June 12, 1928. 1,673,355

A. F. FIFIELD

THREAD CONTROLLING DEVICE

Filed May 11, 1926 2 Sheets-Sheet 1

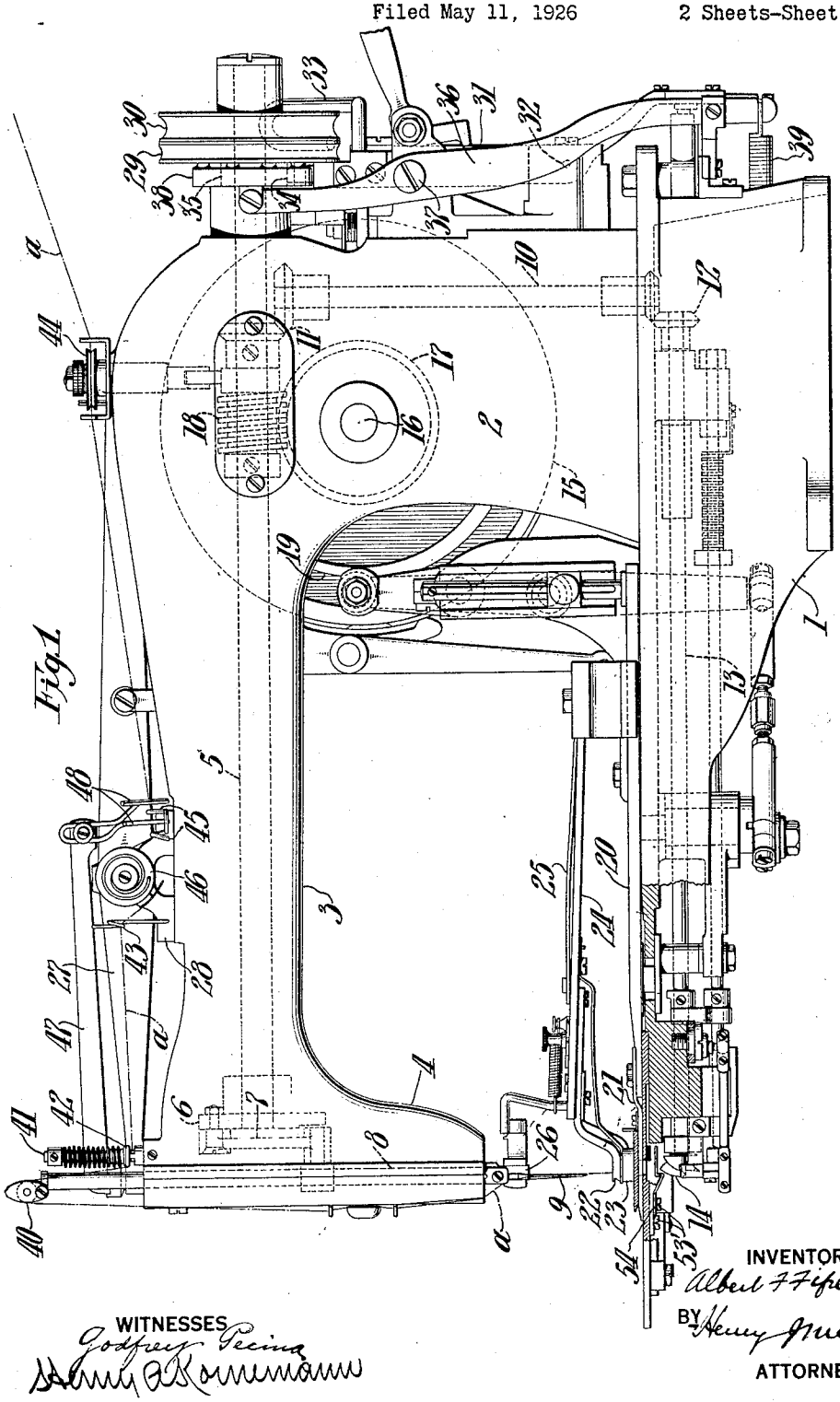


Fig. 1

INVENTOR
Albert F. Fifield
BY Henry Miller
ATTORNEY

WITNESSES
Godfrey Peeina
Henry A. Kommann

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A. F. FIFIELD

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Fig. 2.

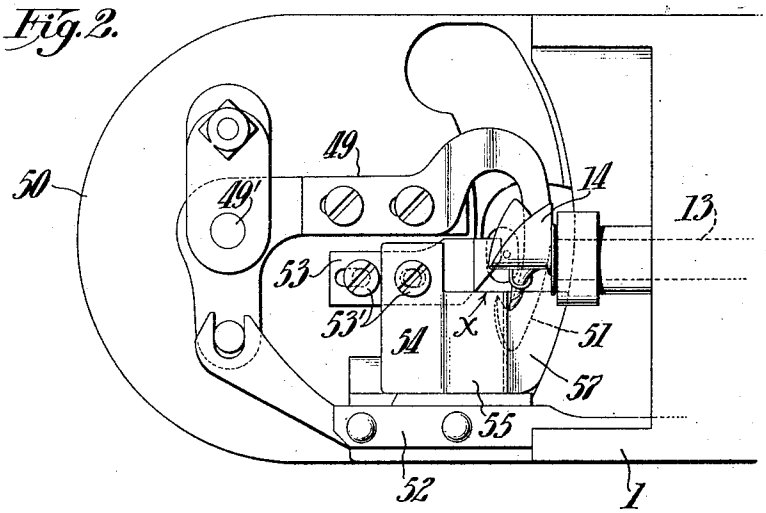
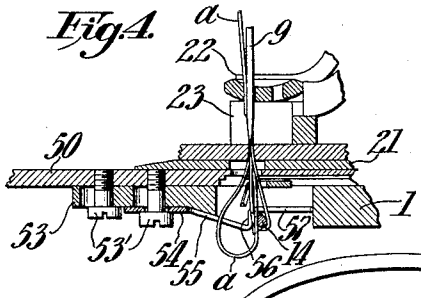


Fig. 4.



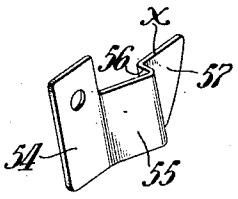


Fig. 5.

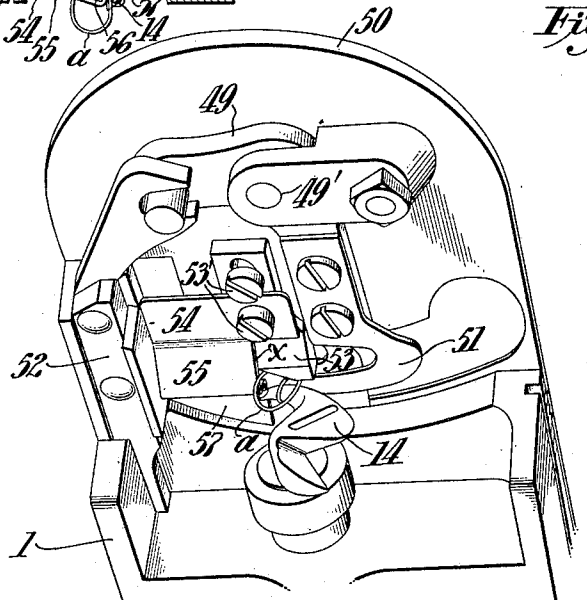


Fig. 3.

WITNESSES

Godfrey Fecina

INVENTOR

Albert F. Fifield

BY Henry J. Miller

ATTORNEY

Patented June 12, 1928. 1,673,355

UNITED STATES PATENT OFFICE.

ALBERT F. FIFIELD, OF NEWARK, NEW JERSEY, ASSIGNOR TO THE SINGER MANUFACTURING COMPANY, OF ELIZABETH, NEW JERSEY, A CORPORATION OF NEW JERSEY.

THREAD-CONTROLLING DEVICE.

Application filed May 11, 1926. Serial No. 108,233.

This invention relates generally to tacking and barring machines of the single thread chain stitch rotary looper type for sewing on buttons and may be embodied in the machine disclosed in my prior Patent No. 1,514,609, dated Nov. 11, 1924. In machines of this type, particularly those in which a large loop of thread is thrown out by the rising needle, due to a long needle-bar stroke, it not infrequently happens that the needle-thread loop is reseized by the looper before the thread is drawn up by the take-up to set the stitch.

An object of the present invention is to provide a guard for the needle-thread loop which will prevent reseizure of the loop by the looper before it is drawn up by the take-up.

It consists preferably of a guard member arranged transversely of and across the plane of movement of the looper beak so as to cover such beak after seizure of the new needle-loop and prevent the old loop from whipping around at either side of the needle into the path of the looper-beak before it is drawn up by the take-up. In one form of the improvement the guard-member for the needle-thread is carried by the needle-guard secured to the under side of the throat-plate.

The improvement is illustrated in the accompanying drawings in which Fig. 1 is a side elevation, partly in section, of a sewing machine embodying the invention. Fig. 2 is a bottom plan view on an enlarged scale of the elements upon the under side of the work-support adjacent the sewing point. Fig. 3 is a perspective view of the parts shown in Fig. 2. Fig. 4 is a sectional elevation of the work-support at the sewing point and Fig. 5 is a detailed perspective view of the thread guard.

In the preferred embodiment of the invention, as illustrated, the sewing machine is constructed with a frame comprising the base or bed 1 from which rises the hollow standard 2 having the overhanging tubular arm 3 extending therefrom and terminating in a head 4. Suitably journaled in the tubular arm 3 is the main-shaft 5 carrying at its forward end a crank-arm 6 having a link-connection 7 with the needle-bar 8 mounted for vertical reciprocation in the head 4 and carrying at its lower end the needle 9.

Journaled in the hollow standard 2 is the vertical shaft 10 geared at 11 to the main-shaft 5 and at 12 to the looper-shaft 13 carrying at its free end the looper 14 cooperating with the needle 9 in the formation of stitches.

The machine illustrated is provided with mechanism for producing relative movement between the work and needle. This mechanism which is or may be that disclosed in my prior patent No. 1,226,963, of May 22, 1917, comprises the feed-wheel 15 mounted at one side of the standard 2 on a shaft 16 passing transversely through the standard and carrying a gear 17 with which meshes a driving worm 18 on the main-shaft 5. The feed-wheel is formed on its side faces with lateral and longitudinal feed-cam grooves, the longitudinal feed-cam groove being shown at 19. The feed-cam grooves are entered by follower rolls carried by the usual lateral and longitudinal feed-connections with the usual work-clamp carried by the clamp-supporting bar 20 slidably mounted upon the bed 1. The particular work-clamp herein illustrated is adapted to hold gaiter buttons spaced from the material to which they are attached so as to produce a thread-shank around which a thread is wound by hand. The clamp comprises the usual work-supporting plate 21 and upper laterally separable button clamping jaws 22 having at their work-engaging faces the blocks 23 for spacing the buttons from the material, and carried by the overhanging or upper supporting member 24 of the work-clamp, which is spring-pressed toward the work by the usual leaf-spring 25. The upper member of the work-clamp may be lifted by the usual connection with a lifter-bar 26 slidably journaled in the head 4 adjacent the needle-bar 8. At its upper end the lifting bar is connected to the treadle-controlled clamp lifting lever 27 fulcrumed on the bracket 28 which latter is mounted on the bracket-arm 3.

On the rear end of the main-shaft 5 are mounted the tight and loose pulleys 29, 30, respectively, of a common form of start and stop motion device including the starting and stopping lever 31 which is pivoted at 32 and carries the belt-shipper 33 and stopping tooth 34, the latter cooperating with the stopping-cam 35 formed on the hub of the tight pulley 29. This stop-motion device is more fully disclosed in the patent to W. L. Barron, No. 1,093,241, of Apr. 14, 1914, to which reference may be had. The stop-motion device is fitted with the brak-

ing device of my prior Patent No. 1,498,649, of June 24, 1924, and comprises essentially the brake-arm 36 pivoted to the stop-motion frame at 37 and carrying at its upper end the brake-shoe 38 adapted to bear against the tight pulley 29 under the action of the coil-spring 39.

The machine is also fitted with the thread-controlling and take-up mechanism of my prior Patent No. 1,452,033, of Apr. 17, 1923, and comprising essentially the needle-bar thread take-up eye 40 cooperating with the thread-post 41 on which is slidingly mounted the spring-pressed collar 42 beneath which the sewing thread is led from the thread-eye 43 on the bracket 28. The sewing thread *a* is led from the source of supply through the usual intermittent tension device 44, through the fixed eyelets 45, constant tension 46, and thence through the fixed eyelet 43 and yielding thread-collar 42 to the needle-bar take-up 40 previously mentioned. A thread-pull-off bar 47, rigidly mounted upon the upper end of the clamp-lifting bar 26 is fitted at its free end with thread-engaging hooks 48 for drawing off a supply of slack-thread through the open intermittent tension device 44 in the well known manner when the machine is at rest and the work-clamp is raised to release the work.

The machine is also fitted with a thread-cutting mechanism comprising a bellcrank-lever 49 pivoted at 49′ upon the under side of the throat-plate 50. The bellcrank-lever has secured thereon a thread-cutting blade 51 and is connected to be operated by means of the usual overthrow side-motion of the stop-lever 31 which gives an endwise movement to the link 52 as the main-shaft 5 comes to rest. This well known endwise movement given to the link 52 causes the lever 49 to be swung about its pivot 49′ whereby the thread-cutting blade 51 is caused to enter and sever the last needle-loop below the work. Secured upon the underside of the throat-plate by the fastening screws 53′ is the needle-guard 53 which is disposed above and on that side of the needle remote from the looper 14 so as to effectually guard against deflection of the needle below the throat-plate and insure seizure of the needle-thread loop by the looper.

Mounted upon the needle-guard 53 by one of the fastening screws 53′ is the shank 54 of the thread-guard having the angularly related walls 55, 56, 57 so disposed adjacent the top and side of the looper-beak as to guard the latter after passing loop-seizing position. It is constructed of sheet metal and comprises the downwardly inclined portion 55 extending from the shank 54, the upturned portion 56 and the laterally extending portion 57 with inclined outer edge.

In the operation of sewing machines of this type, it not infrequently happens that the loop of needle-thread after being cast off from the looper is deflected in the path of the looper beak and caught a second time by the latter before the take-up has drawn it up. This may be due to the air currents produced by the rapidly rotating looper or to the twisting of the needle-thread loop. In order to overcome this difficulty the thread-guard is positioned in rear of the looper and out of range of the expanding or nascent needle-loop prior to seizure of such loop by the looper, so that the effective front edge *x* of such guard covers the looper-beak shortly after the looper has seized a new needle-loop and is shedding the previously seized loop which is drawn upwardly past the edge *x* of the thread-guard above the path of the looper-beak during the action of the take-up.

While in one form of the improvement the thread-guard 54 is mounted upon the needle-guard 53, it will be readily understood that the thread-guard will be equally effective if mounted upon some other part of the machine adjacent the looper 14, provided it is so disposed as to guard the looper-beak after passing loop-seizing position.

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

1. In a sewing machine, in combination, a thread-carrying needle, means for reciprocating said needle, a rotary chain-stitch looper having a loop-seizing beak and loop-spreading wing and cooperating with said needle in the formation of stitches, take-up means, and a guard having its active portions adjacent the needle disposed in rear of the needle-path and out of range of the expanding needle-loop prior to seizure of such loop by the looper, said guard being adapted to cover said looper-beak after it has seized a new needle-loop and prevent its subsequent seizure of the old or cast-off needle-loop before the latter is drawn up by the take-up means.

2. In a sewing machine, in combination, a thread-carrying needle, a rotary chain-stitch looper having a loop-seizing beak and loop-spreading wing and cooperating with said needle in the formation of stitches, take-up means, and a guard having angularly related walls disposed in rear of the needle-path, said walls being disposed respectively adjacent the top and side of the looper-beak after passing loop-seizing position, whereby to guard the looper-beak after it has seized a needle-loop and prevent reseizure of the cast-off needle-loop before the latter is drawn up by the take-up means.

3. In a sewing machine, in combination, a reciprocating needle, a rotary chain-stitch looper having a loop-seizing beak and loop-spreading wing, and a thread-guard having an effective front edge disposed transversely of the plane of movement of the looper-

beak and in rear of the needle-path and adapted to cover the looper-beak after it has seized a needle-loop and prevent the cast-off needle-loop from whipping around in front of the looper-beak.

4. In a sewing machine, in combination, feeding mechanism, a thread-carrying needle, a rotary chain-stitch looper having a loop-seizing beak and loop-spreading wing and cooperating with said needle in the formation of stitches, a needle-guard, take-up means, and a thread-guard carried by the needle-guard and having an active front edge extending transversely of the line of feed in rear of the needle-path for guarding said looper-beak after it has seized a new needle-loop and preventing reseizure of the old or cast-off needle-loop before the latter is drawn up by the take-up means.

In testimony whereof, I have signed my name to this specification.

ALBERT F. FIFIELD.