary latch member 23 insulated from its support by a plate of insulating material 24. The member 23 carries therein a solenoid and a latch with which the hooked member 22 may be engaged. The solenoid is electrically connected with the contact members on the presser bar of the machine, and when the circuit is closed through any of said contact members the solenoid is actuated to release the hooked member 22, whereupon the weight 21 causes the belt shifter to shift the belt to the loose pulley 19 and stop the machine.

As before stated, it is desirable, when any one machine is stopped by failure of its needle to concatenate its thread, that an operative stationed at any machine in the series be able to at once stop all the remaining machines. For this purpose, each machine is provided with a series of push buttons corresponding in number to the number of machines in the series, which push buttons are so electrically connected with the latch members on the various machines that upon pressing the corresponding button in a series on any of the machines the same machine will be stopped. Hence, if any machine be automatically stopped, the operative, no matter where located in the series, can by pressing the buttons corresponding to the other machines, instantly stop them.

In the present disclosure, the machine used is a two-needle lock-stitch machine, and three machines are shown in a series. Referring to Fig. 2 it will be seen that during the normal operation of the machine, as the needle rises and the work is fed beneath the presser foot the needle thread 3′ leading from its last concatenation with the bobbin thread to the needle eye is inclined at a slight angle to the needle and at a relatively large angle to the work, but this inclination is not sufficient to bring it in contact with the roller 15. If, however, for any reason the thread 3′ should fail to be concatenated, as by bending of the needle, or breakage or exhaustion of the bobbin thread, when the needle rises from its last puncture in the material it will pull out its loop and the thread will extend from the needle eye to the previously formed stitch. Due to the feed of the work this stitch has moved sufficiently far back to incline the needle thread 3′ so that it will come in contact with the roller 15 and lift the latter, thereby causing the pin 11 to raise contact member 8 against the contact member 7 and close the circuit. By reference to Fig. 6, it will be seen that the wire 9 leading from the contact member 7 is connected to a battery wire 29, while the wire 10 leading from the contact member 8 is connected to one terminal 25 of the solenoid in the latch member 23. The circuit extends through the solenoid to its other terminal 26, which is grounded on the insulated latch member 23, and then through hooked latch member 22 to a ground on the machine, while the wire 27 grounded on the machine leads to the battery wire 28. Hence, it will be seen that when the contact members 7 and 8 close the circuit the solenoid in the latch member 23 will be actuated to release the hooked latch member 22, thereby allowing the weighted belt shifter to shift the belt 16 to the loose pulley and stop the machine.

In the present instance three machines have been shown, which are designated in Fig. 6 as machines A, B and C, and each machine is equipped with three push buttons. In the case of machine A, the circuit leads from one terminal of the push button

a through the wires 30, 31 and 9 and hence to the battery wire 29. A wire 32 leads from the other terminal of the push button a and connects with the wire 10, and the circuit then leads through the terminal 25, the solenoid, terminal 26, latch members 23 and 22, ground wire 27, to the battery wire 28. In the case of push button a' on machine B the circuit leads from one terminal of the push button through wires 30′, 31′ and 9′ to the battery wire 29. The circuit leads from the other terminal of the push button a' through wires 32′, 33 and 10 and then through the latch members 23 and 22 as before to the battery wire 28. In the case of machine C the circuit leads from one terminal of push button a'' through the wires 30″, 31″ and 9″ to the battery wire 29. The circuit leads from the other terminal through the wires 32″, 33 and 10 and through the latch members 23 and 22 of machine A as before to the battery wire 28.

The circuit leads from one terminal of push button b on machine A through wires 34, 31 and 9 to the battery wire 29. From the other terminal the circuit leads through wires 35, 36, 10′, the latch members 23′ and 22′, and ground wire 27′ to the battery wire 28. From one terminal of push button b' on machine B the circuit leads through wires 34′, 31′ and 9′ to the battery wire 29. From the other terminal the circuit leads through wires 35′, 10′ the latch members 23′ and 22′, and the ground wire 27′ to the battery wire 28. From one terminal of push button b'' on machine C the circuit leads through wires 34″, 31″ and 9″ to the battery wire 29. From the other terminal the circuit leads through wires 35″, 36 and 10′, the latch members 23′ and 22′, and the ground wire 27′ to the battery wire 28.

The circuit leads from one terminal of push button c on machine A through wires 37, 31 and 9 to the battery wire 29. From the other terminal the circuit leads through wires 38, 39 and 10″, the latch members 23″ and 22″, and the ground wire 27″ to the battery wire 28. The circuit leads from one terminal of the push button c' on machine B through wires 37′, 31′ and 9′ to the battery wire 29. From the other terminal it leads through wires 38′, 39 and 10″, the latch members 23″ and 22″, and ground wire 27″ to the battery wire 28. From one terminal of push button c'' on machine C the circuit leads through the wires 37″, 31″ and 9″ to the battery wire 29. From the other terminal the circuit leads through wires 38″ and 10″, the latch members 23″ and 22″, and the ground wire 27″ to the battery wire 28.

Thus it will be seen that an operator, no matter where he is stationed in the series of machines, can instantly stop machine A by pressing the buttons a, a' or a'' of any machine. In a similar manner machines B or C can be stopped by pressing any of the respective buttons b, b' or b'', or c, c' or c''.

By including the insulated latch member 23 and the hooked latch member 22 in the circuit the latter will be broken whenever latch member 22 is disconnected, thus avoiding all liability of running down the batteries should the circuit accidentally be left closed elsewhere.

As before stated machines having any suitable number of needles may be used, and any desired number of these machines may be arranged in stepped relation, it being only necessary to provide circuit closing devices for operation by each needle of a machine, and if the manually actuated stop means is also to be used to provide each machine with a series of push buttons arranged as described. While in the present instance the stop devices are shown as arranged to operate a belt shifter, it is evident that they may be readily applied to operate a clutch or any other means for stopping the machine. Any suitable equivalent may also be substituted for the weight 21 as a means for actuating the belt shifter.

By the use of my device a machine may be instantly stopped upon failure of its needle to concatenate the thread, and if a number of machines are used in series the remaining machines may be stopped by the operative by use of the push buttons no matter at which machine he may be stationed. By the use of my device the number of operatives is also reduced, as a single one can attend a number of machines, and the previous laborious operation of pulling back the belting through the machines upon failure of any of them to concatenate its thread is also obviated.

Having thus described my invention, what I claim and desire to protect by Letters Patent is:

1. In a sewing machine, stitch forming mechanism including a needle, a presser bar, means for stopping the machine including a solenoid, means carried by the presser bar for closing a circuit through said solenoid and including a pair of spring contact points, means for bringing said contact points together including a spring carried by the presser bar and a pin interposed between said spring and one of the contact points, and a roller carried by said spring disposed above the work and adjacent to but slightly in rear of the normal path of the thread from the work to the needle.

2. In a sewing machine, stitch forming mechanism including a plurality of needles, a presser bar coacting therewith, a stop mechanism, and automatic means carried by the presser bar for directly actuating the stop mechanism upon failure of any of the needles to concatenate its thread.

3. In a sewing machine, stitch forming

mechanism including a plurality of needles, a presser bar coacting therewith, stop mechanism, a solenoid for operating the same, a plurality of circuit closers mounted on the presser bar and electrically connected to said solenoid, actuating means for each circuit closer extending adjacent the normal path of the thread from a corresponding needle, said actuating means being adapted to be operated upon deflection of the thread from its normal path.

Signed at Passaic, N. J., this 16th day of April, 1920.

HENRY Z. COBB.